



Biodiversity
Conservation
Trust

Biodiversity Conservation Trust Revegetation plan template

Template for guiding best practice revegetation

October 2020

Contents

Introduction.....	2
Revegetation plan template guidance	3
Establish revegetation objectives.....	4
Planting thresholds	4
Seed and plant supply	5
Revegetation management.....	7
Capacity to deliver works	10
Monitoring	10
Works schedule	11
Risk analysis summary table	11
Budget	13
Revegetation plan template.....	14
Establish revegetation objectives for whole of BSA.....	14
Planting thresholds	14
Outline seed and plant supply requirements.....	14
Revegetation management (MZ x)	17
Capacity to deliver works	21
Monitoring	22
Works schedule	23
Risk analysis summary table	24
Budget	25

Introduction

Who is this template for?

This best practice revegetation plan template is to assist Accredited Assessors in implementing Biodiversity Assessment Method (BAM) requirements for native vegetation and habitat management, and augmentation activities as they relate to '13.3.3 - Active restoration management actions' of the BAM. It will however also be useful as a decision tool for anyone planning supplementary planting or revegetation activities on public and private land across NSW.

Completion of the revegetation plan template will be a requirement for any biodiversity stewardship agreement (BSA) application if supplementary planting is proposed for more than 100ha, and where an assessment of site constraints deem the proposal as high risk.

The Biodiversity Conservation Trust (BCT) will reserve the right to require the template be used for proposals less than 100ha and where an assessment of site constraints deem the proposal as high risk, or requiring further supporting evidence.

The Accredited Assessor will have collated information in accordance with Appendix 2 of the BAM Operational Manual Stage 3. This information will provide detailed guidance on the likely success of the proposed supplementary planting, identified constraints and areas of risk, and through doing so, met the obligations outlined in BAM section 13.3.3 - Active restoration management actions.

This best practice revegetation plan template is a supporting document to the BCT's [Restoring Native Vegetation Guidelines for assisted regeneration and revegetation](#).

Guideline Structure

This document has two sections:

Section 1 is supporting information and instructions to assist complete the template.

Section 2 is the best practice revegetation plan template that provides tables and fields for the Accredited Assessor to complete in order to demonstrate consideration of all factors relating to the effectiveness and practicality of supplementary planting in the relevant management zone(s).

Glossary of Acronyms

APZs – Asset Protection Zones

ARMA - Active restoration management actions

BAM – Biodiversity Assessment Method

BAM-C - Biodiversity Assessment Method Credit Calculator

BCT – NSW Biodiversity Conservation Trust

BSA - Biodiversity stewardship agreement

BSSAR - Biodiversity Stewardship Site Assessment Report

PCT - Plant Community Type

SPA – Seed Production Area

SMART – Specific, Measurable, Achievable, Realistic, Time-bound

VI – Vegetation Integrity score

WHS – Work Health and Safety

Revegetation plan template guidance

This section includes supporting information to assist in completing the template. Particular attention should be given to completion of fields requiring risk identification and defensible explanations of mitigation strategies and subsequent changes to risk ratings.

As outlined in the BAM and the Stage 3 BAM Operational Manual, evidence required for the whole site includes:

13.3.3.6 The BSSAR must provide evidence of the proponent's capability to implement the active restoration management actions set out in the management plan. The BSSAR must:

- a) set out the vegetation attributes and habitat that is subject to the restoration management actions, and
- b) identify any topographical, biophysical, financial, knowledge, resource, methodological or other constraint that is likely to affect reaching the restoration target value for each attribute or threatened flora species, and
- c) demonstrate how each constraint has been addressed in the management plan, including providing evidence of the capability of the proponent to implement the action.

13.3.3.13 The assessor is required to record the duration and timing of additional management actions in the BSSAR.

13.3.3.14 The BSSAR must specify the expected limitations and constraints of the proposed method and availability of appropriate resources and material proposed to be used for active restoration.

The headings in this section align with the section headings in the template and should be used to guide completion of the template.

Establish revegetation objectives

These objectives are a high-level summary. The detail of specific objectives and outcomes per management zone are to be outlined in the revegetation plan template.

Content description	Guidance
There are clear linkages between benchmark or target condition and proposed objectives.	Restoration target value for each attribute clearly stated per zone.
Scale of works proposed are understood by reading the restoration objectives.	The number of hectares subject to supplementary planting and number of plants to be established in total across the BSA.
Expected delivery timeframe is understood by reading the restoration objectives.	Timeframes against critical milestones are identified and supported by a chart in the 'Monitoring' section of the template.
Restoration objectives propose measurable changes.	Anticipated future VI score or attribute scores via active restoration management actions.
Objectives clearly link to BAM calculations.	All site attributes that the assessor has manually increased in the BAM-C as a result of the proposed active restoration are referenced in the objectives.

Planting thresholds

Evidence required for the whole site	Guidance
Seasonality	Preferred revegetation season; preferred months.
Soil moisture	Ideal soil moisture levels to be determined by PCT and region.
Catalyst events	List specific events relevant to the region e.g. seasonal rainfall, periodic flooding, frost days etc (determine as per locally appropriate).

Seed and plant supply

Content description	Evidence required for the whole site.	Guidance
Provenance – prescribed range and rationale	Define the proposed provenance range and rationale with reference to appropriate literature. At a minimum refer to Florabank guidelines (https://www.greeningaustralia.org.au/publications/) and the Restore and Renew Project Webtool https://www.restore-and-renew.org.au/	Ensure that provenance ranges and additional species are climate adjusted with reference to likely future climate scenarios identified in Section 3.3
Seed requirements	List of all species and their likely availability. This will be partially determined through an analysis of constraints in the BSSAR and, to gain an accurate reflection of the diversity expected in the target PCT, will require liaison with suppliers to determine if the proposed actions are viable based on the amount of seed available or able to be supplied within proposed project timeframes.	If diagnostic or species that are critical for structure and composition of the PCT are unavailable and are unlikely to be available at the time of revegetation,
Seed and source material	<p>Collection: Document the collection potential for the target species from the BSA site and surrounding landscape including;</p> <ul style="list-style-type: none"> A list of target species for collection 	If there is little or no viable seed available through wild collection and local suppliers or establishment of a seed production

Availability assessment	<ul style="list-style-type: none"> • A list of the locations from which they are available in the provenance range. • An assessment of the capacity of the proposed collection sites for harvesting in line with FloraBank Collection Guidelines • Any licenses or permissions required to access the sites • Details of landholders who own potential collection sites <p>Purchase:</p> <p>List of seed for target species available from commercial providers including;</p> <ul style="list-style-type: none"> • Name of suppliers • Provenance of seed • Age of seed • Quantity available 	<p>area to supply the proposed works is unviable, supplementary planting is unlikely to successfully achieve the predicted gains.</p>
Plant Supply	<p>Document capacity of nurseries to produce sufficient tube stock to support project outcomes:</p> <ul style="list-style-type: none"> • List of stock held/ able to be produced from local nurseries • Capacity of local nurseries to work to FloraBank guidelines • Capacity of local nurseries to track seed and provenance through their production systems • Nursery hardening off procedures • Holdover or stock replacement strategies if plants are grown but on-ground works are delayed 	<p>If there are no local nurseries or local nurseries to not have capacity to fill the project's needs, consider working with nurseries in similar climates to the BSA location. If there are no nurseries with capacity and processes within appropriate geographic and climatic equivalent areas, reassess whether tubestock revegetation is a viable option for the BSA.</p>

Revegetation management

Content description	Evidence required	Guidance
Management zone revegetation objectives	SMART objectives and detailed documentation of anticipated change to VI and attribute scores through the proposed Revegetation activities	If proposed score change is negative or has no appreciable gain, reconsider whether revegetation is appropriate
Method selection	<p>Table outlining</p> <ul style="list-style-type: none"> • Proposed method • Anticipated effectiveness of proposed methods in achieving predicted gain with • Rationale for practicality of method based on <ul style="list-style-type: none"> ○ site characteristics and ○ applicant's capability to implement the active restoration management actions • Performance measures and Indicators <p>Table of:</p> <ul style="list-style-type: none"> • revegetation objectives – related to predicted VI score increase and site attributes in the BAM-C. • species to be used • target stem density per/ha • any additional restoration methods being to augment revegetation (habitat enhancement, litter harvesting etc) • adaptive management actions 	<p>Must include;</p> <ul style="list-style-type: none"> ○ Reference to peer reviewed literature and/or ○ field tested local case studies and/or <p>Authorship of supplementary planting methodology completed by Native Vegetation Restoration practitioner with proven experience delivering on-ground outcomes within the region of the BSA or comparable landscapes.</p>

	<p>Revegetation map (if required)</p> <ul style="list-style-type: none"> • areas within management zone where each revegetation method will be used. Only needed in addition to existing management actions map in BSA if complexity of supplementary planting methods and timing. 	
Additional restoration methods being used in the management zone	Documentation of other active restoration proposed for the management zone.	Consider whether these actions in combination with required management actions will be sufficient to achieve benchmark or target condition. If so, reconsider if revegetation is necessary.
Management zone Supplementary Planting species list	List the specific species that will be prioritised for restoration within the management zone, including which structural or compositional element they will improve.	
Site preparation	<p>Table outlining</p> <ul style="list-style-type: none"> • methods • chemical proposed to be used • anticipated resourcing required 	<p>Consider if additional fencing will be required (refer to Biodiversity.</p> <p>Conservation Trust Restoring Native Vegetation Guidelines for assisted regeneration and revegetation for advice) and if the condition of current fences will be adequate to manage threats once plants are established.</p>
Anticipated establishment and survival rates and contingency plan	Post planting replanting methods and succession management.	Plant survival rates will depend on local conditions. Previous projects run by local practitioners will provide the best guide for survival rates.

Site maintenance

Documentation of technique and frequency of;

- Watering regime
- Weed control
- Insect and vertebrate herbivore control
- Supporting passive techniques (eg. assisted regeneration techniques)

Activities should be planned according to local climatic means and anticipate site response to site preparation and revegetation activities. However, when putting together a budget for site maintenance it should be considered closely in relation to adaptive management allowances to enable adjustments to maintenance in response to unexpected site conditions or events.

Capacity to deliver works

This section outlines of skills and capacity in the region where work is proposed and reduces likelihood of work being delayed or under-delivered through an unforeseen lack of locally experienced contractors. Given that any NVR practitioner engaged to provide technical guidance during completion of the template will not necessarily be the one undertaking the on-ground works, this section seeks to document the availability of suitable qualified and experienced practitioners who are able to service the region where the BSA is proposed. Documentation here seeks to also understand if it is intended that the work be undertaken with the landholder’s own personnel and equipment or by suitably qualified and experienced restoration practitioners.

Content description	Evidence required for the whole site.
Project manager	Landholder/lead contractor previous experience delivering restoration projects.
Personnel	Proposed delivery team CVs and documentation of their availability to undertake project tasks around other work/projects they are committed to.
Equipment	Machinery and equipment necessary for proposed works owned or available.
Contractors and partners	Documentation of skills, experience and capacity to implement proposed works.

Monitoring

Selection of revegetation methods and species should be evidence-based, and support generation of the predicted gains where revegetation is successful. It is anticipated that ecological monitoring by BCT or to BCT guidelines as scheduled through the BSA Management Plan will measure progress towards predicted gains and be used to validate credit generation. Monitoring requirements for the site must be guided by the BCT Ecological Monitoring Module.

The chart in the ‘Monitoring’ section of the template is to be used as a guide and should be updated in to indicate specific months for initial planting and periodic monitoring.

In the case of non-tubestock supplementary planting methods, there is some value in making allowances for unscheduled monitoring events that may occur after catalyst events that initiate germination (e.g. first rainfall of the year). For all supplementary planting techniques, monitoring should be undertaken, once it is safe to do so, immediately after any event that is unforeseen but has a significant impact on a management zone (e.g. fire or flooding).

Works schedule

The chart in the 'Works schedule' section of the template is a guide based on revegetation activities occurring in the temperate zones of NSW with an assumption of ongoing, reliable rainfall patterns. It will require adaptation based on local climatic conditions.

Activities that relate to the entire site, such as seed collection, can be included in the chart as a collective action across the five-year period. However, actions that are individualised based on management zone requirements, such as preparation, installation and maintenance, need to be split into task rows within the chart for each specific method and task outlined in the 'Outline seed and plant supply requirements' section of the template.

Risk analysis summary table

Risk in the project should be addressed against likelihood and consequence using a similar approach to WHS risk assessment. The purpose of this section is to identify all known material risks apparent through supplementary planting planning, data collection and works in order to reduce uncertainty around the proposed active restoration in delivering predicted gains. All risks should be listed in the table in the template with reference to the risk matrix and guidance tables on the following page.

Risks that remain high after mitigation/control actions have been put in place should be considered as significant limiting factors to successful delivery of predicted gains through the proposed supplementary planting activities. This can be dealt with through reassessing the appropriateness of the proposed activity or be recommended for a staged release of ecosystem credits contingent on the risk being managed and the activity delivering the predicted outcome.

Consequence	Likelihood				
	A	B	C	D	E
	Rare	Unlikely	Possible	Likely	Almost Certain
1 Insignificant	L	L	L	M	M
2 Minor	L	L	M	H	H
3 Moderate	L	M	H	H	H
4 Major	M	H	H	E	E
5 Catastrophic	H	H	E	E	E

Likelihood Rating			
Rank	Descriptor	Frequency	Description
A	Rare	Will occur once every 30 years Once in 30 years or less frequent.	The event may occur in exceptional circumstances. Not likely to occur, but it's not impossible.
B	Unlikely	Will occur once in 10 years. Could occur once in 10 years or multiple times over 20 years.	The event could occur at some time, usually requires a combination of circumstances to occur.
C	Possible	Will occur once every 5 years. Once in 5 years or multiple times over 10 years.	The event should occur at some time. Is sporadic, but not uncommon.
D	Likely	Once per year. Once in a year or so.	Known to re-occur approximately annually.
E	Almost Certain	Will occur more than once a year. Multiple times in a year.	The event is expected or known to occur often.

Consequence Rating		
Rank	Descriptor	Environmental
1	Insignificant	No impact of delivery of predicted gains
2	Minor	Short term or low-level long-term impact on predicted gains
3	Moderate	Long term impact significantly limiting predicted gains
4	Major	Extensive, long term impact on predicted gains with uncertain outcomes
5	Catastrophic	Impacts are irreversible and/or permanent

Rank	Acceptance evaluation	Description
	<i>This decision should be considerate of compliance requirements and As Low As Reasonably Practicable (ALARP)</i>	
Extreme	Unacceptable Rick to outcome	Revegetation shall not proceed without further controls to reduce risk.
High	Undesirable risk to outcome	Work shall only proceed with BCT approval and risk mitigation recorded.
Moderate	Monitor activity and ongoing risk	Work may proceed with ongoing monitoring of control measures.
Low	Acceptable Proceed	Work may proceed, working in accordance with planned controls.

Budget

The project budget is derived from the activities identified in the 'Outline seed and plant supply requirements' and 'Revegetation management' sections of the template. Planning, management, monitoring and seed services should be budgeted for at a whole of BSA level. Other activities related to specific management zones (site preparation, revegetation, maintenance) should be itemised by activity or task per management zone and be derived through accurate assessment of time and resources required to complete the outcome successfully.

Applicants are required to budget for an operational contingency aligned with the risk profile of the proposed methods. Applicants are also encouraged to consider allowances for adaptive management in order to be able to respond to results from monitoring or unexpected events such as fires and floods. These budget items will be largely determined by the assessed risk in the project and will flow through to the Total Fund Deposit.

The budget headings in the template are indicative and high level. Detail is expected underneath each heading that fully explains the costs and associated activities.

Revegetation Plan Template

Establish revegetation objectives for whole of BSA

	Revegetation objective	Performance indicator	Delivery timeframe
Objective 1	eg. Revegetate XXX hectares of XXX PCT to benchmark condition	Changes in attribute scores for PCT	20 years
Objective 2	eg. Revegetate XXX hectares of XXX PCT to future site value with management from BAM-C	Changes in attribute scores for PCT	20 years
Objective 3			

Planting thresholds

Site factor	Threshold level
Most appropriate season for revegetation	
Preferred soil moisture levels	
Catalyst events that may change revegetation schedule	

Outline seed and plant supply requirements

Provenance – prescribed range and rationale

	Distance from site (km)	Description of geographical range and predicted additional species to create 'climate ready' plantings
Current local provenance range (ref. FloraBank guidelines)		
Climate adjusted provenance range (Ref AdaptNSW Climate Projections 2020-2039)		

Seed requirements

This list is for the entire site and is derived from species lists and seed quantities defined for each management zone outlined in the 'Outline seed and plant supply requirements' section. The intent is to have a complete list of seed requirements in a single place to make the quantum of the project seed requirements easily communicable to collectors and suppliers when undertaking seed availability assessments.

Species	Relevant PCT/s (list by PCT Number)	Quantity of seed required (gm)	Available for collection? (Y/N)	Available for purchase? (Y/N)	Viable under seed production? (Y/N)	Pre-treatment of seed required before propagation or direct application? (Y/N and specify treatment method)

Collection locations

Location (Latitude and Longitude in Decimal Degrees)	Landholder details (Name, Property Address)	License/permission required (specify)	Other collectors accessing site (List)	Species available (list per site)	Predicted capacity of proposed collection site per species (gm)

Seed available through suppliers

Species	Name of supplier	Provenance of seed	Age of seed	Viability of seed	Quantity available

Plant supply

Nursery	
Capacity (No. of plants)	
Experience working with FloraBank Guidelines	
Procedure for tracking seed and provenance through production systems	
Holdover and stock replacement strategy	
List of target species able to be produced	Species list

Revegetation management (MZ x)

The information in this section is to be completed for every management zone proposed for supplementary planting – management zone number/ ID needs to be clearly identified. Include attributes in the table below that are the target of revegetation (i.e. values that have been manually increased in the BAM-C).

Management zone revegetation objectives

Objectives (target values) ¹	VI Score	Tree richness	Shrub richness	Grass & grass-like richness	Forb richness	Fern richness	Other richness	Tree cover	Shrub cover	Grass & grass-like cover	Forb cover	Fern cover	Other cover	Total length of fallen logs	Litter cover	Stem size class	
Current value																	
Year 5 target	upper																
	lower																
Year 10 target	upper																
	lower																
Year 15 target	upper																
	lower																
Year 20 target	upper ²																
	lower ³																

¹ See EMM Operational Manual for guidance on target-setting. Targets are only essential for attributes which are being actively restored

² This value is entered into BAM-C by the assessor: *Future value with active restoration gain*

³ This value is generated in the BAM-C after applying the risk weighting: *Future value with offset (After restoration)*

Proposed revegetation method effectiveness and practicality

Method	Anticipated effectiveness	Practicality of method	Performance indicators
1.			
2.			
Anticipated risks and consequences (NB. record risk and consequence in this section and undertake analysis in the 'Risk analysis summary table' below)			
Provisions for adaptive management			
Supporting information required: Revegetation map (if required due to multiple methods and stages)			

Additional restoration methods being used in the management zone

Technique	Rationale	Scale of works

Targeted Supplementary Planting species list

Species	Structural or compositional element being addressed

Management zone preparation plan

Activity	Method	Frequency	Resourcing required
1.			
2.			
3.			
4.			
Chemical usage required (name of chemical and quantity – to be undertaken in line with chemical regulations)			
Anticipated risks and consequences (NB. record risk and consequence in this section and undertake analysis in the 'Risk analysis summary table' below)			

Management zone contingency plan

Anticipated plant establishment and survival rate (%)	
Contingency strategy and replanting methods	

Management zone maintenance plan

Activity	Method	Frequency	Resourcing required
1. Watering			
2. Weed control			
3. Insect and vertebrate herbivore control			
4. Supporting passive techniques			
Chemical usage required (name of chemical and quantity – to be undertaken in line with chemical regulations)			
Anticipated risks and consequences (NB. record risk and consequence in this section and undertake analysis in the 'Risk analysis summary table' below)			

Capacity to deliver works

Project Team	
	Relevant experience (Dot point summary of qualifications, previous related projects, and/or technical, trade or machinery skills as relevant to the project activities)
Revegetation project leader/landholder	
Other project members as appropriate	

Contractors or partners with capacity to service proposed revegetation

Organisation 1:	
Capacity (no. of staff)	
Previous experience undertaking revegetation projects (list here or attach case studies)	
Availability and suitability of contractor equipment to undertake proposed tasks (list relevant equipment)	
Organisation 2:	
Capacity (no. of staff)	
Previous experience undertaking revegetation projects (list here or attach case studies)	
Availability and suitability of contractor equipment to undertake proposed tasks (list relevant equipment)	

Monitoring

Monitoring - Years 1-5	1 month	3 months	6 months	12 months	18 months	2 years	3 years	4 years	5 years
Plant germination (direct or hand seeding)									
Plant survival (tubestock)									
Plant survival post germination (direct seeding)									
Species diversity vs. species list									
Second generation establishment (herbs, forbs and grasses)									
Seed set (woody shrubs and small trees)									
Threat monitoring	Frequency of threat monitoring is dependent on site characteristics as well as budget and resourcing allocated to site preparation and maintenance. Can be undertaken at the same time as performance monitoring.								

Monitoring - Years 6-20	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20
Plant survival (all plants)	1 p.a.	1 p.a.	1 p.a.		1 p.a.					1 p.a.					1 p.a.
Second generation establishment (herbs, forbs and grasses)															
Seed set (woody shrubs and small trees)															
Threat monitoring	Frequency of threat monitoring is dependent on site characteristics as well as budget and resourcing allocated to site preparation and maintenance. Can be undertaken at the same time as performance monitoring at least annually.														

Works schedule

	Y1				Y2				Y3				Y4				Y5			
	Win	Spr	Sum	Aut																
Species selection	█	█																		
Seed collection		█	█			█	█			█	█			█	█			█	█	
Plant propagation			█	█		█	█	█		█	█	█		█	█	█		█	█	█
Site preparation					█	█	█			█	█	█		█	█	█		█	█	
Plant installation						█		█	█	█		█	█							
Direct or hand seeding						█				█				█				█		
Site maintenance							█	█		█	█			█	█			█	█	█
Monitoring							█		█		█			█				█		
Contingency planting												█	█	█		█	█	█		█

Risk analysis summary table

Part of revegetation plan	Risk description	Likelihood	Consequence	Initial risk rating	Mitigation action	Likelihood	Consequence	Revised risk rating

Budget

Budget line item	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10	Year 11	Year 12	Year 13	Year 14	Year 15	Year 16	Year 17	Year 18	Year 19	Year 20	Total	
Whole of BSA Supplementary Planting activities																						
Planning and management																						
Seed supply and services																						
Plant supply																						
Monitoring																						
Adaptive management																						
Total Supplementary Planting coordination budget																						
Management zone 1																						
Site preparation																						
Supplementary planting																						
Site maintenance																						
Risk contingency																						
Total budget management zone 1																						
Management zone 2																						
Site preparation																						
Supplementary planting																						
Site maintenance																						
Risk contingency																						
Total budget management zone 2																						
Management zone 3																						
Site preparation																						
Supplementary planting																						
Site maintenance																						
Risk contingency																						
Total budget management zone 3																						
Total revegetation																						