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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 on the coast from Hawera to Paekākāriki: A guide to the Foxton Ecological District* is for landowners and community groups who want to restore ecosystems by planting native species that best suit their site and conditions or for people who just want to plant the 'right' species for biodiversity in their back yards. It is the fourth of a series about each of the ecological districts, following the restoration planting guides *Egmont Ecological District* (2013), *North Taranaki Ecological District* (2016) and *Matemateonga Ecological District* (2016).

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!



Dune slack forest

Be inspired!

Places where you can view excellent examples of native vegetation are mentioned in the target ecosystems. Others you might visit include:

- Whitiau, the largest dune reserve in Foxton Ecological District (250 ha).
- Tapuarau Reserve (was 'Hawken's Lagoon') the dune reserve (with lake) at Waitotara River mouth.
- The on-going Coast Care restoration project in front of the main urban area at Castlecliff, Wanganui (Seafront Road). Also, as you head further west (access off Longbeach Drive) there are splendid spinifex dunes with sand pimelea and sand coprosma.

Ecological Regions & Districts of Taranaki

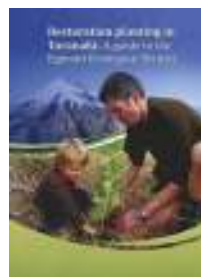
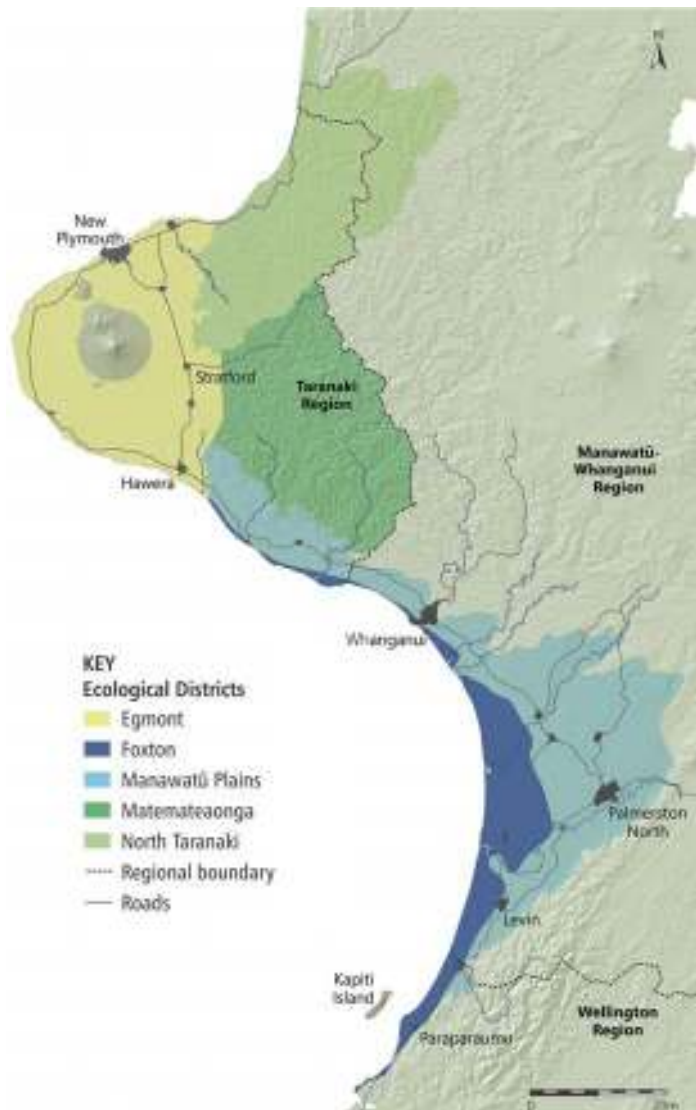
Taranaki contains three Ecological Regions and five Ecological Districts. (See Manawatū-Whanganui over the page).

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

THE FOXTON ECOLOGICAL DISTRICT (105,500ha), the focus of this booklet, is a narrow coastal strip from Tangahoe River near Hawera, that widens in the Foxton area and narrows again to end at Paekākāriki in the south. There are cliffs, especially in the northern section of the district, but it is otherwise dominated by dunes that have been formed by sand movement, especially that of the past. Today this sand movement continues but is so affected by human activities that few natural areas now remain. The district now contains mostly farmland, exotic pine plantations and urban areas.

THE MANAWATŪ PLAINS ECOLOGICAL DISTRICT (312,300ha) lies inland behind the dunes and cliffs of the Foxton 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 Patea.

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 Waitotara but the Manawatū Ecological Region (and its two ecological districts of Manawatū Plains and Foxton) extends far south of this point.



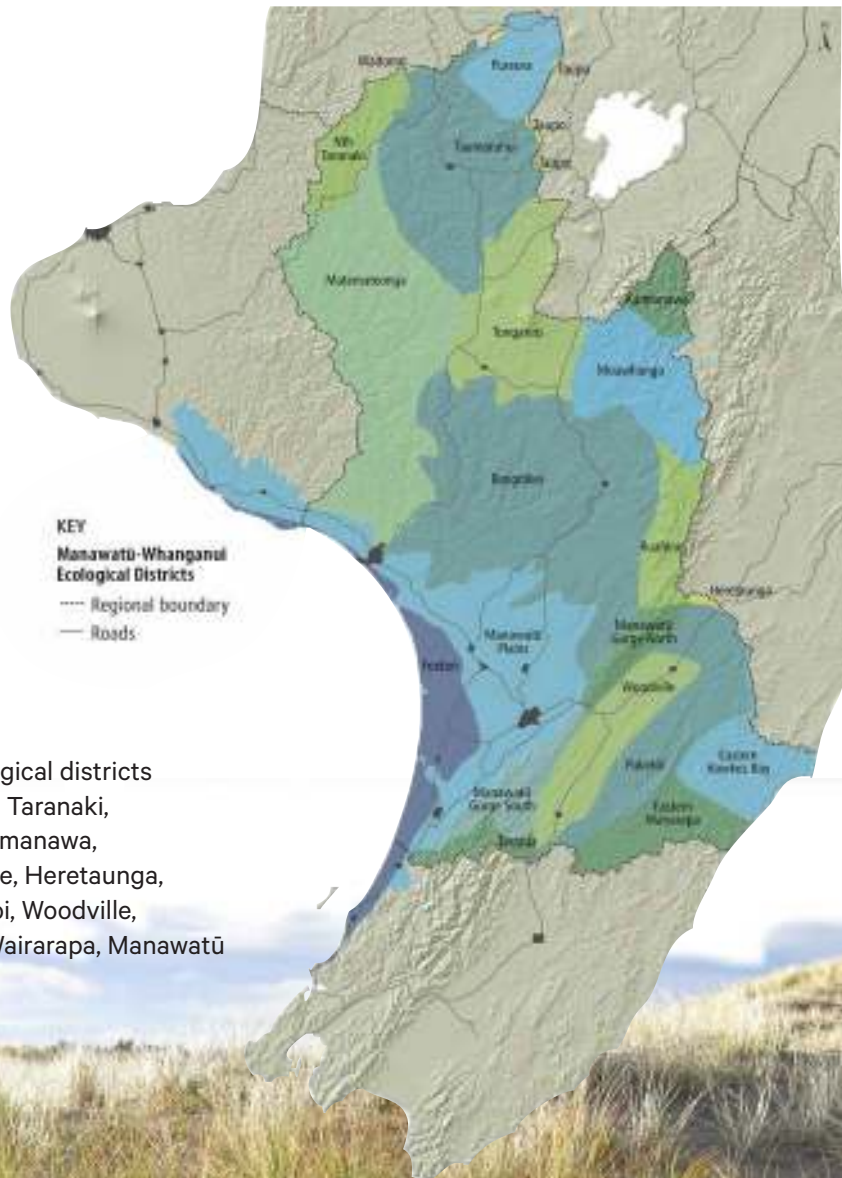
Previous restoration planting guides cover the Ecological Districts of the Egmont and Taranaki Ecological Regions.

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, Taumaranui, North Taranaki, Matamateaonga, Tongariro, Kaimanawa, Moawhango, Rangitikei, Ruahine, Heretaunga, Manawatū Gorge North, Puketoi, Woodville, Eastern Hawkes Bay, Eastern Wairarapa, Manawatū Gorge South and Tararua.



Geology, climate, soils and landscape of Foxton Ecological District

The Foxton Ecological District has one of the most extensive sand-dune systems in New Zealand, covering about 1100 square kilometres.

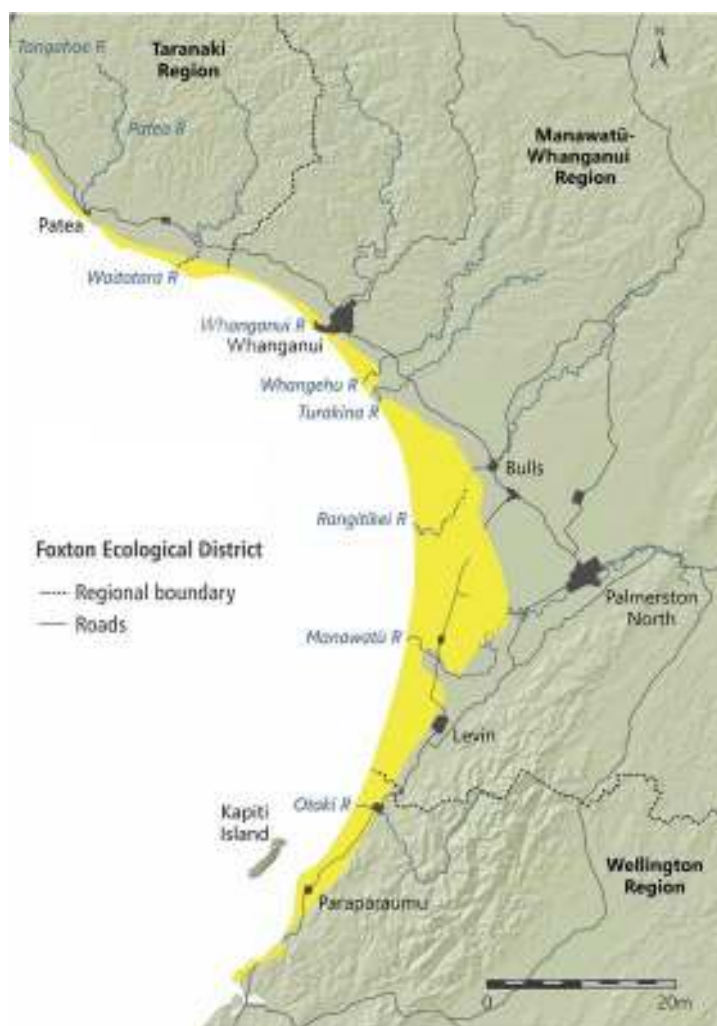
The district runs almost 180 kilometres along the west coast of the lower North Island, and at its widest, extends up to 18 kilometres inland, although it is mostly restricted to within about seven kilometres of the coast. It is bordered in the north by the Tangahoe River south of Hawera. It then runs south in a narrow strip that broadens inland from Koitiata near Ratana. Its widest point is east of Himatangi Beach, after which it narrows again, to end at a point at Paekākāriki.

The district is crossed by three great rivers that drain the lower North Island: the Manawatū, the Rangitikei and the Whanganui.

The dominant winds blow from west to west-north-west with relatively frequent gales that carry sand with them. Rainfall reaches a mean of 900 millimetres per annum and is generally reliably and evenly distributed, with warm summers and mild winters.

Most of the district, especially from Whanganui south, comprises low-lying sand deposits laid down in the last 6500 years. A substantial portion of the coastal margin is dunes that have formed in the last 150 years under the influence of human-generated activity, especially in the coastal foredunes, such as removal of vegetation cover by fire or over-grazing.

The eastern rim of the district consists of old marine deposits uplifted into terraces about 100,000 years ago. Here wind has deposited sand on top of sea-cliffs. The plants that grow there are specialist cliff-types, adapted to an environment that is well-drained, and exposed to salt-laden spray.



Around the river mouths estuarine vegetation replaces sand-country plants, and in between the rivers there are remnants of dune slacks and dune lakes. There are localised gravel beaches around Te Horo.

In combination, all of these geologic, climatic and landscape influences create hugely variable environments for restoration plantings. Take care to identify and avoid areas vulnerable to ongoing erosion, either by removal or by deposition of sand, or your efforts may be wasted.

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.

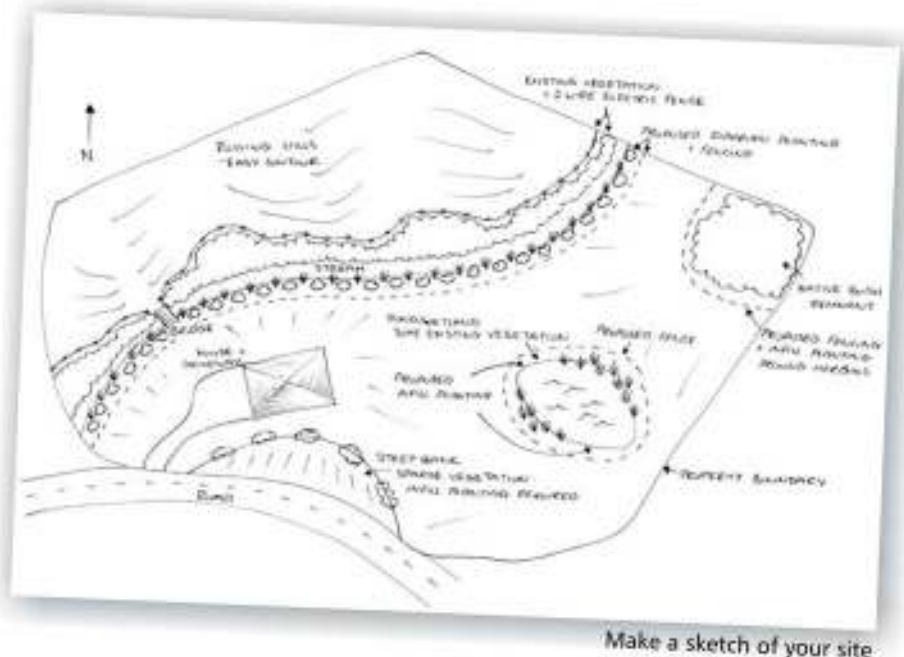
In addition, ask yourself:

- 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.



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. Plant more deeply or more shallowly depending on the wetness or dryness of your site.
- 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 with 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.



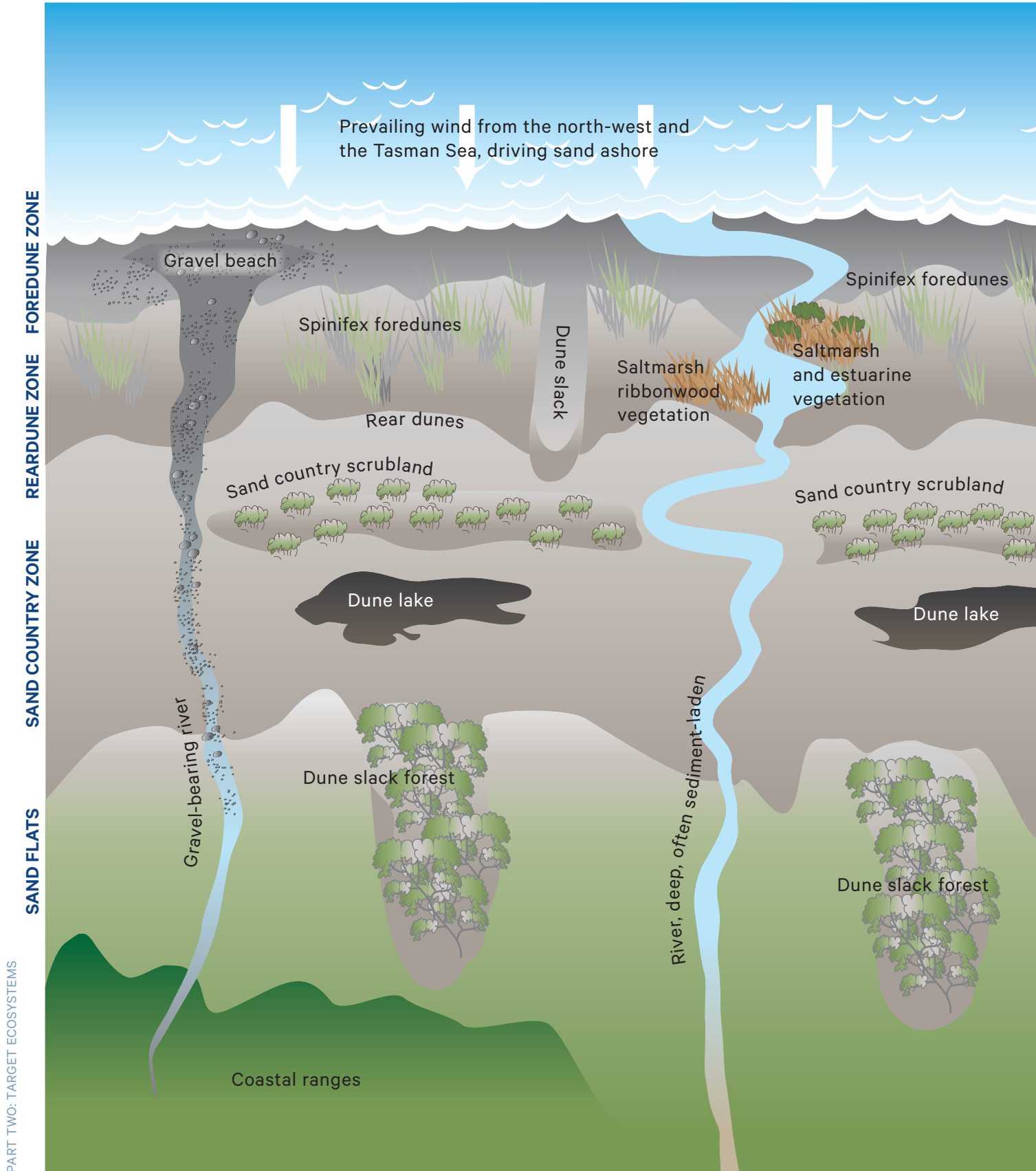
2. Replace the soil around the roots and gently pull the seedling up a very little.

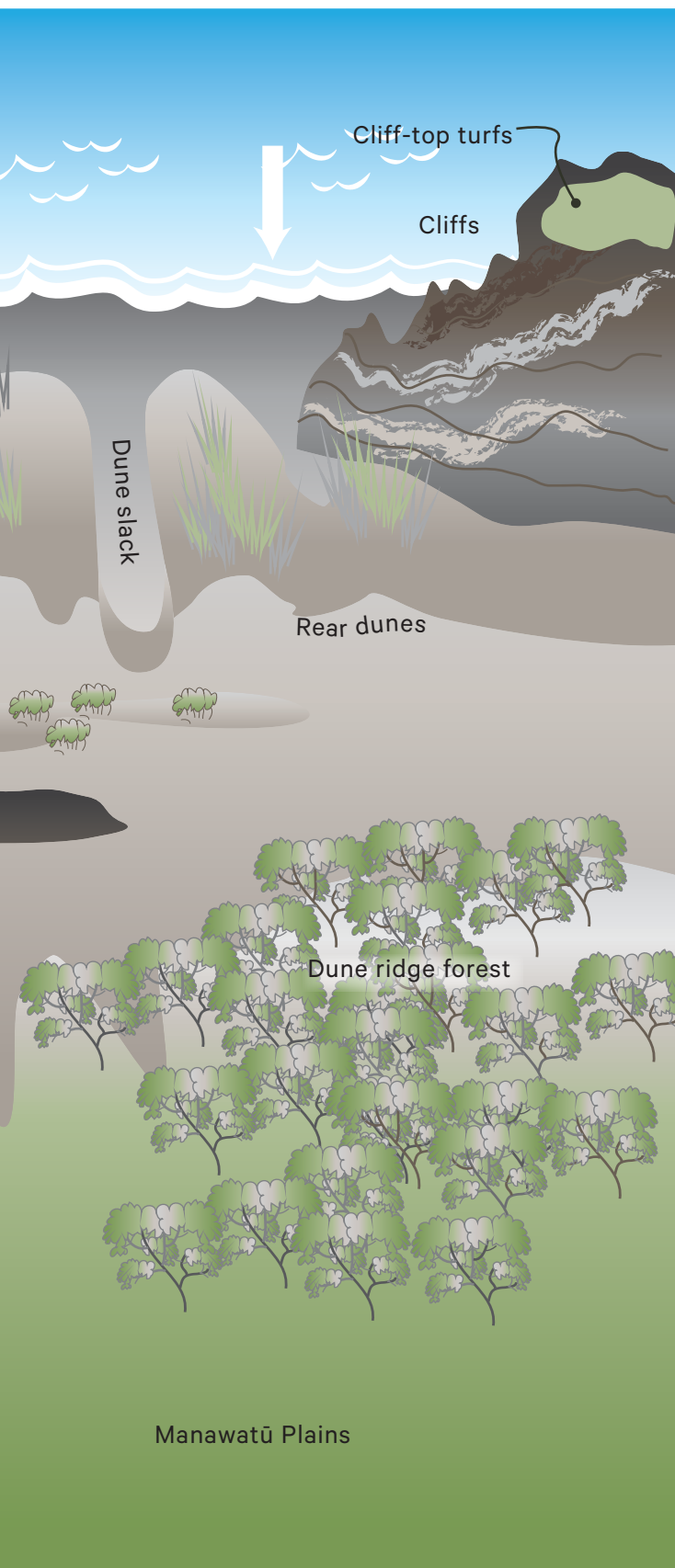


3. Firm the soil around the seedling using your hands. Take care not to over-compress the soil. Leave a small depression around the stem to help retain moisture.

PART TWO: *Target ecosystems*

Generalised landscape & vegetation types





Notes for Foxton Ecological District

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

- 1) **Sand Country:** ecosystems that are dominated by sand in the foredunes and rear dunes;
- 2) **Non-sandy Coastal Vegetation:** found on gravel beaches, cliff-tops and in the estuaries.

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. 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.

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

This guide does not include epiphytes, such as *Astelia hastata* or *Pittosporum cornifolium*, because they require well-established, mature host plants to provide shelter, sufficient in number to generate a moist, forest environment. They need to be introduced late in a restoration programme. Similarly vines such as supplejack and native passionfruit, are not included because they require well-developed canopies.

Orchids are found in Foxton Ecological District but planting requires specialist knowledge and they are not included in this guide. Examples are the nationally endangered swamp greenhood orchid (*Pterostylis micromega*) found in Ihupuku Swamp and the nationally vulnerable lady's tresses (*Spiranthes novae-zelandiae*) found in Whitiua Scientific Reserve.

Only a few ferns are included. They disperse by minute, wind-borne spores and get around well on their own, so are seldom planted in current restoration programmes. However, some fern species are typical in a number of the target ecosystems (such as bracken in sand country scrubland). It may be worth introducing them as soon as cover is sufficient rather than waiting for them to self-introduce.

Sand Country

Plants do not grow on dunes . . . dunes grow on plants!

The sand country of this region stretches along the coast between the Tangahoe River south of Hawera and Paekākāriki, but is only a few metres wide at either end. More extensive areas are between Turakina and Ohau, where the active sand country can extend two kilometres inland, while centuries-old sandy features such as dune ridges, often now under plantation pines, extend up to 18 kilometres inland. If you are planning a planting, do a bit of digging first to find out if you are dealing with sand country or just a shallow layer of wind-blown sand over a different substrate, such as the soil laid down by an ancient river system.

Some of the target ecosystems are in rapidly changing country where running an active restoration project may not be needed because nature will do the work for you — especially if you assist by regularly removing weeds or introduced plants.

The main ecosystem likely to benefit from proactive restoration is the foredunes, where planting can help stabilise the sand and thus provide a little buffering against sea-level rise. The rarity of remnants of coastal scrubland and dry forest also make these excellent targets for improving biodiversity through restoration.

Spinifex foredunes

Spinifex is New Zealand's best foredune binder. It will grow downslope over the face of the dunes, healing eroded areas such as those on the seaward toe of a dune after a spell of heavy seas.

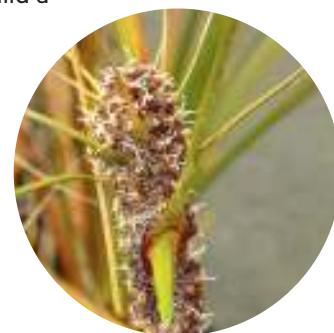
Spinifex does not establish well from cuttings so seedlings need to be planted using seed from local female plants (the ones with big tumble weed heads) — but not from females near the sea because they are seldom pollinated. Check out the Coastal Restoration Trust (see page 38) for more advice.

Planting on the top or even on the sides of an existing dune is seldom successful, because your little seedling's root has to grow a long way down to reach the water table! Instead, plan ahead and use spinifex to trap sand where you want to build a dune in the future.

Spinifex is the only species you need here, but if there is a local source of a second native species, pingao, it can also be added. Pingao is a taonga species for Māori and is rated as 'at risk-declining'. Seed or cuttings can usefully be planted in areas with less mobile sand and less disturbance.

If the coast continues to extend seawards, as it has done along the Manawatū coast, then the restored area will eventually become rear dune on its own, and rear dune species may need to be added later.

Excellent examples of this type of vegetation can be found from Tangimoana to Foxton or at Whitiāu on the Whangaehu River.



Pingao seed head.

SEQUENCE

Start by laying driftwood in rows parallel to the coast to provide shelter for your seedlings. Plant spinifex 50–100cm apart, with occasional clumps of pingao.

WE RECOMMEND

GRASSES	Spinifex (D)
SEDGES	Pingao (O)

Abundance to aim for:

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

MARRAM GRASS (*Ammophila arenaria*)

In times past marram grass (introduced from Europe) was widely planted throughout New Zealand to stabilise dune systems. It is no longer recommended because it forms steep-sided dunes that readily collapse once too tall, as marram cannot grow downwards. Marram is also invasive and competes with native vegetation, reducing habitat for native birds and insects.



Rear dunes

Rear dunes tend to plant themselves if near a natural dune area or if they were the previous foredune. A rear dune environment can be a difficult one in which to plant native species.

Spinifex is the key even though it struggles to establish on large mobile sandsheets. Plant it as soon as you notice the need.

Good examples of rear dunes can be seen in the two small DOC reserves, Tawhirihoē and Moana Roa, north and south of the Rangitikei River mouth near Tangimoana, or in Cousins Reserve just north of the Surf Club at Foxton Beach.



Sand coprosma.

SEQUENCE

Plant with spinifex and dune shrubs, though survival of these may be poor. Spinifex needs to be established from seed, and does not respond well to being planted high on an existing dune where it cannot reach water. Plant it near the dune bases, especially on the windward side.

WE RECOMMEND

SHRUBS	Sand coprosma (O), sand pimelea (O), tauhinu (O)
LIANES & SCRAMBLERS	Shore bindweed (O)
GRASSES	Sand wind grass (R), spinifex (F)
SEDGES	Pīngao (O), wīwī / knobby clubbrush (O)

Abundance to aim for:

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



Dune slacks

Dune slacks are large, flat depressions that form when the wind blows dry sand away leaving a layer of damp sand, usually 20–30 cm above the local water table. These depressions are called *swales* when they lie parallel to the coast, and *slacks* when they are at right angles to the coast.

Slacks are more common on the west coast because of the north-westerly winds, and are usually 200–300 m inland from the foredunes, in open areas when there are large sheets of mobile sand.

A number of small species readily self-establish in damper areas in dune slacks. You can also deliberately plant these. Larger plants such as oioi and *Schoenus nitens* will gradually invade, trapping wind-blown sand that will fill the hollow, raising it above the water table and drying it out. Be aware that weeds will also appear and will need removal.

Dune slacks can be seen at Tawhirihoe Reserve, Tangimoana, about 300 m inland from the foredunes, or seaward of Cousins Reserve just north of Foxton Beach.



TOP: A sand slack below the dunes.
ABOVE: The extremely rare sand slack pimelea grows in depressions amongst mobile sand.

SEQUENCE

Plant a range of small herbs, using cuttings or clumps gathered from other areas, in the lowest-lying parts of a slack. Rushes and taller plants should be introduced around the margins, but still on damp sand. Your dune slack should function naturally, although weeding will still be required.

WE RECOMMEND

SHRUBS	Sand slack pimelea (R)
GRASSES	Toetoe (O)
SEDGES	Sand sedge, wīwī / knobby clubrush (F)
RUSHES	Arrowgrass (O), oioi (F), <i>Schoenus nitens</i> (F)
HERBS	Mudwort (O), shore lobelia (F), slender clubrush (F), remuremu (<i>Selliera radicans</i>) (F) or if between Foxton and Tangimoana, then <i>Selliera rotundifolia</i> (F), tape-measure plant (O)

DUNE SLACK WETLANDS

In very dry summers, the wind sometimes strips away quantities of dry sand and when the rains return, the slacks become *dune slack wetlands*.

Dune slack wetlands occur along the Foxton–Himatangi coast and would also have been found elsewhere in the dunefields before they were stabilised by pasture, forestry or urban areas.

For at least their first 20–50 years these wetlands contain several tiny herbaceous species, some of them extremely rare nationally.

The temporary nature of these habitats and the rarity of the species involved make them unlikely restoration projects.

Sand country scrubland

With time and continual deposition of wind-blown sand, the depressions of the sand country are raised above the water table which means they dry out and become unsuitable for the plants of damp zones that first colonised them.

A scrubland then develops, which is home to fernbird, bittern, crake and other birds that like to live near water.

Such scrubland is a precursor to dune forest, and is dominated by small-leaved, often divaricating, shrubs that are adapted to these exposed environments.

A small tree of special interest in this ecosystem is rawiritoa, from the same family as the more commonly-known kanuka. It is classed as 'at risk-declining'. It can be planted in sand country from Levin southwards.

A good example is the 'fernbird area', a triangular block on the inland side of the Tawhiriho Reserve, south of the Rangitikei river mouth at Tangimoana.



Bracken or rarauhe is a hardy survivor.

SEQUENCE

The main problem in establishing scrubland on bare sand is the distance of the water table below the surface. You will need to monitor your plantings for the first few years and water them if necessary. Plant densely to create shade and allow for losses.

Abundance to aim for:

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

WE RECOMMEND

TREES	Akeake (O), horoeka (O), māhoe (O), tī kōuka (O)
SHRUBS	Coastal tree daisy (O), <i>Coprosma rhamnoides</i> (O), <i>Coprosma rigida</i> (O), kāramu (O), mākaka (F), matagouri (O), mingimingi (F), poataniwha (O), saltmarsh ribbonwood (F), swamp coprosma (O), thin-leaved coprosma (F), twiggy tree daisy (O), wharangi (R)
LIANES & SCRAMBLERS	Leafless lawyer* (O), small-leaved pōhuehue (F)
FERNS	Bracken (O)
GRASSES	Toetoe (F)
SEDGES	<i>Machaerina rubiginosa</i> (O), toetoe upokotangata (O), wīwī / knobby clubrush (O)
HERBS	Harakeke (F)



* Leafless lawyer is a special species that could be added to your plantings if your site is between Sarah Pond and Lake Alice near Bulls and Pakipaki Bush near Levin.

Dune lakes

Lakes form in the dune country at the boundary between two phases of dune building, the Waitarere (less than 150 years ago) and the older Motuiti (less than 1000 years ago). This boundary is close to the regional water table, so that open water appears on the surface, forming fresh-water lakes on sand. Because of the mobile nature of the coastal sands, these lakes often migrate inland and are infilled on the sea-ward sides by wind-blown sand.

Many dune lakes are now surrounded by farmland but if you have the opportunity to restore this ecosystem, or wish to create a riparian boundary between lake and pasture, the result will be an attractive habitat that will host a range of native wetland birds such as fernbirds and crakes as well as exotic water fowl.

Lake Pukepuke, a DOC reserve, is a prime example, with native flora dominated by raupō and purei with other *Carex* species. Around the drier margins harakeke patches occur along with tī kōuka and a range of small-leaved shrubs.



Lake Pauri, a dune lake south of Whanganui.

SEQUENCE

Plant the herbs and sedges in the low-lying areas, even into the substrate under the water. The shrubs, grasses and ferns should be planted on land around the water's edge. If you have a bigger area, you might want to later plant some other appropriate taller forest such as those overleaf on pages 18 and 19.



Small-leaved pōhuehue in sand country scrubland.

WE RECOMMEND

TREES	Horoeka (O), mānuka (O), tī kōuka (O)
SHRUBS	Coastal tree daisy (O), kāramu (O), koromiko (O), māhoe (O), māpou (O), mingimingi (O), pigeonwood (O), swamp coprosma (O), twiggy tree daisy (O)
LIANES & SCRAMBLERS	Small-leaved pōhuehue (O)
FERNS	Kiokio (O), swamp kiokio (O)
GRASSES	Toetoe (F)
SEDGES	Kāpūngāwhā (O), kuta (O), <i>Machaerina rubiginosa</i> (O), purei (F), pygmy clubrush (O), rautahi (O), toetoe upoko-tangata (O)
RUSHES	Giant rush (O), wīwī (O)
HERBS	Bidibid (O), harakeke (F), raupō (A), swamp nettle (O), watermeal (O)

Abundance to aim for:

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

Dune ridge forest

Small fragments of dune ridge forest persist on private land in the Manawatū, but most original forest has been cleared for pasture. It is not clear how widespread such forest was in the past.

Alan Esler, an early Manawatū botanist, thought tōtara probably grew on these ridges quite close to the sea before human settlement.

Examples can be seen on private land at Pakipaki, near Hokino Beach, and at Dear's Bush, Foxton, as well as in Tangimoana Scientific Reserve.



SEQUENCE

In all probability these forests developed from sand country scrubland, so you could plant these species first (see page 16). Once they are established, interplant with kānuka, akeake, titoki and coastal tree daisy to close the canopy and gradually eliminate the original transitional scrubland.

Abundance to aim for:

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

WE RECOMMEND

TREES	Akeake (F), akiraho (R), black maire (O), five finger (O), Godley's kōwhai (O), horoeka (O), kaikōmako (F), kānuka (F), kohekohe (F–O) (from Levin southwards), kōhūhū (F), māhoe (F), makomako (O), mātai (O), mānuka (O), ngaio (O), pigeonwood (O), pōkākā (O), rewarewa (F), rimu (R), small-leaved kōwhai (F), tawa (O), ti kōuka (F), titoki (O), tōtara (A)
SHRUBS	<i>Coprosma crassifolia</i> (O), <i>Coprosma rhamnoides</i> (F), coastal tree daisy (O), hangehange (O), kawakawa (O), korokio (O) (from Bulls southwards), mākaka (O), māpou (O), patē (O), poataniwha (O), poroporo (O), ramarama (O), rangiora (O), rōhutu (O), tall mingimingi (F), tauhinu (O), thin-leaved coprosma (F), tūrepo (O), wharangi (R)
LIANES & SCRAMBLERS	Leafless lawyer (see page 16) (O), small-leaved pōhuehue (O)
TREE FERNS	Mamaku (O), wheki (F)
FERNS	Bracken (O), kōwaowao (O), leather-leaf fern (O), pikopiko (O), shaking brake (O), shining spleenwort (O), sickle spleenwort (O)
GRASSES	<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (O), meadow rice grass (O)
SEDGES	Hook sedge (O), square sedge (R)
HERBS	Bidibid (O), harakeke (F)



A species of kowhai, *Sophora godleyi*, is found in the Lake Alice and Tutaenui Stream dune forests and makes a special addition to restoration plantings.

Dune slack forest

Dune slacks (see also page 15) are damp hollows where water is relatively close to the surface. Over time wetland and shrubland in slacks build up organic material and form soil, which largely isolates the vegetation from the sand below. Forest species then move in. Such forests formed among dunes 2000–6000 years old and four kilometres or more in from the coast.

Despite logging of kahikatea about 1918, there is a good example of a dune slack forest at Round Bush or Omarapapaku. It was tall enough to be visible at sea and was used by early European shipping to locate the mouth of the Manawatū River.

SEQUENCE

These forests follow from dune slacks and sand country scrubland (pages 16–17) so plant some of those species first to establish a closed canopy.

Then interplant to gradually replace the original scrubland.



Dune slack forest at Round Bush.

WE RECOMMEND

TREES	Black maire (O), hīnau (O), horoeka (O), kahikatea (F), kaikōmako (F), kānuka (R), kōhūhū (F), long-leaved lacebark (O), māhoe (F), makomako (O), mānuka (O), narrow-leaved maire (O), ngaio (O), nīkau (in the south of the district) (O), pigeonwood (F), pōkākā (O), pukatea (F), putaputawētā (O), rewarewa (F), ribbonwood (O), rimu (R), swamp maire (F), tawa (F–O), tarata (F), tī kōuka (F), tītoki (F), tōtara (O), white maire (O)
SHRUBS	<i>Coprosma crassifolia</i> (O) (from Bulls southwards), <i>Coprosma rigida</i> (O), hangehange (O), kanono (O), kāramu (O), kawakawa (F), mākaka (O), māpou (O), mingimingi (O), patē (F), poataniwha (O), poroporo (O), ramarama (O), rangiora (O), rōhutu (O), swamp coprosma (O), thin-leaved coprosma (f), tūrepo (O), wharangi (in the south of the district) (O)
LIANES & SCRAMBLERS	Kōtukutuku (R)
TREE FERNS	Mamaku (O), ponga (O), wheki (F)
FERNS	Bracken (O), button fern (O), kiokio (O), kōwaowao (F), leather-leaf fern (O), mokimoki (O), pikopiko (F), shaking brake (O), shining spleenwort (O), sickle spleenwort (O), sweet fern (O), thread fern (F)
GRASSES	<i>Oplismenus hirtellus</i> subsp. <i>imbecillis</i> (O)
SEDGES	Hook sedge (O)
HERBS	Bidibid (O)

Abundance to aim for:

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

Non-sandy coastal vegetation

Non-sandy coastal vegetation is differentiated from sand country vegetation because it lacks sand, although fine particles or even thin layers may occur in the soil, legacies of past storms. The target ecosystems in this section occur on a range of sedimentary or volcanic surfaces, all of which are relatively stable and well-drained. The vegetation is exposed to often strong, salt-laden winds, creating a dry, challenging environment.

This far south the normal lowland forests of the region occur very close to the coast. Frost-intolerant species such as patē and mamaku are more abundant than usual, often intergrading into wind-swept shrubby vegetation before the true coastal vegetation occurs.

Gravel beaches

While most of the region's beaches are sandy, a gravel beach occurs south of the mouth of the Ōtaki River. This is one of the shortest rivers in New Zealand and deposits river-rounded gravels at its mouth, rather than finely-ground sand. The beach consists of storm-built ridges of gravel 1–2 metres high, interspersed with gravel depressions and backed by a hollow, like a dune swale.

It is hard to know how such beaches might have been vegetated in the past, because they are so disturbed today. Native species currently present and others likely to have been present are suggested for restoration projects.



Gravel beach south of the Ōtaki River.

SEQUENCE

Plant highly salt-tolerant plants nearer the sea and plants such as harakeke and toetoe further inland from the surf.

WE RECOMMEND

TREES	Ti kōuka (O)
SHRUBS	Sand coprosma (O)
LIANES & SCRAMBLERS	Pink bindweed (O), small-leaved pōhuehue (O)
GRASSES	Sand wind grass (O), spinifex (O), toetoe (O)
SEDGES	Sand sedge (O), <i>Schoenus nitens</i> (O), toetoe upoko-tangata (O), wiwi / knobby clubrush (O)
RUSHES	Oioi (O)
HERBS	Creeping willowherb (O), glasswort (O), glossy plantain (O), harakeke (O), horokaka (O), kōkihi (O), New Zealand celery (O), shore lobelia (O)

Abundance to aim for:

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



Toetoe.

Cliffs

There are massive mud, siltstone or papa cliffs most of the way from Hawera to Castlecliff, Whanganui.

Constant erosion means there is very little remaining cliff-face vegetation but there is still a range of shrubs and hardy herbs.

Restoring a target ecosystem such as this is likely to be both difficult and dangerous. Planting will involve finding or excavating crevices into which seedlings can be fastened. Alternatively seed could be sprayed onto cliffs using specialised equipment and adhesives.

The cliffs at Kai-iwi are a readily viewable example.

SEQUENCE

Since cliff plants usually function independently of their neighbours, at least for the first few decades, no sequence is required. Plant what and where you can.



Coastal cliffs at Patea, a site of constant erosion.

WE RECOMMEND

TREES	Small-leaved kōwhai (R), tī kōuka (O)
SHRUBS	Kāramu (O), mākaka (O)
LIANES & SCRAMBLERS	Small-leaved pōhuehue (O)
FERNS	Bracken (O), Green Bay kiokio (F), kiokio (O), leather-leaf fern (O), ring fern (O)
GRASSES	Broad-leaved poa (O), buff toetoe (R), toetoe (R)
SEDGES	Rautahi (O), sand sedge (O), <i>Schoenus nitens</i> (O), toetoe upoko-tangata (O), tūhara (F), wīwī / knobby clubrush (F)
RUSHES	Oioi (F)
HERBS	Creeping willowherb (O), glasswort (O), glossy plantain (O), harakeke (F), horokaka (O), kōkihi (O), mudwort (O), New Zealand celery (O), sea primrose (O), shore lobelia (O), shore pūhā (R)



Broad-leaved poa on a cliffside.

Cliff-top turfs

A fringe of plants just 2–3 cm tall often forms a dense, lawn-like vegetation on the tops of volcanic cliffs or on uplifted marine benches of sandstone. These sites are exposed to the most extreme elements, including salt-laden winds and have very poor soils, so the plants are salt-tolerant and low-growing.

Like the coastal herbfields of the Egmont Ecological District, these sites are often associated with disturbance such as grazing or trampling by stock. This disturbance may even help them, because it tends to limit invasion by exotic weeds. However, grazing frequency and intensity needs careful consideration.

Good places to see this vegetation type are Waverley Beach and Kakaramea Powerhouse Cliffs.



SEQUENCE

While an interesting rare ecosystem of the Ecological District, there have been few attempts to restore or recreate such a plant community. Assuming you can locate a site that will not be damaged by having a few plants removed, you could transfer fragments to the flat top of your site and pin, glue or hold them on with wire netting.

If you are starting from cultivated seedlings, plant them densely into continuous mats and fasten the plants into place.

Abundance to aim for:

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

WE RECOMMEND

GRASSES	<i>Zoysia minima</i> (A)
SEDGES	Sand sedge (O), slender clubrush (O)
HERBS	Arrowgrass (O), <i>Colobanthus muelleri</i> (O), <i>Crassula manaia</i> (O), glasswort (R), glossy plantain (O), horokaka (O), <i>Leptinella squalida</i> (O), <i>Plantago raoulii</i> (F), remuremu (O), sea primrose (O), shore lobelia (O), tape-measure plant (O)



Crassula manaia.

Saltmarsh or estuarine vegetation

Most of the region's rivers drop their sediment loads near the coast as their energy subsides. This creates estuaries where salt and fresh water intermingle to various degrees in a relatively wave-free environment. Often now 'reclaimed' or even urbanised, these areas can have rich, attractive and ever-changing flora of their own.

There is a gradient from salt-tolerant plants closest to the coast, into plants adapted to brackish (salt + fresh) water, and on upstream to plants that are able to survive only occasional incursions of salt water. However, even the most salt-tolerant plants of estuaries require periodic washes of fresh-water, so be sure not to separate them from their down-slope drainage routes or river freshes.

The large, complex Foxton estuary of the Manawatū River is a splendid example of a saltmarsh. Tapuarau Reserve on the Waitotara River also has estuarine vegetation.

SEQUENCE

Establish salty herbfields of glasswort and remuremu closest to the tidal zone by planting clumps during times of generally low tides. At the back of the herbfield establish taller wetland species such as oioi, toetoe, sea rush and sea sedge.

WE RECOMMEND

GRASSES	Toetoe (O)
SEDGES	Pūrúa grass (F), <i>Schoenus nitens</i> (O), sea sedge (R), slender clubrush (O), three-square (O), wīwī / knobby clubrush (O)
RUSHES	Oioi (A), sea rush (A)
HERBS	Arrowgrass (O), dwarf musk (R), glasswort (A), New Zealand celery (O), sand buttercup (O), sea primrose (A), shore cotula (O), remuremu (A) or if between Foxton and Tangimoana, <i>Selliera rotundifolia</i> (A)



Foxton Estuary.

Saltmarsh ribbonwood shrubland

Upstream of saltmarsh vegetation there are often areas that are less often exposed to salt and so can develop taller, more robust vegetation such as shrublands.

Shrubs include saltmarsh ribbonwood and coastal tree daisy, with mingimingi.

Saltmarsh ribbonwood shrubland would need to be restored onto an existing mudflat that is linked to an estuary or wetland that is in the process of turning into dry land. The mudflat needs to naturally receive routine quotas of salty and fresh water every year.



The best example of saltmarsh ribbonwood vegetation is to be found inland of the Manawatū River mouth at Foxton Beach.

Saltmarsh-ribbonwood scrub along the Manawatū River mouth at Foxton Beach.

SEQUENCE

Plant grasses and shrubs into the areas that get a saline bath a few (1–3) times per year. If you have low-lying areas that are frequently flooded by the tide (1–2 times per month), these would be best planted with saltmarsh or estuarine vegetation.

Abundance to aim for:
 D = dominant
 A = abundant
 F = frequent
 O = occasional
 R = rare

WE RECOMMEND

TREES	Mānuka (O)
SHRUBS	Coastal tree daisy (O), <i>Coprosma rhamnoides</i> (O), kāramu (O), mingimingi (O), saltmarsh ribbonwood (F), sand coprosma (O)
LIANES & SCRAMBLERS	Small-leaved pōhuehue (O)
GRASSES	Toetoe (O)
SEDGES	Pūrua grass (O), sea sedge (R), wiwi / knobby clubrush (O)
RUSHES	Oioi (F), sea rush (O)



A sward of the jointed rush, oioi.

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.

PART THREE: Reference information

Plant list

The plants in the following lists are those mentioned in this booklet and are appropriate to the Foxton 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 Foxton 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
TREES												
Akeake	<i>Dodonaea viscosa</i>	12	•	•	•	•		☀️	☀️☁️		•	
Akiraho / golden akeake	<i>Olearia paniculata</i>	7				•		☀️				
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>Dacrydium dacrydioides</i>	25+	•	•		•	•	☀️	☀️☁️			•
Kaikōmako	<i>Pennantia corymbosa</i>	12	•	•		•	•	☀️	☀️☁️			•
Kānuka	<i>Kunzea robusta</i>	15	•	•	•	•		☀️	☀️☁️		•	
Kohekohe	<i>Dysoxylum spectabile</i>	15	•		•	•	•		☀️☁️	☁️		•
Kōhūhū / kohukohu	<i>Pittosporum tenuifolium</i>	10	•	•	•	•		☀️	☀️☁️		•	•
Kōwhai, small-leaved	<i>Sophora microphylla</i>	10		•		•		☀️			•	•
Kōwhai, Godley's	<i>Sophora godleyi</i>	25		•		•		☀️			•	•
Lacebark, long-leaved / houhere	<i>Hoheria sexstylosa</i>	8	•	•		•	•	☀️			•	•
Māhoe / whitey wood	<i>Melicytus ramiflorus</i>	10	•		•	•	•	☀️	☀️☁️	☁️	•	•
Maire, black	<i>Nestegis cunninghamii</i>	25	•	•		•		☀️	☀️☁️			•
Maire, narrow-leaved / rororo	<i>Nestegis montana</i>	15		•		•		☀️	☀️☁️			•
Maire, swamp / waiwaka / maire tawake	<i>Syzygium maire</i>	15				•	•	☀️	☀️☁️			•
Maire, white	<i>Nestegis lanceolata</i>	20	•	•		•		☀️	☀️☁️			•
Makomako / wineberry	<i>Aristotelia serrata</i>	10				•			☀️☁️	☁️	•	•
Mānuka	<i>Leptospermum scoparium</i>	15	•	•	•	•	•	☀️	☀️☁️		•	
Mātai	<i>Prumnopitys taxifolia</i>	25+		•		•		☀️	☀️☁️			•
Ngaio	<i>Myoporum laetum</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
Nikau	<i>Rhopalostylis sapida</i>	10				•		☀	☀☁	☁	•	•
Pigeonwood / porokaiwhiri	<i>Hedycarya arborea</i>	15	•			•			☀☁			•
Pōkākā	<i>Elaeocarpus hookerianus</i>	14		•		•			☀☁			
Pukatea	<i>Laurelia novae-zelandiae</i>	25+					•	☀	☀☁	☁		
Putaputawētā / marbleleaf	<i>Carpodetus serratus</i>	10		•		•	•	☀	☀☁		•	•
Rawiritoa	<i>Kunzea amathicola</i>	15	•	•	•	•		☀	☀☁		•	
Rewarewa	<i>Knightia excelsa</i>	25+	•	•		•		☀	☀☁		•	•
Ribbonwood / mānatu	<i>Plagianthus regius</i>	15		•		•	•	☀	☀☁		•	•
Tarata	<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	•			•		☀	☀☁		•	•
Tōtara	<i>Podocarpus totara</i>	25+	•	•		•		☀	☀☁		•	•
SHRUBS & SMALL TREES												
<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, sand / tarakupenga	<i>Coprosma acerosa</i>	1	•		•	•		☀				
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		•		•			☀☁		•	
Kanono	<i>Coprosma grandifolia</i>	6				•	•		☀☁	☁		•
Kāramu	<i>Coprosma robusta</i>	6	•	•	•	•	•	☀	☀☁		•	•
Kawakawa	<i>Piper excelsum</i>	5	•		•	•			☀☁	☁		•
Korokio	<i>Corokia cotoneaster</i>	2	•	•	•	•		☀	☀☁			•
Koromiko	<i>Hebe stricta</i> var. <i>stricta</i>	6	•	•	•	•		☀	☀☁		•	•
Mākaka / broom, common	<i>Carmichaelia australis</i>	3	•	•		•	•	☀	☀☁		•	
Māpou / māpau / red matipo	<i>Myrsine australis</i>	6	•	•		•		☀	☀☁			•
Matagouri / wild Irishman / tūmatakuru	<i>Discaria toumatou</i>	2	•	•	•	•		☀	☀☁			
Mingimingi / black scrub	<i>Coprosma propinqua</i>	6	•	•	•	•	•	☀	☀☁			•
Mingimingi, tall	<i>Leucopogon fasciculatus</i>	2	•	•		•		☀	☀☁		•	
Patē / seven finger	<i>Schefflera digitata</i>	8				•	•		☀☁	☁		•

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
Pimelea, sand / autetaranga / toroheke	<i>Pimelea villosa</i>	1			•	•		☀				
Pimelea, sand slack	<i>Pimelea actea</i>	0.4				•		☀				
Poataniwha	<i>Melicope simplex</i>	5	•	•	•	•		☀	☁			
Poroporo	<i>Solanum laciniatum</i>	2				•		☀	☁			•
Ramarama	<i>Lophomyrtus bullata</i>	8		•		•	•	☀	☁		•	
Rangiora	<i>Brachyglottis repanda</i>	7				•		☀	☁			
Röhutu	<i>Neomyrtus pedunculata</i>	5		•		•	•	☀	☁			•
Saltmarsh ribbonwood / mākaka	<i>Plagianthus divaricatus</i>	2	•	•	•		•	☀				
Tauhinu	<i>Ozothamnus leptophyllus</i>	2	•	•	•	•		☀				
Taupata	<i>Coprosma repens</i>	8	•		•	•		☀				•
Tree daisy, coastal	<i>Olearia solandri</i>	4	•	•	•	•		☀				•
Tree daisy, twiggy	<i>Olearia virgata</i>	4	•	•	•	•		☀				
Tūrepo / small-leaved milk tree	<i>Streblus heterophylla</i>	12	•			•			☁			
Wharangi	<i>Melicope ternata</i>	5	•		•	•		☀	☁			•
LIANES & SCRAMBLERS												
Bindweed, pink / pōhue	<i>Calystegia sepium</i> subsp. <i>roseata</i>	3	•		•	•		☀			•	
Bindweed, shore / rauparaha	<i>Calystegia soldanella</i>	0.2	•		•	•		☀				
Lawyer, leafless	<i>Rubus squarrosus</i>	1.5	•			•			☁			•
Kōtukutuku / fuchsia, climbing	<i>Fuchsia perscandens</i>	5	•			•			☁		•	•
Pōhuehue, creeping	<i>Muehlenbeckia axillaris</i>	0.5	•	•	•	•	•	☀	☁			
Pōhuehue, small-leaved	<i>Muehlenbeckia complexa</i>	2	•	•	•	•	•	☀	☁			
TREE FERNS												
Mamaku / black tree fern	<i>Cyathea medullaris</i>	20				•	•	☀	☁			
Ponga / silver tree fern	<i>Cyathea dealbata</i>	10				•			☁	☁		
Whekī	<i>Dicksonia squarrosa</i>	8	•	•		•	•	☀	☁			
FERNS												
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, leather-leaf	<i>Pyrrosia elaeagnifolia</i>	0.1	•	•	•	•		☀	☁			
Fern, ring / scented fern / mātā / mātātā	<i>Paesia scaberula</i>	0.5	•	•		•		☀	☁			
Fern, sweet	<i>Pteris macilentata</i>	1.4				•	•		☁	☁		

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
Fern, thread / climbing hard fern / pānako	<i>Blechnum filiforme</i>	0.3				•						
Kiokio / horokio	<i>Blechnum novae-zelandiae</i>	1.5	•	•		•	•					
Kiokio, Green Bay	<i>Blechnum triangularifolium</i>	1	•	•		•						
Kiokio, swamp	<i>Blechnum minus</i>	1		•			•					
Kōwaowao / hound's tongue / pāhararaha	<i>Microsorium pustulatum</i>	0.5				•						
Mokimoki / fragrant fern	<i>Microsorium scandens</i>	0.3				•	•					
Pikopiko / hen and chicken fern	<i>Asplenium bulbiferum</i>	1		•		•	•					
Spleenwort, shining	<i>Asplenium oblongifolium</i>	1		•		•	•					
Spleenwort, sickle	<i>Asplenium polyodon</i>	1				•	•					
GRASSES												
Broad-leaved poa	<i>Poa anceps</i>	0.6				•						
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	•				•					
Sand bent / sand wind grass	<i>Lachnagrostis billardierei</i> subsp. <i>billardierei</i>	0.2	•		•	•						
Spinifex / kōwhangata	<i>Spinifex sericeus</i>	0.7	•		•	•						
Toetoe	<i>Austroderia toetoe</i>	4	•	•	•	•	•					
Toetoe, buff	<i>Austroderia fulvida</i>	3.5	•	•	•	•	•					
<i>Zoysia minima</i>	<i>Zoysia minima</i>	mat	•		•	•						
SEDGES												
Clubrush, pygmy	<i>Isolepis basilaris</i>	0.1			•	•						
Clubrush, slender	<i>Isolepis cernua</i>	0.2	•		•		•					
Kāpūngāwhā / kūawa	<i>Schoenoplectus tabernaemontani</i>	2			•		•					
Kuta / bamboo spike sedge	<i>Eleocharis sphacelata</i>	1.5					•					
<i>Machaerina rubiginosa</i>	<i>Machaerina rubiginosa</i>	1	•	•		•	•					
Pingao / pikao / golden sand sedge	<i>Ficinia spiralis</i>	0.6	•	•	•	•						
Pukio / swamp sedge	<i>Carex virgata</i>	2		•		•	•					
Purei / pukio	<i>Carex secta</i>	2	•			•	•					
Pūrua grass	<i>Bolboschoenus caldwellii</i>	1			•		•					
Rautahi	<i>Carex geminata</i>	1.2	•			•	•					
<i>Schoenus nitens</i>	<i>Schoenus nitens</i>	0.2			•		•					
Sedge, hook / kamu	<i>Uncinia uncinata</i>	0.5		•		•	•					
Sedge, sand	<i>Carex pumila</i>	0.3	•	•	•	•	•					
Sedge, sand spike / spike sedge	<i>Eleocharis neozelandica</i>	0.1					•					
Sedge, sea / coastal carex	<i>Carex litorosa</i>	0.4			•		•					
Sedge, square	<i>Lepidosperma australe</i>	1	•	•	•	•	•					

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
Three-square	<i>Schoenoplectus pungens</i>	0.5		•	•		•	☀️				
Toetoe upoko-tangata / giant umbrella sedge	<i>Cyperus ustulatus</i>	2	•	•	•		•	☀️	☀️			
Tūhara	<i>Machaerina sinclairii</i>	1.2	•	•	•	•	•	☀️	☀️			
Wiwi / knobby clubbrush	<i>Ficinia nodosa</i>	1.5	•	•	•	•	•	☀️				
RUSHES & RESTIADS												
Oioi / jointed wire rush	<i>Apodasmia similis</i>	1	•		•	•	•	☀️				
Rush, giant	<i>Juncus pallidus</i>	2					•	☀️				
Rush, sea	<i>Juncus kraussii</i> subsp. <i>australiensis</i>	1.2	•		•		•	☀️				
Wiwi	<i>Juncus edgariae</i>	0.5	•	•			•	☀️				
HERBS												
Arrowgrass	<i>Triglochin striata</i>	0.2			•		•	☀️				
Bidibid / hutuwai / pipiri	<i>Acaena anserinifolia</i>	0.2		•		•		☀️	☀️			
Buttercup, sand	<i>Ranunculus acaulis</i>	mat			•		•	☀️				
Celery, New Zealand	<i>Apium prostratum</i> subsp. <i>prostratum</i> var. <i>filiforme</i>	0.2	•		•	•		☀️			•	
<i>Colobanthus muelleri</i>	<i>Colobanthus muelleri</i>	mat	•		•	•		☀️				
Cotula, shore	<i>Leptinella dioica</i>	mat	•		•	•	•	☀️				
<i>Crassula manaia</i>	<i>Crassula manaia</i>	mat	•	•	•	•		☀️				
Glasswort / ureure	<i>Sarcocornia quinqueflora</i>	0.1			•		•	☀️				
Harakeke / flax	<i>Phormium tenax</i>	3	•	•	•	•	•	☀️	☀️		•	•
Horokaka / native ice plant	<i>Disphyma australe</i>	0.3	•		•	•		☀️			•	
Iris, New Zealand / mikoikoi	<i>Libertia peregrinans</i>	0.7	•	•	•		•	☀️				
Kōkihi / New Zealand spinach	<i>Tetragonia tetragonoides</i>	0.5	•		•	•		☀️				
<i>Leptinella squalida</i>	<i>Leptinella squalida</i>	mat			•	•	•	☀️				
Lobelia, shore	<i>Lobelia anceps</i>	0.1	•				•	☀️	☀️			
Mudwort	<i>Limosella lineata</i>	mat					•	☀️				
Musk, dwarf / matt leaved mazus	<i>Mazus novaezealandiae</i> subsp. <i>impolitus</i> f. <i>impolitus</i>	0.2					•	☀️	☀️			
Nettle, swamp	<i>Urtica perconfusa</i>	2.0	•				•	☀️	☀️			
<i>Plantago raoulii</i>	<i>Plantago raoulii</i>	mat			•	•		☀️				
Plantain, glossy	<i>Plantago triandra</i>	mat			•	•		☀️				
Primrose, sea	<i>Samolus repens</i>	mat	•		•		•	☀️				
Pūhā, shore	<i>Sonchus kirkii</i>	0.3	•		•	•		☀️			•	
Raupō	<i>Typha orientalis</i>	3		•			•	☀️				
Remuremu	<i>Selliera radicans</i>	mat	•		•		•	☀️				
<i>Sebaea ovata</i>	<i>Sebaea ovata</i>	0.3			•		•	☀️				
<i>Selliera rotundifolia</i>	<i>Selliera rotundifolia</i>	mat	•		•		•	☀️				
Tape-measure plant	<i>Lilaeopsis novae-zelandiae</i>	mat					•	☀️				
Watermeal	<i>Wolffia australiana</i>	0					•					
Willowherb, creeping	<i>Epilobium komarovianum</i>	0.4				•	•	☀️				

Nationally threatened and regionally distinctive plant species

If you are interested in planting any species that are nationally threatened, at risk or regionally distinctive in the Foxton Ecological District, contact the Department of Conservation or the biodiversity sections of the Taranaki Regional Council or Horizons Regional Council. You may also find more information on the websites of the New Zealand Plant Conservation Network, the Coastal Restoration Trust of New Zealand and the Department of Conservation.

Only a selection of Nationally Threatened–At Risk species are included in detail on this page. Worthy of brief note, however, are the Nationally Vulnerable *Crassula manaia* and *Myosotis brevis* as well as the Nationally Critical *Leptinella dispersa* subsp. *rupestris*, which is found in tiny pockets of sand on mudstone sea cliffs such as the Kakaramea (Powerhouse Rd) sea cliffs as well as on scattered sites right to Castlecliff. Yet another is the At Risk–Declining *Mentha cunninghamii*, which is found in Whitiāu Scientific Reserve. The Nationally Critical *Sebaea ovata* was once present near Whanganui but is no longer known in this region at all.

Some plant species that are nationally threatened and at risk in the Foxton Ecological District



JILL RAPSON

Sea sedge / coastal carex

SEDGE

Carex litorosa

A tufted sedge with dull greyish, drooping leaves that is usually found in open environments, such as bare patches of mud or muddy sand in estuaries. It is regionally known only as a very occasional plant within 1–2 km of the Manawatū River mouth.

At risk — declining



JILL RAPSON

Sand spike sedge

SEDGE

Eleocharis neozelandica

This rare species is only known from Farewell Spit, Northland and the Manawatū, but was probably more widespread in the past. It grows in small wetlands between dunes and is itself capable of forming dunes to 50 cm. Ask your regional council about including it in your planting.

At risk — declining



JILL RAPSON

Pygmy clubrush

SEDGE

Isolepis basilaris

Pygmy clubrush is listed as rare but it is similar to its more widespread relative, slender clubrush (*Isolepis cernua*) and may not be as endangered as thought. It is small and dark green, with curvy leaves and a flower head like a 4mm-high pine cone at the base of the leaves. Ask your regional council about including it in your dune wetland restoration plans.

Threatened — nationally vulnerable



JILL RAPSON

Sand slack pimelea

SHRUB

Pimelea actea

This is one of the Manawatū–Whanganui's few endemics — it is found nowhere else in the world. Its habitat is the sandy margins of dune wetlands but it is rapidly out-competed by more aggressive grasses and rushes. If you are creating suitable habitat for this species, then liaise with your regional council.

Threatened — nationally critical

Some plant species that are distinctive to Taranaki and Manawatū-Whanganui



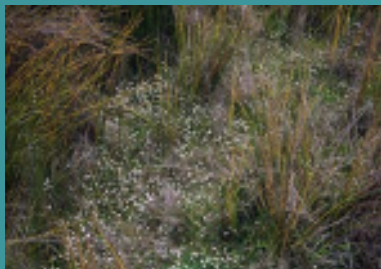
JILL RAPSON

New Zealand iris / mikoikoi

HERB

Libertia peregrinans

This attractive creeping plant produces golden spears of leaves and is common in gardens. However, its natural habitat is well-draining coastal soils along the Taranaki coast. It is rarely encountered in the wild, and no population along the Foxton–Himatangi coast is known. NZ iris spreads readily in the right conditions and can be cloned by planting chunks of rhizome with leaves attached.



COLIN OGLE

Dwarf musk

HERB

Mazus novaezeelandiae ssp. *impolitus* f. *impolitus*

Dwarf musk is a charming little herb to 30cm with purple and white flowers. It is generally found in barely-flowing, shallow, fresh water. It is very susceptible to disturbance, habitat clearance and modification including stock trampling.

The 'At Risk–Naturally Uncommon' Native musk (*Thyridia repens*) is found in the salt marsh at the Manawatū estuary.



AARON MADDEN

Selliera rotundifolia

HERB

This small plant of coastal dune slacks is common along the Manawatū coast from Foxton to Tangimoana, but is found nowhere else in the world. It has a widespread relative, remuremu (*Selliera radicans*), but the local plant grows differently, and appears genetically distinct. If you are restoring a dune slack along this bit of the coast then this is the plant to use. Elsewhere its common relative should be planted. It spreads rapidly from clumps with rhizomes included.



JILL RAPSON

Matagouri / wild Irishman / tūmatakuru

SHRUB

Discaria toumatou

This thorny, almost leafless, divaricating shrub used to be common in the Foxton Ecological District, at Wai Inu, near Whitiāu Scientific Reserve, along the Foxton Straits and near Pakipaki. Only a few plants are now known in this district, in remnants of dune shrublands near Lake Alice. As a nitrogen-fixer, it is useful in areas of coastal shrubland because it accelerates succession to larger species. Keep records to show it has been introduced and where the seed came from.



COLIN OGLE

Watermeal

HERB

Wolffia australiana

This is one of the tiniest flowering plants in the world, at about 0.8 mm long (the smallest ones in this image). It consists of a single leaf, like a small pouch, with a male and female flower sometimes embedded within it. It tends to form sheets on very still fresh water, often intermingled with *Azolla rubra* (a red floating fern). It is a lovely species to introduce to a still, quiet pond. A cup-full of plants will soon subdivide.



BARBARA HAMMONDS

Oplismenus hirtellus ssp. *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.

Taonga species

A large number of species of native plants are taonga to Māori. Those on these pages are a small sample only. Check out 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 medicines while the berries were eaten. The wood was also used for dyes, torches, musical instruments, toys, tools and weapons.



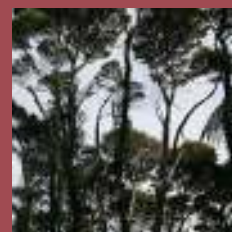
Kahikatea

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, eel traps and spears.



Kānuka

Māhoe / whitey wood

TREE

Melicytus ramiflorus

The inner bark of māhoe was used for medicines; 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 traditional Māori healing, for construction timber, for food, for hunting and fishing hooks and tools, as well as traps such as eel weirs. The bark was used to make rain capes.



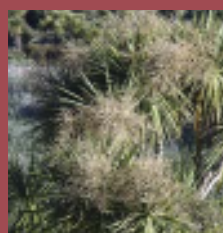
Mānuka

Ti kōuka / cabbage tree

TREE

Cordyline australis

Like raupō, ti kōuka had medicinal qualities and was also valued for fibre from its leaves. It was used to make thatch, clothing, cloaks, mats, baskets, threads, cords and ropes, and a strong four-sided rope.



Ti kōuka

Tōtara

TREE

Podocarpus totara

Tōtara was used for medicines as well as food. 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 medicines. The leaves are a symbol of death and mourning and are used for wreaths and ceremonial purposes.



Kawakawa

Karamū**SHRUB***Coprosma robusta*

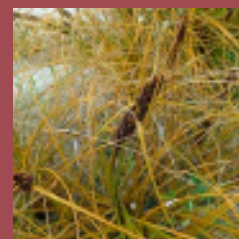
The leaves and bark of karamū were used to make infusions to heal stomach and kidney troubles, the berries were eaten and the bark was used to make orange-coloured dyes. Branches also had ceremonial use.



Karamū

Pīngao / pikao / golden sand sedge**SEDGE***Ficinia spiralis*

Young pīngao shoots are sweet and were eaten, but pīngao's greatest value is the fibre, which is still used for golden highlights in weaving. It is also plaited to make ropes, used for clothing and for whare decoration.



Pīngao

Bracken / rarauhe**FERN***Pteridium esculentum*

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**GRASS***Austroderia fulvida* and *Austroderia toetoe*

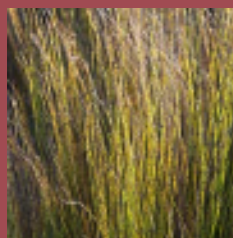
Like raupō, toetoe was used for mats, baskets, for lining houses and storage pits and for house battens. The hollow flower stems were used to make spears.



Toetoe

Oioi / jointed wire rush**RUSH***Apodasmia similis*

Oioi is mostly coastal in estuaries, saltmarshes, dunes and sandy flats and hollows. Because of its durability, oioi was sometimes used for the outer thatching of houses.



Oioi

Wiwī**RUSH***Juncus kraussii* subsp. *australiensis*

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



Wiwī

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

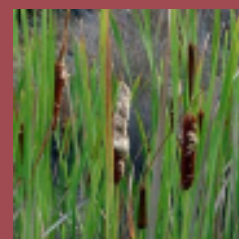
Harakeke was essential in many aspects of life: a medicine (antiseptic), food (nectar and gum) and for fibre (woven cloaks, raincoats, waist garments, belts, headwear and footwear), plaiting (lashings for tools, waka and for use in fishing and hunting), and for making dyes.



Harakeke

Raupō**HERB***Typha orientalis*

Raupō was a multipurpose plant, used for weaving, medicines, food (pollen cakes, rhizomes), bedding, construction (stalks and leaves for thatch), fishing and hunting, canoe, poi- and kite-making.



Raupō



Problem plants

These species are a problem in restoration plantings in the Foxton Ecological District. Some are aggressive; others are natives that simply don't belong in this region. **It is recommended that they are not planted and are eliminated when they first appear.** For more detail on control of problem plants, check out the excellent Weedbusters website (weedbusters.org.nz). ★ = native; ★ = exotic.

Karaka ★

TREE

Corynocarpus laevigatus

Karaka is endemic only to the north of the North Island. It does not belong in other parts of New Zealand, but is there because it was a food source for Māori. It is spread by kererū, the only bird able to eat its fruits.



Karaka



Pohutukawa

Pohutukawa ★

TREE

Metrosideros excelsa

This is a common northern New Zealand tree but should not be planted in restoration projects south of New Plymouth.



Karo



Broad-leafed
muehlenbeckia

Karo ★

SHRUB

Pittosporum crassifolium

Like karaka, karo does not belong in this part of the country and can spread aggressively. It has small leaves, oval-shaped, to about 3cm long, which are thick and very felty underneath.



Tasmanian ngaio



Pink ragwort

Broad-leafed muehlenbeckia ★

CLIMBER

Muehlenbeckia australis

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

Tasmanian ngaio ★

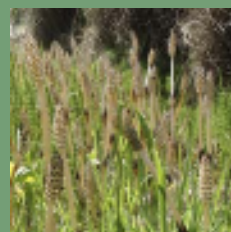
TREE

Myoporum insulare

This plant closely resembles New Zealand's native Ngaio (*Myoporum laetum*). It has narrower leaves, lacks the black viscid leaf apices, and has more transparent, smaller gland dots than the native. Its flowers are only half the size at less than 8mm diameter.



Formosa lily



Horsetail

Pink ragwort ★

HERB

Senecio glastifolius

This robust perennial daisy with largely rose-pink flowers is pretty in gardens but very invasive in sandy or dune areas. It is equally at home on dry cliff faces and rock walls or other disturbed sites.

Formosa lily ★

HERB

Lilium formosanum

This tall summer-green plant has white, trumpet-shaped flowers that are quite spectacular. However it is very invasive in dune areas, once introduced. Carefully dig out all of the bulbs and bulblets, bag and remove.

Horsetail ★

CREEPING HERB

Equisetum arvense

This plant tends to form dense swards and is spread by millions of spores. If you see a patch, contact your local regional council. They may operate a control programme.

Nurseries that eco-source their stock

Kii Tahī Nursery and Land Care

Lower Kaharoa Road, Patea 4597
06-273 6000/ 027 247 9723

Manawatū District Council nursery

Kawakawa Road, Feilding
Rob Bartrum 022 044 5825

Pioneer Nursery

752 Taonui Road
Colyton, RD5, Feilding
06-328 7803

A Rocha Manawatū

A community group based in Palmerston North that offers small stocks of eco-sourced plants.
Christine McArthur 06-353 6820

Starter Plants Limited

Eddie Welsh
126 Turitea Road, Palmerston North
06-353 2904

Manawatū Native Plant Nursery

Flygers Line, Milson, Palmerston North
06-356 1557

Matatoa Trees and Shrubs

82 Engles Rd, Shannon
06-362 7477

Lynwood Nursery

232 Kuku Beach Road, Levin
06-3626101

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, threatened or at risk 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



COASTAL RESTORATION TRUST OF NEW ZEALAND

The trust shares information and carries out projects that support and improve the restoration of New Zealand's coastal environments.

It is based in Wellington. 04 889 2337

www.coastalrestorationtrust.org.nz



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



ENVIRONMENT NETWORK MANAWATŪ

Environment Network Manawatū has over 40 member organisations. It works to foster and encourage environmental initiatives in the Manawatū.

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 Taumaranui, Marton, Woodville and Palmerston North. www.horizons.govt.nz

Contact them (24hr-freephone): (+64) 0508 800 800



LANDCARE RESEARCH MANAAKI WHENUA

Landcare Research supports a wide range of aspects of New Zealand flora including: ethnobotany, plant systematics, pollination, weeds. It is also maintains Ngā Tipu Whakaoranga.

www.landcareresearch.co.nz



NEW ZEALAND FISH & GAME

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



NEW ZEALAND PLANT CONSERVATION NETWORK

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

www.nzpcn.org.nz



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 www.openspace.org.nz



NATIONAL WETLAND TRUST OF NEW ZEALAND

Information on the protection and restoration of wetlands.

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



TARANAKI REGIONAL COUNCIL

The Taranaki Regional Council provides information on biodiversity and sustainable land management.

www.trc.govt.nz



WILD FOR TARANAKI

The trust consists of 19 organisations involved in the protection of native plants, animals and ecosystems in Taranaki.

www.wildfortaranaki.nz



WEEDBUSTERS

Comprehensive and detailed information about weeds in New Zealand, including how to control them. 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 46 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 fourth 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.

Thanks

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www.facebook.com/wildfortaranaki



*Taranaki
Tree Trust*



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