Bairnsdale Airport (EPBC 2024/09848)

Offset Management Plan for Gippsland Red Gum Grassy Woodland and Associated Native Grassland at [redacted] Victoria

FINAL REPORT

Prepared for East Gippsland Shire Council

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Biosis offices

New South Wales

Albury

Phone: (02) 6069 9200
Email: albury@biosis.com.au

Gosford

Phone: (02) 9101 8700
Email: gosford@biosis.com.au

Newcastle

Phone: (02) 4911 4040
Email: newcastle@biosis.com.au

Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Western Sydney

Phone: (02) 9101 8700
Email: sydney@biosis.com.au

Wollongong

Phone: (02) 4201 1090
Email: wollongong@biosis.com.au

Victoria

Ballarat

Phone: (03) 5304 4250
Email: ballarat@biosis.com.au

Melbourne

Phone: (03) 8686 4800
Email: melbourne@biosis.com.au

Wangaratta

Phone: (03) 5718 6900
Email: wangaratta@biosis.com.au

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Biosis acknowledges the Aboriginal and Torres Strait Islander peoples as Traditional Custodians of the land on which we live and work.

We pay our respects to the Traditional Custodians and Elders past and present and honour their connection to Country and ongoing contribution to society.

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Contents

Contents ii
Declaration of accuracy v
Summary vi
Glossary vii
1 Introduction 8
1.1 Project background 8
1.2 Objectives 14
1.3 Plan structure 14
2 Offset suitability 15
2.1 Description of the impact site 15
2.1.1 Impact site details 15
2.1.2 Planning permit for vegetation removal 15
2.1.3 Protected matters for removal 16
2.2 Description of the offset site 16
2.2.1 Offset site details 16
2.2.2 Protected matters present at the offset site 16
2.2.3 The offset site in a state and transition conceptual model 18
2.2.4 Current permitted land uses 19
2.2.5 Existing offset arrangements 19
3 Offset implementation 20
3.1 Offset security and responsibilities 20
3.2 Environmental outcomes to be achieved 21
3.2.1 Performance and completion criteria 21
3.3 Limitations and uncertainty 22
3.4 Risk assessment and adaptive management 23
3.4.1 Contingency 23
3.5 Management actions and land use commitments 23
3.5.1 Fencing 23
3.5.2 Restrictions on agricultural or recreational use 23
3.5.3 Initial site preparation 24
3.5.4 Woody weed management 25
3.5.5 Herbaceous weed management 26
3.5.6 Elimination of new and emerging weeds 29
3.5.7 Pest animals 30
3.5.8 Eucalypt recruitment and biomass control 31
3.5.9 Introduction of logs 32
3.5.10 Revegetation 32
3.6 Ongoing management commitments 35
3.7 Monitoring 36

3.7.1 Land use monitoring 36
3.7.2 Weed monitoring 36
3.7.3 Pest animal monitoring 37
3.7.4 Eucalypt recruitment and biomass monitoring 37
3.7.5 Plains Grassy Woodland condition monitoring 37
3.7.6 Intensive restoration condition monitoring 39
3.8 Reporting 40
3.9 Auditing 41
3.10 Plan review 41
4 Schedule of management actions, risks, monitoring and reporting 43
References 53
Appendices 55
Appendix 1 Preliminary assessment methods 56
4.1 Vegetation mapping and quality assessment 56
4.2 Preliminary data collection 56
4.2.1 Rapid point-intercept transects 56
4.2.2 20 x 20 metre quadrats 56
Appendix 2 Preliminary assessment results 58
Flora species list 58
Transect photos 61
Vegetation quality assessment scores 65
Appendix 3 Habitat scoring system 67
Habitat scoring system for Threatened Ecological Communities 67
Confidence in result 68
Impact area 69
Proposed [redacted] restoration offset 70
Appendix 4 Risk framework 76
Risk rating 76
Likelihood 76
Consequence 76

Tables

Table 1 Impact site details, Bairnsdale airport, Victoria 15
Table 2 Offset site details, [redacted] Victoria 16
Table 3 Security and management responsibilities and reporting requirements 21
Table 4 Management targets for herbaceous weed control 26
Table 5 Revegetation targets within intensive restoration areas (i.e. introduced pasture) 33
Table 6 Schedule of management actions for years 1-15 44
Table 7 Risk assessment of management actions/objectives 47
Table 8 Monitoring schedule 50
Table 9 Reporting schedule 52
Table 10 Flora species observed at the site during preliminary assessment 59

Table 11 Habitat quality scoring system for Threatened Ecological Communities 67
Table 12 Conversion of VQA scores to habitat quality score for the Offsets Assessment Guide 68
Table 13 Impact calculator inputs into the Offset Assessment Guide for Gippsland Red Gum Grassy Woodland 69
Table 14 Offsets Assessment Guide inputs – Plains Grassy Woodland restoration areas 70
Table 15 Offsets Assessment Guide inputs – intensive restoration areas 73
Table 16 Offset calculations for [redacted] Gippsland Red Gum Grassy Woodland offset site – basic restoration areas 75
Table 17 Offset calculations for [redacted] Gippsland Red Gum Grassy Woodland offset site – intensive restoration areas 75

Figures

Figure 1 Location of development site, Victoria 10
Figure 2 Location of the proposed EPBC Act offset for Gippsland Red Gum Grassy Woodland at [redacted] 11
Figure 3 Existing features of the property at [redacted] 12
Figure 4 Configuration of the offset site at [redacted] 13
Figure 5 Monitoring transect locations 66

Declaration of accuracy

Bairnsdale airport (EPBC 2024/09848): Offset Management Plan for Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland at [redacted]

In making this declaration, we are aware that Section 491 of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the Commonwealth Environment Protection and Biodiversity Conservation Regulations 2000. The offence is punishable on conviction by imprisonment or a fine, or both. We are authorised to bind the approval holder to this declaration and have no knowledge of this authorisation being revoked at the time of making this declaration.

Signed:

[redacted]

[redacted]

_____/_____/_____

East Gippsland Shire Council

Summary

East Gippsland Shire Council (EGSC) commissioned Biosis Pty Ltd (Biosis) to prepare an Offset Management Plan (OMP) for a site to provide the environmental offsets required for the Bairnsdale airport runway extension project, Bairnsdale (EPBC 2024/09848).

EGSC is the proponent for the Bairnsdale airport runway extension project, which will require direct removal of 10.354 hectares of Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland (GRGGW) community, listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). As this is likely to have a significant impact on the community, EGSC is seeking approval for the project under the EPBC Act and an environmental offset for this Matter of National Environmental Significance (MNES) is required. The offset proposal must demonstrate how a conservation outcome will be delivered for the protected matter.

The proposed offset meets the requirements of the EPBC Act Environmental Offsets Policy (DSEWPaC 2012a). The Offsets Assessment Guide (DSEWPaC 2012b) was used to estimate the area of offset required to adequately compensate for the residual impacts of the Bairnsdale airport runway extension project. The proposed offset site to be covenanted is located at [redacted].

The site supports 5.12 hectares of modified native vegetation that meets the key diagnostic characteristics of the GRGGW community. This modified vegetation will be restored and enhanced over time to meet the condition thresholds of the community. An additional 21.59 hectares of introduced pasture will be fully restored to meet the GRGGW community key diagnostic criteria and condition thresholds. This offset site will provide environmental offsets in excess of the requirements for the Bairnsdale airport runway extension project. This OMP relates to management of the total 26.71 hectares of vegetation (including areas of modified native vegetation and introduced vegetation) which will be managed and improved to the point that it is consistent with the GRGGW community.

This OMP has regard to the Environmental Management Plan Guidelines (DCCEEW 2024) and specifies a range of management actions for the offset area, including weed and pest animal management and monitoring.

Revegetation trials will compare a top-down (i.e. establishment of woody overstorey vegetation before understorey planting) with bottom-up approaches to revegetation (i.e. woody vegetation plantings following understorey establishment). By testing these methods side-by-side, this site will evaluate differences in establishment success, vegetation structure, and long-term resilience, providing evidence-based guidance for future restoration of GRGGW community projects elsewhere.

The proposed actions are consistent with the published information on GRGGW relating to existing threats and management requirements to achieve positive conservation outcomes. The plan documents an adaptive management framework, in which management actions are modified based on the results of monitoring and auditing activities in order to keep management focused on the outcome of protecting and enhancing restored GRGGW vegetation. A risk assessment also includes triggers for review of the OMP, following environmental events such as significant weed invasion, fire or prolonged drought that have the potential to significantly alter the character and condition of the offset site.

Glossary

Security mechanism	A binding agreement registered on the title of the property that provides enduring protection of the environmental values of the property. In this case the agreement will be either a Section 69 Agreement or a Trust for Nature covenant.
DCCEEW	Australia Government Department of Climate Change, Energy, the Environment and Water.
DEECA	Victorian Government Department of Energy, Environment and Climate Action.
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.
GPS	Global Positioning System.
Incident	Any event that has an impact on a protected matter or has the potential to impact on a protected matter.
Independent audit	An audit conducted by an independent and suitably qualified person as detailed in the Independent Audit and Audit Report Guidelines (DoEE 2019).
MNES	Matters of National Environmental Significance, such as threatened species and threatened ecological communities, listed under the EPBC Act. Also referred to as protected matters.
Gippsland Red Gum Grassy Woodland	Gippsland Red Gum Grassy Woodland and Associated Native Grassland, which is a threatened ecological community listed as critically endangered under the EPBC Act. Abbreviated to GRGGW.
Offset area or offset site	The area of land to be secured and managed for Gippsland Red Gum Grassy Woodland, in this case part of the property at [redacted]
OMP	The Offset Management Plan (this document or any subsequent version approved by DCCEEW), which outlines the management and protection of the offset area.
Suitably qualified person	A person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.
TfN	Trust for Nature (ABN: 60 292 993 543), the Victorian not-for-profit organisation working to protect native plants and wildlife in cooperation with private landowners.

1 Introduction

1.1 Project background

East Gippsland Shire Council (EGSC) commissioned Biosis Pty Ltd (Biosis) to prepare an Offset Management Plan (OMP) for a site to provide the environmental offsets required for the Bairnsdale airport runway extension project, Bairnsdale (EPBC 2024/09848).

An ecological assessment of the project's impacts was completed by Biosis (2023). That assessment report identified the extent and condition of biodiversity values within the project's construction footprint and the potential for both direct and indirect impacts on Matter of National Environmental Significance (MNES). The proposed runway extension will have a significant impact on Gippsland Red Gum (*Eucalyptus tereticornis* subsp. *mediana*) Grassy Woodland and Associated Native Grassland (GRGGW) community, listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The report identified that 10.354 hectares of GRGGW community would be directly impacted (Biosis 2023) (Figure 1). Based on application of the EPBC Act Environmental Offsets Policy (DSEWPaC 2012a) and Offsets Assessment Guide (DSEWPaC 2012b), it is estimated that approximately 40 hectares of GRGGW community would be required to compensate for these direct impacts (assuming a raw conservation gain of 2 out of 10 at the offset site and an 80% confidence in result).

The proposed Bairnsdale Airport runway extension project was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The project was declared a controlled action by the Department of Climate Change, Energy, the Environment and Water (DCCEEW) on 15 July 2024 due to the potential for significant impacts to the Gippsland Red Gum Grassy Woodland community. A request for further information (RFI) was received on 15 July 2024 outlining the preliminary documentation requirements for the project. Section 4 of the RFI requests information on the residual impacts of the project, the proposed offset strategy and management plan.

In October 2025, Biosis visited [redacted] (the offset site, Figure 2) and assessed its potential as an offset site for Gippsland Red Gum Grassy Woodland. The EPBC Act offset prescription for Gippsland Red Gum Grassy Woodland is to be sourced from 5.12 hectares of existing modified native Plains Grassy Woodland vegetation that will be restored to meet the GRGGW community condition thresholds, and an additional 21.59 hectares of introduced pasture will be restored to meet the GRGGW community key diagnostic criteria and condition thresholds. The proposed configuration of the offset site and management areas are shown in Figure 4.

The offset site will be legally secured by either a Section 69 Agreement (under the *Conservation, Forests and Lands Act 1987*) with Department of Energy, Environment and Climate Action (DEECA) or a Trust for Nature (TfN) Covenant (under the *Victorian Conservation Trust Act 1972*). The chosen security mechanism will be registered on title after Bairnsdale airport runway extension is approved and when EGSC decide to formally establish the offset.

The content of the Victorian Government offset management documents is reflected in this EPBC Act OMP, but this OMP has been tailored to meet the specific requirements of the EPBC Act Environmental Offsets Policy (DSEWPaC 2012a) and Environmental Management Plan Guidelines (DoE 2014).

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Benefits of a restoration-based approach

A growing body of Australian research demonstrates that restoration of degraded agricultural land and pasture to high-diversity grassy ecosystems is feasible and opportunities for application at larger scales beyond research trials are needed.

Field-based evidence from the Grassy Groundcover Restoration Project by the University of Melbourne shows that species-rich native grasslands and grassy woodlands can be successfully reconstructed on sites where native vegetation has been severely degraded or entirely absent, using direct seeding and integrated restoration techniques (Gibson Roy 2022). While a directly comparable site of 25 hectares of GRGGW is not identifiable, at scale investment such as that proposed by East Gippsland Shire Council will contribute to the evidence and case studies of restoration.

Recent case studies show that assisted natural regeneration can restore native species diversity where some ecological function remains. A 10 hectare degraded paddock in Victoria recovered to a floristically rich native grassland within approximately 10 years following management interventions such as grazing exclusion, burning and weed control. These findings confirm that restoration can be achieved across a continuum of site conditions, from regeneration in higher-quality areas to full reconstruction in highly modified pasture (Gibson Roy 2022).

The feasibility of restoration has been strengthened by:

- Advances in seed production areas to overcome native seed supply limitations
- Advances in soil and weed management techniques
- Advances in direct seeding and establishment methods
- Scarcity and high costs of third party offset sites

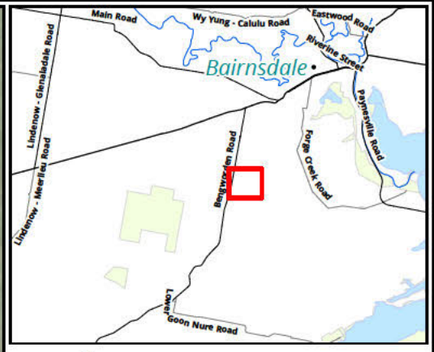
A seed production area has already been developed in advance of large-scale grassy ecosystem restoration at [redacted] for a mining project.

Grassy ecosystems are among the most heavily impacted ecosystems in Australia, requiring active restoration to prevent further loss. Conservation alone is often insufficient, and restoration is essential to re-establish native biodiversity in cleared landscapes

Restoration of Plains Grassy Woodland and derived native grasslands provides substantial ecological and functional benefits consistent with TEC recovery objectives, including:

- Re-establishment of high species richness and functional diversity (grasses, forbs, sedges, shrubs and trees)
- Recovery of ecological processes including recruitment
- Improved soil structure, reduced nutrient loads and enhanced hydrological function
- Enhanced resilience to drought and climate variability
- Provision of ecosystem services including:
  - erosion control
  - water quality improvement
  - pollination support
  - landscape connectivity





Legend

- Study area
- Impact footprint

Figure 1 Location of impact site, Bairnsdale airport, Victoria

0 40 80 120 160 200

Metres

Scale: 1:6,000 @ A3

Coordinate System: GDA2020 MGA Zone 55

N

biosis

APEM Group

Matter: 43635,
Date: 20 November 2025 ,
Prepared for: GZ, Prepared by: EH, Last edited by: [redacted]
Layout: 43635_F1_ImpactSite

[redacted]

Acknowledgements: VicMap BaseMap©State of Victoria

[redacted]

1.2 Objectives

The overall objective of this OMP is to document the impact site and offset site details and requirements for securing, maintaining and improving the quality of Gippsland Red Gum Grassy Woodland habitat within the designated offset site. The aims of this OMP are to:

- Identify the location and boundaries of the area at [redacted], that is nominated as an offset site for Gippsland Red Gum Grassy Woodland, with provision of relevant maps and spatial data.
- Detail necessary management actions and responsibilities to protect and improve the Gippsland Red Gum Grassy Woodland within the offset site, with reference to listing advice and recovery plans for the community where available.
- Provide sufficient information to demonstrate that management actions are additional to existing obligations under other planning regimes, legislation, schemes or duty of care.
- Document timeframes and key milestones for implementation of the measures to reinstate or improve the Gippsland Red Gum Grassy Woodland habitat within the offset site.
- Outline performance and completion criteria for evaluating management of the offset site.
- Outline a program to monitor and report on the effectiveness of the management in relation to the performance and completion criteria, with the aim of gathering and supplying sufficient information to enable a clear assessment of the conservation benefit that has been realised as a result of the offset management actions.
- Describe potential risks to successful implementation of the OMP, including measures to mitigate these risks.

1.3 Plan structure

The structure and content of this OMP is consistent with the standard requirements for OMPs. This OMP is structured as follows:

- Section 1: Introduction – This section summarises the relevant background information, including the purpose and scope of the OMP.
- Section 2: Offset suitability – This section assesses the suitability of the site as an environmental offset by providing details about approved clearing at the impact site (where relevant) and proposed ecological improvements (conservation gain) at the offset site.
- Section 3: Offset implementation – This section describes how the offset is to be implemented and includes details regarding land manager commitments, areas of responsibility, management activities, monitoring and reporting.
- Section 4: Schedule of management actions, risks, monitoring and reporting – This section provides tabulated summaries of key activities to be undertaken and considered during offset implementation.

Sections 3 and 4 are intended for those responsible for implementing the OMP.

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2 Offset suitability

This section provides details of the clearing site, assesses the suitability of the offset site and includes details regarding approved clearing, gain and site improvement. This section should be read in conjunction with Sections 3. The location of the impact site is shown in Figure 1. The location of the offset site is provided in Figure 2 to Figure 4.

2.1 Description of the impact site

2.1.1 Impact site details

The Bairnsdale airport project impact site is located approximately 9 kilometres south-west of Bairnsdale in eastern Victoria (Table 1, Figure 1). It encompasses public land managed by EGSC and is currently zoned Transport Zone 4 (TRZ4). The impact site is within the:

- Gippsland Plain Bioregion.
- Management area of East Gippsland Catchment Management Authority (CMA).
- East Gippsland Shire Council municipality.

Table 1 Impact site details, Bairnsdale airport, Victoria

Impact site details	
Land manager of impact site	East Gippsland Shire Council
Address of impact site	90A Aerodrome Road, Bairnsdale, 3875
Responsible Authority	East Gippsland Shire Council
Project Proponent	East Gippsland Shire Council
Planning permit (Vic)	A planning permit application has not yet been submitted for the project.
EPBC Act referral	EPBC ref: 2024/09848 Controlled Action determination provided 15 July 2024 Preliminary Documentation Request for Further Information also provided 15 July 2024

2.1.2 Planning permit for vegetation removal

A planning permit for native vegetation removal under Clause 52.17 of the Victoria Planning Provisions and East Gippsland Planning Scheme is yet to be submitted for the project. Once submitted, the planning permit application will be referred to the Victorian Department of Energy, Environment and Climate Action (DEECA) as a recommending referral authority. The project requires state biodiversity offsets in accordance with the *Guidelines for the removal, destruction or lopping of native vegetation* (DELWP 2017). The state biodiversity offset requirements are able to be satisfied via a third party credit purchase.

2.1.3 Protected matters for removal

As part of the approvals process for the Bairnsdale airport project, an EPBC Act referral was submitted to DCCEEW in early-2024. In July 2024, DCCEEW (specifically the Australian Government Minister for the Environment) determined that the project was a controlled action, due to potential significant impacts on GRGGW. The potential impacts of the project are currently undergoing assessment by preliminary documentation and have not yet been approved.

2.2 Description of the offset site

2.2.1 Offset site details

The offset site is part of the property at [redacted], 9 kilometres south-west of Bairnsdale in Gippsland (Figure 4; Table 2; referred to as the 'Bengworden site'). It encompasses 80 hectares of private land. It is currently zoned Farming Zone (FZ). A Vegetation Protection Overlay (VPO1) covers vegetation along the north-western boundary of the site (Dahlsens Road, and is within the property) and an Environmental Significance Overlay (ESO1) covers both [redacted] along the eastern boundary of the site (and extends within the property boundary).

The proposed offset site is within the:

- Gippsland Plain Bioregion.
- Management area of West Gippsland Catchment Management Authority (CMA).
- East Gippsland Shire Council municipality.

Table 2 Offset site details, [redacted] Victoria

Offset site details	
Current landowner of offset site	Private third party
Type of offset	First party (private land) - EGSC has an intention to purchase this site for establishing the offset site.
Location and address of offset site	[redacted]
Area of EPBC offset site	45.7215 hectares
Local Government Area	East Gippsland Shire Council
Parish	Moormurng
Allotment	[redacted]
Standard Parcel Identifier	[redacted]
Bioregion	Gippsland Plain

2.2.2 Protected matters present at the offset site

The preliminary monitoring data was collected by a team of experienced botanists including Senior Botanist [redacted] In total, approximately 20 person hours were spent mapping vegetation and collecting relevant floristic and condition information between 29 and 30 October 2025.

This assessment aimed to establish:

- Presence, extent and condition of the GRGGW community.
- Presence, extent and condition of any other native vegetation.
- Which parts of the property are suitable for restoration to GRGGW.

In order to determine community presence and extent in line with the community listing advice (TSSC 2009), the following process was followed:

1. An initial walk through was undertaken to confirm the area supported the correct canopy species (i.e. Gippsland Red Gum) and identify areas with the highest proportion of native understorey grasses.
2. Within the highest quality areas (i.e. those with the highest proportion of native understorey grasses), two 20 by 20 metre quadrats were completed. A full list of species occurring within the quadrat was recorded, along with estimates of each species' life history (perennial/annual), origin (native/weed), cover and abundance
3. Results were compared with the key diagnostic characteristics and condition thresholds for the community.

Additionally, Vegetation Quality Assessments (VQAs) consistent with DEECA's habitat hectare method (DSE 2004) were conducted, with separate VQAs completed for Ecological Vegetation Class (EVC) condition states (i.e. habitat zones). A full description of the assessment methods and results are provided in Appendix 1 and Appendix 2.

The assessment identified a total of 5.12 hectares of Plains Grassy Woodland EVC 55 on the property. Whilst this native vegetation is consistent with the GRGGW key diagnostic characteristics of the community, none of it is of a high enough quality to meet the community condition thresholds (TSSC 2009). When applying the scoring system presented in Appendix 3 for the purposes of the EPBC Act offset assessment guide, the baseline habitat score is 3/10, calculated as follows:

- Site condition: 3.61/7.5 (due to the weighted average site condition VQA score of 36.129/75).
- Landscape context: 0.49/2.5 (due to the weighted average landscape VQA score of 4.935/25).

Following a review of all preliminary data, the Plains Grassy Woodland vegetation patches shown within Figure 4 are considered most appropriate for restoration. These areas support large remnant *Eucalyptus tereticornis* subsp. *mediana* trees and the highest proportion of native cover on the property. The presence of *Eucalyptus tereticornis* subsp. *mediana* remnant trees and some native grass cover on a relatively fertile landscape setting indicates the foundation of the community is present and suitable for restoration activities.

Whilst additional areas of Plains Grassy Woodland were identified on the property (as shown in Figure 3), some areas are not included in the proposed restoration area due to supporting dense eucalypt recruitment. Weed control within these areas, without causing off-target damage to the recruiting eucalypts, is not considered feasible.

Indicative areas of introduced pasture vegetation as shown within Figure 4 are considered most appropriate for full community restoration. The following was considered in developing this indicative area configuration of introduced pasture proposed for full restoration:

- How to reconnect disjunct patches of Plains Grassy Woodland.
- Avoiding areas of dense Juncus within paddocks. Weed control within these areas, without causing off-target damage to Juncus, is not considered feasible.
- Avoiding areas of previous land disturbance or soil compaction (e.g. due to livestock congregation)

- Avoiding higher fertility and wetter areas where the dominant weed species was Paspalum or Yorkshire Fog.
- Avoiding areas which indicated they were incompatible with key diagnostic characteristics (i.e. would have previously supported another type of vegetation rather than Plains Grassy Woodland).

The areas of Plains Grassy Woodland and introduced pasture as described above and shown in Figure 4 is the offset site to which this OMP relates (referred to as the 'offset site' or 'offset area'). The offset site supports 5.12 hectares of Plains Grassy Woodland EVC 55 to be restored, and 21.59 hectares of introduced vegetation to be restored.

2.2.3 The offset site in a state and transition conceptual model

State and transition models are often used to conceptualise the current and future condition of ecosystems, particularly threatened grassland and grassy woodland communities in temperate Australia (Sinclair et al. 2019). These models provide a structured framework for understanding ecological trajectories, identifying stable (or semi-stable) states, recognising thresholds where degradation may become difficult to reverse, and guiding management interventions to shift from degraded to target states (Spooner and Allcock 2006; Yates and Hobbs 1997). In the context of the GRGGW community, a state-and-transition framework is highly valuable for defining and working toward reference condition thresholds for structure, species composition, and ecological function (Sinclair et al. 2019; Prober, Thiele and Lunt 2002).

For the area currently supporting a modified Plains Grassy Woodland shown in Figure 4 (*Plains Grassy Woodland for restoration to GRGGW*), the site may be viewed as occupying an intermediate degradation state where key structural elements (e.g. remnant canopy or scattered trees) remain, but the ground-layer composition and ecological processes have been substantially altered. A state-and-transition approach enables management actions to appropriately focus on removing persistent stressors (such as high threat weeds, altered disturbance regimes, soil compaction or nutrient enrichment) and reintroducing processes (e.g. fire/slashing regimes to manage biomass, groundlayer recruitment, soil nutrient cycling) that favour the recovery of woodland understorey and groundlayer species (Prober, Thiele and Lunt 2002; Sinclair et al. 2019). With careful, adaptive intervention, and monitoring against defined the objectives of this management plan over time, the site can potentially be guided across a transition boundary into a desired reference state that meets EPBC condition thresholds.

The second area subject to this OMP (*introduced pasture for restoration to GRGGW* shown in Figure 4) is currently heavily modified, historically converted to introduced pasture and lacking native woodland structure. Pre-1750 EVC mapping and the landscape setting and adjacent remnant woodland vegetation indicates this area once supported Plains Grassy Woodland highly likely to have been representative of the GRGGW community. The state and transition framework underscores that passive recovery alone is unlikely to return this highly modified area to a Plains Grassy Woodland state representative of the GRGGW community. Empirical and conceptual work shows that degraded woodlands often experience soil changes, altered nutrient cycles, seedbank depletion and other barriers that prevent natural regeneration once disturbance ceases (e.g. Prober, Thiele and Lunt 2002). Therefore, a more intensive restoration strategy is justified and outlined in this OMP for the pasture area including active removal of pasture and weeds, soil decompaction or amelioration where required, revegetation with locally indigenous overstorey, midstorey and groundlayer species (testing both *top down* and *bottom up* approaches) and re-establishment of ecological processes (e.g. fire or mowing regimes, nutrient cycling) that support native species recruitment and persistence (Prober, Thiele and Lunt 2002; Spooner and Allcock 2006). The state and transition model becomes a working tool that helps specify the likely degraded state, the interventions needed for transition, and the target reference state aligned with the EPBC condition thresholds of the GRGGW community.

By applying this structured framework across both parts of the site, this OMP demonstrates a sound conceptual basis. It allows for appropriate management interventions, sets clear ecological objectives and supports adaptive management. The OMP also helps justify why different parts of the site require different levels of intervention, and why some may respond to passive management while others demand active, long-term restoration actions.

2.2.4 Current permitted land uses

The offset site is zoned as Farming Zone (FZ) within the East Gippsland Planning Scheme. This zone provides for the use of land for agriculture, including livestock grazing and associated activities. The property has a history of use for grazing by cattle. Cattle are currently being grazed on the property.

A Vegetation Protection Overlay (VPO1) runs along the north-western boundary of the site and an Environmental Significance Overlay (ESO1) runs along the north-western and the eastern boundaries of the site. VPO1 relates to the protection of Tambo-Bairnsdale Roadside Vegetation and ESO1 relates to East Gippsland Sites of Biological Significance.

There is currently no existing obligation to manage or improve vegetation within the offset site.

The existing permitted agricultural land uses, including livestock grazing, have likely contributed to the extinction of Gippsland Red Gum Grassy Woodland at the offset site. The conservation benefit from establishment and long-term management of an offset site for Gippsland Red Gum Grassy Woodland would be additional to any existing obligations.

The EPBC Act offset site will not be subject to any significant incompatible land uses. There are no existing buildings or infrastructure at the site. The designated offset area is buffered by 50 meters from a dwelling to the south-west of the property boundary (Figure 3).

2.2.5 Existing offset arrangements

No other offset sites have been established on the property. The offset site has not been previously allocated for the provision of any other offsets, either under the EPBC Act or under Victorian State planning policy, including the former Biodiversity Assessment Guidelines (DEPI 2013) or any prior policy.

The offset site will be registered under either a Section 69 Agreement or a Trust for Nature (TfN) covenant. Either approach will likely take more than 12 months to be formally approved by the Victorian Government Minister for Environment. Implementation of the OMP will commence prior to registration of the agreement.

Based on the current indicative offset configuration (per Figure 4), 14.75% of the offset requirement will be met through restoration of 5.12 hectares of modified Plains Grassy Woodland, and 90.67% of the offset requirement can be met through restoration of 21.59 hectares of introduced pasture.

3 Offset implementation

This section presents the actions required to implement the OMP. The OMP details methods for the management and restoration of the 45.72-hectare EPBC Act offset site at [redacted].

In accordance with the state and transition model concept, management actions over time will focus on the enhancement of Plains Grassy Woodland so that these areas will improve to meet the condition thresholds of GRGGW, and on restoration of introduced vegetation so that they also meet the condition thresholds of GRGGW.

At the end of 15 years of management, the offset site is expected to have achieved a conservation gain for GRGGW to offset the impact on this community that will occur as part of the construction of the Bairnsdale airport runway extension project.

After 15 years, management actions will focus on maintaining the improved condition of the reinstated GRGGW and protecting the site in perpetuity under the *Conservation, Forests and Lands Act 1987* or the *Victorian Conservation Trust Act 1972.*

The OMP aims to achieve vegetation improvement gains through on-ground actions and therefore these actions and gains are required to be achievable, measurable, straightforward and practical. All management works at the offset site will be conducted by the landowner (i.e. EGSC in the future) or a suitably qualified and experienced contractor engaged by the landowner. Prescribed management actions are, where relevant, in accordance with the Management Standards for Native Vegetation Offset Sites, prepared by DEECA and its Native Vegetation Credit Register (DEECA 2023). These actions also align with known threats and management interventions for the community (TSSC 2009).

3.1 Offset security and responsibilities

This offset site will be purchased prior to the commencement of the action (prior to the significant impact on the community at Bairnsdale airport runway extension project). The East Gippsland Shire will purchase the site and the site will be in public ownership.

Following improvement in the condition of the site, two types of security agreements available are a Section 69 Agreement (under the *Conservation, Forests and Lands Act 1987*) with DEECA or a Trust for Nature (TfN) Covenant (under the *Victorian Conservation Trust Act 1972*).

The timelines for preparation of this OMP did not allow for discussions with DEECA or TfN prior to its submission to DCCEEW hence both options are discussed.

The agreement will be signed by the landowner and DEECA/TfN (as relevant) and approved by the Victorian Minister for Environment when the condition of the site meets condition thresholds for a covenant to be applied.

Offset site security details and responsibilities are summarised in Table 3.

Table 3 Security and management responsibilities and reporting requirements

Offset requirements and responsibilities	
Who is liable/responsible for meeting offset requirements?	EGSC
Type of security	Public ownership of the site TfN covenant or Section 69 agreement (to be confirmed)
Date of commencement	Public ownership of the site
Date 15-year offset management to commence	Public ownership of the site
TfN stewardship services	Registration of security mechanism on title
Date 15-year offset management expires	15 years after commencing implementation
Date security mechanism registered on-title	When condition thresholds meet TfN requirements
Offset site management responsibility	East Gippsland Shire Council
Offset site monitoring responsibility	East Gippsland Shire Council
Auditing	East Gippsland Shire Council
Reporting responsibility (to TfN and EGSC)	East Gippsland Shire Council
Reporting responsibility (to DCCEEW)	East Gippsland Shire Council
OMP review	East Gippsland Shire Council

3.2 Environmental outcomes to be achieved

The overarching environmental outcomes expected to be achieved through protection and management of the offset site are:

- Improvement of vegetation within the offset site such that both degraded / modified Plains Grassy Woodland vegetation and designated indicative areas of introduced pasture vegetation meet the key diagnostic characteristics and condition thresholds of the GRGGW community.
- Physical protection of the managed vegetation from manageable threats, including domestic stock, other agricultural/commercial activities and the impacts of pest plants, pest animals and any other recreational activities which would conflict with the conservation objectives of the offset site.
- Ongoing legal protection to ensure the conservation management of the 45.72 hectare EPBC Act offset site for the period of this OMP, the life of the Bairnsdale runway extension project and thereafter in perpetuity.

3.2.1 Performance and completion criteria

Key performance criteria expected for completion of this 15-year OMP are:

- Successful management of threats within the offset site (Section 3.5), including:
  - Exclusion of agricultural practices and other inappropriate land-uses.
  - Elimination of all woody weeds to less than 1% cover, with no mature plants present.
  - Control of low threat weeds such that their cover is ≤15%

  - Within areas of remnant Plains Grassy Woodland to be restored, control of high threat weeds such that their cover is ≤5%.
  - Within areas of introduced pasture to be intensively restored, control of high threat weeds such that their cover is ≤30%.
  - Control of pest animals such that signs of pest animal activity (e.g. ground disturbance and scats) are absent or scarce (i.e. signs of pest animal activity are considered negligible).
  - Control of pest animals such that no active rabbit warrens and no active fox dens are observed within the offset site.
- An increase in the weighted average score (VQA) for restored Plains Grassy Woodland to at least 45/100.
- An increase in the weighted average score (VQA) for restored introduced pasture vegetation to at least 45/100.
- Improvement in native vegetation cover and species diversity such that each area of restored Plains Grassy Woodland and of restored introduced pasture vegetation meets the minimum condition thresholds for GRGGW, including:
  - Totals at least 26.71 hectares of GRGGW;
  - Being ≥0.04 hectares in size;
  - Having ≥50% of the perennial ground layer vegetation cover comprising native species (excluding mosses, lichens, litter and bare ground); and
  - Containing ≥7 native species (excluding mosses, lichens and trees and trees shrubs over 5 metres tall).
- Completion of scheduled management actions (Section 3.5 and Table 6).
- Completion of scheduled monitoring activities (Section 3.7 and Table 8).
- Completion of scheduled reports and audits (Section 3.8, Section 3.9 and Table 9).

Failure to achieve these key performance criteria will result in an OMP review in accordance with Section 3.10 of this OMP.

3.3 Limitations and uncertainty

- Historical grazing pressure and pasture improvement may have altered soil chemistry (e.g. elevated phosphorus) and structure. No detailed data (e.g. soil testing) for the site has been collected to confirm its suitability for restoration but other revegetation in the nearby areas suggest woody vegetation can be established on the site.
- Local trials of top down and bottom restoration and revegetation will be developed under management actions.
- Whilst management will seek to achieve plant survival targets, these can be affected by rainfall timing, soil moisture, grazing pressure and unplanned fire. These variables that are inherently unpredictable year to year.
- This level of restoration effort has not been previously attempted, however appropriate contingencies are in place if restoration is unsuccessful.

3.4 Risk assessment and adaptive management

This OMP provides actions and performance criteria for a period of 15 years and notes that ongoing management will be required. Registration of the site via a Section 69 Agreement or with TfN under an offset covenant provides protection and management in perpetuity adding another layer of regulation and scrutiny.

3.4.1 Contingency

In the event that performance and completion criteria are not met following the 15 year active management period, or if a review of the plan considers that performance is so poor it is unreasonable for restoration efforts to continue at the site, EGSC as the approval holder commits to finding an alternative offset site or alternative offset solution, in consultation with DCCEEW to offset the losses associated with Bairnsdale airport runway project.

3.5 Management actions and land use commitments

The offset site will be managed for the purposes of conservation as detailed in this OMP and aims to improve vegetation within the offset site to the point that it meets the community condition thresholds for GRGGW, and protect and maintain this in perpetuity.

This section presents the actions required to implement the management strategy for the offset site. Management actions described below are to be implemented for a period of 15 years.

The landowner will continue to manage the offset site after the completion of Year 15. These ongoing management commitments (i.e. beyond Year 15) are outlined in Section 3.6 of this OMP.

3.5.1 Fencing

The property has existing permanent boundary fencing, however additional fences will be required around the offset site. As grazing pressure is a high threat to successful achievement of restoration targets for the site, and because the site is generally cleared (and therefore relatively easy to fence), a 1.8 metre chain mesh or Ringlock fencing will be installed around the offset site. This will ensure the exclusion deer and macropods and ease the burden of pest control during active management of the site. Additional rabbit-proof netting will be fixed so that it reaches at least 900 millimetres above the ground and is either buried (to 150 millimetres depth) or laid down to a width of 300 millimetres on the ground and secured with pegs. Further guidance on minimum standards for rabbit proof fence netting is found at Management Standards for Native Vegetation Offset Sites (DEECA 2023).

Fencing around the offset site as described above will be established in the first 3 months of the OMP. Fencing to exclude unauthorised person and livestock entry will be maintained in perpetuity, however the 1.8 metre fence may be replaced with more standard farm fencing (per standards in DEECA 2023) following the successful establishment of revegetation. Fencing does not need to follow the offset boundary; if fencing is placed around a broader area, the offset boundary should still be marked in some way e.g. with star pickets. An indicative boundary fence is provided in Figure 3.

3.5.2 Restrictions on agricultural or recreational use

The permitted use of the offset site as agricultural land (as per its existing classification as Farming Zone under the East Gippsland Planning Scheme) will be prohibited under this OMP and formally restricted under the Section 69 Agreement or TfN covenant. Agricultural activities, such as the application of fertilisers and the

overgrazing of domestic stock, are documented threats to GRGGW (TSSC 2009) and will be prohibited within the EPBC Act offset site. Prohibited activities will include:

- Grazing by domestic stock.
- The use of agricultural or other machinery used for farming or recreation, unless required to carry out the management actions prescribed by this OMP (e.g. soil preparation, weed or pest animal control).
- The application of any fertiliser or any pasture improvement activities, such as the sowing of introduced pasture species or stock feed plants.
- Cultivation or any soil disturbance associated with cropping or pasture improvement.
- The use of any hay or stockfeed to feed domestic or native animals.

Impacts of these prohibited activities could include:

- Long-term removal of native vegetation.
- Ground compaction, erosion and sedimentation of surrounding native vegetation.
- Spread of weeds.

With appropriate management actions, the risk of these activities occurring is low. Locked gates would preclude public access to the property.

The landowner's commitments to manage potential threats from such activities include:

- Exclusion of public (i.e. non-management) vehicles or other access from the offset site at all times for any activity other than conservation-oriented programs consistent with this OMP.
- Regular inspection of gates to ensure they prevent access. Prompt replacement of damaged gates and any locks that have been removed.
- Maintenance of existing fencing and installation of new fencing to the relevant DEECA standards (DEECA 2023).
- Signage to indicate the commitment to management of the land for conservation values.

3.5.3 Initial site preparation

The site supports some dilapidated fencelines, farm infrastructure and old machinery that require removal from the offset site. Removal of these items will be the first step of site preparation and will occur within 1 month of the commencement of the OMP.

The areas shown as indicative restoration areas in Figure 4 are generally dominated by Brown-top Bent *Agrostis capillaris*. Brown-top Bent is a dense, mat-forming perennial introduced grass species, which is highly competitive at low fertility.

Prior to any revegetation effort, all indicative areas of intensive restoration (i.e. introduced pasture for restoration per Figure 4) will need to be prepared to ensure optimal conditions for establishment of revegetation. Preparation should begin as early as possible in Year 1.

Preparation of the site will trial the below management techniques for Brown-top Bent control during the first three years of active management, and will be guided by an adaptive management approach based on the results of trials:

- Herbicide application

  - Chemical spraying via boom spray application. Minimum of two applications at suitable rates during the active growing season (usually late winter-spring, or autumn).
- Ecological burning and follow-up herbicide application
- Soil scalping
  - Scalping must not occur within an area twice the diameter of the canopy of existing scattered indigenous trees on the site.
- Slashing during late summer and autumn to prevent seeding.
- Smothering
  - Cardboard, straw, woodchips and jute mesh. Jute mesh would require removal prior to the implementation of any native revegetation.

A Site Preparation Plan will be prepared to guide the implementation of these techniques and combinations of them across indicative intensive restoration areas (Figure 4).

Year 1 will involve trialling the above techniques (and combinations of them) to gauge their relative success at the site, the feasibility of their implementation at scale and understand any other issues that each technique may present. Based on the results of trials, the more successful techniques will be employed during Years 2 and 3.

The aim is to create a 'blank slate' suitable for revegetation activities. The target cover of high threat herbaceous weeds (including Brown-top Bent) to be achieved prior to the implementation of any native revegetation in Years 3 onwards is ≤10%.

Ecological burning for weed control

The controlled application of fire is an efficient and cost-effective technique for reducing thatch buildup and for the control of weeds. Burns during late summer or early autumn when conditions will ensure a hot but controlled burn will work to remove thatch which protect the basal crown of Brown-top Bent. Due to the extent of thatch build up at the site, it is expected that burning or soil scalping is likely to be required across the majority of intensive restoration areas prior to the implementation of revegetation.

While burning may enhance germination of indigenous species within the seed bank, it can also be expected to promote the growth of certain introduced species including Brown-top Bent. Stimulating the soil stored weed seed bank is seen as positive as this allows this seed bank to be depleted, provided the ecological burning is followed by rigorous weed control to remove weed germinants at a time when the up-take of herbicide is most effective. An adaptive management approach to ecological burning within the offset site will be required.

Further information on ecological burning is provided below in Section 3.5.8.

3.5.4 Woody weed management

Woody weeds are introduced plant species that typically have a persistent, lignified (hard and woody) stem above ground.

Two woody weed species, Common Blackberry *Rubus anglocandicans* and Bridal Creeper *Asparagus asparagoides*, were observed within the offset site during the preliminary assessment. These species are present as scattered individuals and have the potential to increase in abundance and cover, although cover was low during the preliminary assessment. These species will need to be controlled and maintained at less

than 1% cover with no mature plants present in the offset site after 15 years. A mature plant is one that can flower (and therefore potentially set seed).

In the first instance, material will be physically removed and any regeneration spot treated with the minimum amount of herbicide required to treat the infestation. Herbicide application can only occur in optimal conditions (i.e. little or no wind, no rain) and preferably in areas more than 2 metres away from wet ground. Where possible, herbicide should be painted (rather than sprayed) onto the target plants immediately (i.e. within 20 seconds) following them being cut.

The few woody weed occurrences present throughout the offset site will be controlled within the first year of the OMP commencement date. Any woody weed recruits subsequently observed within the offset site will have their location recorded and plants subject to control works within 12 months of observation. No woody weeds will be permitted to set seed and will be controlled before any viable seed can be produced.

3.5.5 Herbaceous weed management

Herbaceous weeds are introduced plant species with no persistent, lignified (hard and woody) stems above ground. Herbaceous weeds include graminoids (grass-like plants, including sedges, rushes and true grasses) and forbs. Species in Table 4 below were either noted within the offset site, within the broader property or are known to be common within the surrounding landscape. The targets for herbaceous weed control are shown in Table 4. Further information is provided in the sections that follow.

Table 4 Management targets for herbaceous weed control

Target weeds	Proposed control measures	Target cover after 15 years
Low threat weeds – all areas		
Lesser Quaking-grass *Briza minor,* Wimmera Rye-grass *Lolium rigidum,* Fescues *Vulpia* spp., Barley-grass *Hordeum* spp., Air-grass *Aira* spp., Black Nightshade *Solanum nigrum*, Common Sow-thistle *Sonchus oleraceus.*	Ecological burning to prevent seed set and reduce biomass. Physical removal, heat treatment or targeted herbicide application to minimise seed set.	<15%
High threat weeds - Plains Grassy Woodland		
High threat broad-leaved weeds: Spear Thistle *Cirsium vulgare*, Sheep Sorrel *Acetosella vulgaris,* Cape Weed *Arctotheca calendula,* Buck's-horn Plantain *Plantago coronopus* and Flatweed *Hypochaeris radicata.*	Physical removal, heat treatment, targeted herbicide application or, broad leaf selective herbicide application to minimise flowering and seed set.	<5%
High threat perennial tussock grasses: Rat-tail Grass *Sporobolus africanus,* Yorkshire Fog *Holcus lanatus,* Cocksfoot *Dactylis glomerata,* African Love Grass *Eragrostis curvula* and Sweet Vernal-grass *Anthoxanthum odoratum.* Common species likely present: Toowoomba Canary-grass *Phalaris aquatica*	Ecological burning to prevent seed set and reduce biomass. Physical removal (for small isolated occurrences) or targeted herbicide application in early spring.	
High threat perennial mat-forming grasses: Couch *Cynodon dactylon* var. *dactylon,* Kikuyu	Ecological burning to prevent seed set and reduce biomass, targeted herbicide application	

Target weeds	Proposed control measures	Target cover after 15 years
Cenchrus clandestinus, Brown-top Bent *Agrostis capillaris*	in early spring.	
High threat weeds - Introduced pasture		
As above	As above	<30%
Novel or noxious weeds - all areas		
e.g. Serrated Tussock *Nassella trichotoma*	If any species are detected, immediately map the location and mark it on the ground. Kill plants by physical removal or targeted herbicide application. Manage ground cover to prevent excess recruitment opportunities. Implement weed hygiene protocols in accordance with OMP.	<1%
Total herbaceous weed cover		**≤50%**

*Progress towards achieving target weed covers will be assessed annually by monitoring in spring or early summer.

Strategy for herbaceous weed control

The weed control strategy is a multi-faceted approach that takes advantage of the ecological conditions of the offset area. The weed control strategy is guided by the following principles:

- Minimise weed recruitment and conditions that favour weed recruitment by:
  - Within areas of remnant Plains Grassy Woodland, maintain any existing native ground cover, to minimise the area of bare ground available for weed seeds to germinate and grow.
  - Minimising overall weed cover, particularly before seed set, to reduce weed propagule load and improve opportunities for native plant recruitment. Directly killing weeds prior to seed set with physical removal, heat treatment (such as small hand-held steam weeding or flame weeding) or herbicide.
  - Minimising nutrient enrichment.
  - Adopting the use of fire to encourage germination of soil-stored weed seed and exhaust the weed seed bank (where feasible and subject to implementation of revegetation efforts).
- Maximise recruitment opportunities for native plants species by providing decreased competition from weeds for space, light, nutrients and water.

Note that while this OMP lists particular weed species or groups of weed species as target species, these target species are likely to change over time. The abundance of weeds will change in response to seasonal conditions, grazing (native and/or pest animals), controlled burns (e.g. post-burn flush of broad-leaf weeds) and other weed control actions that occur. In addition, new weeds may emerge as a result of wind or animal-mediated seed dispersal or germination of soil-stored seed.

The management actions for weed control must be adapted to meet the changing conditions. Weed cover and weed species will need to be monitored and management adapted in response to the monitoring results. Management standards for native vegetation offset sites (DEECA 2023) provides information about acceptable weed control activities for conservation activities. However, for any new or emerging weeds or

weeds requiring new management methods, DEECA/TfN (as relevant per chosen security mechanism) will be consulted for site-specific advice and approval of the control techniques.

Use of herbicide

Within existing Plains Grassy Woodland for restoration, and within indicative intensive restoration areas post-implementation of native revegetation, chemical-free weed control methods will need to be used wherever possible to minimise risk of off-target impacts to adjacent remnant/reintroduced native understorey vegetation. Chemical-free methods include physical weed removal and heat treatment (e.g. steam weeding and flame weeding, using small hand-held steam wands). Weed management should be guided by monitoring results and adaptive management, which may result in different methods being recommended over time as priority weeds for management change.

Despite the preference for chemical-free weed control methods, herbicide application is likely to be needed in some instances to effectively and efficiently control herbaceous weeds in a timely manner and to ensure compliance with the OMP. Herbicide application must only occur in optimal conditions (i.e. little or no wind, no rain) and preferably in areas more than two metres away from wet ground (to minimise impacts on aquatic environments). Herbicide application must be targeted in order to minimise damage to adjacent native vegetation and an appropriate herbicide must be used.

Targeted herbicide application requires an appropriate herbicide to be spot-sprayed, wiped or painted on to the target weeds. Where possible, herbicide will be painted, wiped or dabbed (e.g. with a wicker applicator) onto the target plants rather than sprayed. Spot-spraying involves applying herbicide using a small nozzle so that only the target plant is treated.

All herbicide application must be completed in a manner that minimises non-target damage by following all manufacturer's directions regarding rainfall and wind speed on the day of application. Targeted herbicide application will be undertaken regularly, particularly in spring and early summer, with a focus on killing weed plants prior to seed set.

Control of existing low and high threat herbaceous weeds

Low threat herbaceous weeds include annual grasses and herbs. While annual weeds are not considered a high threat to the long-term success of restoration of the offset area, uncontrolled growth of annual weeds will reduce the resources (water, space, light) available to native revegetation whilst it is establishing and will reduce VQA scores (DSE 2004). The objective of low threat weed management will be to ensure that annual weed cover does not exceed 15%. This will be achieved by ecological burning (where feasible, subject to implementation of native revegetation) and more direct control methods such as physical removal, heat treatment and herbicide application.

High threat herbaceous weeds are those that have displaced or have potential to displace one or more native plant life forms within the offset site. Not all high threat herbaceous weeds will be listed as noxious weeds under the Victorian *Catchment and Land Protection Act 1994* (CaLP Act), meaning that there is no legislative obligation on landowners to control all high threat weeds. However, the control of all existing high threat herbaceous weeds is a key management action of this OMP.

The principal method for controlling high threat perennial weeds will be physical removal of plants and/or targeted application of herbicide. Ecological burning is also likely to assist in targeted weed control (where feasible, subject to implementation of native revegetation). Heat treatment (steam weeding and flame weeding) is another weed control option that may be considered for treatment of high threat annual weeds.

Baseline monitoring results for the different growth forms of high threat herbaceous weeds (i.e. broad-leaved weeds, perennial tussock grasses and perennial mat-forming [rhizomatous] grasses) are included in Table 4 however the management target outlined is for high threat herbaceous weeds as a whole.

Weed control will be a regular, critical activity and undertaken generally in accordance with the schedule in Section 4.

3.5.6 Elimination of new and emerging weeds

For the purposes of this OMP, new and emerging weeds are defined as follows:

- New or novel weeds are weed species that are recorded for the first time at the offset site after the preliminary assessment, unless there is reasonable evidence to suggest that the weed species would have been present at the time of the initial assessment.
- Emerging weeds are weed species that are known to be in an early stage of invasion in Victoria.

New and emerging weeds must be eliminated from the offset site during the 15 year active management duration of this OMP so far as is reasonably practicable. A weed species is taken to be eliminated when its cover is maintained at less than 1%. The process for eliminating new and emerging weeds will involve monitoring, identification and treatment of new and emerging weeds, with follow-up monitoring and, if necessary, follow-up treatment.

Monitoring for new and emerging weeds will be conducted quarterly. Procedures must be in place to detect any new weed species or emerging weed problems in time to take preventative action. Monitoring will therefore take place during the landowner's routine inspections and/or annual ecological monitoring.

If any new and emerging weeds are identified, their location will be recorded with a GPS, clearly marked in the field and treated as soon as possible. New and emerging weeds will ideally be treated manually by physical removal (i.e. hand pulled or dug out) with the least amount of soil disturbance possible. If this is not possible, heat or chemical treatment will be needed. Note that the use of residual herbicides is explicitly prohibited. Chemical treatment will be by targeted herbicide application (preferably by wiping, painting or, if necessary, spot spraying), using an appropriate and approved herbicide in optimal conditions (i.e. little or no wind, no rain). Damage to native plants (off target species) will be minimised. TfN/DEECA and DCCEEW will need to be consulted for any proposed 'off label' herbicide use, which may be necessary if specific herbicides are yet to be approved for new and emerging weeds. Records must be kept of any new or emerging weeds identified and the treatment applied.

Follow-up monitoring of any re-growth or new seedlings must occur during subsequent quarterly monitoring. Any re-treatment will follow the methods outlined above.

The surrounding landscape is the most likely source of new weeds. It is therefore advisable to have weed monitoring and treatment schedules for the rest of the property (although this cannot be enforced via the OMP). This is likely to be a cost-effective way to reduce weed loads in the offset area. Public land (e.g. road reserves) can also be a source of weeds it would be prudent for EGSC to target any weed problems on public land adjoining the property.

New and emerging woody weeds that are likely to be present in the broader environment include:

- Horehound *Marrubium vulgare*
- Gorse *Ulex europaeus*
- Sweet Briar *Rosa rubiginosa*
- Broom *Genista* spp.

- Boneseed *Chrysanthemoides monilifera* subsp. *monilifera*

New and emerging herbaceous weeds that are likely to be present in the broader environment include:

- St. John Wort *Hypericum perforatum*
- Patterson's Curse *Echium plantagineum*.

3.5.7 Pest animals

Grazing pressure is a high threat to successful achievement of restoration targets for the site. Per Section 3.5.1, a 1.8 metre fence including rabbit-proof netting will ensure the exclusion deer, rabbits and macropods and ease the burden of pest control during active management of the site.

In addition to fencing, pest animals must be controlled such that their abundance, their activity and the disturbance that they cause are reduced to negligible levels, so far as this is within the reasonable control of the landowner. This means that there must be negligible surface disturbance caused by these species, no active rabbit warrens and no active fox dens. Abundance, activity and disturbance are considered negligible when they cannot be detected by conventional monitoring or are detected at such low levels as to be considered insignificant or inconsequential to the overall success of the offset site. Surface disturbance would be considered negligible if it were detected at only 1% of point intercepts along monitoring transects.

Presence of rabbits at low levels was noted during the preliminary site assessment in October 2025. Rabbits could cause damage at the site by preventing regeneration of native plants, browsing native revegetation and by encouraging weed invasion. Whilst it is expected that rabbits will be generally excluded from the site through installation and maintenance of rabbit-proof fencing (see Section 3.5.1), where required rabbits will be controlled by shooting and baiting, and the destruction of warrens or associated harbour if present (although no warrens were observed at the site during the preliminary assessment). Shooting will take place based on detection of animals while warrens will be destroyed (by implosion or fumigation) within one month of detection. Note that the ripping of rabbit warrens is not permitted under this plan.

Foxes and cats are likely to occur. These species will be controlled upon detection using standard approved control techniques (i.e. shooting, trapping and baiting). Foxes and cats are unlikely to be successfully excluded from the site by the installation of fencing, however they pose less of a threat to the success of restoration of GRGGW at the site.

If baiting for pest animals is to occur, provisions should also be made for the removal of carcases after the baiting event.

Other potential pest animals include deer species, pigs and goats. These pest animals would cause considerable damage to restoration areas if they became established, however should generally be excluded from the site by the installation and maintenance of fencing (see Section 3.5.1). Control measures for rabbits would be broadened to include these new species if they were detected within the offset site.

Kangaroos

The impact of kangaroos on the vegetation within the offset area was not considered detrimental at the time of preliminary assessment, and they will be excluded from the site via fencing throughout the 15 year active management period of the site. The fence may be adjusted (per DEECA 2023) in future years following the successful establishment of revegetation and completion of restoration targets within this OMP. The need for a Kangaroo Management Plan following alteration to fencing after the 15 year active management period may be warranted, and should be guided by the results of periodic site monitoring.

3.5.8 Eucalypt recruitment and biomass control

Eucalypt sapling thinning

There is a possibility that regenerating canopy trees (i.e. Eucalypt saplings) may need thinning if monitoring determines that their growth is stagnating. If thinning is required, no more than one third of tree sapling cover should be thinned out (removed) before monitoring recommences to determine tree recruitment vigour. The preferred methods for thinning include hand pruning or brush cutting with the application of herbicide (painted on to the exposed stem within 20 seconds).

If large quantities of vegetation need to be removed, the cut material may need to be removed from the offset site so that it does not present a fire hazard or smother existing native understorey vegetation/planted revegetation.

Removal of any Eucalypt saplings greater than 10 years old will require a conservation works permit exemption from DEECA prior to removal.

Ecological burning for biomass control

It should be noted that ecological burning is unlikely to be utilised following the implementation of any native revegetation within areas of indicative intensive restoration.

Ecological burning requirements include the following:

- Burning within the offset area will be undertaken only with due consideration to relevant health and safety issues, in consultation with the Country Fire Authority and in line with a fire management plan completed by a suitably qualified person.
- DEECA/TfN (as relevant) must be notified at least three weeks in advance of any prescribed burn and the burn must comply with any relevant laws. This OMP provides guidance for use of burning only in an ecological sense. The landowner is responsible for ensuring any burning outlined in this OMP can be carried out in a manner compliant with all other government planning requirements and permits.
- The purpose of ecological burning is for control of weeds and biomass. Fuel hazard reduction burning is not permitted within the offset site.
- Any planned burns must minimise the potential for the uncontrolled spread of fire.
    - Ecological burning will only occur outside the prescribed declared fire danger period for the region and therefore is unlikely to require a permit. However, the Country Fire Authority must be consulted if there is any doubt about the permit requirements for planned burning.
    - Ecological burns will take place during benign weather conditions (low wind and mild temperature).
- Within areas of Plains Grassy Woodland for restoration to GRGGW, the location, extent, timing and frequency of ecological burns must be based on the following ecological considerations:
    - At no time will all areas of Plains Grassy Woodland be burnt in a single season (unless occurring outside of the landowner's control such as a wildfire).
    - The extent of burning must consider what is feasible for follow-up weed control.
    - Burn areas should be selected to target particular weed species.

  - Should wildfire impact the offset site, then a review must be undertaken by a suitably qualified ecologist. If wildfire should happen to occur in the offset area this will also need to be recorded in the fire history so that appropriate fire frequencies can be maintained.
- Burnt areas will be the focus of intensive post-fire weed control works to remove regenerating weeds.
  - Photos will be taken regularly to track the progress of the post-burn recovery.
- Details of fire within the offset area must be documented in the annual reporting as outlined in Section 3.8.

3.5.9 Introduction of logs

For the purposes of this OMP, and consistent with the VQA method (DSE 2004), logs are defined as dead timber fallen to the ground (substantially detached from the parent tree) with a diameter ≥ 10 centimetres. Large logs are those with a diameter ≥ 40 centimetres.

Logs should be introduced across the site to increase log density over the 15 year management period. The minimum target for cover of logs is 50 metres/hectare (i.e. 1,336 meters across the site), consistent with 50% of the EVC benchmark for Plains Grassy Woodland EVC 55 within the Gippsland Plain bioregion. At least 25% of the total meterage (334 metres) should comprise large logs. Large logs are defined as those ≥40 centimetres diameter.

Introduced logs should be of an appropriate (i.e. local) source, ideally Gippsland Red-gum from other local e.g. neighbouring properties, local arborists or through consultation with EGSC. Logs could be transported in management vehicles (i.e. in the back of a ute). To limit the risk of pest/ disease introduction, the logs should be fresh cut and not have accumulated soil or started to decompose.

The cover of logs will be measured during the VQAs completed by an appropriately qualified ecologist.

3.5.10 Revegetation

Revegetation within Plains Grassy Woodland

In order to restore presence of the GRGGW community, cover of weeds must be reduced and/or cover of native understorey plants increased such that ≥50% of the perennial ground layer vegetation comprises native species.

At the time of preliminary assessment, understorey plant cover and diversity within remnant Plains Grassy Woodland was reduced. Plants within the understorey tree, prostrate shrub, large herb, medium herb and large non-tufted graminoid life forms were absent from the offset site or were present at such low covers as to be considered absent when using the VQA method. Active management tasks to promote an increase in the cover and diversity of some absent or modified plant life forms include:

- Enrichment plantings through revegetation of tubestock and direct seeding.
- Ecological burning to stimulate germination of the seed bank, reduce weed cover and reduce biomass cover.
- Pest animal control to reduce grazing pressure (as outlined in Section 3.5.7 above).
- Weed control (as outlined in Sections 3.5.4 - 3.5.6 above).

General principals to be followed during revegetation planting within remnant Plains Grassy Woodland include:

- Use seed or tubestock (seedlings) of local provenance.
- Staged seeding/planting is encouraged as this results in more than one age class on the site.
- Aim for a result with a natural appearance and avoid planting in straight lines.
- Plant in clusters, as this usually results in better survival rates than planting isolated individuals, particularly of understorey lifeforms.
- Allow for infill plantings during the course of this OMP for replacement of lost plants.

The longer that plants have to establish, the greater their potential cover and height could be at the end of Year 15. It is therefore recommended that the bulk of seeding/planting efforts be undertaken earlier within the management period rather than later. Planting will begin during Year 4 following the completion of site preparation tasks within Years 1 - 3.

Revegetation within introduced pasture for intensive revegetation

Revegetation will begin following completion of site preparation tasks (Section 3.5.3) and the effective removal of Brown-top Bent within Years 1 to 3 of active management. These preparation tasks will effectively create a 'blank slate' ready for re-establishment of native species. Revegetation efforts will employ an adaptive management approach and will be guided by a detailed Revegetation Plan (to be prepared). The Revegetation Plan will outline soil testing requirements (including at both reference site/s and within the restoration areas for key matters such as soil chemistry, soil condition and compaction) and preparation activities, plant species selection and resourcing information including (including discussion of seed production facilities), planting/seeding methods, soil and water management, maintenance and follow up care requirements.

Revegetation efforts within introduced pasture will trial a combination of high-density direct seeding and tubestock planting across different intensive restoration zones to determine the most effective method for restoring GRGGW in this location. The trials will compare a top-down approach, where canopy species are established first to create shade and microclimatic conditions for later understorey revegetation, with a bottom-up approach, where diverse understorey grasses and forbs are initially established through high-density direct seeding before infill planting woody vegetation (i.e. canopy trees and shrubs). The design of the trial will be outlined in the Revegetation Plan. By testing these methods side-by-side, the site will evaluate differences in establishment success, vegetation structure, and long-term resilience, providing evidence-based guidance for future restoration of Plains Grassy Woodland ecosystems elsewhere.

Target covers for each lifeform to be achieved by the end of the active management period are provided in Table 5.

Table 5 Revegetation targets within intensive restoration areas (i.e. introduced pasture)

Species	Common name	Target cover (%) and diversity	Indicative progress goal
Canopy			
Eucalyptus tereticornis subsp. *mediana*	Gippsland Red Gum	Cover: 10% across each intensive revegetation zone Diversity: N/A	Cover goals across intensive restoration areas: • 5% cover achieved by end of Year 10 • 10% cover achieved by end of Year 15
Understorey tree			

Species	Common name	Target cover (%) and diversity	Indicative progress goal
Acacia implexa *Acacia dealbata* *Acacia mearnsii*	Lightwood Silver Wattle Blackwood	Cover: 5% across each intensive revegetation zone Diversity: N/A	Cover goals across intensive restoration areas: • 2% cover achieved by end of Year 10 • 5% cover achieved by end of Year 15
Medium Shrub			
Melicytus dentatus	Native Tree Violet	Cover: 5% across each intensive revegetation zone Diversity: ≥1 species within each intensive restoration area	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 8 • 3% cover achieved by end of Year 10 • 5% cover achieved by end of Year 15
Small and Prostrate Shrub			
Pimelea humilis *Bossiaea prostrata*	Common Rice-flower Creeping Bossiaea	Cover: 1% across each intensive revegetation zone Diversity: N/A	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 15
Large herb lifeform			
Wahlenbergia gracilis *Xerochrysum viscosum* *Chrysocephalum semipapposum* *Senecio hispidulus* *Senecio quadridentatus*	Sprawling Bluebell Sticky Everlasting Clustered Everlasting Rough Fireweed Cotton Fireweed	Cover: 5% across each intensive revegetation zone Diversity: N/A	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 8 • 3% cover achieved by end of Year 12 • 5% cover achieved by end of Year 15
Medium herb lifeform			
Chrysocephalum apiculatum *Veronica gracilis* *Atriplex semibaccata* *Einadia nutans* *Gonocarpus tetragynus* *Hydrocotyle laxiflora* *Hypericum gramineum* *Laxmannia gracilis* *Oxalis perennans* *Solengyne domini* *Leptorhynchos squamatus*	Common Everlasting Slender Speedwell Berry Saltbush Nodding Saltbush Common Raspwort Stinking Pennywort Small St John's Wort Slender Wire-lily Grassland Wood-sorrel Smooth Solengyne Scaly Buttons	Cover: 5% across each intensive revegetation zone Diversity: ≥5 species within each habitat zone	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 8 • 3% cover achieved by end of Year 12 • 5% cover achieved by end of Year 15

Species	Common name	Target cover (%) and diversity	Indicative progress goal
Acaena echinata	Sheep's Burr		
Large Tufted Graminoid			
Austrostipa rudis *Lomandra longifolia*	Veined Spear-grass Wattle Mat-rush	Cover: 5% across each intensive revegetation zone Diversity: ≥5 species within each habitat zone	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 8 • 3% cover achieved by end of Year 12 • 5% cover achieved by end of Year 15
Medium Tufted Graminoid			
Rytidosperma racemosa var. *racemosa* *Rytidosperma setacea* *Rytidosperma tenuior* *Carex breviculmis* *Lomandra filiformis*	Stiped Wallaby Grass Bristly Wallaby-grass Purplish Wallaby-grass Common Grass-sedge Wattle Mat-rush	Cover: 50% across each intensive revegetation zone Diversity: ≥5 species within each habitat zone	Cover goals across intensive restoration areas: • 2% cover achieved by end of Year 5 • 25% cover achieved by end of Year 8 • 40% cover achieved by end of Year 12 • 50% cover achieved by end of Year 15
Medium Non-Tufted Graminoid			
Microlaena stipoides var. *stipoides*	Weeping Grass	Cover: 10% across each intensive revegetation zone Diversity: ≥1 species within each intensive restoration area	Cover goals across intensive restoration areas: • 1% cover achieved by end of Year 8 • 5% cover achieved by end of Year 12 • 10% cover achieved by end of Year 15

3.6 Ongoing management commitments

After 15 years, management actions will focus on maintaining the improved condition of vegetation so that it continues to meet the GRGGW condition thresholds, and protecting the site in perpetuity under the *Conservation, Forests and Lands Act 1987* or the *Victorian Conservation Trust Act 1972* (depending on chosen security mechanism). Management actions will be as described above in Section 3.5 on an as-needs basis. Targets to be maintained are as summarised in Table 6.

3.7 Monitoring

A robust annual monitoring program must be implemented to assess progress towards achieving the performance criteria and targets set out in this OMP. Monitoring will take place in the spring or early summer before management actions commence, so that the baseline (Year 0) condition of the offset site can be documented. Annual monitoring thereafter will take place under the same or similar seasonal conditions and using the same monitoring methods. The monitoring will not only detect changes (ideally improvements) in the condition of the offset site but also identify changes that may need to be made to management actions so as to bring about further improvements.

A monitoring schedule is provided in Table 8 and explained in more detail in the following sections.

Monitoring and reporting activities to be undertaken by a qualified ecologist is the responsibility of EGSC.

3.7.1 Land use monitoring

Threats posed by unauthorised activities are most likely to occur if fencing is damaged or after a land ownership change. Fencing will be assessed for its effectiveness at least annually by the landowner.

Potential land-use changes will be checked independently at least twice after the offset site is formally established and registered, through the audits required as part of this OMP (Section3.9). Monitoring of the management actions by DEECA/TfN (as relevant) will begin upon registration of the security mechanism on title and continue for 15 years.

3.7.2 Weed monitoring

Weed monitoring will be undertaken using two methods:

- Annual point intercept transects as part of condition monitoring (outlined below), conducted in spring or early summer by a suitably qualified ecologist.
- Regular site walkovers by the landowner or appointed land manager.

Permanent point intercept transects will provide an objective estimate of weed covers across the offset site. They will allow for an objective assessment of whether weed management performance targets are being met. However, transects are unlikely to detect all weed infestations across the offset site (particularly new and emerging weeds) because transect monitoring relies on a sub-sampling approach. For this reason, point intercept transects will be complemented with regular site walkovers.

Site walkovers will be conducted quarterly. Site walkovers are a method of monitoring with the particular intent of identifying new threats (such as new weed species, or newly identified weed infestations and management issues) that would require a rapid management response to eradicate or rectify before the issue becomes fully established. This also informs the adaptive management of the offset site. Site walkovers involve the dedicated survey of an area to identify such issues and will be documented with dates, duration, personnel and notes including the general observations that were made during the walkover. This will in turn drive the management efforts in response to emerging issues.

Considering the size of the offset and it's open and flat terrain, a site walkover covering 2-3 hours is likely to detect even relatively small occurrences of target species, most of which are relatively visible and detectable. During site walkovers, locations of high threat weed infestations will be mapped with a GPS. Gradually, as the landowner becomes more in-tune with the offset area and the potential threats, site walkovers can be specifically targeted towards known problematic areas.

If either weed monitoring technique suggests that that weed cover is increasing, site walkovers will be conducted more frequently and inform a greater weed control effort. Site walkovers would initially increase to monthly inspections. If increases in weed cover persist despite more concerted weed control efforts, monitoring would be elevated to fortnightly inspections.

3.7.3 Pest animal monitoring

Spotlight surveys will be conducted twice annually by the landowner during spring and autumn to monitor pest animal activity, particularly rabbits. Pest animal activity will also be recorded by landowner-appointed ecologist along the point intercept transects established to monitor vegetation, if encountered. The extent of pest animal detection will determine the extent of control works with the objective being that these animals have a negligible impact on native vegetation within the offset site.

3.7.4 Eucalypt recruitment and biomass monitoring

Eucalypt recruitment and biomass accumulation or reduction will be monitored in two ways:

- Regular visual inspections by the landowner to assist with management decisions.
- Annual point intercept transects (outlined below) by the landowner-appointed ecologist. The transects will allow for objective estimates of eucalypt recruitment cover, the components of inter-tussock space (bare ground, bryophytes, lichens and soil crust) and the cover of organic litter.

The results of this monitoring will inform biomass reduction actions, including the type of actions that may be required (e.g. changes to the frequency or intensity of ecological burning), where these actions will take place and when.

3.7.5 Plains Grassy Woodland condition monitoring

The condition of Plains Grassy Woodland within the offset site will be monitored in three ways:

- Annual point intercept transects conducted by an appropriately qualified ecologist appointed by the landowner.
- VQAs completed in Years 0, 8, 10 and 15 by an appropriately qualified ecologist appointed by the landowner.
- Annual photo points collected during point intercept monitoring by the ecologist appointed by the landowner.

Point intercept transects

Condition monitoring within Plains Grassy Woodland will include the collection of point intercept data from at least four fixed line 50-metre transects. Data will be collected annually in spring or early summer within Plains Grassy Woodland. These transects will be mapped to at least 50-centimetre accuracy using a differential GPS. This will allow for data to be collected from the same transect or approximately the same transect annually. Random stratified sampling will be used to place the location of the 6 fixed transects, which will be aligned on a north-south bearing for consistency (where possible). Point intercept transects provide a rapid, simple and objective method of collecting quantitative data on the condition of native vegetation and progress towards achieving this OMP's performance criteria.

At each transect, a measuring tape is extended from the start peg (designated as 0 metres) to the end peg (designated as 50 metres). A 5-millimetre diameter steel pin (approximately 1 metre long) is inserted vertically

into the vegetation at 0.5-metre intervals along the tape, starting at 0.5 metres and finishing at 50 metres (i.e. each transect collects information at 100 data points). At each interval, the following observations will be recorded:

- The substrate at the base of the pin, categorised as one of the following:
  - Bare ground: substrate comprising silt, sand, gravel or pebbles i.e. anything with a particle size of 64 millimetres or less and therefore easily erodible (EPA 2021).
  - Rock: substrate comprising cobbles, boulders or bedrock i.e. anything with a particle size greater than 64 millimetres and therefore not easily erodible (EPA 2021).
  - Organic litter: detached plant material.
  - Soil crust: a hard 'crust-like' layer, often with no vertical structure, formed on the soil surface by a combination of algae, crustose cryptogamic life forms and soil particles (DSE 2004).
  - Bryophytes and lichens: a broad grouping of attached non-vascular terrestrial plants, differentiated from soil crust by its vertical structure (DSE 2004).
  - Vascular vegetation: attached vascular plant material. This category is used where the base of the pin rests on a vascular plant, such as the rosette leaves of a herb (native or weed), in which case the species to which the vegetation belongs is also recorded.
  - Water: substrate consisting of running water or a standing pool or puddle of water (generally rare but possible after seasonal conditions or recent rainfall).
- All species of vascular flora touching the pin along any part of the pin's length. If the species or genus cannot be identified, the status of the plant (native or introduced) and its life form (e.g. medium or large graminoid or herb) will be the minimum information that is recorded.

The frequency at which different species and substrates are recorded along a transect provides an indication of the cover of different weeds, litter and biomass in general. It allows quantitative data of the condition of the Plains Grassy Woodland to be documented in a representative sample of the offset site. Estimating cover with point intercepts is less subjective than simple visual estimates, which means that the data are less biased by an individual observer and more suited to vegetation monitoring for detection of change. This means that the data will be more accurate and the estimates of change over time more reliable. Assessing on a continuous scale as opposed to broad categories (as is the case for the widely used Braun-Blanquet or Domin scales) also increases the resolution of the data so that relatively smaller changes can be detected.

Periodic vegetation quality assessments

The condition of the Plains Grassy Woodland was assessed in October 2025 with a VQA using the habitat hectares methodology (DSE 2004), consistent with that which was used to assess the condition of vegetation at the impact site. The habitat hectares methodology can be subjective and is generally poor at detecting small scale changes. Nevertheless, it is a useful indication of the overall quality of habitat present and incorporates local and landscape scale habitat features that other assessment methods do not.

Vegetation Quality Assessments of Plains Grassy Woodland community within the offset site will be conducted periodically in spring or early summer using the habitat hectares methodology (DSE 2004). The first assessment will be conducted during baseline monitoring (Year 0). Subsequent assessments will be conducted in Years 5, 10 and 15. The VQAs must be conducted by a suitably qualified ecologist, appointed by the landowner. Unlike point intercept transect monitoring, the periodic VQAs will provide a holistic (albeit somewhat more subjective) landscape-scale view of the condition of Plains Grassy Woodland vegetation. The VQAs will assist in determining whether conservation gains are being realised and will inform adaptive management actions (particularly as they are timed to coincide with periodic audits of the offset site).

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Photo points

Vegetation condition monitoring will include images collected in a consistent manner from the start and end of each monitoring transect by the landowner-appointed ecologist. Additional photo points will be collected by the landowner, e.g. at the location of a particular management issue, such as rabbit warrens or weed infestations, which would otherwise not be captured by the transect photo points. Photo points will allow for qualitative visual assessment of general vegetation condition and change at the offset site.

3.7.6 Intensive restoration condition monitoring

The vegetation condition within areas of intensive restoration within the offset site will be monitored in the following ways:

- Annual quadrat monitoring conducted by an appropriately qualified ecologist appointed by the landowner.
- Annual condition of revegetation monitoring conducted by an appropriately qualified ecologist appointed by the landowner.
- VQAs completed in Years 8, 10 and 15 by an appropriately qualified ecologist appointed by the landowner.
  - To be completed as described in Section 3.7.5 above.
- Annual photo points collected during quadrat monitoring by the ecologist appointed by the landowner.
  - To be completed as described in Section 3.7.5 above.

Quadrat monitoring

Eight 0.04 hectare (20 x 20 metre) quadrats will be established to assess vegetation condition.

Variables measured at each quadrat will include:

- Visual estimate of total native species cover (as percentage cover).
- Visual estimate of total weed cover (as percentage cover).
- Visual estimate of organic litter, detached plant material (as percentage cover).
- Visual estimate of inter-tussock space, the accumulated covers of bare ground, bryophytes, lichens and soil crust (as percentage cover).
- Species cover-abundance (estimated to 1% for values 1- 10, to nearest 5% for values 11-100).
- Presence/absence and density of scats (Y/N) for Macropods, sheep, rabbits, kangaroos, foxes, cats.
- Average vegetation height.
- Presence/absence of recruitment of native species (seedlings, saplings).

Condition of revegetation monitoring

Within each of the above quadrats, the following will be recorded:

- For each species planted:
  - Average height

- Average stem diameter (woody species only)
- Leaf condition (colour, turgor, wilting, scorch, deformation)
- Measure of foliage density
- Signs of stress (water stress, frost damage, insect attack)
- Reproductive status (immature, mature)
- Survival rate.

Periodic vegetation quality assessments

Vegetation Quality Assessments of intensive restoration areas within the offset site will be conducted periodically in spring or early summer using the habitat hectares methodology (DSE 2004). The first assessment will be conducted during baseline monitoring (Year 0), prior to the completion of any management actions. Subsequent assessments will be conducted in Years 5, 10 and 15. The VQAs must be conducted by a suitably qualified ecologist, appointed by the landowner. Unlike quadrat monitoring, the periodic VQAs will provide a holistic (albeit somewhat more subjective) broader-scale view of the condition of vegetation within intensive restoration areas.

The VQAs will assist in determining whether conservation gains are being realised and will inform adaptive management actions (particularly as they are timed to coincide with periodic audits of the offset site).

3.8 Reporting

This OMP requires the land manager to submit a report annually to DEECA/TfN (as relevant) for each year of the 15 years of the management plan and thereafter at the reasonable request of DEECA/TfN. Once the offset is formally established and the relevant security mechanism registered on title, reporting will occur annually with reports submitted at least two months prior to the anniversary date of the registration on title to allow adequate time for DEECA/TfN to assess compliance before the anniversary date.

The annual report will address progress against the commitments set out in this OMP. Annual reports will be prepared by the landowner and a suitably qualified ecologist. The landowner's reports will follow standard DEECA/TfN reporting requirements, to include details of management actions, observations on the abundance of weeds and pest animals, and their photopoints. The ecologist's reports will include data and interpretation of previous year's monitoring activities. Annual reports will provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of or progress against the management commitments for the offset site. Annual reports will include:

- Details of management actions, including on-ground works, undertaken within the reporting period.
- This information is provided by the landowner or by the land manager appointed by the landowner.
- Results of monitoring activities, including management of access, existing weeds, new and emerging weeds, and the presence and impact of pest animals.
- Site photographs from photo monitoring points. These photos are collected at a consistent time of the year by the ecologist and during management activities by the landowner.
- Data and interpretation of transect monitoring. This data is collected at a consistent time of the year by the ecologist.
- Details of compliance or non-compliance with the schedule of management actions (Table 6). This information is provided by the landowner or by the land manager appointed by the landowner.

- Details of compliance or non-compliance with performance criteria. This assessment is provided by the ecologist.
- Details of any incidents or new and emerging management issues, with recommendations and timing for corrective action and plan review. This assessment is provided by input from both the landowner and the ecologist.
- Details of any fires, drought events or other matters that have arisen in the reporting period.

The reporting schedule is detailed in Table 9.

3.9 Auditing

EGSC is responsible for auditing the implementation and effectiveness of this OMP. Audits will be conducted by an independent ecologist at the following stages:

- At the end of the first year of site management. This is to ensure that initial management actions are conducted as per the OMP, including ensuring initial management actions have commenced. Information in relation to any independent audit of the site for the end of Year 1 must be provided to DCCEEW within an appropriate timeframe.
- At the end of the third year of site management. This will involve an independent assessment of site preparation activities, prior to implementation of native revegetation activities. It will also involve a review of annual monitoring and management reports up to this time.
- At the end of the sixth year of site management. This will involve an independent assessment of initial native revegetation activities (Years 4 - 6), and a review of annual monitoring and management reports up to this time.
- At the end of the tenth year of site management (as per the sixth-year audit).
- Following the completion of the 15 year management period. This is to be a final audit of the implementation and effectiveness of the OMP.

DEECA/TfN (as relevant) will undertake a number of site inspections over the initial 15 year offset period. Additional site visits may be requested by the landowner.

The timing of scheduled audits is detailed in Table 8. Additional audits may be triggered as a result of a plan review (per Section 3.10) or following an environmental incident resulting in significant change to site conditions, as identified in the risk assessment (Table 7).

3.10 Plan review

Scheduled reviews of this plan will be conducted at the end of Year 5 and Year 10 by EGSC in order to ensure management actions are appropriate for site conditions at that time.

This plan also includes an adaptive management framework, where a review may be triggered by events occurring within the offset site, by the results of monitoring activities, or at the reasonable request of the landowner (e.g. due to a major fire or prolonged drought period as described in Table 7).

If, following a plan review, changes to management actions outside the scope of this OMP are proposed, approval must be gained from the landowner, DEECA/TfN (as relevant) and DCCEEW prior to implementation.

Where seasonal conditions influence management actions on the offset site, flexibility for timing of management action may be appropriate and DEECA/TfN (as relevant) advice will be sought. Any future adaptive management changes will be incorporated into the OMP and an updated version of the OMP will be supplied to DCCEEW and DEECA/TfN (as relevant).

The OMP review may involve changes to any part of the OMP, in order to adequately respond to the trigger and re-direct management actions towards achieving the environmental benefits under potentially altered site or environmental conditions. The review could involve changes to:

- Specific details of offset site management methods or timing.
- Monitoring methodology.
- Schedules of monitoring, reporting and auditing.
- Outcomes or key performance criteria.

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4 Schedule of management actions, risks, monitoring and reporting

This section provides a schedule of management actions (Table 6) for the offset area, provides an assessment of the risk of failing to achieve desired outcomes (Table 7) and specifies how this relates to the monitoring (Table 8) and reporting (Table 9) program.

The risk assessment in Table 7 uses the risk framework from the DCCEEW EMP Guidelines (DCCEEW 2024). The likelihood and consequence classification are summarised in Appendix 4.

Table 6 Schedule of management actions for years 1-15

Year	Objective – entire EPBC Act offset site	Timing of activity – month(s)	Standard to be achieved	Related monitoring activity (# – see Table 8)
Year 1 and ongoing	**Control of any unauthorised activities** Ensure the offset site is appropriately fenced and signed to preclude entry from the general public.	Start within 1 month of commencement of the OMP, with regular maintenance checks.	Exclude unauthorised activities.	Management Sec. 3.5.1 Monitoring #1 - Sec. 3.7.1
Year 1 to 3	**Site preparation – rubbish removal** Removal of redundant fencing and old farm equipment/rubbish from within the offset site.	Start within 1 month of commencement of the OMP	No redundant fencing or farm infrastructure or old machinery present within the offset site.	Management Sec. 3.5.3
Year 1 to 3	**Site preparation – weed control** Weeds to be managed in accordance with Section 3.5.3, with a focus on Brown-top Bent and other high threat herbaceous weeds.	Start within 1 month of commencement of the OMP	≤10% cover of high threat herbaceous weeds prior to the implementation of any native revegetation in Years 3 onwards.	Management Sec. 3.5.3
Year 1 and ongoing	**Eliminate all woody weeds within the offset area** Weeds to be managed in accordance with Section 3.5.4 and DEECA (2023) standards, with a focus on African Box-thorn and Gorse.	Start within 1 month of commencement of the OMP. Continue annually in spring/summer.	No mature woody weeds present by end of Year 1 (and annually thereafter). Woody weeds at <1% cover at the end of Year 15. Minimise off-target damage (avoid all native plants and herbicide input into damp areas). Record and control any woody weed regeneration/re-colonisation.	Management Sec. 3.5.4 Monitoring #2 - Sec. 3.7.2
Year 1 or Year 3 and ongoing	**Control all herbaceous weeds within the offset area** Weeds to be managed in accordance with Table 4 and DEECA (2023) standards, with a focus on perennial grass species.	Within Plains Grassy Woodland start within 1 month of	For high threat herbaceous weeds: • Cover to be ≤5% at the end of Year 15 within restored Plains Grassy Woodland.	Management Sec. 3.5.5 Monitoring #2 - Sec. 3.7.2

Year	Objective – entire EPBC Act offset site	Timing of activity – month(s)	Standard to be achieved	Related monitoring activity (# – see Table 8)
		commencement of the OMP. Within introduced pasture to be intensively restored, start in Year 3 following completion of site preparation Continue annually in spring/summer.	• Cover to be ≤30% at the end of Year 15 within restored introduced pasture. Total herbaceous weeds (whether high threat or not) to be ≤50% at the end of Year 15. Minimise off-target damage (avoid all native plants and herbicide input into damp areas). Record and control any herbaceous weed regeneration/re-colonisation.	
Year 1 and ongoing	**Monitor and eliminate new and emerging weeds** Weeds to be monitored and managed in accordance with Section 3.7.2 and DEECA (2023) standards.	Annually in spring/summer.	All new and emerging weeds at <1% cover of at the end of Year 15. Minimise off-target damage (avoid all native plants).	Management Sec. 3.5.6 Monitoring #2 - Sec. 3.7.2
Year 1 and ongoing	**Monitor and control existing pest animals** Rabbits to be monitored via spotlight surveys and managed through shooting or implosion/fumigation of warrens.	Annually in winter and summer.	Conduct spotlight surveys for rabbits and other pest animals twice annually (winter and summer) to monitor rabbit activity and numbers. Target <1% recorded surface disturbance at the end of Year 15.	Management Sec. 3.5.7 Monitoring #3 - Sec. 3.7.3
Year 1 and ongoing	**Monitor and control all new and emerging pest animals**	Ongoing.	Control numbers and impact of any new and emerging pests, such that there is negligible impact from these animals by the end of Year 15.	Management Sec. 3.5.7 Monitoring #3 - Sec. 3.7.3
From Year 3 and ongoing	**Introduction of logs**	Ongoing	Logs density must reach minimum 50 metres/hectare. A minimum of 25 metres/hectare should comprise large logs (i.e. 40cm diameter).	Management Sec. 3.5.9 Monitoring #4 - Sec. 3.7.5 and 3.7.6

Year	Objective – entire EPBC Act offset site	Timing of activity – month(s)	Standard to be achieved	Related monitoring activity (# – see Table 8)
Year 1 and ongoing	**Prepare and submit an annual report**	Annually after on-title registration.	After on-title registration of covenant, annual report is signed, dated and submitted at least 2 months prior to the anniversary date of covenant registration.	Reporting Sec. 3.8

Table 7 Risk assessment of management actions/objectives

Objective (refer to Table 9)	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingencies	Related monitoring activity (see Table 8)
Fencing	Unauthorised entry of incompatible uses and damage to vegetation.	Unlikely	Minor	Low	Incompatible uses and/or impacts identified in offset site.	Upgrade fencing and/or gates and consider increased signage.	1
Site preparation	High threat weed cover within intensive restoration areas is >10% after Year 3	Possible	High	Medium	High threat weed cover within intensive restoration areas is >10% after Year 3.	Elevate levels of weed control.	2, 5
Woody weeds and herb. weeds	Woody weeds are at ≥1% or mature woody weeds present after Year 1. Within Plains Grassy Woodland, herbaceous weeds are increased from baseline covers after Year 1. Herbaceous weeds are at >50% at Year 15.	Possible	Moderate	Low	Woody weed found within the site. Mature woody weeds present. Low threat herbaceous weed cover >15% at Year 15. High threat herbaceous weed cover >5% in Plains Grassy Woodland at Year 15. High threat herbaceous weed cover >30% in intensive restoration areas at Year 15. Total herbaceous weed cover >50% at Year 15.	Elevate levels of weed control. Minimise off-target damage (avoid all native plants) from herbicide use.	2, 4, 5
Pest animals	Rabbits or other pest animals observed within offset site. Damage to native ground cover and revegetation efforts.	Possible	Moderate	Medium	Spotlight survey results. Fresh ground disturbance or pest animal scats observed in the offset area.	Increase shooting program effort. Implement additional control methods (e.g. control of warrens beyond the offset site, introduce biocontrol agents).	3

Objective (refer to Table 9)	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingencies	Related monitoring activity (see Table 8)
					New and emerging pest observed within offset area.	Undertake control works for new and emerging pests as appropriate.	
All	Condition of Plains Grassy Woodland decreases.	Possible	Moderate	Medium	Monitoring shows a decrease in the condition of Plains Grassy Woodland or decrease in native ground cover diversity (compared with baseline) over three or more years.	Increase burning program. Elevate levels of weed control. Elevate levels of shrub control. Increase pest animal management. Undertake supplementary planting.	2, 4
All	Revegetation not meeting indicative progress targets	Possible	Major	High	Monitoring shows that the condition of revegetation is declining over two or more years. Post planting monitoring as outlined in the Revegetation Plan indicates plants are water stressed.	Increase burning program. Elevate levels of weed control. Increase replanting efforts, with planting to occur during the next favourable window where appropriate. Provide targeted supplementary watering to revegetation areas. Review OMP (Section 3.10).	2, 5

Objective (refer to Table 9)	Event or circumstance	Likelihood	Consequence	Risk level	Trigger	Contingencies	Related monitoring activity (see Table 8)
Control all high threats	Major fire or drought event. A major drought is considered to be: • ≤ 50% of long-term average rainfall over a 12 month period, • Or ≥ 2 consecutive years of below-average rainfall	Possible	Moderate	Medium	Impacts of major fire observed within offset area that impacts the species composition and abundance of native flora. Impacts of drought observed that see the mortality of ≥70 per cent of revegetation.	Implement additional watering of revegetation during the drought event to support survival of remaining plants. Assist and enhance natural regeneration post fire or drought event e.g. by elevated levels of weed control, grazing exclusion and pest control. If composition or diversity of flora has been impacted by drought/fire event, implement additional planting following the conclusion of the event. Review OMP (Section 3.10).	2, 3, 4, 5

Table 8 Monitoring schedule

#	Monitoring activity	Parameters measured	Survey/monitoring guidelines	Where	When & by whom	Reliability
1	Access monitoring	Regular inspection of fences and gates. Signs of entry to offset site.	Observations during management and monitoring activities.	Offset area	Ongoing by landowner	High
2	Weed monitoring	Locations of weed infestations. Presence of new and emerging weeds.	Site walk-over to be conducted to identify weed infestations. High threat weed infestations to be mapped using GPS. Refer to Section 3.7.2 for details.	Offset area	Quarterly by landowner – late spring and autumn	High
3	Pest animal monitoring (rabbits, new and emerging pest animals)	Presence of pest animals or signs e.g. scats, diggings, browsing or grazing.	Signs of pest animals to be recorded during spotlight surveys (and incidentally during other site inspections). Locations of rabbit warrens to be mapped using GPS. Refer to Section 3.7.3 for details.	Offset area	Twice annually by landowner – spotlight surveys in spring and autumn, incidental records during other site inspections	High
4	Gippsland Red Gum Grassy Woodland condition monitoring	Point intersection transects (cover of weeds, shrubs and biomass). Vegetation Quality Assessment (VQA). Photo points.	Quantitative data collected annually from transects to provide weed, shrub and biomass covers. VQA to provide periodic habitat condition overview in Years 0, 8, 10 and 15. Images collected from photo monitoring points annually. Refer to Section 3.7.5 for details.	Offset area	In spring or early summer by ecologist Annual quantitative data and periodic.	High
5	Intensive restoration condition monitoring	Quadrats (cover of weeds, native species and biomass).	Quantitative data collected annually from quadrats to provide weed, native and biomass covers. Quantitative data annually from quadrats to provide measures of the health of revegetation.	Offset area	In spring or early summer by ecologist	High

#	Monitoring activity	Parameters measured	Survey/monitoring guidelines	Where	When & by whom	Reliability
		Revegetation monitoring. Vegetation Quality Assessment (VQA). Photo points.	VQA to provide periodic habitat condition overview in Years 0, 8, 10 and 15. Images collected from photo monitoring points annually. Refer to Section 3.7.6 for details.		Annual quantitative data and periodic.	

Table 9 Reporting schedule

#	Type of report	Responsibility	Timing	Reporting authority	Trigger (if any)
1	Annual report. Summarises management actions completed within the offset area and results of offset site monitoring activities (Sections 3.7, 3.8).	EGSC	Annual report to be completed two months prior to the anniversary date of the covenant registration on title, up to and including Year 15	EGSC TfN/DEECA (as relevant)	Not applicable
2	Review of offset management plan (Section 3.10).	EGSC	As required.	DCCEEW TfN/DEECA (as relevant)	Significant environmental event causing widespread impact to vegetation condition within the offset site e.g. wildfire/drought.
3	Audit report (Section 3.9).	EGSC-appointed ecologist	End of Years 1, 3, 6, 10 and 15.	DCCEEW	Not applicable

References

Biosis 2023. Bairnsdale Airport air ambulance and runway extension project: Flora and fauna assessment. Report for East Gippsland Shire Council. [redacted] Biosis Pty Ltd., Wangaratta, Vic. Project no. 39221

DCCEEW 2024. *Environmental Management Plan Guidelines*. Australian Government Department of Climate Change, Energy, the Environment and Water, Canberra.

DEECA 2023. Management Standards for Native Vegetation Offset Sites. Victorian Government Department of Environment, Land, Water and Planning, Melbourne.

DELWP 2015. DELWP Output Delivery Standards for the Delivery of Environmental Activities. Victorian Government Department of Environment, Land, Water and Planning, Melbourne

DoE 2014. Environmental Management Plan Guidelines. Australian Government Department of the Environment, Canberra.

DoEE 2019. Independent Audit and Audit Report Guidelines for Controlled Actions which Have Been Approved under Chapter 4 of the Environment Protection and Biodiversity Conservation Act 1999. Australian Government Department of the Environment and Energy, Canberra.

DSE 2004. Native Vegetation: Sustaining a Living Landscape. Vegetation Quality Assessment Manual – Guidelines for Applying the Habitat Hectares Scoring Method. Victorian Government Department of Sustainability and Environment, Melbourne.

DSEPaC 2012b. Offsets Assessment Guide: For Use in Determining Offsets under the Environment Protection and Biodiversity Conservation Act 1999. Australian Government Department of Sustainability, Environment, Water, Population and Communities, Canberra.

DSEWPaC 2012a. Environment Protection and Biodiversity Conservation Act 1999: Environmental Offsets Policy. Australian Government Department of Sustainability, Environment, Water, Population and Communities, Canberra.

EPA 2021. Guideline for Environmental Management (GEM): Rapid Bioassessment Methodology for Rivers and Streams. Environmental Protection Agency Victoria, Melbourne.

Prober, S., Thiele, K., and Lunt, I. 2002. Identifying ecological barriers to restoration in temperate grassy woodlands: soil changes associated with different degradation states. Australian Journal of Botany, 50(6), 699-712. https://doi.org/10.1071/BT02052

Sinclair, S. J., Zamin, T., Gibson-Roy, P., Dorrough, J., Wong, N., Craigie, V., Garrard, G. E., and Moore, J. L. 2019. A state-and-transition model to guide grassland management. Australian Journal of Botany, 67(5), 437-453. https://doi.org/10.1071/BT18167

Spooner, P., and Allcock, K. 2006. Using a state-and-transition approach to manage endangered Eucalyptus albens (White box) woodlands. Environmental Management, 38(5), 771-783. https://doi.org/10.1007/s00267-005-0133-2

TSSC 2009. *Listing advice - Gippsland Red Gum* (Eucalyptus tereticornis *subsp*. mediana) *Grassy Woodland and Associated Native Grassland*. Threatened Species Scientific Committee, Canberra. http://www.environment.gov.au/biodiversity/threatened/communities/pubs/73-listing-advice.pdf.

Yates, C. J., and Hobbs, R. J. 1997. Woodland restoration in the Western Australian wheatbelt: A conceptual framework using a state and transition model. Restoration Ecology, 5(1), 28-35. https://doi.org/10.1046/j.1526-100X.1997.09703.x

Appendices

Appendix 1 Preliminary assessment methods

4.1 Vegetation mapping and quality assessment

The extent of native vegetation was mapped using the same methodology that was used to assess the extent and quality of native vegetation at the Bairnsdale airport impact site (Biosis 2023).

4.2 Preliminary data collection

Transects were completed to objectively assess the condition of native vegetation across the site. The methodology is described below and includes the following components:

- Seven rapid point-intercept transects and associated 20 x 20 metre quadrats.

4.2.1 Rapid point-intercept transects

Seven 50-metre long point intersect transects were completed at the offset site to collect perennial plant and other lifeform cover levels according to a comprehensive life form schema (Figure 5). The location of transects and associated quadrats were distributed across the site.

The start of each transect (southern end) was mapped using a GPS. The 50 metre tape was rolled out and aligned using a compass in the north bearing. The southern point was designated the start of the transect (meter: 0) and the north was designated the end (metre: 50). Point intercept samples were taken at 0.5-metre increments, the first at 0.5 metres, and the last at 50 metres (total of 100 samples per transect).

Variables were measured at 100 points along each transect at 0.5-metre intervals and includes:

- **Dominant cover at that point.** One of the following groups was recorded at each point: Native grass / annual native forb / perennial native forb / native sub-shrub / annual non-grass weed / perennial non-grass weed / annual grass weed / perennial grass weed / cryptogam / litter or log / bare soil or rock / rubbish.
- **Waypoint.** The southern point of each transect.
- **Photo point**. At start and end point (looking along the transect).

One category of dominant cover condition (per groups above) was recorded at each given point along the transect, meaning that the cumulative cover of each transect would equal 100%.

4.2.2 20 x 20 metre quadrats

At each transect a 20 x 20 metre quadrat was established, extending 10 metres either side of the transect.

Variables measured at each quadrat included:

- Visual estimate of total native species cover (as percentage cover).
- Visual estimate of total weed cover (as percentage cover).
- Visual estimate of organic litter, detached plant material (as percentage cover).

- Visual estimate of inter-tussock space, the accumulated covers of bare ground, bryophytes, lichens and soil crust (as percentage cover).
- Species cover-abundance (estimated to 1% for values 1- 10, to nearest 5% for values 11-100).

Appendix 2 Preliminary assessment results

Flora species list

The flora list presented below is from the preliminary assessment. The following abbreviations and symbols are relevant to this Appendix:

Code	Meaning	Reference
National listings (EPBC Act)		
CR	Critically endangered	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
EN	Endangered	
VU	Vulnerable	
State listings (FFG Act)		
x	Extinct	Victorian *Flora and Fauna Guarantee Act 1988* (FFG Act)
cr	Critically endangered	
e	Endangered	
v	Vulnerable	
t	Threatened	
P	Protected (public land only)	
Noxious weed status (CaLP Act)		
SP	State prohibited species	Victorian *Catchment and Land Protection Act 1994* (CaLP Act)
RP	Regionally prohibited species	
RC	Regionally controlled species	
R	Restricted species	

Table 10 Flora species observed at the site during preliminary assessment

Status	Scientific Name	Common Name
Indigenous species		
	Acacia implexa	Lightwood
RU	*Acacia mearnsii*	Black Wattle
	Acacia melanoxylon	Blackwood
	Allocasuarina spp.	Sheoak
	Anthosachne scabra s.l.	Common Wheat-grass
	Austrostipa spp.	Spear Grass
	Crassula spp.	Crassula
	Dichondra repens	Kidney-weed
	Einadia nutans	Nodding Saltbush
	Eleocharis sphacelata	Tall Spike-sedge
e, P, r	*Eucalyptus bosistoana*	Coast Grey-box
	Eucalyptus bridgesiana s.s.	But But
	Eucalyptus obliqua	Messmate Stringybark
	Eucalyptus polyanthemos	Red Box
	Eucalyptus tereticornis subsp. *mediana*	Gippsland Red-gum
	Eucalyptus viminalis subsp. *pryoriana*	Coast Manna-gum
	Exocarpos cupressiformis	Cherry Ballart
	Gahnia radula	Thatch Saw-sedge
	Hypericum gramineum	Small St John's Wort
	Juncus bufonius	Toad Rush
	Juncus spp.	Rush
	Laphangium luteoalbum	Jersey Cudweed
	Lomandra filiformis	Wattle Mat-rush
	Lomandra longifolia	Spiny-headed Mat-rush
	Malva spp.	Mallow
	Melicytus dentatus s.s.	Tree Violet
	Microlaena stipoides var. *stipoides*	Weeping Grass
	Oxalis perennans	Grassland Wood-sorrel
	Rytidosperma racemosum var. *racemosum*	Slender Wallaby-grass
	Rytidosperma setaceum	Bristly Wallaby-grass
	Rytidosperma spp.	Wallaby Grass
	Schoenus apogon	Common Bog-sedge
	Themeda triandra	Kangaroo Grass
	Wahlenbergia spp.	Bluebell
Introduced species		
	Acetosella vulgaris	Sheep Sorrel
	Agrostis capillaris	Brown-top Bent
	Anthoxanthum odoratum	Sweet Vernal-grass
	Arctotheca calendula	Cape Weed

Status	Scientific Name	Common Name
R	*Asparagus asparagoides*	Bridal Creeper
	Briza minor	Lesser Quaking-grass
	Bromus catharticus	Prairie Grass
	Bromus hordeaceus	Soft Brome
	Cenchrus clandestinus	Kikuyu
	Centaurium erythraea	Common Centaury
	Chenopodium album	Fat Hen
RC	*Cirsium arvense* var. *arvense*	Perennial Thistle
RC	*Cirsium vulgare*	Spear Thistle
	Cynodon dactylon var. *dactylon*	Couch
	Dactylis glomerata	Cocksfoot
	Ehrharta erecta	Panic Veldt-grass
	Ehrharta longiflora	Annual Veldt-grass
	Eleusine indica	Goose-grass
RC	*Eragrostis curvula*	African Love-grass
	Erigeron canadensis s.s.	Canadian Fleabane
	Gamochaeta americana	Spiked Cudweed
	Holcus lanatus	Yorkshire Fog
	Hypochaeris radicata	Flatweed
	Leontodon spp.	Hawkbit
	Lepidium africanum	Common Peppercress
	Lolium rigidum	Wimmera Rye-grass
	Lotus angustissimus	Slender Bird's-foot Trefoil
	Malva parviflora	Small-flower Mallow
	Paronychia brasiliana	Whitlow Wort
	Paspalum dilatatum	Paspalum
	Plantago coronopus	Buck's-horn Plantain
	Plantago lanceolata	Ribwort
	Romulea rosea	Onion Grass
RC	*Rubus anglocandicans*	Common Blackberry
	Solanum nigrum s.s.	Black Nightshade
	Sonchus asper s.s.	Rough Sow-thistle
	Sonchus oleraceus	Common Sow-thistle
	Sporobolus africanus	Rat-tail Grass
	Trifolium spp.	Clover
	Vulpia bromoides	Squirrel-tail Fescue

Transect photos



Photo 1 Transect 1 (T01), southern end facing north (photo taken 30 October 2025).



Photo 2 Transect 2 (T02), southern end facing north (photo taken 30 October 2025).



Photo 3 Transect 3 (T03), southern end facing north (photo taken 30 October 2025).



Photo 4 Transect 4 (T04), southern end facing north (photo taken 30 October 2025).



Photo 5 **Transect 5 (T05), southern end facing north (photo taken 30 October 2025).**



Photo 6 **Transect 6 (T06), southern end facing north (photo taken 30 October 2025).**



Photo 7 Transect 7 (T07), southern end facing north (photo taken 30 October 2025).

Vegetation quality assessment scores

Year*	Date	Habitat Zone	EVC*	Approx. area (ha)*	Large trees	Tree canopy cover	Under-storey	Lack of weeds	Recruit-ment	Organic litter	Logs	Site condition subtotal	Patch size	Neigh-bour-hood	Distance to core area	Landscape context subtotal	Total habitat score
Preliminary	20/11/2025	1a	EVC_55	1.1399	8	5	15	4	3	3	2	40	2	0	3	5	45
Preliminary	20/11/2025	1b	EVC_55	1.0372	8	5	15	4	3	3	2	40	2	0	3	5	45
Preliminary	20/11/2025	2a	EVC_55	1.8423	6	3	15	0	5	3	0	32	2	0	3	5	37
Preliminary	20/11/2025	2b	EVC_55	0.1699	6	3	15	0	5	3	0	32	1	0	3	4	36
Preliminary	20/11/2025	2c	EVC_55	0.1647	10	3	15	0	5	3	0	36	1	0	3	4	40
Preliminary	20/11/2025	2d	EVC_55	0.3017	10	3	15	0	5	3	0	36	2	0	3	5	41
Preliminary	20/11/2025	2e	EVC_55	0.4634	10	3	15	0	5	3	0	36	2	0	3	5	41
Y0	**20/11/2025**	**Weighted Offset Site Average**	**EVC_55**	**5.119**	**7.577**	**3.851**	**15.000**	**1.701**	**4.149**	**3.000**	**0.851**	**36.129**	**1.935**	**0.000**	**3.000**	**4.935**	**41.063**

Notes:

- Baseline monitoring to be conducted will be designated 'Y0'. Subsequent years will be denoted as 'Y2', 'Y3' and so on, depending on when the offset site is implemented.
- EVC (Ecological Vegetation Class): 55 means Plains Grassy Woodland.
- Weighted average: Weighted average scores for the entire offset site have been calculated with reference to the approximate area of each habitat zone, whereby the contribution that a given habitat zone makes to the weighted score is proportionate to the relative area of the habitat zone.

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Appendix 3 Habitat scoring system

Habitat scoring system for Threatened Ecological Communities

Vegetation Quality Assessments (VQA) were undertaken by Biosis for all the patches of Gippsland Red Gum Grassy Woodland (in a derived grassland state) in the Bairnsdale airport impact area (Biosis 2023). The assessment used was the Victorian Department of Energy, Environment and Climate Action (DEECA) VQA method, underpinning the 'habitat hectares' concept (DSE, 2004). Native vegetation was defined in accordance with the *'Guidelines for the removal, destruction or lopping of native vegetation'* (DELWP 2017).

'Habitat hectares' is Victoria's standard metric to quantify native vegetation losses and gains for regulatory approvals and biodiversity offsets. It gives habitats a score out of 100: a site condition score out of 75 plus a landscape context score out of 25. When expressed as a decimal (i.e. divided by 100 for a score out of 1), the VQA score can then be multiplied by the area of the vegetation (in hectares) to calculate the number of habitat hectares in a patch of vegetation.

This method is a good surrogate for habitat quality because it considers important structural and functional elements. These include the density of large trees, understorey complexity, plant species richness, weediness, plant recruitment and coarse woody debris. It also considers the physical connectivity of native vegetation in the landscape (e.g. patch size, configuration and continuity). VQA scores are readily converted to habitat scores out of 10 for use in the Offsets Assessment Guide (Table 11, Table 12).

A total weighted average VQA score (out of 100) was determined for Gippsland Red Gum Grassy Woodland within the impact area. The weighting was based on the area that each patch contributed to the total area of the TEC within the impact area.

Weighted-average VQA scores were divided by 10 (for a score out of 10) and rounded to the nearest whole number, the final score was entered in the Offsets Assessment Guide (Table 11).

Table 11 Habitat quality scoring system for Threatened Ecological Communities

Parameter	Scoring system
Site Condition (max. 7.5 points for treed EVCs)	For treed EVCs (i.e. Plains Grassy Woodland): • Density of large trees, as defined by the relevant EVC benchmark, contributes up to10/100 to the VQA score (1/10 to the habitat quality score). • Tree canopy cover, relative to the EVC benchmark, contributes up to 5/100 to the VQA score (0.5/10 to the habitat quality score). • Presence/absence of large logs and total length of logs, relative to the EVC benchmark, contribute up to 5/100 to the VQA score (0.5/10 to the habitat quality score). • Lack of weed cover and proportion of weed cover due to high threat weeds contribute up to 15/100 to the VQA score (1.5/10 to the habitat quality score). • Percentage recruitment of woody species, scaled according to woody species diversity, contributes up to 10/100 to the VQA score (1/10 to the habitat quality score). • Cover of organic litter, scaled to dominant litter type (native/non-native) and relative to the EVC benchmark, contributes up to 5/100 to the VQA score (0.5/10 to the habitat quality score). • Number of species and the cover and diversity of plant lifeforms, relative to the relevant EVC benchmark, contribute up to 25/100 to the VQA score (2.5/10 to the habitat quality score).

Parameter	Scoring system
	• Note: if the key diagnostic characteristics and condition thresholds for the TEC are not met, the site condition score is reduced by 1 point.
Site context (max. 2.5 points for all EVCs)	For all EVCs (whether treed or treeless and whether or not they meet the key diagnostic characteristics and condition thresholds for the TEC): • Size of the patch of native vegetation within which the TEC is located contributes up to 10/100 to the VQA score (1/10 to the habitat quality score). • Amount and configuration of native vegetation within the neighbourhood, within a radius of up to 5 km, contributes up to 10/100 to the VQA score (1/10 to the habitat quality score). • Distance to the nearest core area of native vegetation (areas of native vegetation >50 ha) contributes up to 5/100 to the VQA score (0.5/10 to the habitat quality score).

Table 12 Conversion of VQA scores to habitat quality score for the Offsets Assessment Guide

Vegetation Quality Assessment score (/100)	Raw score for Offsets Assessment Guide (/10)	Rounded Score for Offsets Assessment Guide (/10)
0 to <5	0 to <0.5	0
≥5 to <15	≥0.5 to <1.5	1
≥15 to <25	≥1.5 to <2.5	2
≥25 to <35	≥2.5 to <3.5	3
≥35 to <45	≥3.5 to <4.5	4
≥45 to <55	≥4.5 to <5.5	5
≥55 to <65	≥5.5 to <6.5	6
≥65 to <75	≥6.5 to <7.5	7
≥75 to <85	≥7.5 to <8.5	8
≥85 to <95	≥8.5 to <9.5	9

Confidence in result

The Commonwealth Department of Environment's '*How to use the offsets assessment guide*' (undated), Section G, outlines the aspects that go into determining the confidence in result percentage. Paragraph four of Section G discusses the past record of the proponent: The past record of the proponent should also be taken into account in determining this figure. That is, confidence in result must take into account not only the confidence in being able to achieve the conservation gain but also take into account the risk that the offset may not be delivered. DCCEEW can have a high level of confidence in EGSC's ability achieve the conservation gain and deliver the offsets for a number of reasons:

- As a public land manager, EGSC has a proven track record of delivering and achieving conservation outcomes at parks and reserves under its management. Council has established offset sites, focusing on high conservation value property on freehold land under its own ownership in order to support the protection and management of values on site.
- As a public land manager, there is a negligible risk that EGSC will not fulfil its commitments required under the offset program as they are demonstrably committed to environmental outcomes, and

understand the commitments being made. Further, there is negligible chance EGSC will not exist in the future and not be able to complete these commitments.

- EGSC undertakes best practice environmental management and has a pro-active and transparent approach with regulators including advice of non-compliances. Council always seeks a positive outcome and works with any legislation or responsible agency to resolve issues.
- EGSC has developed and implemented responsible environmental management, which is embedded in their Environmental Sustainability Strategy. EGSC strives to limit their impact on the environment and create a sustainable future. EGSC have recently released the Environment Strategy 2019-2020 Annual Report. This was an outcome of the Environmental Sustainability Strategy 2014-2017. A revision of this study is currently underway.

In addition to EGSC's past record and capabilities, the confidence in result score for the proposed offset site also accounts for the level of certainty about the successful achievement of the proposed change in quality.

Impact area

The Bairnsdale airport impact area includes:

- 10.354 hectares of Gippsland Red Gum Grassy Woodland in a derived grassland condition state, with a weighted average VQA score of 29.843/100 (habitat quality score of 3/10).

The impact calculator inputs into the Offsets Assessment Guide for Gippsland Red Gum Grassy Woodland are shown in Table 13 below.

Table 13 Impact calculator inputs into the Offset Assessment Guide for Gippsland Red Gum Grassy Woodland

Parameter	Input	Justification
Annual probability of extinction	6.8%	The annual probability of extinction for Gippsland Red Gum Grassy Woodland, a critically endangered ecological community, is 6.8% based on the IUCN category definitions. This is set by DCCEEW guidelines.
Area of habitat	10.354 ha	A total of 10.354 ha was mapped will require removal for the Bairnsdale airport runway extension project
Quality	3	Biosis assessed the quality of the Gippsland Red Gum Grassy Woodland in June 2023 (Biosis 2023) using the VQA method (DSE 2004). The weighted average VQA score of all Gippsland Red Gum Grassy Woodland within the Bairnsdale airport impact area is 29.843/100, which converts to a habitat quality score of 3/10. This score is made up of the following components: • A weighted average site condition score of 26.843/75, made up of the following component scores: large tree score of 0/10; tree canopy score of 01/5; log score of 0/5; lack of weeds score of 6.841/15; recruitment score of 0.998/10; organic litter score of 4.995/5; and, understorey score of 14.008/25.

Parameter	Input	Justification
		• A weighted average landscape context score of 3/25, made up of the following weighted average VQA component scores: patch size score of 2/10; neighbourhood score of 0/10; and, distance to core area score of 1/5.
Total quantum of impact	3.11	This value is set by the offsets assessment guide and represents the value of the Gippsland Red Gum Grassy Woodland within the impact area, expressed in adjusted hectares. The absolute area (in hectares) has been adjusted to account for the quality of this example of Gippsland Red Gum Grassy Woodland.

Proposed [redacted] restoration offset

The offset calculator inputs into the Offsets Assessment Guide for areas of basic and intensive restoration are outlined in Table 14 and Table 15 respectively, with corresponding screenshots of the completed Offsets Assessment Guide in Table 16 and Table 17 below.

Table 14 Offsets Assessment Guide inputs – Plains Grassy Woodland restoration areas

Parameter	Input	Justification
Risk-related time horizon	20 years	The offset site will be protected and managed as a conservation area in perpetuity, but 20 years is the maximum time period that can be entered into this field.
Start area	5.12 hectares	This is the area of remnant Plains Grassy Woodland vegetation proposed for restoration to Gippsland Red Gum Grassy Woodland.
Risk of loss without offset	0%	As advised by DCCEEW with reference to *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al. 2017).
Risk of loss with offset	0%	As advised by DCCEEW with reference to *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al. 2017).
Confidence in result – risk of loss	90%	A 90% confidence reflects that there is no risk of loss Gippsland Red Gum Grassy Woodland community (with or without an offset in place) given the community is not currently present but noting that risk of loss of the TEC's remaining structural elements still exists.
Time until ecological benefit	15 years	A measurable improvement in habitat quality will be achieved after 15 years of management in accordance with the OMP.
Start quality	3	Biosis assessed the quality of Plains Grassy Woodland in October 2025 using the VQA method (DSE 2004). The weighted average VQA score of Plains Grassy Woodland areas for restoration to GRGGW within the proposed offset site is 41.063/100, which converts to a habitat quality score of 4/10. This score is made up of the following components: • A weighted average site condition score of 36.129/75, made up of the following component scores: large tree score of 7.577/10; tree canopy

Parameter	Input	Justification
		score of 3.851/5; log score of 0.851/5; lack of weeds score of 1.701/15; recruitment score of 4.149/10; organic litter score of 3.000/5; and, understorey score of 15/25. • A weighted average landscape context score of 4.935/25 (0.4935/2.5), made up of the following weighted average VQA component scores: patch size score of 1.935/10; neighbourhood score of 0.000/10; and, distance to core area score of 3.000/5. As the vegetation is not consistent with the TEC key diagnostic characteristics and condition thresholds, the habitat quality score is reduced by an additional 1 point (per Table 11), bringing the habitat quality score to 3/10.
Future quality without offset	3	Consistent with 'start quality' above.
Future quality with offset	6	Intensive management of the Gippsland Red Gum Grassy Woodland as an offset site would lead to ecological improvements, resulting in a weighted average VQA score of 59.428/100. This score is made up of the following components: • A weighted average site condition score of 48.428/75. • A weighted average landscape context score of 11.000/25. Ecological improvements to the site condition score would be brought about through: • Reinstatement of small and large logs, leading to an improvement to the weighted average log score of 4.149/100 (from 0.851 to 5.000). • Weed control, which is likely to reduce cover of both high and low-threat weeds and remove all woody weeds. This will lead to an improvement to the weighted average lack of weeds score of 4.299/100 (from 1.701 to 6.000). • Stock exclusion, weed control and pest animal control, all of which are likely to also encourage understorey recruitment and lead to an improvement to the weighted average recruitment score of 1.851/100 (from 4.149 to 6.000). • Ecological burns and revegetation which are likely to improve the cover of organic litter and lead to an improvement to the weighted average organic litter score 2.000/100 (from 3.000 to 5.000)). • Maintenance of the weighted average large tree score (7.577/100), tree canopy score (3.851/100) and understorey score (15.000/100) i.e. no change. Ecological improvements to the landscape condition score would be brought about through: • Restoration of the surrounding introduced pasture areas to reinstate GRGGW vegetation between disjunct areas of Plains Grassy Woodland, leading to an increase in the patch size to >20 hectares (but 'significantly disturbed'). This will improve the weighted average patch size score 6.065/100 (from 1.935 to 8.000/10). • Maintenance of the weighted neighbourhood (0.000/10) and distance to core area score (3.000/10) i.e. no change.

Parameter	Input	Justification
Confidence in result – raw gain	80%	There is a high level of confidence that the landowner and future landowners would have the support, guidance and resources to intensively manage the Plains Grassy Woodland at [redacted] There is a high level of confidence that implementation of the actions listed above would result restoration of GRGGW within areas of remnant Plains Grassy Woodland.

Table 15 Offsets Assessment Guide inputs – intensive restoration areas

Parameter	Input	Justification
Risk-related time horizon	20 years	The offset site will be protected and managed as a conservation area in perpetuity, but 20 years is the maximum time period that can be entered into this field.
Start area	21.5863 hectares	This is the area of remnant introduced pasture proposed for restoration to Gippsland Red Gum Grassy Woodland.
Risk of loss without offset	0%	As advised by DCCEEW with reference to *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al. 2017).
Risk of loss with offset	0%	As advised by DCCEEW with reference to *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act* (Maseyk et al. 2017).
Confidence in result – risk of loss	100%	A 100% confidence reflects that there is no risk of loss Gippsland Red Gum Grassy Woodland community (with or without an offset in place) given the community is not currently present and that no structural elements of the community remain.
Time until ecological benefit	15 years	A measurable improvement in habitat quality will be achieved after 15 years of management in accordance with the OMP.
Start quality	0	As no native vegetation is currently present, the start quality score is 0.
Future quality without offset	0	Consistent with 'start quality' above.
Future quality with offset	5	Intensive management of the introduced pasture as an offset site will lead to ecological improvements, resulting in a weighted average VQA score of 51/100. This score is made up of the following components: • A weighted average site condition score of 40/75. • A weighted average landscape context score of 11/25. Ecological improvements to the site condition score would be brought about through: • Reinstatement of small and large logs, leading to a weighted average log score of 5/100 • Weed control, which will reduce cover of both high and low-threat weeds and remove all woody weeds. This will lead to a weighted average lack of weeds score of 9/100. • Stock exclusion, weed control and pest animal control, all of which will lead to a weighted average recruitment score of 6/100. • Ecological burns and revegetation which will improve the cover of organic litter and lead to a weighted average organic litter score of 5/100. • Revegetation and weed control which improve the cover of native species and will lead to a weighted average understorey score of 15/100 • Maintenance of the large tree score (0/100) and tree canopy scores (0/100) i.e. no change.

Parameter	Input	Justification
		Ecological improvements to the landscape condition score would be brought about through: • Reinstatement of GRGGW within introduced pasture thank links disjunct areas of Plains Grassy Woodland will lead to an increase in the patch size to >20 hectares (but 'significantly disturbed'). This will lead to a weighted average patch size score of 8.000/100 (from 0 to 8.000/10). • Maintenance of the weighted neighbourhood (0.000/10) and distance to core area score (0.000/10) i.e. no change.
Confidence in result – raw gain	70%	There is confidence that the landowner and future landowners would have the support, guidance and resources to undertake intensive restoration of introduced pasture at [redacted]. There is a high level of confidence that implementation of the actions listed above would result restoration of GRGGW within intensive restoration areas.

Table 16 Offset calculations for [redacted] Gippsland Red Gum Grassy Woodland offset site – basic restoration areas

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Clear row	Yes	Permanent removal of Gippsland Red Gum Grassy Woodland within project area	Area	10.4	Hectares	Indigenous Design ecological assessments 2020
			Quality	3	Scale 0-10	
			Total quantum of impact	3.11	Adjusted hectares	

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirem
Ecological Communities																		
Area of community	Yes	3.11	Adjusted hectares	Impact to be compensated by permanent protection of a greater area of this community off-site.	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	5.12	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	30%	0.00	0.00	0.46	14.75%	No
									Future area without offset (adjusted hectares)	5.1	Future area with offset (adjusted hectares)	5.1						
					Time until ecological benefit	15	Start quality (scale of 0-10)	3	Future quality without offset (scale of	3	Future quality with offset (scale of	6	3.00	80%	2.40	0.89		

Table 17 Offset calculations for [redacted] Gippsland Red Gum Grassy Woodland offset site – intensive restoration areas

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Clear row	Yes	Permanent removal of Gippsland Red Gum Grassy Woodland within project area	Area	10.4	Hectares	Indigenous Design ecological assessments 2020
			Quality	3	Scale 0-10	
			Total quantum of impact	3.11	Adjusted hectares	

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirem
Ecological Communities																		
Area of community	Yes	3.11	Adjusted hectares	Impact to be compensated by permanent protection of a greater area of this community off-site.	Risk-related time horizon (max. 20 years)	20	Start area (hectares)	21.586	Risk of loss (%) without offset	0%	Risk of loss (%) with offset	0%	0.00	100%	0.00	0.00	2.82	90.67%	Yes
									Future area without offset (adjusted hectares)	21.6	Future area with offset (adjusted hectares)	21.6						
					Time until ecological benefit	15	Start quality (scale of 0-10)	0	Future quality without offset (scale of	0	Future quality with offset (scale of	5	5.00	70%	3.50	1.30		

Appendix 4 Risk framework

This risk framework has been reproduced from the Environmental Management Plan Guidelines (DCCEEW 2024).

Risk rating

		Consequence				
		Minor	**Moderate**	**High**	**Major**	**Critical**
Likelihood	**Highly likely**	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Likelihood

Qualitative measure of likelihood	How likely is it that this event/issue will occur after management actions have been put in place or are being implemented?
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely
Rare	May occur in exceptional circumstances

Consequence

Qualitative measure of consequence	What will be the consequence/result if the issue does occur?
Minor	Minor incident of environmental damage that can be reversed
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts
High	Substantial instances of environmental damage that could be reversed with intensive effort
Major	Major loss of environmental amenity and real danger of continuing
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage


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