TĀNE'S TREE TRUST
Native Forests for our Future | Hereherea te Wao-nui-a-Tāne

Establishing Native Forests

TĀNE'S TREE TRUST FACTSHEET SERIES

Site preparation for planting natives

FACTSHEET 3

Refer to the other factsheets in this series for more about successfully establishing native forests.

Online version of this document with clickable links: https://docs.tanestrees.org.nz/1233/

Introduction

Good site preparation is critical for successful establishment of native forest. Site preparation covers a multitude of tasks that need to be addressed before the site is planted. These tasks will vary from site to site. This factsheet covers the requirements for preparing a site for planting native trees and shrubs.

Site preparation requirements

- Various factors, some of which are common to all sites, will need to be addressed as part of site preparation. This includes:
  - fencing to exclude domestic grazing stock;
  - pest animal control; and
  - management of existing vegetation cover.
- The exact prescription and intensity of site preparation is influenced by the scale of planting, resources available including labour, the quality and size of planting stock, and the intended density of planting.

Excluding farm stock

- Cattle, goats, deer and sheep will heavily graze nursery-raised seedlings of almost all species of native trees and shrubs.
- Erection and maintenance of appropriate fencing that exclude farm livestock from areas of native trees and shrubs, will last for decades.
- Even recently planted nursery-raised natives that are relatively unpalatable, such as totara, manuka and kanuka, are vulnerable to grazing after planting, possibly due to the increased nutrient loads while growing in the nursery.
- Well-established seedlings and saplings of most native species can be severely browsed, broken or trampled by domestic stock.
- Fencing out domestic stock allows regeneration processes to occur encouraging natural succession of native forest species.

Wire mesh fencing can be used to exclude rabbits and hares.

Fencing options

There is a range of fencing options for areas to be planted with natives:

- Standard deer netting fences (1.8 to 2.0 metres high) will exclude farm livestock including sheep, cattle, horses, goats and most deer, as well as feral deer and goats.
- A permanent eight wire post and batten fencing provide the most effective barrier to sheep and cattle; an additional electric outrigger may be necessary to prevent horses and cattle leaning against the fence and especially where bulls are farmed.
- A well maintained two- or three-wire electric fence will exclude cattle as long as the fence is kept ‘live’ at all times.
- A secured gate is also suggested so that any stock breaking through the fence can be removed quickly.

Planting fenced sites

- The first row of planted seedlings should be located out of reach of livestock that may reach over the fence.
- In a mixed native species planting on an open site, plant hardy coloniser species along the outer edge to provide shelter for trees growing internally; these hardy species will generally be more tolerant of lateral grazing by livestock as they spread towards the fence.
- Irrespective of the width of riparian margins or shelterbelts planted with a mix of native trees and shrubs, permanent fencing is required to exclude all farm livestock.
- Fencing cost is reduced by erecting fences following direct routes along meandering streams; larger fenced off areas provide ideal opportunities for groves of native trees to be established. Find out more.
- Many Regional Councils and organisations such as the Queen Elizabeth II National Trust can provide funding to assist with the cost of establishment of new fencing around retired riparian margins and areas of native bush.

Pest animals

Control options

- Where pest animals are present, a concerted control programme is recommended immediately before planting.
- Possums and rabbits can be controlled by shooting or poison bait, and possums also by trapping, whereas hares are less inclined to take poison bait and so are best controlled by shooting.
- Pindone is generally the most effective bait to use for rabbit control, and a variety of traps and poisons exist for possum control. It is recommended that the advice of experienced pest control experts is sought to avoid unsafe practice and poor results.
- For small-scale planting, rabbits can be excluded from a planted area by the attachment of small aperture (50 mm or less) wire mesh to a standard post and batten fence; to be effective the mesh should extend out horizontally from the fence base (on the pest side) by no less than 400 mm to prevent rabbits digging under the fence.
- Rabbit mesh, as described above, will also exclude hares but it is recommended that the mesh is extended up the full face of the conventional 8 wire fence (i.e., to 1.1 metres).
- Where existing farm fencing is not effective at excluding feral deer, goats and pigs; periodic hunting may be necessary, including in surrounding forests.
- To prevent seedlings being pulled out, plant larger well-grown plant grades (such as PB3 or PB5 grades) and make sure each plant is firmly planted in the ground.
- Tree guards are commonly used in rabbit prone areas and provide shelter on exposed sites; there is a wide range of plastic and compostable versions available.
- Check out more details on livestock and pest animal management required when planting natives.

Monitoring pest animal damage

- Monitor plantings regularly for pest damage and be prepared to enact control quickly if new damage is detected.
- Regular follow-up control efforts may be necessary until seedlings exceed one metre in height.
- Rabbit fencing must be maintained regularly and thoroughly to be effective.

Plant less palatable nursery stock

- If it proves too difficult to control browsing animals consider planting a higher proportion of less palatable native shrub and tree species.
- Less palatable species include manuka, kanuka, tauhinu, ngaio, harakeke, totara.
- Seedlings that have been hardened off in the nursery for 3 months before planting will be less palatable when planted out.
- This hardening off involves removing nursery plants from shelter to open sites and reducing fertiliser so that foliage is less palatable.

What is eating your natives?

Animal pests including deer, goats, pigs, possums, hares and rabbits, and even some native birds can cause extensive damage to newly planted areas of native trees and shrubs.

The tell-tale sign of hare browse on a planted native seedling – a 45° angle clean cut of the main stem on this kahikatea.

- **Possums** are more likely to cause significant damage to older saplings and seedlings planted into scrub and on forest margins; possums characteristically chew accessible new-growth leaves and flowers.
- **Deer** browse tops of newly planted seedlings but are more likely to rub antlers against established saplings leading to ring barking and breakages.
- **Goats** are highly destructive and will eat newly planted seedlings to stubs.
- **Rabbits** cause the greatest damage to freshly planted seedlings especially when planted on pasture and where grass is short or sparse; they generally leave tell-tale diggings and accumulations of round pebble droppings.
- **Hares** typically slice through seedling stems leaving a clean 45° angle cut with tops of plants discarded on the ground.
- **Feral pigs** are most likely to cause damage on forest margins, usually as a result of their habit of rooting up the ground and uplifting planted seedlings exposing roots.
- **Pukeko** cause significant damage to newly planted native tree and shrubs especially near their favourite habitats along waterways, wetlands and adjacent pasture; their playful, but destructive habit of pulling out freshly planted seedlings can be substantial, especially with smaller plant grades.
- **Weka**, like pukeko, can be locally destructive in regions where they occur such as the Westland, seemingly pulling out newly planted natives “for fun” rather than eating them.

Managing existing vegetation cover

Extra effort in controlling problem aggressive weed species before planting will reduce post-planting weed control.

Planting sites

- Planting sites can be grouped into one of several broad categories largely based on the existing vegetation cover requiring different site preparation methods.
- Broad site types include:
  - Retired pasture such as along fenced riparian zones and marginal hill country.
  - Exotic brush weeds present in various densities.
  - Converting exotic forest to natives.
- Other factors likely to influence the level and type of site preparation required before planting include current management and scale of planting envisaged.

Site preparation for pasture sites

- Most native planting is carried out on grassland recently retired from grazing.
- Before finally excluding animals, hard graze pasture within 3 months of planting to reduce the grass sward to near ground level; this allows for easier access, herbicide spraying and planting. Alternatively mowing is also an option for suitable tractor accessible pasture ahead of planting.
- For large-scale planting projects, consider forming access tracks for planting, maintenance and monitoring; these can be either for walking or 4WD access.
- For sites with dense vigorous grass species such as kikuyu, use of herbicides is likely to be the only option. Site preparation involves spraying herbicide to kill grass; herbicide is best sprayed on clean, green foliage where grass is actively growing such as in early autumn or spring for late planting.
- Spot spraying is best for wide-spaced planting over 1.5 m apart, whereas blanket spraying is required for high-density planting of less than 1.5 m plant spacing.
- Where less vigorous grass and herbaceous species dominate ground cover, spraying herbicide may not be required so it is best to plant natives as soon as practical after hard grazing.
- Refer to this document for more detail on preparing grass sites for planting natives.

Do you need to use herbicide?

While many planting operations on grass involve herbicide spraying, there is increasing interest and success in avoiding use of herbicides and adopting a minimal approach to gnd clearance for planting. Depending on what local weed species are present locally, sprayed pasture site can become dominated by even more vigorous weeds like thistles, vines and gorse that may require greater management than hand releasing planted natives from rank grass (if required at all).

Right: heavy duty motorised brush cutter used to clear dense woody weeds such as gorse, broom, wilding pine and old blackberry.

Managing woody weed sites

- Management of dense stands of exotic woody species (e.g., gorse, broom, blackberry, privet) is a significant challenge for landowners wanting to establish native trees and shrubs.
- Poor site preparation often leads to vigorous regrowth of problem brushweeds, which seriously compromises early survival and growth of planted native trees and shrubs.

Options for preparing woody weed sites include:

- Complete removal of the vegetation cover by a combination of spraying herbicide and mechanical methods before natives are planted; depending on scale, this can vary from helicopter spraying and tractor clearing to hand spraying and clearing.
- Temporary conversion of cleared gorse, broom, and blackberry sites by sowing grass then grazing as a dense sward (which should develop in a couple of years) will help suppress woody weeds prior to delayed planting.
- Inter-planting natives into the shelter of existing scrub within any natural gaps, or in cut gaps or lines, may be particularly advantageous on difficult exposed sites.
- Managing succession through brushweeds – native trees and shrubs can succeed gorse, broom and other selected shrub weeds if certain conditions are met; however, scramblers such as blackberry are not desirable nurse crop species.

Mechanical clearance using a 14 tonne excavator and rake to enable easier site access and planting.

- Planting a high proportion of relatively fast-growing shrub hardwoods at high density as part of a nurse crop is likely to give canopy cover within 2-3 years of planting suppressing weed growth and reducing maintenance.
- Refer to detailed methods for site preparation of woody weed sites.

Converting exotic forest to native

There is increasing interest in returning stands of exotic trees, particularly recently logged radiata pine, to native vegetation.

- Clear-felling to remove merchantable logs generally leaves highly disturbed sites with various degrees of regrowth of damaged native shrubs and infilling by exotic brush weeds such as gorse, broom, blackberry, pampas and wilding pines amongst logging debris.
- Control of the most aggressive exotic brush weeds by spot spraying and removal of wilding pines is often required. Planting natives within accessible open sites can supplement any naturally regenerating natives but access for weed control amongst logging slash is often difficult.
- Other exotic forests such as *Acacia* and *Eucalyptus* which have failed or are not economic to log can present many challenges in converting to native forest. Directional felling to minimise damage to understorey natives or poisoning to waste in one operation or over several years may be practical for encouraging gradual conversion by natural regeneration or inter-planted natives.

It takes time!

Thorough site preparation of dense exotic scrub sites takes time. Good site preparation will ensure greater success of a native planting programme with less post-planting weed control and significantly less downstream costs.

For difficult sites, it is wise to allow up to 2 years before planting to prepare woody weed-infested sites and ensure vigorous weed species have been controlled. This will vastly improve the chances of successful establishment of natives.

Native forest factsheets series

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