



Establishing Native Forests

TĀNE'S TREE TRUST FACTSHEET SERIES

The basics of planting natives

FACTSHEET 1, 2022 – by Mike Bergin & David Bergin

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/1111/>

Introduction

Planting nursery-raised seedlings is the most widely used option for the establishment of native forests, planted to meet many objectives. It allows control of the species mix and density of planting, and with appropriate after-planting care, can be highly successful. Planting is, however, an expensive and labour-intensive method for establishing natives so getting the basics right is paramount.



Before you start, check out natural regeneration

Planting requires a substantial commitment of time and resources, so explore if there are opportunities for Nature to assist in establishment of native forests – many native ecosystems have a remarkable ability to regenerate naturally.

- Whatever factors may be stopping natural regeneration, these are likely to be the same factors that will reduce planting success, e.g., grazing by domestic stock, wild animal browsing, persistent vigorous weeds, presence of bird predators.
- Mother Nature does it better – encouraging natural regeneration will lessen the need to plant, especially if seed sources are present and birds are present to assist in seed dispersal.
- Protecting and enhancing any existing remnants that can include some planting should be a priority and will be far cheaper than planting from scratch at a new site.
- Refer to Factsheet on Regeneration for more information.



The planting-only option

In some situations, particularly in heavily modified landscapes, planting to recreate or restore a native forest and associated ecosystems is the only option available.

- Planting will be influenced by the objectives as well as the region and local climate, and site characteristics including altitude and exposure, soils, and drainage.
- The scale and timeline of planting proposed, resources required, and a commitment to long-term maintenance must be considered in planting plans.
- Planting is just one action within a package of tasks including fencing, animal control, and site preparation to post-planting weed control often for two or more years – don't underestimate the time and cost – do it right!



Avoid the legacy of poor planting

For over a century, hundreds of thousands of native tree and shrub seedlings have been planted to re-establish native forest but many have failed, and surviving plantings often bear evidence of poor site selection and management.

- Failure of many planting programmes has resulted in widely held perceptions that native trees are difficult to establish and are slow growing.
- Historically, while prime sites have been used for horticulture and pasture, natives were often planted on poorer sites and then neglected.
- Applying planting practices developed for the exotic pine forest industry, to establishment of native tree plantations, may have also contributed to the relatively poor performance of early plantings of native trees – natives are not radiata pine!

Realistic expectations

Based on what planting of natives requires careful and realistic planning to ensure programmes are successful.

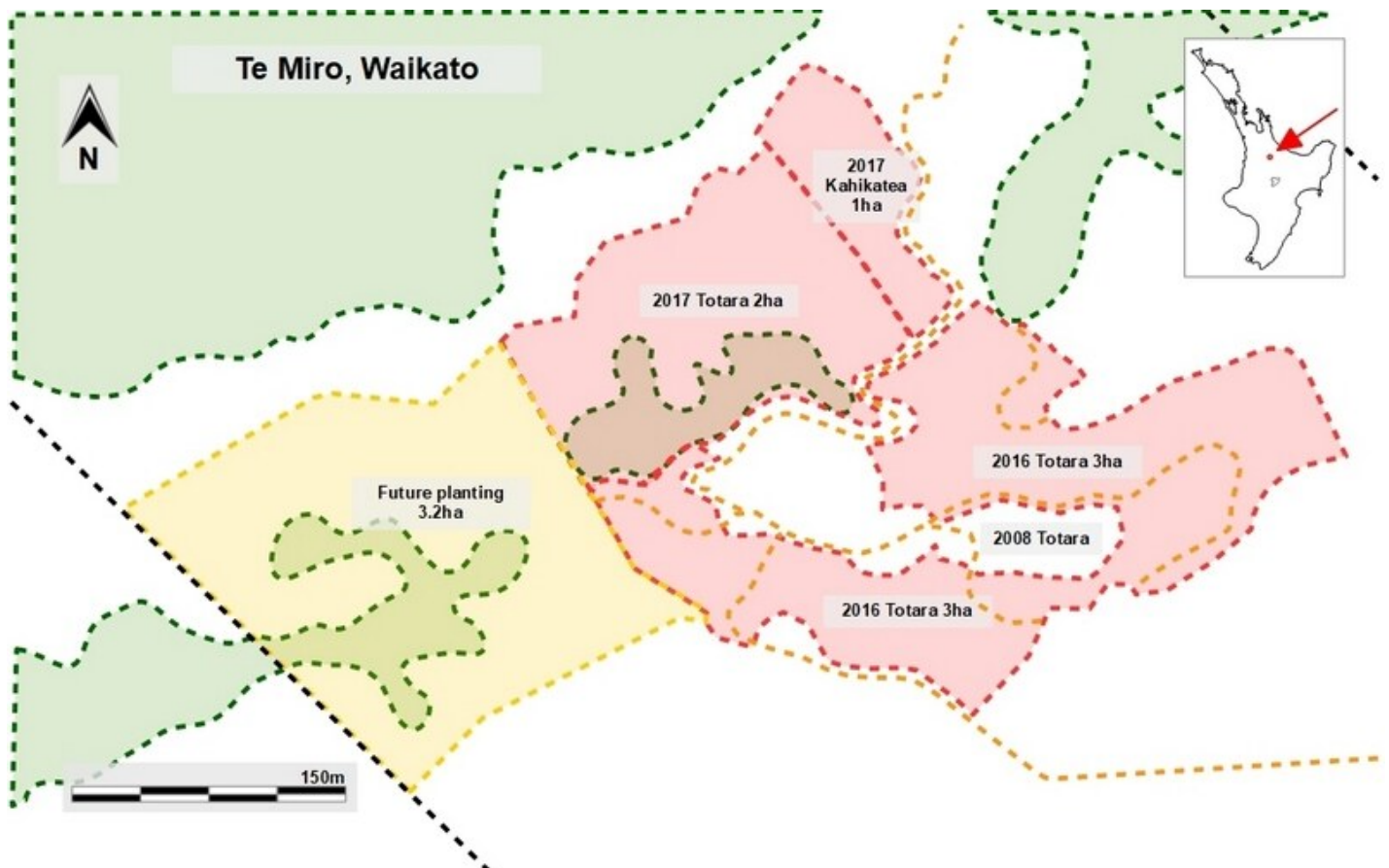
- Matching expectations with resources, good site preparation, monitoring and maintenance, and having the flexibility to modify approaches and practices as work progresses are the key requirements for improving planting performance.
- Successful establishment of native trees is a combination of many aspects including:
 - Protection from domestic grazing stock and control of animal pests.
 - Good site preparation in managing existing vegetation cover.
 - Following ecological and successional processes in selecting the right species to match the site.
 - Choosing the appropriate planting pattern and density.
 - Adopting good planting techniques.
 - Timely monitoring and maintenance.
- While we all like planting as part of community volunteer events, there is a limit – professional contractors are often the most practical for site preparation, planting large remote areas and undertaking weed control.
- Details on each of these activities are given in [other factsheets in this series](#).



From modest beginnings...

As the cost of native forest planting programmes is high and the commitment to managing planted areas is easily underestimated, we recommend starting with a small pilot trial.

- Only prepare and plant a small proportion of the site in the first year, particularly if planters do not have experience or do not have the input of local expertise.
- Small-scale planting allows assessment of site-specific factors influencing early performance, e.g., problem weeds and animal pests may only become apparent after planting.
- A modest approach will avoid possible large-scale failure and provide an opportunity to determine optimum species selection (including nurse crops), nursery stock types and plant spacing.
- Within a year or two, knowledge gained from small pilot plantings will provide planters with confidence to expand planting in subsequent years.



Establish a small area at first to build experience in site preparation, matching species to sites, assessing early performance and maintenance requirements.

What can nature tell you?

- Locally regenerating shrubland and secondary forest will provide insights into early successional processes and species selection.
- The ecology of local forest remnants is a valuable guide to identifying the composition of high-forest tree species for sites including different soils and topography.
- Inspection of nearby restoration sites and established native forest and other native ecosystems will assist in identifying any pest animal and weeds issues that will need to be addressed before planting.
- Where practical mimic nature in restoration of native forest and associated ecosystems.

Learn from other restoration sites

- Talking to others who have already restored a native forest or are well down the track with their plantings is valuable local knowledge.
- Inspecting such sites will help plan plantings, particularly if a history of planting and management is available.
- Essential information includes what the site looked like before planting and in particular what was growing on the site, how were browsing animals managed, what site preparation was undertaken, what was planted at what spacing, and what the monitoring and maintenance was undertaken since planting.

Develop a planting plan

All the essential components of a planting project need to be considered in a planting plan. Key elements include:

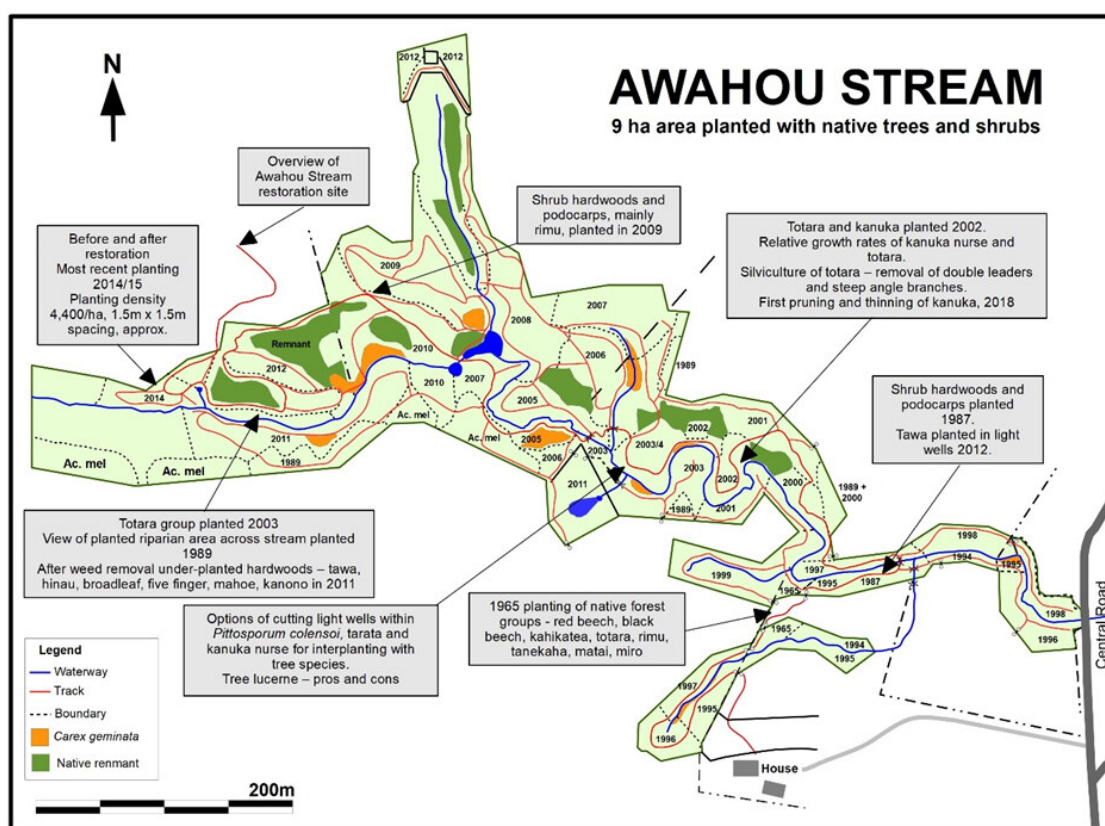
- Site preparation, planting and post-planting monitoring and maintenance, including weed and pest control.
- Multi-staged planting is recommended. Avoid planting large areas all at once – a plan that has several years of planting spreads risk of failure due to unforeseen circumstances such as cold winters or droughts, or the time it may take to control pest animals or weeds.
- Determine the area to be planted that fits within a realistic timeframe to allow building of experience and a realisation of the commitment to site preparation, planting and management; and make sure that the work is in line with the budget and resources.
- Based on information and advice gathered for the site, construct a list of appropriate species that match the site characteristics. Check out the Tane's Tree Trust guidelines on species selection.
- Determine the most appropriate planting density and calculate the number of plants per species required.
- Make sure you factor in a timeline of 1-2 years ahead of planting for ordering plants from the nursery.
- Bringing in a local experienced practitioner or ecologist will provide an assurance that the planting plan is covering all essential tasks. A planting plan will also demonstrate to any potential funders that you have done your homework.



Mapping planting areas

A map of the planting area provides a valuable record for future reference.

- All plantings and especially the larger sites where plantings occur over many years will benefit from a detailed map of what was planted and where.
- Mapping can be hand-drawn or digitally produced including demarcating of sites on aerial photographs.
- Notes on access and location of species planted by year will help with ongoing monitoring and maintenance of planted sites, as well as planning site preparation and resources required for future planting areas.
- File planting maps along with photographs and other site and plant information including monitoring data.



Mapping planting sites provides a record of what was planted when and where. Even a simple hand-drawn map or marking planting areas on an aerial photograph will provide valuable information on success of planting for future reference.

Start early

- Native plant nurseries typically require a minimum of 12 months lead-in time to supply common native shrub species and 2 years or more for common tree species.
- Start planning 1-2 years ahead of planting to ensure good quality eco-sourced stock of locally appropriate species will be available.
- Good site preparation – including fencing out stock and control of wild animals and weeds – takes time and needs to be started several months ahead of planting.



Left: Large-scale mixed species native planting on marginal hill country recently retired from grazing, Hawkes Bay.
 Right: Landscape showing mixed landuse of grazing and naturally-regenerating farm-grown totara, Northland.

Holding pattern

- In developing a planting plan for a site, a key requirement especially for large planting programmes is to match the resources, and the experience and commitment of planters to a realistic timeframe.
- The temptation is to fence off a large area for planting all at once and then progressively plant up the area over several years – but what is happening to those areas not immediately planted?
- Some of those fenced off areas left for planting next year and beyond will become dominated by problem weed species such as blackberry, gorse, broom or whatever else is regionally present – these will add to future site preparation costs.
- A strategy for managing parts of your planting site in a holding pattern for future planting include fencing off only what is to be planted this season and continue grazing the rest, then move the fence each year; an alternative is to inspect future fenced planting areas to identify invasion of problem brush weeds and spot-spray with herbicide.
- For more details on managing future planting sites check out the Site Preparation Factsheet.

Information sources

A wealth of information is available on all aspects of planting natives via various sources including [Tāne’s Tree Trust](#), [Trees That Count](#) and [Department of Conservation](#).

- Websites of most Regional Councils and some District and City Councils offer excellent local advice on planting and managing natives to meet a range of objectives and scale of programmes.
- Management of pest animals and weeds are available from council websites and [Weedbusters](#).
- Contact details of native plant nurseries where plants can be obtained are also on council websites and the [Trees That Count](#) website



Take home messages

- Do your homework – there is a lot of information out there as well as local experience in planting and managing native forest for multiple purposes.
- There are still too many planting projects where the basics of good planning, site preparation, use of quality seedlings of appropriate species, good planting technique, and timely management and monitoring have not been thought through and adequately resourced.
- Check out successful local restoration programmes and find out how they did it, including issues encountered and pitfalls they avoided – warts and all!
- For the inexperienced, test by establishing a small trial first before expanding to a larger scale, then with experience expand your planting programme in subsequent years.
- Don't put all your eggs in one basket – plant different sites over several years to spread risk and avoid major losses due to factors like drought.
- Do not underestimate the time and cost of post-planting maintenance, especially weed and pest animal control – most plantings fail due to lack of attention after planting.
- Successful establishment of native forest ecosystems depends on working with nature and better integration of a range of initiatives to:
 - encourage natural regeneration,
 - pest animal control to prevent damage of establishing seedlings,
 - work with Predator Free NZ and others in boosting bird populations, other native fauna and seed production for diverse forest ecosystems,
 - selective weed control, and
 - targeted best practice planting to bring back once abundant species.
- There are separate factsheets in this series covering the main requirements for improving the success of your planting.

Native forest factsheets series

These factsheets on establishing native forest have been compiled by Tāne's Tree Trust with funding from Te Uru Rākau's One Billion Tree Partnership Fund with support from The Tindall Foundation and Trees That Count. Others providing information and undertaking peer review include Scion, Auckland University of Technology, Northland Totara Working Group, iwi, landowners and selected local authorities and government departments.

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