Restoration planting:

A guide to planning restoration planting projects in the Wellington region

Quality for Life

greater WELLINGTON
THE REGIONAL COUNCIL | Environment

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Why consider restoration planting?

Wellington's ecosystems need your help!

The Wellington region's ecosystems are unique and special. Our region has a particular climate, terrain and soil types that together make our forests, wetlands, dunes and streamside areas different from other parts of New Zealand.

Healthy native ecosystems help keep us and our environment healthy. They clean the air, keep our water clean, stabilise the climate and detoxify our wastes.

Today, in many parts of the Wellington region there is but a shadow of our original native vegetation left. Many plants and animals have become extinct and many are threatened – along with the places they live. Much of our region's lowland bush has been cleared, wetlands drained and waterways degraded to make way for farming and the growth of our city and towns.

Restoration planting is not just a tool for native forests – wetland margins are key restoration sites.

Reaping the rewards of restoration

The news isn't all bad though! Across the region, community groups and individuals are replanting bare land and restoring bush blocks, wetlands, dunes and streamside areas with native plants. Replanting or restoring native plants helps us reclaim some of what we've lost – the plants, the animals and the wider ecosystem benefits – making our region a more attractive and healthy place to be.

Restoring areas with native plants:

- improves biodiversity – the variety of all life
- provides places for native birds and insects to flourish and move between
- helps protect soil and prevent erosion
- provides a carbon sink to remove greenhouse gases from our atmosphere
- improves water quality by filtering runoff and stabilising soil

- improves the look and natural character of our landscape
- provides areas for recreation and enjoyment.

This guide is aimed at both individuals and groups, and provides information about how to successfully restore areas of native vegetation in the Wellington region. While it focuses on native bush, the principles and practices also apply to other ecosystems such as wetlands, dunes and streamside areas.

The guide will help you plan a successful planting project, choose the right plants for your site, get them started, and manage long-term care of your new native haven.

Hatching a plan

Good planning is the key to successfully restoring native vegetation. It pays to take some time to think about:

- what you what to achieve – your goals
- where you want to achieve it – your site
- what's required to get the job done – your approach
- how much time and resources are available – your budget and your commitment.

Many potentially rewarding projects can fall flat if the wrong species are planted or there are no resources left for maintenance, leading to weed invasions. Most of these pitfalls can be avoided with good planning at the outset, making your project a joy to be part of and an asset to the region.

Don't rush in – you may find that you do no planting in the first year of your project while you concentrate on planning and site preparation. Remember the old saying, 'if you fail to plan, you plan to fail!'

Work out your goals

It's often a useful exercise to write down your goals for a project like this. It's likely you have plenty of ideas floating around in your head. Taking some time to consider them will help you chart a clear course forward. This is especially important if you're part of a group, because each individual might have slightly different ideas about the aim of the project.

Some examples of goals for restoration planting might include to:

- make the area look better
- enlarge an area of existing native vegetation
- fill in gaps ('light wells') or seal the edges in an area of existing native vegetation
- attract native birds and insects
- stabilise the soil on steeper slopes
- create a corridor of native vegetation to link with other areas
- fully restore a bare area to its original vegetation.

Taking the time to plan will give effective results

Being clear about what you want to achieve will allow you to make sound decisions about how to approach your project to get the most effective results. Develop a broad overall vision, which you can then break down into bite-sized achievable tasks. Don't bite off more than you can chew – you'll just end up with something you can't manage!

It's also helpful to talk to your neighbours about your plans. If they have stock in boundary paddocks, it will be critical that they keep fences secure to protect your new planting. They might even decide to help out or do some restoration of their own!

Planning in a group

If you're part of a group planning a project, it's useful to think about your vision as a group and then work towards developing objectives and goals together.

- Ask your group what they want things to be like in the future. Write everyone's ideas up on a large piece of paper and check how they're different and similar. Pull together the main ideas to create a vision that everyone is happy with. For example, "Jim's gully is a thriving bush haven for native birds, with walkways so that people can easily enjoy it."
- Ask your group what they would need to achieve to realise their vision. Get everyone to write ideas on sticky notes and group similar ideas together to develop goal statements. Check what might get in the way of achieving the vision as well, to help identify any critical areas for action.

For more information about group planning, check out the Department of Conservation booklet “From Seed to Success – Tool Kit for Community Conservation Projects” on their website at www.doc.govt.nz under Publications.

Consider your site

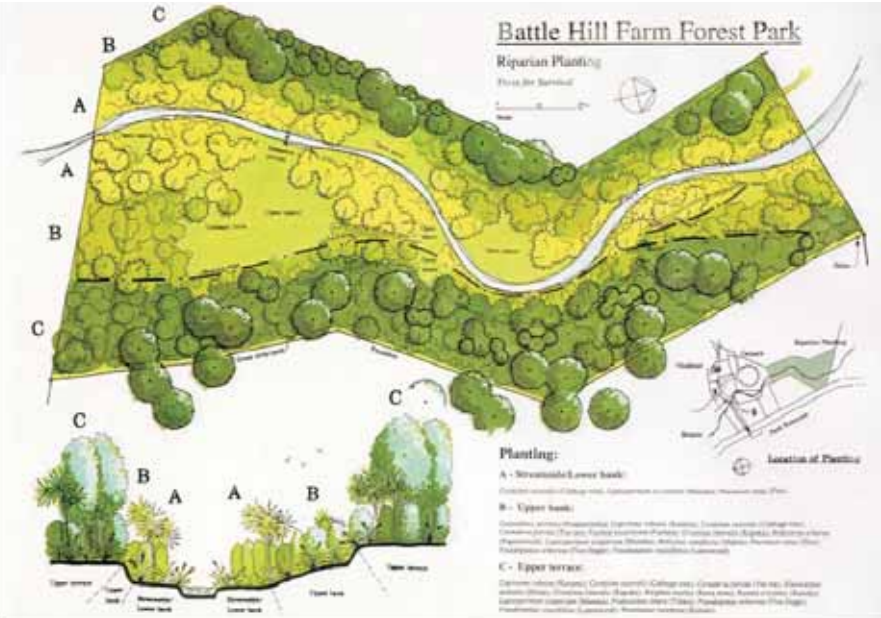
You might already have a site picked out to replant – whether it be around the edges of existing bush or wetland, filling in gaps or starting from scratch. Whatever your site, it’s important to get to know it well before you pick up the spade.

Getting to know your site will help you:

- determine what’s possible
- identify potential problems, such as weeds
- plan to address any problems
- decide what and where to plant first to achieve early successes.

Draw up a simple scale map of the site and mark on it:

- boundaries and a North arrow
- general terrain – slopes and ridges
- existing vegetation, both native and exotic
- weeds and signs of pest animal problems (especially possums, rabbits, hares)
- aspect – sunny north faces, exposed areas, cold frosty areas
- direction of prevailing winds
- wet or swampy spots.



Get your ideas down on paper - use a planting plan

Enhancing an existing area of natives is always an easier job than starting from scratch, if you have the option. It means less work and the existing plants will provide shelter for newly planted trees. Planting to link existing areas together will often yield the biggest benefits for native wildlife by creating a corridor for them to move across the landscape.

If you have a choice with your site, plan to start your planting in well-sheltered areas, with good moisture and no weed problems. This will give you early gains and help maintain enthusiasm for the project. It will also create a more favourable environment for later planting.

If much of your site is exposed, you'll need to consider your best options to create shelter quickly. This could involve shade cloth on ridge fencelines or establishing hardy fast-growing species as a nurse crop or buffer for later plantings. Much maligned weedy species such as gorse and broom can play a valuable role in protecting young native seedlings. Check out Greater Wellington's control requirements for these species in your area and consider retaining them as a nurse crop if it's appropriate.

Sometimes exotic species are suitable for initial shelter planting, allowing you to successfully plant natives later. You'll just need to make sure you can remove the exotic species down the track without damaging your well-established natives.

It's also useful to look at what's already growing on your site and where. This will provide valuable clues about what plants will grow well in different spots. It's possible to establish native plants on even the most difficult sites, as long as you choose the right species for the job.

Decide on the best approach

There are several different approaches you can take to establishing native plants, depending on your site, budget and personal preference.

Revegetation methods include:

- assisting natural regeneration
- establishing a nurse crop
- planting.

On some sites, it might be appropriate to use a mix of these options. The success of each approach will ultimately depend on how you manage the site. For tailored advice about which options are best for your site, contact Greater Wellington (see Page 34 for contact details).

Natural regeneration – Let nature do the work!

On some sites, native plants can regenerate (regrow by themselves) very quickly if conditions are right. This approach to restoring natural areas can be very cost effective, saving you time and money in both purchasing and planting.

Check long grass or scrubby areas on your site to see if there are native seedlings coming up. If there's a nearby source of fast-growing natives, such as manuka, then sometimes all you need to do is keep stock out and control weeds and animal pests. Gorse and broom can provide valuable shelter for regenerating native seedlings. These potential weeds can be described as a natural 'nurse crop' and will eventually be shaded out by the growing natives.

If you have a natural nurse crop on part of your site, you might decide to let nature take its course. Then you can concentrate your efforts on planting in other areas. If the gorse is very large or thick, you might need to remove some of it to provide light for seedlings to germinate, or you can plant into these areas to speed up the process.

Nature at work - native seedlings on the forest floor

Establishing shelter or a nurse crop – Doing it nature's way

If you're starting with bare soil or grass or on an exposed site, consider establishing some fast-growing shelter. This helps to prevent moisture loss from the ground and wind or frost damage to new plantings.

In a natural situation, hardy 'pioneer' species such as tauhinu, manuka, kanuka, karamu, toe toe, tutu and koromiko will rapidly cover bare ground. This creates a sheltered microclimate for less hardy plants that will eventually overtop the pioneers.

You can either plant shelter trees around the edge of your site or plant a nurse crop throughout the site to provide a sheltered, partially shaded environment. Once a shelterbelt is reasonably dense and at least a metre tall, you can begin planting hardier natives. Once a thickly planted nurse crop is established, you can plant underneath or amongst it, gradually thinning the nurse crop out.

Manuka

Hebe

Tree Lucerne

The shelter trees or nurse crop should be:

- fast-growing
- suitable for your site – look around to see what grows well naturally
- frost-hardy
- easy to remove when its role is complete, especially if you choose exotics.

Some examples of species suitable as nurse crops are:

Native species

- Manuka (*Leptospermum scoparium*)
- Kanuka (*Kunzea ericoides*)
- Hebe (*Hebe stricta var. stricta*)

Exotic species

- Tree Lucerne (*Chamaecytisus palmensis*)
- Eucalypts (*Eucalyptus spp.*)

A mix of all the species listed above can be a good approach to achieving a healthy diverse nurse crop. If you're choosing an exotic species, make sure it's not likely to become a weed. Check with Greater Wellington Biosecurity Officers if you need advice.

Planting

Planting good-sized seedlings directly into your site is the most common approach to revegetation. Pages 26-27 provide more information about sourcing good native plants. Start planning where you'll get your plants from well before your planting date.

When it comes to planting, there are two different approaches you can take, depending on your goals:

- use small, cheaper plants if you're prepared to put more time into looking after them; or
- use larger, more expensive plants to achieve good cover in a faster time.

This well-mulched, closely planted, weed-free area will quickly close over and become self-sustaining....

...like this area of 3 year old plants.

Work out your budget

Because restoration projects can go on over many years, it's important to think through the costs you're likely to face. These could include:

- plants and planting labour
- fencing materials and labour
- mulch
- weed control chemicals and / or labour
- pest control chemicals, equipment and labour.

Allow for an ongoing commitment of at least five years. It also helps to break down your costs into time periods that reflect different stages of activity and expense. Don't forget to put some money aside for maintenance of fences and ongoing weed and pest control.

Some general principles

There are a few important principles to keep in mind if you want to successfully restore your site with native plants that are similar to what was once there.

Avoid unwanted natives

To help preserve the unique ecology of the greater Wellington region and your local area, it's important to keep out non-local native plants that could be a threat to ecological integrity. Some native plants with apparent benefits (fast growing, drought resistant etc.) but not local to your area can become weed-like and take over your site.

Two examples of non-local species to avoid in the greater Wellington region are:

- karo (*Pittosporum crassifolium*)
- pohutukawa (*Metrosideros excelsa*).

These species have been widely planted in some parts of our region and have formed self-sustaining populations, excluding some of the more important local species.

Eco-sourcing – use local plants

It's important to use local species and local seed sources to keep your planting consistent with the natural character of the local area and region. This is called 'eco-sourcing' and will avoid the non-local natives mentioned previously. Because eco-sourced seed and plants are well-adapted for the climate and soils of your area, they're also more likely to survive and flourish than outside plant stock, making a more sound investment.

You can either collect your own seed locally, allow natural regeneration or ask for eco-sourced plants at your local native plant nursery.

Eco-siting – choose the right plants for the job

Eco-siting means trying to recreate the same ecosystem that used to exist in an area. It involves matching each plant species to its preferred habitat. New Zealand bush can be made up of a complex array of plant species and communities. These species and plant communities respond to the local climate, soil type, slope, moisture and fertility .

To recreate an ecosystem successfully, you'll need to make sure you choose the right species for different parts of your site. Once you're familiar with your site, this will be relatively easy. For example, it will be obvious to plant kahikatea and swamp flax in the wetter valley bottoms, totara on drier alluvial areas, and ngaio on exposed coastal sites. Putting the right plants in the right place will generally mean they survive better and a more natural forest will be created.

Look at what plants grows where in local forests, streamside areas and wetlands to get ideas for your site. But don't worry too much about getting it wrong, nature will generally sort it out anyway!

It's also important to plant the right balance of plants on your site. For example, the big podocarp trees (rimu, matai, miro, kahikatea) will normally only make up a small percentage of a forest canopy, so don't plant too many of them relative to other species. For forest areas, a good rule of thumb is to plant 50 canopy species for every 1000 hardy colonising plants.

Getting your site ready

Preparation is everything when it comes to restoring native areas successfully.

Plants will grow best if they're not competing with other plants for light, soil nutrients and water. Weeds can be the ultimate downfall of a restoration project, so dealing with them before you start planting is a critical success factor. Your new plants will also need protection from stock and animal pests.

Fencing

Fencing is critical to prevent stock from grazing and trampling regenerating seedlings and new plants. If new fences are needed, it's best to put them up before you start planting. Sometimes, just putting up a fence or closing the gate will be enough to get natural regeneration started, as long as you control any weeds.

If your neighbours have stock in boundary paddocks, you'll need to talk to them about keeping stock secure to protect your planting investment. Maintaining fences in good condition will be essential to keep your growing plants safe.

The barren landscape of a grazed forest floor

Fenced bush shows prolific regeneration

Sorting out the weeds

Weeds are plants that are growing where they're not wanted. Getting weeds under control at the early stages of a restoration project should be your top priority. Weeds compete with plants for light, space, moisture and nutrients. Get your restoration project off to a good start by removing any invasive weeds from the site before you start planting. This will considerably reduce the time and effort needed to deal with weeds once you have plants in the ground.

Tradescantia (or Wandering Willy) can invade native bush and restoration plantings preventing any natural regeneration

You also have a legal obligation to control or eradicate weeds identified in Greater Wellington's Pest Management Strategy. If you're not sure what weeds you have, contact our Biosecurity staff who will visit your site to identify weeds and advise on effective control methods.
If you have significant environmental weeds that are difficult to control, such as Old Man's Beard, blackberry or convolvulus, it's best to control them up to a year before planting. Early control will allow you to eradicate them. This will save you considerable time and effort in the long-term because environmental weeds are very difficult to manage once young plants are growing.

Take care not to leave large areas of soil bare for any length of time when you've removed weeds. If you don't replant again quickly, weeds will move back in. Try mulching the area with untreated sawdust or bark chips to keep new weeds at bay until you're ready to plant.

Blackberry can be a significant weed of restoration sites

Options for weed control

There is a range of options available for controlling and eradicating weeds, depending on the type of weed, the amount of weed, the resources available and your personal preference.

The options generally are:

- hand weeding – labour intensive but avoids herbicides and can work well for small infestations
- ring-barking – can be used instead of herbicides for trees and shrubs with larger stems but before you remove larger vegetation, check whether it provides valuable temporary shade and shelter for your plantings
- herbicides – often necessary for larger infestations but take care to use a suitable product and technique and apply with care.

If you do choose to use herbicides, take care to avoid non-target plants and only to apply as much as you need. Poorly managed weed control is a major source of native plant death because natives are very sensitive to herbicides .

For more information about controlling environmental weeds in the Wellington region, contact Greater Wellington for a copy of the booklet *Controlling problem weeds in riparian zones.*

Ring-barking can be an effective means of controlling larger problem weeds.

Animal pest control

You'll give your new plants and regenerating seedlings a head start if you control any animal pests before you start planting. Possums, hares and rabbits are particularly troublesome for young plants. Greater Wellington's Biosecurity staff can provide advice on appropriate control methods for your site. They are available to visit your site, assess the problem and advise on the best solutions.

Hares can cause extensive damage to new plantings. It may be necessary to use individual plant protectors.

Establishing shelter

When you first assessed your site, you will have considered whether you need to establish shelter or a nurse crop to protect new plantings. Alternatively, windbreak or shade cloth can provide shelter from prevailing winds for smaller areas.

Preparing the ground

Friable soil makes planting easier and encourages root development in new seedlings. If your site is dry and stony, compacted, or has a heavy clay soil, you may want to consider mechanical ripping with a bulldozer or tractor. Talk to a specialist for advice about what will work best on your site.

Otherwise, all you'll need to do is dig individual planting holes with a trenching spade or crowbar. Each planting hole should be around twice the size of the root-ball of the plant. If you can, it's good to loosen soil to a depth of about half a metre to give the plant a good rooting environment.

You'll also need to remove all existing vegetation from planting patches by either spot-spraying or screefing. Screefing is where you chip off the surface vegetation with a spade or grubber. It's a cheap, safe option but takes time and energy and you'll have to make sure you plant soon afterwards.

Spot-sprayed planting patches leave a distinct pattern on the hillside

As a general principle, it's best to minimise the use of herbicides around sensitive native plants. However, spot-spraying can be an efficient and effective option where you have a larger area. If you do decide to use herbicides:

- follow the manufacturers' instructions carefully
- follow recommended safety precautions to avoid harming yourself or contaminating waterways
- use a wetting agent to make the spray stick better
- spray side to side or in 'Z' pattern to get a good square planting patch
- protect any existing natives by placing an old bucket, plastic bag or cardboard over them while you're spraying.

Competition from weeds, particularly grasses, is a major reason for plant deaths. This is especially the case if your plants are small (for example, root trainer size). Getting on to weeds early is critical to the success of your project. You can also use mulching and dense planting to help avoid weed regrowth and keep your project manageable.

What to plant

Experience shows that the greatest successes in restoration planting projects result from using a relatively limited range of hardy 'workhorse' plant species. This is particularly important when you're restoring open sites without much shelter.

Your ultimate goal is probably to end up with a wide diversity of species similar to natural areas. But when you're getting started, you're much more likely to get good results by sticking to the 'first fifteen' – our 'tried and true' species listed on the following pages. These plants are the first to establish in natural situations, creating favourable conditions for less hardy plants.

Restoration sites will differ in their characteristics – frosty, coastal, droughty, wet etc. – so not all of the 'first fifteen' species will be suitable for every site. See what plants are growing naturally on the edge of reserves and native remnants in your local area and talk to staff at Greater Wellington or the Department of Conservation for advice.

Remember to make sure your plants are hardened off for local conditions before you plant them out. Even the hardiest of species won't survive being transferred straight from the shelter of a nursery shade house to an exposed planting site. If you can, it's useful to grow plants on for a few months before the planting season at a location close to the planting site.

The Wellington region first fifteen

The 15 native plant species listed on pages 21-25 are hardy and well-suited to planting in most parts of the greater Wellington region.

Manuka (*Leptospermum scoparium*)

Manuka is found mostly in open habitats throughout New Zealand. It is a fast growing, frost hardy shrub, up to 4 metres tall, which establishes well on disturbed land. Flowers and seed capsules can be present from spring to early winter. The insects that pollinate manuka are attractive to fantails and other insect-eating birds. The roots of young manuka are extremely sensitive to handling so never untangle the roots during re-potting or planting. In restoration planting, less hardy species can be planted later under established manuka or the area can be left to regenerate naturally.

Kanuka (*Kunzea ericoides*)

Kanuka is a hardy small tree, growing up to 15 metres tall. When young, kanuka looks similar to manuka except the leaves are smaller and more prickly. Kanuka bark is light brown, shedding in long strips. Kanuka thrives in open conditions and can withstand wind, frost and relatively dry conditions.

Ti kouka or Cabbage tree (*Cordyline australis*)

An iconic New Zealand tree that reaches up to 20 metres tall, ti kouka grows along the edges of forests, swamps and river banks. Cooked tap roots, the core of the trunk, and the tender shoots were all important food for Maori. Leaves were an important source of fibre. Ti kouka is tough, likes open sunlight and flowers in early summer, with berries from mid-summer to mid-autumn. It provides food for bellbirds and tui and is extremely good at establishing even in open pasture. Damaged trees can sprout new branches.

Karamu (*Coprosma robusta*)

This shrub or small tree with leathery leaves grows up to 6 metres tall and is found throughout New Zealand in lowland forests. It is tough, likes open sunlight, and is frost hardy. Summer berries are food for waxeyes, bellbirds, kereru, and tui. Karamu is extremely good at establishing even in open pasture and its hardiness and popularity with birds makes it an essential revegetation species.

Akiraho (*Olearia paniculata*)

From the daisy family, this very hardy shrub to small tree grows up to 6 metres tall, can stand light soils and is found along forest margins and in scrub. Akiraho is mostly a coastal and lowland plant which likes open sunlight and is frost hardy when mature. Akiraho is very leafy year round and flowers in mid summer, after which the seeds disperse into autumn.

Ngaio (*Myoporum laetum*)

A leafy tree up to 10 metres high, ngaio's spreading branches shade out understorey vegetation. Ngaio likes open sunlight and is frost hardy when mature. It can recover from light frosts when young. Ngaio flowers from mid-spring to mid-summer and the berries ripen through summer and autumn, providing food for bellbirds and tui.

Manatu or Lowland ribbonwood (*Plagianthus regius*)

Manatu is a common lowland forest tree up to 15 metres tall. Unusually, it is regularly leafless in winter. Manatu flowers from mid-spring to mid summer with fruiting through summer to early autumn. It likes open sunlight and is frost hardy.

Kohuhu (*Pittosporum tenuifolium*)

Kohuhu is a coastal to lower mountain forest tree, growing up to 8 metres tall. It is found throughout New Zealand except in the west of the South Island. Kohuhu is tough, frost hardy, likes sun and flowers from mid to late spring. Seed capsules mature from mid summer to early autumn, providing food for bellbirds and tui.

Tarata or Lemonwood (*Pittosporum eugenioides*)

Tarata is a tree which grows up to 12 metres tall with a strong lemony smell. It has attractive showy flowers in October, followed by distinctive black seed capsules. It is found throughout New Zealand along forest margins and on stream banks from sea level to 600 metres. Tarata is frost hardy and tolerates a wide range of conditions (although it can be vulnerable to drought) and is a useful quick growing restoration plant.

Makomako or Wineberry (*Aristotelia serrata*)

Makomako is a very common, fast growing semi-deciduous small tree, growing up to 10 metres tall. It is found throughout New Zealand in forests and scrubland, along forest margins and roadsides. Makomako likes open sunlight and is frost hardy, although it can be vulnerable to drought. Flowers and berries provide food for bellbird, tui, kereru and waxeyes from spring through to early summer.

Koromiko or Hebe (*Hebe stricta var. stricta*)

Koromiko is a common fast growing, hardy shrub with a rounded shape, growing to 2 metres. Koromiko is found throughout the North Island on stream banks, shrubland and on the edge of forest remnants. With attractive white flowers in mid to late summer, it thrives in full light and is a useful colonising plant.

Mapou or Red matipo (*Myrsine australis*)

Mapou is a closely branched shrub or small tree, growing up to 7 metres tall. It has distinctive red branchlets and glands dotting the wrinkled leaves. It is a hardy plant occurring throughout New Zealand on forest margins.

Toetoe – spring flowering (*Cortaderia fulvida*)

This native grass is tough and likes open sunlight. Toetoe grows up to 2 metres high within two to three years of planting. It can be planted on the windward side of a planting area to provide quick shelter. Toetoe is also a useful streamside plant as its roots help to stabilise stream banks.

Totara (*Podocarpus totara*)

Totara is found throughout New Zealand, mostly in lowland forest on fertile alluvial well-drained soils. It grows up to 30 metres tall, likes open sunlight, and is frost hardy and attractive to birds. One of the largest trees in the forest, this has been the most prized tree to Maori. Totara timber was the best for building massive war canoes and was the main timber used for carving. Totara flowers in early summer and smooth red berries form in late summer. Totara look good planted in groups.

Puahou or Five-finger (*Pseudopanax arboreus*)

Five-finger is a common native tree found from sea level to 760 metres in forests and open scrub from North Cape to Southland. It reaches 8 metres in height and has a characteristic leaf with five to seven ‘fingers’.

What's next on the planting list?

Depending on your site, you may choose to continue planting the 'workhorse' species for a number of years and leave the rest to nature. Often if there are healthy remnants of native vegetation in the local area, birds will bring a wide range of seed onto your site in their droppings. Be vigilant for the weeds they can also transport to your site!

If you want to add some more diverse species to follow your pioneer planting, there a number of sources of information about what to plant next. The *Wellington Region Native Plant Guide* provides detailed descriptions of the different types of native vegetation that occurs naturally around the region. It divides the Wellington region into fifteen 'eco-domains' and provides a recommended list of plants for each eco-domain. The guide is available from Greater Wellington and many garden centres and retails at $2.50. The publications and websites listed on pages 35-36 of this guide can also help.

Staff from Greater Wellington and the Department of Conservation are also available to offer advice on the next phase of restoration.

Where to get plants

Grow your own!

Native plants in general, and especially the 'first fifteen', are not difficult to grow from seeds or cuttings. If you have the time and room for some basic nursery facilities, growing your own plants can be a rewarding aspect of a restoration project. There is plenty of information available on how to propagate and grow native plants. In particular, check out www.bush.org.nz, or the book *Native Forest Restoration: A Practical Guide for Landowners* (1993) - see pages 35-36 for more details.

Potted plants in a home nursery await a new home

Or not...

For many restoration projects, it's likely that plants will be purchased from a nursery. Greater Wellington encourages the use of eco-sourced plants for the reasons outlined on page 13. It's often not possible to buy eco-sourced plants 'off the shelf,' especially from garden centres and retail nurseries, so you may need to plan well ahead. However, there are a number of specialist native nurseries that do supply eco-sourced plants.

It is worth considering entering into a contract with a specialist native nursery to supply all the plants for the duration of your project. While this takes a bit of planning, it often reduces the unit cost per plant. You can either supply the nursery with the seeds (or cuttings) of the plants you want, or in many cases the nursery can handle the seed collection aspect as well.

Whatever plant sourcing method you use, you will need 12 –18 months lead time before your plants are ready to plant. This gives you plenty of time to sort out fencing and control plant and animal pests so that your plants can get off to the best possible start in their new home!

Planting for success

Now that your site is ready and you have the plants you need, it's time to get them in the ground. Important factors to consider when you're planting include:

- timing
- placing
- spacing
- technique.

The right plant in the right site at the right time makes for a successful restoration project!

Restoration planting in action

Timing is everything!

Planting in late autumn or winter is generally your best bet. This avoids dry spells and takes advantage of damp soil to help give your plants a good start. If your site is frosty, you may be better to plant in late winter or spring but you'll need to be vigilant with watering over the summer.

Wherever possible, try not to plant on bright sunny days or very windy days, which will increase the risk of plants drying out. Mulching will help plants survive at any time of the year, especially on open sites.

Remember that the conditions in an open and exposed restoration site are harsh. Your initial plantings should be the hardy, early stage species listed on pages 21-25 – the 'first fifteen'. These are hardy fast-growing plants that naturally colonise bare ground. They grow well in the open and their fast growth suppresses weeds. They also attract birds, which encourages seeding of other natives.

Down the track when these plants are well established, you can add in middle and late stage species, which need more shelter and less light.

Placing and spacing

Where possible, it's best to plant densely – around three plants per square metre of ground. While this requires a lot of plants, it will mean they quickly grow to a level where there is no direct light hitting the ground to encourage weed growth. It's generally much better to concentrate on planting more plants in a smaller area to reduce the time you spend managing weeds later.

Planting at a density of about three plants per square metre reduces the opportunity for weed growth

Use a planting plan to help you figure out what to put where. The 'first fifteen' plant list on pages 21-25 provides some information about which species to plant where. You can also talk to staff from Greater Wellington and the Department of Conservation for advice about the needs of your site. It pays to put some thought into where to place plants so that you create a pleasant and natural look. Imagine how a tree or shrub might look when it's mature and how big it will get. Remember to leave spaces in your initial plantings for the later species that will need shade, shelter and protection from the cold. Alternatively, you can thin out some plants to create 'light wells' for later planting.

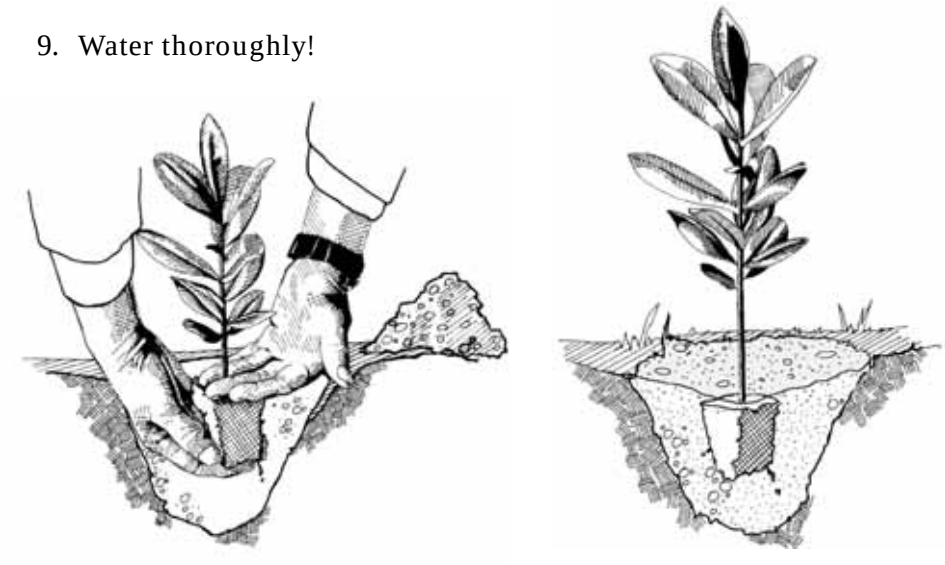
Planting groups or clumps of the same species looks more natural than rows and allows trees to shelter and support one another. This will also help with pollination so that your plants will self seed and produce fruit and nectar for birds.

If you've already planted a nurse crop, you'll probably need to thin it out to under-plant your key native species.

Good planting technique

If you don't plant properly, your valuable and carefully tended plants won't survive, wasting your money, time and effort. The steps below will help you plant for success.

1. Soak plants before planting, leaving them to drain out of direct sunlight.
2. Set your plants out where you want them to go.
3. Dig a hole that is twice the size of the plant container. Loosen the soil at the bottom of the hole to make it easier for the roots to get started and to help drainage.
4. Add water to the hole in dry areas if you can or a water retention product such as Aqua Gel.
5. Remove the plant from its container carefully, keeping as much soil around the roots as you can.
6. If the plant is root bound, untangle or gently tease out the roots to help them grow. Remember not to do this with young manuka, which have extremely sensitive roots.
7. Put the plant in the hole about 10cm deeper than the final position you want. Replace the soil around the roots, firming as you go, and gently pull the plant up to straighten up the roots.
8. Firm the soil well after planting, leaving a slight depression to catch any rain.
9. Water thoroughly!



Good planting technique improves plant survival

You might want to consider marking plants with small stakes to help you find them when you come back for weeding.

Fertiliser

Where possible, putting slow-release fertiliser granules in the planting hole will help your plants (and not weeds) get a good start. Most natives grow without fertiliser but it will help them to grow more vigorously.

Mulching

Well mulched new planting

Mulching involves spreading loose material such as newspaper, wet straw, bark or untreated sawdust around the plant to protect the roots and trap moisture. It is also very helpful in controlling weed growth. If you have access to good cheap mulch, lay it down as soon after you've planted as possible to keep the weeds at bay.

Water your plants thoroughly before you mulch or leave your mulching until after the first good rainfall following planting. Lay the mulch at least 10 cm deep around the plant in a weed-cleared area.

Looking after your investment

Getting your plants in the ground is far from the end of the story! Ongoing maintenance is essential to the success of your project. Weeds are a constant threat that needs to be managed, especially in the first few years. Weeds are often the biggest downfall in any restoration project. Animal pests also need to be controlled to give your plants a good chance to flourish.

Weed control

Weed control or 'releasing' involves removing any unwanted plants such as grass from around your new plants. Your native plants will not be the only plants shooting away come spring! Weeds and grasses will compete for moisture and nutrients and can smother younger plants. They are a major cause of plant death, especially with smaller root trainer sized plants.

For fast-growing species, you might only need to release in the first year after planting. For other species, it pays to help them out for the first two to three years. Using mulch or weed mats will reduce the need for time-consuming weed control, as well as thorough pre-planting weed control. It's important to control weeds in late winter or early spring before they get too large. Once weeds are larger, it becomes much more difficult to control them without damaging your natives, regardless of the technique you use.

Make sure you're very careful when using herbicides for weed control, because natives can be very sensitive to chemicals. It's useful to make a simple shield to use while spraying. Sometimes it's cost effective to employ a skilled weed sprayer who is familiar with native plants, to make sure you protect your investment.

Young plant recently released with herbicide

For small areas with fewer weeds, controlling by hand can be a good option if you're prepared to put in the regular effort. Use a grubber or a slasher to cut back vegetation or pull smaller weeds and grass by hand. Be very careful not to damage trees or tree roots when you're using grubbers or weed-eaters – this is another major cause of plant death.

Talk to Greater Wellington's Biosecurity staff for advice on safe control methods for persistent weeds.

Possum bait station nailed to a mature tree

Pest control

Make sure your lush new plantings don't become a tasty meal for possums, rabbits or other pests! Good fences are critical to stop stock eating your plantings but you'll also need to take action to deal with animal pests.

Consider traps or bait stations for possums. Repellents can be useful for rabbits and hares, alongside poisoning.

As your planting develops and becomes an important habitat for native birds, you'll also need to consider controlling rats, ferrets, stoats and feral cats. These animals can have a devastating effect on native birds by preying on adult and young birds and eating eggs.

Contact Greater Wellington's Biosecurity staff for site specific advice about the best solutions for pest control.

Ongoing planting

Middle and late stage plants can be planted once your early plants are established and providing a level of shelter and shade (this could take a few years). Seed collection and scattering under your initial plantings can be a good way to encourage new seedlings. You'll also need to replace any failed plantings to avoid gaps for weeds to invade.

Keep track of your progress

It can be satisfying to keep a record of your achievements so you can see how far you've come and celebrate success. It's also a good way to take note of what did and didn't work, so you can help others learn from your experience.

An annual photo record is a good simple record of progress. You might also like to keep a note of things like:

- natural regeneration
- bird life at your site
- the extent of weed populations.

Congratulations on helping to protect our region's valuable natural heritage. Keep up the good work!

Finding out more

Now you can sit back and enjoy your planting and the birds and insects it attracts. If you want to find out more about any of the subjects covered in this guide, check out the information sources below. Don't forget to ask for help if you need it! There's a wealth of experience throughout our community on restoring native ecosystems – it's just a matter of asking around.

Greater Wellington Regional Council

Greater Wellington can provide you with a range of advice.

- For advice on plant and animal pest control, phone our Biosecurity Officers on 04 526 4133 or 06 378 2484. You can also email us at pest.animals@gw.govt.nz or pest.plants@gw.govt.nz.
- For general advice on restoration projects contact us at biodiversity@gw.govt.nz.

Visit our website for more information about restoring natural areas at www.gw.govt.nz.

Department of Conservation

The Department of Conservation (DOC) can provide advice on how to identify, maintain and enhance native vegetation. Contact your local office:

- Wairarapa – 06 377 0700
- Kapiti – 04 296 1112
- Poneke – 04 472 5821

You can also visit DOC's website at www.doc.govt.nz

QEII National Trust

The QEII National Trust helps private landowners protect natural areas by using covenants. For more information, visit www.nationaltrust.org.nz or phone 0508 732 878.

New Zealand Landcare Trust

The New Zealand Landcare Trust helps with community group projects and can sometimes provide funding. Contact them at www.landcare.org.nz or phone 0508 526 322.

Useful Websites

www.bush.org.nz

This is the website of the New Zealand Ecological Restoration Network, a non-profit, community-driven organisation dedicated to sharing knowledge and experiences about ecological restoration. Check out their planting guides.

http://nzflora.landcareresearch.co.nz

This site has a wealth of information about native plants.

www.doc.govt.nz

The Department of Conservation website provides information about conservation on private land and includes several useful publications. In particular, in the Publications section, check out 'Seed to Success' and 'Protecting and Restoring our Natural Heritage—a Practical Guide.'

www.biocommunity.org.nz

This website has useful examples of community restoration projects around New Zealand.

www.gw.govt.nz

The Greater Wellington website provides information about plant and animal pest control, key native ecosystems in the Wellington region, wetland restoration and much more. You can also access and order several useful publications.

www.wellingtonbotsoc.wellington.net.nz

The Wellington Botanical Society advocates for the conservation and protection of native plants. Their website provides information about upcoming trips, events, meetings, publications and links to other groups.

www.nznfrt.org.nz

The New Zealand Native Forests Restoration Trust website includes a great section on D.I.Y restoration, together with information about sucessful restoration projects across New Zealand.

References and Further Reading

Department of Conservation 2001: *Protecting and Restoring our Natural Heritage – a practical guide*. Canterbury Conservancy. Department of Conservation, Wellington.

Department of Conservation 2003: *From Seed to Success – Tool Kit for Community Conservation Projects*. Department of Conservation, Wellington.

Greater Wellington Regional Council 1999: *Wellington Regional Native Plant Guide.* Greater Wellington Regional Council, Wellington.

Greater Wellington Regional Council 2004: *Mind the Stream. A guide to looking after urban and rural streams in the Wellington region*. Greater Wellington Regional Council, Wellington.

Greater Wellington Regional Council 2004: *Controlling Problem Weeds in Riparian Zones*. Greater Wellington Regional Council, Wellington.

Hamilton City Council 2002: *Gully Restoration Guide – A guide to assist in the ecological restoration of Hamilton's gully systems.* Second edition. Hamilton.

Janssen, Helmut 2004: *Bush Vitality – A Visual Assessment Kit*. Horizons Regional Council, Palmerston North.

Kapiti Coast District Council 1999: *Growing Native Plants in Kapiti*. Kapiti Coast District Council, Paraparaumu.

Porteous, T 1993: *Native Forest Restoration – A Practical Guide for Landowners.* Queen Elizabeth the Second National Trust. Wellington.

Waitakere City Council 1999: *A Guide for Planting and Restoring the Nature of Waitakere City.* Waitakere City Council, Auckland.