

# ADVANCED

## Monitoring Guidelines

500 trees or more

**Planting trees is only the first step toward establishing new areas of native forest. Robust monitoring of survival and growth over time using sample plots will enable us to determine how successful planting has been and discover what has contributed to its growth or decline.**

This will increase the accuracy of both our overall tree count and our measures of potential CO<sub>2</sub> sequestration. To achieve these benefits, Trees That Count recommends any individual or group planting **1000 trees or more** establish a full network of sampling plots at their planting site(s) and collect monitoring data from them at regular intervals.

### What Do You Need To Do?

Print the Field Sheets provided in this pack and using the guidelines below fill them out as best as you can.

The **Planting Information Sheet** provides Trees That Count with basic information about your site, and we'll use this until we have automated monitoring procedures in place on a mobile app or on our website.

You will need to complete a separate **Plot/Transect Field Sheet** for each sampling plot established at your site. You should ensure that at least one of these Plot/Transect sheets provides us with some basic information about your sampling methods (i.e. what kinds of plots you are using and how many of them there are). Use a new copy of each sheet each time you are monitoring your plantings.

### What is Advanced Monitoring?

For larger planting sites the aim is to measure a small sample of planted natives to provide a statistically robust estimate of survival and early growth. At this level, an evenly distributed network of sampling plots enables the collection of high quality scientific data which will not only contribute to Trees That Count's national and regional measures of planting success, but also provide community groups, landowners and others involved in planting with scientifically and statistically robust data suitable for their own internal use. This level of monitoring has been designed to be as quick and easy to implement as possible while still collecting high quality data. It should take two persons approximately half a day to set up and complete baseline measurements. Subsequent measurements will take even less time.

### Monitoring Criteria

To satisfy Trees That Count criteria, the sampling of a proportion of planted natives at each site is required. A sampling plot or transect is simply a small section of your site where the trees will be examined at regular intervals. These plots or transects must:

- Be at a fixed location
- Be of a precisely defined shape and area
- Contain between 15 – 30 trees
- Not be moved or altered once established.

Enough of these sampling points should be established at your site to ensure a minimum total sample of 200 planted natives.

### Monitoring Methods

There are two methods suggested for determining the size, shape and placement of sampling plots. Which is the most appropriate will depend on the size and geography of the planting site.

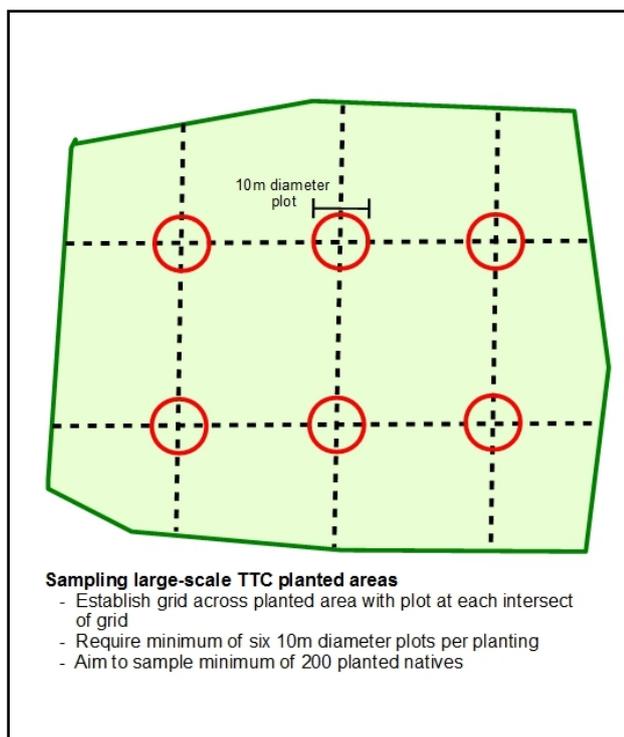


Figure 1. Circular monitoring plots for large planted areas

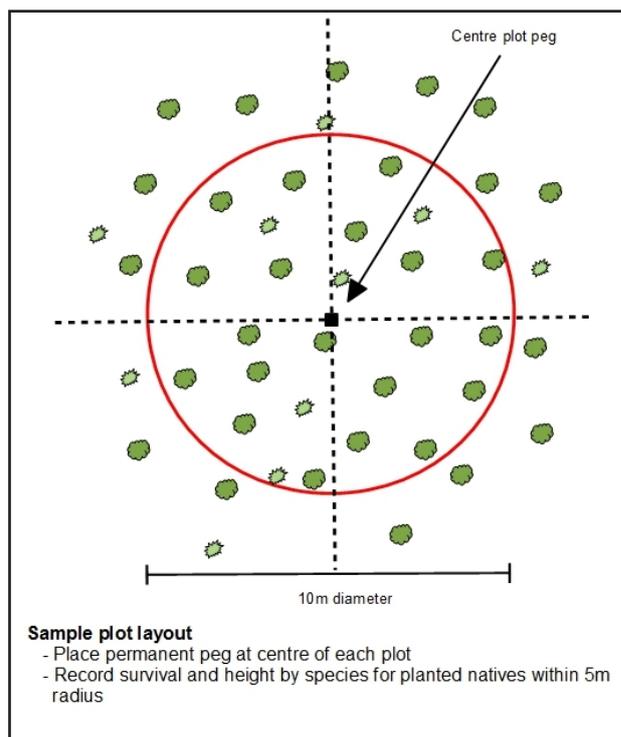


Figure 2. Circular plot layout.

- **Circular Plots** (see Figure 2) evenly distributed in a grid pattern (see Figure 1) to avoid any bias in their placement are most appropriate for large-scale block plantings. Plots should be 10 metres in diameter. There is no need to correct for slope. A minimum of six plots are required to sample the planting site. However, the exact number of plots required will be determined by the density of planting. Lower density plantings, for instance, may require a greater number of plots to achieve the minimum total sample of 200 planted natives (e.g. eight plots containing an average of 25 plants each will provide the minimum sample of 200 planted natives).

- **Belt Transects** (see Figure 3) are best used for narrow planted sites, such as riparian zones. A transect is a sampling area defined between two parallel lines, and can be used to sample the variation across the zone from fence-line to stream edge. A minimum of six transects are required to sample the planting site, with the exact width of each transect determined by the geography of the planting site. Each transect should be of sufficient width to ensure the required minimum sample of 200 plants. Generally, this will result in transects 2-10 metres wide (depending on their length). Transects should be evenly distributed across the length of the entire site (see Figure 3).

When establishing new plots, the following guidelines should be observed:

- Establish your plots as soon as possible after your trees are first planted. Ideally, this will be within days of first planting, but should be within **two weeks** at the very latest.
- Mark all of your plots with permanent marker pegs. For circular plots, a **single** central marker peg is sufficient. For belt transects, **two** marker pegs will be required, one for each end of the transect centre line.
- Using GPS, record the locations of these permanent markers. This will help anyone else who monitors the site in future to locate each plot. In the case of belt transects, it may also be helpful to record a compass bearing for each marker peg, indicating the direction in which the other peg might be found.
- Give each plot a number, to help uniquely identify it on field sheets. You may also write this number on the marker peg with paint or permanent marker to make it easier for those monitoring the site in future to fill out their field sheets correctly.

Remember when establishing plots, that 200 planted natives is only the minimum total sample. Larger sample sizes will result in higher quality data, and are especially recommended for sites which are highly variable or at which many different species have been planted.

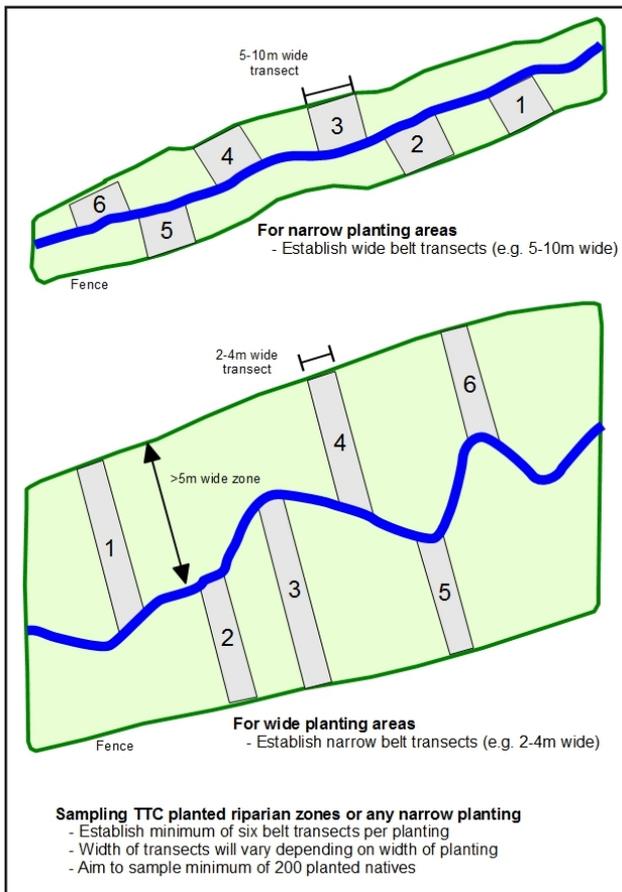


Figure 3. Belt transects for narrow planted sites

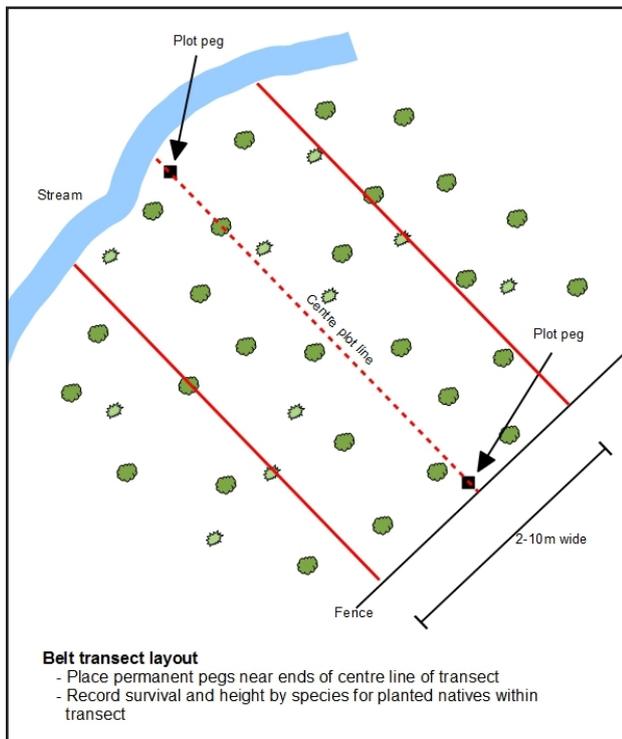


Figure 4. Belt transect layout.

## Collecting Monitoring Data

Initial monitoring measurements should be undertaken as soon as possible after planting. Ideally this would be at the same time as the plots themselves are first established, but should be within two weeks of planting at the latest.

The following data must be recorded for every planted seedling within the plot or transect:

- The **species** of the seedling (e.g. kanuka, manuka). A list of the most common species (along with shorthand codes to make recording them easier) is available with our monitoring field sheets.
- The **height** of the seedling (in centimetres).
- (Optional) Any additional information about the seedling which may be useful (e.g. frost damage, evidence of animal browsing).

Note that plants which are on the very edge of the plot or transect boundaries must be identified as within the plot area to avoid errors in repeat survival assessments.

For each **subsequent monitoring**, the species and height are to be recorded for living trees only within each plot or transect; there is no requirement to record any data at all for trees which have died.

## Monitoring Intervals

After initial baseline measurements, data should be collected from these sampling plots at intervals of approximately one year, two to three years and five years after the initial planting, or until plants are a minimum of 1.5 metres high (or above the height of competing exotic vegetation).

## Monitoring Field Sheets

Completed monitoring forms can be scanned and sent to: [monitoring@treesthatcount.co.nz](mailto:monitoring@treesthatcount.co.nz)

Or, alternatively, posted to:  
Monitoring Team, Trees That Count  
P.O. Box 10420, Wellington 6143

## Contacts

For further information, please visit [www.treesthatcount.co.nz](http://www.treesthatcount.co.nz) or contact:

Technical Advisor, David Bergin, 027 600 3017, [david@treesthatcount.co.nz](mailto:david@treesthatcount.co.nz)  
Operations Manager, Caroline Wallace, 027 229 3623, [caroline@treesthatcount.co.nz](mailto:caroline@treesthatcount.co.nz)



## Planting Information Sheet

Complete this sheet for each of the planting sites you are monitoring and return it to [monitoring@treesthatcount.co.nz](mailto:monitoring@treesthatcount.co.nz)

### Site location and contacts

Name of your planting site / your identifier	
Site No. (if you have one)	
Site Location (Planting Site Address & Region)	
Site Contact (Owner/Manager)	
Contact Phone Number and Email	
GPS Reference (approx. central point of planting)	
Site Description (e.g. current land-use, vegetation cover)	
Aspect of site (N,S,E,W or bearing) and Altitude (m)	

### Planting details

Planted by (e.g. community, contractor, landowner, council)	
Date planting began at site	
Average spacing (or stems/ha)	
Notes (e.g. any other planting in the area, expected threats to planting such as potential vigorous woody weeds or pest animals)	

### All trees planted at this site (by species)

Date	Species	No. Planted	Date	Species	No. Planted

### History of other (non-planting) activities undertaken at this site

(e.g. site preparation, site inspection/notes, weed control, animal control)

Date	Activity

### Diagram of planting site (as well as location of any monitoring plots/transects/photopoints)

(Indicate access points, local roads, geographical features, monitoring layout, photopoint location, etc.)



## Plot/Transect Field Sheet (for Advanced Monitoring)

Complete one for each plot or transect per inspection

Name of your planting site (your reference)	
Plot /Transect No.	
Date site first planted	
Total no. of Plots and/or Transects at site	

Description of sampling method (i.e. random or grid placement of plots/transects) (required for Level Three Monitoring ONLY)				

Plot/Transect Size (i.e. plot diameter or transect length AND width)	Average Plot slope (degrees)	Average Plot aspect (N, S, E, W or bearing)	GPS reference of plot marker (Latitude/ Longitude)	GPS reference of second marker (for TRANSECTS ONLY)

Date of assessment - Select only one option (use separate field sheet for each inspection)				
	ASAP after planting	1 year after planting	2 years after planting	5 years after planting
Date:				

Stem No.	Species	Height CM	Notes
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Stem No.	Species	Height CM	Notes
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