Australian Rail Track Corporation

Inland Rail Illabo to Stockinbingal

Box Gum Restoration Plan

July 2025



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Inland Rail Illabo to Stockinbingal
Box Gum Restoration Plan

Australian Rail Track Corporation

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Approved by:	Selga Harrington	28/05/2025	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Definitions and abbreviations

ARMA	Active Restoration Management Action
APZ	Asset Protection Zone
BAM-C	Biodiversity Assessment Method Calculator
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCS	Former Biodiversity, Conservation and Science (BCS) Group of the NSW Department of Climate Change, Energy, the Environment and Water
Box Gum Woodland TEC	White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland Threatened Ecological Community
BSA	Biodiversity Stewardship Agreement
BSA site	Biodiversity Stewardship Agreement site
BSSAR	Biodiversity Stewardship Site Assessment Report
CoA	Conditions of Approval
Commonwealth DCCEEW	The Commonwealth Department of Climate Change, Energy, the Environment and Water
CPHR	Conservation Programs, Heritage and Regulation Group within the Department of Climate Change, Energy, the Environment and Water (DCCEEW)
EMM	BCT Ecological Monitoring Module
EMM Operational Manual	BCT Ecological Monitoring Module Operational Manual
EP&A Act	*Environmental Planning and Assessment Act 1979* (EP&A Act).
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
Healthy condition threshold	A minimum condition of ground cover required (by region) using % ground cover and an average native grass sward height as set out in Appendix A of the *Biodiversity Conservation Trust Livestock grazing guidelines for private land conservation* (Biodiversity Conservation Trust 2021).
High threat weed (HTW)	High threat weed
I2S	The Illabo to Stockinbingal Project (I2S) project
IBRA	Interim Biogeographic Regionalisation for Australia (IBRA)
LLS	Local Land Service
NSW	New South Wales
NSW DCCEEW	The NSW Department of Climate Change, Energy, the Environment and Water
DPHI	The NSW Department of Planning, Housing and Infrastructure (DPHI)

LMZ	Land Management Zone
MZ	Management Zone
Pest	Animal species not native to Australia including fox, cat, pig, goat, horse, avian species and any other non-native animal species.
RSPAMP	Riverina Regional Strategic Prest Animal Management Plan
Weed species	Vascular plant species not native to Australia listed.
Management Action	Management actions in this Management Plan
Plant Community Type (PCT)	Plant Community Types which are the subject of biodiversity credits created under the BSA.
POTSE	Planning, Offsets and Threatened Species and Ecosystems Division of NSW DCCEEW
SAII	Serious and Irreversible Impact
SFAZ	Strategic Fire Advantage Zone
TBDC	Threatened Biodiversity Data Collection
Threatened ecological community (TEC)	Threatened ecological community which are the subject of biodiversity credits created under the BSA.
VI	Vegetation Integrity
VZ	Vegetation Zone

1 Introduction

1.1 Background and scope

The Inland Rail program proposes development of the Illabo to Stockinbingal Project (I2S) to connect the Main South Line near Bethungra with the Stockinbingal to Parkes line at Stockinbingal. The I2S project has been declared to be a Critical State Significant Infrastructure Project under the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (EP&A Act).

Alignment of the railway corridor has an estimated overall impact of approximately 77.17 hectares on native vegetation. Of this, approximately 39.08 hectares are to vegetation communities that have been identified as the White Box Yellow Box Blakely's Red Gum Woodland and Derived Native Grassland Threatened Ecological Community (TEC) and henceforth referred to as Box Gum Woodland TEC.

The Department of Planning, Housing and Infrastructure (DPHI) and the Conservation Programs, Heritage and Regulation Group (CPHR) of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW)) are seeking a number of measures to compensate for impacts to the Box Gum Woodland TEC which is listed as a Serious and Irreversible Impact (SAII) entity.

These compensative measures include the development of a Biodiversity Stewardship Agreement (BSA) and a Box Gum Restoration Plan as outlined in the Conditions of Approval (CoA) for the project as outlined in Table 1.1. This report addresses the requirements of the Box Gum Restoration Plan and has been developed to be consistent with the requirements of the BSA (CoA E34).

Table 1.1 Conditions of Approval relevant to Box Gum Woodland Restoration (SSI-9406)

Condition of Approval		Where Condition of Approval is addressed
E34	*Within 12 months of the date of this approval, the Proponent must apply for , and, if approved, enter into a Biodiversity Stewardship Agreement (BSA) to ensure ongoing management and active restoration of 45.7 hectares of Box Gum Woodland within a 123.15 hectare restoration site of a portion of Lot 23 DP 592854 as outlined in documents listed in Condition A1(e) and A1(f). the management and restoration actions are additional to credit obligations required by Condition E26*	Biodiversity Stewardship Site Assessment Report (BSSAR) is being developed for a BSA separate to this document.
E35	*A Box Gum Woodland Restoration Plan must be prepared by an ecologist with appropriate qualification and experience in Box gum woodland restoration determined in consultation with BCS for the management of the restoration site identified in Condition A1(e) and A1(f) to ensure:*	Section 1.4 Personnel of this report.
a	*in perpetuity management of existing Box Gum Woodland*	A BSSAR is being prepared to support the establishment of a BSA to ensure in perpetuity management of Box Gum Woodland.
b	*increase in the extent of Box Gum Woodland*	— Section 2.4 Box Gum Woodland ARMA — Figure 2.1 Management Zones — Section 4.2 Management outcomes.

Condition of Approval		Where Condition of Approval is addressed
C	*Improve connectivity within and across the site identified in condition E34*	— Section 2.4 Box Gum Woodland ARMA — Figure 2.1 Management Zones — Section 4.2 Management outcomes.
E36	*The Box Gum Restoration Plan must include:*	
a	*Site map identifying the site boundary, existing vegetation to be maintained, areas to be actively restored and connectivity or movement corridors to be established or maintained*	— Figure 1.1 Site Map — Figure 2.1 Management Zones.
b	*Active restoration and maintenance activities, including seed collection, fire management, threatened species habitat management, feral pest and weed management;*	— Section 2.4 Box Gum Woodland ARMA — Appendix A Management Plan: — Appendix A Section 3: Management actions – Weed management and control — Appendix A Section 4: Pest animal controls — Appendix A Section 5: Plant Community Types and Threatened Ecological Communities (Native Vegetation) — Appendix A Section 6: Threatened species habitat — Appendix A Section 8: Management actions – Fire management.
c	*Proposed restoration and connectivity targets*	— Section 3 Monitoring and adaptive management — Appendix A Section 5: Plant Community Types and Threatened Ecological Communities (Native Vegetation) — Appendix A Section 6: Threatened species habitat — Appendix A Management Plan Site Map.
d	*Timeframes and responsibilities for meeting targets, including all actions to be completed prior to entering into a Biodiversity Stewardship Agreement*	— Section 3 Monitoring and adaptive management — Appendix A Management Plan.
e	*Monitoring plan*	— Section 3 Monitoring and adaptive management — Appendix A Section 9: Management actions – Monitoring and adaptive management — Appendix A Monitoring map.
f	*Adaptive management program to assess the effectiveness of the restoration and maintenance activities in meeting the targets identified in C*	— Section 3 Monitoring and adaptive management — Appendix A Section 9: Management actions – Monitoring and adaptive management.
g	*A process to ensure adaptive management measures, if targets not met.*	— Section 3 Monitoring and adaptive management — Appendix A Section 9: Management actions – Monitoring and adaptive management.

1.2 Location of the subject land

The BSA site is located on the Gum Flat property, Lot 3 DP591854 and Lot 1/ CP1248466 (960 Ironbong Road, Bethungra) in NSW. The lot boundaries will be revised to excise the rail corridor creating two separate lots. The subject land occurs approximately 5.5km from the Bethungra township and the I2S railway corridor runs through the centre of the property (Figure 1.1 and Figure 1.2).

This area was identified as a potential rehabilitation site for Box Gum Woodland to compensate for the project's impacts in consultation with CPHR. This rehabilitation site was identified based on:

- Its proximity to the project.
- The identification of Box Gum Woodland on site in NSW State Vegetation Mapping and ecology field surveys for the project. This included areas of derived grassland which would benefit from management to increase canopy cover.
- The potential to increase patch size of existing remnant woodland vegetation within the site.
- The potential to improve connectivity for the ecological community including threatened fauna recorded within the property and surrounding area including Superb Parrot (*Polytelis swainsonii*) and Squirrel Glider (*Petaurus norfolcensis*).

1.3 Site description

The BSA site is 127.15 ha, of which 45.72 ha is Box Gum Woodland, consisting of 14.7 ha of woodland and 31.02 ha of derived grassland.

The site occurs as a modified agricultural landscape with patches of older remnant vegetation, particularly around the north-western portion of the property and riparian vegetation surrounding Run Boundary Creek, which runs through the site from the north-east. This northern portion of the site also contains evidence of natural eucalyptus regeneration in grassland areas. More modified vegetation (derived grassland) areas occur to the southeast and the property is currently subject to existing disturbance from livestock grazing.

An area within the proposed BSA site has been fenced for restoration and has not been included as part of the Box Gum Woodland restoration area.

1.4 Personnel

This BSSAR was prepared by a team of qualified and experienced personnel, as outlined in Table 1.2, below.

Table 1.2 Personnel

Name	Qualifications and experience	Role
Selga Harrington	Principal Ecologist Bachelor of Science (Hons), Accredited BAM assessor BAAS17079 25 years' experience	Ecology lead for field surveys and reporting
Alicia Palmer	Ecologist Bachelor of Science (Hons) 6 years' experience	Field surveys and reporting
Tanya Bangel	Senior Associate Ecologist (Restoration ecologist) Bachelor of Environmental Management and Science Diploma of Conservation and Land Management Accredited BAM assessor BAAS18076 14 years' experience	Reporting – technical input and review
Tasman Carr	Ecologist (Restoration ecologist) Bachelor of Science (Geography) Certificate 3 Conservation and Land Management 6 years' experience	Field surveys and reporting
Devon Raiff	Senior Ecologist (Restoration ecologist) Bachelor of Science Certificate 3 Conservation and Land Management Accredited BAM assessor BAAS23009 6 years' experience	Reporting – technical input
Lachlan Robertson	Associate Ecological Rehabilitation and Soils Specialist (Restoration ecologist) Bachelor of Agricultural Science (Hons I) PhD – Environmental Eco-Engineering of Mine Waste Certificate IV in Work Health and Safety 8 years' experience	Reporting – technical input
Lukas Clews	Principal Ecologist (Restoration ecologist) Master of Scientific Studies, University of New England Diploma of Conservation and Land Management, Riverina Institute of TAFE Graduate Certificate in Applied Science, Charles Sturt University Bachelor of Science, University of Newcastle 18 years' experience	Reporting – technical input and review
Alex Cockerill	Principal Ecologist Bachelor of Science (Hons) Accredited BAM assessor BAAS17020 22 years' experience	Reporting – technical input

IRONBONG ROAD

IRONBONG CREEK

RUN BOUNDARY CREEK

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ILLABO TO STOCKINBINGAL

Figure 1.1
Site Map
MAP 1 OF 1

LEGEND

- Minor Watercourse
- Contours (2m)
- Railway Track Alignment
- Cadastre
- Subject Land
- Property Boundary
- Construction Impact Zone
- Operational Boundary of Rail Line

Proposed Crossing Structures

- Bridge Underpass
- Rope Bridge



0 200 400 Metres

Coordinate System: GDA2020 MGA Zone 55

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ILLABO TO STOCKINBINGAL

Figure 1.2
Location Map
MAP 1 OF 1

LEGEND

- Habitat Connectivity
- Minor Watercourse
- Railway Track Alignment
- Cadastre
- Subject Land
- Property Boundary
- IBRA Regions and Sub-regions

Proposed Crossing Structures

- Bridge Underpass
- Rope Bridge

Strahler

- 1
- 2
- 3
- 4

Mitchell Landscapes

- Frampton Hills
- Murrumbidgee - Tarcutta Channels and Floodplains
- Springdale Hills



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2 Management and improving biodiversity values

This section relates to the reasoning and justification for this management plan which is to form part of the BSA application for this site. The BSA Management Plan has been prepared as a separate document using the NSW Government management plan template (refer to Appendix A).

2.1 Description of the current and past management of the BSA site

The BSA site has been historically managed for grazing and agricultural purposes (for over 80 years based on historic aerial imagery (NSW Government 2024)). BSA site is currently used for sheep and cattle grazing. Patches of remnant vegetation have been retained on the site, particularly in association with Run Boundary Creek and associated tributaries, as well as remnant paddock trees which are scattered through the site.

Areas of land within the property previously subjected to cropping have been excluded from the BSA site. These areas were excluded as they have limited potential for rehabilitation due to past soil disturbance which has resulted in the loss of the natural seed bank and lead to a high groundcover of exotic flora species.

The BSA site contains areas of good quality remnant vegetation and areas of derived native grassland in the north-east and north-west of the property. There are no existing management obligations on the BSA site. Current conservation management actions that have been undertaken at the site to date include:

- Installation of nest boxes in River Red Gum vegetation (PCT 79) to encourage use by native fauna (particularly Superb Parrots).
- Fencing of regenerating Eucalypts in one location in the east of the site (PCT 277) to prevent disturbance by livestock and other fauna. This existing fenced restoration area has not been excluded from the area calculations in this restoration plan.
- Active weed control across the proposed BSA site.

Areas being prioritised for conservation and rehabilitation have existing patches of remnant and derived native grassland vegetation consistent with the Box Gum Woodland TEC. Rehabilitation of the BSA site would aim to improve connectivity, increase overall woodland patch size and improve natural rehabilitation of Box Gum Woodland TEC derived native grassland to woodland on site. These actions may go on to improve the broader landscape surrounding the site by supporting greater biodiversity that may expand out overtime (e.g. seed and pollen dispersal).

2.2 Management zones

Based on the identified management actions, the BSA site may include:

- one Active Restoration Management Action (ARMA) zone (MZ1) and five required management zones (MZ2, MZ3, M4, MZ5 and M6)
- two ecological burn management zones
- one weed management zone.

These three types of management zones are independent of each other and are treated separately (areas may overlap). Additionally, management zones may not align with vegetation zones.

The Operations Schedule and maps set out in the Management Plan detail the location and description of the actions, timeframe/frequency and monitoring requirements for each management zone or area (see Appendix A).

A summary is provided below in Table 2.1 to Table 2.3 with general site management actions (including any ARMA) shown in Figure 2.1.

Table 2.1 Required and active restoration (ARMA) management: Description of management zones/areas within the BSA site

Active restoration management zone or area	Area (ha)	Details of Management Zone or area
MZ 1	16.11	Box Gum Woodland (PCT 276 and PCT 277) Priority zone for restoration High resilience management zone where mandatory actions are required but ARMA not needed except as part of adaptive management.
MZ 2	31.32	Box Gum Woodland (PCT 276 and PCT 277) – derived grassland Priority zone for ARMA Disturbed cleared grassland areas containing native grasses and forbs amongst various weed species. Requires mandatory actions and ARMA. ARMA includes planting of canopy species representative of PCT with the aim of connecting woodland patches.
MZ3	37.53	River Red Gum Woodland (PCT 79) High resilience management zone where mandatory actions are required but ARMA is not needed.
MZ4	1.83	River Red Gum Woodland (PCT 79) – derived grassland Disturbed cleared grassland areas containing native grasses and forbs amongst various weed species. Requires mandatory actions only.
MZ5	13.30	Open grassy woodland (PCT 76 and PCT 346) High resilience management zone where mandatory actions are required but ARMA is not needed.
MZ6	18.67	Open grassy woodland (PCT 76 and PCT 346) – derived grassland Disturbed cleared grassland areas containing native grasses and forbs amongst various weed species. Requires mandatory actions only, AMRMA not needed.
Waterbody	0.38	

Table 2.2 Ecological burn: Description of burn zones/areas within the BSA site

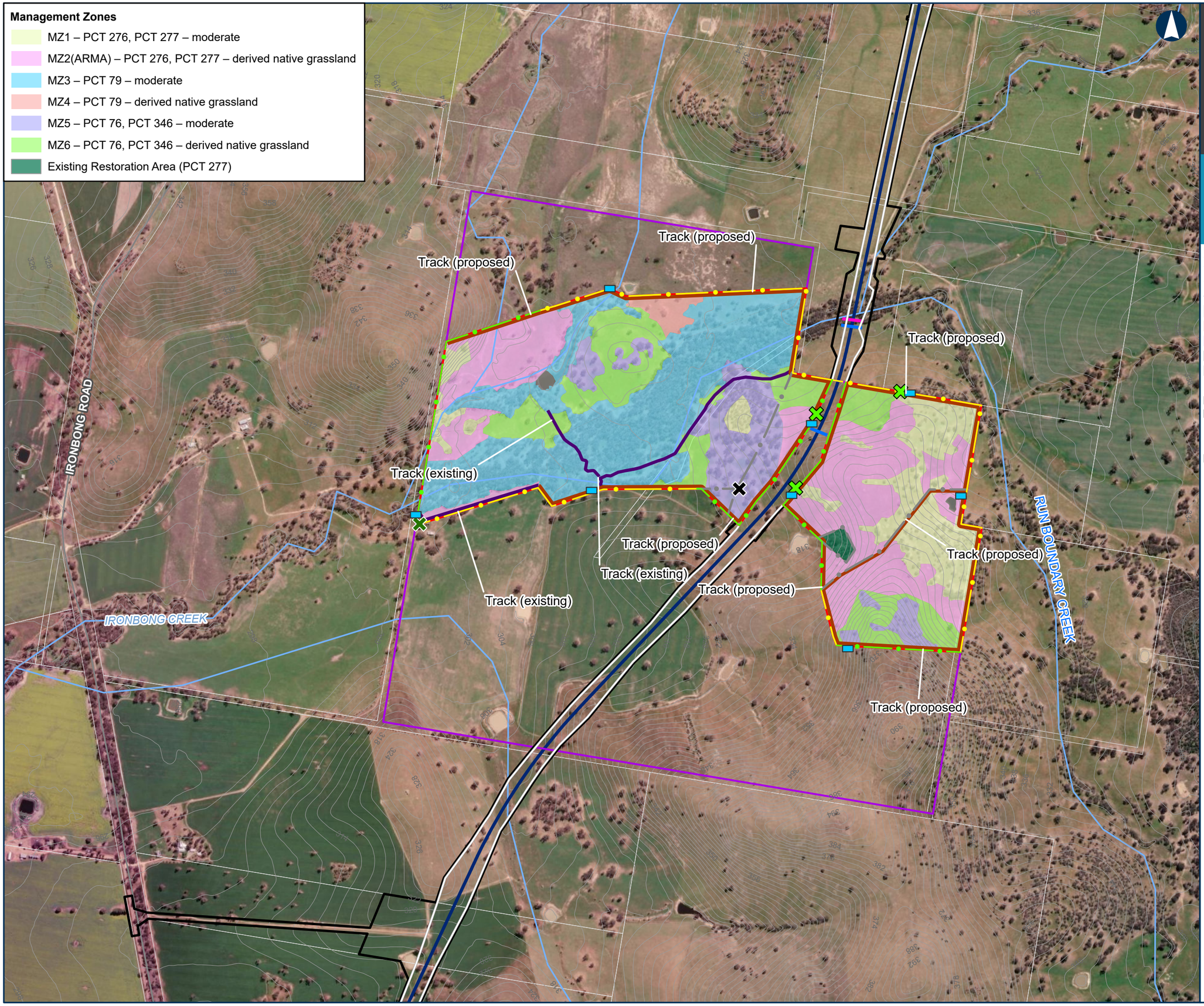
Ecological burn management zone or area	Area (ha)	Details of Management Zone or area
BMZ 1	8.3	BMZ 1 applies to part of Woodland Zone MZ5. Proposed minimum fire interval is 10 years. To begin in Year 10. Burns to then occur every 10 years. Occasional greater intervals may be desirable, greater than 15 years.
BMZ 2	10.73	BMZ 2 and 3 applies to areas of MZ3.
BMZ 3	19.13	Vegetation formation: Forested wetlands. PCT 79 – River Red Gum shrub/grass riparian tall woodland or open forest wetland mainly in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion Occurs on flats adjacent to ephemeral drainage lines and Run Boundary Creek. Groundlayer consists predominantly of native sedges, herbs and grasses. The predominant fuel type is native sedges which are tussocky and discontinuous.
BMZ 4	41.81	Temporary fire exclusion until monitoring indicates plantings and regeneration is large and resilient enough to withstand fire. Includes areas of ARMA, areas of derived grassland (MZ2, MZ4, MZ6) and areas of regenerating grassy and forested woodland with sparse canopy.

Table 2.3 Weed management: Description of management zones/areas within the BSA site

Weed management zone or area	Area (ha)	Details of Management Zone or area
WMZ 1	119.15	Medium density weed cover (11-50% weed cover). Medium density of annual and perennial grasses and broad-leaved herbaceous weeds, with low density of high priority weeds.

Management Zones

- MZ1 – PCT 276, PCT 277 – moderate
- MZ2(ARMA) – PCT 276, PCT 277 – derived native grassland
- MZ3 – PCT 79 – moderate
- MZ4 – PCT 79 – derived native grassland
- MZ5 – PCT 76, PCT 346 – moderate
- MZ6 – PCT 76, PCT 346 – derived native grassland
- Existing Restoration Area (PCT 277)



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Figure 2.1
Management Plan Site Map

MAP 1 OF 1

LEGEND

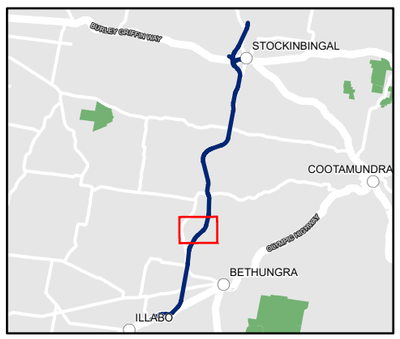
- Minor Watercourse
- Contours (2m)
- Railway Track alignment
- Cadastre
- Subject Land
- Property Boundary
- Construction Impact Zone
- Operational Boundary of Rail Line
- Water Body

Fauna Crossing Structures Proposed for I2S Project

- Bridge Underpass
- Rope Bridge

Proposed Infrastructure

- Sign
- Gate (existing to be removed)
- Gate (existing to be retained)
- Gate (proposed)
- Existing Fence (to be removed)
- Existing Fence (to be retained)
- Proposed Fence
- Track (existing)
- Track (proposed)



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2.3 Required management

This section outlines the management actions required for BSA site.

2.3.1 Disturbance and infrastructure

A description of the current disturbance and infrastructure of the BSA site is described below and depicted in Figure 2.1.

2.3.1.1 Fencing

Fencing is located on the boundary of the property and along the edge of paddocks, separating cropping areas in the south and dividing larger paddocks in the east and west. Boundary fences surrounding the BSA site are proposed to be maintained to exclude livestock and prevent unauthorised access. Redundant internal fences would be removed to support ongoing management actions and reduce hazards and/or barriers that may affect wildlife utilising the site.

It was noted onsite that some of the fences contain barbed wire and wire netting. All fencing will be modified in order to comply with the wildlife friendly fencing standards specified in the *Biodiversity Conservation Trust Essential conservation fencing infrastructure* guideline (Biodiversity Conservation Trust 2024). Wildlife-friendly fencing should align with the standard for 'standard sites in Central and Eastern NSW' described in this guideline and include:

- Plain wire fences:
  - 5–7 horizontal wires (no barb on top or bottom lines)
  - steel post spacing up to a maximum of 8 m.
- Prefab wire mesh:
  - 7 line wires, 900 mm high, 300 mm mesh (7:90:30). Line wires graded to no less than 100 mm at the base of the fence (i.e. 300 mm x 120 mm mesh)
  - steel post spacing up to a maximum of 8 m
  - plain top and bottom support wire
  - one or two plain top wires may be placed above the mesh to raise the height.

The BSA site would:

- utilise 3921 m of existing fencing (modified to be fauna friendly)
- remove 1637 m of fencing
- include installation of 2907 m of new fencing consisting of plain wire fence (with two strands of barb on internal strands).

2.3.1.2 Gates

Gates observed within the site were in good condition and are proposed to be maintained where fences remain. One gate would be removed and three additional gates will be installed: at the entrance to the eastern section of the BSA; and two installed on the operational rail corridor to allow access by the ARTC in the interim.

2.3.1.3 Signage

Signs will be installed along the perimeter fence in higher trafficked areas (i.e., around the railway line and near the entrance to the property) to inform the public and neighbours to the presence of the BSA site. In total, 8 signs will be installed.

2.3.1.4 Access tracks

There are multiple existing access tracks in the western portion of the site. These tracks are in good condition. Access tracks are not present in the eastern portion and access is generally limited to only accessible on foot or through grassland areas. Access to the eastern portion will from public road to north of site.

A cleared access track (3 m wide) will be maintained along the boundary fence of the BSA site to provide access around the site for management activities including maintenance of boundary fence (6628 m) and used for firebreaks. Internal access tracks would be mulched and then regrowth treated to maintain track.

2.3.1.5 Erosion

The soil condition varied across the BSA site. The flat areas and low rises, particularly in the north of the site in proximity to Run Boundary Creek and cropped area, were characterised by deeper soils. On the hilltops and steep slopes in the east and south of the site, soils were very shallow, hard setting, and gravelly with rock outcropping.

The soil landscapes within the site are prone to gully, sheet and rill erosion in disturbed areas. Minor gully erosion occurred along concentrated drainage flowlines (see Photo 2.1 and Photo 2.2). The rehabilitation enclosure in the centre of the site surrounded an area of gully erosion. Erosion will be managed through restoration plantings, with additional controls considered as part of adaptive management.



Photo 2.1 Minor erosion (gully)



Photo 2.2 Minor erosion (gully and creekline)

2.3.1.6 Weed management and control

The site is located within council RU1 Primary Production with rotational cattle and sheep grazing. As such the site displays minimal disturbance and weed presence within forested areas.

The objectives of weed control actions are to prevent the introduction and further spread of invasive weeds to improve the overall vegetation integrity of ecosystems present within the BSA site. The landowner must implement the Integrated Weed Management Plan which includes measures to:

- prevent the introduction of new weed species via the implementation of biosecurity measures
- control the spread of existing weed species, in particular High Threat Weed (HTW) species
- undertake fine-scale intensive removal of HTW and other exotic vegetation.

Weed management should be broken into the following two key initiatives:

1. eliminate HTW species
2. manage all other weed species.

A total of 47 exotic species were recorded within the BSA site including five HTWs which were all recorded within the site in low abundance:

- *Lycium ferocissimum* (African Boxthorn)
- *Xanthium spinosum* (Bathurst Burr)
- *Hypericum perforatum* (St John's Wort)
- *Bromus diandrus* (Giant Brome)
- *Nassella neesiana* (Chilean Needle Grass).

Overall weed density, including HTW density, was very low across the BSA site. Average cover of high threat weeds – *Lycium ferocissimum*, *Hypericum perforatum*, *Xanthium spinosum* and *Nassella neesiana* was 0.06%. Higher cover of *Bromus diandras* was recorded in some areas (average cover of 9.75% in VZ3, 0.5% in VZ7 and 0.3% in VZ10). Maintenance control of weeds and HTWs would be predominantly undertaken through spot spraying and slashing in accordance with relevant guidelines including DPI New South Wales Weed Control Handbook, Seventh Edition (nsw.gov.au). Specific management applications required to control the HTW species present on site include:

- *Lycium ferocissimum* (African Boxthorn) was recorded in woodland management zones (MZ1, MZ3, MZ5) and likely scattered throughout the other MZs. This species is listed as Weed of National Significance under the NSW *Biosecurity Act 2015* (Biosecurity Act). Herbicide products such as Roundup®, Tordon® 75-D or Grazon Extra® should be used for actively growing plants within the subject land using foliar spay for smaller plants and cut and paint for larger plants.
- *Hypericum perforatum* (St John's Wort), *Xanthium spinosum* (Bathurst Burr) and *Nassella neesiana* (Chilean Needle Grass) are all HTWs listed as a General Biosecurity Duty under the Biosecurity Act that were recorded in low densities throughout the BSA and should also be subject to targeted spot spray. Suitable herbicides to use for these plants may include Amicide® 625 and Starane™ (*Xanthium spinosum*), Grazon Extra® (*Hypericum perforatum*) or Roundup® (*Hypericum perforatum* and *Nassella neesiana*).
- *Bromus diandrus* (Giant Brome) is also listed as an additional HTW under the NSW Biodiversity Assessment Method (BAM) (Department of Planning Industry and Environment 2020). This species was generally recorded in low densities, though was found to be locally abundant in some areas (average cover of 6.6% across VZ3, VZ7 and VZ10). This species may be controlled in conjunction with targeted (seasonally) timed control of other annual grass species using glyphosphate (i.e., Roundup®) to maintain low densities.

These control measures have been proven effective at controlling these species if application directions for each product are followed correctly. The BSA contains sensitive riparian ecosystems including Run Boundary Creek and associated vegetation run through the centre of the BSA site. Despite the presence of this key waterway, the potential risk of herbicide application is considered minimal with use limited to spot praying individual plants which are infrequent within the site and are mainly located in areas away from riparian zones. Furthermore, risks to fauna (including livestock) are also expected to be of little concern from such targeted herbicide application.

2.3.2 Pest animal controls

Pest animal controls aim to manage threats posed by feral herbivores grazing on native vegetation within the BSA site as well as predation of native fauna by pests.

The Riverina Regional Strategic Prest Animal Management Plan (RSPAMP) (NSW Local Land Services 2024) has identified the following regional significant priority species: Wild Dog, Feral Pig, Feral Deer, Feral Horse, Common Carp, Feral Cat, European Red Fox, Feral Goat and Wild Rabbits.

Feral Pigs (*Sus scrofa*) are considered the primary pest for the BSA site as considerable evidence of scats and rooting was recorded during site surveys. Additional pests recorded within the BSA include Wild Rabbits (*Oryctolagus cuniculus*), Feral Goats (*Capra hircus*) and European Red Fox (*Vulpes vulpes*). Although not recorded, Feral Cats (*Felis catus*) and Wild Dogs (*Canis familiaris*) may also occur on occasion.

The RSPAMP recommends coordinated control programs be implanted by landholders for targeting Feral Pigs using approved control methods and activities such as ground baiting, trapping, ground shooting and aerial shooting. The proposed BSA control methods of pest animals are detailed within Appendix D and involve a combination of baiting and ground shooting in accordance with PestSmart Standard Operating Procedures.

Feral pest control would include control of (though not exclusively of) these species as required. Shooting is to be undertaken opportunistically or in coordination with adjacent landholders as part of local and regional scale control programs. Freal Pigs and European Red Foxes would also be managed through 1080 ground-baiting (suitable for medium to low density populations). This method has the potential to impact on native fauna through secondary ingestion of bait, thus guidance should be sought from the Riverina Local Land Services (LLS) and BCT before proceeding.

2.3.3 *Plant community types and threatened ecological communities (Native Vegetation)*

Within the BSA, MZ1 has been subject to past vegetation clearing for grazing and consequently is the only management zone which requires active restoration of native vegetation. Replanting will be done in accordance with the Operations Schedule outlined in Appendix D. Briefly, this involves:

- Site preparation of areas for planting which will include tilling, turning or auguring of soil in derived native grassland within the site.
- Each planting lot will be prepared no less than 3 months prior to installation of plants with regular weed reduction works to increase soil moisture and conditions for installation.
- Tubestock planting of trees of approximately 32.5 ha (approx. 4,952 tubestock).
- Maintenance of plantings including watering, slashing, and spraying weeds. Plants are to be maintained for a period of at least six months post planting to ensure survival rate is above 80%. After 2 years, if the survival rate is less than 80% then replacement planting will be required.
- Allowance for planting contingency where required (e.g. where an individual has not survived) which involves replanting tree or shrub species using hand planting methods.

The species chosen for planting are typical of PCT 277 and PCT 276 which form part of the Box Gum Woodlands TEC listed under the BC Act and EPBC Act.

2.3.4 *Threatened species*

No threatened species of plant have been recorded. Two threatened fauna species (Superb Parrot and Squirrel Glider) have been recorded. No species-specific required actions are proposed as part of this BSA which is aiming to improve extent, condition and connectivity of Box Gum Woodland TEC.

2.3.5 *Grazing management*

Box gum grassy woodlands can exist in a number of different “states”, which are related to their species composition and disturbance history. The condition of a woodland remnant can change through adaptive management activities and options such as grazing exclusion are often a suitable option where some native ground cover is present within the seedbank and regeneration of canopy species is observed (Rawlings, Freudenberger and Carr 2010). In areas where more heavy grazing has been observed, or nutrient cycles have been altered through ongoing agricultural use, additional active management is likely to be required to improve the condition of the rehabilitation areas.

Grazing exclusion is proposed to ensure that the rehabilitation areas can meet the healthy condition threshold for grass and understorey cover (% ground cover which includes living vegetation, dry litter coarse woody debris (logs), mosses and lichens, excluding exposed bare ground and surface rock).

As grazing is excluded, removal of internal fencing is recommended to improve wildlife connectivity. Fencing would be in accordance with the BCT Essential Conservation Fencing Guide (2020a) and as described in Section 2.3.1.1.

2.3.6 *Fire management*

The proposed BSA site is located within an area that is subject to the Riverina Bush Fire Risk Management Plan (NSW Rural Fire Service 2017). This Bush Fire Risk Management Plan is a comprehensive document that maps and describes the level of bush fire risk across the Riverina. The Bush Fire Risk Management Plan identifies assets for which are at risk of bush fire. In the region, this includes Bethungra, Illabo, the Olympic Highway and the Sydney/Melbourne rail line.

Fire management within the BSA site must adhere to the Bush Fire Risk Management Plan. The proposed BSA site is considered part of a Land Management Zone (LMZ), the purpose, suppression objectives and zone characteristics are as follows:

- **Purpose:** To meet relevant land management objectives in areas where Asset Protection Zone(s) (APZs) or Strategic Fire Advantage Zone (SFAZs) are not appropriate.
- **Suppression objectives:** As per the land management and fire protection objectives of the responsible land management agency:
  - to reduce the likelihood of spread of fires
  - to undertake mosaic burning.
- **Zone characteristics:** As appropriate to achieve land management e.g. heritage and/or fire protection e.g. broad scale mosaic burning objectives.

Fire management within the BSA must therefore take into account and be done in accordance with the Bush Fire Risk Management Plan.

A draft burn plan is provided in Table 2.2 and recommendations for fire management are provided in BSA management plan (Appendix A).

2.4 Box Gum Woodland management

Management actions are undertaken to improve biodiversity values (gain). Improving biodiversity gains is achieved on a BSA through standard (required) management actions (Section 2.3) and can be increased if active restoration management actions (ARMA) are implemented. ARMA improve biodiversity values above that predicted from standard management alone. The proposed restoration actions for Box Gum Woodland (MZ2 - VZ7 and VZ9) include revegetation which will increase native species richness and cover (see BAM 11.3.2). ARMA are in addition to required management for a BSA and are optional. Future VI scores are adjusted manually in the BAM-C, for each applicable composition (diversity), structure (cover) and function attributes, that will benefit from the active restoration management action proposed.

Table 7 of the BAM outlines additional ARMA that may be completed to improve or manage native vegetation or threatened species habitat. Native vegetation and habitat management and augmentation is proposed for MZ2 (VZ7 and VZ9) (see Appendix A). This involves targeted supplementary planting to increase native plant richness and cover above the level determined for management gain within VZ7 and VZ9.

Two methodologies have been proposed to increase structure and function scores, with separate methodologies proposed for woodland areas (Section 2.4.2) and derived grassland areas (Section 2.4.1).

The aim of Box Gum Management is to:

- increase the extent of remnant Box Gum Woodland through restoration planting of canopy species in areas of derived grassland (31.02 ha)
- increase wildlife connectivity values within and across the site.

2.4.1 ARMA in Box-Gum Woodland derived native grassland

Targeted supplementary planting is proposed as an ARMA on the proposed BSA within MZ2 Box Gum Woodland derived grasslands.

The derived native grasslands within MZ2 are disturbed by clearing and grazing and are considered unlikely to regenerate sufficiently without ARMA. The aim is to increase native plant richness and cover above the level determined for management gain. The goal is to increase species richness and structure in the necessary growth forms to reach benchmark levels for the relevant PCT.

Restoration planting of canopy species is proposed for native (derived) grassland areas to improve connectivity between patches of Box Gum Woodland. Corridors would be a minimum of 30 m wide to account for any edge effect. Plantings would include species representative of the identified or adjacent PCT which take longer to establish and have low likelihoods of regenerating naturally in the short-term. Plantings would not be prioritised in areas where the soil is heavily compacted by grazing animals – however, techniques such as deep-ripping could be considered to improve planting conditions in these areas.

Strategic revegetation will be the main restoration method used to reach PCT benchmarks for tree cover and abundance in these areas. Planting densities in each area will be dependent on the specific PCT benchmark requirements with notional proportions for planting outlined below. Seed source for selected species will be established from site collection on the target property and from associated communities within the vicinity of the site.

For these areas it is proposed to have plants installed in three stages. The planting schedule has also been proposed to be delayed allowing for primary weed and pest control to be undertaken first so to reduce risk of impact to new plant and to reduce negative environmental pressures. Further, the exclusion of livestock during this time may allow the soil seed bank an opportunity to naturally regenerate.

Derived grassland areas will be ripped, tilled or turned to create discrete planting lots, avoiding areas exhibiting natural regeneration. It is expected that there will be around 1,200 planting lots (30 m^2 to 100 m^2). Within each planting lot a total of 5 to 10 individual plants will be installed with initial watering. Watering at the time of planting establishes good root to soil contact and helps overcome transplant shock. The use of soil conditioner may also reduce the amount of watering needed. Follow-up watering may be necessary if plants have been established in very dry seasons. Watering would be undertaken with IBC water tanks, water cart or ute mounted water tank as required.

Planting is proposed in autumn to coincide with mild temperature, adequate rainfall and appropriate soil moistures. An early autumn planting will also allow for maximum time before frost condition are present on the BSA site.

This clump method planting would reduce effort to prepare the site and maintain yearly planting, use shade techniques to reduce weed load, retain areas of grassland that contain high diversity of natives and to reduce risk of over planting. This method has been preferred to restore a high quality resilient grassy woodland that will be resilient and have a high likelihood of success.

The specific requirements for revegetation at the proposed BSA are as follows:

- Planting will consist of a diverse mix of trees.
- Tree planting will consist of tube stock native trees and shrubs from the target PCT.
- Tree planting will commence after primary weed control.
- Planting techniques for trees will include:
  - Collection techniques, seed preparation, and growing should be as per Florabank Best Practice Guidelines (NSW Government 2021)
  - All plants should be provided in tubestock or hiko cells.
  - Plantings of trees will be undertaken in clumped patterns to create a varied landscape that includes open areas and more dense areas of vegetation to promote habitat variability.

- Plantings of trees will be sparse at around 200 plants per hectare to promote a grassy woodland vegetation structure and will take into consideration natural regeneration.
- Planting should be undertaken in the autumn to improve chances of establishment.
- Trees will be installed by hand or with a petrol auger. A hole twice the depth and width of the root-ball should be dug and a handful of native fertiliser applied.
- Plantings should be watered immediately after planting and as conditions dictate to ensure survival (e.g. drier conditions will require more watering events). Planting can be scheduled immediately before rain events to satisfy this condition.
- Trees will be protected from native herbivore and pest grazing with use of tree guards for the first 4 years after planting or seeding or until the plants exceed 200 cm in height to ensure that the plants are established.

There are no plans to remove regrowth or remnant native vegetation within the proposed BSA apart from maintaining regrowth along tracks and fence lines. Otherwise, the landowner will ensure that native vegetation (whether remnant native vegetation or regrowth) on the BSA site will not be cut down, felled, thinned, logged, killed, destroyed, poisoned, ringbarked, uprooted, burnt or otherwise removed, except in accordance with the management plan (Appendix A).

Plants will be sourced locally if possible (exact source of plants to be determined by the revegetation contractor).

All plants are to be installed in Year 2. A minimum of 80% survival rate of installed plants at 2 years post installation is required. Contingency planting will be implemented if survival rates are not achieved (see Appendix A).

Supplementary plantings of shrubs, forbs, etc may be required after tree plantings established (after 15 years) if monitoring indicates that these revegetated areas are not reaching the PCT benchmarks. Indicative species for planting is provided in Appendix B with estimated number of tubestock provided in Table 2.4 and Table 2.5.

Table 2.4 Minimum tubestock for revegetation

PCT	Canopy Benchmark Composition (no. species)	Canopy Benchmark Structure (% cover)	Derived Native Grassland area for revegetation (ha)	Minimum tree plantings required to meet Structure Benchmark (trees/ha)*	Minimum trees required for revegetation*	Minimum number of tree plantings required, including contingency*
PCT 276	3	19	1.5	127	191	239
PCT 277	3	19	25.6	127	3,252	4,065
Total					**3,443**	**4,304**

Notes: * assumes 80% survival. Planting density should be increased to account for mortality, depending on seasonal conditions as well as taking into consideration natural regeneration within the site.

Table 2.5 Canopy Revegetation Species Mixture for Box Gum Woodland TEC

Representative PCTs	Scientific Name	Common Name	Minimum number canopy trees required to meet Structure Benchmark (trees/ha) (indicative quantities by species)	Minimum number of canopy trees required based on area (ha)	Minimum number of tree plantings required for contingency*
PCT 276	*Eucalyptus melliodora*	Yellow Box	107	161	202
	Eucalyptus blakelyi	Blakely's Red Gum	10	15	19
	Eucalyptus bridgesiana	Apple Box	10	15	19
PCT 277	*Eucalyptus blakelyi*	Blakely's Red Gum	57	1460	1,825
	Eucalyptus melliodora	Yellow Box	57	1460	1,825
	Eucalyptus bridgesiana	Apple Box	5	128	160
	Eucalyptus microcarpa	Grey Box	3	77	97
	Eucalyptus goniocalyx	Long-leaved Box	5	128	160

Notes: * assumes 100% survival. Planting density should be increased to account for mortality, depending on seasonal conditions as well as taking into consideration natural regeneration within the site.

2.4.2 *Adaptive management pending natural regeneration of groundcover in Box Gum Woodland and derived grassland*

In Box Gum Woodland areas (MZ 1) and derived grassland areas (MZ2) native vegetation management of groundcover is proposed to include mandatory actions and be based on principals of natural regeneration. Natural regeneration is considered likely following exclusion of grazing, as evidenced by existing regeneration of *Eucalyptus* species within woodland patches and scattered trees in the derived grassland areas. It is likely that current grazing activities are inhibiting the natural regeneration of some species in these areas and exclusion of grazing is likely to promote additional regeneration.

This method is suitable as they have not been subjected to hard compaction from excessive grazing, or subjected to fertilisers or other inappropriate land management practices which could alter the condition of the soil. The grass cover within these areas contains native species and good seed sources as they are located adjacent to and within high quality vegetation.

Supplementary plantings of understorey species may be required in MZ 1 and MZ 2 if monitoring indicates that natural regeneration areas are not reaching the PCT benchmarks. Indicative species for planting for each PCT, including shrub layer and groundcover is provided in Appendix B.

3 Monitoring and adaptive management

3.1 Annual monitoring commencement and timing

Annual photographic monitoring points (photographic points, weeds, pests etc) must be established and completed in Year 1 before works commence, within 12 months of the Agreement Date. Thereafter, monitoring would occur annually. Reporting on annual monitoring would also occur annually from the Agreement Date.

3.2 Monitoring in accordance with the Ecological Monitoring Module

Annual monitoring of the BSA site will be undertaken in accordance with the *Biodiversity Conservation Trust Ecological Monitoring Module Operational manual* (Biodiversity Conservation Trust 2022) (EMM Operational Manual) and will include:

- Monitoring of planted canopy species in grassland areas and around fauna crossings to ensure survival rate is above 80% by Year 3 post initial planting (Biodiversity Conservation Trust 2020b).
- Monitoring of ground cover vegetation and adaptive management to consider additional planting of native groundcover species in woodland and grassland areas.
- Annual photographic point monitoring of vegetation in restoration areas. Photographic point locations will be selected during the restoration planning process. Monitoring locations will be established in the BSSAR prior to restoration works commencing as part of the BSA.
- Incidental recording of pest animal evidence during on-site works.
- All infrastructure inspected against BCT guidelines (fences, gates, signs and tracks).
- Floristic monitoring plots, as described below.

In addition to above monitoring, baseline monitoring of fauna movement corridors and monitoring of connectivity structures are listed as conditions of approval for the project (conditions E40 – E45) will be undertaken separately to the BSA monitoring

3.2.1 Floristic plots and photo monitoring

Twelve floristic monitoring plots would be monitored within the proposed BSA site in accordance with the procedure outlined in the EMM Operational Manual (Biodiversity Conservation Trust 2022).

The floristic monitoring plots (Vegetation Integrity (VI) plots) would be monitored every 5 years for the first 20 years then every 10 years in perpetuity. The VI plots collected for preparation of this BSSAR will be used as baseline as long as work begins within two years of the data collection date.

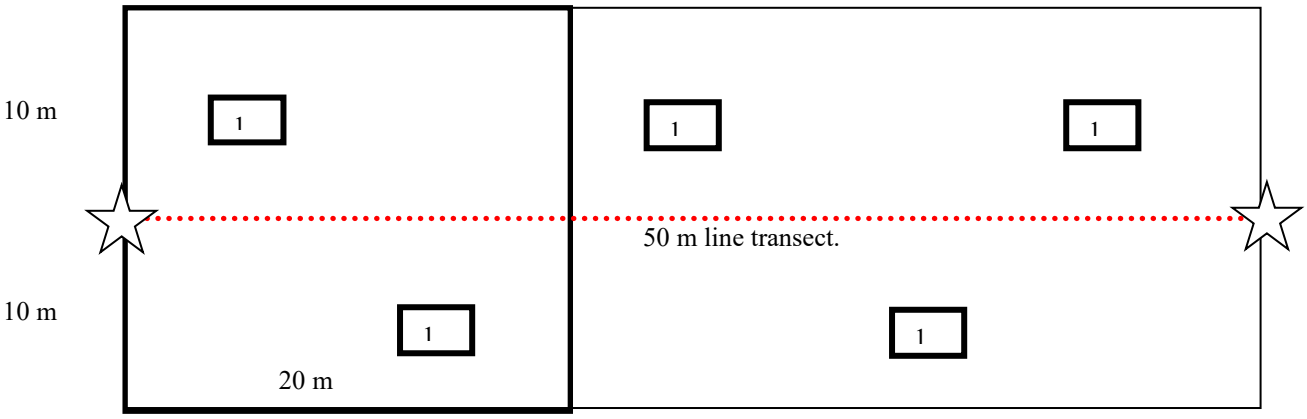
Data collected at each monitoring point would comprise

- VI full floristic plot data in accordance with the EMM, including:
  - full scientific name of all vascular plant species within the 20 x 20 m plot
  - estimated % foliage cover of each species with individuals rooted in or overhanging the plot
  - estimated abundance of each species
  - whether the species is native, exotic, or high threat exotic.
- Function attributes assessed within the 20x50 m plot as per the BAM, i.e.:
  - litter cover
  - number of tree stem size classes
  - number of large trees
  - total length of fallen logs.
- Photo points at 0 m and 50 m.

General observations at each Floristic monitoring plot:

- Assignment of weeds to High Threat and non-High Threat.
- Weed mapping using Projective Foliage Cover in accordance with 5.8.2 of the Ecological Monitoring Module Operational Manual (Biodiversity Conservation Trust 2021) in response to an increase in weed cover class for High Threat weeds in Floristic monitoring plots.

Layout of the monitoring plots is illustrated in Figure 3.1 and includes photo monitoring points at 0 and 50 m points (as illustrated by star) on the transect (Figure 3.2).



Note: star indicates location of photo point

Figure 3.1 Schematic diagram illustrating the layout of the nested 20 x 50 m, 20 x 20 m and 1 x 1 m sub-quadrats used for the assessment of condition attributes at each site

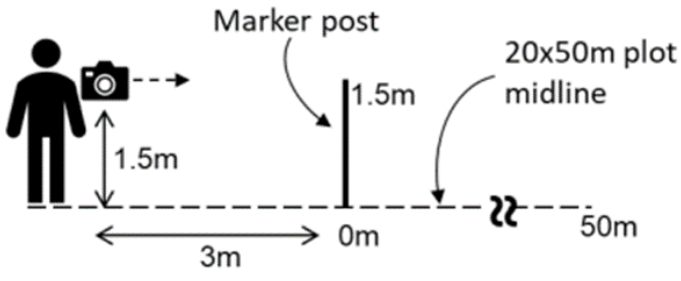


Figure 3.2 Photo point locations at monitoring plots (Biodiversity Conservation Trust 2021)

3.2.2 ARMA monitoring

3.2.2.1 Monitoring methods

In addition to floristic plots (outlined above), monitoring plots within MZ2 (which will be subject to ARMA) will also implement point-intercept cover measure (for monitoring vegetation structure) and tree density and size distribution monitoring as outlined in the EMM. These additional monitoring measures are necessary as revegetation will result in changes to vegetation structure perhaps most notably the revegetation is expected to generate significant change in the density and size distribution of trees and shrubs.

Supplementary measures required to track short- and medium-term progress, in the first 10 years post-planting, include:

- survivorship of all planted species
- seed set (small trees; year 5+)
- qualitative assessment of any disturbance impacts (e.g. browsing, trampling).

These attributes would be assessed for all revegetated areas using an appropriate sampling method for larger plantings – e.g. 'Latin squares', with timing and frequency as outlined in Table 3.1. Monitoring of all indicators measured at year 10 should continue at 5-yearly intervals until restoration targets (e.g. for cover and richness by growth form) have been met.

Rapid qualitative assessment of survivorship (i.e. to identify any major issues) would occur as part of annual compliance visits.

Table 3.1 Timing of monitoring events and indicators for revegetation management zones in first 10 years post planting

Monitoring component	Years post – revegetation					
	0	1	2/3	5	7/8	10
Survivorship						
Full floristics (cover/abundance)						
Stem density / size distribution						
Seed set						
Disturbance assessment						

3.2.2.2 Targets for revegetation

Current and benchmark condition for condition, structure and function are provided in Table 3.2, Table 3.3 and Table 3.4 respectively.

Table 3.2 Composition condition benchmarks and current plot means

Item	Tree composition	Shrub	Grass	Forb	Fern	Other
276 Benchmark	**3**	**3**	**8**	**10**	**1**	**1**
277 Benchmark	**3**	**3**	**8**	**10**	**1**	**1**
276 DNG current score	**0.3**	**0**	**2.3**	**1.3**	**0**	**0**
277 DNG current score	0.1	0.3	6.2	3.1	0.2	0

Table 3.3 Structure condition benchmarks and current plot means

Item	Tree	Shrub	Grass	Forb	Fern	Other
276 Benchmark	**19**	**1**	**32**	**6**	**0**	**0**
277 Benchmark	**19**	**1**	**32**	**6**	**0**	**0**
276 DNG current score	0.2	0	**45**	0.2	**0**	**0**
277 DNG Current score	0.4	0	**45.8**	1.8	**0**	**0**

Note: Bold indicates at or above benchmark

Table 3.4 Function condition benchmarks and current plot means

Item	No. of large trees	Litter Cover	Stem size class	Tree regeneration (<5cm diameter)	HTW cover
276 Benchmark	**4**	**55**	**4**	**Present**	**0**
277 Benchmark	**4**	**55**	**4**	**Present**	**0**
276 DNG current score	0	0	0	Absent	0.2
277 DNG Current score	0.1	12.5	0	Absent	0

Targets for Box Gum Woodland derived grassland ARMA have been developed following BCT EMM to ensure that rehabilitated areas have the best opportunity to reach their associated PCT benchmarks. Targets are provided in Appendix A and summarised in Table 3.5 and Table 3.6.

Table 3.5 Tree composition targets

VZ	Current Value	FA = Future value with active restoration gain	FW = Future value with offset	5 year target upper	5 year target lower	10+ year target upper	10+ year target lower
7	0.3	3	1	2.46	0.86	3	1
9	0	3	1.2	2.4	0.96	3	1.2

Table 3.6 Tree structure targets

VZ	Current Value	FA = Future value with active restoration gain	FW = Future value with offset (after Restoration	5 year target		10 year target		15 year target		20 year target	
				Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
7	0.2	18.8	5.8	4.9	1.6	9.5	3.0	14.2	4.4	18.8	5.8
9	0.2	18.8	5.8	4.9	1.6	9.5	3.0	14.2	4.4	18.8	5.8

3.2.3 Pest monitoring

The BCT EMM Operational Manual suggests a targeted monitoring program for threatened vertebrate pests should only be established if/where pest management is classified as 'high intensity' or where the source of the disturbance is not known. Direct pest monitoring is not included for this site as:

- Pest monitoring is only required if management is part of a strategic approach beyond the scope of required management. Only required pest management is being implemented for this site.
- Monitoring of herbivore pests is not currently considered necessary as they are not suspected to be significantly impacting biodiversity.
- Monitoring of predator pests is not considered necessary as:
  - direct monitoring of these species via remote cameras is generally unlikely to provide meaningful data at the scale of a single agreement site due to the large home range of vertebrate predators
  - threatened prey species is not the target of conservation measures.
- The need for pest monitoring will be reconsidered as part of the adaptive management and management plan review.

4 Conclusion

This report addresses the CoA for the Inland Rail I2S project relating to Box Gum Woodland Restoration Plan (E35 and E36) as outlined in Section 1.1. A BSSAR is being developed to establish a BSA to ensure in perpetuity management of Box Gum Woodland and to address CoA E34 and E35. This restoration plan has been developed to be consistent with BSA requirements.

4.1 Management issues

Due to a history of agricultural grazing, the proposed BSA site is considered to be moderately disturbed. Other disturbance and infrastructure are minimal or absent.

Existing fencing is found along the boundary and within the subject land. This fencing is proposed to be removed and replaced in certain areas as per the BSA Management Plan with wildlife friendly fencing.

There are limited access tracks through the proposed BSA site. The access tracks that are present are key for future access and management of the BSA site and will be maintained. Cleared access track (3 m wide) will be maintained along the boundary fence and the existing internal tracks and along removed internal fencelines to provide access around the site for management activities including fence maintenance.

High Threat Weeds including *Lycium ferocissimum* (African Boxthorn), *Xanthium spinosum* (Bathurst Burr), *Hypericum perforatum* (St John's Wort), *Bromus diandrus* (Giant Brome) and *Nassella neesiana* (Chilean Needle Grass) will be targeted for control.

In terms of pests, Feral Pigs are considered to occur in high density within the locality of the site with evidence of Feral Pig presence onsite observed during site surveys. Additional pests recorded within the BSA or considered likely to occur on occasion include Wild Rabbits (*Oryctolagus cuniculus*), Feral Goats (*Capra hircus*), European Red Fox (*Vulpes vulpes*), Feral Cats (*Felis catus*) and Wild Dogs (*Canis familiaris*) may also occur on occasion. Feral pest control would include control of (though not exclusively of) these species as required.

The BSA site is currently grazed by sheep and cattle. No conservational grazing is proposed, instead livestock grazing will be excluded from the BSA site in perpetuity.

Fire history of the site is unknown with no fires mapped for the site (NSW DCCEEW 2025c). However, from the site inspections and viewing of historical aerial photography the site has not been burnt for at least 10 years. The proposed minimum fire interval for the site is 8 years. Burns will occur every 8 years to meet requirements of the Bush Fire Risk Management Plan for the Mid-Western Regional Council area. It is recommended that fire is excluded from areas of ARMA (revegetation in MZ1) until monitoring indicates plantings are large and resilient enough to withstand fire. Ecological burning will be undertaken on the BSA site to meet the requirements of the Bush Fire Risk Management Plan for the Mid-Western Regional Council area and the minimum interval meets the recommended requirements for each vegetation formation.

Box Gum Woodland TEC is the target for ecological management for this BSA and ARMA in the form of revegetation is proposed to re-introduce the mid and upper stratum in this vegetation zone.

Management and restoration within the site will improve connectivity, enhance existing vegetation and habitats and expand area and patch size for threatened woodland communities. The inclusion of rehabilitation will provide benefits to Box Gum Woodland TEC quality and quantity on this property and in the broader landscape including:

- Increased connectivity – enhancing and conserving in perpetuity an existing corridor along Run Boundary Creek between extensive vegetation of Bethungra Range and vegetation to the west.
- Increased extent of vegetation protected and managed for conservation, including:
  - Protection of existing vegetation including an extensive area of River Red Gum Woodland around Run Boundary Creek as well as remnant patches of Box Gum Woodland and Grey Box Woodland TECs.
  - Increasing the extent of Box Gum Woodland TEC and Grey Box Woodland within the site and region.
  - Improvement of vegetation integrity (including diversity, structure and function) of native vegetation within the site via planting of canopy species to areas of derived grassland and increased cover and diversity of groundcover vegetation via the exclusion of livestock grazing.
  - Increased patch size resulting in decreased edge effects.
  - Improved habitat condition for fauna by providing larger and more resilient habitat patches for flora and fauna including threatened species known to occur within the site (Superb Parrot and Squirrel Glider).
  - Providing long-term conservation of these important features on an agricultural property in an over-cleared landscape.

4.2 Management outcomes

4.2.1 Improved connectivity

Rehabilitation and protection will increase connectivity in the landscape along and from Run Boundary Creek and link into more extensive vegetation of the Bethungra Range. This would include:

- Protection of existing River Red Gum Woodland (PCT 79) adjacent to Run Boundary Creek.
- Provision of wider corridor connection than currently present along Run Boundary Creek and to the vegetation to the east of the site. Corridor width would increase from 30 m at its current narrowest point to over 500 m.
- Increasing connectivity between patches of TECs. For example, the western rehabilitation area will potentially link smaller patches of moderate condition PCT 277 (Box Gum Woodland TEC) to each other, in addition to the larger patch that occurs on Run Boundary Creek.
- Increasing connectivity for flora and fauna including threatened species known to occur within the site (Superb Parrot and Squirrel Glider).

The establishment of canopy led revegetation will see a future potential for reestablishing connectivity from the riparian corridor to neighbouring areas of established vegetation.

Canopy plantings will assist in linking up remnant patches of moderate condition PCT 277 (Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion).

A key management action for Box Gum Woodland TEC is habitat rehabilitation/restoration and/or regeneration. This action sets out to ensure that remnants remain connected or linked to each other; in cases where remnants have lost connective links, re-establish them by revegetating sites to act as stepping stones for fauna, and flora (pollen and seed dispersal).

The revegetation will eventually allow for greater access to old growth trees for threatened species, such as the Squirrel Glider (*Petaurus norfolcensis*).

4.2.2 Increased extent with long-term conservation

The proposed revegetation area would be subject to a BSA ensuring conservation of the Box Gum Woodland TEC. The area in conservation would be no less than equivalent to the project impacts on Box Gum Woodland and derived grassland, taking into consideration current and future condition. Without a conservation agreement, this vegetation is at risk of degradation or loss as a result of agriculture. The integrity and scale of the rehabilitated Box Gum Woodland areas will provide considerably greater long-term conservation outcomes than the fragmented pattern impacted by the I2S project.

4.2.3 Improved condition

Restoration targets have been established to ensure that rehabilitated areas will reach their associated tree species richness and projected foliage cover PCT benchmarks. This includes planting of canopy species within the derived native grassland areas resulting in improved structure and function including connectivity.

Groundcover and understorey diversity and structure will improve as a result of removing the ongoing threat of livestock grazing. Adaptive restoration and planting will be undertaken where benchmark targets are not met. Function will improve also including increased leaf litter and fallen timber.

4.2.4 Increased patch size

The large patch size of the remnant riparian corridor will be widened as a result of the proposed rehabilitation areas.

An added benefit of having the revegetation near such large patches is the potential for improved exchange of endemic species from the larger patch to the revegetation patches. This will potentially improve the species richness beneath the planted canopy, reducing the need for future understory revegetation.

5 Limitations

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6 References

Biodiversity Conservation Trust (2020a). Essential conservation fencing infrastructure. Guidelines, standards and cost benchmarks.

Biodiversity Conservation Trust (2020b). Restoring Native Vegetation: Guidelines for assisted regeneration and revegetation.

Biodiversity Conservation Trust (2021). Biodiversity Conservation Trust Livestock grazing guidelines for private land conservation.

Biodiversity Conservation Trust (2022). Biodiversity Conservation Trust Ecological Monitoring Module Operational manual.

Biodiversity Conservation Trust (2024). Essential conservation fencing infrastructure. Guidelines, standards and cost benchmarks.

Commonwealth DCCEEW (2005). "Directory of Important Wetlands in Australia." from https://www.environment.gov.au/cgi-bin/wetlands/search.pl?smode=DOIW.

Commonwealth DCCEEW (2025). "Species Profile and Threats Database." from http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl.

Cropper, S. C. (1993). Management of Endangered Plants. Melbourne, CSIRO Australia.

Department of Planning Industry and Environment (2020a). Biodiversity Assessment Method. Parramatta, NSW.

Department of Planning Industry and Environment (2020b). Biodiversity Assessment Method 2020 Operational Manual – Stage 1.

Department of Planning Industry and Environment (2020c). Guidance for assessors and decision-makers in applying modified benchmarks to assessments of vegetation integrity.

NSW DCCEEW (2020). "NSW (Mitchell) Landscapes - version 3.1." from https://data.nsw.gov.au/data/dataset/nsw-mitchell-landscapes-version-3-1.

NSW DCCEEW (2024a). "Interim Biogeographic Regionalisation of Australia (IBRA version 7.0).". from https://data.gov.au/dataset/ds-nsw-188ae132-d7b4-4a1a-8785-21786bcbe0bf/details#:~:text=gov.au%20%2D%20beta-,Interim%20Biogeographic%20Regionalisation%20for%20Australia,)%2C%20Version%207%20(Subregions)&text=Interim%20Biogeographic%20Regionalisation%20for%20Australia%20(IBRA)%20version%207.0%20represents%20a,and%20419%20sub%20regions%20...

NSW DCCEEW (2024b). "NSW State Vegetation Type Map C2.0.M2.1." from https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map.

NSW DCCEEW (2025a). "BioNet Atlas of NSW Wildlife." from https://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/AtlasSearch.aspx?who=19533fc8-b324-475a-8bbe-ca262c77039a.

NSW DCCEEW (2025b). "Bionet Vegetation Classification." from https://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx?ReturnUrl=%2fNSWVCA20PRapp%2fUserRegistration.aspx.

NSW DCCEEW (2025c). "NPWS Fire History - Wildfires and Prescribed Burns.". from https://datasets.seed.nsw.gov.au/dataset/fire-history-wildfires-and-prescribed-burns-1e8b6.

NSW Government (2024). "Historical imagery." from https://portal.spatial.nsw.gov.au/portal/apps/webappviewer/index.html?id=f7c215b873864d44bccddda8075238cb.

NSW Local Land Services (2024). Riverina strategic pest animal management plan - 2024 - 2028.

NSW Rural Fire Service (2017). Riverina Bush Fire Management Committee - bush fire risk management plan.

NSW Rural Fire Service (2022). Bush fire environmental assessment code - supporting document. Fire intervals for strategic fire advantage zones and land management zones.

Rawlings, R., D. Freudenberger and D. Carr (2010). A guide to managing Box Gum Grassy Woodlands.

Appendix A

BSA Management plan



Attachment 3: Management Plan

Section 1: General requirements

1. This Management Plan sets out the Management Actions that the Landowner must comply with as set out under Part D of the Biodiversity Stewardship Agreement (BSA).
2. The objectives of this Management Plan and its implementation are to:
   a) manage, protect and restore Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) for which ecosystem credits have been created under the BSA
   b) manage, protect, restore habitat for Threatened Species including protection of breeding habitat features for which species credits have been created under the BSA.
3. All Management Actions apply to the entire Biodiversity Stewardship Site from the Agreement Date unless otherwise stated.
4. Implementation of the Management Plan does not authorise the Landowner to harm, damage or desecrate an Aboriginal Object or Aboriginal Place.
5. An Annual Report must be prepared in accordance with the template published by the Biodiversity Conservation Trust (BCT) including the information as set out within this Management Plan.
6. Ecological monitoring must be undertaken by a suitably qualified person in accordance with the requirements set out in Section 9 of the Management Plan and consistent with any guidance from the BCT.
7. A review of the Management Plan, including evaluation of progress in the objectives of the Management Plan and each of the operations schedules is to be undertaken every five years in accordance with Biodiversity Stewardship Agreement. The review of the Management Plan must be provided to the Biodiversity Conservation Trust (BCT).
8. The Management Plan may be amended to ensure the conservation of Biodiversity and Biodiversity Values through a variation to the Biodiversity Stewardship Agreement.

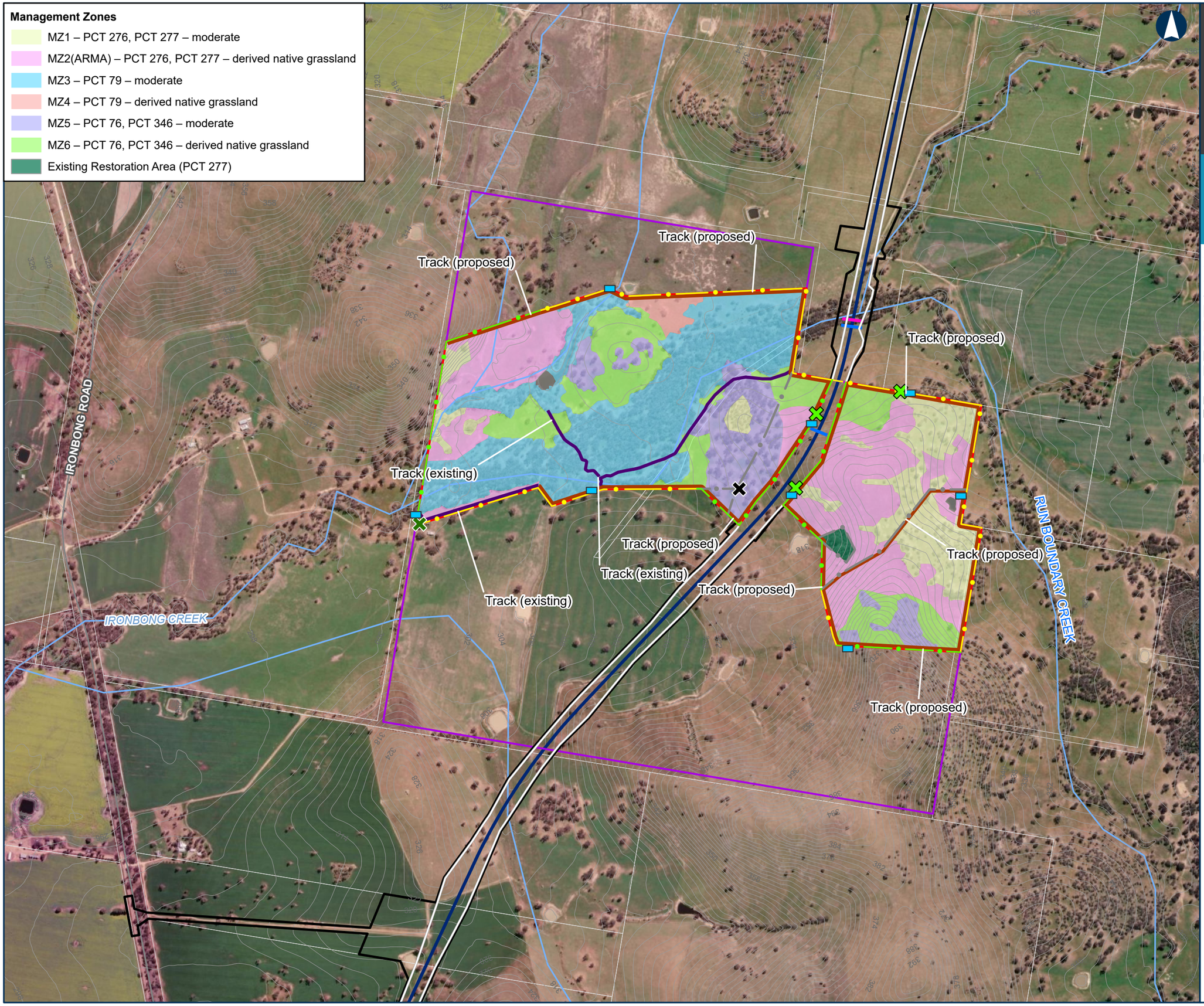
Management Plan Site Map

COMPLETE THIS ACTION USING THE IMAGE BOX ON THE NEXT PAGE >>
Insert the Management Plan Site Map at the largest scale possible for an A4 page that shows:

- Biodiversity Stewardship Site boundary
- Access tracks (including existing, proposed new tracks and tracks to be closed)
- Vegetation zones
- Active restoration management zones (actions such as revegetation, thinning, introduction of woody debris etc.)
- Fencing, gates (existing - maintained, existing - to be removed, proposed), signs.
- Location of disturbance and infrastructure issues to be addressed (such as erosion control, waste removal)
- Location of grazing areas and grazing prohibited areas (if relevant)
- Location of dams and/or other structures (if relevant)
- Contours where available

Management Zones

- MZ1 – PCT 276, PCT 277 – moderate
- MZ2(ARMA) – PCT 276, PCT 277 – derived native grassland
- MZ3 – PCT 79 – moderate
- MZ4 – PCT 79 – derived native grassland
- MZ5 – PCT 76, PCT 346 – moderate
- MZ6 – PCT 76, PCT 346 – derived native grassland
- Existing Restoration Area (PCT 277)



INLAND RAIL ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

ILLABO TO STOCKINBINGAL

Management Plan Site Map

MAP 1 OF 1

LEGEND

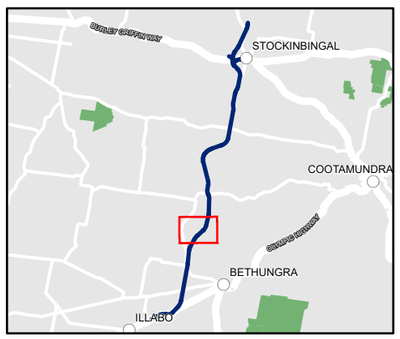
- Minor Watercourse
- Contours (2m)
- Railway Track alignment
- Cadastre
- Subject Land
- Property Boundary
- Construction Impact Zone
- Operational Boundary of Rail Line
- Water Body

Fauna Crossing Structures Proposed for I2S Project

- Bridge Underpass
- Rope Bridge

Proposed Infrastructure

- Sign
- Gate (existing to be removed)
- Gate (existing to be retained)
- Gate (proposed)
- Existing Fence (to be removed)
- Existing Fence (to be retained)
- Proposed Fence
- Track (existing)
- Track (proposed)



0 200 400 Metres

Coordinate System: GDA2020 MGA Zone 55

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Date: 2/07/2025 Paper: A3
Author: IRDJV Scale: 1:12,000
Data Sources: IRDJV, ARTC, LPI,World Imagery:Esri

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Section 2: Management actions – Disturbance and infrastructure

Management actions

9. Management to reduce disturbance is to be undertaken in accordance with Operations Schedule for this section and the Management Plan Site Map.
10. Waste must not be stored, disposed of, or caused, or permitted to be disposed of, on the Biodiversity Stewardship Site, and any new waste must be removed as soon as possible, or according to the timing set out in the Operations Schedule.
11. No structures, dams or access tracks are to be retained or constructed unless shown on the Management Plan Site Map.
12. Fire trails and access tracks shown on the Management Plan Site Map must be maintained in accordance with the Operations Schedule to permit the carrying out of Management Actions, and at an appropriate standard to minimise erosion and run-off.
13. All reasonable steps must be taken to prevent, control and remedy erosion, including obtaining advice from a suitable expert.
14. Sediment traps must be installed in accordance with the Operations Schedule if there is a risk of soil or sediment or runoff entering waterways.
15. The location and type of fencing specified in the Operations Schedule must be of a type that can minimise harm to native fauna and allows for ease of movement for native fauna on and off the Biodiversity Stewardship Site.
16. Natural hydrology must be retained and no artificial structures such as dams, levee banks or other construction or works can be established unless shown on the Management Plan Site Map and constructed in accordance with the Operations Schedule.

Record keeping

17. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) management actions for disturbance and infrastructure set out in the Operations Schedule that have been implemented during the year
    b) any observations of new disturbance events – such as, erosion or rubbish dumping, illegal access
    c) any minor variations from the Operations Schedule
    d) results of monitoring against performance measures.

Operations Schedule – Disturbance and infrastructure

Table 1: List of actions and timing for addressing disturbance and infrastructure (add/remove rows as needed)

TFD Item	Activity	Action/treatment/specifications	Frequency/timing	Performance measures
1	Fence installation	Approximately 2,907 m of new boundary fencing requires installation consisting of plain wire fence (with two strands of barb on internal strands)	From first payment date. Fencing to be installed in Year 1.	New fences installed and maintained in accordance with BCT Essential conservation fencing infrastructure guideline. New fences to be installed within 12 months of first payment date.
2	Fence removal	All internal, redundant fencing, including fencing not consistent with BCT fencing standards is to be removed from the BSA site. For difficult areas, fencing posts can be retained in-situ however wires are to be removed.	From first payment date. Fencing to be removed in Year 1.	All internal, old or redundant fencing to be removed within 12 months of payment date.
3	Fence maintenance	When required, replace/maintain boundary fencing in line with the wildlife-friendly fencing guidelines in Biodiversity Conservation Trust Essential conservation fencing infrastructure (Biodiversity Conservation Trust 2024).	From agreement date. Ongoing as required.	Fences maintained in accordance with BCT Essential conservation fencing infrastructure guidelines from first payment date. Boundary fences maintained to a standard that effectively excludes livestock from the BSA from agreement date.
4	Gate installation	Four new gates to be installed at the BSA site. One gate to be located on entry road from west and one in eastern section on northern boundary. Two gates to be installed on the rail corridor fence.	From first payment date. Gates to be installed in Year 1.	Gates are in good working order, allow egress to and from the site to perform management actions and are of a high enough standard to exclude livestock from entering the BSA. Gates meet BCT Essential conservation fencing infrastructure guidelines.
5	Gate maintenance and replacement	Gates will be maintained and replaced every 10 years or as required due to loss of function	From Year 10 Ongoing as required from Year 10.	Gates are in good working order to allow egress to and from the site to perform management actions and are of a high enough standard to exclude livestock from entering the BSA. Gates meet BCT Essential conservation fencing infrastructure guideline. Gates are replaced if they can no longer be maintained.
6	BSA sign installation	Eight signs will be installed at the BSA site. Signs to be placed at the entrances to the property and on	Installed within 12 months of first payment date.	Signs are installed within 12 months of first payment date. Four signs are present and legible in locations identified.

TFD Item	Activity	Action/treatment/specifications	Frequency/timing	Performance measures
		either side of the railway corridor. Signs to be consistent with BCT requirements.	Maintenance ongoing as required.	
7	BSA sign maintenance	Signs to be maintained to ensure that they are clear and readable and consistent with BCT requirements. Sign replacement to be undertaken as required.	Signs to be replaced every five years or as otherwise required.	Four signs are present and legible in locations identified. If damaged or unreadable signs to be replaced within 12 months of identification.
8	Roads, tracks and fire trails	Construction of 3 m wide track along fence boundary and new access track to eastern section of BSA site. Access tracks would be mulched and then regrowth treated to maintain track.	From first payment date. Track to be installed in Year 1.	Boundary track along fence line to be established in conjunction with fencing, within 12 months of first payment. New access track installed to enable access to eastern section of BSA site from northern boundary. Track installed within 12 months of first payment date, prior to establishment of construction exclusion for I2S project.
9	Roads, tracks and fire trails	Maintain 6628m of access tracks through BSA site and 400m access track to site.	From Year 2. Ongoing as required.	All tracks to be maintained from Year 2 annually in perpetuity, as required to allow for management actions to be completed. If roads, track or trail damage is identified it is maintained within 12–24 months of identification.
10	Roads, tracks and fire trails. Erosion remediation	Track erosion controls to be used as required as part of the adaptive management of the site. This may include construction of diversion banks.	Contingency cost for track erosion controls to be used as required (contingency costs allocated every three years, starting Year 3).	Contingency cost performance measure. Erosion remains stable or improves over time. Where erosion is identified or existing erosion worsens, remediation actions to occur within 12-24 months of identification.

Section 3: Management actions – Weed management and control

Management actions

18. Management of the Biodiversity Stewardship Site to control and remove weeds is to be undertaken in accordance with the Operations Schedule for this section and the Weed Management Map.
19. Removal and control of weed species is to enable an increase in the abundance, cover and diversity of Native Vegetation and protect and restore Threatened Species habitat through natural regeneration and/or undertaking Supplementary Planting.
20. Measures to reduce the risk of introducing new weed species or spreading existing weed species on the Biodiversity Stewardship Site must be implemented in accordance with the Operations Schedule.
21. Any other weed species not listed in the Operations Schedule that occur on the Biodiversity Stewardship site at any time are to be controlled and removed using methods of control and management consistent with similar species identified in the Operations Schedule.
22. The use of herbicide or other chemicals for weed management and control must be undertaken in accordance with APVMA requirements or current industry standards.

Record keeping

23. The Landowner must retain the following records and include in the annual report to the BCT:
    a) weed management actions set out in the Operations Schedule that have been implemented during the year
    b) any observations of the density and the distribution of weed species present on the Biodiversity Stewardship Site
    c) any minor variations from the Operations Schedule
    d) progress on meeting performance measures for weed management actions set out in the Operations Schedule that have been implemented during the year or require reporting on during the year
    e) Pesticide application records required by the NSW Environmental Protection Authority (EPA).

Operations Schedule – Weed management

Table 2: List of weeds targeted for management and their weed management group (add/remove rows as needed)

Common name	Scientific name	Weed management group
Hair Grass	*Aira spp.*	Low priority – annual and perennial grasses
Capeweed	*Arctotheca calendula*	Low priority – broadleaved herbaceous
Slender Wild Oat	*Avena barbata*	Low priority – annual and perennial grasses
Common Wild Oats	*Avena fatua*	Low priority – annual and perennial grasses
Great Brome	*Bromus diandrus*	High threat weed
Soft Brome	*Bromus hordeaceus*	Low priority – annual and perennial grasses
Soft Brome	*Bromus molliformis*	Low priority – annual and perennial grasses
Spear Thistle	*Cirsium vulgare*	Low priority – broadleaved herbaceous
Feather Fingergrass	*Chloris virgata*	Low priority – annual and perennial grasses
Skeleton Weed	*Chondrilla juncea*	Low priority – broadleaved herbaceous
Paddy Melon	*Cucumis myriocarpus*	Low priority – broadleaved herbaceous
Paterson's Curse	*Echium plantagineum*	Low priority – broadleaved herbaceous
Goose Grass	*Eleusine tristachya*	Low priority – annual and perennial grasses
Stink	*Eragrostis cilianensis*	Low priority – annual and perennial grasses
Hairy-pitted Stork's-bill	*Erodium brachycarpum*	Low priority – broadleaved herbaceous
Matted Sandmat	*Euphorbia serpens*	Low priority – broadleaved herbaceous
Red Fescue	*Festuca rubra*	Low priority – annual and perennial grasses
Barley Grass	*Hordeum leporinum*	Low priority – annual and perennial grasses
-	*Hordeum marinum*	Low priority – annual and perennial grasses
Barley	*Hordeum vulgare*	Low priority – annual and perennial grasses

Common name	Scientific name	Weed management group
Catsear	*Hypochaeris radicata*	Low priority – broadleaved herbaceous
St. Johns Wort	*Hypericum perforatum*	High threat weed
Prickly Lettuce	*Lactuca serriola*	Low priority – broadleaved herbaceous
Common Peppercress	*Lepidium africanum*	Low priority – broadleaved herbaceous
Ryegrass	*Lolium perenne*	Low priority – annual and perennial grasses
African Boxthorn	*Lycium ferocissimum*	High threat weed
-	*Malva neglecta*	Low priority – broadleaved herbaceous
Cheesewood Mallow	*Malva parviflora*	Low priority – broadleaved herbaceous
Burr Medic	*Medicago polymorpha*	Low priority – broadleaved herbaceous
Red-flowered Mallow	*Modiola caroliniana*	Low priority – broadleaved herbaceous
Thread Iris	*Moraea setifolia*	Low priority – broadleaved herbaceous
Chilean Needlegrass	*Nassella neesiana*	High threat weed
Common Knotgrass	*Polygonum aviculare*	Low priority – annual and perennial grasses
Turnip Weed	*Rapistrum rugosum*	Low priority – broadleaved herbaceous
Curly Dock	*Rumex crispus*	Low priority – broadleaved herbaceous
Blackberry Nightshade	*Solanum nigrum*	Low priority – broadleaved herbaceous
Common Sowthistle	*Sonchus oleraceus*	Low priority – broadleaved herbaceous
Common Dandelion	*Taraxacum officinale*	Low priority – broadleaved herbaceous
Puncture Vine	*Tribulus terrestris*	Low priority – broadleaved herbaceous
Narrow Clover	*Trifolium angustifolium*	Low priority – broadleaved herbaceous
White Clover	*Trifolium repens*	Low priority – broadleaved herbaceous
Subterranean Clover	*Trifolium subterraneum*	Low priority – broadleaved herbaceous
Squirreltail Fescue	*Vulpia bromoides*	Low priority – annual and perennial grasses

Common name	Scientific name	Weed management group
Rat's Tail Fescue	*Vulpia myuros*	Low priority – annual and perennial grasses
Spiny Cocklebur	*Xanthium spinosum*	High threat weed

Table 3: Methods of weed control and management (add/remove rows as needed)

TFD Item	Weed management group	Map location	Method of control/management	Frequency/ timing	Performance measures
11	All	All	Undertake detailed mapping of high threat weed in year 1	Year 1	High Threat Weed mapping complete in year 1.
12-14	All	All	Weed management actions should be completed under the guidance of an experienced bush regenerator. Spot spraying must be undertaken by suitably qualified, experienced and licenced personnel to minimise damage to off-target species. As such, person(s) undertaking spray applications must be highly competent in plant identification. Any treatment must be undertaken as per current best practice as described in Department of Primary Industry's Weedwise (Department of Primary Industries, 2024) or Local Land Services (NSW Government, 2024). Any spot spraying is to take into consideration current local and expected future weather conditions to minimise the risk of spray drift (in windy conditions) or mobilisation (following rainfall). Assessment of suitable conditions is to be undertaken prior to any spraying on the BSA site. Only herbicides registered for use in sensitive environments are to be used within 100m of the top bank of riparian zones.	Ongoing	All weed treatment is undertaken appropriately each year and no more than minimal off-target damage is recorded on a yearly basis.

TFD Item	Weed management group	Map location	Method of control/management	Frequency/ timing	Performance measures
12-14	High Priority – High Threat Weed – *Bromus diandrus*	All	Weed control methods may include: • Slash dense infestations with follow up within three months to spray regrowth. • Foliar spot spraying with approved monocot selective registered herbicide. • Chip out with mattock or axe in sensitive areas. • For smaller infestations, remove and bag all seed heads from individuals. Dispose appropriately offsite.	Primary weed management (Years 1-5): six person days, annually Secondary weed management (Years 6-10): six person days annually Maintenance weed management (Years 11+): six person days annually	At 5 years: • <10 % foliage cover in the ground stratum (<1 m). • Weed infestations are not spreading to adjacent areas. • Removed weed cover is not being replaced by HTE species. At 10 years: • <5% foliage cover in the ground stratum (<1m). • Weeds infestations are not spreading into adjacent areas. • Removed weed cover is not being replaced by additional weed species. At 20 years: • <5% foliage cover in the ground stratum (<1m). • Weeds infestations are not spreading into adjacent areas. • Removed weed cover is not being replaced by additional weed species. • Removed weed cover is being replaced by regenerating native plant species derived from the surrounding native PCT. • Maintain at similar or higher condition for ongoing management.
12-14	High Priority – High Threat Weed – *Hypericum perforatum*	All	Weed control methods may include: • Spot spraying with approved registered herbicide. • Small mosaic areas of tilling/turning soils may be appropriate where dense infestations are occurring and native seed source is high. • Manual removal, removing from base to get all roots.	Maintenance weed management (Years 1+): two person days annually	• <5% foliage cover in the ground stratum (<1m). • Weeds infestations are not spreading into adjacent areas. • Removed weed cover is not being replaced by additional weed species. • Removed weed cover is being replaced by regenerating native plant species derived from the surrounding native PCT. • Maintain at similar or higher condition for ongoing management.

TFD Item	Weed management group	Map location	Method of control/management	Frequency/ timing	Performance measures
12-14	High Priority – High Threat Weed – *Xanthium spinosum*	All	Weed control methods may include: • Spot spraying with approved registered herbicide. • Small mosaic areas of tilling/turning soils may be appropriate where dense infestations are occurring and native seed source is high. • Manual removal, removing from base to get all roots.	Maintenance weed management (Years 1+): two person days annually	• <5% foliage cover in the ground stratum (<1m). • Weeds infestations are not spreading into adjacent areas. • Removed weed cover is not being replaced by additional weed species. • Removed weed cover is being replaced by regenerating native plant species derived from the surrounding native PCT. • Maintain at similar or higher condition for ongoing management.
12-14	High Priority – High Threat Weed – *Nassella neesiana*	All	Weed control methods may include: • Slash dense infestations with follow up within three months to spray regrowth. • Foliar spot spraying with approved monocot selective registered herbicide. • Chip out with mattock or axe in sensitive areas. • For small infestations, remove and bag all seed heads from individuals. Dispose appropriately offsite.	Maintenance weed management (Years 1+): two person days annually	• <5% foliage cover in the ground stratum (<1m). • Weeds infestations are not spreading into adjacent areas. • Removed weed cover is not being replaced by additional weed species. • Removed weed cover is being replaced by regenerating native plant species derived from the surrounding native PCT. • Maintain at similar or higher condition for ongoing management.
12-14	High Priority – High Threat Weed – *Lycium ferocissimum*	All	Weed control methods may include: • Spraying of approved and appropriate herbicide to the entire foliage during the active growing period (best for plants <2m tall). • Cut stump and apply approved herbicide. Spot spray any regrowth.	Primary weed management (Years 1-5): two person days, annually. Secondary weed management (Years 6-10): two person days annually. Maintenance weed management (Years 11+): two person days, annually.	At 5 years: • <1 % foliage cover in all strata. • Weed infestations are not spreading to adjacent areas. • Removed weed cover is not being replaced by HTE species. At 5 + years: • Maintained as per Year 5 metrics.

TFD Item	Weed management group	Map location	Method of control/management	Frequency/ timing	Performance measures
12-14	Low Priority – broadleaf herbaceous – Broad-leaved herbaceous	All	Weed control methods may include: • Spot spraying with approved registered herbicide. • Focus on areas of higher historic grazing intensity and other disturbances. • Small mosaic areas of tilling/turning soils may be appropriate where dense infestations are occurring and native seed source is high. • Manual removal, removing from base to get all roots. • Chip out with mattock or axe in sensitive areas.	Primary weed management (Years 1-10): ten person days annually. Secondary weed management (Years 11-20): eight person days annually. Maintenance weed management (Years 11+): two person days annually.	At 5 years: • <10 % foliage cover in the ground stratum (<1 m). • Weed infestations are not spreading to adjacent areas. • Removed weed cover is not being replaced by HTE species. At 10 years: • < 5 % in the ground stratum (< 1 m). • Removed weed cover is not being replaced by HTE species. • Removed weed cover is being replaced by regenerating native plants species derived from the surrounding local grassland areas. At 11 years +: • Maintained as per Year 10 metrics.
12-14	Low priority – Annual and perennial grasses	All	Weed control methods may include: • Slash dense infestations with follow up within three months to spray regrowth. • Foliar spot spraying with approved monocot selective registered herbicide. • Chip out with mattock or axe in sensitive areas.	Primary weed management (Years 1-10): ten person days annually. Secondary weed management (Years 11-20): eight person days annually. Maintenance weed management (Years 11+): two person days annually.	At 5 years: • <20 % foliage cover in the ground stratum (<1 m). • Weed infestations are not spreading to adjacent areas. • Removed weed cover is not being replaced by HTE species. At 10 years: • < 15 % in the ground stratum (< 1 m). • Removed weed cover is not being replaced by HTE species. • Removed weed cover is being replaced by regenerating native plants species derived from the surrounding local grassland areas. At 15 years +: • < 10 % in the ground stratum (< 1 m). • Removed weed cover is not being replaced by HTE species. • Removed weed cover is being replaced by regenerating native plants species derived from the surrounding local grassland areas. At 20 years+: • Maintained as per Year 15 metrics.

Weed Management Map

Note: A Weed Management Map may not be required if the Biodiversity Stewardship Agreement site has only scattered weeds.

COMPLETE THIS ACTION USING THE IMAGE BOX ON THE NEXT PAGE >>

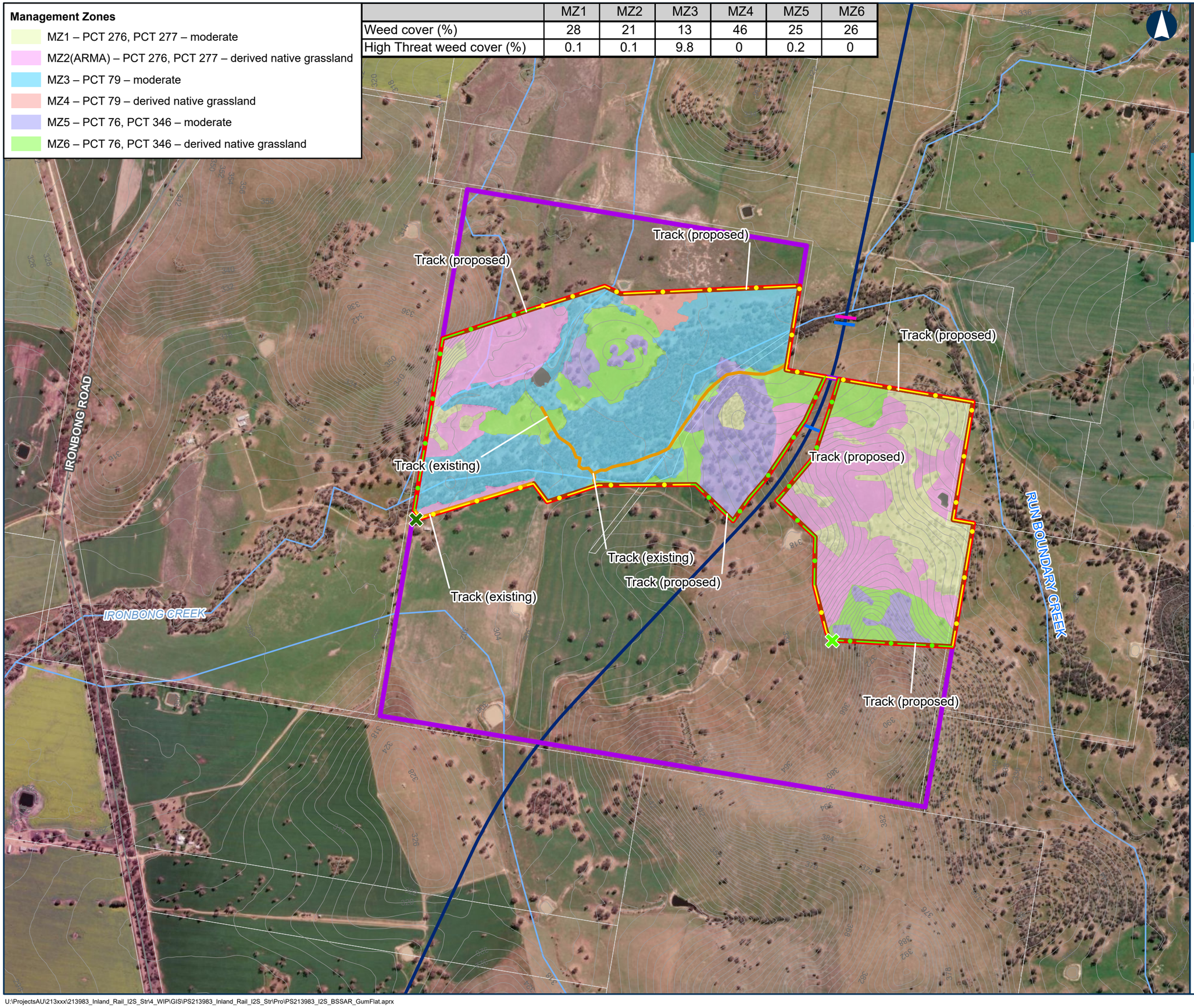
Include Weed Management map at largest scale possible for A4 page that shows:

- Biodiversity Stewardship Site boundary
- Access tracks
- Weeds or weed management group including high threat weeds
- Scattered and/or discrete weed infestation locations (where required)
- Management zones showing cover at baseline and with future targets identified in table/legend of map (the weed species or weed management group combined with the percentage foliage cover)
- Contours where available

Management Zones

- MZ1 – PCT 276, PCT 277 – moderate
- MZ2(ARMA) – PCT 276, PCT 277 – derived native grassland
- MZ3 – PCT 79 – moderate
- MZ4 – PCT 79 – derived native grassland
- MZ5 – PCT 76, PCT 346 – moderate
- MZ6 – PCT 76, PCT 346 – derived native grassland

	MZ1	MZ2	MZ3	MZ4	MZ5	MZ6
Weed cover (%)	28	21	13	46	25	26
High Threat weed cover (%)	0.1	0.1	9.8	0	0.2	0



INLAND RAIL ARTC

The Australian Government is delivering Inland Rail through the Australian Rail Track Corporation (ARTC), in partnership with the private sector.

ILLABO TO STOCKINBINGAL

Weed Management Map

MAP 1 OF 1

LEGEND

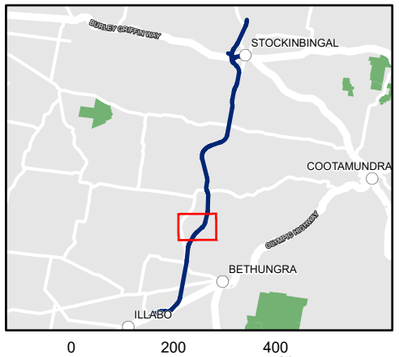
- Minor Watercourse
- Contours (2m)
- Railway Track alignment
- Cadastre
- Subject Land
- Property Boundary
- Water Body

Fauna Crossing Structures Proposed for I2S Project

- Bridge Underpass
- Rope Bridge

Proposed Infrastructure

- Gate (existing to be retained)
- Gate (proposed)
- Existing Fence (to be retained)
- Proposed Fence
- Track (existing)
- Track (proposed)



0 200 400 Met

Coordinate System: GDA2020 MGA Zone 55

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Date: 2/06/2025 Paper: A3
Author: IRDJV Scale: 1:12,000
Data Sources: IRDJV, ARTC, LPI,World Imagery:Esri

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Section 4: Pest animal controls

Management actions

24. Management of the Biodiversity Stewardship Site to control and remove pests is to be undertaken in accordance with Operations Schedule Pest Animal controls for this section and the Management Plan Site Map.
25. Removal and control of pest species is to enable increased recovery of native fauna and flora by reducing predation, grazing pressure, and competition.
26. The Landowner must obtain advice from Local Land Services on legal requirements and effective control methods prior to commencing any control activities. Advice from Local Land Services is to be obtained prior to the 5-yearly review of the Management Plan).
27. If any methods advised or recommended by Local Land Services differ from those identified in this Management Plan, the Landowner must advise BCT in writing prior to commencing control activities.
28. Any other pest animals not listed in the Operations Schedule are to be controlled and managed using methods of control and management that are consistent with similar species identified in the Operations Schedule, or methods recommended by Local Land Services.
29. Where possible, the Landowner will seek to coordinate implementation of pest animal control activities with neighbouring landowners.

Record keeping

30. The Landowner must retain the following records and include in the annual report to the BCT:
    a) feral pest control actions set out in the Operations Schedule Pest animal controls that have been implemented during the year
    b) results of feral pest control actions implemented during the year including list of target species, estimated number of target species culled or removed from the Biodiversity Stewardship Site
    c) any observations of the density and the distribution of feral pests present on the Biodiversity Stewardship Site
    d) any minor variations from the Operations Schedule Pest Animal Controls
    e) results of monitoring against performance measures
    f) chemical application records required by the EPA
    g) records of any new pest animals that are sighted within the Biodiversity Stewardship Site.

Operations Schedule – Pest animal controls

Table 4: List of pest animals, control methods and timing for actions (add/remove rows as needed)

TFD item	Common name	Map location	Method of control/management	Frequency/ timing	Performance measures
15-18	Feral Pig (*Sus scrofa*)	All MZs	Initial control via an effective method that will remove a large number of the population is important. This should be followed up by secondary control methods to further reduce the population and prevent future population expansions. Ground baiting: Baiting of pigs using 1080 poison following the Standard Operating Procedure (Sharp, 2022) is a good primary control method. Baiting should be avoided during the farrowing period where possible (between May and October). The best time to conduct a poisoning program is when surface water and food is scarce and Feral Pigs will be	Ground baiting: Ongoing/as required, and if/when regional control programs are running. Timing preferably Autumn. Conducted in conjunction with fox baiting each year. Ground shooting – as required (conducted and costed as a consolidated effort).	Feral Pig activity to be reduced to 'medium' by end of Year 5. Feral Pig activity to be reduced to 'low' or maintained at 'medium' from year 5 onwards. If Feral Pig rooting is impacting VI score of ecosystem credits present after Year 5 consider adapting management plan as part of 5-yearly review or discuss options with LLS. **LLS pest level activity categories:** • High – abundance evident, individuals easily visible

TFD item	Common name	Map location	Method of control/management	Frequency/ timing	Performance measures
			concentrated near permanent water points and are more likely to eat bait due to hunger. In south-eastern Australia, late autumn is usually the most effective period for baiting pigs. To minimise potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended: To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are used: • Pre-feeding with non-poisoned bait – allows an assessment of what animals are eating the bait. This can be monitored through camera traps. • Use bait that is locally attractive to Feral Pigs e.g., fermented grains, and less attractive to non-targets. Dye bait material a green or blue colour to reduce attractiveness to non-target fauna, especially birds. Placement of baits in the prime feeding areas of Feral Pigs, and areas inaccessible to off-target species. I.e., place baits in a fenced area which excludes livestock and other non-target animals but allows Feral Pigs to push through to access. • Timing – baits are best laid in the evening as Feral Pigs are mostly active between dusk and dawn and will consume most of the baits overnight. • Collect and destroy uneaten bait and Feral Pig carcases or bury with a minimum of 500 mm of soil. • Ground shooting – Ground shooting is recommended as a secondary Feral Pig control measure and should follow the Standard Operating Procedure (Sharp, 2022) – for Feral Pigs.		• Medium – active areas present, recent signs of animals observed • Low – some signs observed, may not be recent • Zero – no sign.

TFD item	Common name	Map location	Method of control/management	Frequency/ timing	Performance measures
15-18	European Red Fox (*Vulpes vulpes*)	All MZs	Ground baiting: Baiting of foxes using 1080 poison following the Standard Operating Procedure (SOP-FOX001) (Sharp, 2012). It is preferable not to undertake baiting programs when vixens are lactating (i.e., August to September). This is also the time when vixens are moving around least within their territory thus reducing the likelihood of finding baits. To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended: • Bait size and concentration of 1080 baits should be large enough so that small native animals cannot eat enough of them to ingest a lethal dose. Each bait should contain a precise amount of 1080 (3mg) which is sufficient to deliver a lethal dose to a fox. The rate is calculated to minimise sublethal doses and overdosing. • Burial placement of baits – bury baits 10cm underground Buried baits are less likely to be removed by native species. • Distance between bait stations – space baits at least 100m apart to minimise the risk of native animals finding multiple baits • Palatability and attractiveness to baits – ensure that bait types used are highly attractive to foxes and less attractive to non-target species. Some native animals may not be attracted to meat or may be unable to eat some bait types. • Marking of bait stations – mark the location of buried baits so that any baits remaining at the end of the program can be collected and destroyed. Ground shooting: Ground shooting is recommended as a secondary fox control measure and should follow the Standard Operating Procedure (SOP-FOX003 – for feral foxes (Sharp, 2012).	Ground baiting: Ongoing/as required, and if/when regional control programs are running. Timing preferably Autumn to Spring. Conducted in conjunction with pig baiting each year. Ground shooting – as required (conducted and costed as a consolidated effort).	Fox activity to be reduced to 'medium' or 'low' by end of Year 5. Fox activity to be reduced to 'low' from Year 5 onwards. No evidence of Fox predation or incidence. If present, enact Fox control as part of pest management program.
15-18	European Rabbit	All MZs	Ground shooting: Ground shooting is recommended for this species due to the humaneness of the	Ground shooting – as required (conducted and	Rabbit activity to be reduced to 'medium' by end of Year 5.

TFD item	Common name	Map location	Method of control/management	Frequency/ timing	Performance measures
	(*Oryctolagus cuniculus*)		method and use in conjunction with control of other species. Ground shooting should follow the Standard Operating Procedure SOP-RAB008 (Sharp, 2016). Other control methods that could be considered for Rabbits if recorded include: • Warren destruction • Warren fumigation • Baiting (Pindone) • Biological control (RHDV).	costed as a consolidated effort)	Rabbit activity to be reduced to 'low' or maintained at 'medium' from year 5 onwards. No evidence of Rabbit incidence or warrens. If present, enact Rabbit control as part of pest management program. If Rabbit warrens or grazing are impacting VI score of ecosystem credits present after Year 5 consider adapting management plan as part of 5-yearly review or discuss options with LLS.
15-18	Feral Goat (*Capra hircus*)	All MZs	Ground shooting: Ground shooting is recommended for this species due to the humaneness of the method and use in conjunction with control of other species. Ground shooting should follow the Standard Operating Procedure NATSOP-GOA001 (Sharp, 2005). No poisoning is approved for use in the control of Feral Goats in NSW and therefore should not be used to control this species.	Ground shooting – as required (conducted and costed as a consolidated effort)	Feral Goat activity to be reduced to 'medium' by end of Year 5. Feral Goat activity to be reduced to 'low' or maintained at 'medium' from year 5 onwards. No evidence of Goats. If present, enact Goat control as part of pest management program. If Goat grazing is impacting VI score of ecosystem credits present after Year 5 consider adapting management plan as part of 5-yearly review or discuss options with LLS.

Section 5: Plant Community Types and Threatened Ecological Communities (Native Vegetation)

Management actions

31. Management of the Biodiversity Stewardship Site to protect, restore and enhance native vegetation is to be undertaken in accordance with the Operations Schedules for this section and the Management Plan Site Map.
32. Native Vegetation must not be cut down, felled, thinned, logged, killed, destroyed, poisoned, ringbarked, uprooted, burnt or otherwise removed, except in accordance with the Operations Schedule.
33. Dead timber (whether standing or fallen and including branches and leaf litter) must not be removed from or moved, except for the personal (non-commercial) use by the Landowner for firewood for one dwelling only or for repair of fences (not for construction of fences).
34. The Landowner must prevent Fertilisers and other sources of nutrients – for example, manure – other than those that would occur as a result of natural ecosystem function, or from approved stock grazing activities from entering or being used except in accordance with the Operations Schedule.
35. Pesticides must not be applied except in accordance with the Operations Schedules.
36. Replanting and other activities to enhance Plant Community Types (PCT) and/or Threatened Ecological Communities (TEC) must occur in accordance with the Operations Schedules.
37. If replanting or seeding, the Operations Schedule must set out measures as required to assist survival and establishment of native species such as watering, weed control, replacement planting.

Record keeping

38. The Landowner must retain the following diary records and include in the Annual Report:
    a) dates of planting/seeding
    b) source of seed/seedlings
    c) survival rates of planting/seeding
    d) dates and results of monitoring against performance measures
    e) activities related to the collection of firewood or the repair of fences.

Operations Schedule – PCTs and TECs (Native Vegetation)

Table 5: Management action method s for PCTs and TECs (add/remove rows as needed)

TFD item	Map location	Methods (including site preparation and maintenance methods)	Timing/frequency	Performance measures
27-33	**MZ1**	Assisted native regeneration. Management zone will be subjected to the following actions: • Removal of grazing pressure through exclusion of livestock. • Monitoring of ground cover regeneration. Contingency action: supplementary planting in these areas if efforts do not result in suitable regeneration/germination after two years of grazing exclusion.	Exclusion of livestock from Agreement Date. Contingency restoration plantings considered from Year 3, as required.	Natural regeneration of native species after two years of livestock exclusion. PCTs reach or are on a trajectory to reach predicted canopy benchmark targets for restoration (refer to Section 9). Planting of groundcover species required if native composition remains below PCT benchmarks after 2 years of grazing exclusion.

TFD item	Map location	Methods (including site preparation and maintenance methods)	Timing/frequency	Performance measures
19-23	**MZ2**	Active restoration planting. will be subjected to the following actions: • Removal of grazing pressure through exclusion of livestock. • Planting of canopy species representative of mapped PCT to connect woodland patches. • Monitoring of ground cover regeneration. Contingency action: supplementary plantings and planting of native understorey species considered if efforts do not result in suitable planting survival or understorey germination.	From Year 2. Supplementary canopy plantings and groundcover plantings considered from Year 3, as required.	PCTs reach or are on a trajectory to reach predicted canopy benchmark targets for restoration (refer to Section 9). Supplementary planting of canopy species is to be considered if planting survival is below 80% after three years of grazing exclusion. If deemed appropriate supplementary actions are completed until target is met or on a trajectory to do so. Planting of groundcover species required if native composition remains below PCT benchmarks after 2 years of grazing exclusion.
19	**MZ2**	Site preparation for areas of active planting will include tilling, turning or auguring of soil within areas of high density of light dependent herbaceous species over individual planting lots each covering 50-100 m2 with a total cover of 31 ha. Each planting lot will be prepared no more than 4 weeks prior to installation of plants to reduce likelihood of herbaceous regrowth prior to installation.	No more than 4 weeks before planting installation in year 2.	Total of 31 ha of area is prepared for planting no more than 4 weeks prior to plant installation.
19-23	**MZ2**	All areas of active planting must be managed as required to assist the establishment and survival of native plant species. Maintenance includes watering, slashing and spraying of weeds and plant replacement at strategic times of the year. Plants are to be maintained for a period of at least six months post planting to ensure survival rate is above 80%. Plants used for active planting must be obtained from appropriate and climate-ready seed source. Contingency action: after two years, if the survival rate is less than 80%, then plant replacement will be required. Refer to table below for planting species, timings, number of plants, planting method and performance/ target.	As required	Minimum 80% survival of installed plants at two years post-installation otherwise supplementary planting required until threshold for contingency is met.

Table 6.A: Replanting for [insert PCT or TEC name] – Species list (add/remove rows and replicate or delete table as needed)

Management zone	Common name (Scientific name)	Timing (years)	Number of plants per year (assumes 80% survival)	Planting method	Performance measures
MZ2 – PCT 276	Yellow Box (*Eucalyptus melliodora*)	Autumn (March to May) Year 2, ongoing as required.	193	Propagated tubestock Mechanical and hand planting	All initial planting installed by end of Year 2. Minium 80% survival of installed plants at 2 years post installation. Supplementary planting undertaken if survival rate is less than 80% target. VI score has met or is on a trajectory to meet target VI score assigned in Section 9. If not, consider adaptive management for example implementing further supplementary planting, weed management or direct seeding to improve chances of success.
	Blakely's Red Gum (*Eucalyptus blakelyi*)		23	Propagated tubestock Mechanical and hand planting	
	Apple Box (*Eucalyptus bridgesiana*)		23	Propagated tubestock Mechanical and hand planting	
MZ2 – PCT 277	Blakely's Red Gum (*Eucalyptus blakelyi*)		1,932	Propagated tubestock Mechanical and hand planting	All initial planting installed by end of Year 2. Minium 80% survival of installed plants at 2 years post installation. Supplementary planting undertaken if survival rate is less than 80% target. VI score has met or is on a trajectory to meet target VI score assigned in Section 9. If not, consider adaptive management for example implementing further supplementary planting, weed management or direct seeding to improve chances of success.
	Yellow Box (*Eucalyptus melliodora*)		1,935	Propagated tubestock Mechanical and hand planting	
	Apple Box (*Eucalyptus bridgesiana*)		172	Propagated tubestock Mechanical and hand planting	
	Grey Box (*Eucalyptus microcarpa*)		105	Propagated tubestock Mechanical and hand planting	
	Long-leaved Box (*Eucalyptus goniocalyx*)		160	Propagated tubestock Mechanical and hand planting	

~~**Table 6.B: Replanting for [insert PCT or TEC name] – Species list** (add/remove rows and replicate or delete table as needed~~

~~Not needed~~)

Section 6: Threatened species habitat

Management actions

39. Management of the Biodiversity Stewardship Site to protect, restore and enhance Threatened Species habitat (for ecosystem credits and species credits) is to be undertaken in accordance with the Operations Schedule for this section and the Threatened Species Habitat Map.
40. Breeding habitat features – for example, hollow-bearing trees – and other habitat features for Threatened Species, including any breeding sites and other habitat features are to be retained and not removed or impacted by any activities shown on the Threatened Species Habitat Map.
41. Threatened Species habitat elements such as bush rocks, termite mounds and fallen logs, must not be moved or removed except in accordance with the Threatened Species Operations Schedule.

Record keeping

42. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) management actions set out in the Threatened Species habitat Operations Schedule that have been implemented during the year
    b) any observations of changes in the number or area of Threatened Species and their habitat
    c) any minor variations from the Threatened Species habitat Operations Schedule
    d) records of any new Threatened Species recorded on the Biodiversity Stewardship Site
    e) results of monitoring against performance measures.

Operations Schedule – Threatened species habitat

Table 7: List of methods and timing for threatened species habitat management actions (add/remove rows as needed)

TFD Item	Common name (Scientific name)	Map location	Method/action	Timing/frequency	Performance measure
Not applicable – no species-specific actions proposed on site.					

Threatened Species Habitat Map

COMPLETE THIS ACTION USING THE IMAGE BOX ON THE NEXT PAGE >>
Include Threatened Species Habitat Map at largest scale possible for A4 page that shows:

- Biodiversity Stewardship Site boundary
- Access tracks
- Location of known threatened species (both ecosystem and species credit)
- Species polygons showing current and proposed restored habitat for species credit species
- Location of known habitat features (both ecosystem and species credits such as breeding sites, waterbodies, caves etc.)
- Contours where available

Map may not be required unless there are specific actions to be carried out in defined areas. Separate maps for different threatened species can also be included.

Section 7: Grazing management

This section is to be included for BSAs where grazing is suitable (see BSA Application Guide). Grazing is excluded on all other BSAs.

Management actions

43. Stock grazing is not permitted to occur on the Biodiversity Stewardship site.
44. The Operations Schedule Grazing management is to identify Healthy Condition thresholds for ground cover taking into account seasonal, climatic and Site conditions. Thresholds for Healthy Condition are based on regional rainfall (annual averages) and the dominant grass species present. Thresholds for Healthy Condition must include grazing pressure from native herbivores and any pest herbivores.
45. Stock grazing regime is to:
    a) assist enhancing the diversity and cover of native flora species, enhance habitat for native fauna species, control weeds and promote natural regeneration rather than be for the purpose of agricultural productivity
    b) be confined to appropriate grassy ecosystems on the Biodiversity Stewardship site
    c) be excluded from riparian and other sensitive areas shown on the Management Actions Map using appropriate fencing
    d) ensure ground cover is maintained above Healthy Condition thresholds.
    e) be put on hold during periods when the Healthy Condition thresholds are not met within a grazing location listed in the Operations Schedule for this section
    f) be undertaken during defined times to allow native species to flower, set seed and germinate in order encourage future recruitment of native plants.
46. Stock must be removed immediately (grazing must cease) in any area of the Biodiversity Stewardship Site where the groundcover or sward height is below the Performance Measures in the Operations Schedule.
47. Grazing must not occur in map locations that contain replanted areas, and/or areas where natural regeneration of tree cover is occurring until tree stems are at height (metres) or diameter breast height (centimetres) that is set out in the Healthy Condition performance measures listed in the Operations Schedule.
48. The Landowner must take all reasonable precautions to minimise the risk of introducing new weed species, or the spread of known weed species when stock enter onto or within the Biodiversity Stewardship Site.

Record keeping

49. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) Dates, duration and intensity of grazing for each grazing area
    b) Other management actions implemented set out in the Operations Schedule Grazing Management that have been implemented during the year, including records of any quarantine measures
    c) Details of any unauthorised grazing and action taken
    d) any minor variations to the Operations Schedule Grazing Management
    e) observations of the management objectives and results of monitoring against healthy condition performance measures.

Operations Schedule – Grazing management

Table 8: Grazing management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Map location	Stock type	Method (cell/rotational/crash)	Timing/Frequency	Healthy Condition performance measures
Not applicable – no conservational grazing proposed on site.					

Section 8: Management actions – Fire management

This section is only to be included for BSAs with fire management requirements (see BSA Application Guide)

Management actions

50. Ecological burns of Native Vegetation may be undertaken to help stimulate Native Plant regeneration, control weeds and enhance Biodiversity in accordance with the Operations Schedule for this section (including performance measures) and the Fire Management Map.
51. Burns are to be undertaken at a frequency and intensity suitable for the PCTs and Threatened Species.
52. Burning should only be undertaken when and where it is safe to do so without major risk to property, infrastructure or Biodiversity that is sensitive to fire. The Fire Management Map must identify these areas as fire exclusion zones.
53. Ecological Burns are to be carried out in a mosaic-pattern of different burn intervals to ensure refuge areas for native fauna are available at all times. Reasonable measures are to be taken prior to the burn event to flush out native animals.
54. Prior to each instance of an ecological burn being undertaken, an operational burn plan must be prepared by a suitably qualified and/or experienced person. Each operational burn plan should have regard to the other management actions in this Management Plan, and must:
    a) identify site access and notification requirements
    b) specify the ignition pattern (consider planning the burn path to allow for safe corridors of retained vegetation for fauna to retreat away from the fire to nearby bushland)
    c) identify containment lines that will restrict the spread of fire to within the planned burn unit and maintain the fire exclusion zones
    d) describe desirable weather conditions for when to conduct the burn
    e) conduct a work safety and risk assessment
    f) identify the permits and approvals required for conducting the burn
    g) specify communication procedures and protocols.
55. Following a wildfire event or a hazard reduction burn undertaken by Rural Fire Service, an Ecological Burn must only be carried out on any area of the Biodiversity Stewardship Site according to the frequency specified in the Operations Schedule to stimulate Native Plant regeneration, control weeds and enhance Biodiversity.
56. Ecological Burns should be carried out in accordance with the Bush Fire Environmental Assessment Code including the Threatened Species Hazard Reduction List for Plants, Animals and Threatened Ecological Communities (NSW Rural Fire Service), except for an ecological burn that is being undertaken in accordance with the Operations Schedule Fire management and the Biodiversity Stewardship Agreement.

Record keeping

57. The Landowner must retain the following diary records and provide the following in the annual report to the BCT:
    a) date, cause, area (hectares), and relative intensity of any fire event that occurred within the Biodiversity Stewardship Site
    b) weather conditions and observations such as the scorch height on tree species and any impacts on threatened species
    c) contractors involved in management of any burns – for example, RFS or a cultural burn practitioner.
    d) response of PCTs and native plants to any fire events.

Operations Schedule – Fire management

Table 9: Fire management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Ecological burn unit	Timing of burn	Fire frequency	Fire intensity	Other methods	Performance measures
24	BMZ1 -3	Year 9 Year 15			Review/Preparation of strategic and operational burn plans	Strategic and operational burn plans prepared prior to burn implementation
25	BMZ1	Autumn and winter Timing of burn done in accordance with the Bush Fire Risk Management Plan for Riverina	Proposed minimum fire interval is 10 years. To begin in Year 10. Recommend fire exclusion from areas of ARMA (revegetation in MZ2) and areas of natural canopy regeneration (in MZ4, MZ6 and MZ8) until monitoring indicates saplings are large and resilient enough to withstand fire.	Low intensity mosaic burns that ensure that some locations of refugia remain unburnt.	Burns done in accordance with the requirements outlined in the Bush Fire Risk Management Plan for the Riverina	First burn completed in Year 10. Burns undertaken on a 10 year schedule unless conditions result in extension. Occasional greater intervals may be desirable (greater than 15 years in MZ1, MZ5 and greater than 20 in MZ3). Burn undertaken in autumn and/or winter. Burn undertaken are low intensity ground fires (resulting in a burn mosaic). VI scores completed as part of EMM monitoring indicate that vegetation condition is being maintained or improving. If not, consider adapting fire management plan for example modifying frequency.
25	BMZ2	Autumn and winter Timing of burn done in accordance with the Bush Fire Risk Management Plan for Riverina	Proposed minimum fire interval is 10 years. To begin in Year 10. Recommend fire exclusion from areas of ARMA (revegetation in MZ2) and areas of natural canopy regeneration (in MZ4, MZ6 and MZ8) until monitoring indicates saplings are large and resilient enough to withstand fire.	Low intensity mosaic burns that ensure that some locations of refugia remain unburnt.	Burns done in accordance with the requirements outlined in the Bush Fire Risk Management Plan for the Riverina	First burn completed in Year 10. Burns undertaken on a 10 year schedule unless conditions result in extension. Occasional greater intervals may be desirable (greater than 15 years in MZ1, MZ5 and greater than 20 in MZ3). Burn undertaken in autumn and/or winter. Burn undertaken are low intensity ground fires (resulting in a burn mosaic). VI scores completed as part of EMM monitoring indicate that vegetation condition is being maintained or improving. If not, consider adapting fire management plan for example modifying frequency.

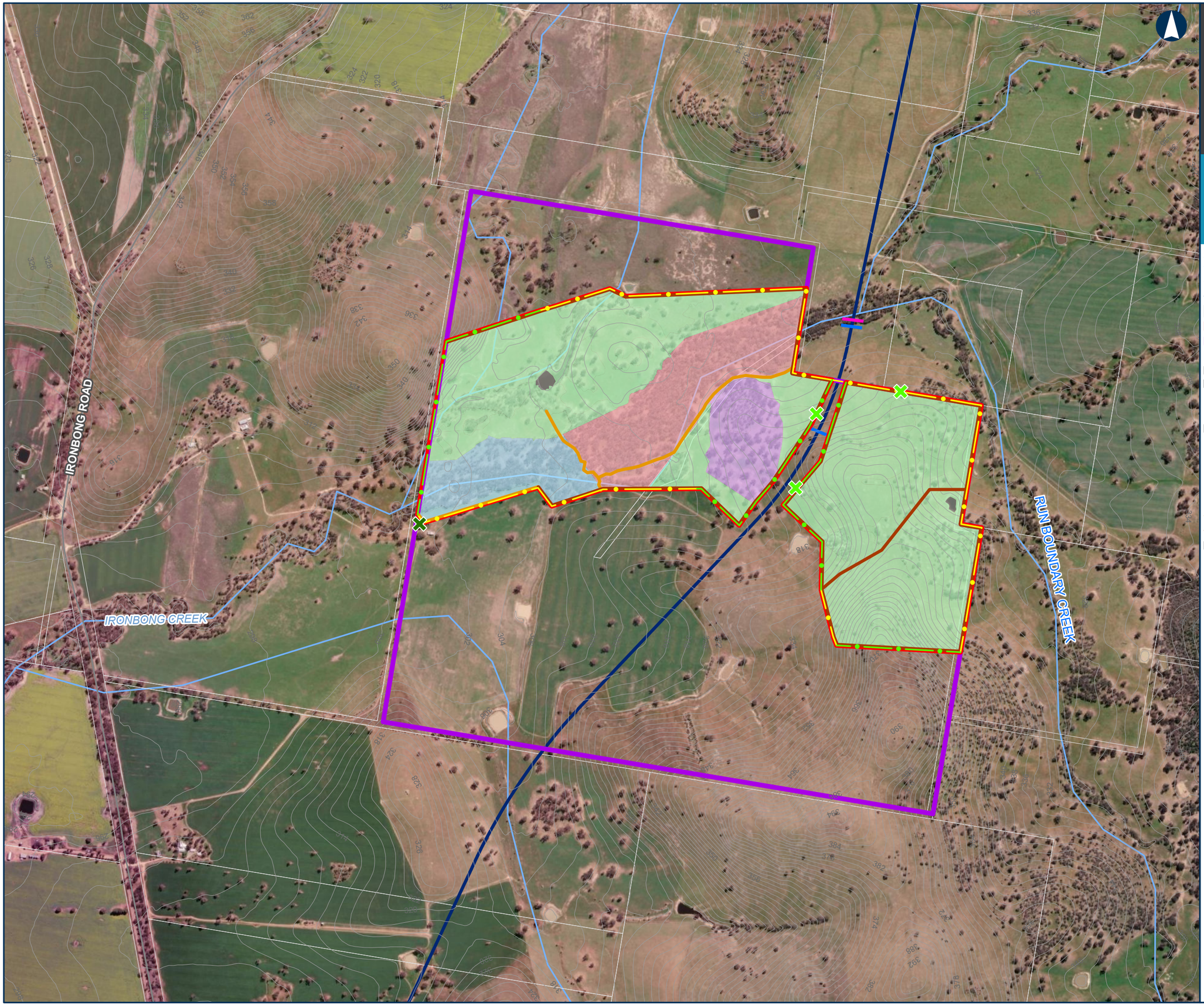
TFD Item	Ecological burn unit	Timing of burn	Fire frequency	Fire intensity	Other methods	Performance measures
26	BMZ3	Autumn and winter Timing of burn done in accordance with the Bush Fire Risk Management Plan for Riverina	Proposed minimum fire interval is 10 years. To begin in Year 15. Recommend fire exclusion from areas of ARMA (revegetation in MZ2) and areas of natural canopy regeneration (in MZ4, MZ6 and MZ8) until monitoring indicates saplings are large and resilient enough to withstand fire.	Low intensity mosaic burns that ensure that some locations of refugia remain unburnt.	Burns done in accordance with the requirements outlined in the Bush Fire Risk Management Plan for the Riverina	First burn completed in Year 15. Burns undertaken on a 10 year schedule unless conditions result in extension. Occasional greater intervals may be desirable (greater than 15 years in MZ1, MZ5 and greater than 20 in MZ3). Burn undertaken in autumn and/or winter. Burn undertaken are low intensity ground fires (resulting in a burn mosaic). VI scores completed as part of EMM monitoring indicate that vegetation condition is being maintained or improving. If not, consider adapting fire management plan for example modifying frequency.
24-26	BMZ4	Burn excluded	Minimum fire interval is 10 years, with fire excluded for 20+ years pending monitoring results and adaptive management	n/a	n/a	Burn plan reviewed based on monitoring outcomes

Fire Management Map

COMPLETE THIS ACTION USING THE IMAGE BOX ON THE NEXT PAGE >>
Include a Fire Management Map at largest scale possible for an A4 page that shows:

- Biodiversity Stewardship Site boundary
- Access tracks
- Ecological burn units

- Areas temporarily excluded from fire (such as proposed revegetation sites)
- Areas permanently excluded from fire (such as fire sensitive PCTS, threatened species habitat, AHIMS, Heritage sites etc.)
- Contours where available



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ILLABO TO STOCKINBINGAL

Fire Management Map

MAP 1 OF 1

LEGEND

- Minor Watercourse
- Contours (2m)
- Railway Track alignment
- Cadastre
- Subject Land
- Property Boundary
- Water Body

Fauna Crossing Structures Proposed for I2S Project

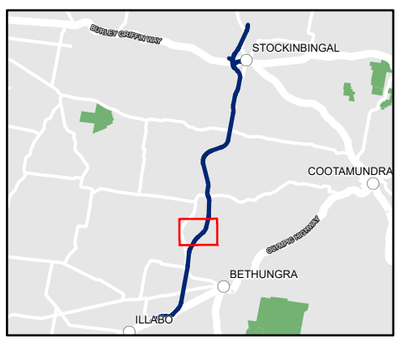
- Bridge Underpass
- Rope Bridge

Proposed Infrastructure

- Gate (existing to be retained)
- Gate (proposed)
- Existing Fence (to be retained)
- Proposed Fence
- Track (existing)
- Track (proposed)

BMZ

- BMZ1
- BMZ2
- BMZ3
- BMZ4 (temporarily exclude fire)



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Coordinate System: GDA2020 MGA Zone 55

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Date: 1/07/2025 Paper: A3
Author: IRDJV Scale: 1:12,000
Data Sources: IRDJV, ARTC, LPI,World Imagery:Esri

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Section 9: Management actions – Monitoring and adaptive management

Management actions

58. Monitoring and adaptive management under this Management Plan will be in accordance with the performance measures described in each section and the Operations Schedule for this section and the Monitoring Map.
59. Ecological Monitoring Points are to be established in accordance with the Operations Schedule for Monitoring and adaptive management with the locations of each point shown on the Monitoring Map (a minimum of one Ecological Monitoring Point in each vegetation zone) within 12 months of the Agreement Date).
60. Photographs must be taken at each Ecological Monitoring Point within 12 months of the Agreement Date and then at least every 12 months thereafter showing all 360 degrees and must:
    a) be taken from each end of the transect length at the same location, with the same starting direction for the commencement and direction of the sweep, with the camera held at the same location, height and angle
    b) show exactly the same field of view each monitoring event, to enable comparison across years
    c) be clear and of suitable resolution to show detail and taken at appropriate light conditions to display optimal contrast
    d) be dated and labelled and retained by the Landowner.

Record keeping

61. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) management actions set out in the Operations Schedule for monitoring and adaptive management that have been implemented during the year
    b) photographs and any observations taken from the photo points
    c) any minor variations from the Operations Schedule Monitoring and adaptive management.

Operations Schedule – Monitoring and adaptive management

Table 10: Monitoring and adaptive management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Map location	Method	Frequency/timing	Performance measures
27-31, 34	All	Annual Monitoring (photo points, weeds, pests, etc.). Annual photographic monitoring points are to be established in Year 1 before works commence. Photographs must be taken at each Ecological Monitoring Point within 12 months of the Agreement Date and then at least every 12 months thereafter showing all 360 degrees and must: • Be taken from the same location, with the same starting direction for the commencement and direction of the sweep, with the camera held at the same location, height and angle. • Show the same field of view each monitoring event, to enable comparison across years. • Be clear and of suitable resolution to show detail and taken at appropriate light conditions to display optimal contrast. • Be dated and labelled and retained by the Landowner.	Within 12 months of the Agreement Date and annually thereafter.	Photographic monitoring points installed within 12 months of Agreement Date. Photographic monitoring points collected annually at locations in Table 11. Photographic monitoring points installed after Year 1 added to management plan as part of first 5-yearly review.
34	All	**BSA general inspections** General inspections of the BSA to identify the following would be completed opportunistically whilst undertaking other management actions: • Inspect fence, gate and sign condition (at least once every 6 months) to ensure livestock are excluded from BSA site and control/limit human disturbance. • Signs of unauthorised access (continuous, ongoing). • Inspect condition along access tracks (at least every 6 months) to ensure they continue to allow management actions to occur. • Signs of erosion (continuous, ongoing). • Detect presence of rubbish that requires removal from the BSA (continuous, ongoing)..	As specified in previous cell.	Where observations indicate management actions are required, the owner must implement as described in the relevant sections of this management plan.
27-31, 34	All	Annual Monitoring Reporting (photo points, weeds, pests, etc.). Report production inclusion of all annual monitoring items as per diary record keeping requirements.	Annually from Year 1.	Reporting delivered annually.
27-31	All	EMM monitoring is undertaken as per ecological response monitoring table (Table 11).	Every 5 years starting from Year 5 (Year 5, 10, 15, 20).	EMM monitoring undertaken at Year 5, 15, and 20. If BSA does not become active within 2 years of the Agreement Date then a baseline EMM event would occur in Year 1.
27-31	All	EMM monitoring is undertaken as per ecological response monitoring table (Table 11).	Every 10 years starting from Year 20.	EMM monitoring undertaken at Year 20 then every 10 years.

TFD Item	Map location	Method	Frequency/timing	Performance measures
27-31	All	If performance measures are not met discussion of use of contingency funds to be determined. EMM monitoring is undertaken as per ecological response monitoring table (Table 11).	If required.	EMM monitoring is undertaken and data assessed against targets. Adaptive management planned.
27-31	All	EMM ARMA monitoring EMM monitoring is undertaken as per ecological response monitoring table (Table 11).	Every 2 years from Year 6 – 12.	EMM ARMA monitoring undertaken within the first 10 years post planting.

Table 11: Ecological response monitoring (add/remove rows as needed)

Point ID	Zone/Species	Biodiversity Target	Description of the method or the metric	Easting	Northing	Frequency	Baseline	Target
1	VZ1	Vegetation Integrity	Full Floristic BAM VI Plot	576529	6159787	Every 5 years for the first 20 years then every 10 years in perpetuity.	31.1	5 year target: 31.9 10 year target: 32.7 15 year target:33.5 20 year target: 34.3
2	VZ2	Vegetation Integrity	Full Floristic BAM VI Plot	576596	6159888	Every 5 years for the first 20 years then every 10 years in perpetuity.	8.6	8.6
3	VZ3	Vegetation Integrity	Full Floristic BAM VI Plot	575901	6160588	Every 5 years for the first 20 years then every 10 years in perpetuity.	54	5 year target: 54.7 10 year target:55.4 15 year target:56.1 20 year target:56.8
4	VZ4	Vegetation Integrity	Full Floristic BAM VI Plot	576212	6160457	Every 5 years for the first 20 years then every 10 years in perpetuity.	48.9	5 year target: 51.6 10 year target:54.2 15 year target:56.9 20 year target:59.5
5	VZ5	Vegetation Integrity	Full Floristic BAM VI Plot	576564	6160613	Every 5 years for the first 20 years then every 10 years in perpetuity.	10	10
6	VZ6	Vegetation Integrity	Full Floristic BAM VI Plot	575914	6160868	Every 5 years for the first 20 years then every 10 years in perpetuity.	7.8	5 year target: 10 year target: 15 year target: 20 year target:

Point ID	Zone/Species	Biodiversity Target	Description of the method or the metric	Easting	Northing	Frequency	Baseline	Target
7a	VZ7	Vegetation Integrity	Full Floristic BAM VI Plot	575513	6160908	Every 5 years for the first 20 years then every 10 years in perpetuity.	7.6	5 year target: 8.8 10 year target:8.9 15 year target:9 20 year target:9.1
7b	VZ7	Vegetation Integrity	Full Floristic BAM VI Plot	575454	6160765	Every 5 years for the first 20 years then every 10 years in perpetuity.	7.6	5 year target: 8.8 10 year target:8.9 15 year target:9 20 year target:9.1
7c	VZ7	Vegetation Integrity	Full Floristic BAM VI Plot	575260	6160474	Every 5 years for the first 20 years then every 10 years in perpetuity.	7.6	5 year target: 8.8 10 year target:8.9 15 year target:9 20 year target:9.1
8a	VZ8	Vegetation Integrity	Full Floristic BAM VI Plot	576849	6160536	Every 5 years for the first 20 years then every 10 years in perpetuity.	55.4	5 year target: 57.4 10 year target:59.3 15 year target:61.3 20 year target:63.2
8b	VZ8	Vegetation Integrity	Full Floristic BAM VI Plot	576164	6160540	Every 5 years for the first 20 years then every 10 years in perpetuity.	55.4	5 year target: 57.4 10 year target:59.3 15 year target:61.3 20 year target:63.2
9a	VZ9	Vegetation Integrity	Full Floristic BAM VI Plot	576566	6160384	Every 5 years for the first 20 years then every 10 years in perpetuity.	11.5	5 year target: 12.2 10 year target: 12.3 15 year target:12.3 20 year target:12.4
9b	VZ9	Vegetation Integrity	Full Floristic BAM VI Plot	576487	6160328	Every 5 years for the first 20 years then every 10 years in perpetuity.	11.5	5 year target: 12.2 10 year target: 12.3 15 year target:12.3 20 year target:12.4
9c	VZ9	Vegetation Integrity	Full Floristic BAM VI Plot	576880	6160390	Every 5 years for the first 20 years then every 10 years in perpetuity.	11.5	5 year target: 12.2 10 year target: 12.3 15 year target:12.3 20 year target:12.4
9d	VZ9	Vegetation Integrity	Full Floristic BAM VI Plot	576586	6160089	Every 5 years for the first 20 years then every 10 years in perpetuity.	11.5	5 year target: 12.2 10 year target: 12.3 15 year target:12.3 20 year target:12.4
10	VZ10	Vegetation Integrity	Full Floristic BAM VI Plot	575192	6160542	Every 5 years for the first 20 years then every 10 years in perpetuity.	44.6	5 year target: 48.1 10 year target: 51.5 15 year target:55 20 year target:58.4

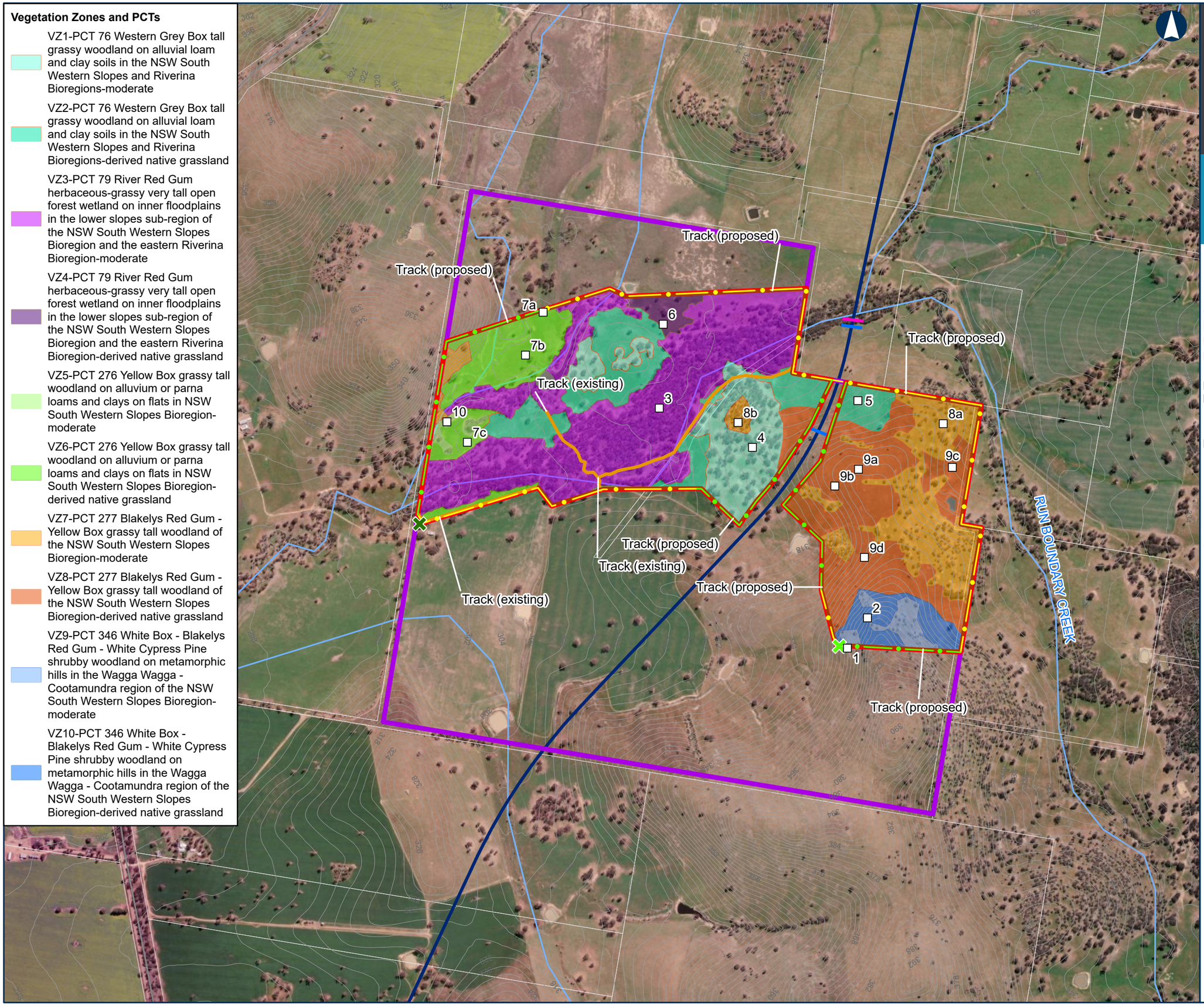
Monitoring Map

COMPLETE THIS ACTION USING THE IMAGE BOX ON THE NEXT PAGE >>
Include the Monitoring Map at largest scale possible for an A4 page that shows:

- Biodiversity Stewardship Site boundary
- Access tracks
- Vegetation zones
- Photo points and ecological response monitoring points
- Threatened species monitoring locations (such as remote cameras, transects or plots etc.)
- Any other monitoring requirements (such as for erosion etc.)
- Contours where available

Vegetation Zones and PCTs

- VZ1-PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions-moderate
- VZ2-PCT 76 Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions-derived native grassland
- VZ3-PCT 79 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion-moderate
- VZ4-PCT 79 River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion-derived native grassland
- VZ5-PCT 276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion-moderate
- VZ6-PCT 276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion-derived native grassland
- VZ7-PCT 277 Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion-moderate
- VZ8-PCT 277 Blakelys Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion-derived native grassland
- VZ9-PCT 346 White Box - Blakelys Red Gum - White Cypress Pine shrubby woodland on metamorphic hills in the Wagga Wagga - Cootamundra region of the NSW South Western Slopes Bioregion-moderate
- VZ10-PCT 346 White Box - Blakelys Red Gum - White Cypress Pine shrubby woodland on metamorphic hills in the Wagga Wagga - Cootamundra region of the NSW South Western Slopes Bioregion-derived native grassland



INLAND RAIL ARTC

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ILLABO TO STOCKINBINGAL

Monitoring Map

MAP 1 OF 1

LEGEND

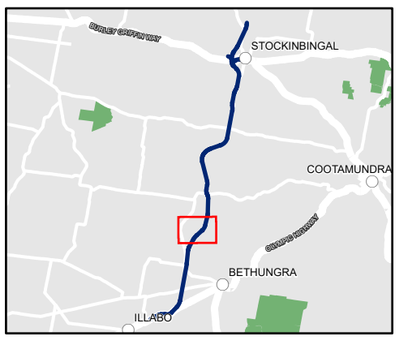
- Monitoring Plots
- Minor Watercourse
- Contours (2m)
- Railway Track alignment
- Cadastre
- Subject Land
- Property Boundary
- Water Body

Fauna Crossing Structures Proposed for I2S Project

- Bridge Underpass
- Rope Bridge

Proposed Infrastructure

- Gate (existing to be retained)
- Gate (proposed)
- Existing Fence (to be retained)
- Proposed Fence
- Track (existing)
- Track (proposed)



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Coordinate System: GDA2020 MGA Zone 55

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Date: 2/06/2025 Paper: A3
Author: IRDJV Scale: 1:12,000
Data Sources: IRDJV, ARTC, LPI,World Imagery:Esri

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Definitions

This Management Plan uses the same definitions from Attachment 1 of the BSA. Additional definitions specific to the Management Plan are:

APVMA means the Australian Pesticides and Veterinary Medicines Authority

Ecological Burn means burning of Native Vegetation undertaken to help stimulate Native Plant regeneration, control weeds and enhance Biodiversity

Ecological Monitoring Point means location identified in Section 9 of this Management Plan at which photographs are to be taken to show the ecological response in all directions (360°) from that point on the land for the purpose of monitoring ecological condition over time

Habitat means an area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic habitat component used by the species

Healthy Condition means the minimum percent of groundcover and average grass sward height specified in Section 6 that is to be maintained in areas where stock grazing is permitted on the Biodiversity Stewardship Site

Pest means animal species not native to Australia including fox, cat, pig, goat, horse, avian species and any other non-native animal species

Fertiliser means a substance that consists of or contains nitrogen, phosphorus or potassium (or any combination of these) manufactured, represented, sold or used to directly or indirectly supply nutrients to enhance the growth, productivity, quality or reproductive capacity of vegetation

Weed Species means a vascular plant species not native to Australia

Large Woody Debris means fallen dead tree branches and trunks

Living Ground Cover means all living vegetation below 1 metre in height including native and non-native ground cover species

Management Action means the management actions, activities and controls within this Management Plan

Native Vegetation has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act

Operations Schedule means the program of management actions, activities and controls that are to be undertaken on the Biodiversity Stewardship Site

Plant Community Type (PCT) means the plant community types which are the subject of biodiversity credits created under the BSA and identified using the NSW PCT classification system

Pesticide means an agricultural chemical product or veterinary chemical product (within the meaning of the Agvet Code) that is represented as being suitable for, or is manufactured, supplied or used for, the external control of ectoparasites of animals, and is not prescribed under the Stock Medicines Act 1989 as a low-risk veterinary chemical product. A pesticide continues to be regarded as a pesticide even when it is mixed with some other substance (whether the other substance is a pesticide)

Sediment Trap means a temporary or permanent structure used to collect, trap and store sediment to prevent entry of sediment to a waterway

Species Polygon means the area or count and location of suitable habitat for a species for which the BSA generates biodiversity credits

Stock means cattle and sheep kept by the Owner. Horses, camels' goats, alpacas, llamas, pigs, deer, ostriches, emus or any other animal kept by the Landowner are prohibited from grazing on the Biodiversity Stewardship Site

Supplementary Planting means planting of locally indigenous native plants in one or more areas of the Biodiversity Stewardship Site to:

a) increase Native Plant species richness and foliage cover and/or

b) restore or enhance the native plant species composition and structure of recognisable PCTs and/or
c) improve habitat suitability for specific Threatened Species.

Threatened Ecological Community (TEC) means the threatened ecological community which are the subject of biodiversity credits created under the BSA.

Vegetation Integrity Survey Plot means an area within a vegetation zone in which condition attributes are assessed in accordance with the BAM (composition, structure and function)

Vegetation Zone means an area of similar native vegetation on the Biodiversity Stewardship Site with the same PCT and condition state.

Waste means any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment including substance that is discarded, rejected, unwanted, surplus or abandoned substance, including when it is intended for recycling or reuse.

Weed management group means the group of weeds defined in the Operations Schedule that are subject to the same weed control and management actions.

Appendix B

Indicative species for planting

Table B.1 Indicative species for planting for Box Gum Woodland restoration

PCT ID	PCT Name	Upper Stratum Species List	Mid Stratum Species List	Ground Stratum Species List
276	Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	*Eucalyptus melliodora* *Eucalyptus blakelyi* *Eucalyptus bridgesiana*	*Acacia decora* *Maireana microphylla* *Acacia deanei* subsp. *deanei* *Acacia implexa* *Acacia montana* *Acacia pycnantha* *Acacia paradoxa*	*Bothriochloa macra* *Austrostipa bigeniculata* *Vittadinia cuneata* *Elymus scaber* var. *scaber* *Chloris truncata* *Convolvulus graminetinus* *Sida corrugata* *Goodenia pinnatifida* *Austrodanthonia auriculata* *Austrodanthonia setacea* *Austrostipa scabra* subsp. *falcata* *Calotis cuneata* var. *cuneata* *Carex inversa* *Oxalis exilis* *Rumex brownii*
277	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	*Eucalyptus blakelyi* *Eucalyptus melliodora* *Eucalyptus bridgesiana* *Eucalyptus microcarpa* *Eucalyptus goniocalyx*	*Acacia dealbata* *Hibbertia obtusifolia*	*Themeda australis* *Poa sieberiana* *Bothriochloa macra* *Aristida ramosa* *Panicum effusum* *Austrostipa verticillata* *Austrostipa scabra* subsp. *scabra* *Austrostipa bigeniculata* *Austrodanthonia auriculata* *Austrodanthonia setacea* *Cymbopogon refractus* *Elymus scaber* var. *scaber* *Juncus usitatus* *Lomandra filiformis* subsp. *coriacea*

PCT ID	PCT Name	Upper Stratum Species List	Mid Stratum Species List	Ground Stratum Species List
				Alternanthera nana *Geranium solanderi* var. *solanderi* *Chrysocephalum apiculatum* *Sida corrugata* *Carex inversa* *Wahlenbergia luteola* *Chloris truncata* *Cheilanthes sieberi* subsp. *sieberi* *Vittadinia cuneata* *Lomandra filiformis* subsp. *coriacea* *Enteropogon acicularis* *Convolvulus graminetinus* *Bulbine bulbosa* *Dianella revoluta* var. *revoluta* *Calotis scabiosifolia* var. *scabiosifolia*

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