

# Restoration planting in Taranaki: A guide to the Egmont Ecological District



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# PART ONE: *Getting started*

## Introduction

The Taranaki region intersects three Ecological Regions and five Ecological Districts. Each of these areas has slightly different landforms, climate, soils, human history and land use. The native vegetation of each ecological district has uniquely evolved to match the differing conditions.

Before human settlement native forest covered almost the entire region, but extensive clearance and development of land for farming has led to the loss of large areas of indigenous vegetation over the ring plain and coastal terraces. The few remaining fragments of indigenous vegetation have suffered heavily from the introduction of pest plants and animals. Protecting, enhancing, and creating new areas of indigenous vegetation will ensure the long term sustainability of Taranaki's biodiversity.

*Restoration planting in Taranaki: A guide to the Egmont Ecological District* provides information on restoring and enhancing the indigenous vegetation cover which has been lost from

Taranaki. It is the first of a planned series about each of the ecological districts. It is a guide to enable landowners, community groups and practitioners to restore ecosystems by planting native species.

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

Native plants provide shelter and food for native birds, fish, lizards and insects. Each site that is revegetated becomes a stepping stone in the greater Taranaki landscape, eventually reconnecting an essential network for wildlife. Providing a seed source for the area increases the potential for the spread of native plants across a wide swathe of countryside. These plants 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, not only your children, but their children may stand beneath the trees that are small seedlings now, and thank you for your efforts and foresight.



# Ecological Regions and Districts of Taranaki

As defined in McEwen, WM (1987 *Ecological Regions and Districts of New Zealand*) Taranaki is intersected by three Ecological Regions and five Ecological Districts.

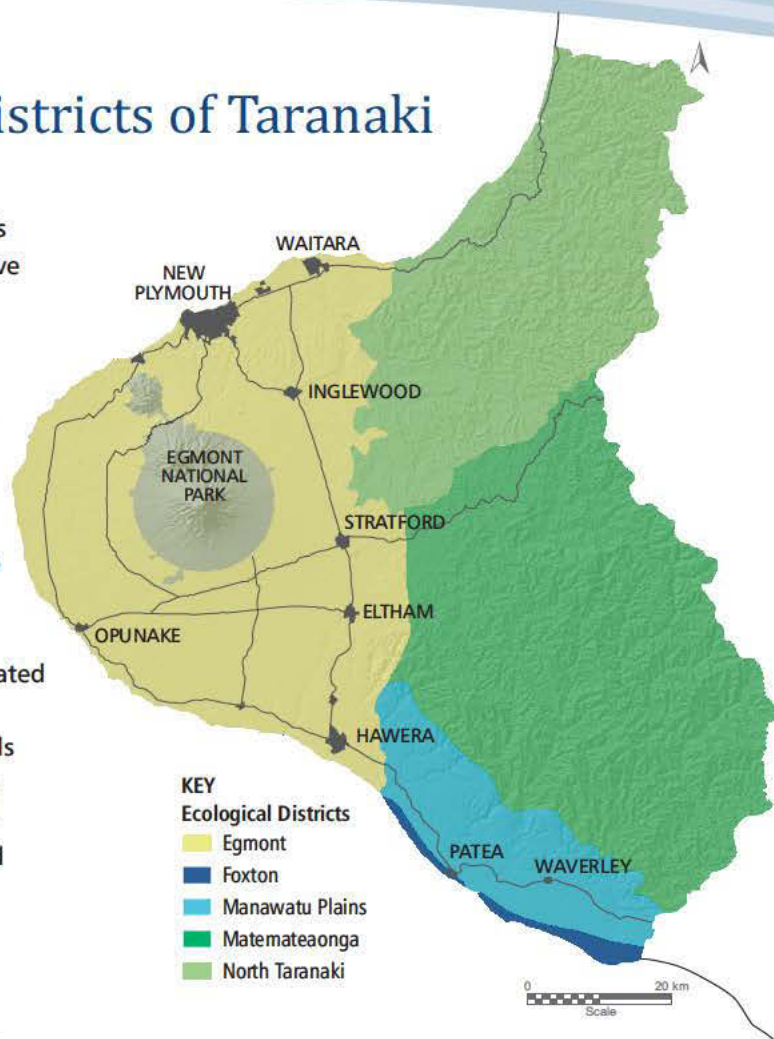
## Egmont Ecological Region

Egmont Ecological District (270,300 ha, 100% within Taranaki) includes the mountain, its ring plain, and all the land west of a north-south line from a little west of Urenui in the north to the Tangahoe River east of Hawera in the south. It includes Inglewood, Stratford, Eltham and Hawera as well as Waitara, New Plymouth and Opunake. This district is dominated by Mount Taranaki, the Pouakai and Kaitake Ranges, and the Sugar Loaf Islands. Fertile soils are derived from volcanic material originating from Mount Taranaki. Thirteen percent of the district is inside the Egmont National Park and reserves. Much of the district is devoted to pastoral farming, especially dairying.

## Taranaki Ecological Region

North Taranaki Ecological District (166,300 ha, 65% within Taranaki) is hill country which was once almost completely forested. It has a great variety of forest types as well as non-forested coastal communities, estuaries, and freshwater wetlands. It is the southern limit for a number of important plant species such as pohutukawa and karo.

Matemateaonga Ecological District (223,400 ha, 43% within Taranaki) is the largest ecological district in the North Island. It is steep and hilly with deeply cut rivers, and extensive tracts of lowland forest. It is sparsely settled with few roads and no large urban areas. The rainforest in Matemateaonga district is nationally important for species of native wildlife that require extensive lowland forests. The Whanganui National Park and its river are particularly outstanding.



## Manawatu Ecological Region

Foxton Ecological District (5,500 ha, 5% within Taranaki) is sand country. Its landforms are the result of sand movement, especially in the past. Today sand movement continues but is more restricted by human intervention. Few natural areas now remain. Foxton Ecological District has a long history of major modification and now contains mostly farmland, exotic pine plantations and urban areas.

Manawatu Plains Ecological District (56,000 ha, 18% within Taranaki) is distinguished by flat-surfaced flood plains and terraces. Its original forests and wetlands have been largely displaced by farming and urban centres including Palmerston North, Wanganui, Feilding, Marton, Bulls, Waverley and Patea.

# Plan of action

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

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 target outcome for this site?

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

You can look around your neighbourhood, you may see established sites that will give you ideas.

Get maps and photos of the site off Taranaki Regional Xplorer  
[www.trc.govt.nz/taranaki-regional-xplorer](http://www.trc.govt.nz/taranaki-regional-xplorer).

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.

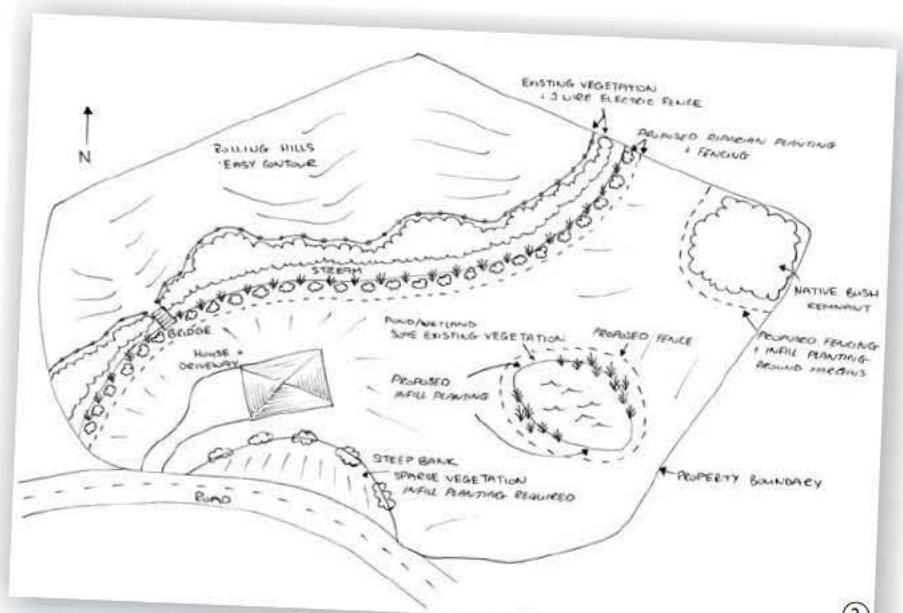
In addition, note:

- What direction does your site face?
- What are the moisture levels? Some parts may be wet or damp, while others are dry.
- Is it 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 (such as rocky, stony, silty, clay or peat)?
- Any other information that may be important, such as whether it has been burned or grazed.
- Are there areas of vegetation such as weeds or plantation forests that need to be removed, and 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 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 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.

Massed and random groups of plants (e.g. groups of three as a minimum) create refuges for wildlife as well as visual interest, and screening if needed. Group plantings also aid pollination.

- Ensure a mix of male and female plants (if applicable).
- A closed canopy will help to exclude weeds.
- Don't forget to allow space for your larger specimens to expand.
- Think carefully about where you plant trees. You don't want them to cause future hazards.
- Food plants for birds will have an added benefit once established because they spread seeds on your behalf.
- Place low ground cover alongside paths.
- Leave selected spaces for viewshafts.

## Where to get plants?

Find a local native plant nursery to supply your plants and order them several months in advance of planting so plants will be available when you need them. You need to order rare or threatened plants two years in advance because seed or cuttings have to be collected and the plants grown.

Plants from your own ecological district (eco-sourced) will do better and will continue to preserve the biodiversity of your area. Ask the nursery where the plants came from. A list of potential nurseries is found on page 38.

To learn more about New Zealand Flora there is a two week block course 'Flora of Aotearoa/New Zealand' available at the University of Waikato. You could also attend local plant propagation demonstrations at places like the Taranaki Regional Gardens, Western Institute of Technology at Taranaki (WITT), or Hive Taranaki.

*You could grow your own plants from locally collected cuttings or seed, or collect and transplant unwanted seedlings such as those that have established along roadsides. Always ask the permission of the landowner, and do not take from reserves or public conservation land.*

### What is eco-sourcing?

Eco-sourcing means getting your plants from seed and cuttings obtained from within, rather than outside, your region. These plants are better adapted to local conditions and are more likely to thrive.

When plants are sourced from different regions 'genetic pollution' is likely to occur, leading to species loss and a decrease in biodiversity.

It is recommended you buy plants from nurseries that follow eco-sourcing principles. You not only support the locals but there's less handling, and less cost to you and to the environment.



## Preparation

- Fence the area to exclude grazing stock.
- Commence pest animal control e.g. possums, feral goats and deer, rabbits and hares.
- Identify pest plants and prioritise their control.
- 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 between plants to establish a reasonably dense cover.

\* A herbicide caution! Glyphosate will damage any green tissue it touches, especially when 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. Amitrol can remain in sandy and low-organic soils for at least 12 months.

## Planting

- Plant coastal and lowland sites in May or June so plants establish over winter before the summer dry. Plant upland areas in early spring when plants are dormant and have been hardened off by frost. Leave frost-susceptible species as late as possible — until September or October.
- Ensure that your plant is well watered before you begin.
- Dig a hole at least twice the size of the container and break up the soil in the bottom to make a soft bed. Plant more deeply or more shallowly depending on the wetness or dryness of your site.
- Remove your plant from its container and carefully loosen or prune off any entangled

roots, keeping disturbance to a minimum. Place it in the hole.

- Depending on the soil, you may want to add a New Zealand-made slow-release fertiliser tablet. Know the fertiliser history of the planting site as some species such as rewarewa and toro can be severely stunted or even killed by soluble phosphates. In very free-draining soils, nutrients placed below the root ball can be lost by soil water movement. In these situations it may be better to place the fertiliser about 10 cm away from the root ball on the uphill side if planting on a slope. This will ensure that soil water movement will move the dissolved nutrients past the plants' roots as part of natural soil drainage.
- At sites where the soils are well drained and exposed, such as coastal sands, plants can be planted deep so that the top of the rootball is at twice its original depth. This ensures more stability and access to moisture over a longer period in dry weather.
- Replace the soil and pull the seedling up about 5 cm.
- Taller plants may require staking, especially if they are in an exposed location.
- Create a barrier to protect plants on the edge of your site from wind or salt if it is exposed.

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

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

- Mulch with bark chips, newspaper, woollen mats, sheep manure, cut grass, old hay or other biodegradable 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. Plants that are kept clear of weeds will reward you with greater growth and vigour. Release in late spring, summer and autumn if required. Release clearing can either be done by hand or by spraying with a herbicide selected specifically for the job.

You may need 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 removing flowers, fruit, palatable foliage, and bark.

Planting the right species at the right time will allow good root growth before summer 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 reasons for these will assist future decision making.

In the following and subsequent seasons, replace failed plants. Once your first plantings are established (3–5 years), middle and late-stage plants which need some degree of protection 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. Sprinkle in a little fertiliser. Place the seedling in the hole.



2. Replace the soil around the roots and gently pull the seedling up. This will straighten any roots that are twisted or swept up.



3. Firm the soil around the seedling using your hands or the toe of your boot. Taking care not to over-compress the soil and damage the seedling.

4. Leave a small depression when you firm the soil around the seedling to help retain water.



## What's in a name?

Most plants have at least three names!

In the first instance they have a two-part scientific name that is recognised internationally and only allocated to a single species.

Next they have a common name which often relates to some characteristic of the plant. Different species can have the same common name. Some plants have more than one common name.

Sometimes the common name is also a Maori name – but some plants have both a common name and a Maori name.

To complicate matters, lesser known plants may 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 plant list on page 28.

# PART TWO: *Target ecosystems*

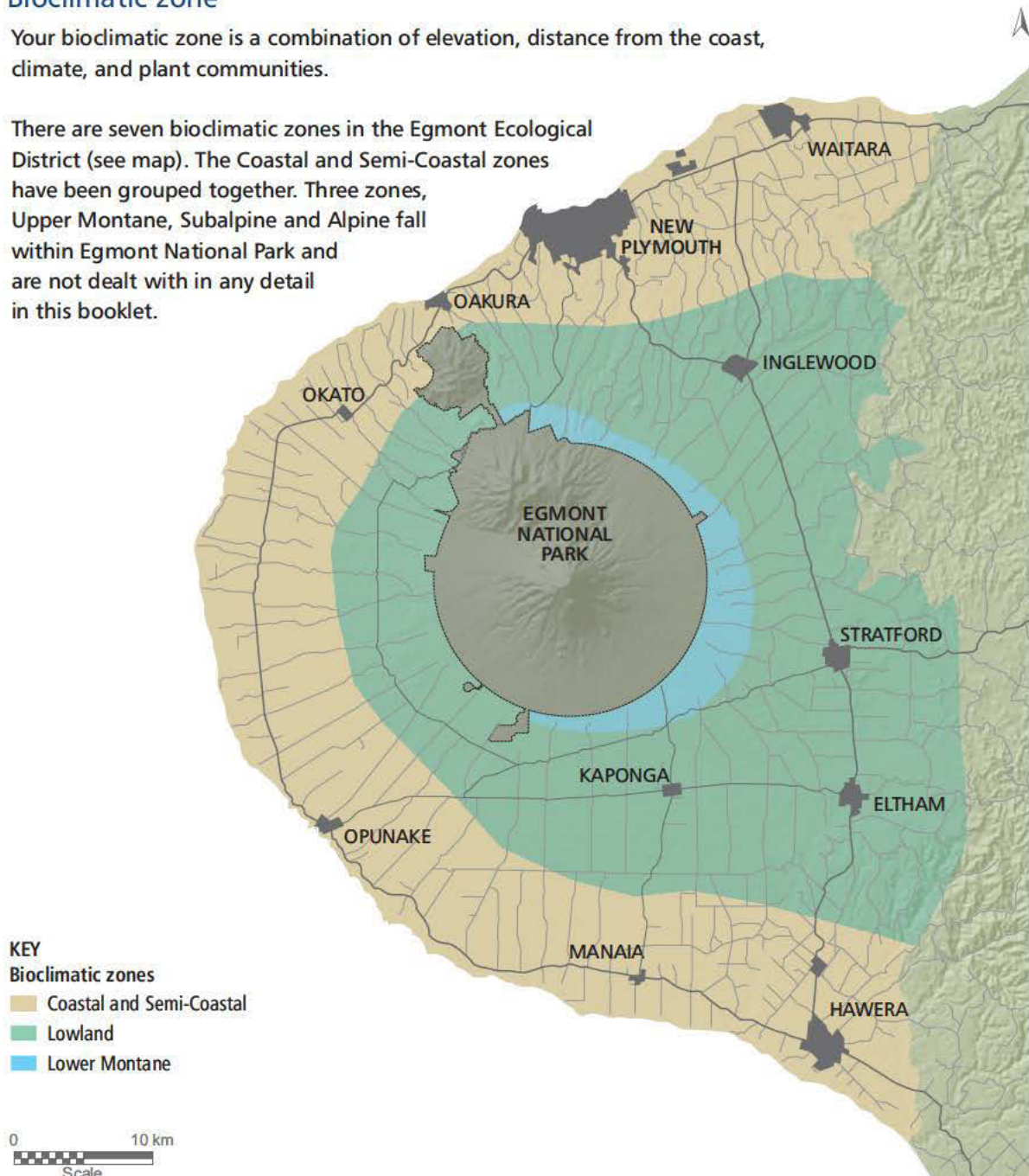
## What to plant and where

The composition of your planting is determined by two things: your bioclimatic zone and your target ecosystem.

### Bioclimatic zone

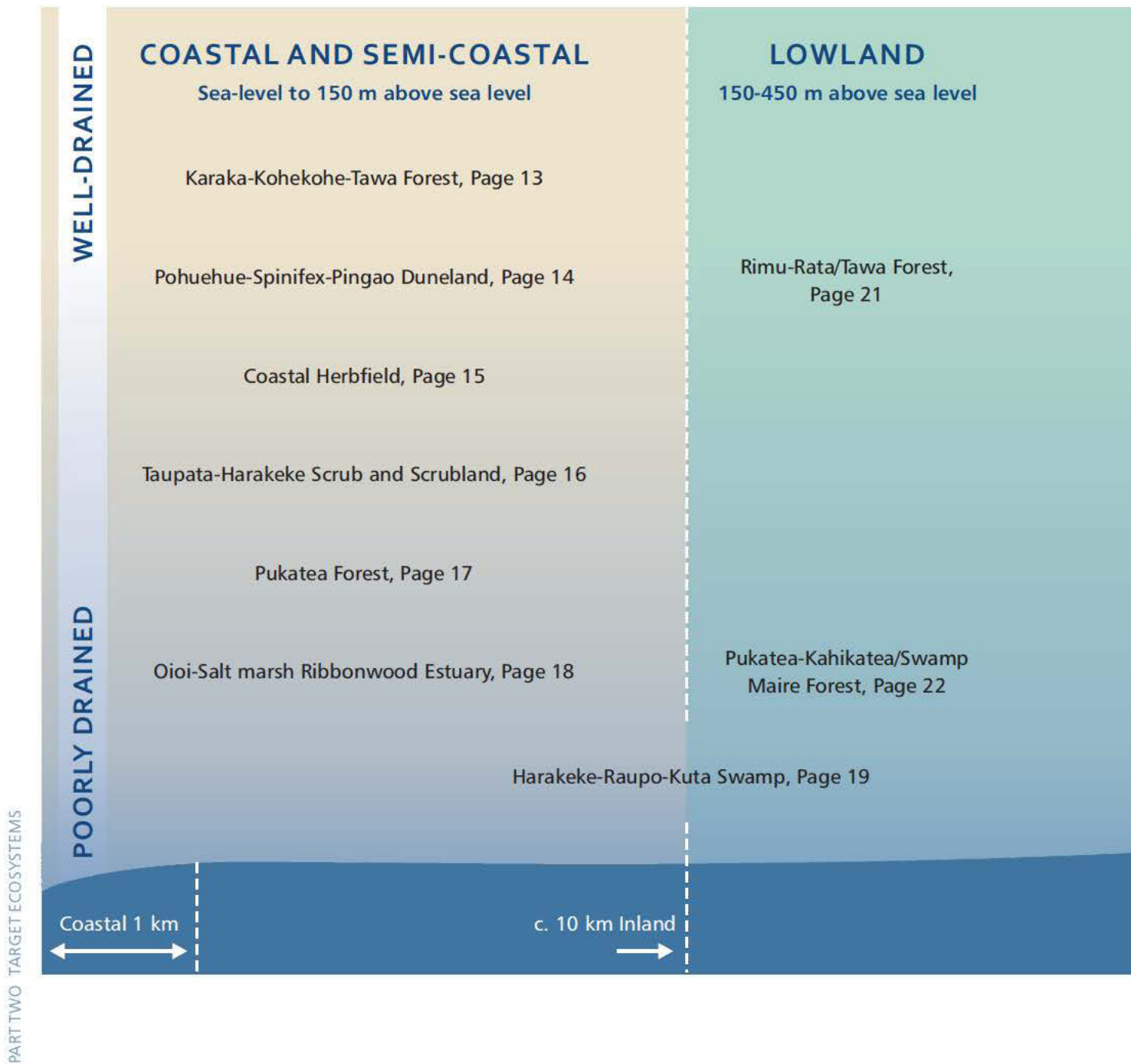
Your bioclimatic zone is a combination of elevation, distance from the coast, climate, and plant communities.

There are seven bioclimatic zones in the Egmont Ecological District (see map). The Coastal and Semi-Coastal zones have been grouped together. Three zones, Upper Montane, Subalpine and Alpine fall within Egmont National Park and are not dealt with in any detail in this booklet.



## Target ecosystems

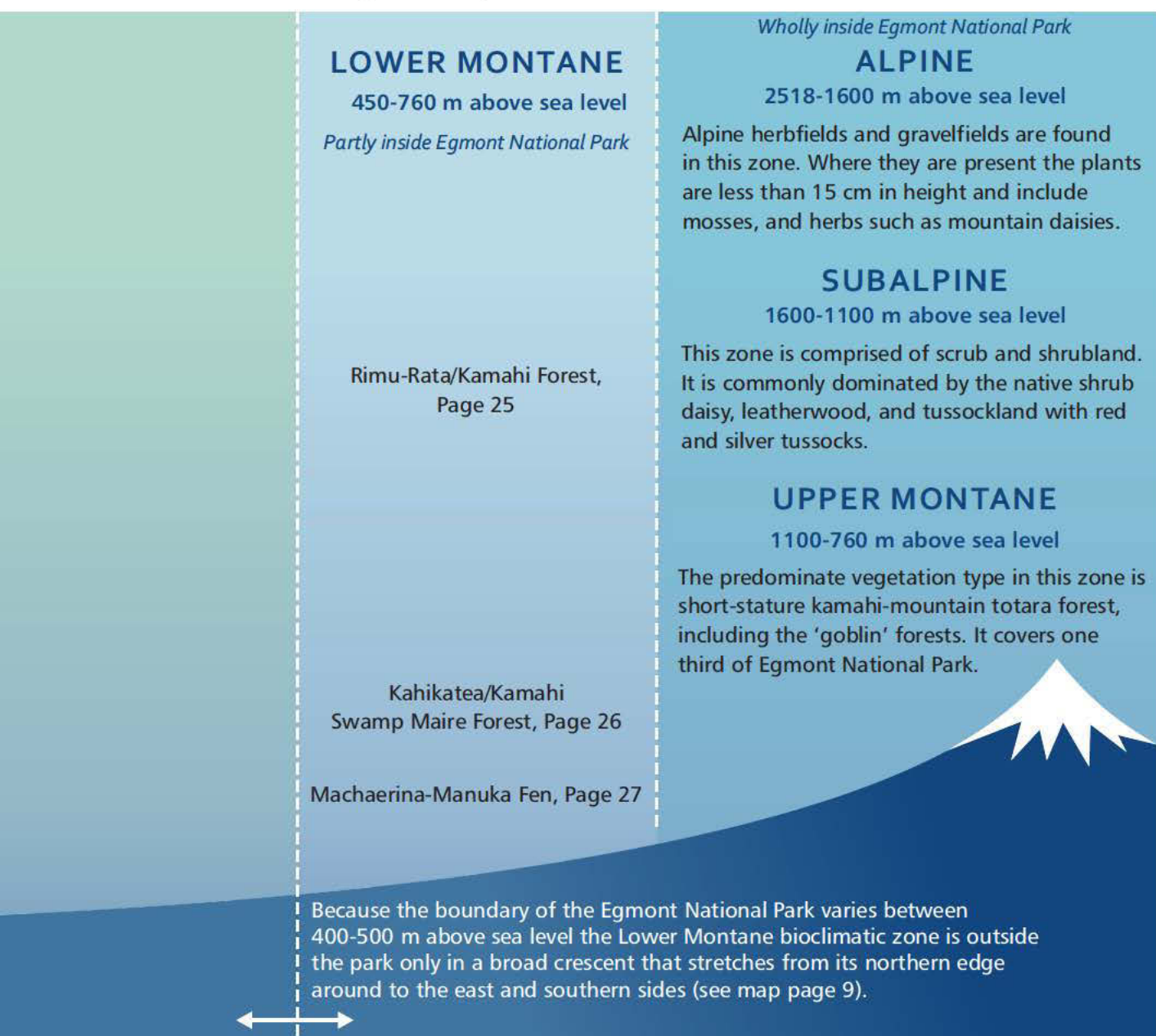
Each of the bioclimatic zones can be further subdivided according to local site conditions into target ecosystems. This diagram shows how the target ecosystems are distributed within the bioclimatic zones according to whether they are well-drained or poorly-drained.



Identify the target ecosystem for your site. The target ecosystems are described on the pages that follow.

There are suggestions for your initial planting and follow-up in later years. The plants listed are cross-referenced to a plant list on page 28.

Those marked with a tick ✓ are most likely to be locally available eco-sourced from within the Egmont Ecological District.





## Karaka-Kohekohe-Tawa Forest

Well-drained coastal and semi-coastal areas can support a mix of karaka, kohekohe and tawa in a mature forest. Other trees you will find in the canopy include rewarewa, titoki, mahoe, lancewood, pukatea and puriri (which does not naturally grow south of 39° 09' S). Understorey species include kawakawa, mahoe, supplejack, rangiora, pigeonwood, kanono, karamu and tree ferns. The ground cover includes numerous ferns, bush rice grass and tree seedlings. Examples of this vegetation type occur at Barrett Lake and Ratapihipihi Scenic Reserves.

### SEQUENCE

- 1] The dominant species of a Karaka-kohekohe-tawa forest must be planted under a well-established canopy of earlier hardy species. Your first planting should therefore be plants such as karamu, *Coprosma rhamnoides*, rangiora, mahoe, karo, kowhai, rewarewa, lancewood, lacebark, karaka, kanuka and wheki. Puriri (if you are far enough north) and titoki could also be included.
- 2] Kohekohe and tawa are shade tolerant and should not be planted until a canopy is established. Shrubs such as kawakawa, pigeonwood and kanono are also best planted under a canopy, as is the rare king fern (north of Oakura). Scramblers, epiphytes and lianes could be added once trees are capable of supporting their weight. Epiphytes with wind-dispersed spores or seeds are likely to self-colonise and may not need planting.

### WE RECOMMEND

TREES	kanuka✓, karaka✓, kohekohe✓, kowhai✓, lacebark✓, lancewood✓, mahoe✓, nikau✓, pigeonwood✓, pukatea✓, puriri✓, rewarewa✓, tawa✓, titoki✓
SHRUBS	Hangehange, kanono✓, karamu✓, karo (see note page 16)✓, kawakawa✓, toropapa, rangiora✓, <i>Coprosma rhamnoides</i> ✓
GRASSES	Bush rice grass
SEDGES	Hook sedge
FERNS	Fragrant fern, gully fern, hen and chicken fern✓, lance fern, shining spleenwort, smooth shield fern✓, sweet fern, thread fern
TREE FERNS	Mamaku✓, silver fern✓, wheki✓
SCRAMBLERS	Kiekie
LIANES	Climbing rata, supplejack
EPIPHYTES	<i>Collospermum hastatum</i> , perching lily

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

Puriri does not naturally grow south of this line



Karaka seed should be collected from coastal areas at the northern end of Egmont Ecological District as it is thought this is the natural southern limit of this species. Seed should not be collected from plants associated with cultural sites because karaka was widely planted over New Zealand by Maori.

## Pohuehue-Spinifex-Pingao Dune

Although most dune systems in Egmont Ecological District have been degraded or modified to some extent, coastal sand dunes are an important ecosystem in their own right, supporting a range of native plants and animals, and acting as a buffer between land and sea.

There are three dune zones: active foredune (closest to the sea), mid-dune and consolidated back dune.

In a native state, the active foredune supports species such as spinifex, pingao, sand sedge and native ice plant. The mid-dune is home to sand coprosma, wiwi, small-leaved pohuehue, tauhinu, shore spurge and pinatoro. The consolidated backdune can support taupata, karo, rangiora, akeake, karamu and ngaio.

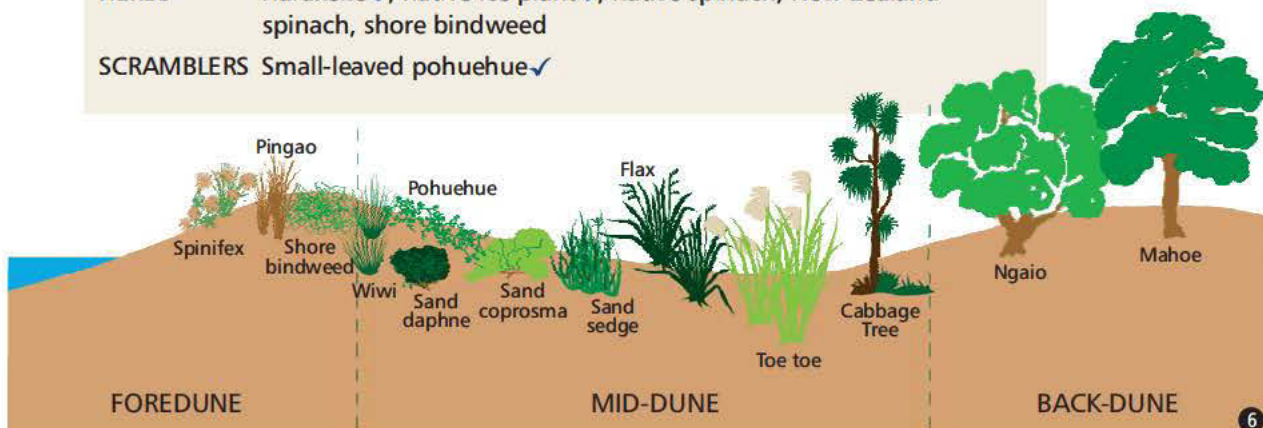
A good example of a dune revegetation project can be found on the northern side of the Te Rewa Rewa bridge across the Waiwhakaiho River.

### SEQUENCE

All of the characteristic species in this vegetation type are hardy and suitable for the initial planting. They will remain on the fore and mid-dunes, although they will be periodically affected by sand movement. Once the tree and shrub species are well established in the consolidated back dunes, locations with adequate soil development and drainage may be under-planted with trees such as karaka and whau to form a later successional karaka-kohekohe-tawa forest. It is important that plants such as pingao are eco-sourced.

### WE RECOMMEND

TREES	Cabbage tree ✓, ngaio ✓, mahoe ✓, karaka, whau
SHRUBS	Coastal tree daisy ✓, hangehange, karamu ✓, karo (see note, page 16) ✓, korokio ✓, koromiko ✓, pinatoro, rangiora ✓, tauhinu, taupata ✓
GRASSES	Toetoe ✓, spinifex,
SEDGES	Sand sedge, wiwi, pingao
HERBS	Harakeke ✓, native ice plant ✓, native spinach, New Zealand spinach, shore bindweed
SCRAMBLERS	Small-leaved pohuehue ✓



## Coastal Herbfield

Coastal herbfields or turfs are found immediately adjacent to the coast in very exposed situations that are unable to support shrubs. Common species include remuremu, *Leptinella squalida*, sea primrose, slender clubrush, *Crassula manaiia*, glossy plantain\*, pygmy forget-me-not, shore spurge, and coastal cress. Communities dominated by prickly couch are more common on drier, free-draining areas. A number of other herbs, including some threatened nationally and with restricted distributions are also present e.g. *Craspedia* 'coast'. Good examples of Coastal herbfields occur at the end of Stent Road and Puketapu Road.

\* Specimens of glossy plantain from the coast are distinct from those growing at inland sites, so propagation material for coastal herbfields must be collected from coastal sites to maintain the distinction.



### SEQUENCE

Before attempting to establish the threatened or uncommon species the agricultural impacts need to be negligible.

Generally, coastal herbfield species are not available for purchase, so an alternative restoration approach may be required. If the site is capable of supporting a coastal herbfield, but is presently dominated by herbaceous weeds, there may still be small areas with native herbfield species present. In this case, small "plugs" of native herbfield may be removed and then introduced into areas not heavily infested with exotic plants. This should only be done under the guidance of the Taranaki Regional Council or Department of Conservation.

Establishment of the main herbfield formers prickly couch and remuremu are the first priority. Prickly couch requires better-drained sandy soils, while remuremu will do best where salt meadow conditions prevail. With subsequent weed control, these plugs will eventually spread and coalesce to form a native herbfield. Adjacent private land owners could potentially be a source for plugs of native species. Native-dominated herbfields are often more common on areas which are periodically lightly grazed by stock because they tend to browse the larger exotics, leaving the smaller natives behind.

### WE RECOMMEND

GRASSES	Prickly couch, pincushion grass
SEDGES	Slender clubrush
HERBS	Remuremu, bachelors button, <i>Chaerophyllum</i> 'minute flower' <sup>©</sup> , coastal harebell, glossy plantain, mudwort, <i>Leptinella dispersa</i> , <i>Leptinella squalida</i> , Muellers starwort, native ice plant ✓, pygmy forget-me-not, sea primrose, shore buttercup, shore cotula, shore lobelia, shore puha, shore spurge, <i>Pseudognaphalium</i> 'coast'*

© An unnamed coastal form of *Chaerophyllum colensoi* (usually an alpine plant).

\* From within the *Pseudognaphalium luteoalbum* aggregate.



## Taupata-Harakeke Scrub and Shrubland

This vegetation type occurs on the steep coastal cliffs and exposed dryland of the Taranaki coastline. The canopy is predominantly taupata and harakeke, with occasional kawakawa, hangehange, cabbage tree, mahoe, karo, korokio and wharangi. Ground cover species include small-leaved pohuehue, *Asplenium* spp., shore spurge, Cooks scurvy grass and Mercury Bay weed. Examples of this vegetation type occur on Paritutu and Nga Motu/Sugar Loaf Islands.

### SEQUENCE

- 1] Taupata and harakeke form the initial planting along with karo, akeake, cabbage tree, korokio and small-leaved pohuehue.
- 2] Once successfully established, karaka, kawakawa, koromiko, hangehange, mahoe, shore spurge and ferns could be introduced, although ferns may not need to be planted as they frequently establish by themselves.

This vegetation type naturally occurs where salt/wind conditions are too harsh for many species.

### Karo - use sparingly!

Although karo was noted in the New Plymouth area in 1867, and is present on Moturoa Island, there is a question mark over whether the karo present around the district is natural to the Egmont Ecological Region. We advise caution in its use unless the source is verified.



### WE RECOMMEND

TREES	Cabbage tree ✓, karaka, wharangi, mahoe ✓, ngaio ✓, kowhai ✓▲, whau ✓▲, rangiora ✓▲
SHRUBS	Hangehange, karo ✓, kawakawa ✓, korokio ✓, koromiko, taupata ✓
HERBS	Mercury Bay weed, harakeke ✓
FERNS	Coastal spleenwort, shining spleenwort
SCRAMBLERS	Small-leaved pohuehue ✓

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

The more sheltered areas could support species marked with ▲ in the list above.

## Pukatea Forest

Pukatea forest occurs on stream margins and poorly drained sites in the Coastal and Semi-Coastal zones. Occasional canopy associates, depending on soil drainage, are tawa, kahikatea, mahoe, kamahi and swamp maire. The under-growth commonly consists of dense tangles of kiekie and supplejack with pate, pigeonwood, nikau and hangehange. Kohekohe also occurs in the understory. The ground cover usually consists of scattered hen and chicken fern, *Astelia* spp., and hook sedges interspersed with areas of open water and mud.

A good example of this forest type occurs at Corbett Lake Scenic Reserve near Okato.

### SEQUENCE

This vegetation type cannot be created from just one planting but needs a series of plantings over a number of years. Close attention to water levels in the soil is required, with pukatea, kahikatea and swamp maire doing better on mounds, and kohekohe, tawa and mahoe all requiring better drained sites.

- 1] First plantings should include harakeke, swamp astelia, swamp sedge and pukio. Harakeke can be quite space-competitive and should be used with care.
- 2] These would be followed by pukatea, the dominant species, and some kahikatea and swamp maire in sheltered gaps among the first plantings.
- 3] Once a closed canopy is established, later species such as kohekohe, tawa, pigeonwood, mahoe and nikau could be planted in light wells.

The climbers kiekie, supplejack and swamp lawyer are best left out until the established trees are able to support their weight.

### WE RECOMMEND

TREES	Pukatea ✓, kahikatea ✓, tawa ✓, kohekohe ✓, pigeonwood ✓, nikau ✓, mahoe ✓, swamp maire ✓, kamahi ✓
SHRUBS	Pate ✓, hangehange, swamp coprosma ✓, thin-leaved coprosma ✓, kanono ✓
SEDGES	Pukio ✓, swamp sedge, hook sedge
HERBS	Bush lily, swamp astelia ✓, harakeke ✓
FERNS	Hen and chicken fern ✓, gully fern, swamp kiokio, jointed fern
SCRAMBLERS	Kiekie
LIANES	Supplejack, swamp lawyer

## Oioi-Salt marsh Ribbonwood Estuary

The only naturally occurring example of an Oioi-salt marsh ribbonwood estuary in the Egmont Ecological District is the Waitara River mouth and estuary. Small areas are dominated by oioi, salt marsh ribbonwood, sea rush, raupo and kuawa, with occasional taupata, cabbage tree, koromiko, karamu, toetoe and harakeke.

The presence of water and salinity determine which species will be most successful and where. Oioi, sea rush and salt marsh ribbonwood are the main salt-tolerant species, while harakeke and raupo require freshwater, and koromiko and taupata require dryland sites.

### SEQUENCE

There is very little change for this target ecosystem—the first planting of the species listed becomes the main planting into the future. The only exception is salt marsh ribbonwood, which benefits from the shelter of other species when it is introduced. The estuarine environment prevents the Oioi-salt marsh ribbonwood vegetation from developing further.

You could plant Taupata-harakeke scrub and shrubland or Pukatea forest along the margins. Kowhai could be added to freshwater stream/river banks on margins away from salt water influences. Ferns are not a significant component of an estuarine environment but will arrive naturally if conditions are suitable.



### WE RECOMMEND

TREES	Cabbage tree ✓, kowhai ✓
SHRUBS	Taupata ✓, karamu ✓, koromiko, salt marsh ribbonwood, coastal tree daisy ✓
GRASSES	Toetoe ✓
RUSHES	Oioi ✓, <i>Juncus edgariae</i> , fan-flowered rush, sea rush
SEDGES	Kuawa
HERBS	Harakeke ✓, raupo

✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

## Harakeke-Raupo-Kuta Swamp

A Harakeke-raupo-kuta swamp is usually the result of clearance or degradation of swamp forest. These swamps occur from the coast through to the Lowland zone on the poorly drained margins of stream channels, fertile swamps and ponds.

As you move from the swamp margin towards open water, first harakeke, then raupo and finally kuta are the dominant plants, with companion plants including karamu, swamp coprosma, cabbage tree, *Carex* spp., *Machaerina* and toetoe.

A good example of this type of swamp vegetation can be seen around the margins of the Waipu Lagoons at Bell Block.

### SEQUENCE

Once established, the species listed for your Harakeke-raupo-kuta swamp will remain indefinitely—the initial planting is more-or-less the final target composition. If the site becomes better drained at a later point (especially at the margins), there could be potential to further develop the habitat into Pukatea forest through secondary planting. Other species such as ferns will arrive naturally and establish once conditions are suitable.



### WE RECOMMEND

TREES	Cabbage tree ✓
SHRUBS	Karamu ✓, swamp coprosma ✓
GRASSES	Toetoe ✓, swamp millet
RUSHES	Giant rush, <i>Juncus planifolius</i>
SEDGES	<i>Machaerina</i> , pukio ✓, swamp sedge, coastal cutty grass, sharp spike sedge, kuta, kuawa, <i>Isolepis distigmatosa</i>
HERBS	Raupo, harakeke ✓
FERNS	Swamp kiokio



## Rimu-Rata/Tawa Forest

Rimu-rata/tawa forest was once widespread on the Taranaki lowland. It is found on moderate to well-drained sites, including ridges, sideslopes, riverbanks, watercourses and land between rivers and volcanic mudflow mounds. Rimu and northern rata grow taller than tawa, with canopy trees including rewarewa, hinau, kamahi, mahoe, totara and matai. The understorey is varied with mahoe, kanono, supplejack, kiekie, pigeonwood, and young tawa common. Ground cover is dominated by ferns, hooked sedges and tree seedlings. Examples of Rimu-rata/tawa forest are common around New Plymouth e.g. Huatoki Scenic Reserve (Tupari) and on the Kaitake Range, though selective logging in the past has removed much of the rimu and rata.

Depending on the lay of the land, many of the species characteristic of other forest types may be present as well. For example, poorly drained gullies or depressions may have pukatea and kahikatea, while drier ridges support more rewarewa, totara or hinau.

### SEQUENCE

- 1] The aim of the first plantings is to establish a canopy to support later stages. Use hardy species such as karamu, rangiora, lacebark, totara, rewarewa, lancewood, kamahi, and wheki. Tutu can be used to boost soil nitrogen levels but may not be needed where land has been previously farmed.
- 2] Once a canopy is established, plant rimu in gaps and mahoe, pigeonwood and kanono underneath. Rata is capable of growing in open sites but normally only establishes once nest epiphytes are abundant. Ferns, along with epiphytes and lianes can be added, although those with light wind-dispersed spores or seeds are likely to self-colonise and may not need planting.

### WE RECOMMEND

TREES	Hinau, kamahi ✓, lacebark ✓, lancewood ✓, kahikatea ✓, kowhai ✓, mahoe ✓, makomako ✓, matai ✓, pigeonwood ✓, pukatea ✓, rangiora ✓, northern rata ✓, rewarewa ✓, rimu ✓, tawa ✓, totara ✓, white maire, tree fuchsia ✓
SHRUBS	Black matipo ✓, hangehange, kanono ✓, karamu ✓, tutu, poroporo
GRASSES	Bush rice grass
SEDGES	Hook sedge
FERNS	Crown fern ✓, fragrant fern, hairy fern, lance fern, shining spleenwort, sweet fern, thread fern
TREE FERNS	Wheki ✓
SCRAMBLERS	Kiekie
LIANES	White rata ✓, supplejack

Note: Tutu is poisonous. Choose your site carefully.

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

## Pukatea-Kahikatea/Swamp Maire Forest

This forest type occurs on poorly drained sites in the Lowland zone including lahar and peat deposits, deposits left by rivers and water, hollows and waterway terraces. The canopy is composed of varying amounts of pukatea, kahikatea and swamp maire. Other canopy trees include hinau, rimu and tawa. The understorey is variable, but often comprises a tangle of climbers such as supplejack and kiekie with shrubs such as kanono, hangehange, mahoe and swamp coprosma. Ground covers include ferns, *Astelia* spp., bush rice grass and hook sedges.

An example of this vegetation type occurs at Umutekai Bush and Conservation Area.

### SEQUENCE

- 1] A first planting of early successional species such as harakeke, *Carex* spp., cabbage tree, swamp coprosma and swamp astelia would be beneficial. Kahikatea can also be planted at the outset but grows better within a nurse crop.
- 2] Swamp maire should be planted in gaps once adequate shelter has been established. Pukatea is a shade-tolerant species best introduced under a canopy. If drainage is sufficient, rimu, tawa and hinau could also be planted below an established canopy, but rimu needs a canopy gap with sufficient light, while tawa is shade tolerant. The climbers kiekie and supplejack could also be introduced under a mature canopy. Ferns will arrive naturally once conditions are suitable.

### WE RECOMMEND

TREES	Cabbage tree ✓, hinau, kahikatea ✓, mahoe ✓, pigeonwood ✓, pukatea ✓, rimu ✓, swamp maire ✓, tawa ✓
SHRUBS	Hangehange, kanono ✓, swamp coprosma ✓, thin-leaved coprosma
GRASSES	Bush rice grass
SEDGES	Hook sedges, swamp sedge, pukio ✓
HERBS	Harakeke ✓, bush lily, swamp astelia
FERNS	Hen and chicken fern ✓, swamp kiokio, water fern
TREE FERNS	Mamaku ✓, wheki ✓
SCRAMBLERS	Kiekie
LIANES	Supplejack

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

Swamp maire - *Syzygium maire*







## Rimu-Rata/Kamaha Forest

Rimu-rata/kamaha forest is widespread within the Egmont National Park. It is also found in remnants adjacent to the park boundary. Emergent rimu and associated epiphytic rata are scattered throughout, although many emergent trees have been removed by logging. The canopy is dominated by kamaha in association with mahoe, hinau, black maire and miro. Understorey species include mahoe, kamaha, toro, tree ferns, kanono, and supplejack. Common ground cover species are bush rice grass, hook sedges, crown fern, hen and chicken fern and filmy ferns.

### SEQUENCE

- 1] Rata and kamaha can form part of the initial planting in this vegetation type, along with hardy species such as broadleaf, karamu, shining karamu, marbleleaf, lancewood and wheki. Manuka and *Coprosma dumosa* can be planted on exposed sites.
- 2] Once a canopy is established, a second planting phase of ferns, trees and shrubs could include rimu, hinau, kanono, pigeonwood, miro, pate, katote and hangehange. Care needs to be taken to match species' light requirements; for example, rimu responds best in canopy gaps while miro is more shade tolerant. Epiphytes and lianes will largely self-establish in this zone.

### WE RECOMMEND

TREES	Broadleaf✓, hinau, kamaha✓, manuka✓, lancewood✓, mahoe✓, black maire✓, marbleleaf✓, miro✓, pigeonwood✓, northern rata✓, raukawa, rimu✓, toro✓
SHRUBS	Hangehange, kanono✓, karamu✓, pate, shining karamu, swamp coprosma✓, <i>Coprosma dumosa</i>
GRASSES	Bush rice grass
SEDGES	Hook sedge
HERBS	Bush lily
FERNS	<i>Blechnum membranaceum</i> , creek fern✓, crown fern✓, drooping filmy fern, filmy fern, hen and chicken fern✓, rusty filmy fern, sickle spleenwort
TREE FERNS	Katote✓, mamaku✓, wheki✓
LIANES	Climbing rata, white rata✓, supplejack
EPIPHYTES	<i>Collospermum hastatum</i> , kohurangi, perching lily

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

## Kahikatea/Kamaha-Swamp Maire Forest

Variations of Kahikatea/kamaha-swamp maire forest occur on poorly drained sites in the Lower Montane zone, upon volcanic mudflow deposits, swampy land between rivers and on poorly drained peatlands. The canopy is mixed, with the most common species being kahikatea, emergent over kamaha and swamp maire. Other canopy trees include hinau, rimu, lancewood, toro and marbleleaf. The understorey is diverse, often with kiekie and supplejack as the dominant species, as well as hangehange, mahoe, wheki, pigeonwood, kanono and swamp coprosma. Ferns and hook sedges tend to dominate the ground layer.

Examples of this vegetation type occur at Norfolk, York, Denbigh and Kahui Roads and in the Egmont National Park.

### SEQUENCE

- 1] Plant to establish a cover of manuka, pukio, swamp coprosma, swamp astelia, marbleleaf, kaikomako, lancewood and wheki.
- 2] Once they are established plant kahikatea and kamaha among them.
- 3] Later species such as swamp maire, rimu, hinau, miro, mahoe, toro and ferns could be introduced, but care needs to be taken to match the light requirements of different species. Epiphytes and lianes will largely self-establish in this zone.

### WE RECOMMEND

TREES	Hinau, kahikatea✓, kaikomako✓, kamaha✓, tree fuchsia✓, lancewood✓, mahoe✓, miro✓, pigeonwood✓, marbleleaf✓, rimu✓, rohutu, swamp maire✓, toro✓, manuka✓
SHRUBS	Hangehange, kanono✓, shining karamu, swamp coprosma✓
SEDGES	Pukio✓, mapere, hook sedge
HERBS	Bush lily, swamp astelia
FERNS	Creek fern✓, hen and chicken fern✓, much-divided filmy fern, rough filmy fern, swamp kiokio, water fern
TREE FERNS	Katote✓, wheki✓
SCRAMBLERS	Kiekie
LIANES	Supplejack
EPIPHYTES	<i>Collospermum hastatum</i> , perching lily

- ✓ Taranaki stock that is most likely to be available locally. Unmarked species may be more difficult to obtain and need to be propagated by arrangement with a local nursery.

## Machaerina-Manuka Fen

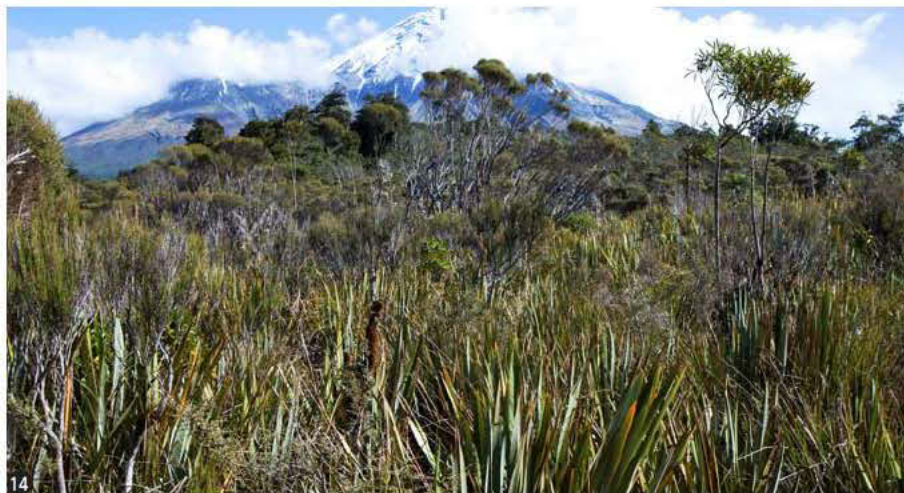
In the Lower Montane zone, a number of wetlands (fens) with a high peat content have developed in shallow, poorly-drained depressions of debris flows from the mountain. In a natural state, manuka overtops scattered harakeke, swamp astelia, swamp coprosma and a mixture of rushes and sedges including *Machaerina*, square sedge, pukio and mapere, as well as tangle fern and mosses.

A good example of a *Machaerina*-manuka fen can be seen at Potaema in Egmont National Park.

Anyone contemplating restoring a lowland wetland within the footprint of the former Ngaere Swamp could use this site as a reference site.

### SEQUENCE

All of the usual species in this vegetation type are suitable for the initial planting. On the edges of the fen, if conditions permit, elements of the Kahikatea/kamahi-swamp maire forest could be added. Characteristic ferns are tangle fern and swamp kiokio. Other ferns will arrive naturally if conditions are suitable.



### WE RECOMMEND

TREES	Broadleaf✓, lancewood✓, manuka✓
SHRUBS	Five finger✓, swamp coprosma✓, tall mingimingi
SEDGES	<i>Machaerina</i> , mapere, pukio ✓, square sedge
HERBS	Harakeke✓, swamp astelia
FERNS	Tangle fern, swamp kiokio

# PART THREE: Reference information

## Plant list

This list contains all the plants mentioned in Part 2. They are suitable for planting in Egmont Ecological District. The plants are organised according to type (tree, shrub, grass etc) with a key to show how tall

each plant will grow, and columns to describe the conditions that will suit it best. If you are having difficulty obtaining any of the plant species listed please contact the Biodiversity Section of the Taranaki Regional Council.

COMMON/MAORI NAMES	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>												
Black maire	<i>Nestegis cunninghamii</i>	25		•		•	•	☀️	☀️			•
Broadleaf, kapuka	<i>Griselinia littoralis</i>	10	•	•	•	•	•	☀️	☀️			•
Cabbage tree, ti kouka	<i>Cordyline australis</i>	10	•	•	•	•	•	☀️	☀️		•	•
Hinau	<i>Elaeocarpus dentatus</i>	20	•	•				☀️	☀️		•	•
Kahikatea, white pine	<i>Dacrycarpus dacrydioides</i>	25+	•	•			•	☀️	☀️			•
Kaikomako	<i>Pennantia corymbosa</i>	10		•			•	☀️	☀️	☁️		•
Kamaha	<i>Weinmannia racemosa</i>	25	•	•		•	•	☀️	☀️		•	•
Kanuka	<i>Kunzea ericoides</i> var. <i>ericoides</i>	10	•	•	•	•		☀️	☀️		•	
Karaka	<i>Corynocarpus laevigatus</i>	15	•		•	•		☀️	☀️			•
Kohekohe	<i>Dysoxylum spectabile</i>	15	•		•	•	•	☀️	☀️	☁️		•
Kowhai	<i>Sophora microphylla</i>	20		•		•		☀️	☀️		•	•
Lacebark, houhere	<i>Hoheria sexstylosa</i>	15	•	•		•	•	☀️			•	
Lancewood, horoeka	<i>Pseudopanax crassifolius</i>	15	•	•		•	•	☀️	☀️		•	•
Mahoe, whitey wood	<i>Melicactus ramiflorus</i>	10	•		•	•	•	☀️	☀️	☁️	•	•
Makomako, wineberry	<i>Aristotelia serrata</i>	10	•	•		•	•	☀️				•
Marbleleaf, putaputaweta	<i>Carpodetus serratus</i>	10		•		•	•	☀️	☀️			•
Matai, black pine	<i>Prumnopitys taxifolia</i>	25		•		•	•	☀️	☀️			•
Miro, brown pine	<i>Prumnopitys ferruginea</i>	25		•		•	•			☁️		•
Ngaio	<i>Myoporum laetum</i>	10	•		•	•		☀️			•	•
Nikau palm	<i>Rhopalostylis sapida</i>	10				•	•	☀️	☀️	☁️	•	•
Northern rata	<i>Metrosideros robusta</i>	25+		•		•	•	☀️	☀️		•	•
Pigeonwood, porokaiwhiri	<i>Hedycarya arborea</i>	12	•			•		☀️	☀️			•
Pukatea	<i>Laurelia novae-zelandiae</i>	25				•	•	☀️	☀️			•
Puriri	<i>Vitex lucens</i>	20	•		•	•		☀️	☀️		•	•
Raukawa	<i>Raukawa edgerleyi</i>	12	•	•		•	•	☀️	☀️			•
Rewarewa, NZ honeysuckle	<i>Knightia excelsa</i>	25+	•	•		•		☀️	☀️		•	•
Rimu, red pine	<i>Dacrydium cupressinum</i>	25+	•	•		•	•	☀️	☀️			•
Tawa	<i>Beilschmiedia tawa</i>	25				•	•	☀️	☀️	☁️		•
Titoki	<i>Alectryon excelsus</i>	10	•			•		☀️	☀️			•
Toro	<i>Myrsine salicina</i>	10		•		•	•	☀️	☀️			•
Totara	<i>Podocarpus totara</i>	25+	•	•		•		☀️	☀️			•
Tree fuchsia, kotukutuku	<i>Fuchsia excorticata</i>	15		•		•	•	☀️	☀️	☁️	•	•
Waiwaka, swamp maire, maire tawake	<i>Syzygium maire</i>	15				•	•	☀️	☀️			•
White maire	<i>Nestegis lanceolata</i>	20				•		☀️	☀️			•

COMMON/MAORI NAMES	BOTANICAL NAME	Final height (m)	Wind tolerant	Frost hardy	Salt tolerant	Wet/drainy soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
<b>SHRUBS AND SMALL TREES</b>												
Akeake	<i>Dodonaea viscosa</i>	6	•	•	•	•		☀				
Black matipo	<i>Pittosporum tenuifolium</i>	5	•	•		•	•	☀	☁			•
Coastal tree daisy	<i>Olearia solandri</i>	4	•	•	•	•	•	☀				
Coprosma	<i>Coprosma dumosa</i>	3	•	•		•	•	☀	☁			•
Coprosma	<i>Coprosma rhamnoides</i>	1.5	•	•	•	•		☀	☁			•
Five finger, whauwhaupaku	<i>Pseudopanax arboreus</i>	8	•		•	•		☀	☁		•	•
Hangehange	<i>Geniostoma ligustrifolium</i> var. <i>ligustrifolium</i>	5	•		•	•		☀	☁		•	•
Hutu	<i>Ascarina lucida</i> var. <i>lucida</i>	6				•	•	☀	☁			
Kanono	<i>Coprosma grandifolia</i>	6				•	•	☀	☁			•
Karamu	<i>Coprosma robusta</i>	6	•	•	•	•	•	☀	☁			•
Karo	<i>Pittosporum crassifolium</i>	8	•	•	•	•		☀	☁			•
Kawakawa	<i>Macropiper excelsum</i>	5	•		•	•		☀	☁			•
Korokio	<i>Corokia cotoneaster</i> var. 'Paritutu'	1	•	•	•	•		☀				•
Koromiko	<i>Hebe stricta</i> var. <i>macroura</i>	4	•	•	•	•		☀	☁		•	
Manuka	<i>Leptospermum scoparium</i>	5	•	•	•	•	•	☀			•	
Pate, seven finger	<i>Schefflera digitata</i>	8				•	•	☀	☁			•
Pinatoro	<i>Pimelea carnosa</i>	0.1	•	•	•	•		☀				
Poroporo	<i>Solanum laciniatum</i>	4				•		☀				•
Rangiora	<i>Brachyglottis repanda</i>	5				•		☀	☁			
Red mapau	<i>Myrsine australis</i>	6	•	•		•		☀	☁			•
Rohutu	<i>Neomyrtus pedunculata</i>	5		•		•	•	☀	☁			•
Salt marsh ribbonwood	<i>Plagianthus divaricatus</i>	2	•	•	•		•	☀	☁			
Sand coprosma	<i>Coprosma acerosa</i>	0.5	•		•	•		☀				
Shining karamu	<i>Coprosma lucida</i>	4	•	•		•	•	☀	☁			•
Swamp coprosma, hukihuki	<i>Coprosma tenuicaulis</i>	3		•		•	•	☀	☁			•
Tall mingimingi	<i>Leucopogon fasciculatus</i>	2	•	•		•		☀	☁		•	
Tauhinu	<i>Ozothamnus leptophyllus</i>	2	•	•	•	•		☀				
Taupata	<i>Coprosma repens</i>	8	•		•	•		☀				•
Thin-leaved coprosma	<i>Coprosma areolata</i>	5				•	•	☀	☁			•
Toropapa, karapapa	<i>Alseuosmia macrophylla</i>	2		•		•	•	☀	☁			•
Tutu	<i>Coriaria arborea</i> var. <i>arborea</i>	6	•	•		•		☀				•
Wharangi	<i>Melicope ternata</i>	5	•		•	•		☀	☁			•
Whau	<i>Entelea arborescens</i>	8	•		•	•		☀	☁			
<b>GRASSES</b>												
Bush rice grass	<i>Microlaena avenacea</i>	0.5		•		•	•	☀	☁			
Pincushion grass	<i>Agrostis muscosa</i>	0.03	•	•	•	•	•	☀				
Prickly couch	<i>Zoysia minima</i>	0.05	•	•	•	•		☀				
Swamp millet	<i>Isachne globosa</i>	1	•		•	•	•	☀	☁			
Toetoe	<i>Austroderia toetoe</i>	4	•	•	•	•	•	☀				
<b>RUSHES</b>												
Edgar's rush	<i>Juncus edgariae</i>	2	•	•		•	•	☀				
Fan flowered rush	<i>Juncus sarophorus</i>	1.5	•	•		•	•	☀	☁			
Giant rush, wiwi	<i>Juncus pallidus</i>	2	•	•	•	•		☀				
Grass-leaved rush	<i>Juncus planifolius</i>	0.1	•	•		•	•	☀				
Oioi, jointed wire rush	<i>Apodasmia similis</i>	1.5	•	•	•	•	•	☀				
Sea rush	<i>Juncus kraussii</i> var. <i>australiensis</i>	1	•		•	•	•	☀				

COMMON/MAORI NAMES	BOTANICAL NAME	Final height (m)	Wind tolerant	Frost hardy	Salt tolerant	Wet-drained soil	Poorly-drained soil	Sun	Partial shade	Shade	Bee-friendly	Bird-friendly
<b>SEDGES</b>												
Coastal cutty grass, giant umbrella sedge	<i>Cyperus ustulatus</i>	2	•	•	•		•	☀️	☀️☁️			
Hook sedge	<i>Uncinia uncinata</i>	0.5	•	•		•	•	☀️☁️				
Isolepis	<i>Isolepis distigmata</i>	0.2				•	•	☀️				
Kuawa	<i>Schoenoplectus tabernaemontani</i>	2			•	•	•	☀️				
Kuta, bamboo spike sedge	<i>Eleocharis sphacelata</i>	1.5			•	•	•	☀️				
Machaerina	<i>Machaerina rubiginosa</i>	1.5		•		•	•	☀️				
Machaerina	<i>Machaerina tenax</i>	2		•		•	•	☀️				
Mapere	<i>Gahnia xanthocarpa</i>	3.5	•	•		•	•	☀️				
Pingao, golden sand sedge	<i>Ficinia spiralis</i>	0.7	•	•	•	•	•	☀️				
Pukio	<i>Carex secta</i>	2	•	•		•	•	☀️☀️☁️				
Sand sedge	<i>Carex pumila</i>	0.2	•	•	•	•	•	☀️				
Sharp spike sedge	<i>Eleocharis acuta</i>	1	•	•		•	•	☀️				
Slender clubrush	<i>Isolepis cernua</i> var. <i>cernua</i>	0.2	•		•	•	•	☀️				
Square sedge	<i>Lepidosperma australe</i>	1	•	•		•	•	☀️☀️☁️				
Swamp sedge	<i>Carex virgata</i>	2		•		•	•	☀️☀️☁️				
Wiwi, knobby clubrush	<i>Ficinia nodosa</i>	1.5	•	•	•	•	•	☀️				
Zotovs hook sedge	<i>Uncinia zotovii</i>	1				•	•	☀️☀️☁️				
<b>HERBS</b>												
Batchelor's button	<i>Cotula coronopifolia</i>	0.4	•		•	•	•	☀️				
Bush lily	<i>Astelia fragrans</i>	1	•	•		•	•	☀️☀️☁️				
Chaerophyllum	<i>Chaerophyllum</i> 'minute flower'	0.05	•		•	•	•	☀️				
Coastal cress	<i>Lepidium flexicaule</i>	0.1	•		•	•	•	☀️				
Coastal harebell	<i>Wahlenbergia ramosa</i>	0.1	•		•	•	•	☀️				
Craspedia, woollyhead	<i>Craspedia</i> 'coast'	0.1	•		•	•	•	☀️☀️☁️				
Crassula	<i>Crassula manaia</i>	mat	•	•	•	•	•	☀️				
Crassula	<i>Crassula peduncularis</i>	0.1	•		•	•	•	☀️				
Glossy plantain	<i>Plantago triandra</i> subsp. <i>masoniae</i>	0.02	•			•	•	☀️				
Harakeke, flax	<i>Phormium tenax</i>	3	•	•	•	•	•	☀️☀️☁️			•	•
Koheriki	<i>Scandia rosifolia</i> 'Coastal'	0.7	•		•	•	•	☀️			•	
Leptinella	<i>Leptinella squalida</i>	mat			•	•	•	☀️				
Leptinella	<i>Leptinella dispersa</i>	mat	•		•	•	•	☀️				
Mercury Bay weed	<i>Dichondra repens</i>	0.01	•			•	•	☀️☀️☁️				
Mudwort	<i>Limosella lineata</i>	0.02				•	•	☀️				
Muellers starwort	<i>Callitriche muelleri</i>	0.05	•			•	•	☀️☀️☁️				
Native ice plant	<i>Disphyma australe</i>	mat	•		•	•	•	☀️				
Native spinach	<i>Tetragonia implexicoma</i>	0.2	•		•	•	•	☀️				
Nau	<i>Lepidium oleraceum</i>	0.5	•		•	•	•	☀️				
New Zealand spinach	<i>Tetragonia tetragonioides</i>	0.2	•		•	•	•	☀️				
Pseudognaphalium	<i>Pseudognaphalium</i> 'coast'	0.01	•		•	•	•	☀️				
Pygmy forget-me-not	<i>Myosotis pygmaea</i>	0.01	•		•	•	•	☀️				
Raupo, bullrush	<i>Typha orientalis</i>	3			•	•	•	☀️				
Remuremu	<i>Selliera radicans</i>	mat	•		•	•	•	☀️☀️☁️				
Sea primrose	<i>Samolus repens</i>	0.1	•		•	•	•	☀️				
Shore buttercup	<i>Ranunculus acaulis</i>	0.01	•		•	•	•	☀️				
Shore cotula	<i>Leptinella dioica</i>	mat	•		•	•	•	☀️☀️☁️				
Shore lobelia	<i>Lobelia anceps</i>	0.1	•		•	•	•	☀️☀️☁️				
Shore puha	<i>Sonchus kirkii</i>	0.5	•		•	•	•	☀️☀️☁️			•	
Shore spurge	<i>Euphorbia glauca</i>	1	•		•	•	•	☀️				

COMMON/MAORI NAMES	BOTANICAL NAME	Final height (m)	Wind tolerant	Frost hardy	Salt tolerant	Well-drained soil	Poorly-drained soil	Sun	Part shade	Shade	Bee-friendly	Bird-friendly
Spinifex, kowhangatara	<i>Spinifex sericeus</i>	0.5	•	•	•	•		☀				
Swamp astelia	<i>Astelia grandis</i>	2	•	•			•	☀☀				
<b>FERNS</b>												
Blechnum	<i>Blechnum membranaceum</i>	0.2				•		☀☁				
Coastal spleenwort	<i>Asplenium appendiculatum</i> subsp. <i>maritimum</i>	0.5	•		•	•		☀☀☁				
Creek fern, kiwikiwi	<i>Blechnum fluviatile</i>	0.5		•		•		☀☀☁				
Crown fern, petipeti	<i>Blechnum discolor</i>	1.5		•		•			☁			
Drooping filmy fern	<i>Hymenophyllum demissum</i>	0.1		•		•			☁			
Gully fern	<i>Pneumatopteris pennigera</i>	1.5		•		•		☀☀☁				
Hairy fern	<i>Lastreopsis hispida</i>	0.5		•		•		☀☀☁				
Hen and chicken fern, pikopiko	<i>Asplenium bulbiferum</i>	0.8		•		•		☀☀☁				
Kingfern	<i>Ptisana salicina</i>	5				•		☀☀☁				
Lance fern	<i>Blechnum chambersii</i>	0.2		•		•			☁			
Much-divided filmy fern	<i>Hymenophyllum multifidum</i>	0.1		•		•			☁			
Rough filmy fern	<i>Hymenophyllum scabrum</i>	0.2		•		•			☁			
Shining spleenwort	<i>Asplenium oblongifolium</i>	2				•	☀		☁			
Smooth shield fern	<i>Lastreopsis glabella</i>	0.4		•		•		☀☀☁				
Swamp kiokio	<i>Blechnum minus</i>	1		•		•		☀☀☁				
Sweet fern	<i>Pteris macilenta</i>	1.4			•	•		☀☀☁				
Tangle fern	<i>Gleichenia dicarpa</i>	0.5		•		•	☀☀	☀☀				
Water fern	<i>Histiopteris incisa</i>	1		•		•	☀☀	☀☀				
<b>TREE FERNS</b>												
Katote, soft tree fern	<i>Cyathea smithii</i>	8		•		•	☀☀	☀☀				
Mamaku, black tree fern	<i>Cyathea medullaris</i>	20				•	☀☀	☀☀				
Silver fern, ponga	<i>Cyathea dealbata</i>	10				•	☀☀	☀☀☁				
Wheki, brown tree fern	<i>Dicksonia squarrosa</i>	8	•	•		•	☀☀	☀☀				
<b>SCRAMBLERS AND CLIMBERS</b>												
Fragrant fern	<i>Microsorium scandens</i>	0.4		•		•		☀☀☁				
Jointed fern	<i>Arthropteris tenella</i>	0.4				•	•		☁			
Shore bindweed, rauparaha	<i>Calystegia soldanella</i>	0.1			•	•	☀					
Small-leaved pohuehue	<i>Muehlenbeckia complexa</i>	2	•	•	•	•	☀					
Thread fern	<i>Blechnum filiforme</i>	0.4				•			☁			
<b>LIANES</b>												
Climbing rata	<i>Metrosideros diffusa</i>	6				•		☀☀☁				
Climbing scarlet rata	<i>Metrosideros fulgens</i>	6				•		☀☀☁				
Kiekie	<i>Freycinetia banksii</i>	2				•	•	☀☀				•
Supplejack, kareao	<i>Ripogonum scandens</i>	6				•	•	☀☀☁				•
Swamp lawyer, tataramoa	<i>Rubus australis</i>	10+	•	•		•	☀☀	☀☀☁		•	•	
White rata	<i>Metrosideros perforata</i>	6				•	☀☀	☀☀☁				
<b>EPIPHYTES</b>												
Filmy fern	<i>Hymenophyllum dilatatum</i>	0.4		•		•			☁			
Kahakaha	<i>Collospermum hastatum</i>	1				•		☀☀☁				•
Kirks kohuhu	<i>Pittosporum kirkii</i>	5		•		•	☀☀	☀☀☁				
Kohurangi, Kirks daisy	<i>Brachyglottis kirkii</i> var. <i>kirkii</i>	3				•	☀☀	☀☀☁				
Perching lily	<i>Astelia solandri</i>	2		•		•	☀☀	☀☀☁				•
Puka	<i>Griselinia lucida</i>	8				•	☀☀	☀☀☁				•
Rusty filmy fern	<i>Hymenophyllum frankliniae</i>	0.1		•		•			☁			
Sickle spleenwort, petako	<i>Asplenium polyodon</i>	0.8				•		☀☀☁				
Tawhirikaro	<i>Pittosporum cornifolium</i>	2.5			•	•	☀☀	☀☀				



## Nationally threatened and regionally significant indigenous vascular plants

If you are interested in planting any species which are nationally threatened or regionally significant contact the Department of Conservation or the Biodiversity section of the Taranaki Regional Council.

Information in these tables has been sourced from the websites of the New Zealand Plant Conservation Network and the Department of Conservation, and the Taranaki Flora Group.

### Plants that are nationally threatened and at risk



15

Coastal cress  
*Lepidium flexicaule*

HERB

South Taranaki coast. Found in coastal herbfields, but also on rock stacks, outcrops, headlands, cliff faces, and among boulders.

**Nationally endangered.** Threatened by habitat loss through weed encroachment, coastal development and browsing.



16

*Crassula manaia*

HERB

South Taranaki coast. Found in coastal herbfields with associated fine silts and gravels.

**Nationally vulnerable.** Out competed by taller, faster growing weeds. It's survival depends on some level of disturbance to retain the open coast herbfield communities it needs without destroying its sensitive habitat.



17

*Crassula peduncularis*

HERB

South from the South Taranaki coast. Coastal to subalpine. Found in seasonally damp, summer dry habitats such as ephemeral wetlands (lake margins, tarns), seasonally damp coastal turfs, and uplifted marine terraces.

**Nationally critical.** Threatened by weed invasion. Most larger populations exist where browsing animals inhibit competing weed species. Its small size and annual habit make it easily overlooked, so some of its former habitats have been inadvertently destroyed by coastal development.



18

King fern, para, tawhiti para  
*Ptisana salicina*

FERN

North west of the North Island from Timaru Stream, Oakura northwards. Found in cave entrances, dark gullies and stream sides, often amongst supplejack and parataniwha. Plant in third successional stage.

**Declining.** Browsed by feral and domestic stock, wild pigs and goats. Over collected by plant enthusiasts.



19

Kirks daisy, kohurangi  
*Brachyglottis kirkii* var. *kirkii*

EPIPHYTE

Usually grows as an epiphyte on trees in established forest. Occasionally grows terrestrially in the absence of browsers in Rimu rata/tawa forest in Lowland zone, or Rimu rata/kamaha forest in Lower Montane zone. Introduce in third successional stage.

**Declining.** Browsed by possums, goats and deer.



20

**Kirks kohuhu, thick-leaved kohukohu**  
*Pittosporum kirkii*

EPIPHYTE

Grows in established forest canopy as an epiphyte, often on *Collospermum hastatum*. Introduced in third successional stage in Rimu rata/kamaha forest in Lower Montane zone.

**Declining.** Browsed by possums and threatened by forest clearance.



21

**Koheriki**  
*Scandia rosifolia* 'Coastal'

HERB

Found on cliff faces, clay banks or among boulders and occasionally in scrub. Plant in first successional stage.

**Declining.** The local population is distinct from that of other regions. Very palatable and is consumed wherever plants are accessible to browsing animals. In many locations is now only represented by small scattered populations or single plants.



22

*Leptinella dispersa*

HERB

Naturally sporadic distribution. Usually coastal on stream, lake or wetland margins, or on shaded cliff faces.

**Naturally uncommon.** Populations are at risk from land reclamation, wetland drainage and competition from weeds.



23

**Pingao, golden sand sedge**  
*Ficinia spiralis*

SEDGE

Found in active sand dunes often on the front face on unstable sloping surfaces. Plant in first successional stage.

**Declining.** Pingao is threatened by competition from marram grass, dune stabilisation, trampling, vehicle traffic and browsing animals.



24

**Pygmy forget-me-not**  
*Myosotis pygmaea*

HERB

South Taranaki coast. Found in open coastal habitats, herbfields, open rocky or sandy places, and on stream sides.

**Declining.** The main threats are loss of habitat caused by land development, weed invasion and coastal erosion.



25

**Nau, Cooks scurvy grass**  
*Lepidium oleraceum*




HERB

Usually found in friable well manured soils, guano deposits, or rock crevices associated with seabird roosts and nesting sites.

**Nationally endangered.** Seriously threatened by loss of sea bird nesting grounds because it needs high fertility soils and regular cycles of animal induced disturbance. Susceptible to introduced pests and diseases; browsed by livestock; affected by a fungus like disease; and over collected by people.

 <p>26</p>	<p><b>Sand coprosma, tarakupenga, tatarakeke</b> SHRUB <i>Coprosma acerosa</i></p> <p>From Paritutu southwards. Found in back dunes on dry hard surfaces such as cliffs, stony ground and limestone. Plant in first successional stage.</p> <p><b>Declining.</b> The local population is distinct from those of other regions. Threatened by dune reclamation and competition from marram grass.</p>
 <p>27</p>	<p><b>Shore spurge</b> HERB <i>Euphorbia glauca</i></p> <p>In dunes, mainly mid dunes. Once the dune is fully consolidated it is quickly overtaken by taller plants.</p> <p><b>Declining.</b> Threatened by browsing and trampling by cattle, sheep, pigs and possums; by competition from taller vegetation; and by coastal development and erosion.</p>
 <p>28</p>	<p><b>Shore puha</b> HERB <i>Sonchus kirkii</i></p> <p>Coastal. Found on cliff faces, in and around damp seepages.</p> <p><b>Declining.</b> Declining over most of its range. Its main threat is competition by faster growing weed species.</p>

### Plants that are significant to Taranaki

 <p>29</p>	<p><b>Akeake</b> TREE/SHRUB <i>Dodonaea viscosa</i></p> <p>Found in consolidated back dunes of Pohuehue spinifex pingao dune and in Taupata harakeke scrub and shrubland. Plant in first successional stage.</p>
 <p>30</p>	<p><b>Coastal tree daisy</b> TREE/SHRUB <i>Olearia solandri</i></p> <p>Found in estuarine swamps, on rocky outcrops and on dry hillslopes. Plant in first successional stage.</p>
 <p>31</p>	<p><b>Grass-leaved rush</b> RUSH <i>Juncus caespiticus</i></p> <p>From Opunake southwards. Grows in or near damp seepages. Plant in second successional stage.</p>
 <p>32</p>	<p><b>Hutu, glossy ascarine</b> TREE/SHRUB <i>Ascarina lucida</i> Hook.f. var. <i>lucida</i></p> <p>Plant in third successional stage in Rimu rata/kamahahi forest in the Lower Montane zone. It is frost sensitive.</p> <p>Very uncommon in the North Island. One significant population near Cold Creek in Egmont Ecological District.</p>



33

**Koromiko**

*Hebe stricta* var. *macroua*

SHRUB

On coastal cliff faces, talus slopes and rock faces.  
Plant in first successional stage.



34

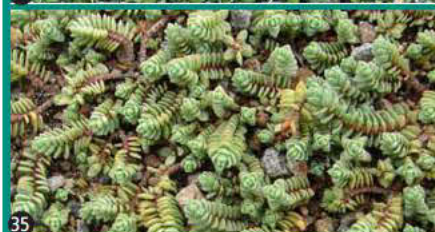
**'Paritutu' korokio**

*Corokia cotoneaster* "Paritutu"

TREE/SHRUB

From Paritutu northwards. Favours open forest and scrub on steep hillsides and cliffs. Plant in first successional stage.

The local population is distinct from those of other regions.



35

**Pinatoro**

*Pimelea carmosa*

SHRUB

On the Sugar Loaf Islands and south Taranaki coastal cliffs. Also on banks and sometimes dunes, commonly in short turf on wind and spray swept cliff tops. Food plant for caterpillars of the *Notoreas* 'Taranaki' moth. Plant in first successional stage.  
Threatened by competition from weed species, trampling, livestock, vehicle traffic and coastal development.



36

**Swamp maire, Waiwaka, Maire tawake,**

*Syzygium maire*

TREE

Found in riparian forest in waterlogged ground on the margins of swamps and streamsides. Plant in second successional stage.

Scarce or absent over large parts of its former range due to the clearance of swamp forest.



37

**Tawhirikaro**

*Pittosporum cornifolium*

EPIPHYTE

An epiphyte in Lowland and Lower Montane forest. It can be introduced to Rimu rata/tawa forest and Pukatea kahikatea/swamp maire forest. Plant in third successional stage.

More common in Egmont Ecological District than in other parts of New Zealand. Tawhirikaro has an uncommon growth form, as a shrub epiphyte.



38

**Wharangi**

*Melicope temata*

TREE/SHRUB

Found from Kaitake Range northward.  
Plant in second successional stage.



39

**Woollyhead**

*Craspedia* 'coast'

HERB

Confined to the south Taranaki coast. Found in constantly wet seepy cliff like environment.

Endangered but has yet to be formally classified as data is deficient. Range restricted, found only at two sites in the North Island.

## Sources of further information

### Department of Conservation



The Taranaki Area Office  
55A Rimu Street  
PO Box 462, New Plymouth 4340  
Phone: 06 759 0350  
Email: [taranakiao@doc.govt.nz](mailto:taranakiao@doc.govt.nz)  
[www.doc.govt.nz](http://www.doc.govt.nz)

### Dune Restoration Trust of New Zealand



Manners Street  
PO Box 11302  
Wellington 6142  
Phone: 04 889 2337  
Email: [info@dunetrust.org.nz](mailto:info@dunetrust.org.nz)  
Advice on dune planting

### Landcare Research Manaaki Whenua



[www.landcareresearch.co.nz](http://www.landcareresearch.co.nz)  
Detailed information on New Zealand flora including:  
ethnobotany, plant systematics, pollination and weeds

### New Zealand Fish & Game



Taranaki Senior Field Officer: Allen Stancliff  
PO Box 662  
New Plymouth 4340  
Phone: 06 757 9676  
Email: [taranaki@fishandgame.org.nz](mailto:taranaki@fishandgame.org.nz)  
[www.fishandgame.org.nz](http://www.fishandgame.org.nz)

### New Zealand Plant Conservation Network



Comprehensive information about New Zealand plants.  
[www.nzpcn.org.nz](http://www.nzpcn.org.nz)



### QE II National Trust

Taranaki Regional Representative: Neil Phillips  
Phone: 06 753 6433  
[www.openspace.org.nz](http://www.openspace.org.nz)



### National Wetland Trust of New Zealand

Information on the protection and restoration of wetlands.



### Royal Forest & Bird Protection Society of New Zealand

North Taranaki branch: Chairperson, Carolyn Brough  
[Northtaranaki.branch@forestandbird.org.nz](mailto:Northtaranaki.branch@forestandbird.org.nz)  
Phone: 06 758 2813  
South Taranaki branch: Chairperson, Dave Digby  
[Southtaranaki.branch@forestandbird.org.nz](mailto:Southtaranaki.branch@forestandbird.org.nz)  
Phone: 06 765 7482 [www.forestandbird.org.nz](http://www.forestandbird.org.nz)



### Taranaki Flora

Aims to be a one-stop shop for accessible information on the flora and vegetation of the Taranaki region.  
[www.taranakiflora.co.nz](http://www.taranakiflora.co.nz)



### Taranaki Regional Council

47 Cloten Road  
Private Bag 713, Stratford 4352  
Phone: 06 765 7127  
[www.trc.govt.nz](http://www.trc.govt.nz)  
Provides information on biodiversity and sustainable land management



### Taranaki Tree Trust

Information on how to apply for funding to assist with your restoration planting project.  
[www.taranakitreetrust.org.nz](http://www.taranakitreetrust.org.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)

## Taranaki nurseries which eco-source their stock

### Atawhai Nursery

765 Carrington Road, RD 1, New Plymouth 4371  
Phone: 06 753 3306

### Huatoki Native Plant Nursery

4 Camden Street, New Plymouth 4310  
Phone: 06 753 5811

### Kii Tahī Nursery and Land Care

Lower Kaharoa Road, Patea 4597  
Phone: 06 273 6000  
Mobile: 027 247 9723  
www.kiitahi.co.nz

### Landscape Essentials

15 Albert Street, Hawera 4610  
Phone: 06 278 8261

### Moturoa Primary School

Pioneer Road, New Plymouth 4310  
Phone: 06 751 0392

### New Life Nursery

183 Tasman Street, Opunake 4616  
Phone: 06 761 8067

### Te Kahuri Nurseries

510 Eltham Road, Mangatoki 4391  
Phone: 06 764 5020  
www.tekahurinurseries.co.nz

### St Josephs Primary School

Whitcombe Road, Opunake 4616  
Phone: 06 761 8388

### Taranaki Regional Council Nursery

c/o The Land Management Section,  
Taranaki Regional Council,  
Private Bag 713, Stratford 4352  
Phone: 06 765 7127

### Woodleigh Nursery

300 Mountain Road, RD 3,  
New Plymouth 4373  
Phone: 06 752 0830  
Mobile: 021 072 7394;  
www.woodleigh.co.nz

*You will need to order less common, threatened or rare plants up to **two years** in advance because seed or cuttings have to be collected, and the plants grown.*

# PART FOUR: *Acknowledgements*

The Taranaki Tree Trust thanks the many people who have contributed expertise and time to produce this booklet. Professor Bruce Clarkson, Jackson Efford and Rebecca Bylsma from the Environmental Research Institute, University Of Waikato, Janica Amoore, Bill Clarkson, Ken Davey, Kelly Eaton, Janet Hunt, Leigh Honnor, Graeme La Cock and Taranaki Regional Council staff. The Taranaki Tree Trust is grateful for the generosity of the Biodiversity Advice Fund, Taranaki Regional Council, and TSB Community Trust for their assistance with production, publication and printing costs.



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Tim Weston: photo 13





# Taranaki Tree Trust

The Taranaki Tree Trust is a charitable trust dedicated to the protection and enhancement of the region's ecosystems and landscapes. The Taranaki Regional Council administers the Taranaki Tree Trust and provides a part time Co-ordinator.

The Taranaki Tree Trust assists landowners with the protection and restoration of:

- wetlands
  - native forest remnants
  - coastal ecosystems
  - threatened land environments
  - habitats of threatened species
- and amenity planting which enhances community areas e.g. schools, marae and public reserves

The Trust makes grants of between \$300 and \$5,000. It can contribute up to 75% of the total cost of a project by a community group, or up to 50% of the cost of a project on private land. The 'total cost' includes cash and the dollar value of any 'in kind' contributions such as labour.

The Trust is a signatory to the Taranaki Biodiversity Accord, and an active member of the Taranaki Biodiversity Forum and the Taranaki Flora Group. The Trust supports inter-agency collaboration and has facilitated or supported the following projects: Hutuiwai Whitebait Habitat protection, Herekawe Stream Walkway restoration, and Living Legends for the Rugby World Cup.

For more information please visit:  
[www.taranakitreetrust.org.nz](http://www.taranakitreetrust.org.nz)



Taranaki Tree Trust trustees and staff 2012/13 (left to right): Leigh Honnor (Co ordinator), Kevin Phillips, Carolyn Brough, Allen Standliff, Michael Joyce (Chairperson), Dave Digby, Gerry Kennedy, Neil Phillips, and Kathryn van Gameren (Administrator). Absent: Blue Read