

## Monitoring Revegetation Activities - Adaptive Learning Project

*A simple protocol for agencies and community groups to report on revegetation outcomes*

### Background

The aim of this project is to develop a quick and simple monitoring method for revegetation projects, to better understand how well plants survive after planting, and what influences their survival and growth. To do this, it is necessary to record how many plants or seed of each species are planted, and their survival after the first summer (i.e. in the following Autumn).

Important information to collect includes land-use history, the type of planting (e.g. windbreaks, patches), the site location (e.g. paddock, near bushland) and landscape topography (e.g. flats, slope, floodplain, etc).

### Data Collection

To collect the most relevant information, three data sheets are provided:

1. To record your project and site information;
2. To undertake initial monitoring after planting; and
3. Follow-up monitoring after the first summer (Autumn).

These data sheets are as follows:

#### 1. Project & Site Information

This sheet is to record initial information about the project and site, including the purpose of the revegetation, the previous land-use history at the site, and details about site preparation.

#### 2. Initial Monitoring (30 min - 1 hour per plot)

This sheet provides details about how to set-up a monitoring plot during, or shortly after, planting; and how to survey it to record the species planted and other relevant information. We recommend plots are 50m X 4m in size for Tubestock Plantings (Figure 1), and 20m X 20m in size for Direct Seeding sites, and that you set-up 2 - 3 plots per site. If the site is larger than 1 ha, do more.

#### 3. Follow-Up Monitoring - Autumn (15 - 30 min per plot)

This sheet is to record follow-up monitoring data; i.e., to record which plants have survived after the first summer (Autumn monitoring: 7 - 9 months after planting), and then in subsequent years in Autumn. It would also be valuable to initially monitor sites 1 - 2 months after planting (i.e. Spring).

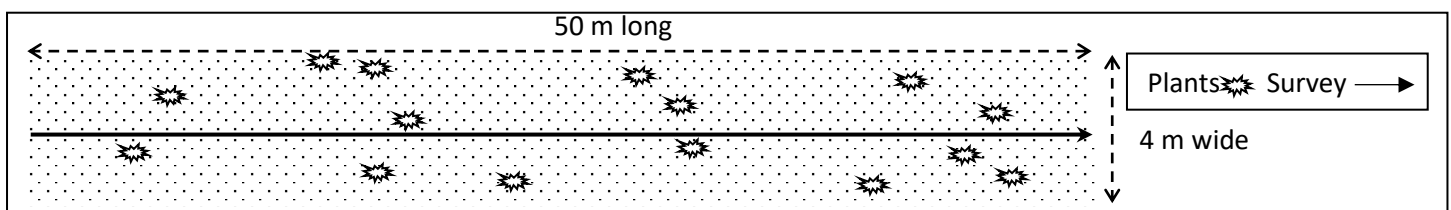


Figure 1: An example of the monitoring plot used to assess plant survival in Tubestock plantings.

Please send completed datasheets and enquires to Sacha Jellinek - [sjellinek@greeningaustralia.org.au](mailto:sjellinek@greeningaustralia.org.au)

## 1. Project & Site Information

### General Information

Date:	
Site name:	Landholder name:
Location (nearest road name & town):	
Site entry coordinates (for future access):	
Easting (GPS):	Northing (GPS):
Assessor name:	Assessor organisation:
Funding body (select one) & project name: <i>Local Government (DELWP)</i> <input type="checkbox"/> <i>Local Council</i> <input type="checkbox"/> <i>Federal</i> <input type="checkbox"/> <i>Other</i> .....	
Purpose of revegetation (select one or more): <i>Conservation</i> <input type="checkbox"/> <i>Shelterbelt</i> <input type="checkbox"/> <i>Land Stabilisation</i> <input type="checkbox"/> <i>Other</i> .....	
Revegetation goal (vegetation type/target EVC) - if known:	

### Site Details (please record details for the whole of the planting area)

Land-use before planting (select one or more): <i>Grazing</i> <input type="checkbox"/> <i>Cropping</i> <input type="checkbox"/> <i>Horticulture</i> <input type="checkbox"/> <i>Plantation</i> <input type="checkbox"/> <i>Other</i> .....	
Main vegetation at time of planting (select one): <i>None (bare ground)</i> <input type="checkbox"/> <i>Pasture Grass</i> <input type="checkbox"/> <i>Scattered Trees</i> <input type="checkbox"/> <i>Remnant Bush</i> <input type="checkbox"/> <i>Other</i> .....	
Soil type (select one or more): <i>Gravel</i> <input type="checkbox"/> <i>Sand</i> <input type="checkbox"/> <i>Loam</i> <input type="checkbox"/> <i>Clay</i> <input type="checkbox"/> <i>Other</i> .....	
Site topography (select one or more): <i>Floodplain</i> <input type="checkbox"/> <i>Slope</i> <input type="checkbox"/> <i>Ridge</i> <input type="checkbox"/> <i>Dune</i> <input type="checkbox"/> <i>Flats</i> <input type="checkbox"/> <i>Other</i> .....	
Planting area (size - ha):	
Previously planted: <i>Yes</i> <input type="checkbox"/> <i>No</i> <input type="checkbox"/> <i>Unsure</i> <input type="checkbox"/>	If Yes, when:

### Site Preparation Details

Was weed control done (select one): <i>No</i> <input type="checkbox"/> <i>Spot Spray</i> <input type="checkbox"/> <i>Strip Spray</i> <input type="checkbox"/> <i>Whole Paddock</i> <input type="checkbox"/> <i>Other</i> .....	
Other site preparation (select one or more): <i>Fenced to Exclude Animals</i> <input type="checkbox"/> <i>Ripping</i> <input type="checkbox"/> <i>Scalping</i> <input type="checkbox"/> <i>Animal Control</i> <input type="checkbox"/> <i>Burning</i> <input type="checkbox"/> <i>Other</i> .....	
Notes:	

## 2. Initial Monitoring

### How to Set-up and Survey a Monitoring Plot

- A. Select an area that is representative of the planting site and set-up a plot. At each corner of the plot, permanently mark with a star picket:
  - a. For **Tubestock Plantings** set-up a **200 m<sup>2</sup> area** (e.g. 50m X 4m recommended size, although size/shape can vary). In the centre of the two long sides of the plot add a stake
  - b. For **Direct Seeding** set-up a **400 m<sup>2</sup> area** (e.g. 20m X 20m recommended size, although size/shape can vary).
- B. Record the GPS coordinates (use WGS84 map datum with Eastings and Northings) for the start and end of the plot, and give the plot a unique Site Name and Monitoring Plot Number.
- C. Take a picture of the plants in the plot (photopoint) - (i) Sit a camera or phone (landscape) on the star picket in the north-west corner of the plot and take a photo towards the opposite end, (ii) download the photo, naming it with the site name, monitoring plot number and date (e.g. Walker01\_17082019).
- D. Tubestock Planting - Walk within the plot area and record (count) all the native species that were planted and any pre-existing native plants. Take the average height of the first five plants for each planted species, using the categories provided. Estimate weed cover and cover of bare ground.
- E. Direct Seeding - Record the kilograms (kg) of seed used per hectare (ha) for each species sown. Initial monitoring not required for direct seeding.

### Monitoring Plot Details

Site name:	Date:
Assessor name:	Assessor organisation:
Monitoring plot location: Start Easting (GPS): Start Northing (GPS):	End Easting (GPS): End Northing (GPS):
Plot size (select one): 50m * 4m <input type="checkbox"/> Other.....	
Plot position (select one): Floodplain <input type="checkbox"/> Slope <input type="checkbox"/> Ridge <input type="checkbox"/> Dune <input type="checkbox"/> Flats <input type="checkbox"/> Other.....	
Planting dates:	Initial survey date:
Planted by (select one or more): Contractor <input type="checkbox"/> Volunteers <input type="checkbox"/> Landholder <input type="checkbox"/> Other.....	
Planting type (select one or more): Tubestock <input type="checkbox"/> Direct Seeding <input type="checkbox"/> Other.....	
Source of plants (nursery?):	Seed provenance:
Were any of these agents used (select one or more): Wetting Agent <input type="checkbox"/> Fertiliser <input type="checkbox"/> Pest Repellent <input type="checkbox"/> Other.....	
Plants guarded: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Guard type (select one): Cardboard <input type="checkbox"/> Mesh <input type="checkbox"/> Hard Plastic <input type="checkbox"/> Soft Plastic <input type="checkbox"/>	
Plants watered during planting: Yes <input type="checkbox"/> No <input type="checkbox"/>	After planting: Yes <input type="checkbox"/> No <input type="checkbox"/>

**Monitoring Plot Survey Records (Initial)** - print one datasheet for each plot

*Record (count) all the native species that were planted and any pre-existing native plants, or if direct seeded, the kg of seed used per hectare for each species.*

*Plant height categories: <0.5m, 0.5 - 1m, 1 - 1.5m, 1.5 - 2m, >2m*

Monitoring plot number:		Photopoint number:
Evidence of grazing animals: Rabbits <input type="checkbox"/> Hares <input type="checkbox"/> Kangaroos <input type="checkbox"/> Deer <input type="checkbox"/> Livestock <input type="checkbox"/> Other.....		
Species Name (planted or direct seeded)	Number of plants or Kg seed per ha (by species)	Average height of first five plants for each species
Pre-existing Trees and Shrubs:		
Estimated Weed Cover in the Plot (select one): <5 % <input type="checkbox"/> 5 - 25 % <input type="checkbox"/> 25-50 % <input type="checkbox"/> >50 % <input type="checkbox"/>		
Estimated Bare Ground in the Plot (select one): <5 % <input type="checkbox"/> 5 - 25 % <input type="checkbox"/> 25-50 % <input type="checkbox"/> >50 % <input type="checkbox"/>		
Notes:		

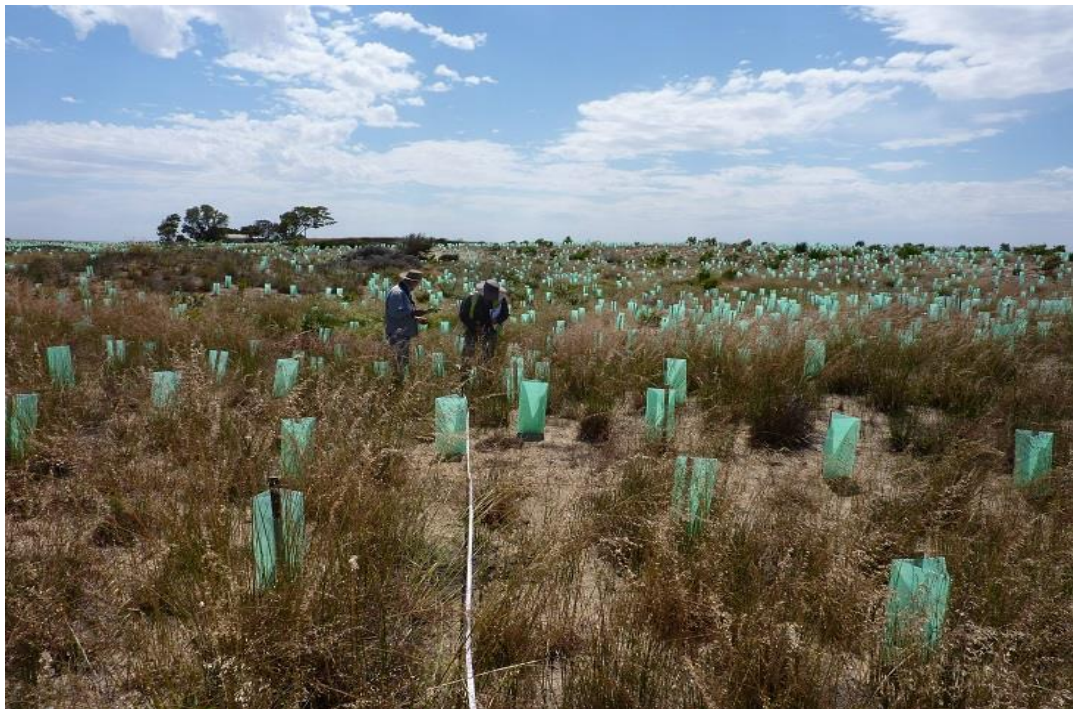
### 3. Follow-Up Monitoring - Autumn

#### Methods

- A. Return to the monitoring plot in Autumn (after summer). If possible, use the same assessor who initially monitored the site.
- B. Take a photopoint of the plot using the information in Section 2 C.
- C. Walk within the plot area and count and record all the alive native species that were planted or direct seeded, any pre-existing native or naturally recruiting plants, and note whether any plant species are flowering or producing seed. Take the average height of the first five plants for each planted species, using the categories provided. Estimate weed cover and cover of bare ground.

#### Monitoring Plot Details

Site name:	Date:
Assessor name:	Assessor organisation:



**Monitoring Plot Survey Records (Autumn)** - print one datasheet for each plot

Count and record each of the planted and/or direct seeded plants and existing trees and shrubs in the plot.

Plant height categories: <0.5m, 0.5 - 1m, 1 - 1.5m, 1.5 - 2m, >2m

Monitoring plot number:		Photopoint number:	
Evidence of grazing animals: Rabbits <input type="checkbox"/> Hares <input type="checkbox"/> Kangaroos <input type="checkbox"/> Deer <input type="checkbox"/> Livestock <input type="checkbox"/> Other.....			
Species Name (planted or direct seeded)	Number of plants alive (plant partially or wholly green)	Average height of first five plants for each species	Producing Seed (Y/N) Flowering (Y/N)
Pre-existing Trees and Shrubs:			
Naturally Regenerating Species:			
Estimated Weed Cover in the Plot (select one): <5 % <input type="checkbox"/> 5 - 25 % <input type="checkbox"/> 25-50 % <input type="checkbox"/> >50 % <input type="checkbox"/>			
Estimated Bare Ground in the Plot (select one): <5 % <input type="checkbox"/> 5 - 25 % <input type="checkbox"/> 25-50 % <input type="checkbox"/> >50 % <input type="checkbox"/>			
Notes:			