

Ngā tikanga whakatō tipu kia toitū ai

Restoration planting techniques

Restoration planting is no easy task in Wellington's rugged, windy and exposed coastal environments. The following techniques have been collated from the experiences of community groups, landowners and Council staff in Wellington.



Te whakatō tipu i ngā marama mākū

Plant during wetter months

The best time to plant natives in Wellington is from mid-May to mid-August when the soil is moist. Ground moisture is the most important factor for plants to get a good start in life. Planting out of the main planting season can result in very stressed plants that take longer to grow and are less resilient.

If circumstances necessitate late planting, water plants thoroughly at planting time and for the following weeks. Use mulch or weed mats to help retain moisture in the ground.

At well sheltered sites where ground moisture is available for longer periods (like along stream sides or in sheltered gullies), planting can start earlier, around April, and finish in early spring.

If you are planting coastal dunes, aim for June-July as this is when the moisture in the Wellington dune systems is highest.

Dress up warm for winter planting in Wellington. Dig holes around your site to ensure there is good ground moisture if planting early in the season.



Me tika te tipu mō te āhua o te whenua

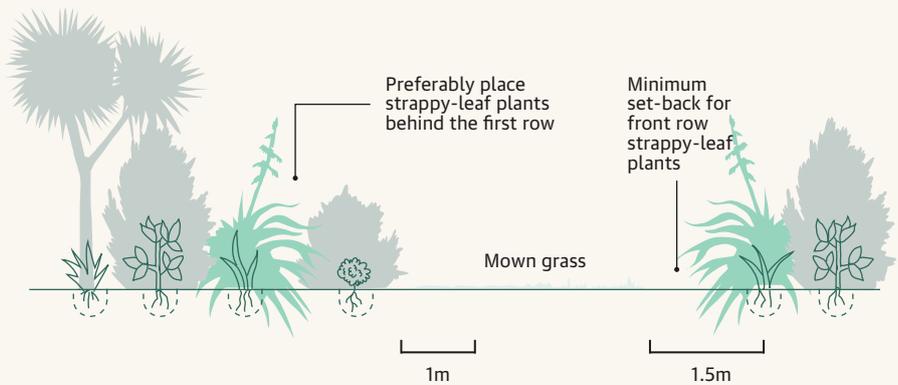
Match the plant with the site conditions

Plants can generally be mixed randomly however there are some situations where particular plants will need to be sorted out for planting in specific locations. Here are some common examples.

Wellington City Council park rangers can provide advice on your plant selection and how to match plants to suitable microsites.

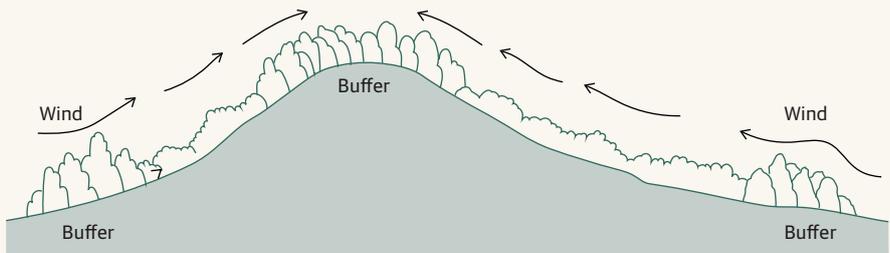
Strappy-leaved plants

Plants with fibrous, strappy leaves such as flax, cabbage trees and toetoe should be kept at least 1.5m back from all tracks and mown areas as these types of leaves can tangle with mowing and trimming equipment. On these edges use mainly smaller-growing plants such as hebes and coprosmas.



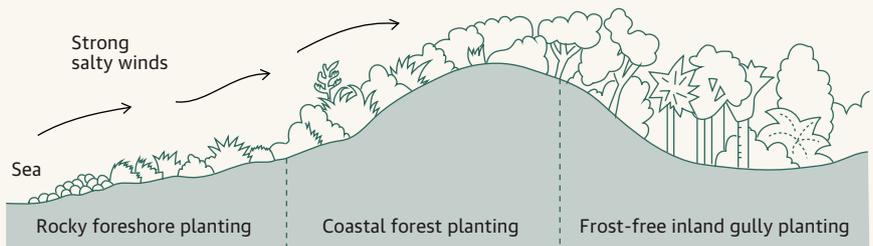
Buffer plants

Use plants that are wind hardy and fast growing on the most exposed parts of your planting area, such as around the edges or on the tops of spurs. They will provide shelter to the rest of the planting.



Microsites

Adapt your plant selection as conditions change inland. Information on the suitability for each species to different conditions is provided in the plant list tables. See the *Restoration Planting Sites* guide that suits your location.

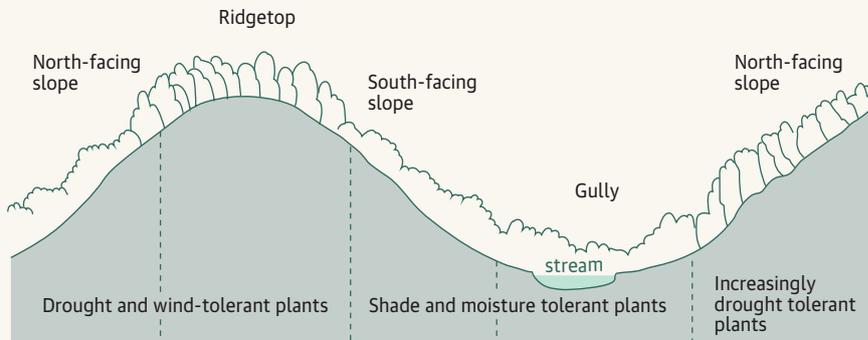


Gullies

In gullies use species that are moisture and shade tolerant and, on upper slopes and the tops of spurs and ridges, species that are drought and wind tolerant.

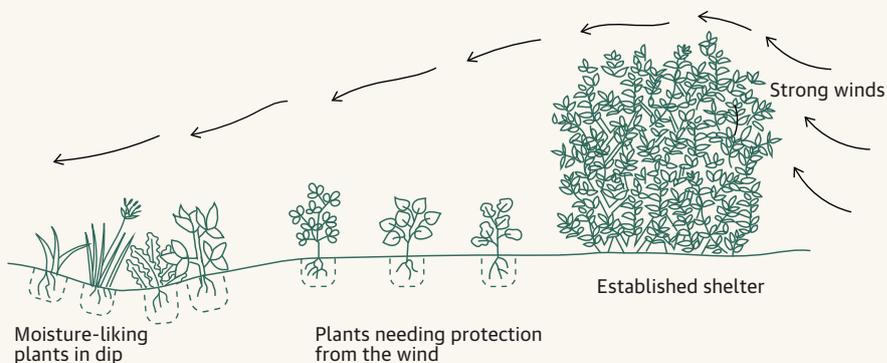
Stream and wetland edges

Different species are best suited to the immediate water's edge and to the bank above. Check Restoration planting for riparian areas in Wellington



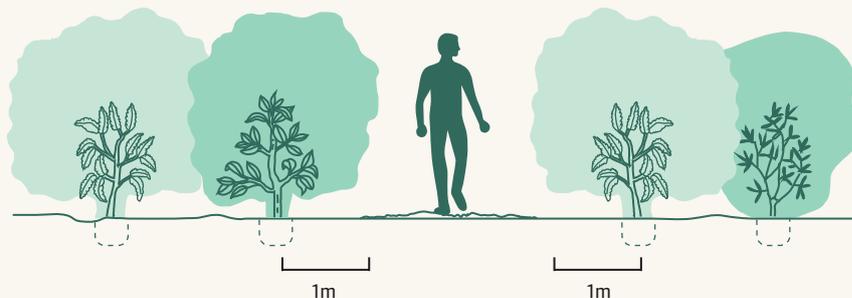
Sheltered microsites

Observe variations at the close-range scale of plant locations, such as dips and hollows with more moisture and sheltered spots in the lee of existing planting.



Track sides

Plant smaller-growing species beside tracks to prevent overgrowth and the need for future trimming or removal to keep the track clear. Plant at least 1 metre from the track edge and think what size and shape plants will ultimately grow.



Views and services

Avoid planting tree species that will, in the long term, block any desirable views or interfere with powerlines. Avoid planting directly over any underground services known to cross your planting site.



Me māwehe ngā tipu kia kapi ai te kāuru o te ngahere

Space plants to achieve canopy closure

“Nature is a vacuum, as soon as you pull something out, it will fill back up again with a weed - especially in Wellington where the wind blows seed around all the time.”

Sue Reid, Owhiro Bay

One of the aims of restoration planting is to achieve canopy closure over the ground as soon as possible. The canopy shades the ground, which shades out light-hungry weeds and reduces moisture loss from exposed soil.

Plants grow at different rates, depending on the species, site conditions and where each plant is located. In Wellington it can take anything from four to nine years to get good canopy closure. To speed canopy closure, space plants at the following distances from each other:

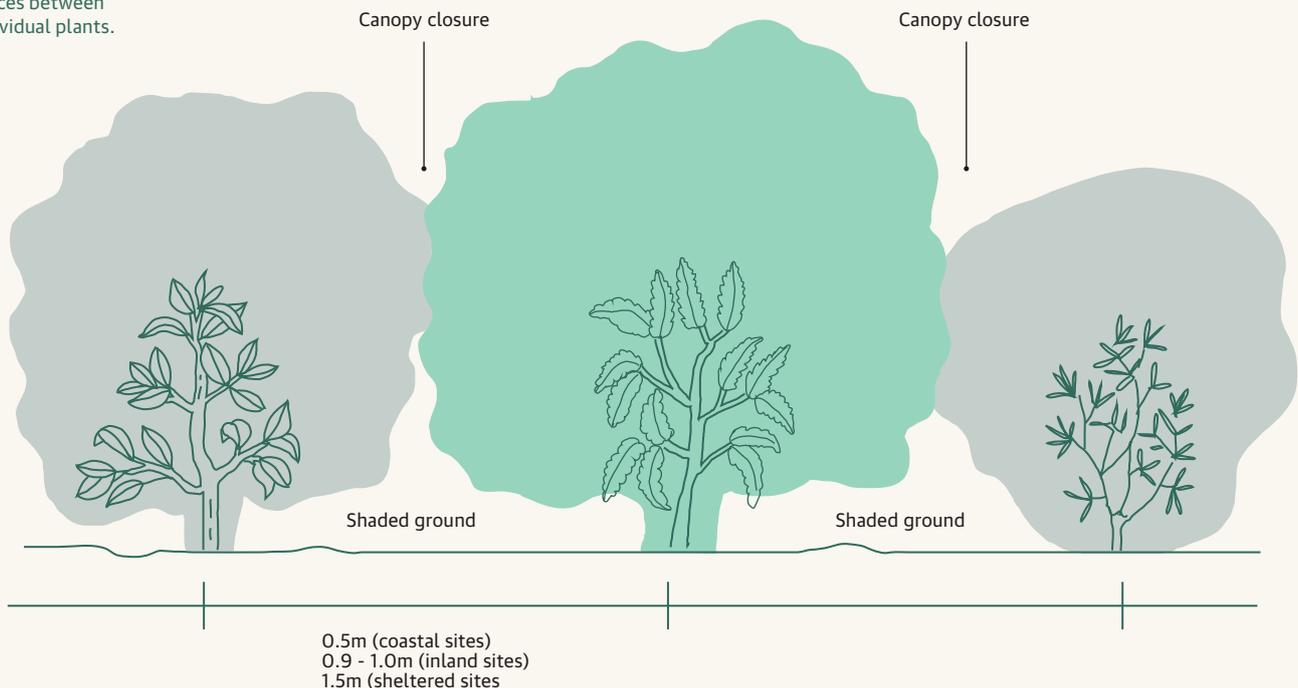
- On coastal sites, plant at 0.5 metre spacings. Coastal plants contend with harsh conditions, often growing slower and smaller than they might at other sites.
- In well sheltered environments (eg gullies), plant at 1 to 1.5 metre spacings.
- On inland and more sheltered sites, plant at 1 metre spacings.

This should achieve canopy after two to three years in sheltered sites (eg riparian areas, lower slopes). On other more exposed sites (eg windy sites, upper hill slopes, hilltops) canopy closure may take as long as four to nine years.

If you are planting within existing forest or scrub, increase the diversity of species, spacings will vary depending on the mix of plants already at the site. See Forest enhancement planting in Wellington for further detail.

Fill in any gaps in your planting where plants die to reduce the likelihood of weed spread.

The canopy closes when plant growth merges to fill the spaces between individual plants.



Me āta mahi kia tika ai te whakatō i ia tipu

Take the time to plant each plant well

The way a plant is put in the ground can affect how its roots grow and whether it will survive. Planting young plants well is particularly important in the exposed and often steep Wellington conditions.

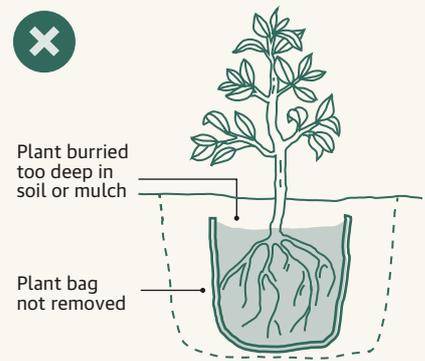
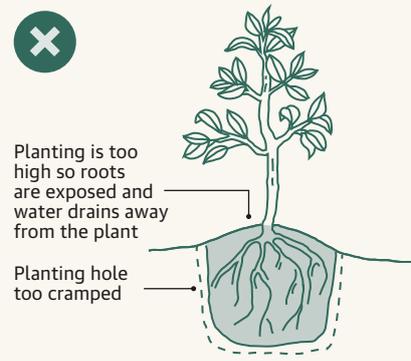
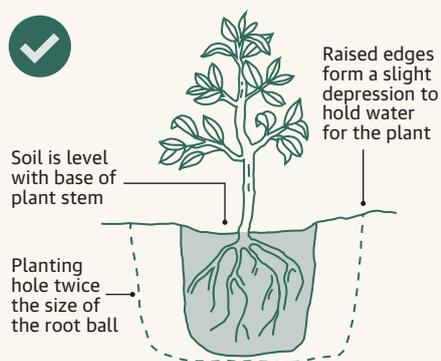
Dig the hole deep enough so the base of the plant stem is not buried (risk of collar rot or smothering) and not sitting high (wobbly plant, exposed roots).

- If you dig too deep, place soil back in the base of the hole to get the right depth.
- Make sure there is no green matter below the plant (it will rot and the plant will sink).

Dig the hole wide enough, about twice the width of the root ball, so there is friable soil for roots to easily grow into.

- Break up any lumps and firm down the soil around the plant to avoid air pockets and to stabilise the plant in Wellington's windy climate.

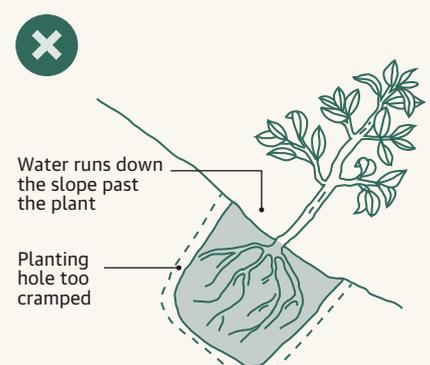
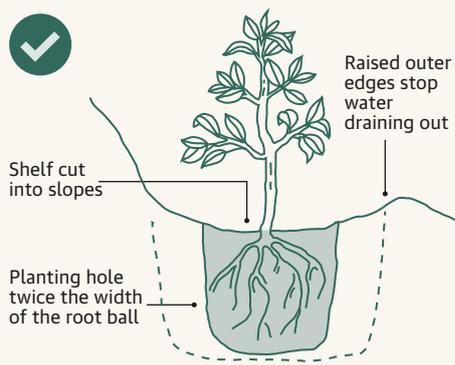
Form a slight depression to catch water.



Planting on a slope

Dig into the slope, form a small shelf and plant each plant upright.

This will provide a stable base and help the plant collect water rather than let it run off. Planting onto steep slopes is a common situation in Wellington. It can be hard work, with rocky soil and tricky footing, but it's worth the effort.



Tips for planting native plants

Handle plants gently

Carrying plants by their stems and 'yanking' plant bags off are common causes of damage. If bags are hard to remove, cut them off,

If in a hard pot, tap the top of the pot with the plant upside down, holding your hands across the top of the soil area.

Soak plants before planting

Plants will establish far better if they have adequate moisture at planting time. Pre-soaking the plants is good practice, especially where it's not feasible to water plants such as on steep slopes. If the plants or the ground is dry, soak the plants in a stream or in tubs of water with their planter bags on before planting.

Remove the plastic planter bag before planting

Inexperienced volunteers sometimes forget this and the evidence is buried out of sight until the plant fails to thrive.

Gently loosen the roots before planting if they have started growing into a ball

Some plants have fragile roots or are susceptible to root rot, so be careful if you are teasing out root systems. If the roots are tightly entwined together (root-bound) gently make shallow vertical cuts in the outside of the root ball to promote outward growth.

Avoid over-compacting soil in the planting hole

The soil should be firm enough so the plant doesn't wobble in the wind and you can't pull it out easily, but not rammed so tight that water cannot percolate down and the plant roots cannot expand easily into it.

Avoid putting any spray residue from spot-spraying into the plant hole

Slice off the top layer of soil if it has been spot-sprayed and place to one side, being careful not to mix it with the backfill soil from the planting hole. Don't put back around the plant.

See video demonstration

Tim Park from Wellington City Council shows how to plant a tree online at [youtube.com/watch?v=_gkWxLvCVzII](https://www.youtube.com/watch?v=_gkWxLvCVzII)

Understand your plants' requirements

Especially important to site some species well to ensure the plant will grow. Some species will be happy in just about any position.

If you research your plant and observe the species growing naturally you will gain an understanding of where the species will thrive.

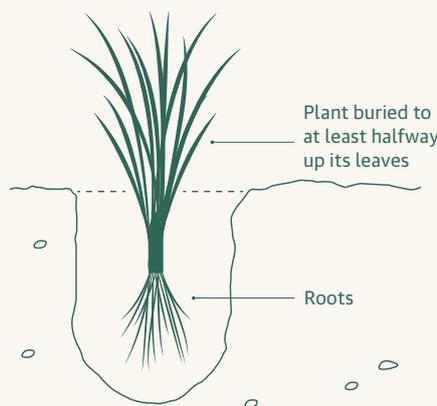
Climbers

See fact sheet for enhancement planting. Generally climbers need a cool root run, ie plant in the shade but in a position that they can climb out into the sun.

Planting spinifex and pīngao on coastal dunes

Sand-binding dune plants, spinifex and pīngao, require a different planting technique to other species. They must be planted at least half-way up the leaves to thoroughly bury the crown of the plant. This stimulates them to grow through the sand. If they are not buried, they will not be stimulated to grow and may be blown or washed away. See Restoration planting on coastal dunes, rocky shore and turf fields in Wellington for further information.

Diagram of planting spinifex and pīngao



Wairākau Mulch

“We have used mulch extensively, it has been fantastic, it keeps the moisture in and the weeds down. Mulch needs to be at least 30-50mm thick. Lay it around the plant, but away from the stem so it doesn't damage it. We tried using carpet at one stage, but it wasn't permeable enough, so light showers of rain didn't get through to the plants. There are new weed mats that are more permeable and will biodegrade - we are still pulling out old bits of carpet. If we could get mulch to our steeper sites we would!”

Peter, Trelissick Park Group

Mulch is a layer of natural material laid over the ground around new plants. It improves plant survival by helping to retain ground moisture, adding nutrients and slowing weed growth. Options for mulch include basic wood chip, natural matting materials and several tailored commercial products. When considering mulch, weigh up the costs, availability and how you will get the product around your planting site. Always ensure there is good ground moisture before you apply mulch - if you mulch onto dry ground, it will stay dry.

Woodchipper mulch can be 'blanket' spread over the site before planting. If using this technique, it is best to leave the mulch for a year to settle and partially break down before planting into it. If newly spread mulch is too deep, don't plant into it as the plants will end up sitting above the soil level once the mulch settles.

Wood mulch can also be spread in circles around each plant after planting (see below). This is a useful technique if blanket mulching is unfeasible due to difficult access or steep slopes. Barrowing or bucketing mulch by hand is labour-intensive so don't aim to cover all the ground on the site - annual weeds, like grass, that might grow on the uncovered spaces can provide useful shelter and shade to your plants.

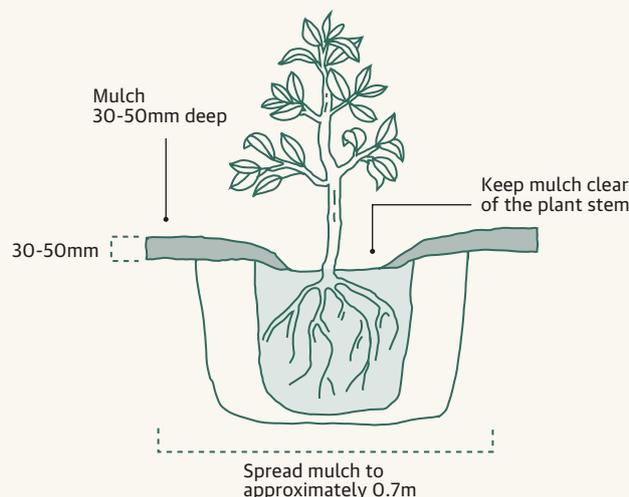
Wellington City Council can supply and deliver woodchipper mulch to restoration sites when it is available.



Wood chip mulch in use around individual trees.

Wood mulch should be 30-50mm deep and at least 0.7m in diameter around the plant.

Keep the mulch away from the base of your plants to prevent collar rot.



Natural fibre carpet/matting

squares can be used effectively as a mulch by laying them on the ground around each plant with enough space around the plant stem to allow for several years' growth. It can be a low-cost option if you have a source of old or offcut material. However, use only pure wool or natural fibre that will completely rot down, including any reinforcing fibre and backing. Plastic content or artificial fibres, such as nylon, do not rot but disintegrate into tiny strands that pollute the environment. Avoid products that may have been treated with preservatives or chemicals that could end up polluting the soil.

Wool mulch mats are a purchased product, supplied either pre-cut to size or in a roll, and need to be pegged into position. They will break down over time, usually well after the plants are self-sufficient. Ensure the ground is clear of weeds and very damp before laying.

EcoCover is another type of mat product, which is made from wastepaper. It, too, needs to be pegged to the ground and breaks down in a few years. It will suppress weeds for at least three years, by which stage the plants should not need intensive releasing (weeding). Some of these types of weed mats are also impregnated with fertiliser, which is released to the plants as the mats break down. Avoid using fertiliser impregnating products for riparian plantings as they can leach nutrients into the waterway.



Wool mats in use around small restoration plants.

Whakahaumako Fertiliser

Most indigenous plants do not need added fertiliser, especially if they have been chosen for the local conditions. Fertiliser can be expensive, so it is best used to give plants a good head start in areas where the soil lacks nutrients, like dunes. In these situations, use fertiliser tablets, broken up in the base of the planting hole and covered with a thin layer of sand or soil to avoid root-burn.

Fertilisers are unnecessary for riparian plantings because the nutrient levels tend to be high in these areas. The fertiliser can also leach into the waterway.

Poupou tipu Plant stakes

Placing a bamboo or wooden stake next to young plants can be useful even though it adds time and cost to a planting project. Experience at existing restoration planting sites in Wellington shows that staking is useful when:

- Grass growth is so rapid that plants disappear from view. Just a bamboo stake with fluorescent paint on the tip may be enough to prevent plants being stood on or cut down by line trimming.
- Emergent trees are being planted amongst fast growing understorey species so they can be easily located and pruned around where necessary.

Ngā tioata pupuri wai Water retention crystals

During dry periods, it can be tempting to water your plants. Sometimes it will assist them to survive but it can also cause problems because it encourages shallow root growth towards the surface. Left to themselves, the plants are likely to develop deeper rooting systems which will sustain them far better in periods of stress.

While your plants are establishing, consider deliberately leaving long grass in the spaces between them to provide shelter and shade. It can be enough to help plants pull through dry periods.

Water retention crystals have been used for many years to help retain moisture for planting. When it rains the crystals absorb moisture and expand, then gradually shrink and release the water back to the plants during dry periods. If you have a site where plants will likely dry out, place a few granules in the bottom of the hole during planting, following the manufacturer's guidelines.

Ngā kaiwhakaruruhau tipu

Plant protectors

“Our biggest threat to young plants is rabbits, not just on exposed sites, but in the bush. Get help from Council to get on top of rabbit control. Plant protectors, or tree shelters, are useful to reduce rabbit browsing. They also protect young plants from the wind. Biodegradable ones are better because they break down as the plant grows so you don’t need to go back and collect them.”

Garth, Highbury, who plants in the Polhill Reserve

Plant protectors help young plants to establish by providing wind shelter and protection from rabbits and hares. They also help to locate plants in long grass. The most common plant protectors are made of corflute, and a range of biodegradable products are coming on to the market. Plant protectors need to be well staked to stop them blowing away in Wellington winds. The combined cost of plant protectors and stakes is initially high but once plants are established, the materials can be re-used.



Plant protectors in use. Here, along the edge of a mowing strip, they highlight the edge of the planting area.

Te whakahaere rā whakatō tipu kia angitu ai

Running a successful planting day

“My advice for planting days and working bees - keep it simple. Only have one or two jobs that need doing. With regard to health and safety - have a look at the site a couple of days before people are due to come, and check it is safe to work at. We have health and safety information that we send out before a planting day or working bee, then we go through it again on the day.”

Peter, Trelissick Park Group

Great organisation is key to getting volunteers to help you out on planting

Set your date(s) early

Schedule your planting days well ahead of time. If you have a large planting site, try splitting the planting between different groups who come on different days - it's easier to manage fewer volunteers planting fewer plants in one go.

Promote your planting date online about two weeks before.

Community planting day, upper Kaiwharawhara Stream, restoring the stream bank with a mix of trees, shrubs and grasses. Photo credit Otari-Wilton Bush.

Organise to get your plants and mulch on site

If your plants are coming from the Wellington City Council nursery, we may be able to help transport them to your site. Check this when you order your plants.

Try to get your plants delivered as close to your planting site as possible as this cuts down work pushing wheelbarrows or carrying plants. If you have ordered a large number of plants to plant over several days or weeks, designate a site to store them where you can keep them protected and watered.

If you are having mulch delivered, make sure it is piled somewhere close to the site where volunteers can easily barrow it to plants.





“Keep it simple, keep it social, keep it short! We started out doing day-long planting days, it’s too much.

Now we do two hours then have a slap-up afternoon tea. We work in a smaller area all together so people don’t get too spread out. That way it’s more fun and no one is plugging away on their own.

It feels like a team effort.”

Rebecca, Makaracarpas, Makara

Estimate how many plants to set out

The number of plants that can be planted in one session depends on the fitness and skill level of volunteers, the type of terrain and factors like how hard the soil is and whether plants are being mulched. Allow for slower progress if you have inexperienced volunteers and if the digging will be hard.

Inexperienced planters might take 15-20 minutes to plant one plant well, whilst experienced volunteers could plant one every 5-10 minutes depending on terrain. Emphasise to all volunteers that every plant needs care and attention and doing it well can help plant survival.

Set out plants and any equipment before people arrive

When planting with volunteers, particularly large groups, it is essential that plants are set out where you want them to go before planters arrive. Doing this means you are free to walk around and check plants are going into the ground correctly.

Setting out plants on steep slopes can be difficult as they tend to roll downhill. In these situations, have volunteers dig planting holes at required spacings first then set plants in the holes to be planted. Make sure the people setting out plants know how to match each plant to a suitable location on the site.

(Above) Place groups of plants out on site before volunteers arrive to ensure the plants are set out correctly.

Demonstrate how to plant

Always start with a planting demonstration. Experienced people can benefit from refreshing their skills and any new volunteers need to be shown how to dig a hole, how to take the plant out of the bag, place the soil back around the plant and firm the plant into the ground.

Have designated supervisors

Allocate at least one person to run the planting day and supervise as their sole activity. It's the best way to ensure plants are planted correctly in the right places. Make sure materials like stakes and mulch are on hand where needed and volunteers understand when and how to use them. When planting with large groups, especially children, have experienced planters working alongside them.

- **Inexperienced volunteers** need clear instructions and checking to see how they're getting on, especially when English is not their first language.
- **School groups** need to be well supervised and generally require some assistance with digging holes deep enough. A ratio of 1:3 adults to children helps with ensuring quality control.

Health and safety - know your site and communicate any risks

Check your site before volunteers arrive to make sure it's safe for planting, for example are there any flooded streams, fallen unstable trees, wasp nests or poisonous plants. Create a list of the health and safety issues that might arise and decide how you will manage these.

Brief all volunteers at the start of the day on the health and safety risks and how they can be safe. Your supervisor can brief anyone who arrives later before they go on site. Simple actions like wearing sturdy shoes and gloves, keeping spades low to the ground, safe working distances when using tools, stretching before you start work, rotating between tasks, bending correctly, looking out for uneven ground, steep drop offs, planting holes and keeping away from streams will deal with a lot of health and safety issues. Consider doing short warm-up exercises before planting starts, to avoid or reduce strains or injury. You can provide information to people prior to the day to make sure they wear appropriate clothing, bring any supplies needed (eg gloves, drink bottle) and know how to take responsibility for themselves on site. Have sunscreen, a first aid kit and water available if possible.

Have a plan for rubbish

Have bins or bags on site to collect planter bags and containers, any general waste, recyclables and food scraps. Talk to your ranger about removal of larger items of rubbish like tyres. If these can be placed next to a road they can be collected. All hard containers and plant trays should be returned to Berhampore Nursery. Recycle plastic bags if possible.

Thank your volunteers!

Make sure to thank your volunteers, if they feel appreciated they are more likely to come back and help another day or support the project through donations and positive comments!



School children under supervision on a planting day.

A successful school planting day will encourage students to continue to maintain the planting site.



Support the base of the root ball when taking plants out of a pot or bag to avoid root damage.

Template for planting day briefing

Thanks for coming to _____ to help us today!

We couldn't do this work without people like you helping us out!

My name is _____ and our supervisors for the day are _____

Please ask one of us if you have any questions or need any help during the day.

This area is special because _____

Our aim for today is to _____

Key tasks are:

To make sure everyone is safe on site can you all please (list any on-site risks and health and safety actions, eg wear gloves, use sunscreen, keep away from specific areas etc):

Toilets are located _____

We have water, sunscreen, first aid kit located _____

Wellington is a really difficult place to survive as a young plant, so every plant we put in the ground today needs a bit of extra care and attention.

[Planting demonstration]

[Provide any special instructions, eg plants are set out for you, work in teams of two or three, put all planter bags in the containers provided etc]

If you don't know the person planting next to you, introduce yourself!

Help each other out and above all enjoy yourself!
