Native to the West

A guide for planting and restoring the nature of Waitakere City

Waitakere City Council
Te Taiao o Waitakere

GREENNETWORK

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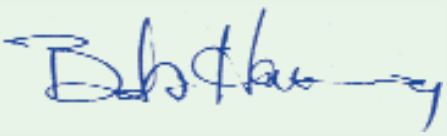
Message from the Mayor

Waitakere City is blessed with a unique natural heritage. The city's landscape is stunning, dominated by native forest, and sea. At the city's heart, the Waitakere Ranges are a valued resource for the entire Auckland region. The coastline varies from rugged West Coast beaches and cliffs to the sheltered bays of the Manukau and Waitemata Harbours.

The Green Network programme encourages residents to look after the city's valuable natural assets, and allows streams, parks, patches of bush and forest to weave throughout the ranges, rural, urban and coastal areas. People are showing enormous enthusiasm towards greening the city on public and private land.

This updated planting guide builds on the success of the earlier publication and provides a valuable tool to help residents care for and restore the nature of Waitakere. Happy planting!



Bob Harvey

Mayor of Waitakere City

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A guide for planting and restoring the nature of Waitakere City

If you live in Waitakere City and want to know what native plants to grow on your property, this booklet is for you. It offers useful information, whether your patch is located in suburban New Lynn, backs onto bush in the Waitakere foothills or is within walking distance from a West Coast beach.

You may want to 'restore' a piece of land back to its original bush cover. The aim of restoring is to establish a habitat made up of plants that are as close as possible to the natural vegetation that used to grow on your property.

Or you may simply wish to create a corner for native plants in your urban garden to attract native birds.

Whatever the size and scope of your planting project, this booklet encourages you to research the ecosystem your backyard is part of, and to work out what natives are best suited to your conditions.

Use the booklet as a starting point and reference tool. You can also contact Waitakere City Council directly for advice and information. Refer to the inside back cover for helpful contacts and further reading material.

Diana Elliot

Contents

Take a look at the big picture

Native plants are simply those plants that grew, evolved or migrated here without help from people. Nearly 80 percent of New Zealand's native plants live nowhere else in the world, and some are facing extinction.

Our own Waitakere Ranges forest is nationally important with a unique collection of native species and its own distinctive ecology. Its appearance and ecology are entirely different from other kauri forests, especially Waipoua and Coromandel.

The more we learn about local plants, the more we appreciate what's special and unique about our place. Plants that are part of our lives are also part of our cultural heritage and identity.

The Green Network

By deciding to plant natives suitable for Waitakere City, you are doing something enjoyable for yourself but also creating a habitat for wildlife and helping grow the city's Green Network.

The Green Network programme has been underway since 1993 and is about greening up the city and enhancing, connecting, and extending existing natural areas.

The vision is to connect the Waitakere Ranges with the sea, and improve the ecological health of the city, via strands of greenery – bush, gardens, vineyards, and parks. Viewed from above, the network would look like a web of green intersecting built-up areas of the city.

Access to the Green Network might be at your front gate or your backyard. Your hedge or garden may connect with your neighbours' planting. The trees down your street might lead to a park that borders a stream. The stream may flow by a sports field, and run into a wetland and beyond into a mangrove forest, and on to the sea.

Or you may join the Green Network up in the Waitakere Ranges. The forest there meets scrubland and farm shelter belts. The paddocks of the farms merge with vineyards and orchards and these merge into neighbourhood parks and people's back gardens.

The Green Network helps increase Waitakere's biodiversity by enabling a greater number and range of creatures to live here. Having a variety of birds, fish, lizards and insects in good numbers is a sign of ecological health. Linking vegetation is especially important, as many native birds need continuous cover and access to sizeable tracts of bush as **they will not fly over open or built-up areas**. All native birds rely on the food that comes from native plants, including insects that live amongst these plants.

From the Green Network we also gain: great views and vistas, places to play, walk and talk, fresh air, wide open spaces and wilderness, clean water for drinking, clean surf to swim in and stretches of nature that are good for the soul.

Our economy also relies on the 'services' provided by natural systems that are working healthily together. If a stream ecosystem is functioning well (this includes the vegetation on its banks), cleaner water then flows into our harbours. When these systems become overwhelmed or fail, economic costs go up and the quality of our lifestyle goes down.

Refer to the contacts list for council and community projects that are expanding the Green Network.

Opanuku Stream at Corban's Art Estate, Henderson, part of the Green Network.

Streamside planting

Is your place one of the hundreds of Waitakere properties with a stream running through it? These streams are vital native habitats and Green Network links. They are also often neglected and in a poor state of health.

The bush of the Waitakere Ranges protects the quality of water in streams in the upper catchment areas, but the lack of vegetation along the edges of waterways (the riparian margins) in our urban and rural areas is a major concern.

By removing lawn edges and weeds and replanting even a metre either side of the stream with the right native plants, you can make a significant difference to the health of the stream's micro-ecosystem. It will also look great!

Replanting streamsides:

- helps secure banks against slips and erosion
- provides a home and food source for aquatic creatures and other native animals and birds
- keeps invasive weeds at bay
- provides shade to keep water cool for stream life
- reduces flooding – appropriate plantings absorb water and improve drainage

- filters sediment from surface run-off before it reaches the stream.

For more information on streamside protection see the 'Contacts and Reading List', or contact the Council Call Centre 839 0400.

Carex is the name for the attractive native sedges that are especially beneficial planted right on the edge of a streambank. There are several varieties – they are very popular but can be used incorrectly.
The species to use in Waitakere are *Carex lessoniana*, *C. flagellifera*, *C. maorica* for fast flowing stream edges and *C. dissita*, *C. secta* for still water edges, eg. ponds. Refer to the reading list for more information on *Carex* and streamside planting.

Ecosourced plants

You will have greater success with your backyard planting or larger restoration project, if you use 'ecosourced' plants.

These are plants grown from seeds that have been collected locally from a range of the naturally occurring vegetation in your area. Locally sourced plants are adapted to local conditions and frequently grow better than outside stock.

Eco-sourcing maintains the genetic diversity of local plants and helps keep the unique character of the Waitakere landscape. Although we may call them by the same name, there are often subtle genetic differences between the same types of plants from different regions. Plant species from the South Island are as alien to Waitakere as non-New Zealand species.

Ecosourced plants are of benefit in any area, including backyards, as whatever you plant will find its way (through seed dispersal by wind, water and birds) to natural parts of Waitakere. They are particularly important in areas:

- of outstanding vegetation – Green Bay cliffs and around Moire Park, Massey
- bordering streams
- close to 'wild populations' – bush properties like those on Scenic Drive and in Titirangi.

Native plants found in nurseries are not necessarily ecosourced. When buying plants, look for the council's 'ecosourced' label. Contact the council for a list of local nurseries that supply ecosourced plants.

Unwanted natives

Several plants native to other parts of New Zealand are not native to Waitakere. The following plants should **not** be grown as they can change the make-up or compromise the survival of local plant populations by hybridising with Waitakere species. This may result in a dramatic change to the local identity and ecology of Waitakere forests.

- Houhere/lacebark
  Keep *Hoheria sexstylosa* south of the Bombay Hills (*Hoheria populnea* is fine to plant in Waitakere)
- offshore island kawakawa *Macropiper* varieties
- Kamahi *Weinmannia racemosa*
- Kapuka *Griselinia littoralis* especially in Scenic Drive, Piha and Mountain Road areas
- Three Kings *Coprosma macrocarpa subsp macrocarpa* (large-fruited plant). Waitakere-sourced *Coprosma macrocarpa subsp minor* is ok
- Makamaka *Caldcluvia (Ackama) rosaefolia*
- Offshore pohutukawa, Tahitian (*Metrosideros collina*), and Kermadec (*M. kermadecenis*).

In the ranges and foothills – from Great North Road west to the coast – **don't** plant non-Waitakere:

- *Pseudopanax* (lancewood/horoeka, houpara etc)

On West Coast and Manukau Harbour coast up to Huia **avoid**:

- non-Waitakere *Hebe* of any species capable of flowering in Auckland (alpine species are acceptable)
- any kowhai other than *Sophora fulvida*, the special local variety.

To help control their sale and cultivation in Waitakere, a list of high-risk plants has been compiled and is available from the council.

Unwanted introduced plants

Introduced plants (exotics) will also enhance your garden. But check them out carefully first – no matter how beautiful they seem – and do **not** use plants that can smother natives, and invade the nearby bush and forest.

The number of invasive weed species in Waitakere is approaching 250. This is only 1% of all the plants that can be grown here. When buying plants, choose from the huge range of other splendid native and non-invasive introduced plants.

Contact the Auckland Regional Council for its booklet *Plant Me Instead*. It gives many great examples of introduced and native species than can be used to replace weed species – rengarenga lilies instead of agapanthus.

The greatest threat to healthy environments in Waitakere and New Zealand is posed by introduced species of: aquatic plants, vines, groundcovers, palms and ferns. Grasses, shrubs and tree species generally pose a lesser threat – although weeds do exist in these growth forms. The best plants to use are natives (especially those that grow naturally in the local area), and those introduced plants that have been here longest and are not invasive.

Auckland-wide, the weed problem is controlled by the Auckland Regional Council, through its 'Regional Pest Management Strategy.' The strategy provides a statutory framework for the management of plant and animal pests to minimise the effects of targeted pests.

Eradicating introduced plants that have become noxious weeds is a big part of any planting project. For more information on weeds and weed control refer p10 and the reading list (p53).

Gardening…eco-gardening…restoring

Imagine these three types of planting activities on a continuum with gardening at one end, restoring at the other.

Many of us love **gardening**. Traditional gardening methods usually aim to control and maintain nature to suit popular and personal notions of a lovely garden. Some natural processes still occur but generally we restrict them, through weeding, mulching, and the pruning or thinning of trees. We also organise plants into beds, grow specimen trees and like to keep things 'tidy' (raking etc). Often we modify ground conditions to suit chosen plants.

Think about expanding your gardening practice to incorporate **eco-gardening** principles. This is a way to combine a love of gardening with concerns for a healthy environment. Eco-gardening draws inspiration from the wild and seeks to maximise the benefits of nature – even in small spaces and residential areas. You can start with just one corner of your urban garden by taking the following steps:

- Cluster plants in groups (instead of as separated specimens), and keep leaf litter, old branches, and loose rocks on the ground. This will connect you to the wider Green Network (p2) and increase the potential for native birds, insects, worms, lizards, soil bacteria, fungi etc, to make a safe home and find food at your property.
- Provide green links – between such clustered plants and then to the hedge, the stream or the bush edge. This will help wildlife get safely to the homes and habitats you have provided.
- Plant species side-by-side that naturally grow together – 'natural neighbours'. Choose them not only for the form, texture, colour of the individuals but the effect they create together – refer to the plant tables pp26-51.
- Use ecosourced plants native to the locale of your garden – refer to the ecosystem map p17.
- Keep your 'wild corner' free of invasive weeds.
- Doing any of the above is of benefit to the health and functioning of the Waitakere environment.

Restoring is a planting activity concerned with establishing wild vegetation and then letting nature take care of itself.

In a bush environment dense plant growth is a natural tool for inhibiting weeds. Even dying trees and dead branches contribute to the natural system by forming habitat for many other creatures. With good planning, and planting suited to the conditions, we humans can enhance or kick start these natural processes. We can also help by reducing threats to the restored habitat by removing invasive weeds and animal pests. Refer to p8 for priority areas to restore and guidelines for how to go about it.

Each part of this planting continuum has a place in our lives. Be sure to distinguish between them and choose which is appropriate where. Transferring common gardening practices into natural areas can have damaging consequences for wildlife.

Diana Elliot

Native plants provide essential food and habitat for insects and birds, even in small city spaces.

Gardening with natives

Native plants grow naturally where they 'compete' best. When they are planted outside their natural ecosystems, as often happens with gardening, they can still survive and do well because **you** the gardener keeps the competition at bay by weeding and pruning. The plants listed in this section are safe to plant in all garden sites around the city. It is, however, vital to use only ecosourced plants if you are *restoring* bush.

The use of native plants in a garden offers so much. The big challenge is to familiarise yourself with the variety and features of available plants. You can 'pick and mix' natives or you can use them in combinations they would naturally grow in. Try some of the suggestions given below and look at the plant tables pp26-51 for other ideas. There's plenty of potential to experiment. Refer to the reading list for *The Native Garden*, a book with more great ideas on this topic.

Trees for streets and gardens

Kanuka (*Kunzea ericoides*) Hardy and fast growing. All soils suitable except boggy. Soft foliage and white flowers like a dusting of snow. An excellent landscape tree, visually softening and providing a link with the ranges.

Karaka (*Corynocarpus laevigatus*) Striking with bold, shiny foliage.

Karo (*Pittosporum crassifolium*) Naturally confined to coastal fringe.

Kohekohe (*Dysoxylum spectabile*) A striking tree with bold foliage, needing good soil. Susceptible to possum attack.

Kohuhu (*Pittosporum tenuifolium*) Use the distinctive small-foliage Waitakere form.

Kowhai (*Sophora microphylla*) A northern form belonging to Auckland and Northland. Buds and nectar bring birds to town – kereru and tui. Only plant in free-draining soils, with plenty of light. To protect the vulnerable trunk from damage from mowers, etc. plant with flax or shrubs at the base.

Check the plant tables for more information on kowhai.

Manuka (*Leptospermum scoparium*) Fast growing. Needs moist soil to grow well. Good companion plant in cluster plantings.

Miro (*Prumnopitys ferruginea*) Needs good soil to perform well. A slower growing, quality tree.

Nikau (*Rhopalostylis sapida*) A distinctive palm tree for groves and avenues. Inter-plant with other species during establishment. A long-term investment, as very slow to establish a trunk (12+ years). Needs moisture. (Note: faster growing exotic and offshore island species/varieties of palms are **not** appropriate in Waitakere)

Pohutukawa (*Metrosideros excelsa*) Natural range limited to narrow coastal fringe habitat. Use to reinforce natural patterns. A hardy street tree.

Ponga, silver tree fern (*Cyathea dealbata*) Drought tolerant, slower growing.

There are three species of kowhai found in Waitakere:

Sophora fulvida (West Coast kowhai)

Sophora microphylla (kowhai) and *Sophora chathamica*.

Plant West Coast kowhai only in areas west of Scenic Drive including the West Coast and Manukau Harbour from Whatipu to Cornwallis.

Puriri (*Vitex lucens*) The flowers and fruits bring birds like tui and kereru to town. Bold, shiny foliage, puriri tolerates poorer soil than titoki, taraire and kowhai, but must have a good depth of topsoil.

Rata (*Metrosideros robusta*) Inland cousin of pohutukawa. Hardy, attractive tidy tree with summer red flower display, a little less regal than pohutukawa. Extensive range in Waitakere.

Taraire (*Beilschmiedia tarairi*) Stately, with bold, shiny foliage. Needs good soil.

Tarata, lemonwood (*Pittosporum eugenioides*) Hardy tree. Use the Waitakere variety which has wider foliage.

Ti kouka, cabbage tree (*Cordyline australis*)

Titoki (*Alectryon excelsus*) Splendid tree for use in good soil in the Waitakere lowlands.

Toru (*Toronia toru*) Neat and tidy tree with light green foliage. Clay tolerant.

Totara, tanekaha, rimu, rewarewa, kahikatea, kauri Tall stately trees for avenue, statement, effect, or inter-mixed among smaller-growing trees.

A guide to plant heights:

Tall trees:
taller than 15 metres

Medium trees:
less than 15 metres

Small trees / large shrubs:
less than 5 metres

Shrub / flax like plants:
less than 3 metres

Grasses / sedges / rushes:
less than 1.5 metres

Low ground plants:
less than 1 metre

Jacki Byrd

Mature native street trees (pohutukawa in this case) provide food and habitat for native birds, and character to streets.

Hedges and screens

Fine foliage screen planting:

Hangehange (*Geniostoma rupestre*) 1-2m high

Karo (*Pittosporum crassifolium*) 3-6m high

Kohuhu (*Pittosporum tenuifolium*) 3-6m high

Mapou (*Myrsine australis*) 3-6m high

Totara (*Podocarpus totara*) 3-6m high

Formal low hedge (like Box):

Coprosma rhamnoides

Pohuehue (*Muehlenbeckia complexa*)

Ramarama (*Lophomyrtus bullata*)

Formal hedge:

Korokio (*Corokia buddleioides*)

Bluff korokio (*Corokia cotoneaster*)

Taupata (*Coprosma repens*)

Mamangi (*Coprosma arborea*)

Thin leaved coprosma (*Coprosma areolata*)

Bird fodder:

Harakeke (flax)

Hangehange

Kahikatea

Karaka

Karamu (*Coprosma robusta*)

Kohekohe

Kotukutuku (tree fuchsia)

Kowhai

Mahoe

Maire

Miro

Nikau

Pigeonwood

Pohutukawa

Puriri

Rewarewa

Rimu

Taraire

Tawa

Titoki

Whauwhaupaku (5-finger)

Showy flowers

From early spring to mid-summer there is a cascade of colour as a succession of trees burst into flower

Red:

Carmine rata vine Can grow as a shrub. Has large leaves. The Waitakere strain is distinct from standard horticultural stock.

Rata vine Can grow as a shrub. [Please do not grow introduced *Metrosideros* – Tahitian. Pollinated by bees and birds, the introduced forms threaten to pollinate and inter-breed with native rata and ruin our NZ heritage.]

Taurepo Grow in pots or garden.

Toropapa Grow in pot or garden. Scented.

Yellow:

Kowhai Pot or garden. Can be trimmed. Dwarf strains occur. Pollinated by birds.

White:

Pua waananga bush clematis vine (*Clematis paniculata*) The most showy of the native clematis. For results, plant with roots in the shade, and foliage in the sun. Plant with humus, peat and blood & bone.

Tree daisy (*Olearia furfuracea*) Clay tolerant. A mass of white flowers in summer. Hedge or screen use. *Olearia rani* too.

Manuka Fast-growing, hardy, colourful. Fast and inexpensive. Suitable for mass planting toward the back of a garden and interplant with special natives. Use local Waitakere manuka.

Kanuka Softly cascading foliage when in flower. A snowfall effect. Excellent landscape tree in urban areas to provide quick character and a softening effect. Use local Waitakere kanuka.

Ti kouka cabbage tree Large flower panicles.

Perfumed plants

Karaka The ripe fruit has a distinctive smell

Pleasant forest flower scent:

Hangehange

Mahoe

Pigeonwood

Putaputaweta

Floral perfume:

Heketara

Rangiora

Karo Lightly scented, flowers October.

Toropapa Waitakere has beautiful pink and red forms with particularly good size blooms. Avoid other species or non-Waitakere stock, flowers August.

Clematis (*Clematis forsteri*) Sept-Oct. Beautiful scent, like feijoa fruit scent. Best in a rockery or a tub. Grows above Waitakere bluffs.

NZ jasmine vine (*Parsonsia heterophylla*) This one is **not** invasive!

Ti kouka cabbage tree

Scented foliage:

Wharangi

Mairehau

Kanuka The foliage makes an acceptable tea drink.

Kawakawa A relative of Fijian kava.

Perfumed non-invasive exotics

Boronia

Gardenia

Rose

Carnation

Lavender

Poisonous plants

Toxic Waitakere plants:

Tutu (*Coriaria arborea*) All parts extremely toxic.

Ngaio (*Myoporum laetum*) Causes vomiting, pain, etc.

Kowhai (*Sophora spp.*) Seeds in particular are toxic.

Poroporo (*Solanum spp.*) Berries cause sickness, taste unpleasant.

Karaka (*Corynocarpus laevigatus*) Fruit kernels toxic.

Jacki Byrd

Low maintenance natives can be complemented with flowering annuals to provide additional colour.

Natural neighbours from special habitats

Some wild communities of native plants offer a distinctive look and interesting mix of plants for a garden. Listed below are examples of specific plant groups that you could mimic in your garden. The heading for each group indicates the natural habitats where they grow in the wild.

Saltmarsh herbfield

Found beside estuaries and on bluff tops; plants are happy with salt, some with mowing, but none with trampling.

In pine bark, scoria mulch, plus a few rocks or shells:

Oioi (jointed rush)

Wonderful piupiu-type foliage

Wiwi – dark green rush

Wind grass – in rocks

Saltmarsh ribbonwood

plus native and flowering herbs such as:

Remuremu mix with others, or use alone as a courtyard lawn grown in fine, weed-free bark, not soil.

Shore pimpernel

NZ spinach (edible)

Native celery

In a setting of coastal fringe plants either:

Coastal karamu

(Coprosma macrocarpa)

Kawakawa

Kowhai

Wharangi

or, coastal alluvial flat plants:

Flax

Toetoe (not pampas)

Nikau

Kahikatea

Putaputaweta

Inner harbour shrub border

Kawakawa

Wharangi

Coastal karamu

(Coprosma macrocarpa)

Possibly also a saltmarsh herbfield planted in sand or fine bark mulch.

Blufftop shrubland

With rocks interspersed, a shrub garden with:

Korokio

Whararikí

Puka (*Griselinia lucida*)

Akepiro

Rata vines carmine, small white and red rata species.

Kiekie

Wharawhara coastal astelia (*Astelia banksii*)

Huia hebe (*H. bishopiana*)

Prickly mingimingi (*Cyathodes juniperina*)

Gahnia lacera bamboo cutty grass

Clematis forsteri scented clematis. Hard to obtain but a real delight.

Ferns (refer plant tables)

Mikoikoi NZ iris (*Libertia ixiodes*)

Large flowered iris (*Libertia grandiflora*)
Perhaps also associated trees, such as: **tanekaha**, **kauri**, or **miro**

Waitakere rockland

West Coast kowhai spring flowers

Puka (*Griselinia lucida*) shiny foliage

Coastal astelia (*Astelia banksii*) handsome foliage

Huia hebe (*H. bishopiana*) spring-summer flowers

Carmine rata spring flowers

White rata summer flowers

Korokio fine silver foliage

Taurepo orange flowers, summer

Waitakere forget-me-not (*Myosotis petiolata var. pansa*)

Kauri community

As in the leaf litter under each kauri tree:

Kauri grass a smart tussock

Toropara fragrant, winter flowers (also lovely pot plant)

Mairehau fragrant foliage often tinged red

Spiderwood

Neinei

Akepiro

Mingimingi (*Leucopogon fasciculatus*)

Prickly mingimingi (*Cyathodes juniperina*)

Kahakaha (*Collospermum hastatum*)

Kiekie

Turutu beautiful blue berries

Cool gullies

Parataniwha Plant a glade, with lots of moisture, mulch and good soil. Visit the ranges to see what a wonderful effect you can create!

Nikau

Hen & chicken fern

King fern Rare due to wild pigs. Needs fertile soil, good drainage, lot of summer moisture. Beautiful fronds 2-3m long

Lastreopsis hispida
A beautiful fern with hanging stems.

Provide shade with fast-growing:

Mamaku

Pate

Houhere

Piha coastal cliff community

Small trees & shrubs such as:
Houpara (& local hybrids)

Kawakawa

Karo

West Coast kowhai

Taupata

Coprosma macrocarpa

plus, over rocks:

Coastal astelia (*Astelia banksii*)

Waitakere rock daisy

on a sand pile:

Pohuehue

Native spinach (*Tetragonia implexicoma*)

Spinifex

Native Dichondra

Makaka

Groundcover Ferns:

Asplenium oblongifolium

Shield fern

Giant hypolepis

Rosy maidenhair

Associated large trees:
Pohutukawa

Karaka

Puriri

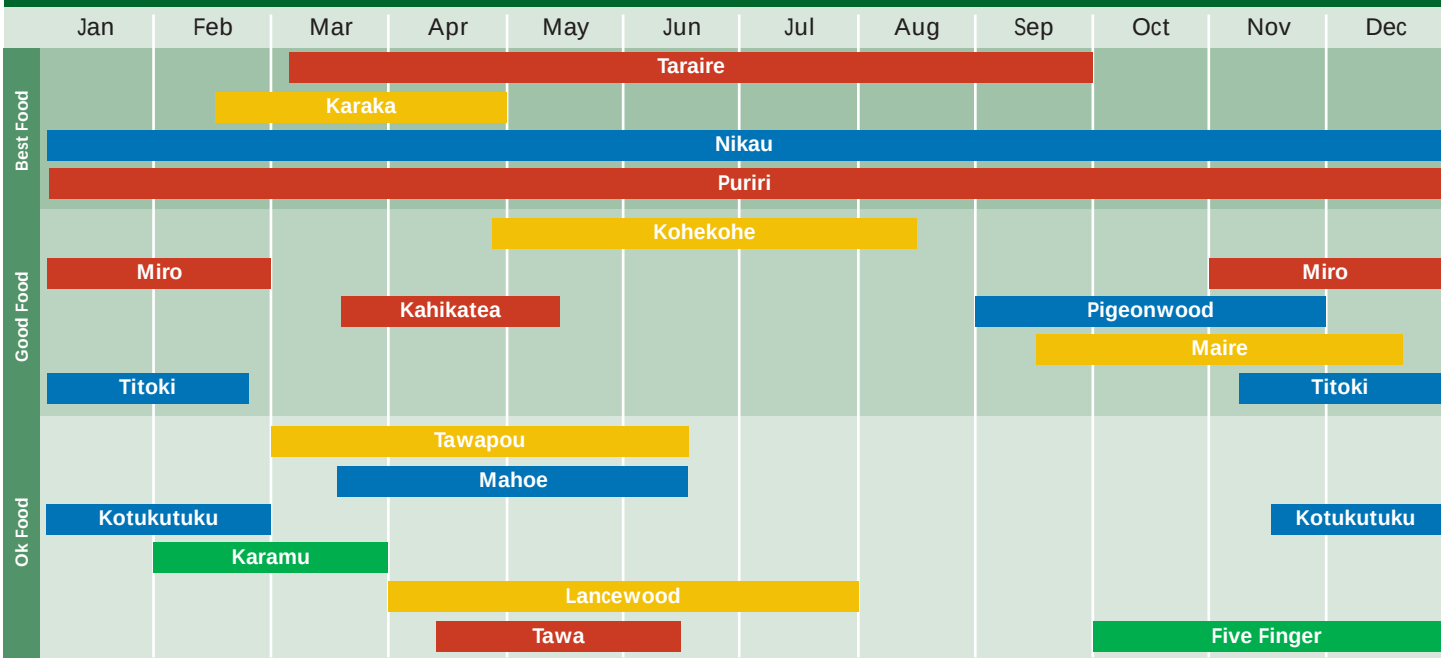
Kohekohe

Stephen King

Hebe bishopiana

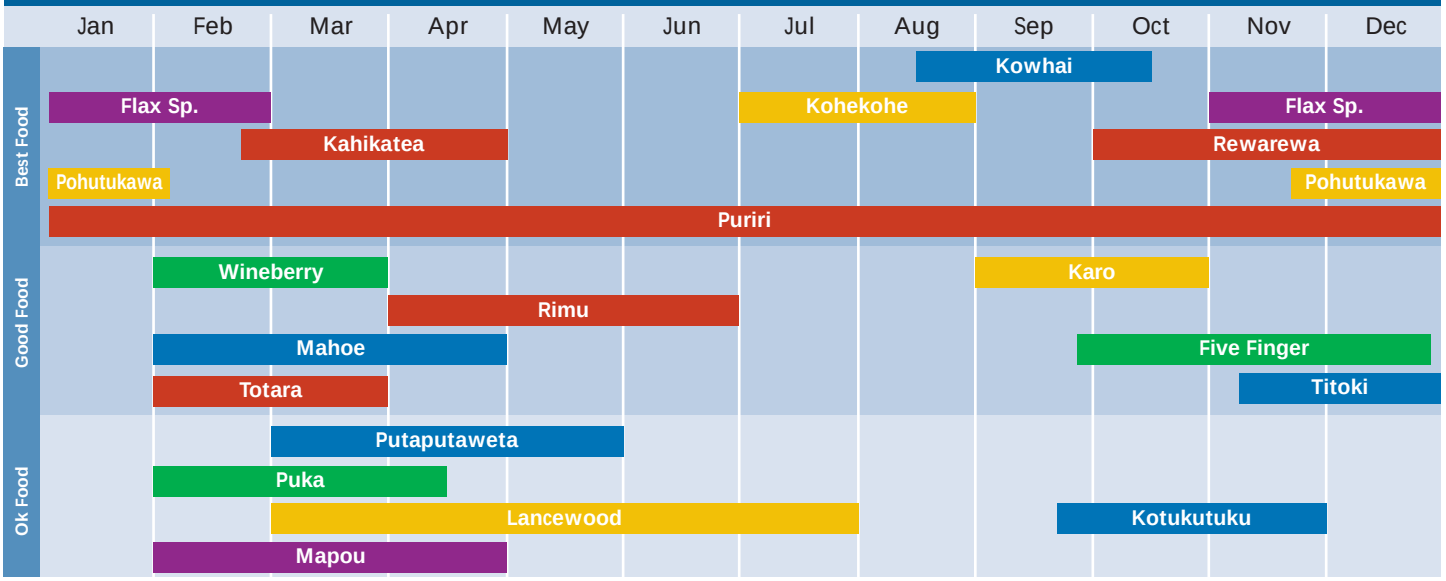
Planting for birds

Native Trees for Kereru (Pigeon) Food



During the breeding season (July–February), the home range of Kereru can be 4-5 hectares or even smaller if there is sufficient food. During the non-breeding season Kereru will fly several kilometers for different foods. These tree fruiting times are a guide only and may differ slightly in your area.

Native Trees for Tui and Silver Eye Food



During their breeding season (September-January), tui have a home range of 4-5 hectares, but at other times will fly up to 50 kilometres in search of food. Silvereye have a breeding season range of just one hectare but at other times will typically travel up to 10 kilometres for food. These tree fruiting times are a guide only and may differ slightly in your area.

Plant Height

- Plants to 6 metres
- Plants to 6-8 metres
- Plants to 9-12 metres
- Plants to 13-20 metres
- Plants over 20 metres

Source: Department of Conservation / Northland Regional Council

The ABC of restoring bush

The ABC sections below offer guidelines for how to restore a piece of land back to its original vegetation. Mature native bush develops in several steps over many years, with each step providing conditions that will suit the next group of plants.

The basic ABC principles also apply when planting natives on a smaller scale in a garden setting, but refer to pp 5-7 for specific ideas and explanatory notes on what to plant.

3 STAGES

A = Plan and Prepare

B = Plant

C = Maintain

A and C are the most important. B is the most fun!

Some areas are especially important to restore, because of the large impact they have on the health of areas connected to them. These priority sites include:

Streamsides – often called riparian planting – refer to p2.

Bush edges – healthy vegetation on the edges of existing bush keeps out invasive weeds and maintains a moist air environment. You can create a bush edge or repair damage to an existing one by eradicating weeds and filling in any gaps with the appropriate nurse plants (see p10 for more on nurse plants).

Gaps in a bush canopy – large gaps in the canopy of a bush area can leave the bush vulnerable because it takes a long time to repair. A 'too large' gap is one where the canopy species around the gap cannot fill the space by branches growing sideways from all sides; and where there are no young trees to grow up into the gap. To repair the gap use the appropriate nurse plants to cover the ground within the gap as the first step.

Passageways of green that connect two otherwise separate natural areas – this linkage provides cover through which birds and other wildlife can move, and contributes to the health of those areas and the Green Network (p2). The further a natural area is from a like area, the longer it takes for plant species to successfully travel from one to the other as part of the natural repair process. A distance of 300 metres in a straight line is a good measure. Beyond this, new plant species arrive very slowly.

Note: Except in the circumstances described above, weed-free, large or well-connected bush areas tend to maintain themselves, healing damage in both the canopy and the understorey and inhibiting new weeds. **Such areas should be left to do so**. The main thing we can do is to manage weeds or pests, exclude stock etc while the repair happens.

In all cases, when planting in or near already established bush, take great care to choose species appropriate to the ecosystem, and to use ecosourced plants.

Through its Green Network Community Assistance Programme the council is happy to assist and encourage you with technical advice and support for free. This incentive programme is designed to help you overcome obstacles that would otherwise stop your progress.

Jacki Byrd

Healthy streamsides are well planted to provide soil stability, retain water and provide shade.

Stephen King

A healthy forest margin is densely planted to keep out weeds and keep in moisture.

A Plan and Prepare

Your time and money are involved, so think carefully about what you are doing before you begin spending either.

Over time it is possible to establish a naturally functioning ecosystem that is low maintenance and self-sustaining.

Check out your ecosystem and your site

- Use the map (p17) to locate what ecosystem your property belongs to. Read up on the description of this ecosystem (pp18-23).
- Assess the site you wish to plant and decide what habitats it has (eg. boggy area, steep or gentle slope...)
- Decide what needs doing – is it your aim to fill gaps in the existing bush, create new bush or plant up a bush edge? Imagine the end result when your plants are fully grown and mature. This may take several years to achieve but once a site is planted and well maintained for up to 5 years, it will mostly look after itself.

Work out what to plant where

- Look up the plant tables relevant to your area and ecosystem (pp26-51):
    - identify the **nurse** (look for the heart symbol ♥) or colonising species appropriate to your site especially if you are restoring an open site
    - select a variety of plants suitable for the topography of your site, and check how many you should plant
    - check the tolerances list – sun, shade etc.
    - check out the comments on 'natural neighbours' – not all plants grow together
    - identify the tall or **canopy** species for filling 'gaps' or planting out after nurse plants are established
    - see over for more information on all of the above.
- You will now have a list of the plants you should be planting on your site, and an idea of where to plant them.
- Take this booklet into a native plant nursery and check out some of the species up close – this will help you visualise how your planting is going to look.
- Take time also to research nurseries that sell ecosourced plants. Call the council for a list of nurseries that might sell ecosourced plants for your area.

Weed control

Weeds are a major threat as they will outgrow and smother natives, and affect the scale and timing of the project, even whether it should go ahead. Your first job is to work out a weed control plan for your project, and carry out all necessary weed eradication. It is better to clear a small area thoroughly of weeds and then replant it, rather than planting widely into poorly weeded areas.

Two groups of weeds will threaten the success of your project:

Grass, dock and other broadleaf weeds

These weeds will compete with your young plants. They do have benefits, such as improving soil structure, preventing soil loss and silt pollution to streams and retaining moisture. They can be kept but need to be regularly cut back below the height of your growing nurse plants to reduce competition and smothering. Once your nurse plants (p11) are established these weeds will die out due to shading.

'Environmentally damaging' or invasive weeds

These weeds will outgrow your plants as well as invade vegetation on streamsides and in the bush. They need to be eradicated **before** planting. There are about 250 'environmentally damaging' weeds in Waitakere. They include: kikuyu grass, ginger, pampas, privet, wandering Jew and monkey apple as well as climbing weeds such as jasmine, climbing asparagus, moth plant and Japanese honeysuckle.

Your weed control plan may influence whether to plant seedlings or direct seed (manuka, karamu, etc), and whether to kill larger weed species such as tree privet and wattle. You will need to decide whether to remove the latter or keep them temporarily as nurse plants (p11).

Getting rid of weeds can be a daunting task. Ask the council for advice and the brochure on *Invasive or Environmental Weeds of Waitakere.* Available also are leaflets on how to tackle individual weeds such as ginger.

Stephen King

Weed control. Jerry Birch and kaumatua Davey Paniora know from experience the importance of getting rid of the invasive weeds: it's more important than planting!

Nurse plants – the first stage

Nurse species are hardy and fast growing. They are good at colonising open areas because they grow well in exposed conditions enabling them to suppress weed species and shade out grass. When grown en masse a nurse crop creates an environment sheltered from the wind, with reduced direct sunlight which reduces competition from weeds, and with a leaf litter that provides nutrients and retains moisture – ideal conditions for our tall forest species to grow in.

Most common mistake –
planting tall (canopy) trees too early

Trees such as miro and kauri need the conditions created by earlier nurse species eg. side shelter. Without these conditions tall trees will struggle and need a lot of maintenance – or they may die.

See the diagram below for examples of nurse crop species to plant. Refer also to the heart symbol (♥) in the plant tables.

Second most common mistake – planting too sparsely

Nurse plants need to be able to touch each other within the first year of planting. This blocks sunlight at ground level and

Toetoe – a rising native plant star – is a valued nurse plant. Don't confuse it with pampas grass, an invasive weed from overseas, and not a nurse plant. Toetoe is for any restoration site that gets good levels of light eg. stream banks, bush edges, slips, roadsides. Two of the NZ species are native to Waitakere – *Cortaderia fulvida* and *Cortaderia splendens*. A detailed information sheet on toetoe is available from the council.

Forest Research

Nurse Crop Species

The first species to plant for establishing successful restoration

Coastal	Open Pasture	Regular Flood Zone	Stream Bank	Forest Edge & Extension	
Gahnia xanthocarpa *Pseudodopanx lessonii* *Coprosma macrocarpa* *Melicytus ramiflorus*	*Gahnia setifolia* *Coprosma robusta* *Hoheria populnea* *Cordyline australis*	*Carex flagellifera* *Carex virgata* *Cordyline australis* *Melicytus ramiflorus*	*Gahnia setifolia* *Phormium tenax* *Coprosma robusta* *Melicytus ramiflorus*	*Gahnia lacera* *Coprosma lucida* *Hoheria populnea* *Melicytus ramiflorus*	Shady Sites
Cortaderia splendens *Phormium tenax* *Coprosma repens* *Melicytus ramiflorus*	*Cortaderia fulvida* *Coprosma robusta* *Kunzea ericoides* *Hoheria populnea* *Leptospermum scoparium*	*Cortaderia fulvida* *Carex flagellifera* *Carex virgata* *Cordyline australis*	*Cortaderia fulvida* *Phormium tenax* *Coprosma robusta* *Melicytus ramiflorus* *Cordyline australis*	*Cortaderia fulvida* *Coprosma robusta* *Aristotelia serrata* *Melicytus ramiflorus* *Leptospermum scoparium*	Sunny Sites

prevents weed invasion, moisture loss and lessens competition from grass, dock and other broadleaf weeds. Most nurse species should be planted no more than one metre apart. Good nurse planting will usually prevent the need for mulch.

Canopy trees – the second stage

Once the nurse cover is established (this usually takes up to two years) the next step is either to plant canopy species or allow them to regenerate naturally from seed distributed by wind, birds and water.

Big canopy trees like kauri and rimu or character trees like mamangi and puriri will dictate the overall shape of any restoration planting for many generations to come.

Care needs to be taken NOT to plant too many of the main or canopy trees. Well-planted, well-sited trees usually establish well so there is not normally any need to over-plant in anticipation of big losses. Allow them plenty of room to mature this doesn't mean thinning out other natives beside them.

In nature, many trees are scattered in the landscape in surprisingly low numbers, often on special sites, even though they may be conspicuous due to their size and contribute significantly to the character of any area. Before planting, take a look at some natural sites on similar slopes or habitats in the same ecosystem and at a similar altitude. Use these areas as your guide.

If your site already has a nurse crop canopy...

of weed species such as tree privet, wattle or willows:

- Keep the weed trees in the short term as nurse plants. Plant under them with natives that will eventually grow to become the new canopy. While it may seem strange to leave weed trees, even weeds are better than a bare patch of earth. Choose semi-shade tolerant natives, such as rimu, kohekohe, tawa, kahikatea. Start by removing all environmental weeds from under the weed trees, then prune off some of the lower branches to create space and light for the new natives. Keep up this pruning every year to give the natives the ongoing space they need, and eventually cut down the weed trees but leave the roots, which will continue to provide soil stability.

of natives such as manuka, mahoe, bracken or karamu:

- Plant up the edge of the bush with nurse plants and wait for birds and the wind to bring in new native seeds, or seeds in the soil to germinate. If more than 300 metres away from a wild plant population that can provide seeds, you may need to plant second stage shade and semi-shade tolerant native species under the canopy in the gaps that exist.

Stop! Do a reality check

- Check again the practical issues and timeframes of eradicating invasive weeds that may affect plants establishing (p10,14).
- Check your site is totally clear of environmental weeds before you plant. Through site preparation before planting is easier than a lot of ongoing and fiddly weeding around small plants later.
- Work out in detail the quantities of plants required (p13).
- Re-evaluate the project at this stage for its achievability and sustainability (ecologically, financially, long-term commitment) and be prepared to modify your plans before committing yourself and others.
- A poorly sited and chosen project can end up a wasted effort, a big disappointment, even a burden to others or to the environment – especially if it becomes a haven for weeds.

Stephen King

Good site preparation ensures success. Round Up™ is used to |get rid of kikuyu grass before planting.

Stephen King

Very tall (rank) grass or thick piles of weeds often need follow-up sprays to achieve total control.

B Plant

Actual planting is the most enjoyable part, but there's still more to think about

- April to September is the best time for planting, when the soil is moist and more rain is predicted.
- Use plants big enough to cope with weed threats – 'root trainers' if site is very clear or planter bag (PB) size 3 and bigger if competing with broadleaf weeds.
- Use larger plants for the main trees such as PB 12 and larger.
- In a restoration site good nurse planting will usually prevent the need for mulch and encourage better 'ecological processes'. In a garden, however, mulch helps keep weeds at bay, and encourages good soil life. Wood mulch is better than bark mulch.
- Don't plant large trees where they could obscure views or result in excessive shading and loss of light to houses.
- Areas where you have replanted with natives look better and more natural if plants of the same species are grouped together in groups of 3, 5, 7 or 9.
- For most nurse crops, like manuka and toetoe, the maximum recommended spacing is one metre apart. For smaller plants, like *Carex*, or *Coprosma robusta*, plant closer, at 50 or 75 cm apart.

Planting density guide

	10 m^2	100 m^2	10,000 m^2 *(1 hectare)*
plant spacing	*Number of plants needed*		
50cm apart	40	400	40,000
75cm apart	18	180	18,000
1m apart	10	100	10,000

Planting Guide

Dig a hole deeper and double the width of the root ball of the plant. Have loose soil or compost in the bottom. Place the plant into the hole, fill with soil and press firmly but gently around the plant to remove air pockets. After planting, the soil level against the stem should be the same as before planting.

A slow release fertiliser pellet can be placed with each plant, to the manufacturer's specifications.

Water your plants as soon as you have planted them, and keep them moist.

Weed them regularly.

Stephen King

The fun part – planting a manuka nurse crop after weed control. In two years they should be a couple of metres tall.

Stephen King

Keeping it up: experienced planters know the importance of dealing to pests and weeds to ensure success. A little maintenance goes a long way.

C Maintain

Careful planning followed by regular maintenance are essential to ensure that your plants become established. The timeline opposite sets out a typical maintenance programme for the first three years of a restoration project.

For plantings on a smaller scale, it's just as important to follow up on removing and disposing of weeds.

For more detailed advice and information on managing a long-term restoration project, contact the council.

Remember

A well-sited, well-planted project will often largely take care of itself, especially if it's in a weed-free zone and natural regeneration can take place. Sometimes simply removing key weed sources, removing cattle and closing the gate, are enough to bring reward!

Maintenance timeline

Year One:

1. Eradicate environmentally damaging plants. *Spring + Summer*
2. Cut back grass and broadleaf weeds to reduce competition. *Spring + Summer*
3. Plant nurse crop. *Autumn + Winter*

Year Two:

4. Weed around plants. Cut back grass and broadleaf weeds to reduce competition. *Spring + Summer*
5. Weed around plants. Remove any new invasive weeds that have appeared. *Autumn + ongoing*
6. Replace dead plants. *Autumn + Winter*

Year Three and Onwards:

7. Remove any invasive weeds. *Year round*
8. Plant appropriate forest canopy species into native nurse cover. *Autumn + Winter*

Stephen King

In a couple of years there is enough shelter from the nurse crop to plant long term trees such as kauri.

Stephen King

The satisfaction of restored bush: in just 5 to 10 years you can create beautiful native bush like this! It's worth the effort!

The nature of Waitakere

The forests of Waitakere are unique. They sit on an ancient volcanic system and are strongly influenced by the marine coastal environment, being surrounded on three sides; by the Waitemata and Manukau Harbours, and the Tasman Sea.

However, of today's bush, much was burnt or logged last century and in the new urban lowlands only a few clumps of original native trees survive. When first purchased for park and water catchment, much Waitakere land was under 'scrub' or even grassland. There were also some substantial areas that had escaped logging. Given a few decades, the forest is now naturally regenerating back toward its former state – a rich pattern of a diverse range of lowland forest communities. From today's fragmented Waitakere landscape a picture of the original forest pattern has been recreated to illuminate our wonderful natural heritage and provide a guide for landowners to restore it.

> At least 400 plant species make up Waitakere in a diverse array of distinct forest communities, each related to its own particular habitat of terrain, geology and climate.

The Waitakere Ranges were formed by an ancient massive uplift of hard volcanic basalt creating an elevated plateau with a cool climate, catching the clouds and a rainfall twice that of Auckland and Henderson. Rimu thrives on the cool plateau. Within the ranges, softer rock has eroded away creating steep rugged hills with good drainage that suits kauri. Very steep slopes of crumbling, actively eroding rock release nutrients in this infertile landscape and provide a refuge for trees like puriri that normally abound in its preferred fertile soils of lowland flats or young volcanic areas.

The hard basalt is exposed in many sites to form spectacular gorges, waterfalls and bluffs. These rockland habitats support communities of specialised plants that can tolerate droughts and little soil. In this habitat the Waitakere Ranges has an especially drought-tolerant kowhai, found elsewhere in a similar habitat near Waipoua Forest, Raglan Harbour and Whangarei Heads.

Silt has collected from slowly eroding hills in a few small valleys to form alluvial forests of kahikatea, pukatea, puriri and ti kouka (cabbage tree).

Some abundant Northland and Auckland trees, notably taraire and towai, are strangely almost absent from the ranges of Waitakere – there are some unusual groves of taraire at Karekare which may have been introduced by coastal-dwelling Māori 800-1000 years ago as fruit trees and to facilitate bird snaring.

Henderson, Te Atatu and Whenuapai were once covered by the great broadleaf forests of the Waitemata lowlands. A good impression of the magnificent glades that once stood can be glimpsed by taking a walk through similar areas such as Smith's Bush in Takapuna, Murphy's Bush in Takanini or Kirk's Bush in Papakura.

On the Te Atatu Peninsula majestic 50m tall kahikatea-pukatea forest once stood high above a dense sea of nikau palms, overlooking Pollen Island, Waitemata and Auckland.

East of the Waitakere Ranges, around Titirangi and Laingholm, the soils are more sedimentary than volcanic, holding more moisture in summer and are highly fertile. Therefore, on these 'Waitemata' soils lowland totara is more common and the lush kohekohe, puriri, karaka and nikau are notably more widespread and abundant.

Climate and topography are key influences over what grows where and this is especially the case in Waitakere's wild West Coast. Storms from the Tasman Sea dump salt spray onto the rugged landscape creating a band of salt resistant pohutukawa forest and a whole array of other salt hardy plants. Native toetoe, NZ spinach and wild celery grow on the sand. Coastal ice plants, waxy taupata, hebes, and even tough ferns cling to sheer rock walls which are constantly blasted with the full force of salt spray.

The unrelenting coastal elements have moved mountains of sand, damming valleys to create wetlands and dune impounded lakes, partially burying pohutukawa trees, and creating a new coastline that has grown 1.5km this century! The Te Henga wetlands are the largest in the Auckland region, supporting bitterns and a wealth of other wetland birdlife. The Whatipu dunelands provide a nesting habitat for the rare banded dotterel, a haven for duneland plants and a human retreat in Auckland's best coastal wilderness.

The salt-storm forces diminish in the Manukau harbour so the pohutukawa belt narrows and salt-tolerant species dwindle but still the coastal air has its influence. As the coastal air moves inland up into valleys and even over the Titirangi ridge, plants respond to its warming climatic influence.
The best indicator of this natural air conditioner is mamangi (*Coprosma arborea)*, a handsome tree that hugs the gentle north-facing slopes and turns gold in the cool winter months.

A special feature of the Waitakere coast is the kowhai (*Sophora fulvida*) where rockland and coastal habitats are peppered with gold to herald the spring. A subsequent succession of flower colour from kanuka, pohutukawa and rata continues through to mid-summer.

From the coast to the interior a profusion of fern species abound in every niche from bare rock and dark waterfalls to tree tops to provide one of the richest fern havens available, supporting 110 species.

Exposed Coastal Ecosystem

Tough fleshy leaves of pohutukawa and houpara, hairy waxy leaves of spinifex grass withstand the rugged salty environment of the exposed coastal ecosystem. Pohutukawa on the rocks, spinifex on the sand and the houpara in the gullies. Each species has its preferred habitat.

Stormy Coastal Hill Ecosystem

Less salty than the exposed coastal ecosystem, the Stormy Coastal Hills ecosystem is still a rugged climatic environment.

Harbour Coastline Ecosystem

Kowhai overhang a shell bank, karaka and kohekohe grow in the damper shadows in the sheltered harbour coastline environment. Here pohutukawa is limited to a narrow fringe on exposed sites. Coastal karamu (*Coprosma macrocarpa*) and coastal astelia proclaim the character of this environment.

Warm Lowlands Ecosystem

A diverse array of luxuriant growth and forest communities feature in the lowlands. Kauri on ridges, rainforest with occasional puriri on slopes, kahikatea and lush nikau groves in valley bottoms. Interspersed are special habitats such as the bluff community at the Cascades complete with its own assemblage of species.

left: Tall podocarps grow on Scenic Drive lowland forests with pukatea and nikau in a wet hollow (lower right corner).

High Rainfall Hills Ecosystem

Abundant rimu, Hall's totara, miro and kiekie are features of the high rainfall ecosystem. An excellent example is growing here on the Scenic Drive near the transmitter dome (north of TV transmitter). Note the canopy of ancient rimu on the skyline.

Uplands Ecosystem

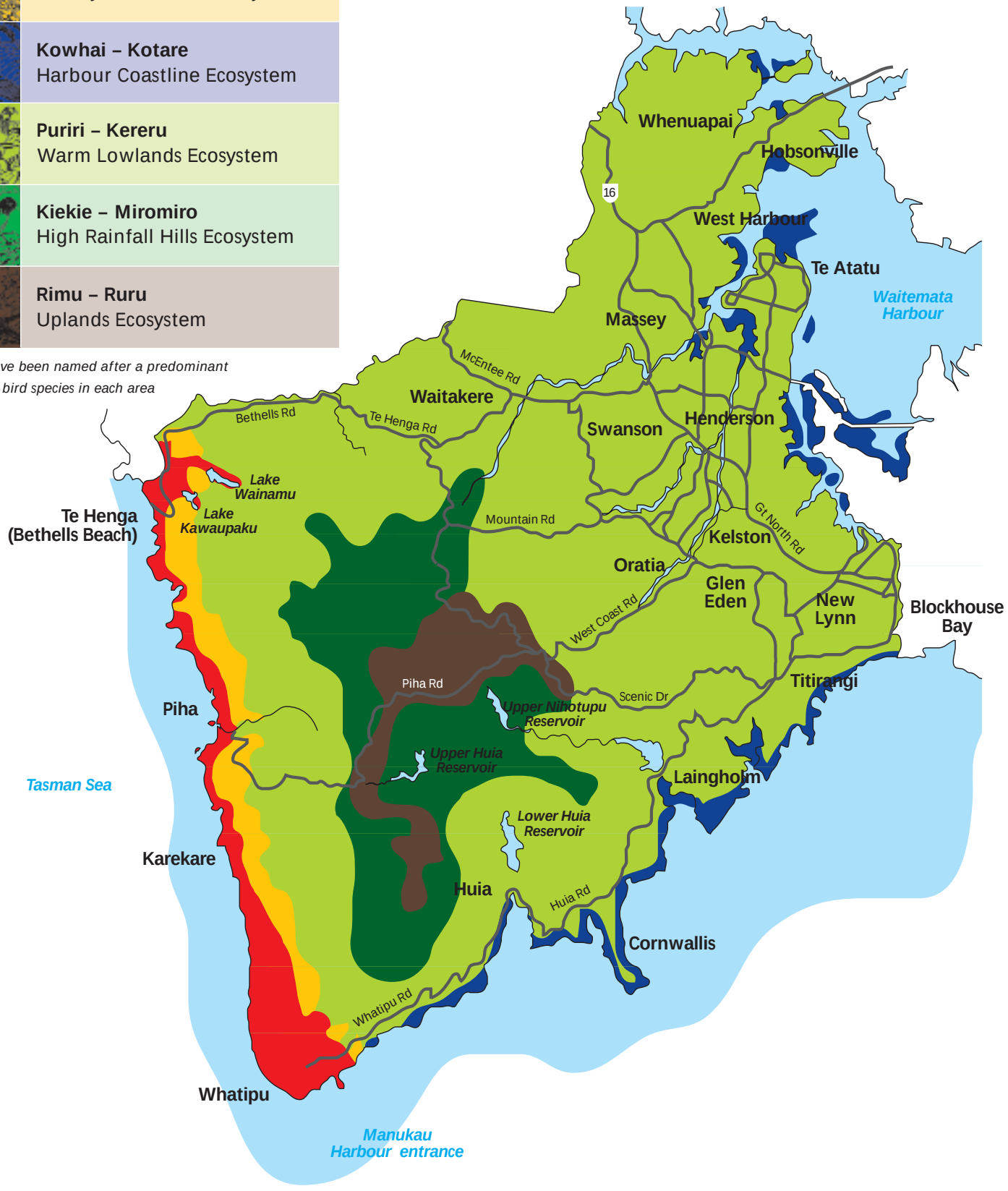
Head in the clouds, these ancient rimu and rata stand proud above an uplands forest canopy that includes cold tolerant tawheowheo (*Quintinia*) and toro (*Myrsine salicina*). These hardy species often have red or purple leaves.

Photos: Stephen King

Waitakere Ecosystems

1	**Pohutukawa – Oi** Exposed Coastal Ecosystem
2	**Manuka – Kahu** Stormy Coastal Hill Ecosystem
3	**Kowhai – Kotare** Harbour Coastline Ecosystem
4	**Puriri – Kereru** Warm Lowlands Ecosystem
5	**Kiekie – Miromiro** High Rainfall Hills Ecosystem
6	**Rimu – Ruru** Uplands Ecosystem

These have been named after a predominant tree and bird species in each area



1 Pohutukawa – Oi
Exposed Coastal Ecosystem

This area is a strip along the coast facing out to Tasman Sea, the **Pohutukawa – Oi** Exposed Coastal Ecosystem (p17, Ecosystems map). It has three main components – dune systems, dune lakes, and the areas above the dunes affected by saltspray.

Dune System

Dune systems of shifting sands support **pingao**, and small semi-stabilised dunes have **spinifex**. Stabilised dunelands are clothed with **pohuehue**, **kawakawa** and **ti kouka** (cabbage trees). There are also extensive wetlands.

Dune Impounded Lakes

The twiggy *Coprosma crassifolia* is one of the many divaricating – twiggy and tangled – plant forms that are a feature of the pohutukawa forest at the dune-impounded Lake Kawaupaku.

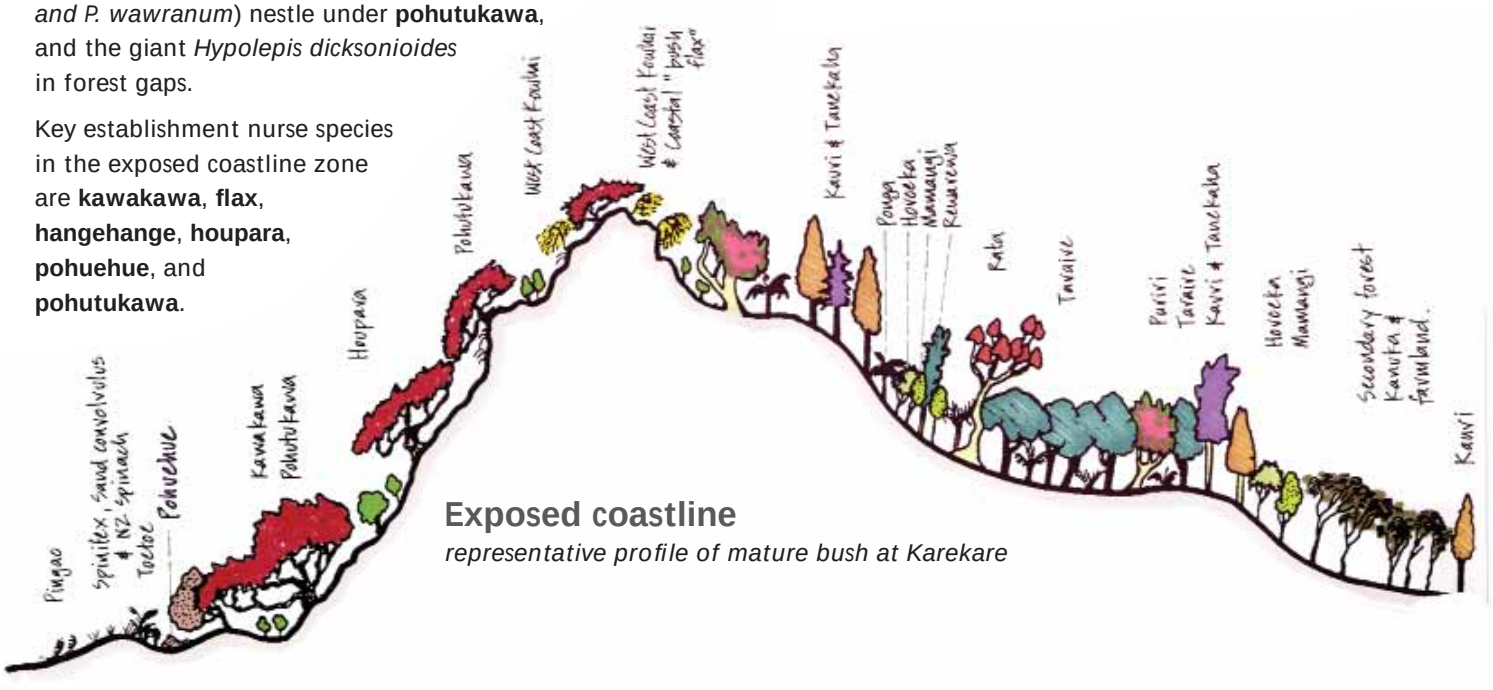
Exposed West Coast

This saltspray coastal zone is dominated by **pohutukawa** forest and supports its own endemic plant, the **Waitakere rock daisy**. Other saltspray tolerant plants include **taupata**, **West Coast cliff hebe**, and **horokaka**, an ice-plant. Sloping cliffs support **pohutukawa** forest with **houpara**, **karo**, **karaka**, **kawakawa**, **nikau**, **coastal karamu**, ti kouka (cabbage tree) and on more sheltered sites also West Coast kowhai, puriri and occasionally tawapou.

Harakeke (flax), **toetoe** and **kawakawa** are the main colonising shrub species. Pohutukawa growing on or partially buried by encroaching sand often supports lush growth of nikau, karaka, kawakawa and New Zealand spinach.

Ngaio and tree daisy *Olearia albida* are present but scarce. **Taraire** is also scarce, found at just one site at Whatipu. Interesting ferns include *Asplenium obtusatum*, on salt spray vertical cliffs, and *Blechnum banksii*. The dainty *Pteris saxatillis* and the shield fern (*Polystichum neozelandicum and P. wawranum*) nestle under **pohutukawa**, and the giant *Hypolepis dicksonioides* in forest gaps.

Key establishment nurse species in the exposed coastline zone are **kawakawa**, **flax**, **hangehange**, **houpara**, **pohuehue**, and **pohutukawa**.



Exposed coastline
representative profile of mature bush at Karekare

2 Manuka – Kahu
Stormy Coastal Hill Ecosystem

Above the exposed coastal system (see p17 Ecosystems map), this lowland forest is subject to occasional fierce storms that burn off the tops of puriri and other trees. **Pohutukawa** is present on rock outcrops, plus **pohutukawa-rata** hybrids. Flax is abundant in secondary vegetation.

Less salty than the exposed coastal ecosystem, the Stormy Coastal Hills Ecosystem is still a rugged climatic environment. Flax, cabbage trees and manuka predominate among pioneer vegetation. A meeting place between lowland forest and the coastal environment, interesting hybrids between species of the two realms grow in the stormy coastal hills. Notable are pohutukawa x rata, houpara x horoeka and *Coprosma robusta* x *C. macrocarpa* hybrids.

Stephen King

3 Kowhai – Kotare
Harbour Coastline Ecosystem

This ecosystem is located along the Manukau and Waitemata Harbour coastlines (see Ecosystem map p17). The vegetation on the coastline from the harbour mouth to Little Huia is different from that further in, and this area can be described as the semi-exposed harbour entrance.

Semi-Exposed Harbour Entrance

Pohutukawa-puriri coastline with very diverse lowland forest including abundant **nikau**, **mamangi** and **West Coast kowhai**. **Ngaio** and **tawapou** are present. A local feature is *Pittosporum ellipticum* on dry hillsides above the salt spray zone.

Sheltered Coastal Fringe

A narrow coastal fringe of **pohutukawa** and **pohutukawa-rata** hybrids joins the kowhai (*Sophora microphylla*), abundant **kohekohe**, **puriri**, **kauri** and very diverse lowland forest including **karaka** and occasionally **titoki**, *Coprosma macrocarpa*, and the **coastal astelia** are common. The handsome **wharangi** is present. **Ngaio** and tree daisy *Olearia albida* are rare. Numerous fern species include the abundant **maidenhair** *Adiantum cunninghamii*, and more rarely the dainty maidenhair *Adiantum diaphanum* and *Asplenium hookerianum* – all weed endangered. A wide range of lowland plants, including **kauri**, reach the shoreline.

4 Puriri – Kereru
Warm Lowlands Ecosystem

Introduction – overview

Throughout the warm lowlands ecosystem that is natural to most of Waitakere City (see on Ecosystems Map p17), **kauri**, **rimu**, **rata**, **kahikatea**, **rewarewa** and the occasional **miro** are the main high canopy or emergent trees. Below 200m altitude, **tanekaha** is abundant on ridges, but in the mature forest it occurs on the fringe. **Kauri** stands on spurs or dry sharp ridges and on summer – dry clay soils especially below 100m altitude. **Lowland totara** is common only in the Waitemata lowlands and foothills, the Manukau-Waitakere warm foothills, frosty Te Henga valley, alluvial valley floors and a small site at Karekare.

While **lowland totara** prefers fertile easy slopes or flats, **Hall's totara** typically grows on sharp ridges, knolls, rocky streamsides and infertile sites. An unusual feature is the absence of **towai** and **kamahi** (*Weinmannia spp.*) and rarity of **taraire**.

The forests of the lowlands have a characteristically irregular and broken lower canopy due to mid-canopy trees like **taraire** being uncommon resulting in an abundance of treeferns, small trees and shrubs. This reflects the hilly nature and low nutrient status of the ancient weathered volcanic soils. In fact, excepting the **kohekohe** glades on Exhibition Drive at Waima and **taraire** groves at Karekare, nowhere do broadleaf trees form a continuous upper canopy or extensive glades.

However on the fertile Waitemata lowlands, wherever the soils are friable and deep, broadleaf trees were once abundant. Scattered between tall forest emergents, extensive glades of broadleaf trees were previously dominated by **taraire**, huge **puriri**, **karaka** or **titoki** along with abundant **kohekohe**, frequent **tawa**, with **mangaeo** and **hinau** more rarely present. In wetter sites tall **kahikatea**, **pukatea** and **nikau** grew in profusion. Elsewhere, **kauri**, **rimu**, **totara** and occasionally **rata**, **matai** and **miro** stood as emergents.

Swampy depressions throughout support large tall **kahikatea**, **rata** and **pukatea** emerging high over **swamp maire** and abundant **nikau**, **kiekie**, and **wheki**. **Kohekohe** prefers at least moderate fertility and summer moist slopes and is thus more abundant in the Waitemata soils and south-east sector of the Waitakere.

Puriri prefers the fertile deep soils or alluvium found in the Waitemata lowlands. Elsewhere **puriri** is typically found scattered on mid-slopes but is also common on harbour coastal cliffs, rocky slopes, bluff bases, and mobile gullies especially near Titirangi-Laingholm, sites where light and nutrients favour **puriri** establishment.

Mamangi is perhaps the most sensitive climatic indicator, and common only on warmer mid-slope sites where it is influenced by the Tasman coastal airflow.

Titoki is a good fertility indicator and uncommon except abundant in the alluvial floodzone in Henderson Valley.

Nikau palm is widespread, clearly preferring gullies, depressions, steepland footslopes, slump sites and other seepage sites where moisture is abundant. **Wheki**, along with **putaputaweta**, favours wet depressions, and moist alluvial streamsides in frosty valley bottoms. **Ponga**, the silver tree fern is universally abundant, along with **mapou**, preferring gentle ridges and side slopes. **Mamaku**, the black tree fern, is abundant on very steep slopes and gullies (along with **mahoe**, **pate**, **houhere** and **supplejack**). Examples of these **nikau** palm and tree fern patterns are all visible from the Arataki Information Centre viewing platform.

Kowhai grows on sharp spurs, ridges, escarpments and along flood prone streambanks and coastal margins. **White maire** is widespread but never abundant and favours ridges and side slopes.

Shrubs common everywhere include **mahoe**, **mapou**, **hangehange** and **karamu**. **Mahoe**, **pate** and **houhere** thrive in damp gullies and wet rocky sites. A wide group of shrubs, eg. the **shiny karamu**, favour drier sites and former kauri forests; **akepiro**, **prickly mingimingi** and **kumerahou** being especially

characteristic of former kauri forest as is **tanekaha**. **Kawakawa** favours the coast, sandy, rubbly, fertile sites.

Kohuhu and **tarata** feature everywhere on broad ridges, basins, wide valleys and the broad fertile terraces of Waitemata lowlands.

Native tree daisies are well-represented. **Heketara** is common in steeper hill country on infertile ancient volcanics, whereas **akepiro** is abundant on often infertile summer-dry, clay country of former kauri forest and on stormy coastal hills. **Rangiora** is particularly abundant on windy or rocky steep slopes. The beautiful, possum-prone **kohurangi** was once very common in the lowland kauri forests.

Recovery Species

Manuka, **kanuka** and **bracken** are nature's healers of burnt forests and bare land in the lowlands – hence their abundance today.

Mahoe, **mapou**, **ponga**, **mamaku**, **hangehange**, **karamu**, and **pate** are the principal broadleaf nurse plants for forest establishment in the warm lowlands.

Each lowland forest zone is defined by geological, climatic, topographic and soil features that significantly affect forest composition. The key habitat themes are outlined for each of the warm lowlands zones.

(a). Waitemata Lowland Forests

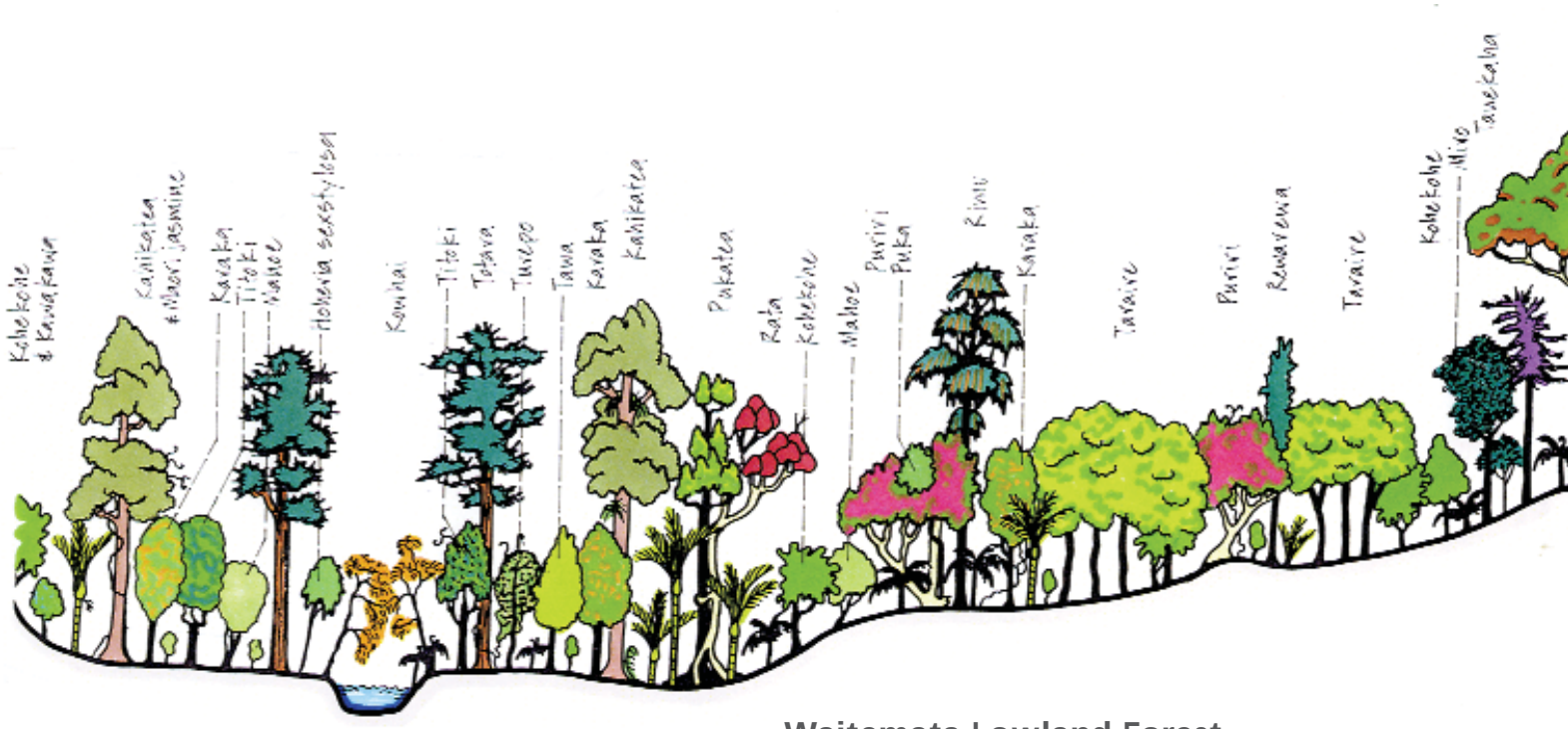
Hobsonville, Whenuapai, Te Atatu, Henderson, Kelston, Glendene, New Lynn, Sunnyvale, Lower Oratia

- *Free-draining fertile soils, gentle slopes and broad terraces provide ideal habitat for lowland totara and abundant broadleaf trees – taraire, puriri, karaka, and titoki.*

The key and characteristic feature of these gentle lowlands with fertile deep friable soils is the abundance of large broadleaf trees.

Puriri was common and locally abundant forming groves of very large epiphyte-laden trees with abundant **karaka**, **kohekohe** and tall **mahoe**. **Tawa** and **titoki** were probably somewhat less abundant but still common. On dry, free-draining sites, **hinau**, and less commonly **mangaeo**, were present. Subtle folds in the land created changes in species dominance and abundance. Evidence suggests **taraire** was at least locally abundant forming extensive glades and possibly abundant throughout. **Ponga**, **mapou** and **mahoe** were the most abundant low canopy or understorey trees and on wetter sites **nikau** and **supplejack**. The understorey included abundant **kawakawa** and **turepo**. Large forest vines were prolific, especially **kohia** and the native jasmine, **kaiku**.

Other trees included **white maire** and frequent **kohuhu** and **tarata**. Tall emergent trees would have been less scattered throughout but locally abundant especially on wet sites **kahikatea**, ridge crests and areas with poorer soil **kauri**. Other tall emergents were **rimu**, **miro**, **matai** and notably lowland **totara**. Large **rata** trees are likely to have been present in the damper sites especially in dense glades of **puriri**. **Coastal karamu** was common near the coast and it is possible **mamangi** inhabited some warm slopes.



Waitemata Lowland Forest

representative profile of mature bush in Henderson Valley

An attractive forest floor is frequently carpeted with creeping ferns including *Blechnum filiforme*, *Asplenium lamprophyllum, Phymatodes scandens* and *Arthropteris tenella*.

Waitemata Lowlands were a world apart from the present urban landscape – rich, tranquil and beautiful.

(b). Waitemata Coastal Peaty Alluvium

Harbour view on to Te Atatu Peninsula

- *Free-draining peaty soils sheltered by a scarp.*
- *Deep peaty soils favour prolific growth of pukatea, kahikatea, nikau and ti kouka (cabbage tree).*

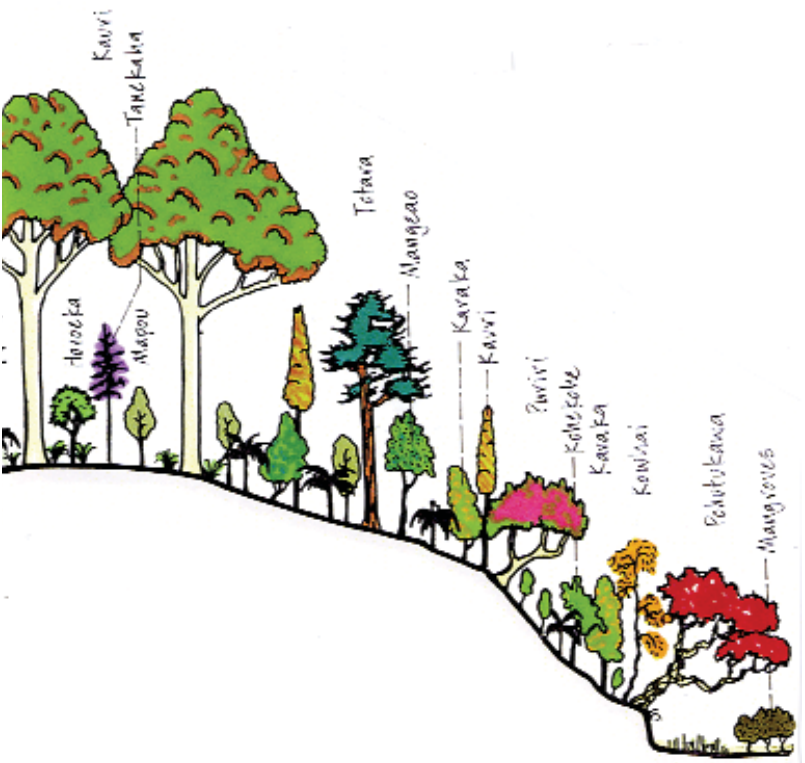
Large, tall **kahikatea**, scattered **pukatea** and **rata** are emergent over occasional **swamp maire**, **puriri**, frequent **karaka**, **kohekohe** and abundant **nikau**, **kawakawa** and *Coprosma areolata*. **Ti kouka** (cabbage trees) grow on wetter sites. The forest formed a well-defined **ecotone** boundary grading to flax and coastal shrub and rushland and **mangrove** communities on the coastal margin. The giant bush astelia *Astelia grandis* probably grew here.

(c). Alluvial Flood-Zone Forests

Oratia, Opanuku and Swanson stream valleys

- *Free-draining, deep fertile soils on flood-prone valley floors.*
- *Ideal habitat for titoki and totara, and kowhai on streamsides.*

Frequent **kahikatea**, **totara** and occasional **pukatea**, **matai**, **rimu** emergent over a mid-canopy of **titoki** – **tawa** – **karaka,** over a dense low canopy of **mahoe**. Large **turepo** and **kaiku** are common. *Hoheria populnea*, **kowhai** and occasional **wheki** grow along riverbanks.



The flood-prone forest floor supports hen-and-chicken fern (**manamana** *Asplenium bulbiferum*), *Asplenium lamprophyllum*, and abundant *Phymatodes scandens* ferns. The rare round-leaved **maidenhair** (**makaka** *Adiantum aethiopicum)* is present but endangered, the small maidenhair (*Adiantum diaphanum*) was probably formerly present. This is a seriously weed-endangered ecosystem.

(d). Waitemata-Waitakere Foothills

Massey, West Harbour, Waitakere Village, Sturges Rd, Green Bay, North Titirangi, Glen Eden, Konini and upper Oratia/Forest Hill

- *Waitemata and Waitakere volcanic soils.*
- *Abundant kahikatea, rata, rimu, nikau, features of moist easy land.*
- *Waitakere foothills contain volcanic material otherwise moist Waitemata clay soils favouring kohekohe, lowland totara, nikau.*

Low lying hill country sheltered from Tasman coastal airflow influences. Characterised by extensive ridges dominated by **kauri** with **tanekaha** and **rimu**; and on the valley sides **puriri**, **rata**, **rimu**, **kahikatea** with **kohekohe** and **nikau**, abundant **ponga**, **mahoe** and other broadleaf shrubs/trees. **Putaputaweta**, **mahoe**, **pate**, **makomako**, **nikau** in gullies. (Similar to Manukau lowland gullies).

Gentle terraces and sheltered easy terrain characteristically host abundant **rimu-kahikatea-rata**, with occasional **miro**, **kauri** and **totara** emergent over a low broadleaf canopy including **ponga**, **kohekohe**, **mahoe** and abundant **nikau**.

Occasional rock outcrops feature **kowhai**, **kohekohe**, **nikau**, **puriri, while** abundant **kohekohe**, **nikau**, **puriri** and **supplejack** grow on steep gullies. Large **kohia** vines feature in moist valleys such as Oratia.

Urban Massey, Glen Eden, Henderson, Glendene and New Lynn once supported the following forest types: extensive areas were covered with **kauri**, **rimu**, **tanekaha** with occasional **totara** and **puriri** on broader ridges, **kahikatea**, **rata**, **kohekohe** and occasional **karaka** on the valley sides and damp sites. **Nikau** and **ponga** grew abundantly.

Kahikatea, **pukatea**, **rata**, **nikau** forest wetland communities and forest ponds are a feature on old slump sites and depressions, especially around the Rangemore Track.

(e). Manukau – Waitakere Warm Lowlands

Titirangi South, Wood Bay, French Bay, Waima, Woodlands Park, Laingholm, Parau and Cornwallis

- *Mix of volcanics and sedimentary; easy terrain with some steep scarps.*
- *Kohekohe abundant and lowland totara significant.*
- *Tasman coastal airflow provides a moderating climatic influence.*

These Manukau Lowlands are geologically, topographically and climatically between the Waitakere Ranges Warm Lowlands and the Waitemata-Waitakere Foothills zones. With a mixture of Waitakere volcanic and Waitemata sedimentary soils on predominantly fairly gentle relief with steep scarps, the zone is strongly influenced by the moderating Tasman coastal airflow.

Coastal Waitakere links include **mamangi-puriri** forests (some of the best).

Waitemata links include frequent **totara** and abundant **kohekohe** (the best) often growing with **puriri**, **tawa**, **kowhai**, **karaka** and **nikau** on south-facing slopes (Waima-Woodlands).

Abundant **kowhai** is a special feature of steep ridges and scarps. Here **kowhai** grows to 10m in height and 50cm diameter trunk. Some of the best are at Laingholm. **Kahikatea-rimu-rata-kauri-nikau** forest, with **pukatea**, **titoki**, **kohekohe** and **putaputaweta**, is a feature of easy terrain (Waima).

Kauri-tanekaha-rimu is characteristic of low ridges with **puriri** and **kohekohe** on side slopes. Abundant **kawakawa**, occasional **houpara** and **rata-pohutukawa** hybrid trees are found inland on Titirangi ridge reflecting coastal influences. **Totara** is a feature of ridges, warm slopes and valley floors.

(f). Waitakere Ranges Warm Lowlands

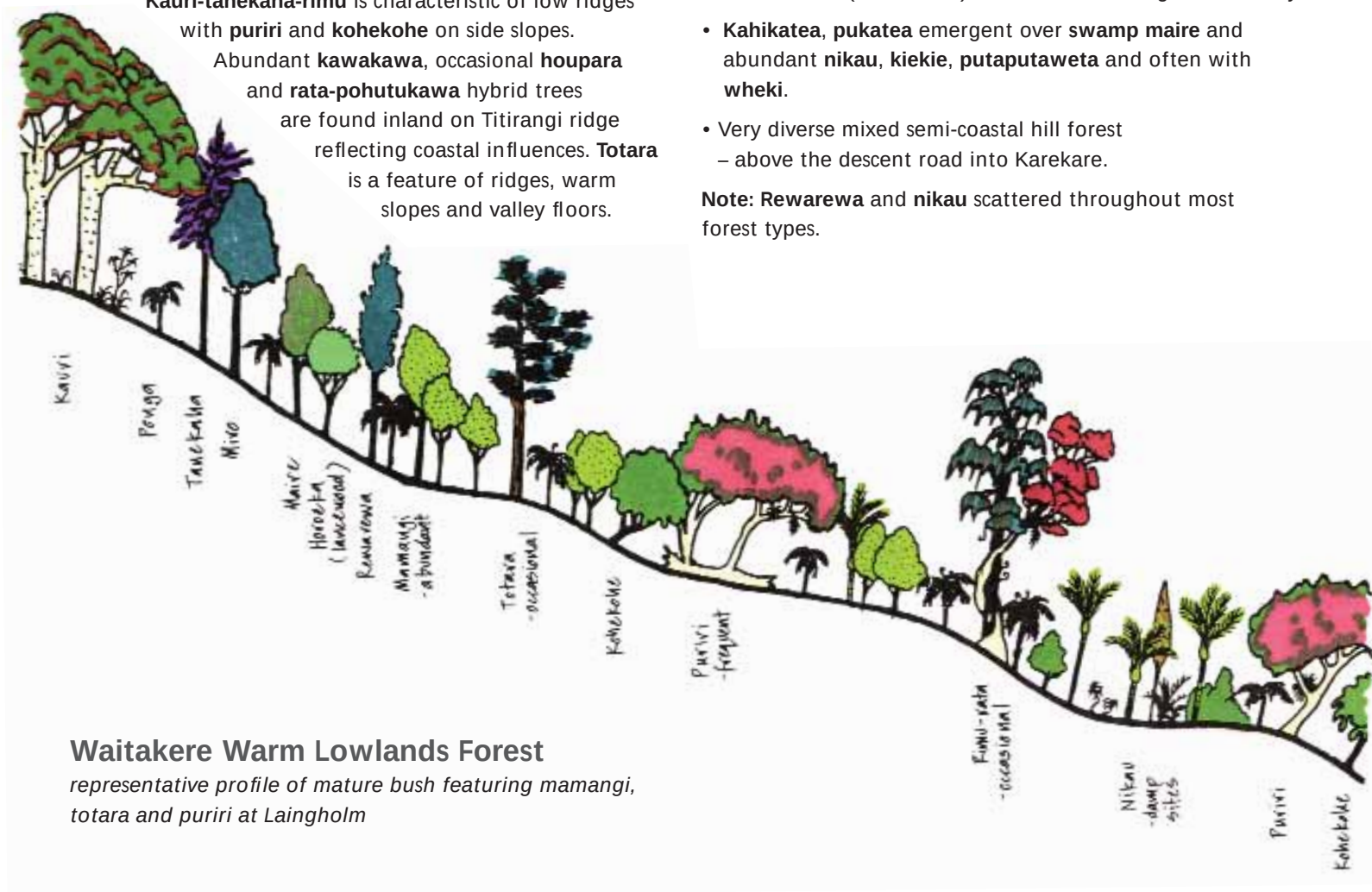
Waiatarua, Scenic Drive North, Bethells Valley, Lone Kauri Rd, Te Ahu Ahu Rd, Whatipu Rd and Little Huia

- *Infertile weathered ancient volcanics.*
- *Predominantly rugged hill country but wide local topographic diversity.*
- *Mostly West Coast climate influenced.*

A diverse range of forest communities characterised by the following patterns:

- **Kauri-tanekaha** forest on ridges, spurs, and bluff tops – Huia, near dam, and Cascades.
- **Rimu-kahikatea-rata** forest with occasional **kauri** on gentle terrain – Huia catchment (Christie's).
- Steepland ridges of **Hall's totara**, **miro** with **rata** – Fairy Falls.
- Steepland slopes of widely scattered **rata**, **kahikatea**, **rimu**, **miro**, occasional **puriri** and scattered **tawa** emergent over a low broadleaf shrub canopy characterised by **mamaku**, **heketara**, **houhere**, **mahoe**, **ponga**, **nikau**, **supplejack** and abundant **parataniwha** – Fairy Falls.
- Steepland rocky sites with **kowhai** and often **tawa** and **puriri** – Cascades.
- Gentle warm mid-slopes of occasional **rata**, podocarps and scattered **puriri**. **Nikau** emergent over **mamangi**, **ponga**, and **horoeka** (lancewood).– Karekare, Te Henga, Piha Valley.
- **Kahikatea**, **pukatea** emergent over **swamp maire** and abundant **nikau**, **kiekie**, **putaputaweta** and often with **wheki**.
- Very diverse mixed semi-coastal hill forest – above the descent road into Karekare.

Note: Rewarewa and **nikau** scattered throughout most forest types.



Waitakere Warm Lowlands Forest

representative profile of mature bush featuring mamangi, totara and puriri at Laingholm

Two distinctive local forest variants are:

1) **Taraire forests** at Karekare and Pararaha with scattered clumps in Piha, Te Henga, Huia and Whatipu. Dense taraire type with scattered large **puriri**, frequent **rewarewa** and occasional **rimu**, **kauri**, associated with abundant **mamangi**.
2) **Te Henga frosty totara valley zone** characterised by frequent **totara** on the valley floor and sunny slopes and ridges, abundant **mamangi** on warm north slopes and abundant **kaikomako**, *Coprosma areolata* and other divaricating shrubs especially near the valley floor.

Totara is also found in other alluvial valleys at Piha, Karekare and Little Huia.

(g). Coastal Waitakere Alluvial Valleys

Upper Waitakere River Valley

- *often with Coprosma areolata.*
- *silty and clay soils, sometimes on locally derived volcanic gravels.*

Kahikatea-puriri-karaka and on wetter sites **kahikatea-pukatea-swamp maire** with abundant **nikau**, **ti kouka** (cabbage tree), **putaputaweta**, and in some valleys, *Coprosma areolata*. **Rata** or **pohutakawa** and **totara** may be present. Riverine **kowhai** and **harakeke** (flax) too.

(h). Waitakere Wetland

Flax-ti kouka (cabbage tree)-raupo wetlands alternate with extensive reedlands, sedgelands, **manuka**, and open water at Auckland's largest wetland. There is a rich array of wetland wildlife (bittern, marsh crake, fernbird, banded rail, pukeko, etc.).

5 Kiekie – Miromiro
High Rainfall Hills Ecosystem

This area is situated above the climatic zone of puriri in the cool, high rainfall belt – 2000-2500mm/year (an annual rainfall twice that of Auckland!) and characterised by high rainfall species. It lies above the zone of **tanekaha** and **mamangi**; **lowland totara** is absent and **Hall's totara** is common. **Kauri**, **rata**, **rimu**, **kahikatea** are abundant emergent trees, with frequent **Hall's totara** and **miro** on ridges, and occasional **pukatea**, **hinau**, **maire**, and frequent **rewarewa**. The Waitakere, Upper Huia and Upper Nihotupu reservoirs and their catchments are within this ecosystem (see Ecosystem Map, p17).

Limited areas of sheltered easy slopes and 'terraces' support a dense high canopy dominated by **rimu-rata-kahikatea** with occasional **kauri**, **miro** and **Hall's totara**.

An abundance of **kiekie**, **wheki**, **pigeonwood**, **supplejack** and **kanono** is characteristic, reflecting the high rainfall climate. **Horoeka** (lancewood), **nikau**, **mahoe**, **houhere**, **rata** and **ponga** are common.

Although not abundant, a special characteristic feature is high rainfall tree ferns. **Katote** and **punui** and the now rare possum-vulnerable **raukawa** tree.

6 Rimu – Ruru
Uplands Ecosystem

The top 'level' stretch of the Piha Road passes through this ecosystem from approximately Waiatarua to the Karekare-Piha fork. **Rimu** dominate the high rainfall upland forest areas, with distinctive cool climate species – **tawheowheo**, **tawari**, **toro** growing on an elevated plateau of erosion-resistant volcanic basalt.

Rimu is emergent with an occasional **rata**, **miro**, **kahikatea**, **Hall's totara** and **kauri** – usually with short rounded crowns and laden with epiphytes. These species emerge over a low canopy characterised by an abundance of **heketara**, **kiekie**, **wheki** and cool climate species such as **tawheowheo**, **tawari** and **toro**. **Hinau**, **mountain maire**, **horoeka**, **ponga**, **wheki**, **pigeonwood** and **rata** are common. **Nikau** are present. **Kanuka** and **kohuhu** are common second growth or recovery species.

The uplands embrace a plateau, a sheltered basin with a warmer climate but characteristically subject to heavy frosts. Remnant frost-hardy species find their last Waitakere refuge including **wheki-ponga**, **mahoewao** and **giant swamp astelia**. **Tawheowheo** and **toro** are less common. The isolated presence of **lowland totara**, although infrequent, reflects the gentle terrain and frosty microclimate. **Kiokio** ferns and the giant cutty grass, **toikiwi**, are notably abundant in this wet environment.

The plateau is an ideal habitat for ancient giant kauri and once supported the biggest kauri trees in the Auckland region.

Note: On this plateau Auckland's largest kauri tree – of Tane Mahuta proportions – was purchased by a visiting English lord to ensure its protection. Unfortunately local loggers could not resist the temptation and set fire to the tree to justify their subsequent 'rescue' of its timber.

Rocklands – Bluff System

Rocklands, found usually as steep outcrops from the bush or as coastal rock faces, are fascinating places. In their usually small terrain they contain a range of plants not likely to be found in surrounding areas. Their rugged exposed situation both protects them (goats, people and possums find them unfriendly places) but weeds such as agapanthus, can destroy these valuable communities in just a few years.

Exposed bluffs typically of basalt, occasionally also conglomerate, support **West Coast kowhai**, **puka**, **coastal astelia** and the **rock lily**, **rengarenga**. **Whahariki** (**flax**) and **rata** vines, including rare **carmine rata**, are sometimes present. Bluff tops are characteristically **kauri-tanekaha** communities in the lowlands, and abundant **parataniwha**, and **kauri-Hall's totara-rata-miro** in the high rainfall zone.

Coastal astelia, **puka** or **West Coast kowhai** are almost always present at the top.

Nutrient-rich rocky footslopes support **tawa**, **karaka** lowland forest, often enriched with **taurepo** and **wharanui**, and abundant **houhere**, **nikau**, **mahoe**, and **puriri**, **kawakawa** and **para**, the **king fern**, in the Cascades.

All Waitakere endemic plants are confined to the bluff systems or coastal rocklands. These are nationally significant systems including these endemic plants:

Celmisia major var. major	**Waitakere rock daisy** (coastal) also on Great Barrier Is
Myosotis petiolata var. pansa	**Waitakere forget-me-not** (coastal)
Hebe bishopiana	**Huia hebe** (semi-coastal)
Sophora fulvida	**West Coast kowhai** (also at Maunganui Bluff, Piwakawaka, Mt Karioi near Raglan, Whangarei Heads)

Associated nationally rare or restricted species include:

- *Hebe obtusata* **West Coast cliff hebe** (coastal), and
- *Metrosideros carminea* **carmine rata**, **akakura** (not exclusive to Northland).

Dominant fall-face species are **puka**, **coastal astelia** and the rock lily, **rengarenga**. For a full list of Rocklands species, refer to the Rocklands column in the species charts for trees, shrubs etc.

Key secondary or recovery species are **kanuka** on bluff-tops, **mahoe** and **mamaku** on footslopes.

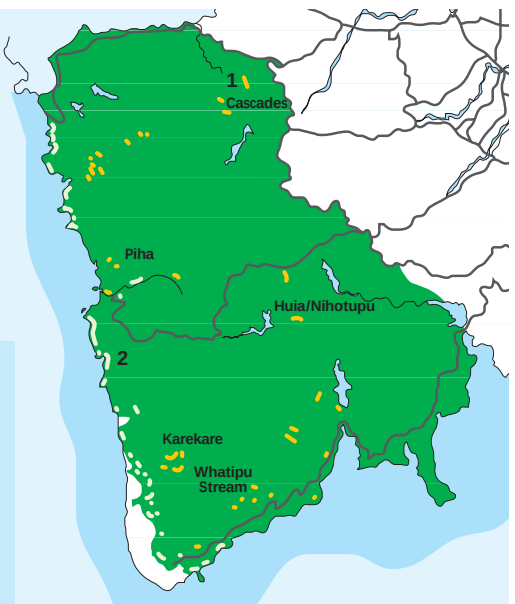
Key Rockland/Bluff System Plants

Arthropodium cirratum	rengarenga, rock lilly	EC HC L
Astelia banksii	coastal astelia	EC HC L
Celmisia major var major	Waitakere rock daisy	EC
Coprosma repens	taupata	EC
Disphyma australe	horokaka, NZ iceplant	EC
Griselinia lucida	puka	HC
Hebe obtusata	cliff hebe	EC
Metrosideros carminea	carmine rata	HC L
Metrosideros perforata	akatea, small white rata	HC L
Myosotis petiolata var. pansa ■*	Waitakere forget-me-not	EC L
Sophora fulvida	West Coast kowhai	EC L

EC = Exposed Coastline **HC** = Harbour Coastline **L** = Lowlands
* = Waitakere endemic plants ■ = rare

Key Rockland Invasive Weeds

Agapanthus praecox	agapanthus
Ageratina riparia	mistflower
Asparagus asparagoides	smilax
Asparagus densiflorus	bushy asparagus
Asparagus scandens	climbing asparagus
Cortaderia jubata	pampas grass
Cortaderia selloana	pampas grass
Cotoneaster spp.	cotoneaster
Erigeron karvinskianus	Mexican daisy
Hedera helix	ivy
Hedychium flavescens	yellow ginger
Hedychium gardnerianum	wild ginger
Nephrolepis cordifolia	tuber ladder fern
Polygala myrtifolia	sweetpea shrub
Polygonum capitatum	pink-head knotweed
Ulex europaeus	gorse



Rocklands Bluff System

Exposed coastal rocklands
lowland rocklands
(predominately **West Coast kowhai**)

Kowhai or hybrids may occur in upper Nihotupu-Upper Huia sites

Key Rockland plant sites:

1. Cascades

2. Mercer Bay/Hikurangi saltspray cliffs. Weed infested sites

Māori Glossary

The following is a list of Māori plant names used in the previous pages.

māori	latin	common
akatea	*Metrosideros perforata*	white rata
akakura	*Metrosideros carminea*	carmine rata
akepiro	*Olearia furfuracea*	
hangehange	*Geniostoma rupestre*	
harakeke	*Phormium tenax*	flax
heketara	*Olearia rani*	
hinau	*Elaeocarpus dentatus*	
horoeka	*Pseudopanax crassifolius*	lancewood
horokaka	*Disphyma australe*	ice plant
houhere	*Hoheria populnea*	lacebark
houpara	*Pseudopanax lessonii*	
kahakaha	*Collospermum hastatum*	
kahikatea	*Dacrycarpus dacrydiodes*	white pine
kaikomako	*Pennantia corymbosa*	
kaiku	*Parsonsia capsularis*	NZ jasmine
kamahi	*Weinmannia racemosa*	
kanuka	*Kunzea ericoides*	tea tree
karaka	*Corynocarpus laevigatus*	
karamu	*Coprosma robusta*	
karo	*Pittosporum crassifolium*	
katote	*Cyathea smithii*	
kauri	*Agathis australis*	
kawakawa	*Macropiper excelsum*	
kiekie	*Freycinetia banksii*	
kiokio	*Blechnum novae-zelandiae*	
kohekohe	*Dysoxylum spectabile*	
kohia	*Passiflora tetrandra*	NZ passion vine
kohuhu	*Pittosporum tenuifolium*	
kohurangi	*Brachyglottis kirkii*	
korokio	*Corokia buddleioides, C.cotoneaster*	
kotukutuku	*Fuchsia excorticata*	tree fuchsia
kowhai	*Sophora microphylla, S.fulvida, S.chathamica*	
kumaraho	*Pomaderis kumerahou*	
mahoe	*Melicytus ramiflorus*	whitey wood
mahoewao	*Melicytus lanceolatus*	
maire	*Nestegis spp.*	
mairehau	*Phebalium nudum*	
makaka	*Adiantum aethiopicum*	maidenhair
makomako	*Aristotelia serrata*	wineberry
mamaku	*Cyathea medullaris*	black tree fern
mamangi	*Coprosma arborea*	
manamana	*Asplenium bulbiferum*	hen & chicken fern
mangeao	*Litsea calicaris*	
manuka	*Leptospermum scoparium*	tea tree
mapou	*Myrsine australis*	red matipo
matai	*Prumnopitys taxifolia*	
mingimingi	*Cyathodes juniperina*	
miro	*Prumnopitys ferruginea*	
ngaio	*Myoporum laetum*	
nikau	*Rhopalostylis sapida*	
oioi	*Apodasmia similis*	jointed wire rush
para	*Marattia salicina*	king fern
parataniwha	*Elatostema rugosum*	
pate	*Schefflera digitata*	seven finger
pingao	*Desmoschoenus spiralis*	
pohuehue	*Muehlenbeckia complexa*	
pohutukawa	*Metrosideros excelsa*	
ponga	*Cyathea dealbata*	silver fern
poroporo	*Solanum aviculare*	
puka	*Griselinia lucida*	
pukatea	*Laurelia novae-zelandiae*	
puriri	*Vitex lucens*	
pua waananga	*Clematis paniculata*	bush clematis
punui	*Cyathea cunninghamii*	gully fern
putaputaweta	*Carpodetus serratus*	
ramarama	*Lophomyrtus bullata*	
rangiora	*Brachyglottis repanda*	
rata	*Metrosideros robusta*	northern rata
raupo	*Typha orientalis*	bull rush
raukawa	*Pseudopanax edgerleyi*	
remuremu	*Selliera radicans*	
rengarenga	*Arthropodium cirratum*	rock lily
rewarewa	*Knightia excelsa*	NZ honeysuckle
rimu	*Dacrydium cuppressinum*	
tanekaha	*Phyllocladus trichomanoides*	
taraire	*Beilschmiedia tarairi*	
tarata	*Pittosporum eugenioides*	lemonwood
taupata	*Coprosma repens*	
taurepo	*Rhabdothamnus solandri*	
tawa	*Beilschmiedia tawa*	
tawapou	*Planchonella costata*	
tawari	*Ixerba brexioides*	
tawheowheo	*Quintinia*	
ti kouka	*Cordyline australis*	cabbage tree
titoki	*Alectryon excelsus*	
toetoe	*Cortaderia fulvida*	
toikiwi or **toetoekiwi**	Gahnia lacera	
toro	*Myrsine salicina*	
toropapa	*Alseuosmia macrophylla*	shrubby honeysuckle
toru	*Toronia toru*	
totara	*Podocarpus totara*	
towai	*Weinmannia silvicola*	
turepo	*Streblus heterophyllus*	
turutu	*Dianella nigra*	NZ blueberry
tutu	*Coriaria arborea*	
wharangi	*Melicope ternata*	
wharanui	*Phormium tenax*	flax
whatariki	*Phormium cookianum*	coastal flax
whau	*Entelea arborescens*	
whauwhaupaku	*Psedopanex arboreus*	five finger
wheki	*Dicksonia squarrosa*	
wiwi	*Juncus pallidus*	rush