Guide Sheet 4

Te Uru Rākau
Forestry New Zealand

One Billion Trees Fund

Direct Grants – *Planting and Management Plans*

Your application will need both a management plan and a map created of the areas you intend to plant

This guide sets out how to develop a *Planting and Management Plan* and what to include in it to make sure all stages of your project are covered. Setting out these details also helps to make sure the planting project timeframes are achievable. There are *planting and management plan* examples at the end of this guide. These can be modified to create your own specific *Planting and Management Plan*.

A *Planting and Management Plan* will include tree species, property description, steps for managing site preparation, pest and weed control, fencing, the specifics of what plants go where, post-planting maintenance, and harvesting (if applicable).

Consider where your strengths lie and whether it would be a good idea to get some help with:

- computer-based matters
- checking what is involved for land preparation and planting
- confirming what is possible for you to do by yourself
- other resources, e.g. hiring contractors to plant.

A *Planting and Management Plan* needs:

1. A number for each block.
2. A map and photographs for each block.
3. Details of the management of each planting category:
   - site preparation before planting, for example:
     - grazing;
     - pre-plant spraying;
     - other weed control, incuding any weed trees being removed.
   - pest and weed control
   - fencing to keep stock out
   - planting:
     - species for each block;
     - number of stems planted per hectare;
     - year(s) of planting (or retirement from grazing if it's a reversion project);
     - area (hectares).
   - post-planting maintenance:
     - releasing from weeds and grass.

NOTE: Your plan may also need to include details on multiple year planting, for example, planting mānuka one year then other natives the following year.

Management plan map

The map needs to clearly show where each intended block of planting and/or reversion will be.

Draw a boundary (ideally by computer) around each block, making sure that each block conforms to the mapping rules, and give each block a unique number. Use that number on the planting and management plan to describe what will happen for this site. The details on the map need to match what is recorded on the application form.

For details on how to create an electronic map file see the end of this guide, or go to **www.teururakau.govt.nz**

Supporting information

Photos

Photographs help to show the current condition of the site, are used to assess eligibility and can speed up the processing of your application. Land cannot be in forest land now or in the 5 years before applying.

If you have, or have had, vegetation cover other than pasture on an area you intend to plant, photos of the block are important to help establish your eligibility.

Proof of compliance

You may also need proof of compliance with regulations for example, forestry regulations (**NES-PF**), wilding tree requirements, known archaeological sites (**Heritage NZ**), or written notices to councils.

Top-up information

Some top-up grant categories may need other evidence.

- The fencing top-up will need a map of where the fence is going and a quote for the cost of the fence.
- Applications for the erosion and high land prep top-ups are helped by information from farm plans and quotes for land preparation work. Guide sheet 2 has the criteria for the top-up.
- Some top-up or planting categories may also need other evidence, for example a letter of support from the local council or local catchment group.

Evidence of non-forest species

How to create a *Planting and Management Plan* map

Option 1: GIS digital file

Shapefile format

Preferred. It allows for the fastest processing of the application.

Shapefiles can be created using:

- Geographic Information Systems (GIS) software including ArcGIS Pro, QGIS, MapInfo, etc. A shapefile:
  - is a file that records attributes which are tied to a spatial location.
  - is constructed of more than four subfiles which need to be sent to Te Uru Rākau including .shp, .shx, .prj, and .dbf files.
  - can be created in different GIS software. Third parties such as forestry consultants or council land management advisors will likely capture information using shapefiles which can be forwarded on.
- The 1BT shapefile creator tool, which will be available via MPI's website once ready.

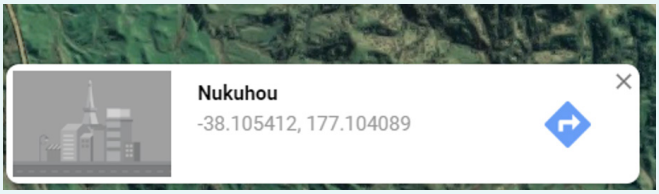
GooglePro kml or kmz format

Details on how to create a map using Google EarthPro KMZ shapefiles is on the Farm Forestry website: **https://www.nzffa.org.nz/article-archive/how-to-create-good-kmz-google-earth-files**

Option 2: Hard copy – Google Earth or LINZ aerial map printout, or aerial photo printout, with hand-drawn lines

This option will be more work for those receiving the application, so it could take longer to process.

1. Open Google maps or LINZ aerial photos.
2. Zoom in until the area you want to plant takes up most of the screen.
3. On Google Earth put a "pin" in the middle of the area to be planted.
4. At the bottom of the screen the compass northing and easting will appear as 2 numbers. To help those processing the application to find the site on their GIS system take a note of these, for example:



5. Take a screen shot (on your keyboard as "print screen") of the aerial photo.
6. Open a Word document and paste the screen shot into it. Save the document with the name of the block/your name on it.

Print it off, and mark on the paper the planting boundaries and any fences.

Management Plan photos

Current and older photos of the block you intend planting are important if you have, or have had, vegetation cover other than pasture on an area you intend to plant. Photographs help to show the current vegetation cover of the site, are used to assess eligibility and can speed up the processing of your application.

Ideally the person assessing the application is able to tell where the photos have been taken from (geotagged on the computer or marked on a map) and which direction they are facing. It is helpful to include some comments on the direction and the date, as well as any vegetation visible in the photo, e.g. areas of gorse with emerging forest species, blackberry, young mānuka, mix of broom and bracken, etc.

How to do this is set out below.

1. For a hard copy map, mark on the map where the photo was taken from. Put an arrow of the direction the camera was pointing when it was taken.
2. Match that information on the map with each photo. This example below shows:
   - Photo A points NE
   - Photo B points E

Most smartphones can add geo reference and date in the photo settings or through an app.

GPS coordinates are stored as "metadata" embedded in the photo files themselves (provided this is switched on in the phone settings).

After downloading the photo to the computer, view the file properties:

- In **Windows**, right-click a picture file, select "Properties" and then click the "Details" tab in the properties window. Look for the Latitude and Longitude coordinates under GPS.
- In **macOS**, right-click the image file (or Control+click it) and select "Get Info". Latitude and Longitude coordinates are under the "More Info" section.

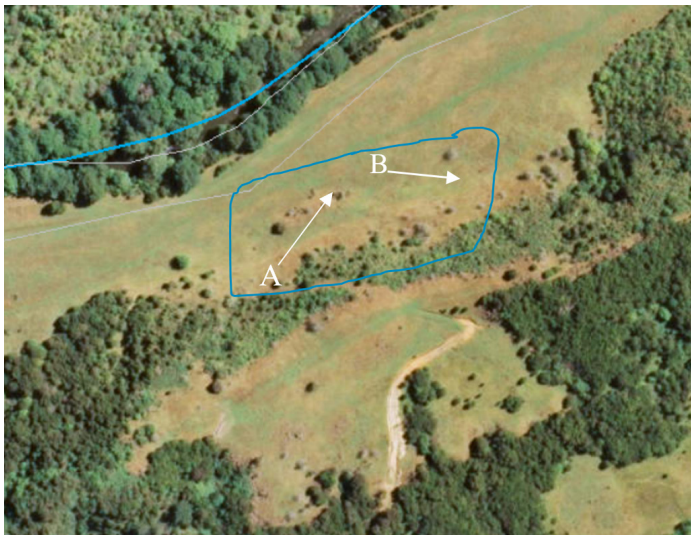


Photo A

Photo B

Online map resources from local council (regional or district) and national datasets

Some councils have online mapping resources that may be helpful in creating a *planting and management plan* map.

Council	Web link to council site or to Land Information New Zealand
Northland	**https://www.nrc.govt.nz/your-council/online-services/online-maps**
Auckland	**https://geomapspublic.aucklandcouncil.govt.nz/viewer/index.html**
Gisborne	**https://www.gdc.govt.nz/property-search**
Waikato	**https://www.waikatoregion.govt.nz/services/maps**
Bay of Plenty	**http://geospatial.boprc.govt.nz/Html5Viewer/Index.html?viewer=bayexplorer**
Hawke's Bay	Has Land Use Capability, but not aerial photos **https://hbmaps.hbrc.govt.nz/mapviewer/?map=67686b47a9dc4def9987143ded8c6f60**
Taranaki	**https://maps.trc.govt.nz/LocalMapsViewer/?map=0824911d3f58406dbab44cfb8dde6ae6**
Manawatū-Whanganui	Use LINZ **https://data.linz.govt.nz/data/category/aerial-photos/global/oceania/new-zealand/manawatu-wanganui**
Wellington	Use LINZ **https://data.linz.govt.nz/data/category/aerial-photos/global/oceania/new-zealand/wellington**
Tasman	**https://www.topofthesouthmaps.co.nz/app**
Nelson	
Marlborough	
West Coast	Use LINZ data to get an aerial photo **https://data.linz.govt.nz/data/category/aerial-photos/global/oceania/new-zealand/west-coast**
Canterbury	**https://mapviewer.canterburymaps.govt.nz**
Otago	Use LINZ data to get an aerial photo **https://data.linz.govt.nz/data/category/aerial-photos/global/oceania/new-zealand/otago**
Southland	**http://gis.es.govt.nz/index.aspx?app=basic**
Nationwide	LINZ **https://data.linz.govt.nz/set/4702-nz-aerial-imagery**

Number of trees per hectare

Mortality varies and depends on species, site, planting and maintenance quality. Commercial radiata pine plantations expect a mortality of 5%. Experience with natives is that 20% mortality is low and higher mortality is common. This means there are different stocking rate expectations. Work back from the desired final stocking rate and take into account expected mortality at planting and in the first few years.

Table 1 sets out the recommended planting density as "stems per hectare" (sph). This usually has to be higher than final stocking rates to allow for some mortality. On difficult sites mortality rates can be 30% or more.

Table 1: Recommended planting density as stems per hectare (sph)

Activity	General good practice planting density range stems per hectare (sph)
Timber	
Radiata pine	Typically **833–1250sph** 1000–1250sph on erosion-prone sites.
Douglas-fir	Typically **1100–1600sph** 1200–1600sph on erosion-prone sites.
Redwoods	Typically **500–800sph** Redwoods are unsuited to very steep, erosion-prone or low fertility sites.
Cypresses	Typically **833–1600sph**
Eucalypts	Typically **1100–2000sph**
Other exotic species	Typically **1100–1600sph**
Native trees for timber – with a nurse crop	Nurse crop (for example, mānuka, kānuka and tree lucerne). Typically **800–2500sph** with 400–2500sph of tall tree species planted at the same time or in years 3–5. **Tōtara:** typically 600–800sph **Beech:** typically 800–1100sph Expected mortality of 20%.
Native trees for timber – no nurse crop	Planting stocking rates for the trees are higher to promote straighter trees (thinned later). **Tōtara:** typically 2000–2500sph **Beech:** typically 1100– 2500sph Expected mortality of 20%.
Not timber	
Mix of native shrubs and trees for forest restoration or riparian restoration	Typical restoration project **planting density around 2500sph and up to 10,000sph,** made up of: 2000–3000sph (up to 10,000sph) of shrubs and small tree, and 400–600sph (up to 2500sph) of tall tree species. Erosion-prone sites 1200sph (500sph of tall tree species). Expect mortality of 20% for natives. Difficult/weedy sites will require even higher stocking rate to account for higher initial mortality). Planting projects may be staged with initial planting of shrubs, followed by taller species at years 2–3, particularly for difficult/exposed sites.
Mānuka/kānuka	In a plantation setting aims to maximise growth of flowers (for honey) or leafy stems. Standard for honey industry is 1111–1600sph.

Number of trees per hectare spacing chart

Table 2 below shows what the number of trees per hectare will be for various spacings.

Common spacing for **native restoration planting** is 2 metres by 2 metres.

Common spacing for **mānuka** is 3 metres by 3 metres.

Common spacing for ***Pinus radiata*** is 4 metres by 3 metres.

Key

Blue shading	Native restoration plant spacing 2500–10,000 sph
Green shading	Timber tree spacing 833–2000 sph
	Eucalypts higher spacing (dark green) 1111–2,000 sph
	Radiata lower spacing (light green) 833–1600 sph

Table 2: The number of trees per hectare at various spacings

Spacing between lines	0.90	1.00	1.20	1.40	1.50	1.60	1.80	2.00	2.50	3.00	3.50	4.00	4.50	5.00
0.90	12,345	11,111	9,259	7,936	7,407	6,844	6,172	5,555						
1.00	11,111	10,000	8,333	7,142	6,666	6,250	5,555	5,000	4,000	3,333				
1.20	9,259	8,333	6,944	5,952	5,555	5,208	4,630	4,166	3,333	2,778				
1.40	7,936	7,142	5,952	5,102	4,762	4,464	3,968	3,571	2,857	2,381				
1.50	7,407	6,666	5,555	4,762	4,444	4,167	3,704	3,333	2,667	2,222				
1.60	6,944	6,250	5,208	4,464	4,167	3,906	3,472	3,125	2,500	2,083				
1.80	6,172	5,555	4,630	3,968	3,704	3,472	3,086	2,778	2,222	1,852				
2.00	5,555	5,000	4,166	3,571	3,333	3,125	2,778	2,500	2,000	1,666	1,428	1,250	1,111	1,000
2.50	-	4,000	3,333	2,857	2,667	2,500	2,222	2,000	1,600	1,300	1,142	1,000	888	800
3.00	-	3,333	2,778	2,381	2,222	2,083	1,852	1,666	1,300	1,111	952	833	747	666
3.50	-	-	-	-	-	-	-	1,428	1,142	952	816	714	635	571
4.00	-	-	-	-	-	-	-	1,250	1,000	833	714	625	555	500
4.50	-	-	-	-	-	-	-	1,111	888	747	635	555	493	444
5.00	-	-	-	-	-	-	-	1,000	800	666	571	500	444	400

Management plan examples

Management plan examples are below – electronic copies will be available from our website to download.

Aim to clearly explain how the project will be undertaken, including planting rates and use clear maps and photos.

The quality of the management plan will affect how fast the application and claims can be processed.

[Name of person and project]
Exotics – *Planting and Management Plan*

	Management Plan – original plan	*Year Activity Planned*	*Actual – Fill in this column at milestone claim process*
Block number (same as on your map)	**Block [1]**		
Site preparation – Pre-planting plan (the land preparation needed and timing)	Hard [sheep] grazing 2 weeks before planting **[date dd/mm/yyyy]** or Spot spraying **[x weeks]** before planting with **[type of chemical]** or Broadcast spraying **[x weeks]** before planting with **[type of chemical/rate]** Specific weed control of **[relevant weed species]** See **https://www.weedbusters.org.nz** for weed identification and control methods		Milestone 1 Actual site prep was **[…]**
Planting Plan and spacing/stocking rate	**[p. radiata]** spacing **[3m x 3m]** for initial stocking rate of **[1111/ha]**		Milestone 1 Actual stocking rate was **[…]**
Planting quality control check	Quality control check to be carried out by…		Quality control check was carried out by… Used transect of x m to check for: Wrong spacing, Poor site selection, Tree damaged, Loose tree, Poor cultivation, Roots wrong, Tree not vertical, Planted too shallow/deep
Post-planting plan (for example, releasing, silviculture)	Main plant pest is **[relevant weed species for example, gorse, broom, buddleia…]** Plant pest control by **[type of chemical/rate] or […]** Spot releasing **[#months]** after planting using **[type of chemical/rate]** post-planting maintenance of **[…]**		Milestone 2 Actual releasing was **[…]**
Pest control plan (animal)	Main animal pests are **[possum, deer, wallaby…]** Animal pest control methods are **[…]** Note: Make sure fencing is adequate so that stock are not animal pests.		Milestone 1 Actual pest control was **[…]** Milestone 2 Actual pest control was **[…]**
Who will do the planting? (choose the relevant one)	I will My community will help me Planting contractor: **[name]** Other (specify):		Milestone 1 Planting was done by **[…]**

[Name of person and project] Reversion – *Management Plan*			
	Management Plan – original plan	*Year Activity Planned*	*Actual – Fill in this column at milestone claim process*
Block number (same as on your map)	[Block 2 – reversion]		
Site preparation – Pre-planting plan (the land preparation needed and timing)	Selective broadcast spraying of weeds [x weeks] with [type of chemical] Remove stock Specific weed control of [relevant weed species] See **https://www.weedbusters.org.nz** for weed identification and control methods		Milestone 1 Actual site prep was [. . .]
Planting Plan and spacing/stocking rate	NA, Relying on reversion of mainly Mānuka and Kānuka Other broadleaved trees present nearby are expected to seed here, including [whiteywood, five finger...] or Supplementary planting in [part of block that won't meet 750stems/ha stocking rate] see map.		Milestone 1 Actual stocking rate was [. . .]
Post-planting plan (for example, releasing, silviculture)	NA, unless doing supplementary planting		Milestone 2 Actual releasing was [. . .]
Fencing plan	See map for location of [new/replaced] fence required on [southern] boundary Describe fencing type, for example, conventional post and batten 7 wire [400 m] required See map for fence location No terrain issues, or known animal pest pressures or [swampy patch on eastern boundary] [cows]		
Pest control plan (weed and animal)	Main plant pest is [relevant weed species . . . for example, blackberry, old man's beard] Plant pest control by [type of chemical/rate] or [. . .] Main animal pests are [possum, deer, wallaby. . .] Animal pest control methods are [. . .]		Milestone 1 Actual pest control was [. . .] Milestone 2 Actual pest control was [. . .]
Who will do the planting? (choose the relevant one)	I will My community will help me Planting contractor: [name] Other (specify):		Milestone 1 Planting was done by [. . .]

[Name of person and project] **Mānuka/Kānuka – *Management Plan***			
	Management Plan – original plan	*Year Activity Planned*	*Actual – Fill in this column at milestone claim process*
Block number (same as on the map)	**[Block 3 – mānuka]**		
Site preparation - Pre-planting plan (the land preparation needed and timing)	Hard **[sheep]** grazing 2 weeks before planting **[date dd/mm/yyyy]** or Spot spraying **[x weeks]** before planting with **[type of chemical]** or Broadcast spraying **[x weeks]** before planting with **[type of chemical/rate]** Specific weed control of **[relevant weed species]** See **https://www.weedbusters.org.nz** for weed identification and control methods		Milestone 1 Actual site prep was **[…]**
Planting Plan and spacing/stocking rate	Spacing 2.5m x 2.5m for initial stocking rate of **[1600/ha]**		Milestone 1 Actual stocking rate was **[…]**
Post-planting plan (for example, releasing, silviculture)	Spot releasing **[#months]** after planting using **[chemical]** post-planting maintenance		Milestone 2 Actual releasing was **[…]**
Pest control plan (weed and animal)	Main plant pest is **[relevant weed species, for example, gorse, broom, buddleia]** Plant pest control by **[type of chemical/rate]** or **[…]** Main animal pests are **[possum, deer, wallaby…]** Animal pest control methods are **[…]** Note: Make sure fencing is adequate so that stock aren't animal pests.		Milestone 1 Actual pest control was **[…]** Milestone 2 Actual pest control was **[…]**
Who will do the planting? (choose the relevant one)	I will My community will help me Planting contractor: **[name]** Other (specify):		Milestone 1 Planting was done by **[…]**

[Name of person and project]
Native planting – *Planting and Management Plan*

Note: For the ecological restoration top-up, please contact a Te Uru Rākau Grants Advisor about top-up criteria.

	Management Plan – intention	*Year Activity Planned*	*Fill in this column at milestone claim process*
Block number (same as on the map)	**[Block 4 – native planting]**		
Site preparation – Pre-planting plan (the land preparation needed and timing)	Hard **[sheep]** grazing 2 weeks before planting **[date dd/mm/yyyy]** or Spot spraying **[x weeks]** before planting with **[type of chemical]** or Broadcast spraying **[x weeks]** before planting with **[type of chemical and rate]** Specific weed control of **[relevant weed species]** See **https://www.weedbusters.org.nz** for weed identification and control methods		Milestone 1 Actual site prep was **[…]**
Planting Plan and spacing/stocking rate	Species: Number and types of tree species are: **[titoki, rimu, matai …]** Number and types of other species are: **[cabbage tree, five finger, coprosma, pittosporum, flaxes, sedges]** spacing 2m x 1.4m for initial stocking rate of **[3500/ha]**		Milestone 1 Actual stocking rate was **[…]**
Quality control	Quality control check to be carried out by…		Quality control check was carried out by… Used transect of x m to check for: Wrong spacing, Poor site selection, Tree damaged, Loose tree, Poor cultivation, Roots wrong, Tree not vertical, Planted too shallow/deep
Post-planting plan (for example, releasing, silviculture)	Spot releasing **[#months]** after planting using **[chemical]** Mulching – **[what technique] using [what]** for mulch post-planting maintenance		Milestone 2 actual releasing was **[…]**
Fencing plan	See map for location of **[new/replaced]** fence required on **[southern]** boundary Describe fencing type, for example, conventional post and batten 7 wire **[600 m]** required No terrain issues, or known animal pest pressures or **[swampy patch on eastern boundary]**		Milestone 1 Actual fencing was **[…]**
Pest control plan (weed and animal)	Main plant pest is **[relevant weed species for example, blackberry, old man's beard…]** Plant pest control by **[type of chemical/rate] or […]** Main animal pests are **[possum, deer, wallaby…]** Animal pest control methods are **[…]**		Milestone 1 Actual pest control was **[…]** Milestone 2 Actual pest control was **[…]**
Who will do the planting? (choose the relevant one)	I will My community will help me Planting contractor: **[name]** Other (specify):		Milestone 1 Planting was done by **[…]**
Trees maintained	Second round of releasing **[#months (>12)]** after planting using **[chemical]** and/or using hand releasing		Milestone 3

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