

# Restoration planting from Taranaki to Manawatū–Whanganui

A guide to the Manawatū Plains Ecological District



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# PART ONE: *Getting started*

## Introduction

The Taranaki region has three Ecological Regions and five Ecological Districts. Two of these ecological districts extend into the Manawatū-Whanganui region. Each ecological district has different landforms, climate and soils and a correspondingly distinct native vegetation.

As elsewhere in New Zealand, logging and development of land for settlement and farming have significantly altered the landscape. Large areas of indigenous vegetation have been removed and remaining fragments suffer from introduced pest plants and animals.

This booklet, *Restoration planting from Taranaki to Manawatū-Whanganui* is for landowners and community groups who want to restore ecosystems by planting native species that best suit their site and conditions, and for people who just want to plant the 'right' species for biodiversity in their back yards. It is the fifth of a series about each of the ecological districts, following the restoration planting guides to *Egmont Ecological District* (2013), *North Taranaki Ecological District* (2016), *Matemateaonga Ecological District* (2016) and *Foxton Ecological District* (2018).

### Why plant native species?

New Zealand's native trees and plants have evolved in these latitudes and conditions over millions of years. They have a unique character and variety of form and are spectacularly beautiful. Not only that, but, as Māori have known for hundreds of years (see pp. 34 and 35), they have many uses.

Native trees and plants are part of the greater, interlinked forest ecosystem, providing shelter and food for native birds, bats, fish, lizards and insects and other invertebrates. Each site that is replanted is a small addition to the greater regional landscape, and part of an eventual wildlife network. Providing a seed source increases the potential for the spread of native plants that will protect the soil and water on your land. Best of all, what you plant will become your legacy to the future. At some distant time, your children and theirs may stand among plantings that are small seedlings now, and celebrate your efforts and foresight.

Your project will require time, effort, money and patience but the rewards are beyond measure!



*Moutoa Swamp forest*

# Ecological Regions & Districts of Taranaki

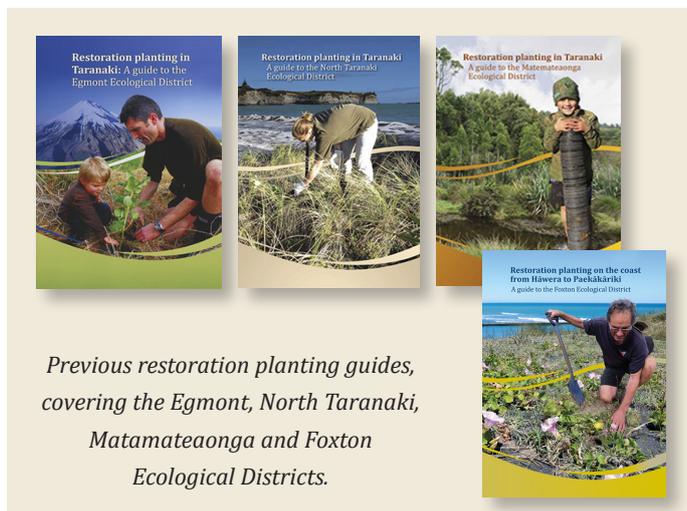
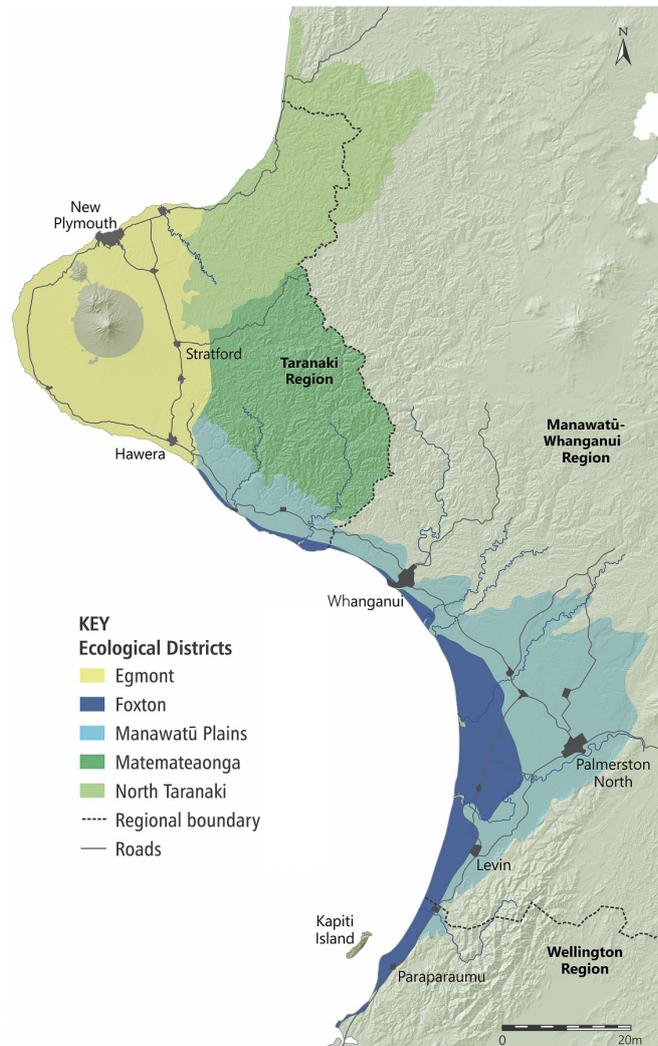
Taranaki contains three Ecological Regions and five Ecological Districts. (See Manawatū-Whanganui over the page).

The Ecological Regions are: **Egmont Ecological Region** (containing only one ecological district, with the same name); **Taranaki Ecological Region** (encompassing the Matemateaonga Ecological District and North Taranaki Ecological District) and **Manawatū Ecological Region** (comprised of the Manawatū Plains Ecological District and the Foxton Ecological District).

THE MANAWATŪ PLAINS ECOLOGICAL DISTRICT (312,300ha) lies inland behind the dunes and cliffs of the Foxton Ecological District. It extends to the foothills of the Ruahine and Tararua Ranges in the west, and in the north to the rolling hill country of the Rangitikei Ecological District. It has flat-surfaced flood plains and terraces, with its original forests and wetlands largely displaced by farming. Its urban centres include Palmerston North, Whanganui, Feilding, Marton, Bulls, Waverley and Pātea.

THE FOXTON ECOLOGICAL DISTRICT (105,500ha) is a narrow coastal strip from Tangahoe River near Hāwera, that widens in the Foxton area and narrows again to end at Paekākāriki in the south. There are sand-topped cliffs, especially in the north, but it is otherwise dominated by dunes formed by sand movement, especially in the past. Few natural areas now remain in this district. It contains mostly farmland, exotic pine plantations and urban areas.

Note: the administrative and political boundaries of Taranaki and Manawatū-Whanganui do not coincide with the ecological boundaries. The Taranaki Regional Council's area ends south of Waitōtara but the Manawatū Ecological Region (and its two ecological districts of Manawatū Plains and Foxton) extends far south of this point.

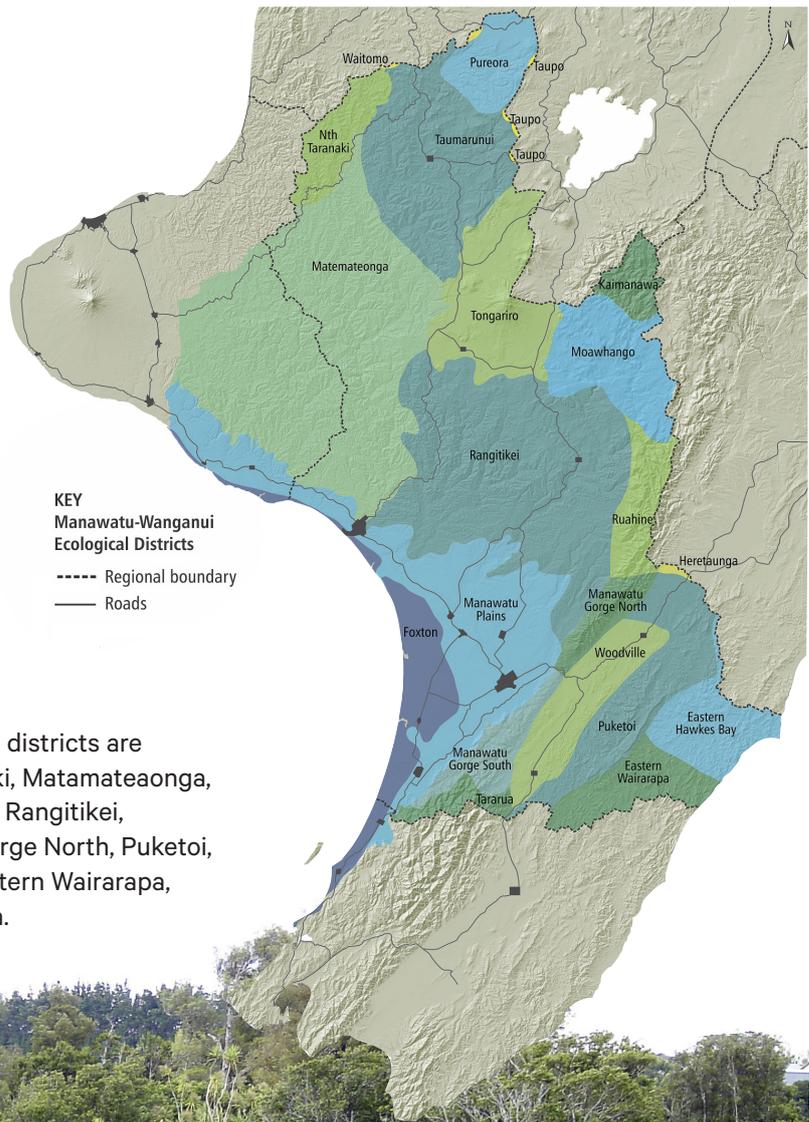


# Ecological Districts of Manawatū-Whanganui

THE FOXTON ECOLOGICAL DISTRICT and the MANAWATŪ PLAINS ECOLOGICAL DISTRICT are shared by Taranaki and Manawatū-Whanganui. (As noted on the bottom of the previous page, ecological boundaries extend beyond and are different from regional council boundaries.)

The Horizons Regional Council administers the Manawatū-Whanganui area, which contains 17 ecological districts (including Foxton and Manawatū Plains). The region is shaped by three major river catchments: the Whanganui, the Rangitikei and the Manawatū.

From the north, the other ecological districts are Pureora, Taumarunui, North Taranaki, Matamateonga, Tongariro, Kaimanawa, Moawhango, Rangitikei, Ruahine, Heretaunga, Manawatū Gorge North, Puketoi, Woodville, Eastern Hawkes Bay, Eastern Wairarapa, Manawatū Gorge South and Tararua.



*Keeble's Bush, near Linton south of Palmerston North*

# Geology, climate, soils and landscape of the Manawatū Plains Ecological District

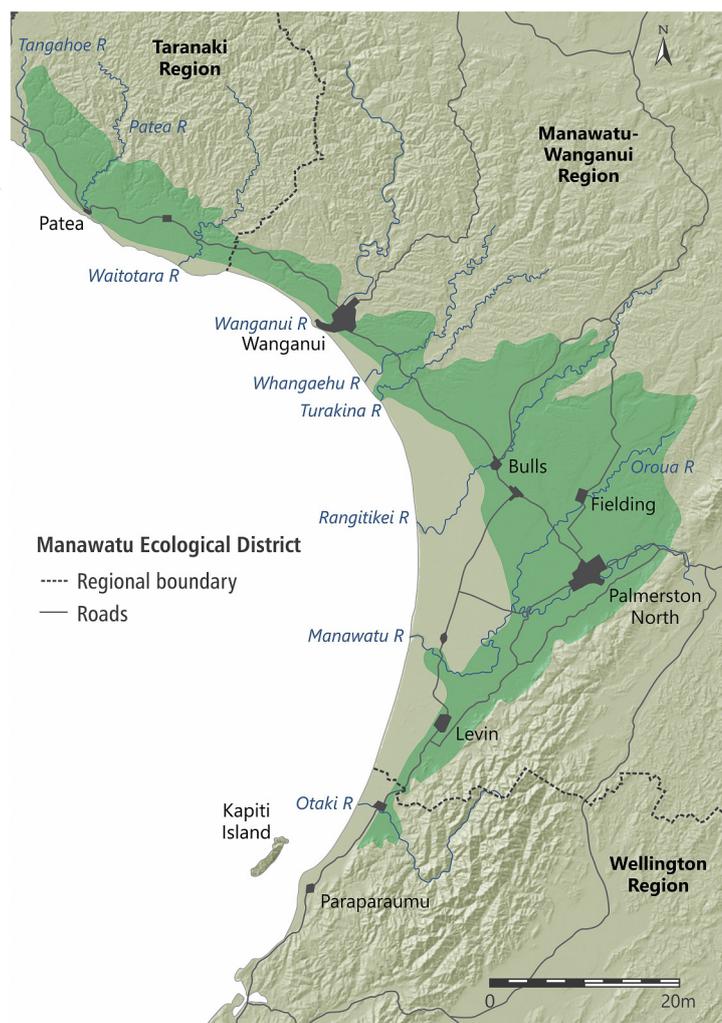
The lowland vegetation that once covered the Manawatū Plains Ecological District has been cleared, so that less than 1% remains in reserves today. There is little information to work off when planning restorations. As a general rule, look at local vegetation remnants and be guided by what seems sensible, at the same time bearing in mind that even these remnants are likely to have been heavily modified, with valuable and vulnerable species lost from them.

The Manawatū Plains Ecological District has a very equable climate, with rain falling consistently in every month of the year, though summer is a little drier, and occasionally extremely dry (less than 1 cm of rain per month). Daytime temperatures range from average summer highs of 23C° to winter lows of below 4 C°, but growth is possible for all except the winter months. The area experiences only mild frosts from May to September, but these can come unexpectedly, which is most damaging. Westerly winds can be extreme and persistent due to the coastal exposure.

The Manawatū Plains Ecological District is largely made up of marine terraces. Long ago sediments were deposited in the offshore basin that forms most of the South Taranaki Bight. Some of the sediment was washed in from rivers and some came from volcanic eruptions.

Over time, these sediments were uplifted out of the ocean to form terraces. In the northern parts of the district the terraces slope gently towards the south (4.5°) due to tilting of the basin. During periods of high sea levels, whichever terrace was at the coast had its seaward edge eroded away to form a cliff. Terrace scarps are therefore old sea-cliffs.

The terraces have been further modified by layers of fine wind-blown sediment. In the west of the district, closer to Mt Taranaki, this includes volcanic ash and results in a soil that is well drained. Further south, towards



Palmerston North, the terraces have received less volcanic ash (from the faraway Taupo eruptions) and soils are more poorly-drained.

This system of marine terraces is cross-cut by the drainage channels of the rivers, especially the Rangitikei and Manawatu, which progressively create broad flood-plains. These floodplains are then themselves downcut by further river erosion that creates river terraces. These river terraces usually run parallel with the river's course. They are very well-drained and are hostile environments for forest.

# Plan of action

*“Restoration of an ecosystem is an ongoing process, and key ecosystem types cannot be re-created with one initial planting. They are dynamic systems that require enrichment with mid- and late-successional species as they develop.”*

—Professor Bruce Clarkson, Waikato University (2014)

You are about to set out on a journey that may take a number of years. Before you begin it will be helpful to plan what you intend to do. Think about your site.

What is it like now? What is your vision for this site?

- at the end of this season?
- at the end of next season?
- a decade from now?
- 50 years from now?

Look around your neighbourhood; you may see established sites that will give you ideas. Better yet, go and see some of the representative vegetation types or remnants listed in this guide.

It may help to make a sketch. Mark boundaries, fences, streams, banks or gullies, mature trees, remnant vegetation and other points of interest. Identify and mark characteristic vegetation zones—there may be a number of different kinds within your site.

You may want to make an overlay sketch to show your planned plantings as well as walkways and other features.

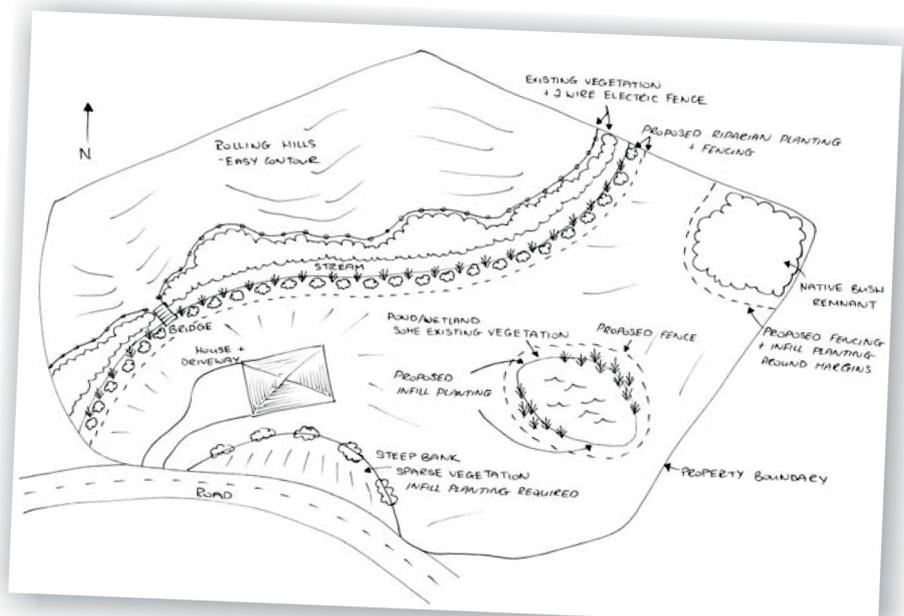
In addition, ask yourself:

- What direction does your site face?
- What are the moisture levels? Some parts may be wet or damp, while others are dry.
- Is your site exposed to wind/ frost/ salt?
- What parts are sunny? What parts are shady?
- Is it flat or steep? Does it have difficult slopes?
- What kind of soil does it have? Is it sandy or non-sandy? Is it rocks, stones, silt, clay or peat?
- Is there any other potentially important information, such as whether it has been burned or grazed?
- Are there areas of weedy vegetation or plantation forests that need to be removed? When?

## Planting plan

Make a list of plant species for each distinct area choosing the right species for the right place and purpose.

Take into account the growth habit and requirements of the different species as well as those already on site.



Make a sketch of your site

Divide the list into plants that will go in during your first phase of planting and those that will be better planted when some shade and wind protection has been established. Keep your ambitions modest until you know how much you will be able to achieve, and how much time and money it will cost.

Work out where you want your plants to go. If they are the first generation of cover, it doesn't matter so much, but long-lived plants need to be placed where they will be appropriate when they are mature. Think about whether you want them in clumps or scattered about. Try to follow nature and be careful NOT to space plants in rows or to plant different species alternately or in some other unnatural pattern.

Your plantings will create refuges for wildlife as well as visual interest, and will create shelter if needed. Group plantings also aid pollination.

### Eco-sourcing is best!

Eco-sourcing means getting your plants from seed and from cuttings from the nearest possible similar vegetation type in your ecological district. It's a *win-win!*

- You preserve the genetic biodiversity and biological health of your area.
- Because these plants are adapted to local conditions they are more likely to survive and thrive.

The best current approach is to eco-source from the nearest available source of the species you want to plant, provided those species grow in a similar bioclimatic zone and ecosystem to the one you wish to create. It's especially important for long-lived species. This practice has been followed in the very successful plantings of Keeble's Bush near Palmerston North.

### Nurseries that eco-source their stock

Buy locally. There's less handling, and less cost to you and to the environment and your plants will grow better.

Some nurseries in this ecological district will grow plants on request, especially if you bring in your local seed or cuttings. You may need to order two years in advance to allow time for your plants to grow.

A list of nurseries that ecosource plants is on page 37.

Learn more about New Zealand plants. Go to local plant propagation demonstrations in your area.

- Ensure a mix of male and female plants (if applicable).
- A closed canopy will help to exclude weeds.
- Think carefully about where you plant trees. You want them to be in the best position not just now but in a century or two!
- Food plants for birds will have an added benefit because once the plants are established birds spread seeds on your behalf.
- You might want to leave walkways or vistas open for human visitors for the long-term, so don't plant large or vigorous plants there.
- Plants that are attractive to bees can improve pollination and seed production.

#### GROW YOUR OWN!

*It can be immensely satisfying to grow your own plants from locally-collected cuttings, seedlings or seed. Always be considerate about the site you are harvesting from. Get permission in advance and don't deplete one area in order to restore another!*



## Preparation

- Fence the area to exclude grazing stock.
- Commence pest animal control e.g. possums, feral goats, pigs, deer, rabbits and hares.
- Identify problem plants and prioritise their control. See page 36 for a list.
- Clear growth for about half a metre radius for each plant, either by hand or by spraying with herbicide\*. The better you prepare the planting site, the greater your success will be. Allow a maximum of two metres and a minimum of one metre between plants to establish a reasonably dense cover.

### *\* A herbicide caution!*

*Glyphosate will damage any green tissue it touches, especially when a wetting agent is used. A lot of damage can occur if Glyphosate is used in release clearing within the first 4–6 years when plant stems are often still green. Glyphosate is also very toxic to aquatic organisms.*

## Planting

- Plant coastal and lowland sites from June to August so plants establish over the wet period before the summer dry. Plant stream banks in the spring, after the winter floods and plant upland areas in early spring as well. Plants will be dormant and have been hardened off by frost. Leave frost-susceptible species as late as possible but keep in mind the need for water.
- Water your plant well before you begin.
- Dig a hole at least one and a half times the size of the container in all directions (including down) and break up the soil in the bottom to make a soft bed.
- Depending on the soil and your plants, you may want to add a New Zealand-made slow-release fertiliser tablet, although some plants — such as rewarewa and toro — are better without them, and if the soil is very free-draining, fertilisers can be washed away. If you are planting on a slope, place the fertiliser about 10 cm away from the root ball on the uphill side so the dissolved nutrients will wash past the plants' roots as part of natural soil drainage.

Putting in a fertiliser tablet is a great job for little kids on a planting day. They love having something just for them to do!

- Remove your plant from its container and carefully loosen or prune off any entangled roots, keeping disturbance to a minimum, although, if your plant is container-bound, you may need to carefully open up the root system. Place the plant in the hole, keeping its soil level slightly below the top of the hole, and letting the roots dangle.
- Replace the soil and gently jiggle the seedling up about 2 cm.
- Taller plants may require staking, especially if they are in an exposed location.
- If your site is exposed you may want to create a barrier to protect plants on the outside of the site from wind or salt.

Many nurseries sell New Zealand-made slow-release fertiliser tablets containing nitrogen, phosphorus, magnesium, potassium, sulphur, calcium and trace elements. The tablets slowly release nutrients over two to three years. All you need to do is place one in the hole, cover it with a little earth and insert your plant.

They can be obtained from many suppliers including farm supply stores, nurseries and garden centres.

- Mulching around each plant is desirable if you can. Use bark chips, newspaper, sheep manure, cut grass, old hay or other biodegradable natural material. Be careful with animal manure because it can bring in weeds. Mulching preserves moisture, slows drying and also retards the advance of weeds. Always consider on-site mulch resources first as they are cheap, on-hand and don't require cartage.
- A bamboo stick or 25 mm x 25 mm stake, flag or marker beside each plant will help you locate your plants at a later date, especially if grasses have taken over! Try painting the top with fluoro paint.

### After planting

Weed control is essential, especially during the first three years, to avoid competition with your plantings. Plants that are kept clear of pest plants will reward you with greater growth and vigour. Release or clear around each plant in late spring, summer and autumn if required, either by hand or by spraying with a herbicide selected specifically for the job.

You may need to continue to control animal pests such as possums, rabbits and hares or, if you are near a

larger forested area, feral goats, pigs and deer. In their different ways, they will damage your plants by eating flowers, fruit, palatable foliage, and bark.

Consider ways to protect young plants from pukeko if they are present in your planting area.

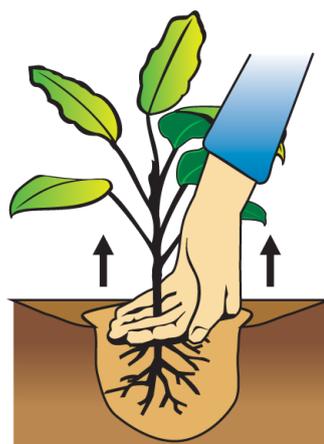
Planting the right species at the right time will allow good root growth before summer's dry conditions. However if it is exceptionally dry over summer you may need to water your plants, especially in the first year.

Monitor your site. A yearly photograph taken from a constant vantage point will become a valuable historical record and a source of great satisfaction as your project develops. A count of successes and failures, and plausible reasons for these, will assist future decision making.

In the following planting seasons, replace failed plants. Once your first plantings are established (3–5 years), middle and late-stage plants which need some degree of protection from wind and cold can be added.



1. Plant in sites that have been hand-cleared or prepared with knockdown herbicide. Make the planting hole at least twice the size of the container. Add fertiliser if appropriate. Place the seedling in the hole.



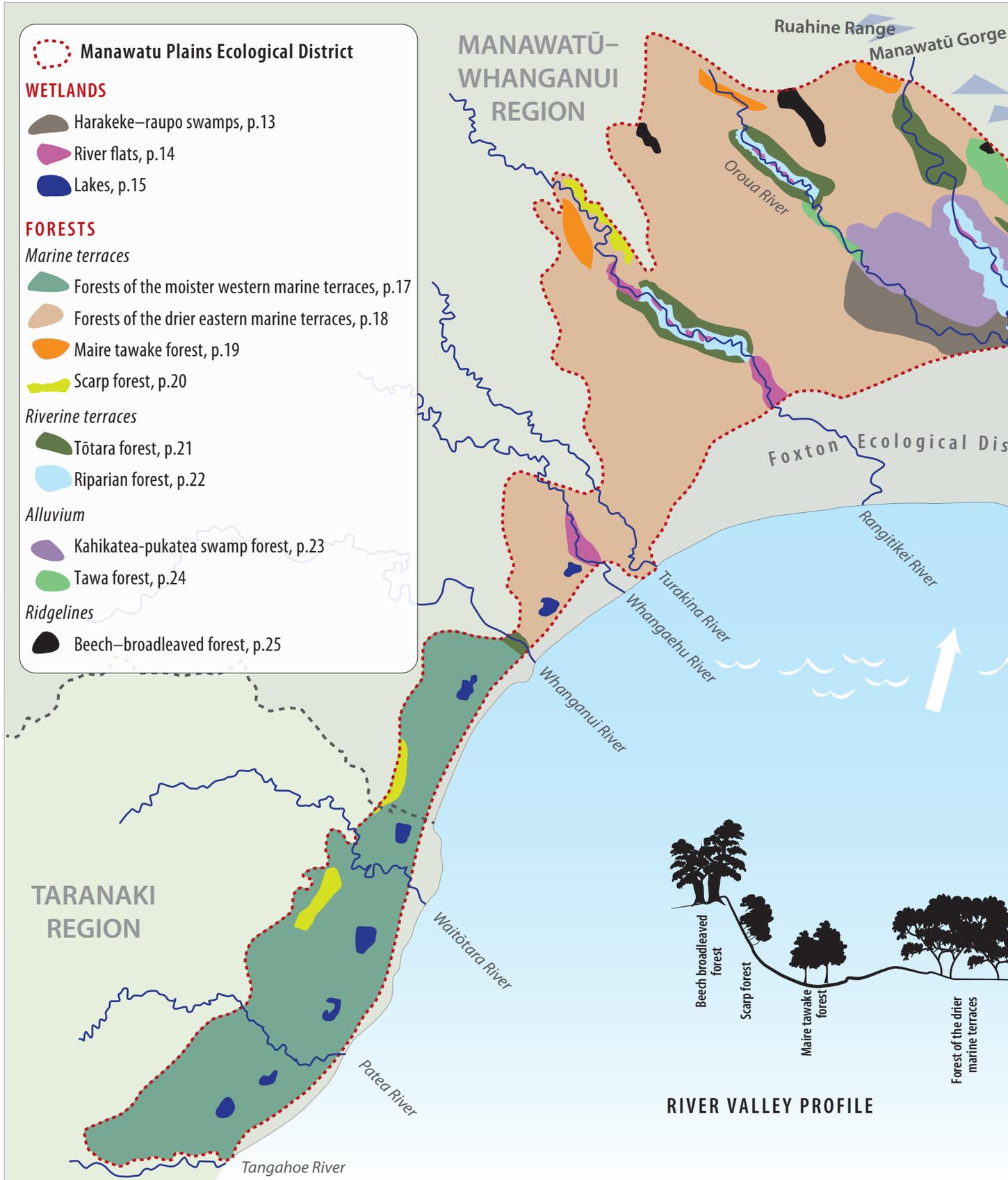
2. Replace the soil around the roots and gently pull the seedling up a very little.



3. Firm the soil around the seedling using your hands. Take care not to over-compress the soil. Leave a small depression around the stem to help retain moisture.

# PART TWO: *Target ecosystems*

## Generalised landscape & vegetation types





## Notes for Manawatū Plains Ecological District

The target ecosystems for the Manawatū Plains Ecological District on the following pages are in two sections:

- 1) **Wetlands**
- 2) **Forests**

### Abundance

Recommended species for the different ecosystems are each assigned a ranking on the DAFOR scale to signal the abundance you should be aiming for.

D = dominant	: more than 50%
A = abundant	: 30–50%
F = frequent	: 15–30%
O = occasional	: 5–15%
R = rare	: less than 5%

In the vegetation descriptions on the following pages, suggested abundances are in brackets after the main species' names. Keep in mind that there will be different mortality rates.

This guide does not generally include epiphytes, such as *Astelia hastata* or tawhirikaro, because they require well-established, mature host plants to provide shelter, and sufficient in number to generate a moist, forest environment. Epiphytes need to be introduced late in a restoration programme. Similarly vines (such as supplejack, the bush lawyers and native passionfruit) are not included because they require well-developed canopies and should only be introduced after several decades.

Nor are many ferns included. Ferns disperse by tiny, wind-borne spores and get around well on their own, and so are seldom planted in current restoration programmes. However, some species are typical of some ecosystems, and it may well be worth considering introducing them as soon as cover is sufficient.

## Wetlands

Wetlands, specifically fresh-water swamps containing large semi-aquatic herbs, once covered 30% of the centre of the Ecological District, particularly in zones with river-borne sediments. Many wetlands may have been caused by early Māori fires, lit for hunting or scrub-clearing on the drier lands.

In the 1870s Europeans cleared swamp forests to grow harakeke for the local Foxton flax mill, an important international source of fibre for rope-making. Following the collapse of the rope industry in the early 1900s, the swamps were progressively drained and cleared for farming.

Today protected lowland wetlands of the Manawatū-Whanganui Ecological District number only 20, less than half a percent of the catchment's area, and even these are heavily modified.

## Harakeke-raupō swamps

Harakeke swamps were the most common type of vegetation along the lowland portion of the Manawatū River during the last two centuries. There is raupō in wetter areas, but it is likely that historically there was also a range of shrub species. Some swamps contain buried timbers, evidence of the forests that once grew there.

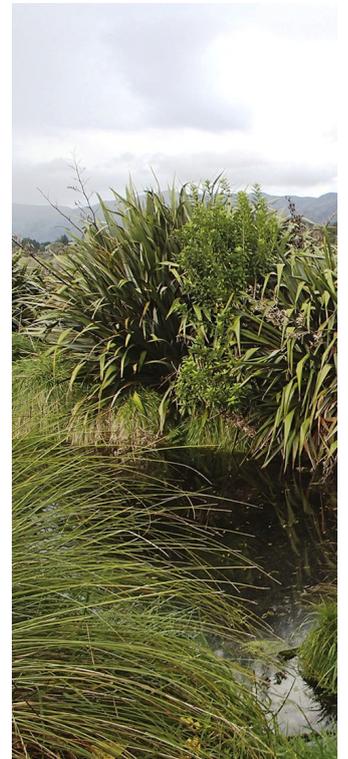
The Foxton flax industry used the local cultivar known to Māori as ‘Ngaro’, with long, strong fibres. This is the common harakeke present today in the region’s swamps. Avoid the many other harakeke cultivars and use “tillers” or hands of harakeke from plants with a known source.

Natural swampy areas can be seen at Lake Papaitonga, south-west of Levin, Koputaroa Scientific Reserve, near Shannon, and, to the north-west, Lake Waiau Wildlife Management Reserve and Tapuarau Conservation Area near Waitōtara.

### SEQUENCE

The first requirement for a freshwater swamp is a low-lying area with a semi-permanent water regime. Remember that plants, especially trees, progressively dry out wetlands and may make a wetland only temporarily viable on the site. You may need to remove larger trees if they start to invade.

Since you are making a swamp, you can plant everything at once. Plant giant rush, purei, kuta and raupō in the wetter areas, then toetoe and harakeke with the other species on the margins.



*Pōhāngina wetland.*

### WE RECOMMEND

TREES	Kōhūhū (O), mānuka (F), ribbonwood (O), small-leaved kōwhai (O), tī kōuka (F)
SHRUBS	<i>Coprosma rhamnoides</i> (O), hangehange (O), kāramu (O), koromiko (O), mingimingi (O), swamp coprosma (O), thin-leaved coprosma (O), twiggly tree daisy (O)
LIANES & SCRAMBLERS	Pink bindweed (O), small-leaved pōhuehue (O)
FERNS	Bracken (O), kiokio (O), mātā (O), swamp kiokio (O)
GRASSES	Toetoe (A)
SEDGES	<i>Isolepis prolifera</i> (O), kuta (R), māpere (O), pukio (R), purei (F), rautahi ( <i>Carex geminata</i> and <i>C. lessoniana</i> ) (O), toetoe upokotangata (O), wiwi ( <i>Ficinia nodosa</i> ) (R)
RUSHES	Giant rush (O), wiwi ( <i>Juncus edgariae</i> ) (O)
HERBS	Creeping willowherb (O), <i>Glossostigma elatinoides</i> (O), harakeke (D), raupō (F), toatoa (O)

Abundance to aim for:

D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare

## River flats

River flats are the gravelly braids between a river's channels and other low-lying areas close to the channel. They are subject to occasional flooding and relatively active erosion. The Manawatū River is stony in its upper reaches, but below Ōpiki it has a silty bottom because the riverbed flattens and the water flow is too sluggish to shift gravels.

Today river flats are so invaded by exotic species that it is hard to guess what once might have grown on them. Most aquatic species you see here are exotics, but the native red pond weed does occur. Native shrubs, especially nitrogen-fixers like tutu adapt well to such sites, but the river flats are too mobile for sedges such as purei.

The Rangitikei River has extensive and accessible braids around Bulls.



*Pōhāngina River flat.*

### SEQUENCE

Newly-exposed river flats are rapidly colonised by exotics, so if you wish to plant on one, you will have competition. Quickly developing a cover of natives is the best approach. Bear in mind such habitats are frequently disturbed by later river movements. Yours will be too, unless you are hoping to plant riverine forest species later on. In that case you will need to select a site a little higher above the river.

*Abundance to aim for:*

D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare

### WE RECOMMEND

TREES	Makomako (O), mānuka (F), narrow-leaved lacebark (O), ribbonwood (F), small-leaved kōwhai (O)
SHRUBS	Kāramu (O), koromiko (F), mākaka (O), mātou (O), mingimingi (O), swamp coprosma (O), tutu (O)
LIANES & SCRAMBLERS	Leafless lawyer (R)
FERNS	Bracken (O), kiokio (O)
GRASSES	Buff toetoe (O), toetoe (R)
SEDGES	Toetoe upoko-tangata (F), wiwi ( <i>Ficinia nodosa</i> ) (O)
HERBS	Dwarf musk (R), harakeke (O), tutahuna (O)

## Lakes

This ecosystem contains both oxbows and true lakes. Oxbows are formed when sections of former river bed are cut off, particularly along the Manawatū River. These low-lying, sinuous zones are often full of water, but no longer connected to the active river flow. True lakes form on some of the marine terraces where there has been subsidence or erosion followed by natural damming. All lakes gradually dry out over time, unless accidentally reflooded or unless they are particularly deep.

Few specialist plants grow on shingly bottoms. Their place is taken by swamp plants even though the edges of these lakes are generally much steeper than swamp edges. This gives little space for smaller, more light-demanding herbs.

Good examples are Lakes Horowhenua and Papaitonga, both near Levin; Lake Pauri near Kaitoke; Lake Waiau near Waitōtara; and Lake Oturi near Waverley.

### SEQUENCE

If you are digging a lake, think about the water level you want to maintain, especially in relation to the regional water table, and plan to manage it. Plant the most water-tolerant plants closest to the planned water level. You may get better results if you gradually raise the water after you have planted your wetland's margins because seedlings struggle in high water conditions, and in nature probably only establish during droughts. Mānuka, ribbonwood and other taller plants go on the higher margins.



Lake Papaitonga and adjacent wetland.



Raupō.

### WE RECOMMEND

TREES	Five finger (O), horoeka (O), kōhūhū (O), māhoe (O), mānuka (F), ngaio ★ (O), ribbonwood (O), small-leaved kōwhai (O), tī kōuka (F)
SHRUBS	<i>Coprosma rhamnoides</i> (O), hangehange (O), kāramu (O), koromiko (O), māpou (O), mingimingi (O), swamp coprosma (O), twiggy tree daisy (O), tutu (O)
LIANES & SCRAMBLERS	Pink bindweed (O)
FERNS	Bracken (O), kiokio (O), mātā (O), swamp kiokio (O)
GRASSES	Buff toetoe (O), toetoe (F)
SEDGES	<i>Isolepis prolifera</i> (O), Kāpūngāwhā (O), māpere (F), purei (O), toetoe upoko-tangata (F)
RUSHES	Giant rush (O)
HERBS	Harakeke (F), <i>Hydrocotyle novae-zeelandiae</i> (O), kōkihi (O), raupō (D), water-meal (R)

#### ★ Tasmanian ngaio

Take care to plant the correct ngaio! The Tasmanian ngaio (*Myoporum insulare*) closely resembles New Zealand's native ngaio (*Myoporum laetum*). The Tasmanian plant has narrower leaves and flowers that are only half the size — less than 8mm diameter.

## Forests

The forests of the Manawatū Plains Ecological Districts all have similar species but in varying abundances. If in doubt, follow the lead of other remnants in the area, plant as wisely as possible and accept subsequent losses of some species on the premise that “nature knows best”.

One characteristic of these forests is the presence of emergent trees that grow above the canopy of surrounding broadleaved trees. Mostly these are New Zealand conifers (podocarps). Under the right conditions podocarps can even grow so densely there is no room for broadleaved trees.

One of these tall trees that is not a conifer is Northern rātā.

It starts life high in an emergent tree and grows both upwards and downwards from there, giving it a head start.

See also pp. 26 and 33.

## Forests of the moister western marine terraces

These old marine terraces occur from Hāwera south-east to Whanganui. The surfaces tend to be very flat near the coast and rolling further inland where they are older and more eroded. They are covered in crumbly, free-draining soils. They receive moderate and reliable rainfall.

Emergent kahikatea are more common towards the coast, and tōtara towards the hills. Rimu and mātai are abundant emergents on drier areas, with some miro. The canopy is mainly tawa with some

makomako. Kāmahi is not common in the canopy. Pukatea would be more common in the damper areas, but moister forest is generally not suitable for divaricating shrubs. Godley's kōwhai is the common kōwhai, occurring in more exposed areas.

Bushy Park is a spectacular example of forest of the moister western marine terraces. Northern rātā is common but was probably rare in this ecosystem type.

### SEQUENCE

To generate cover for forest species, begin with a nurse crop of light-tolerant species such as kōhūhū, hebe, horoeka, māhoe, mānuka, lacebark, tī kōuka, tītoki and tōtara. In a few years under-plant with kahikatea and lesser amounts of rewarewa. Tawa, hangehange, pigeonwood, kanono, kawakawa, pukatea, rangiora, taurepo, thin-leaved coprosma,

tūrepo and whekī are best planted under an existing canopy. Plant rimu in light gaps once adequate shelter has been established, and leave northern rātā until it has something to climb up — See pages 26 and 33. Plant sedges in the dampest sites and kōtukutuku only if possum control is being undertaken.

### WE RECOMMEND

TREES	Black maire (O), broadleaf (O), five finger (O), Godley's kōwhai (F), hīnau (F), horoeka (O), kahikatea (A-F), kaikōmako (O), kāmahi (O), kōhūhū (O), kōtukutuku (R), long-leaved lacebark (O), māhoe (O), makomako (O), mānuka (O), mātai (F), miro (O), narrow-leaved lacebark (O), ngaio (O-R), northern rātā (O-R), pigeonwood (F), puka (O), pukatea (F-O), putaputawētā (O), rewarewa (F), rimu (F), tarata (F), tawa (A), tī kōuka (O), tītoki (F), toro (R), tōtara (F-R), white maire (O)
SHRUBS	<i>Coprosma rhamnoides</i> (O), hangehange (O), heketara (O), kanono (O), kawakawa (O), mākaka (R), manakura (F-O), māpou (O), patē (O), ramarama (O), rangiora (O), round-leaved coprosma (O), tall mingimingi (O), taurepo (O), thin-leaved coprosma (F), tūrepo (O)
TREE FERNS	Mamaku (O), ponga (O), whekī (O), whekī-ponga (O)
FERNS	Button fern (O), gully fern (O), kiokio (O), kōwaowao (O), leather-leaf fern (F), pikopiko (O), mokimoki (F), shining spleenwort (O), thread fern (F)
GRASSES	Bush rice grass (O), meadow rice grass (O), <i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (O)
SEDGES	Hook sedge (F), rautahi ( <i>Carex geminata</i> ) (O), toetoe upoko-tangata (O)
HERBS	Parataniwha (F)



#### Divaricating plants

New Zealand has a large number of shrubs and trees up to 5m high, that have small leaves and an unusual way of growing — their twigs branch at wide angles and are often densely criss-crossed. Some trees have a divaricating juvenile form but grow out of it as they mature.

## Forests of the drier eastern marine terraces

The drier eastern marine terraces are more difficult to grow on because their soils are thinner and poorer. These forests are also less productive, shorter and more flammable.

Kahikatea is more common towards the coast and tōtara towards the hills. Rimu is often dominant, especially north of Levin, with lots of mātai on drier areas, and occasional miro. The canopy was titoki and tawa, with the latter especially common towards the hills. Northern rātā and kāmahi were more common than today, while kohekohe was common in the south of the District, where the

climate is warmer. Supplejack is not listed for planting but is a memorable feature of these forests. White and black maire were relatively common but have largely disappeared from local remnants, although plantings may be more successful.

A prime example of this type of forest is Keeble's Bush, gazetted for scientific purposes and privately owned. Visit by arrangement with the trustees. Other examples are the terrace forest above Lake Papaitonga, near Levin and Nitschke/Gorton's Bush near Cheltenham, a privately-owned extensive remnant.

### SEQUENCE

If establishing in pasture, you will need an early successional community, as for the moister forests, of species such as five finger, makomako, mānuka, tī kōuka, māpou and kāramu to inhibit weeds and

exotic grasses. Under-plant later with other native shrubs and kahikatea, tōtara, miro and mātai. Leave tawa, rimu and rangiora till last.

### WE RECOMMEND

TREES	Black maire (A), broadleaf (F), five finger (O), horoeka (O), Godley's kōwhai (O), hīnau (O), kahikatea (A), kaikōmako (O), kāmahi (F), kohekohe (F-R), kōhūhū (O), kōtukutuku (F), long-leaved lacebark (O), māhoe (F), makomako (O), mānuka (O-R), mātai (A-F), miro (F), ngaio (O), nikau (R), northern rātā (F-O), pigeonwood (O), pōkākā (O), puka (O), pukatea (O), putaputawētā (O), rewarewa (F-O), rimu (D-A), small-leaved kōwhai (O), tarata (F-O), tawa (A-F), tī kōuka (O), titoki (A-F), toro (R), tōtara (A-F), white maire (F)
SHRUBS	<i>Coprosma crassifolia</i> (O), <i>Coprosma rhamnoides</i> (O), <i>Coprosma rigida</i> (O), hangehange (F), heketara (O), kanono (R), kāramu (O), kawakawa (F-O), mākaka (O), manakura (O), māpou (O), ongaonga (O), patē (O), poataniwha (O), poroporo (O), ramarama (O), rangiora (O), <i>Raukawa anomalous</i> (O), round-leaved coprosma (O), swamp coprosma (O), taurepo (O), thin-leaved coprosma (F), tūrepo (F)
LIANES & SCRAMBLERS	Climbing fuchsia (O), kiekie (O)
TREE FERNS	Mamaku (O), ponga (F), whekī (F), whekī-ponga (R)
FERNS	Bracken (O), button fern (O), giant maidenhair (O), gully fern (O), hen and chicken fern (F-O), kiokio (O), kōwaowao (O), leather-leaf fern (F), mokimoki (O), petipeti (R), pikopiko (A-F), shining spleenwort (O), sickle spleenwort (O), smooth shield fern (O), thread fern (F)
GRASSES	Bamboo grass (O), bush rice grass (O), meadow rice grass (F), <i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (O)
SEDGES	Hook sedge (O), rautahi ( <i>Carex geminata</i> ) (O), toetoe upoko-tangata (O)
HERBS	NZ iris (O)

## Maire tawake forest

Maire tawake is one of two New Zealand species which can form vertical breathing roots. It grows in warm, wet, fertile soils, and was originally common in swamp forests. Maire tawake forest very likely grew on poorly-drained terraces near rivers, or in particularly wet spots close to the foot of scarps.

A local example is on Broadlands Station, which is dominated by about 80% cover of maire tawake. The presence of a few deformed kahikatea trees suggests the forest was once more diverse.



*Maire tawake forest at Broadlands Station near the Ruahine Range.*

### SEQUENCE

Since maire tawake is hardy as a seedling, plant a dense covering of them. Intersperse with a few other small trees, such as māhoe and kaikōmako. Eventually kahikatea and pukatea should be introduced, but only in low numbers if you wish to preserve the maire tawake component. Plant raupō, purei and giant rush in wetter areas.

### WE RECOMMEND

TREES	Horoeaka (F), kahikatea (O), kaikōmako (O), kōhūhū (O), long-leaved lacebark (O), māhoe (O), maire tawake (A), mānuka (O), miro (R), nikau (O), pigeonwood (O), pukatea (O), putaputawētā (O), tarata (O), tawa (O), tī kōuka (F), tītoki (O), tōtara (R)
SHRUBS	Kāramu (F), koromiko (F), māpou (O), mingimingi (O), ramarama (O), swamp coprosma (O), thin-leaved coprosma (O), tūrepo (O), twiggy tree daisy (O)
LIANES & SCRAMBLERS	Kiekie (F), small-leaved pōhuehue (O)
FERNS	Hen and chicken fern (O), kōwaowao (O), shining spleenwort (O), sickle spleenwort (O), swamp kiokio (F)
GRASSES	Bush rice grass (O), toetoe (O)
SEDGES	Forest sedge (O), <i>Isolepis prolifera</i> (O), kuta (O), rautahi ( <i>Carex geminata</i> ) (O)
RUSHES	Giant rush (O)
HERBS	<i>Hydrocotyle novae-zeelandiae</i> (O), raupō (F)

*Abundance to aim for:*

D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare

## Scarp forest

The plateaus of terraces around the ecological district have mostly been deforested and are covered in pasture or in a loose, semi-exotic scrub. Occasionally the scarps or steep slopes below the terraces remain in native vegetation. They are well-drained and often gravelly. They are dry and difficult habitats, often disturbed by erosion, but relatively frost-free. Such scarps are ideal for kōwhai forest. Wharangi is rare, but occurs with ngaio and akeake, on warm, steep north-facing scarps in frost-free sites around Waitōtara.

Kōwhai form a splendid show of yellow flowers during the late spring, attracting flocks of tui. Seeds are produced in woody pods and are tough, so they can establish and root in very unpromising situations.

Scarp forest can be found in the north of the ecological district and on the cliffs and cliff-crests in the upper reaches of the Rangitikei River. An example of frost-intolerant wharangi-dominated forest can be seen at the junction of Waitōtara Valley and Parekama Roads.



Scarp forest at Waitōtara.

### SEQUENCE

Kōwhai is robust and can be planted very early in the sequence, along with a range of smaller plants. Tōtara may also be planted but will probably not persist on steep, unstable slopes and will never attain emergent status.

*Abundance to aim for:*

D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare

### WE RECOMMEND

TREES	Akeake (F-O), five finger (O), Godley's kōwhai (A), kaikōmako (O), kāmahi (O), kānuka (O), ngaio (F), rewarewa (O), tarata (O), tōtara (O)
SHRUBS	Bush snowberry (O), kāramu (O), koromiko (O), mākaka (O), māpou (O), poroporo (F), taupata (O), thin-leaved coprosma (A), tūrepo (O), tutu (O), wharangi (R)
TREE FERNS	Mamaku (O)
FERNS	Bracken (O), kōwaowao (O), leather-leaf fern (O), shining spleenwort (O), sickle spleenwort (O)
GRASSES	Broad-leaved poa (O), toetoe (O)
HERBS	Wharariki (O)



Small-leaved kowhai.

## Tōtara forest

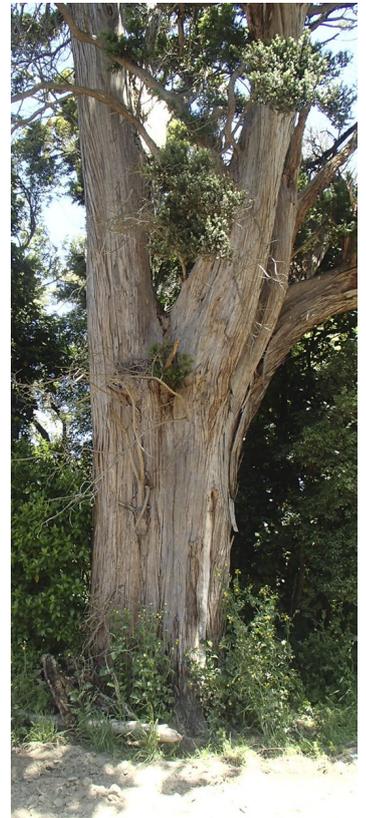
The river terraces around Ohakēā are about 10 000 years old, the youngest in the ecological district. They are too dry for many trees of the plains and swamp forests. There are occasional emergent rewarewa and mātai and the floor of the forest is open and litter-covered, with a scattering of ferns.

These terraces were once dominated by tōtara but the trees were clear felled by early settlers for building and fencing. Stands of tōtara also grew on the gravel river embankments, low-lying terraces and terrace scarp crests of the major rivers, or anywhere that drainage was better. An example is the Pettifar Track at Tōtara Reserve, Pōhāngina Valley.

Examples of tōtara forest under moister climates are Wedde Bush in Linton Village, Kiripiti, near Ōtaki, which is secondary forest, and along the margin of the Manawatū River at Ashhurst Domain. Very dry tōtara forest, in the lower rainfall zone coastwards of the mountains, is now represented only by Gate Pā Bush at Ohakēā Air Force Base.

### SEQUENCE

Tōtara is a robust, long-lived plant. It can be planted early in the sequence along with kānuka, māhoe, akeake and a range of shrubs to give good cover. The other trees and shrubs should wait until canopy closure occurs before being planted, and should be planted at low frequency. They will thin as the developing canopy reduces light levels on the forest floor.



*The distinctive stringy bark of tōtara.*

### WE RECOMMEND

TREES	Akeake (O), black maire (O), five finger (O), hīnau (O), horoeka (O), kaikōmako (F), kānuka (O-F), kōhūhū (O), kōtukutuku (O), long-leaved lacebark (R), māhoe (O), mānuka (O), mātai (F), ngaio (O), northern rātā (O), rewarewa (F), ribbonwood (O), small-leaved kōwhai (O-F), tarata (O), tawa (O), tī kōuka (O), titoki (O), tōtara (F-D), white maire (O)
SHRUBS	<i>Coprosma crassifolia</i> (O), <i>Coprosma rhamnoides</i> (O), hangehange (O), kāramu (O), kawakawa (F), koromiko (F), māpou (O), patē (O), mingimingi (O), poataniwha (O), ramarama (O), rangiora (O), tall mingimingi (O), thin-leaved coprosma (O), tūrepo (O)
FERNS	Bracken (O), button fern (R), hen and chicken fern (R), kōwaowao (O), leather-leaf fern (O), mokimoki (O), shining spleenwort (R), sickle spleenwort (R)
GRASSES	Bamboo grass (R), bush rice grass (R), <i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (R)
SEDGES	Hook sedge (O)

HERBS Bidibid (O)

## Riparian forest

Three huge rivers, the Whanganui, the Rangitikei and the Manawatū, drain into the South Taranaki Bight. Riparian forest may have occurred widely along their banks, especially in their upper reaches. Riparian forest tends to be greedy for water and nutrients and needs a damp site near a river, with good deposits of fine sediments. It is also best if the site is not too vulnerable to floods.

Initially the main species is ribbonwood, which is common alongside rivers. Over time longer-lived native conifers (aside from miro or rimu) dominate the canopy, Divaricating shrubs, including small-leaved kōwhai in its juvenile phase, grow in the understorey. The environment is open enough for kōtukutuku or ongaonga, and wet enough for maire tawake.

A remnant example of riparian forest is the wet middle of the lower terrace at Ashhurst Domain.



### SEQUENCE

Ribbonwood survives well in open conditions and can be planted among other shrubs and trees right away. More shade-tolerant plants such as tawa and kōtukutuku need to be added after a few years. Rewarewa and nīkau can be planted in frost-free areas.

### WE RECOMMEND

TREES	Black maire (O-R), five finger (O), hīnau (O), horoeka (O), kānuka (F-O), kahikatea (A), kaikōmako (O), kōhūhū (O), kōtukutuku (O), long-leaved lacebark (O), māhoe (F), maire tawake (A-O), mānuka (F-O), mātai (O), narrow-leaved lacebark (O), nīkau (O), northern rātā (O-R), pigeonwood (O), puka (O), pukatea (F), putaputawētā (O), ribbonwood (A-F), small-leaved kōwhai (O), tarata (O), tawa (F), tī kōuka (F), tītoki (F-O), tōtara (R)
SHRUBS	<i>Coprosma crassifolia</i> (R), <i>Coprosma rhamnoides</i> (O), hangehange (F), kāramu (F), kawakawa (O-F), koromiko (F), māpou (O), ongaonga (O), patē (O), poataniwha (O), ramarama (O), rangiora (O), swamp coprosma (O), taurepo (O), thin-leaved coprosma (O), tutu (O), tūrepo (O), twiggy tree daisy (O)
LIANES & SCRAMBLERS	Kiekie (O)
TREE FERNS	Mamaku (F), ponga (O), whekī (O), whekī-ponga (R)
FERNS	Bracken (O), gully fern (O), hen and chicken fern (O), kōwaowao (O), leather-leaf fern (O), mokimoki (O), shining spleenwort (O), sickle spleenwort (R), swamp kiokio (F)
GRASSES	Bamboo grass (F), bush rice grass (O), toetoe (O)
SEDGES	Forest sedge (O), <i>Isolepis prolifera</i> (O), māpere (O), rautahi ( <i>Carex geminata</i> ) (O)
RUSHES	Giant rush (O)
HERBS	Harakeke (F)

## Kahikatea-pukatea swamp forest

This forest type once dominated the vast alluvial plains of the Manawatū and Horowhenua. The forest was often in a mosaic with more open, swampy areas that would have contained harakeke, and better-drained sites, where tōtara dominated.

Kahikatea and pukatea are notably abundant in wet forests in New Zealand. Large, centuries-old specimens form buttresses, considered to assist stability by spreading the weight of the tree over a larger area. Kahikatea is dominant in wetter areas,

but in dense forest it is pukatea that forms the canopy, amongst tawa and occasional tītoki. The ground layers of such forests are very moist, with a range of ferns, and some small shrubs, but the wet environment is generally hostile to most shrubs and trees.

The prime remaining examples are on the edge of the sand country, such as Omarapapaku, the low-lying forests besides Lakes Papaitonga and Horowhenua, and more inland reserves such as Koputaroa Reserve near Shannon.

### SEQUENCE

Plant in well-drained, fertile sites where drought is not a problem, using early successional plants to help reduce the impact of weeds. In wetter areas, plant rushes and sedges, along with maire tawake, pukatea, ribbonwood and kahikatea.

A mix of kōhūhū, koromiko, horoeka, kanono, kāramu, māhoe, mānuka, the two lacebarks, tītoki, tōtara and tī kōuka are better for slightly

drier sites. Once cover is generated under-plant with kaikōmako, miro, putaputawētā and swamp coprosma in the wetter areas, and in the drier areas with five finger, kawakawa, māpou, pigeonwood, rewarewa, tarata, tūrepo, and the native grasses. Leave rimu, tawa, puka and northern rātā until shade has been established, and there is something for the rātā to climb.

### WE RECOMMEND

TREES	Black maire (R), broadleaf (O), five finger (O), hīnau (O), horoeka (O), kahikatea (A), kaikōmako (O), kāmahī (O-R), kōtukutuku (O), long-leaved lacebark (R), māhoe (O-F), maire tawake (O), makomako (O), mātai (O), miro (O), narrow-leaved lacebark (O), northern rātā (O), pigeonwood (F), puka (O), pukatea (F), putaputawētā (O), rewarewa (F), ribbonwood (O), rimu (O-R), small-leaved kōwhai (O), tarata (O), tawa (F), tī kōuka (F), tītoki (F-O), tōtara (O-R), white maire (O)
SHRUBS	Hangehange (F), kanono (O), kāramu (F), kawakawa (F), koromiko (O), māpou (O), mingimingi (O), patē (O), ramarama (O), rangiora (O), rōhutu (O), swamp coprosma (O), thin-leaved coprosma (O), tūrepo (O)
LIANES & SCRAMBLERS	Climbing fuchsia (O), kiekie (O), small-leaved pōhuehue (O)
TREE FERNS	Mamaku (O), ponga (O), whekī (O)
FERNS	Bracken (O), button fern (O), gully fern (O), kiokio (O), kōwaowao (F), leather-leaf fern (F), mokimoki (F), petipeti (R), pikopiko (O), shining spleenwort (O), sickle spleenwort (O), swamp kiokio (O), thread fern (O)
GRASSES	Bush rice grass (O), <i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (O), toetoe (O)
SEDGES	Hook sedge (O), māpere (R), purei (R)

## Tawa forest

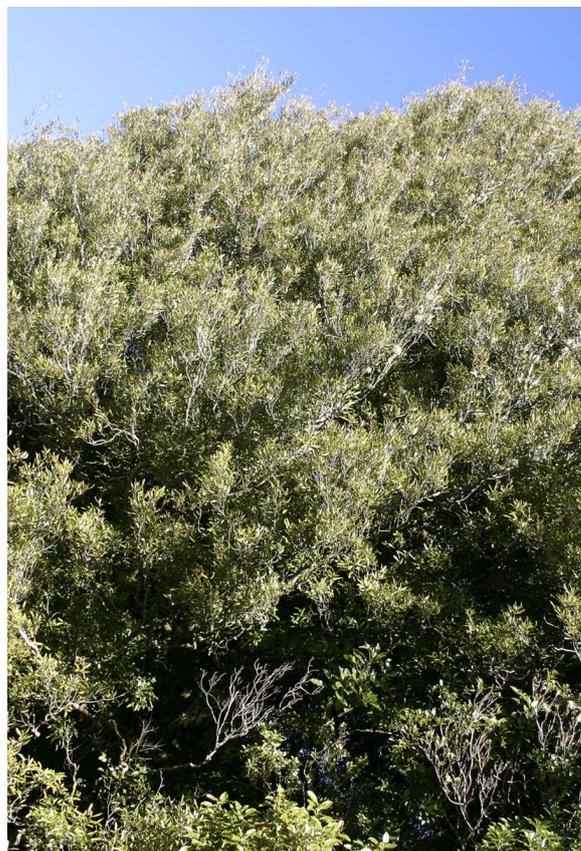
Tawa is widespread in lowland forests of the Manawatū Plains Ecological District, forming part of the canopy beneath emergent native conifers (podocarps). Pure tawa forests, with no emergent trees, are only likely to have occurred in very stable, disturbance-free patches.

Early maps of the Manawatū show occasional tawa stands close to the river. Moutua Scenic Reserve on the embankment of the Manawatū River near Shannon is likely to be a remnant of original tawa forest.

### SEQUENCE

Tawa seedlings need a forest canopy. If you want to make a tawa stand, and cannot find a pre-existing logged one that needs restoration, then first planting and establishing a dense nurse crop of shrubs, such as kānuka, is essential.

You need to eliminate competition from faster-growing species, both native and exotic, particularly while your plants are young.



Mature tawa forest.

### WE RECOMMEND

TREES	Broadleaf (O), five finger (O), hīnau (O), horoeka (O), kāmahi (O), kānuka (O), kōtukutuku (O), long-leaved lacebark (O), māhoe (F), pigeonwood (F), rewarewa (F), rimu (R), tarata (F), tawa (D), titoki (O), toro (F)
SHRUBS	<i>Coprosma rhamnoides</i> (O), round-leaved coprosma (O), hangehange (O), heketara (O), kanono (O), kawakawa (O), patē (O), taurepo (O), rangiora (O), tūrepo (O)
LIANES & SCRAMBLERS	Kiekie (O)
TREE FERNS	Kātote (R), mamaku (O), ponga (F), whēkī (O)
FERNS	Kiokio (O), leather-leaf fern (O), petipeti (R), pikopiko (O), shining spleenwort (O), sickle spleenwort (O), smooth shield fern (O), thread fern (O)
GRASSES	Bush rice grass (O)
SEDGES	Hook sedge (O)

Abundance to aim for:

D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare

## Black beech–broadleaved forest

Black beech is marginal to the Manawatū Plains Ecological District. It is generally a ridgeline or upland forest species that is tolerant of low-fertility soils.

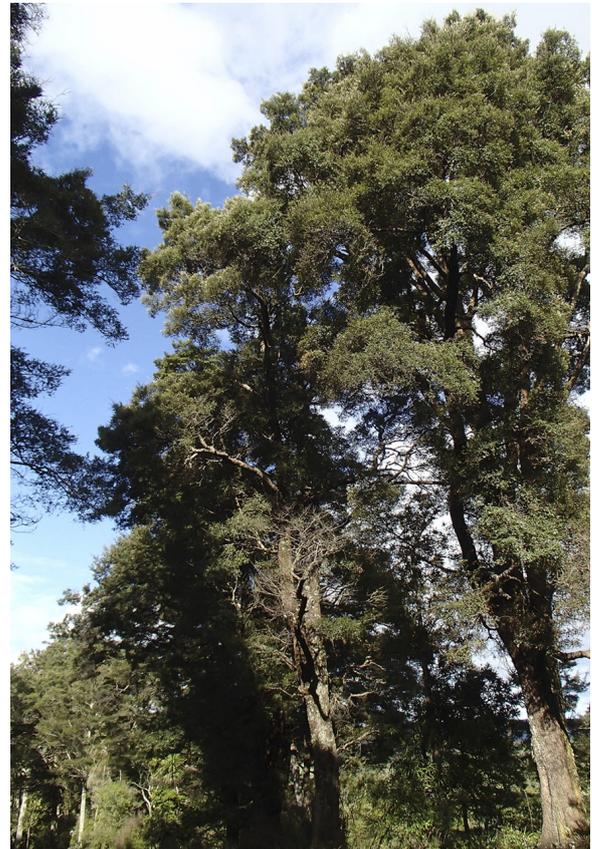
An appropriate site would be a dry, open spur on the northern limits of the ecological district.

When planted in the lowlands, however, black beech does persist, though somewhat reluctantly.

A good example of a black beech-broadleaved forest can be seen at Tōtara Reserve in the Pōhāngina Valley, on the tops of spurs sloping down to the river.

### SEQUENCE

Plant well-established black beech seedlings (at least 1 metre tall) amongst the other shrubs and herbs.



*Black beech–broadleaved forest.*

*Abundance to aim for:*

*D = dominant  
A = abundant  
F = frequent  
O = occasional  
R = rare*

### WE RECOMMEND

TREES	Akeake (O), black beech (D), broadleaf (O), five finger (O), Godley's kōwhai (O), horoeka (F), kaikōmako (O), kōhūhū (O), māhoe (O), mānuka (O), putaputawētā (O), tītoki (O)
SHRUBS	Bush snowberry (O), <i>Coprosma rhamnoides</i> (F), kāramu (O), māpou (O), niniao (O), rangiora (O), rōhutu (O), tall mingimingi (O)
FERNS	Bracken (O), leather-leaf fern (O)
GRASSES	Broad-leaved poa (O)
SEDGES	Hook sedge (O), māpere (O)
HERBS	NZ iris (O)



*Black beech.*

## What's in a name?

Most plants have at least three!

First, they have a two-part scientific name (written in italics) that is recognised internationally and is unique to a single species.

Next they usually have a common name that often is linked to some characteristic of the plant. Different species can have the same common name and some plants have more than one common name.

Sometimes the common name is also a Māori name — but some plants have both a common European name and a common Māori name.

To complicate matters, lesser-known plants often only have a scientific name.

This book uses common names in the first instance and scientific names if the plant does not have a common name. All names are given in the main plant lists on the next pages.



**Northern rātā** was once one of the most common tree species in this ecological district, particularly in lowland to upland forest. It has become extremely rare because possums love to eat it.

The rātā starts life as an epiphyte high in the branches of a host, and climbs both up and down from there, ultimately developing strong supporting roots that allow it to stand alone after its host dies. Because of this growth habit, northern rātā forms only short trunks high in the canopy and so it was seldom logged.

# PART THREE: Reference information

## Plant list

The plants in the following lists are those mentioned in this booklet and are appropriate to the Manawatū Plains Ecological District. They are organised according to type (tree, shrub, grass etc) with a column to show how tall each plant will grow and other columns to describe the conditions that will suit it best. If you are having difficulty obtaining any of the species listed, please contact the biodiversity section of your regional council. Plants in a pale yellow cell are threatened, at risk or regionally distinctive in the Manawatū Plains Ecological District.

COMMON/MĀORI NAME	BOTANICAL NAME	Final height (m)	Wind-tolerant	Frost hardy	Salt-tolerant	Well-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
<b>TREES</b>												
Akeake	<i>Dodonaea viscosa</i>	12	•	•	•	•		☀️	☀️☁️		•	
Beech, black	<i>Fuscospora solandri</i>	20		•		•		☀️	☀️☁️			
Broadleaf / kāpuka	<i>Griselinia littoralis</i>	17	•	•	•	•		☀️	☀️☁️			•
Five finger / whauwhaupaku	<i>Pseudopanax arboreus</i>	10		•		•		☀️	☀️☁️		•	•
Hīnau	<i>Elaeocarpus dentatus</i>	20	•	•		•		☀️	☀️☁️		•	•
Horoeka / lancewood	<i>Pseudopanax crassifolius</i>	15	•	•		•	•	☀️	☀️☁️		•	•
Kahikatea	<i>Dacrycarpus dacrydioides</i>	25+	•	•		•	•	☀️	☀️☁️			•
Kaikōmako	<i>Pennantia corymbosa</i>	12	•	•		•	•	☀️	☀️☁️			•
Kāmahi	<i>Weinmannia racemosa</i>	25	•	•		•	•	☀️	☀️☁️		•	•
Kānuka	<i>Kunzea robusta</i>	15	•	•	•	•		☀️	☀️☁️		•	
Kohekohe	<i>Dysoxylum spectabile</i>	15	•		•	•	•		☀️☁️	☁️		•
Kōhūhū / kohukohu	<i>Pittosporum tenuifolium</i>	10	•	•	•	•		☀️	☀️☁️		•	•
Kōtukutuku / tree fuchsia	<i>Fuchsia excorticata</i>	15		•		•	•		☀️☁️	☁️	•	•
Kōwhai, Godley's	<i>Sophora godleyi</i>	20		•		•		☀️			•	•
Kōwhai, small-leaved	<i>Sophora microphylla</i>	20		•		•	•	☀️				•
Lacebark, long-leaved /houhere	<i>Hoheria sexstylosa</i>	8	•	•		•	•	☀️			•	•
Lacebark, narrow-leaved	<i>Hoheria angustifolia</i>	10	•			•	•	☀️	☀️☁️		•	•
Māhoe / whitey wood	<i>Melicytus ramiflorus</i>	10	•		•	•	•	☀️	☀️☁️	☁️	•	•
Maire tawake / swamp maire / waiwaka	<i>Syzygium maire</i>	15					•	☀️	☀️☁️			•
Maire, black	<i>Nestegis cunninghamii</i>	25	•	•		•		☀️	☀️☁️			•
Maire, white	<i>Nestegis lanceolata</i>	20	•	•		•		☀️	☀️☁️			•
Makomako / wineberry	<i>Aristotelia serrata</i>	10				•			☀️☁️	☁️	•	•

COMMON/MĀORI NAME	BOTANICAL NAME	Final height (m)	Wind	Frost hardy	Salt tolerant	Well-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
Mānuka	<i>Leptospermum scoparium</i>	15	•	•	•	•	•	☀️	☀️☁️		•	
Mātai	<i>Prumnopitys taxifolia</i>	25+		•		•		☀️	☀️☁️			•
Miro	<i>Prumnopitys ferruginea</i>	25		•		•	•			☁️		•
Ngaio	<i>Myoporum laetum</i>	10	•	•	•	•		☀️			•	•
Nikau	<i>Rhopalostylis sapida</i>	10				•		☀️	☀️☁️	☁️	•	•
Pigeonwood / porokaiwhiri	<i>Hedycarya arborea</i>	15	•			•			☀️☁️			•
Pōkākā	<i>Elaeocarpus hookerianus</i>	14		•		•			☀️☁️			
Puka	<i>Griselinia lucida</i>	10	•	•	•	•		☀️	☀️☁️			•
Pukatea	<i>Laurelia novae-zelandiae</i>	25+					•	☀️	☀️☁️	☁️		
Putaputawētā / marbleleaf	<i>Carpodetus serratus</i>	10		•		•	•	☀️	☀️☁️		•	•
Rātā, northern	<i>Metrosideros robusta</i>	30		•		•	•	☀️	☀️☁️		•	•
Rewarewa	<i>Knightia excelsa</i>	25+	•	•		•		☀️	☀️☁️		•	•
Ribbonwood / mānatu	<i>Plagianthus regius</i>	15		•		•	•	☀️	☀️☁️		•	•
Rimu	<i>Dacrydium cupressinum</i>	30	•	•		•	•	☀️	☀️☁️			•
Tarata / lemonwood	<i>Pittosporum eugenioides</i>	12	•	•	•	•		☀️	☀️☁️		•	•
Tawa	<i>Beilschmiedia tawa</i>	25				•			☀️☁️	☁️		•
Ti kōuka / cabbage tree	<i>Cordyline australis</i>	10	•	•	•	•	•	☀️	☀️☁️		•	•
Titoki	<i>Alectryon excelsus</i>	20	•			•		☀️	☀️☁️		•	•
Toro	<i>Myrsine salicina</i>	10		•		•			☀️☁️	☁️	•	•
Tōtara	<i>Podocarpus totara</i>	25+	•	•		•		☀️	☀️☁️		•	•
<b>SHRUBS &amp; SMALL TREES</b>												
<i>Coprosma crassifolia</i>	<i>Coprosma crassifolia</i>	3				•			☀️☁️			•
<i>Coprosma rhamnoides</i>	<i>Coprosma rhamnoides</i>	2	•	•	•	•	•	☀️	☀️☁️	☁️		•
<i>Coprosma rigida</i>	<i>Coprosma rigida</i>	2				•			☀️☁️			
Coprosma, round-leaved	<i>Coprosma rotundifolia</i>	5	•	•		•			☀️☁️	☁️		•
Coprosma, swamp	<i>Coprosma tenuicaulis</i>	3		•		•	•	☀️	☀️☁️			•
Coprosma, thin-leaved	<i>Coprosma areolata</i>	5				•	•		☀️☁️	☁️		•
Hangehange	<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i>	4		•		•			☀️☁️	☁️	•	
Heketara	<i>Olearia rani</i>	8				•		☀️	☀️☁️			
Kanono	<i>Coprosma grandifolia</i>	6				•	•		☀️☁️	☁️		•
Kāramu	<i>Coprosma robusta</i>	6	•	•	•	•	•	☀️	☀️☁️		•	•
Kawakawa	<i>Piper excelsum</i>	5				•				☁️		•

COMMON/MĀORI NAME	BOTANICAL NAME	Final height (m)	Wind	Frost hardy	Salt tolerant	Well-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
Koromiko	<i>Hebe stricta</i>	6	•	•	•	•		☀	☁		•	•
Mākaka / broom, common	<i>Carmichaelia australis</i>	3	•	•		•	•	☀	☁		•	
Manakura / swamp māhoe	<i>Melicytus micranthus</i>	5				•			☁			•
Māpou / māpau / red matipo	<i>Myrsine australis</i>	6	•	•		•		☀	☁			•
Mingimingi / black scrub	<i>Coprosma propinqua</i>	5	•	•	•	•	•	☀	☁			•
Mingimingi, tall	<i>Leucopogon fasciculatus</i>	2	•	•		•		☀	☁		•	
Ninia	<i>Helichrysum lanceolatum</i>	2		•		•		☀	☁			
Ongaonga / tree nettle	<i>Urtica ferox</i>	2		•		•		☀	☁			
Patē / seven finger	<i>Schefflera digitata</i>	8				•	•		☁	☁		•
Poataniwha	<i>Melicope simplex</i>	5	•	•	•	•		☀	☁			
Poroporo	<i>Solanum laciniatum</i>	2				•		☀	☁		•	•
Ramarama	<i>Lophomyrtus bullata</i>	8		•		•	•		☁		•	
Rangiora	<i>Brachyglottis repanda</i>	7				•			☁			
Raukaua anomalous	<i>Raukaua anomalous</i>	4				•			☁	☁		
Rōhutu	<i>Neomyrtus pedunculata</i>	5		•		•	•	☀	☁			•
Snowberry, bush	<i>Gaultheria antipoda</i>	1	•	•		•		☀	☁			•
Taupata	<i>Coprosma repens</i>	8	•		•	•		☀				•
Taurepo / NZ gloxinia	<i>Rhabdothamnus solandri</i>	2				•			☁	☁		•
Tree daisy, twiggy	<i>Olearia virgata</i>	4	•	•	•	•		☀				
Tūrepo / small-leaved milk tree	<i>Streblus heterophylla</i>	12	•			•			☁			
Tutu	<i>Coriaria arborea</i>	8	•	•		•	•	☀				•
Wharangi	<i>Melicope ternata</i>	5	•		•	•		☀	☁			•
<b>LIANES &amp; SCRAMBLERS</b>												
Bindweed, pink	<i>Calystegia sepium</i> subsp. <i>roseata</i>	3	•		•	•		☀			•	
Fuchsia, climbing	<i>Fuchsia perscandens</i>	5	•			•			☁		•	•
Kiekie	<i>Freycinetia banksii</i>	15	•			•			☁		•	•
Lawyer, leafless	<i>Rubus squarrosus</i>	1.5	•			•			☁			•
Pōhuehue, small-leaved	<i>Muehlenbeckia complexa</i>	2	•	•	•	•	•	☀	☁			
<b>TREE FERNS</b>												
Kātote / soft tree fern	<i>Cyathea smithii</i>	8				•			☁			
Mamaku / black tree fern	<i>Cyathea medullaris</i>	20				•	•	☀	☁			
Ponga / silver tree fern	<i>Cyathea dealbata</i>	10				•			☁	☁		

COMMON/MĀORI NAME	BOTANICAL NAME	Final height (m)	Wind	Frost hardy	Salt tolerant	Well-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
Wheki	<i>Dicksonia squarrosa</i>	8	•	•		•	•	☀	☀☁			
Wheki-ponga	<i>Dicksonia fibrosa</i>	10		•		•	•	☀	☀☁			
<b>FERNS</b>												
Bracken / rarauhe	<i>Pteridium esculentum</i>	2	•	•		•	•	☀	☀☁			
Brake, shaking / tender brake	<i>Pteris tremula</i>	1					•		☀☁	☁		
Fern, button / round-leaved fern / tarawera	<i>Pellaea rotundifolia</i>	0.2				•			☀☁	☁		
Fern, gully / piupiu	<i>Pneumatopteris pennigera</i>	1.5		•			•		☀☁	☁		
Fern, hen and chicken	<i>Asplenium gracillimum</i>	1		•		•	•		☀☁	☁		
Fern, leather-leaf	<i>Pyrosia elaeagnifolia</i>	0.1	•	•	•	•		☀	☀☁			
Fern, sweet	<i>Pteris macilentia</i>	1.4				•	•		☀☁	☁		
Fern, thread / climbing hard fern / pānako	<i>Blechnum filiforme</i>	0.3				•			☀☁	☁		
Kiokio / horokio	<i>Blechnum novae-zelandiae</i>	1.5	•	•		•	•	☀	☀☁			
Kiokio, swamp	<i>Blechnum minus</i>	1		•			•		☀☁	☁		
Kōwaowao / hound's tongue / pārahara	<i>Microsorium pustulatum</i>	0.5				•			☀☁	☁		
Maidenhair, giant	<i>Adiantum formosum</i>	0.6				•				☁		
Mātā / water fern	<i>Histiopteris incisa</i>	1.5		•		•	•	☀	☀☁			
Mokimoki / fragrant fern	<i>Microsorium scandens</i>	0.3				•	•		☀☁	☁		
Petipeti / piupiu / crown fern	<i>Blechnum discolor</i>	1.5		•		•			☀☁			
Pikopiko / hen and chicken fern	<i>Asplenium bulbiferum</i>	1		•		•	•		☀☁	☁		
Shield fern, smooth	<i>Lastreopsis glabella</i>	0.8		•		•			☀☁			
Spleenwort, shining	<i>Asplenium oblongifolium</i>	1	•	•		•	•		☀☁	☁		
Spleenwort, sickle	<i>Asplenium polyodon</i>	1				•	•		☀☁	☁		
<b>GRASSES</b>												
Bamboo grass	<i>Microlaena polynoda</i>	0.5				•			☀☁			
Broad-leaved poa	<i>Poa anceps</i>	0.6				•		☀	☀☁	☁		
Bush rice grass	<i>Microlaena avenacea</i>	0.5		•		•			☀☁	☁		
Meadow rice grass	<i>Microlaena stipoides</i>	0.6		•		•			☀☁			
<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i>	<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i>	0.2	•				•		☀☁	☁		
Toetoe	<i>Austroderia toetoe</i>	4	•	•	•	•	•	☀				
Toetoe, buff	<i>Austroderia fulvida</i>	3.5	•	•	•	•	•	☀				

COMMON/MĀORI NAME	BOTANICAL NAME	Final height (m)	Wind	Frost hardy	Salt tolerant	Well-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
<b>SEDGES</b>												
<i>Isolepis prolifera</i>	<i>Isolepis prolifera</i>	1			•		•	☀️	☀️			
Kāpūngāwhā / kūawa	<i>Schoenoplectus tabernaemontani</i>	2			•		•	☀️				
Kuta / bamboo spike sedge	<i>Eleocharis sphacelata</i>	1.5	•	•			•	☀️				
Māpere	<i>Gahnia xanthocarpa</i>	3.5	•	•		•	•	☀️	☀️	☁️		
Pukio / swamp sedge	<i>Carex virgata</i>	2		•		•	•		☀️			
Purei / pukio	<i>Carex secta</i>	2	•				•	☀️	☀️			
Rautahi	<i>Carex geminata</i>	1.2	•			•	•	☀️	☀️			
Rautahi	<i>Carex lessoniana</i>	1.5			•		•	☀️	☀️			
Sedge, forest	<i>Carex dissita</i>	0.5		•			•		☀️			
Sedge, hook / kamu	<i>Uncinia uncinata</i>	0.5		•		•	•		☀️	☁️		
Toetoe upoko-tangata / giant umbrella sedge	<i>Cyperus ustulatus</i>	2	•	•	•		•	☀️	☀️			
Wiwi / knobby clubrush	<i>Ficinia nodosa</i>	1.5	•	•	•	•	•	☀️				
<b>RUSHES &amp; RESTIADS</b>												
Rush, giant	<i>Juncus pallidus</i>	2					•	☀️				
Wiwi	<i>Juncus edgariae</i>	0.5	•	•			•	☀️				
<b>HERBS</b>												
<i>Glossostigma elatinoides</i>	<i>Glossostigma elatinoides</i>	mat					•	☀️				
Harakeke / flax	<i>Phormium tenax</i>	3	•	•	•	•	•	☀️	☀️		•	•
<i>Hydrocotyle novae-zeelandiae</i>	<i>Hydrocotyle novae-zeelandiae</i> var. <i>novae-zeelandiae</i>	mat					•	☀️	☀️			
Iris, New Zealand / mikoikoi	<i>Libertia peregrinans</i>	0.7	•	•	•		•	☀️				
Kōkihi / New Zealand spinach	<i>Tetragonia tetragonoides</i>	0.5	•		•	•		☀️				
Musk, dwarf / matt-leaved mazus	<i>Mazus novaezeelandiae</i> subsp. <i>novaezeelandiae</i>	0.2					•	☀️	☀️			
Parataniwha	<i>Elatostema rugosum</i>	0.5		•			•			☁️		
Raupō	<i>Typha orientalis</i>	3		•			•	☀️				
Red pond weed	<i>Potamogeton cheesemanii</i>	0						☀️				
Toatoa	<i>Haloragis erecta</i> subsp. <i>erecta</i>	1	•	•	•	•	•	☀️	☀️			
Tutahuna / mat daisy	<i>Raoulia tenuicaulis</i>	mat	•	•		•		☀️				
Water-meal	<i>Wolffia australiana</i>	0					•					
Wharariki / mountain flax	<i>Phormium cookianum</i>	2	•	•	•	•		☀️	☀️		•	•
Willowherb, creeping	<i>Epilobium nummulariifolium</i>	0.4				•	•	☀️				
<b>EPIPHYTES</b>												
Puka	<i>Griselinia lucida</i>	10	•	•	•	•		☀️	☀️			•
Tawhirikaro	<i>Pittosporum cornifolium</i>	2.5	•	•	•	•		☀️	☀️			•

## Nationally threatened and regionally distinctive plant species

If you are interested in planting any species that are nationally threatened and distinctive to the Manawatū Plains Ecological District, contact the Department of Conservation or the biodiversity sections of the Taranaki Regional Council or Horizons Regional Council.

Only a selection of Nationally Threatened species are included in detail on this page. You will also find more information on the websites of the New Zealand Plant Conservation Network and the Department of Conservation.

### Some plant species that are Nationally Threatened in the Manawatū Plains Ecological District



JILL RAPSON

#### Giant Maidenhair fern

FERN

*Adiantum formosum*

An uncommon fern found only in the Manawatū region. Many believe it is a vagrant that has self-dispersed from Australia and established due to human disturbance. It is relatively fragile and threatened by trampling by wandering humans or stock. It is found in scattered forest reserves around Palmerston North, in quite dense patches. It stands up to 60 cm tall on a dark stalk.

At risk — relict



BARBARA HAMMONDS

#### Oplismenus hirtellus subsp. imbecillis

GRASS

This scrambling grass is widespread, though not common, in forest reserves of Taranaki, the Manawatū and Horowhenua. It forms swards to 20 cm high, not dense, but with attractive purple feathery-like stamens to its few flowers (see photo). This is a good plant to target if you are specifically trying to improve the biodiversity of a dune ridge or dune slack forest.

At Risk — Naturally Uncommon



JEREMY ROLFE

#### Dwarf musk

HERB

*Mazus novaezeelandiae* subsp. *novaezeelandiae*

Dwarf musk is a small, creeping herb with purple and white flowers. It is generally found in barely-flowing, shallow, fresh water. It is susceptible to disturbance, habitat clearance and modification including stock trampling.

At Risk — declining



JANET HUNT

#### Kōkihi / New Zealand spinach

HERB

*Tetragonia tetragonoides*

This trailing perennial herb forms dense patches, circular mats, and sometimes mounds of interlacing branches up to 1 m thick. It is primarily a species of the coastal strand zone. Despite the fact that it is also cultivated as a garden vegetable it is threatened by habitat disturbance in the wild.

At Risk — Naturally Uncommon

## Some plant species that are Distinctive to the Manawatū Plains Ecological District



PHIL BENDLE

### Climbing fuchsia

**SCRAMBLER**

*Fuchsia perscandens*

This scrambling small shrub is an attractive plant that sprawls loosely through the surrounding vegetation. It has green and violet to purple flowers and fleshy berries that are attractive to fruit-eating invertebrates. It was first named from Kitchener Reserve near Feilding, which is called its “type” locality.



JANET HUNT

### Nikau

**PALM**

*Rhopalostylis sapida*

Nikau is the world’s most southerly palm. It is not tolerant of frost and reaches its southern limit along the west coast of the North Island and upper west coast of the South Island. Nikau is a lovely plant to introduce to a coastal planting or a sheltered area but struggles in dark or cold forest. The seedlings take a decade or two to form a trunk and start to elongate.



JILL RAPSON

### Northern rātā

**CLIMBER/TREE**

*Metrosideros robusta*

Northern rātā seedlings form attractive bushes but seldom develop into trees because they are frost-intolerant. However, the CT Keeble Memorial Forest Trust plants young seedlings into upright tree fern poles and when roots appear at its base, plants both pole and seedling into a light gap, with struts for initial support. Young rātā require regular releasing and pruning assistance to encourage them to become single stemmed and grow up as far as possible. See also p.26.



JILL RAPSON

### Bamboo grass

**GRASS**

*Microlaena polynoda*

This scrambling grass looks like a short, weak bamboo, and occurs occasionally in light, open forest or scrub on well-drained sites like cliff faces and tops.

It is likely that this will establish from cloned segments of stem.



BILL CLARKSON

### Tawhirikaro

**EPIPHYTE**

*Pittosporum cornifolium*

This plant is uncommon in this region, but it was previously present in mature forests.

It seeds readily but it is hard to establish the seedlings as epiphytes. Specimens have been successfully planted and thrive on the ground at Keeble’s Bush.



BARBARA HAMMONDS

### Ongaonga / tree nettle

**SHRUB**

*Urtica ferox*

Humans have spent decades destroying ongaonga because it has stinging hairs that are poisonous when touched. (It is especially a problem for dogs.) That is why it is now very rare. It grows in open patches of scrub or alongside streams where there is more light. Ongaonga is a host plant for red admiral butterflies and adds diversity to your planting, if you can find a source.

**Make sure it is well away from tracks or access routes.**

# Taonga species

A large number of species of native plants are taonga to Māori. The species on these pages are a small sample only. Check out Manaaki Whenua Landcare's Ngā Tipu Whakaoranga Māori plant use database (Māoriplantuse.landcareresearch.co.nz) for more.

## Kahikatea

TREE

*Dacrycarpus dacrydioides*

Bark, leaves and wood were used for rongoā / traditional Māori healing, while the fruit was eaten. The wood was also used for dyes, torches, musical instruments, toys, tools and weapons.



Kahikatea

## Kānuka

TREE

*Kunzea robusta*

The bark of kānuka was boiled and drunk to heal dysentery. The timber was used to make tools such as fernroot beaters, paddles, spades, tuna / eel traps and spears.



Kānuka

## Māhoe / whitey wood

TREE

*Melicytus ramiflorus*

The inner bark of māhoe was used for rongoā, the berries were used for dyes and the timber for construction. It was also used for making fire by rubbing against other woods (such as tōtara).



Māhoe

## Mānuka

TREE

*Leptospermum scoparium*

Mānuka was used in rongoā, for construction timber, for kai, for hunting and fishing hooks and tools, as well as traps such as tuna / eel weirs. The bark was used to make rain capes.



Mānuka

## Ti kōuka / cabbage tree

TREE

*Cordyline australis*

Ti kouka had medicinal qualities and was also valued for the fibre from its leaves. It was used to make thatch, clothing, cloaks, mats, baskets, threads, cords, and a strong four-sided rope.



Ti kōuka

## Tōtara

TREE

*Podocarpus totara*

Tōtara was used for rongoā as well as kai. The wood was used to make tools such as troughs and scoops as well as in buildings, for carvings and for pa stockades. It was used for waka and for making fire.



Tōtara

## Kawakawa

SHRUB

*Piper excelsum*

Kawakawa leaves, bark, fruit and roots were used for rongoā. The leaves are a symbol of death and mourning and are used for wreaths and ceremonial purposes.



Kawakawa

**Karamū***Coprosma robusta***SHRUB**

The leaves and bark of karamū were used to make infusions to heal stomach and kidney troubles, the berries were eaten and the bark was used to make orange-coloured dyes. Branches also had ceremonial use.

*Karamū***Kuta / bamboo spike sedge***Eleocharis sphacelata*

The leaves of kuta were valued for their fibre. It was used for plaiting coarse floor mats and kete as well as hats and garments.

*Kuta***Rarauhe / bracken***Pteridium esculentum***FERN**

Bracken is another multipurpose plant with medicinal qualities. It was cultivated as a food crop for the rhizomes, and bunches of fronds were used when fishing for kōura.

*Rarauhe***Toetoe***Austroderia fulvida* and *Austroderia toetoe***GRASS**

Toetoe was used for whāriki / mats, kete / baskets, for lining houses, for rua / storage pits and for house battens. The hollow flower stems were used to make piha / spears.

*Toetoe***Koromiko***Hebe stricta***SHRUB**

Koromiko has long been valued for its beneficial effects in cases of diarrhoea and dysentery. Liquid from boiling the leaves was also used as a mouth-wash or gargle.

*Koromiko***Wiwi***Juncus edgariae***RUSH**

All native rushes provided useful fibre for construction, for thatching and for making tools and traps. *Juncus edgariae* is common from coast to mountain but most often found in open shrubland and damp sites.

*Wiwi***Harakeke / flax***Phormium tenax***HERB**

Harakeke was essential in many aspects of life: rongoā, kai (nectar and gum) and for fibre (woven cloaks, raincoats, waist garments, belts, headwear and footwear), plaiting (lashings for tools, waka and for use in fishing and hunting), and for making dyes.

*Harakeke***Raupō***Typha orientalis***HERB**

Raupō was a multipurpose plant, used for weaving, rongoā, kai (pollen cakes, rhizomes), bedding, construction (stalks and leaves for thatch), fishing and hunting, waka, poi- and manu tukutuku / kite making.

*Raupō*



## Problem plants

These species are either aggressive weeds or have become problematic in restoration plantings. Control, or better yet, eliminate them when they first put in an appearance. For more detail on control of problem plants, check out the excellent Weedbusters website ([weedbusters.org.nz](http://weedbusters.org.nz)). ★ = native; ☆ = exotic.

### Karaka ★

*Corynocarpus laevigatus*

TREE

Karaka naturally belongs only to the northern half of the North Island. Historically, Māori planted it in other parts of New Zealand for food. It is spread by kererū, the only bird able to eat its fruits. The kernel is poisonous.



Karaka

### Karo ☆

*Pittosporum crassifolium*

SHRUB

Like karaka, karo belongs only in the upper North Island. It can spread aggressively. Its seed is taken by birds and dispersed widely.



Karo

### Broad-leafed muehlenbeckia ★

*Muehlenbeckia australis*

CLIMBER

This native climber is aggressive, particularly around forest margins where there is plenty of light. It should be monitored and cut back or removed if it begins to become overwhelming.



Broad-leafed  
muehlenbeckia

### Old Man's Beard ☆

*Clematis vitalba*

CLIMBER

This smothering clematis has five leaflets (natives have up to three) and flowers in autumn. It produces thousands of wind-borne seeds per plant. Seed is also dispersed by water, humans and birds.



Old Man's beard

### Elderberry / Elder / Elderflower ☆

*Sambucus nigra*

SHRUB

This shrub or small tree was valued by early European settlers for elderberry wine or cordial. It produces enormous amounts of seed which are poisonous to stock and dispersed by birds so it is a nuisance near plantings.



Elderberry

### Selaginella ★

*Selaginella kraussiana*

CREEPING HERB

This evolutionarily primitive plant is a tough little survivor, and in a damp shady environment it quickly forms a thick carpet. Spores and stems are dispersed by wind, soil movement, water, humans, stock and machinery.



Selaginella

### Tradescantia ☆

*Tradescantia fluminensis*

CREEPING HERB

This frost-sensitive European species forms dense cover in lowland forests and prevents establishment of native seedlings. Remove dense patches before planting. Fragments are dispersed by water, stock and humans.



Tradescantia

### Goat's rue ☆

*Galega officinalis*

PERENNIAL HERB

Goat's rue is an aggressive pest in the Manawatū region. It forms strong, green stems to 2 m with large, soft pea-like leaves and large sprays of mauve flowers. It invades flood-prone land and crowds out all other plants shorter than 1.5 m. The stems die back in the winter, collapsing on anything underneath.



Goat's rue

## Nurseries that eco-source their stock

Nurseries marked  sell mainly eco-sourced plants. Those marked  sell a mix of eco-sourced and other plants. Some will also grow to order, especially if you bring in your local seed. Ask at the counter.

 **Kii Tahi Nursery and Land Care**

Lower Kaharoa Road, Pātea  
06-273 6000 / 027 247 9723

 **Manawatū District Council Native Plant Nursery**

Supplies to government projects only  
022 044 5825

 **Pioneer Nursery**

752 Taonui Road, Colyton, Feilding  
06-328 7803

 **A Rocha Manawatū**

A community group based in Palmerston North that gives away small stocks of eco-sourced plants in return for koha.  
06-353 6820 / 06-357 5743

 **Tōtara Glen Nurseries**

167 Staces Road, Aokautere, Palmerston North  
027 498 1583

 **Sunshine Environmentals**

75 Pinfold Road, Aokautere  
06-357 4043

 **Manawatū Native Plant Nursery**

Flygers Line, Milson, Palmerston North  
06-356 1557

 **Talisman Nursery**

135 Ringawhata Rd, Otaki  
06-364 5893

 **Gus Evans Nurseries**

12 Utauta Street, Waikanae  
04-293 2501

 **Kapiti Nursery and Landscaping**

140 Otaihanga Rd, Paraparaumu  
027 514 6848

*Order less common, regionally distinctive, and threatened plants up to **two or three years** in advance to allow time for seed or cuttings to be collected, and the plants grown.*

## Sources of further information



Department of  
Conservation  
*Te Papa Atawhai*

### DEPARTMENT OF CONSERVATION

The Department of Conservation works with the community to protect and restore natural, cultural and historic heritage. DOC has offices in New Plymouth, Whanganui, Palmerston North and Kapiti. [www.doc.govt.nz](http://www.doc.govt.nz)



### ENVIRONMENT NETWORK MANAWATŪ

Environment Network Manawātū has over 40 member organisations. It works to foster and encourage environmental initiatives in the Manawātū. 06 355 0126 | 021 157 6177 | <https://enm.org.nz>



### HORIZONS REGIONAL COUNCIL

Horizons Regional Council provides information on biodiversity and sustainable land management. There are offices in Taumarunui, Marton, Woodville and Palmerston North. [www.horizons.govt.nz](http://www.horizons.govt.nz) 0508 800 800



### MANAAKI WHENUA LANDCARE RESEARCH

Landcare Research supports a wide range of aspects of New Zealand flora including: ethnobotany, plant systematics, pollination, weeds. It also maintains Ngā Tipu Whakaoranga. [www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)



### FISH & GAME NEW ZEALAND

Fish & Game NZ manages, maintains and enhances sports fish and game birds and their habitats. <https://fishandgame.org.nz>



### NEW ZEALAND LANDCARE TRUST

NZ Landcare Trust works to create sustainable landscapes and waterways. [www.landcare.org.nz](http://www.landcare.org.nz)



#### NEW ZEALAND PLANT CONSERVATION NETWORK

The go-to people for comprehensive information about New Zealand plants.

[www.nzpcn.org.nz](http://www.nzpcn.org.nz)



QEII National Trust  
Open Space New Zealand  
Ngā Kairauhi Papa

#### QE II NATIONAL TRUST/ OPEN SPACE NEW ZEALAND

Aim: to protect special areas in perpetuity.

Head Office (Wellington) ph 04 472 6626

or find your local QEII National Trust representative at <https://qeii-nationaltrust.org.nz>



#### NATIONAL WETLAND TRUST OF NEW ZEALAND

Information on the protection and restoration of wetlands.

[www.wetlandtrust.org.nz](http://www.wetlandtrust.org.nz)



#### ROYAL FOREST & BIRD PROTECTION SOCIETY

Forest & Bird has branches in South Taranaki, Whanganui, Rangitikei, Manawatū, Horowhenua and Kāpiti Mana.

[www.forestandbird.org.nz](http://www.forestandbird.org.nz)



#### TARANAKI REGIONAL COUNCIL

The Taranaki Regional Council office is in Stratford, ph 0800 736 2222. TRC provides information on biodiversity and sustainable land management.

[www.trc.govt.nz](http://www.trc.govt.nz)



#### WILD FOR TARANAKI

The trust consists of 43 groups and organisations involved in the protection of native plants, animals and ecosystems in Taranaki.

[www.wildfortaranaki.nz](http://www.wildfortaranaki.nz)



#### WEEDBUSTERS

Comprehensive and detailed information about weeds in New Zealand, including how to control them. [www.weedbusters.org.nz](http://www.weedbusters.org.nz)

## Wild for Taranaki

Wild for Taranaki is a charitable trust dedicated to the protection, enhancement and celebration of biodiversity in Taranaki. The trust was formed in 2015 and currently consists of 43 member groups and organisations. It is a community commitment to protecting native plants, animals and ecosystems where people live, work and play. The goals of the trust are to raise the profile of biodiversity, support the work already being done, foster collaboration, develop new projects, raise funds to support this work and encourage people to get involved.

In 2012 the Taranaki Tree Trust, with the assistance of the University of Waikato, began publication of a series of Restoration Guides which cover the five Ecological Districts in Taranaki. This is the final volume in the series. It has been produced with assistance of Massey University.

The Taranaki Tree Trust was a charitable trust dedicated to the protection and enhancement of the region's ecosystems and landscapes. It was in operation for 23 years, from 1992 until 2015. During its lifetime the trust provided financial support to hundreds of planting projects around the region. As a result thousands of native plants were planted for the benefit of our community and the environment on both private and public land.

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[www.facebook.com/wildfortaranaki](http://www.facebook.com/wildfortaranaki)



*Taranaki  
Tree Trust*



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