LIDDELL

GLENCORE

Biodiversity Offset Management

Plan

Number: LIDOC-90533967-3755
Owner: Environment & Community Officer
Status: Approved
Version: 14.0
Effective: 20/11/2025
Review: 03/01/2027

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Glossary of Terms

BOMP	Biodiversity Offset Management Plan
CEEC	Critically Endangered Ecological Community
DCCEEW	Department of Climate Change, Energy the Environment and Water (Commonwealth)
DoEE	Department of the Environment and Energy (Commonwealth) (now DCCEEW)
DPE	Department of Planning and Environment (NSW)
DNG	Derived native grassland
EEC	Endangered Ecological Community
EPA Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
Glencore Coal	Glencore Coal Pty Limited
GDP	Ground Disturbance Permit
ha	Hectares
LCO	Liddell Coal Operations
LCO biodiversity offset areas	Relates to the Mitchell Hills South, Mountain Block and Bowmans Creek Riparian Corridor biodiversity offset areas
LGA	Local Government Area
Mig	Migratory species (under the EPBC Act)
NSW	New South Wales
OEH	Office of Environment and Heritage (NSW) (now DPE)
P&E	Planning and Environment (NSW)
TEC	Threatened Ecological Community
BC Act	*Biodiversity Conservation Act 2016* (NSW)
VEC	Vulnerable Ecological Community
PCT	Plant Community Type

PFC	Percent Foliage Cover

1. Introduction

1.1 Background

Liddell Coal Operations (LCO) is a former open cut coal mine located approximately 25 kilometres north-west of Singleton in the Hunter Valley of New South Wales (refer to Figure 1-1). LCO ceased operations in November 2023 with the mine site now in the mine closure and rehabilitation phase. LCO site is divided by the boundary between the Singleton and Muswellbrook local government areas (LGAs).

LCO is operated and managed by Liddell Coal Operations Pty Limited, a wholly owned subsidiary of Glencore Coal Pty Limited (Glencore Coal).

LCO received approval for the extension of Liddell Open Cut coal mining operations under the State Environmental Planning and Assessment Act 1979 (EPA Act) on 1 December 2014 (DA 305-11-01 Modification 5) and under the Commonwealth Environment Protection Biodiversity Conservation Act 1999 (EPBC Act) on 24 December 2014 (EPBC Approval 2013/6908).

The State and Commonwealth approvals for this modification both require preparation of a Biodiversity Offset Management Plan (BOMP) to guide ongoing management of the LCO biodiversity offset areas (BOAs) to maintain and enhance biodiversity values, particularly those relating to threatened species.

This document has been prepared to satisfy the State and Commonwealth conditions of approval relating to the BOMP, and its requirements apply to the three LCO BOAs being Bowmans Creek Riparian Corridor, Mountain Block and Mitchell Hills South in Figure 1-2. The former two BOAs are requirements under the State approval, while Mitchell Hills South is an additional BOA required under the Commonwealth approval only. This document should be read in conjunction with the LIDOC-90533967-3687 Biodiversity Management (LCO 2022) where the management of the onsite biodiversity values is documented, and LIDOC-90533967-3776 Indirect Offset (LCO, 2020) concerning Spotted-tailed Quoll recovery actions.

1.2 Objectives

The objectives of this BOMP are to provide direction for the short to long term management and enhancement of the biodiversity values of the LCO BOAs, as well as to provide a description of the measures to be implemented to achieve this over the next three years. The BOMP will be reviewed on a regular basis in relation to progress, actions completed, forward planning of remaining actions and any alterations/additions resulting from the adaptive management process (see Section 5). The BOMP areas will be implemented for the life of mine including during and post closure until objectives are agreed to have been satisfied.

The specific requirements of the BOMP are to:

- Identify and describe the areas of land that will be managed in accordance with this BOMP;
- Provide clear and concise management measures for the BOMP to adhere to the State and Commonwealth approval conditions (***Section 1.3***) and to minimise the impacts of key threats;

- Provide a working schedule for the implementation of activities required in the BOMP; and
- Describe monitoring, performance evaluation and reporting procedures that are informative, practical and achievable.

1.3 Regulatory Requirements

This BOMP has been prepared to address the relevant components of Conditions 6, 7, 8 and 9 of the Commonwealth EPBC Act project approval 2013/6908 and Conditions 24, 25, 27 and 29 of Schedule 3 of the State EP&A Act approval DA 305-11-01 Modification 8. The details of these conditions and reference to where they are addressed in this BOMP are provided in ***Table 1-1***.

Figure 1-1 - Locality Map

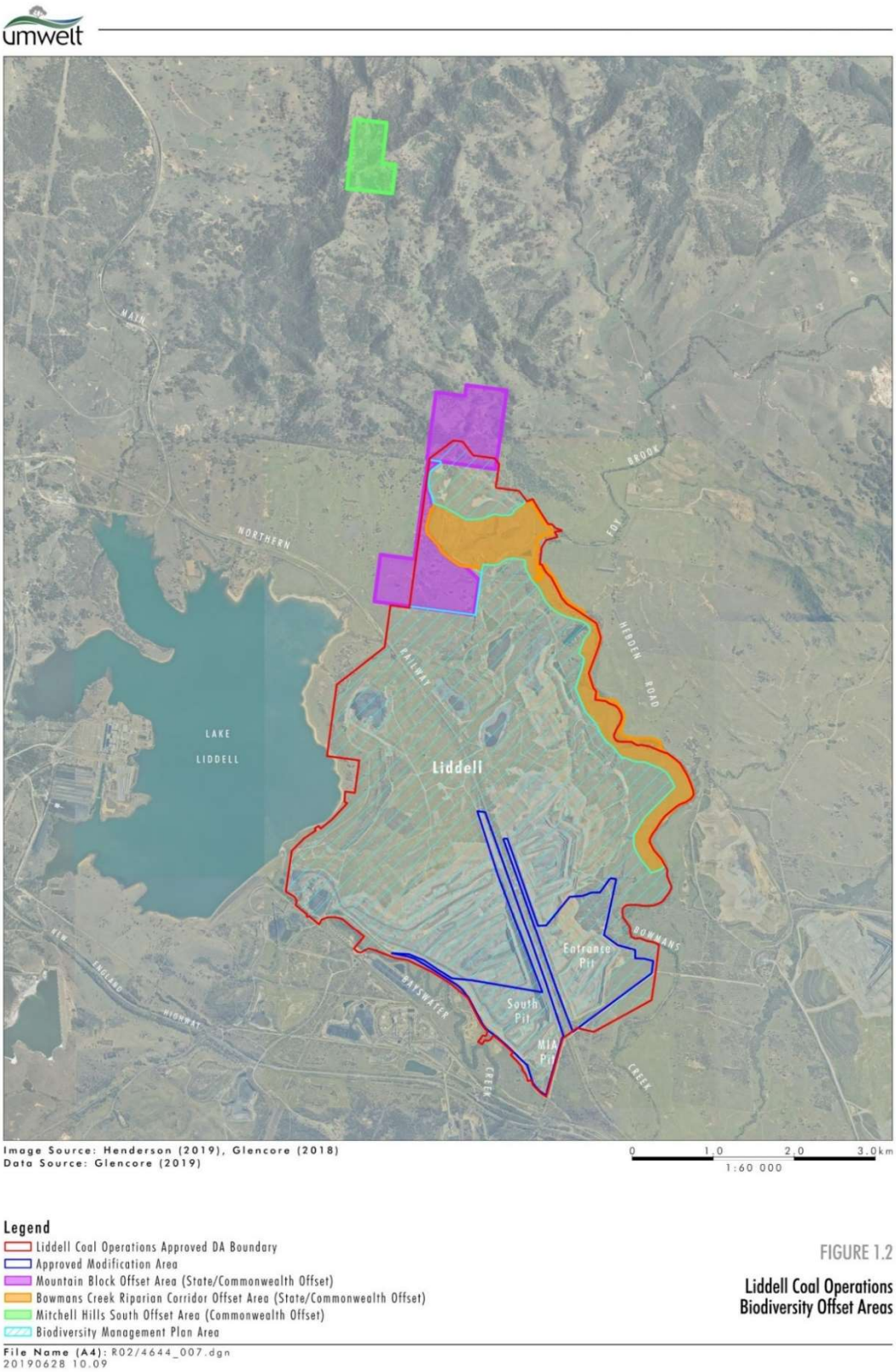

Figure 1-2 - Liddell Coal Operations Biodiversity Offset Areas

Table 1-1 - Project Approval Conditions Relevant to BOMP

Condition	Relevant Section of BOMP
EPBC Act Project Approval 2013/6908	
6. In order to compensate for residual significant impact on threatened species, the approval holder must protect the offset areas through a legal instrument under relevant conservation legislation prior to 30 June 2017 or on any other date agreed in writing by the Minister. The legal instrument must:	Section 1.9
a) Be registered on the title of the Offset;	
b) Provide for the protection and ongoing conservation management of the Offset areas in perpetuity;	
c) Prevent any future development activities or clearing of native vegetation on the Offset areas; and	
d) Require the approval of a State Planning or Environment Minister to be changed or revoked.	
7. The approval holder must provide the Department with detail of the offset areas, including offset attributes, shapefiles, textual descriptions and maps to clearly define the location and boundaries of the offset area, to be submitted to the Department prior to commencement of the action.	Provided separately.
8. To ensure management of the offset areas, the approval holder must submit an Offset Management Plan to the Minister for approval prior to 31 May 2015 to provide for the conservation and management in perpetuity of the offset areas. The Plan must include:	
• A detailed methodology, frequency, timing and duration of all Offset areas management measures proposed. The management measures must include:	Section 2
i. Weed and pest control; ii. Fencing; iii. Ecological monitoring; and iv. Assisted regeneration.	Section 2.6 and 2.7 Section 2.3 Section 3 Section 2.8

<table>
<tr><th>Condition</th><th>Relevant Section of BOMP</th></tr>
<tr><td>• Key milestones, performance indicators, corrective actions and timeframes for the completion of all actions outlined in the Plan;</td><td>Provided for each Management Action
Section 5</td></tr>
<tr><td>• A detailed methodology, timing goals and corrective actions for revegetation of:</td><td rowspan="2">Sections 2.8
Section 5</td></tr>
<tr><td>i. The Bowmans Creek Riparian Corridor, in accordance with Figure 8.3 (Annexure D);
ii. The Mountain Block Offset Site, in accordance with Figure 8.4 (Annexure E); and
iii. Exotic grassland and derived grassland areas of Mitchell Hills South Offset Area, as depicted in Figure 3.1 of the letter from David Foster to the Department dated 29 October 2014 (Annexure F), with native woodland or forest communities that occur on the site.</td></tr>
<tr><td>9. The approved Offset Management Plan required under Condition 8 must be implemented.</td><td></td></tr>
<tr><td colspan="2">EPA Act Approval DA 305-11-01 Modification 7</td></tr>
<tr><td>24. The Applicant must implement the biodiversity offset strategy described in the EA, summarised in Table 7 and conceptually shown in Appendix 7.
<table><tr><th colspan="3">Table 7: Summary of the Biodiversity Offset Strategy</th></tr><tr><td>Area</td><td>Offset Type</td><td>Minimum Size (ha)</td></tr><tr><td>Mountain Block Offset</td><td>Existing vegetation and vegetation to be established</td><td>168</td></tr><tr><td>Bowmans Creek Riparian Corridor</td><td>Existing vegetation and vegetation to be established</td><td>185</td></tr><tr><td colspan="2">Total</td><td>353</td></tr></table>Note: To identify the areas referred to in Table 7 refer to the applicable figures in Appendix 7.</td><td>Section 1.9</td></tr>
<tr><td>25. The Applicant must ensure that the offset strategy and/or rehabilitation strategy is focused on the reestablishment of:
(a) significant and/or threatened plant communities, including:
• Central Hunter Box – Ironbark Woodland EEC;
• Narrow-Leaved Ironbark – Spotted Gum Woodland EEC;</td><td>Sections 2.8
Section 2.10
Section 2.9.3</td></tr>
</table>

Condition	Relevant Section of BOMP
• Narrow-Leaved Ironbark – Bulloak Open Forest EEC; (b) significant and/or threatened plant species; and (c) habitat for significant and/or threatened animal species including the Spotted-tailed Quoll.	
27. By the end of December 2015, unless the Secretary agrees otherwise, the Applicant must make suitable arrangements to provide appropriate long term security for the land within the biodiversity offset strategy identified in Table 7, to the satisfaction of the Secretary.	Section 1.9
29. The Applicant must prepare and implement a detailed Biodiversity Management Plan for the site to the satisfaction of the Secretary. This plan must:	This condition relates to the BMP, rather than the BOMP, however contains aspects required for the BOMP.
a) be prepared in consultation with OEH and be submitted to the Secretary for approval by the end of May 2015, unless otherwise agreed by the Secretary;	Section 1.5
b) describe how the implementation of the offset strategy would be integrated with the overall rehabilitation of the site (see below);	
c) include:	
• a description of the short, medium and long term measures that would be implemented to:	
• implement the offset strategy; and	
• manage the remnant vegetation and habitat on the site in the offset areas;	Section 2
• detailed performance and completion criteria for the implementation of the offset strategy;	Section 2
• a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:	Section 2

Condition	Relevant Section of BOMP
• implementing revegetation and regeneration with the disturbance areas and offset areas, including establishment of canopy, sub-canopy (if relevant), understorey and ground strata;	Section 2.8
• protecting vegetation and soil outside the disturbance areas;	Section 2.3
• rehabilitating creeks and drainage lines that occur on the site;	Provided in BMP
• managing salinity;	Section 2.13
• conserving and reusing topsoil;	Provided in BMP
• undertaking pre-clearance surveys;	Provided in BMP
• managing impacts on fauna;	Provided in BMP
• collecting and propagating seed;	Section 2.12
• salvaging and reusing material from the site for habitat enhancement;	Section 2.9.2
• salvaging, transplanting and/or propagating threatened flora in accordance with the Guidelines for the Translocation of Threatened Plants in Australia (Vallee et al., 2004);	Section 2.10
• controlling weeds and feral pests including investigating alternate technologies to reduce poisoning of non-target species	Section 2.6 and 2.7
• managing grazing and agriculture;	Section 2.4
• controlling access;	Section 2.3
• bushfire management;	Section 2.14
• habitat enhancement works;	Section 2.9
• seasonal monitoring of in-stream and riparian ecological condition;	Provided in BMP

Condition	Relevant Section of BOMP
• survey of stygofauna in Bowmans Creek alluvial aquifer (prior to predicted drawdown); and	Provided in BMP
• monitoring of stygofauna populations every 6 months following the occurrence of the predicted drawdown;	Provided in BMP
• a seasonally-based program to monitor the effectiveness of these measures, and progress against the performance and completion criteria;	Section 3
• a description of the potential risks to successful revegetation, and a description of the contingency measures that would be implemented to mitigate these risks; and	Section 5.1
• details of who would be responsible for monitoring, reviewing and implementing the plan.	Section 1.6

This BOMP is designed to support the overarching ***Biodiversity Management Plan*** for LCO (LCO 2022). The BOMP follows (where appropriate) the NSW Department of Planning and Environment (DP&E) ***Hunter Valley Coal Mines: Best Practice Guidelines for Biodiversity Offset Management Plans*** (DP&E 2014).

1.4 Interaction of the BOMP and BMP

Condition 8 of EPBC Act Project Approval 2013/6908 requires the preparation of a BOMP; whereas Schedule 3 Condition 29 (a) of EPA Act Approval DA 305-11-01 requires the preparation of a Biodiversity Management Plan (BMP) that integrates the requirements for offset management. For ease in addressing this, LCO prepared two separate management documents:

- the BMP – which directs the management of LCO lands (that are not required to offset mining impacts) within the approved DA boundary, and
- the BOMP – which directs management of the three offset areas.

1.5 Authority Consultation

In accordance with Schedule 3 Condition 29 (a), the BOMP was developed in consultation with The NSW Office of Environment and Heritage (OEH) and the Department of Planning, Housing and Infrastructure (DPHI). Post July 2019, OEH consultation requirements have been replaced by consultation with the Biodiversity and Conservation Division (BCD, within DPE). Correspondence relating to this is contained in the DPHI Major Projects Portal.

1.6 Roles and Responsibility

Responsibility for the implementation of the BOMP lies with LCO, with input from external specialists and contractors as required. ***Table 1-2*** lists the key roles and responsibilities of specific LCO positions concerning the implementation of the BOMP.

Table 1-2 - BOMP Roles and Responsibilities

Role	Accountabilities for this Role
Project Manager	Sufficient time and resources are allocated to allow for the implementation of biodiversity management and monitoring strategies as outlined in the BOMP.
Environment & Community Manager	Allocate sufficient resources and time for the implementation of the BOMP management activities. Undertake biannual inspections of each biodiversity offset area. Analyse and collate documentation for inclusion in the Annual Review. Assess the effectiveness of the management strategies and instigate the adaptive management process, as required. Internal and external reporting requirements are met, including necessary revisions of the BOMP. All relevant records are effectively maintained. Periodically review progress against performance indicators and completion criteria. The results of the BOMP monitoring programs and research trials are utilised to refine closure criteria as well as to evaluate the effectiveness of biodiversity management practices to facilitate continual improvement. Personnel involved in the carrying out and monitoring of the BOMP activities and values are appropriately qualified, licensed and experienced to undertake the task. Manage/control access to the biodiversity offset areas.
All Persons	Receive training regarding controls on activities within the biodiversity offset areas. Observe boundaries of the biodiversity offset areas when undertaking work on site. Undertake activities in the biodiversity offset areas in accordance with this plan.

1.7 Performance Indicators & Completion Criteria

The performance criteria listed in each section will be used to determine the success of the ongoing management of the site in accordance with the specified approval conditions and biodiversity management objectives.

In summary, preliminary performance indicators for the LCO BOAs are:

- an appropriate long-term land conservation mechanism for the BOAs is agreed upon in consultation with the relevant authorities;

- all boundary fences are in place and reports of unauthorised access and fence line compromises of the BOAs are addressed as soon as practical;
- there are no livestock grazing activities within the boundaries of the BOAs (except as required for ecological restoration purposes (such as weed management and bushfire management);
- monitoring indicates that natural regeneration of derived native grassland (DNG) areas is occurring and that areas of introduced grassland are being revegetated;
- monitoring indicates that the regeneration/revegetation areas:
  - Contain a flora species assemblage trending towards the target native woodland communities
  - Include a range of flora species from each vegetation strata represented in target community (such as trees, shrubs, and groundcover forbs and grasses), even if only as seedlings/juvenile plants initially
- monitoring indicates that remnant woodland areas are remaining similar to or increasing in flora and fauna species diversity;
- there is no evidence of significant pest animal or weed infestation; and
- it can be demonstrated that accurate records are being maintained substantiating all activities and monitoring associated with the BOMP.

The performance indicators and completion criteria within this plan apply to the following years of the BOMP implementation:

- Year 10: August 2024 – August 2025
- Year 11: August 2025 – August 2026
- Year 12: August 2026 – August 2027

Every three years the performance indicators and completion criteria are revised in response to monitoring outcomes and the success of the management and improvement strategies. Description of Biodiversity Offset Areas

The following sections provide a summary of the characteristics and biodiversity values of the LCO BOAs.

1.8 Location

The three LCO BOAs are located in the vicinity of the LCO (***Figure 1-2***). The Bowmans Creek Riparian Corridor runs in a north/south direction on the eastern boundary of LCO and is 185.53 hectares (ha) in size. Mountain Block is 168.34 ha in size and is located to the immediate north of the LCO. Mitchell Hills South is located approximately three kilometres north west of Mountain Block and is 40.5 ha in size.

While the LCO BOAs are not located in an identified priority area for the Great Eastern Ranges Initiative, they do fall on the southern foot slopes of the Mount Royal/Barrington Tops National Parks which are a recognised connectivity gap in the central Hunter region.

These BOAs lie within a cluster of other Glencore offset areas established for the Ravensworth and Mount Owen Operations (***Figure 1-3***). This cluster currently serves to protect existing vegetation in the highly cleared Lake Liddell area and will assist in securing existing 'stepping-stone' habitat in this area that leads from the valley floor north into secure conservation areas. In addition to protecting

existing vegetation, the management commitments for these areas will promote active and natural regeneration of native vegetation communities to further enhance this habitat connectivity.

LCO is located close to the northern border of the Sydney Basin Bioregion (OEH 2011), where it joins the boundary of the NSW North Coast Bioregion. The Sydney Basin Bioregion lies on the central east coast of NSW, covers an area of 3,624,008 hectares and is characterised by a temperate climate.

The LCO is within the Hunter subregion which is characterised by rolling hills, wide valleys, with the meandering Hunter River system on a wide floodplain. A diverse range of flora and fauna assemblages occur in the local area, with a mixture of coastal and inland influences. Due to the proximity to the NSW North Coast Bioregion, LCO also displays environmental characteristics of this bioregion.

1.9 Land Tenure and Conservation Mechanism

Four Conservation Agreements (CAs) are registered on title for the BOAs. A CA is a legal agreement under section 69 of the NPW Act for an area of land with significant conservation value. These CAs are legally binding for both current and future landholders and is registered on the land title. The CAs document:

- conservation values present
- management arrangements and costings
- monitoring arrangements

The CA area naming conventions slightly differ from the BOAs, but the overall areas are the same. The agreements are summarised in ***Table 1-3.***

Table 1-3 - LCO BOA Conservation Agreements

Agreement Name	Agreement No.	Date Executed	Date Registered on Title	Approx. Area
Mitchell Hills South Conservation Area	VC00505	7/05/2019	8/08/2019	40
Mountain Block Conservation Area	VC0525	13/05/2019	1/10/2019	168
Bowmans Creek Riparian Corridor	VC00506	7/05/2019	1/10/2019	183
Bowmans Creek Riparian Corridor East	VC00516	9/05/2019	6/08/2019	3

The performance and completion criteria for the Conservation Mechanism is complete and has been recorded in Appendix C.

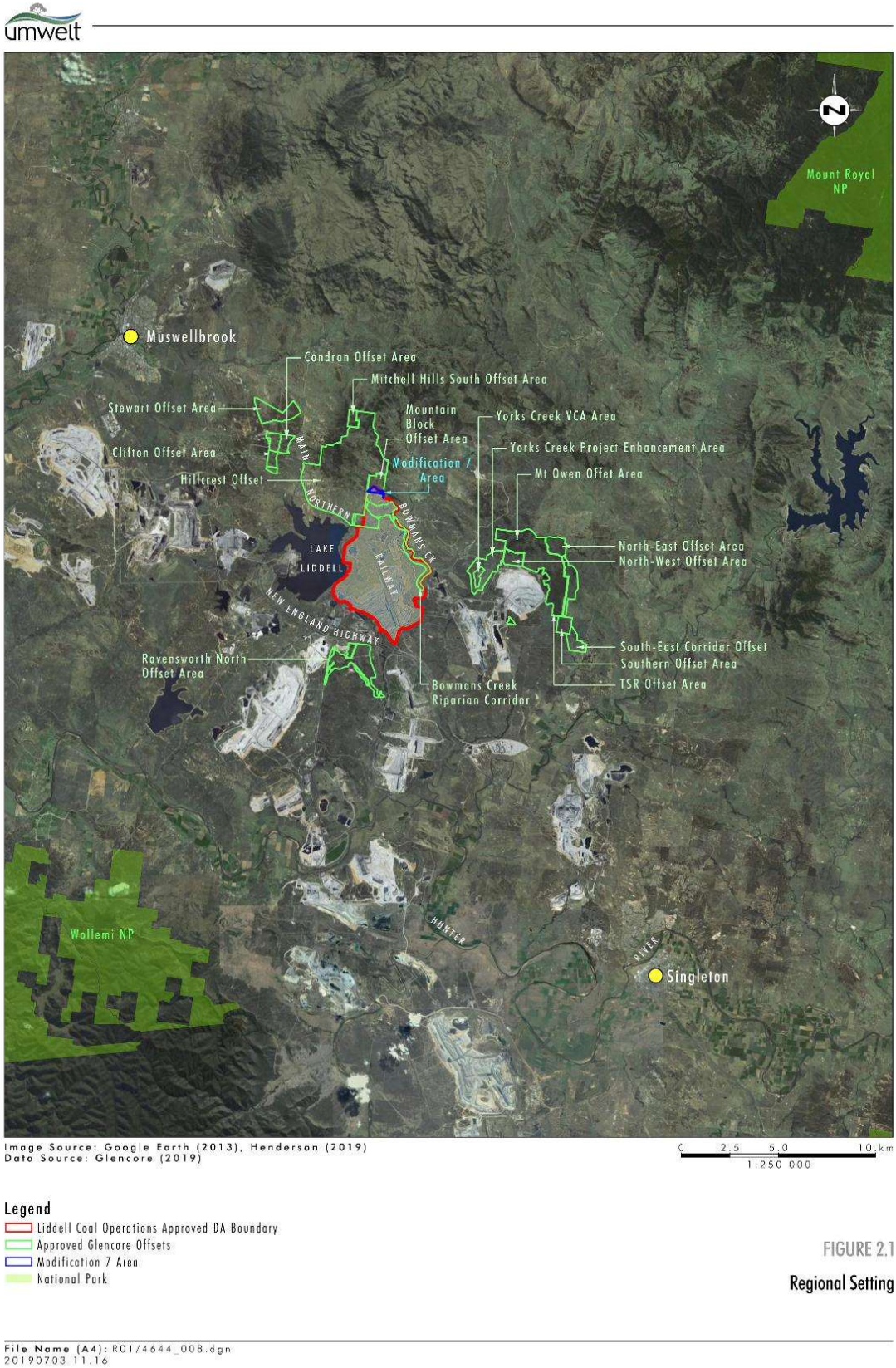

Figure 1-3 – Regional Setting

1.10 Climatic Information

Table 1-4 provides the relevant average climactic conditions for the area collated from the St Heliers Weather Station (Muswellbrook) (BOM 2019) to provide local historic climate context as well as onsite data collated by the LCO meteorological station required under ***EPL 2094***. This data can be considered when scheduling rehabilitation and revegetation works.

Table 1-4 - Climatic Data

	Rainfall (mm)		Temperature (°C)					
Month	**St Heliers**	**LCO**	**Singleton**			**LCO**		
	Mean	**Mean**	**Mean**	**Highest Monthly Mean**	**Lowest Monthly Mean**	**Mean**	**Mean High**	**Mean Low**
January	60.0	90.0	32.1	36.0	28.9	32.8	32.8	19.4
February	60.7	47.5	30.7	34.8	26.4	31.0	31.0	18.2
March	62.8	100.3	28.3	30.3	26.1	28.4	28.4	17.3
April	35.6	18.9	24.9	27.5	22.5	25.3	25.3	14.4
May	41.8	27.0	21.6	23.3	19.9	21.6	21.6	11.1
June	51.9	43.8	18.1	19.7	16.2	17.7	17.7	9.4
July	37.1	19.4	18.0	19.9	16.5	18.1	18.1	8.0
August	40.3	36.5	19.9	22.1	17.7	19.6	19.6	8.5
September	44.2	35.0	23.5	26.6	21.5	23.2	23.2	10.9
October	44.9	34.4	26.3	29.3	23.1	27.1	27.1	13.2
November	74.3	74.6	28.8	32.1	26.3	28.9	28.9	15.6
December	64.0	79.7	30.3	34.8	25.2	31.4	31.4	17.8

Rainfall observations were taken from Muswellbrook (St Heliers Weather Station) (1992 to 2019) and Temperature Observations were from Singleton STP (2002 to 2019) (BOM 2019).

1.11 Physiography, Geology and Soils

LCO is situated centrally on the Hunter Valley floor, within the 22,000 km² Hunter catchment which is drained by the Hunter and Goulburn Rivers and their tributaries. It is situated approximately 100 kilometres from the coast and 140 kilometres from the western extremity of the Hunter catchment at the Great Dividing Range.

The central Hunter Valley is characterised by relatively gentle undulating hills, broad river valleys and floodplains. To the south are the dissected sandstone plateaux of Wollemi and Yengo National Parks, while to the north the foothills of the Barrington Tops and Mount Royal Range adjoin the Hunter Valley floor, which is bounded by the Hunter Thrust System (Peake 2006). To the east and west extend the highly eroded Permian lowlands of the floor of the Hunter Valley.

The central Hunter Valley lies at the intersection of the north-eastern margin of the Sydney Basin and the south-eastern margin of the New England Fold Belt. The Sydney Basin extends from the South Coast of NSW well into the central Queensland Coast (Hawley & Brunton 1995), and it mostly consists of a thick Permian-Triassic rock succession formed during early Permian rifting and contains large reserves of coal.

The central Hunter Valley is primarily underlain by four major geological strata: Carboniferous; Permian; Triassic and Quaternary. To a lesser extent it is also underlain by Jurassic and Tertiary strata. Carboniferous rocks mostly underlie the areas in the north-east of the region and are a combination of erosion resistant marine, volcanic, conglomerate, and limestone sediments; these typically form steep-sided hills and valleys. Permian rocks make up most of the region and mostly consist of the moderately erosion resistant Singleton Coal Measures, conglomerate, sandstone, shale, tuff, and some lava beds which typically form low, undulating hills. The Triassic rock is mostly located in areas in the north-west, west, and south of the central Hunter Valley and consists of highly erosion resistant sandstone which tends to form infertile, rugged country. Quaternary sediments are mostly identified along and in proximity to the major rivers and creeks of the central Hunter Valley. The Jurassic rocks are typically in the form of Saxonvale volcanics and are mostly found around Bayswater, Fordwich and Lemington; and the Tertiary stratum are typically only found in the form of small basalt caps in several very small areas.

Within the Sydney Basin, LCO is located in the Hunter Coalfield. The coal-bearing sedimentary rocks within LCO include the Foybrook Formation, with the Vane Subgroup of the Whittingham Coal Measures, which form the lower part of the Singleton Supergroup.

1.12 Key Ecological Values

The three LCO BOAs provide protection to a variety of key ecological values, including:

- threatened ecological community (TEC) and endangered flora population habitat areas;
- habitat for threatened flora species;
- habitat for threatened fauna species; and
- are positioned strategically within the landscape.

A summary of the vegetation communities, TECs and threatened species recorded in the BOAs is provided in the sections below.

1.12.1 Vegetation Communities and Threatened Ecological Communities

A total of two endangered ecological communities (EECs) (being Central Hunter Ironbark – Spotted Gum – Grey Box Forest and Central Hunter Grey Box – Ironbark Woodland) have been recorded across the three LCO BOAs. Additionally, a vulnerable ecological community (VEC) has been recorded also, this being the Lower Hunter Valley Dry Rainforest. All of these are listed under the Biodiversity Conservation Act 2016 (BC Act). A number of these communities (or components thereof) also comprise (or partially comprise) the Commonwealth Central Hunter Valley eucalypt forest and woodland critically endangered ecological community (CEEC) (listed under the EPBC Act) which was listed post project approval. The vegetation communities of the LCO BOAs are listed in ***Table 1-5***. These communities are mapped in ***Figure 1-4*** for the Bowmans Creek Riparian Corridor, ***Figure 1-5*** for Mountain Block and ***Figure 1-6*** for Mitchell Hills South.

Table 1-5 - Vegetation Communities of LCO Biodiversity Offset Areas

Vegetation Community	PCT*	BC Act	EPBC Act	Bowmans Creek Riparian Corridor (ha)	Mountain Block (ha)	Mitchell Hills South (ha)	Total (ha)
Central Hunter Ironbark-Spotted Gum- Grey Box Forest	3351 -Central Hunter Ironbark - Spotted Gum Forest	EEC - Central Hunter Ironbark – Spotted Gum – Grey Box Forest	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	0.28	0	0	**0.28**
Central Hunter Grey Box – Ironbark Woodland	3431 - Central Hunter Ironbark Grassy Woodland	EEC - Central Hunter Grey Box – Ironbark Woodland		0.11	0	0	**0.11**
Central Hunter Box – Ironbark DNG	3431 - Central Hunter Ironbark Grassy Woodland - Derived Native Grassland	-		10.13	0	0	**10.13**
Narrow-leaved Ironbark – Spotted Gum Woodland DNG	3351 -Central Hunter Ironbark - Spotted Gum ForestDNG	-	A small component comprises CEEC - Central Hunter Valley Eucalypt Forest and Woodland	8.28	0	0	**8.28**
Hunter Valley River Oak Forest	4081 - Northwest River Oak-River Red Gum Forest	-	-	21.6	0	0	**21.6**
Rehabilitation		-	-	12.47	0	0	**12.47**
Introduced Grassland		-	-	121.68	0	0.73	**122.41**

Vegetation Community	PCT*	BC Act	EPBC Act	Bowmans Creek Riparian Corridor (ha)	Mountain Block (ha)	Mitchell Hills South (ha)	Total (ha)
Introduced Woodland	No defined PCT	-	-	2.26	0	0	**2.26**
Narrow-leaved Ironbark – Spotted Gum Woodland	3351 -Central Hunter Ironbark - Spotted Gum Forest	EEC - Central Hunter Ironbark – Spotted Gum – Grey Box Forest	A small component comprises CEEC - Central Hunter Valley Eucalypt Forest and Woodland	0	37.85 (3.10)*	0	**37.85**
Narrow-leaved Ironbark – Bulloak Open Forest	3431 - Central Hunter Ironbark Grassy Woodland	EEC - Central Hunter Grey Box – Ironbark Woodland	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	0	21.24	0	**21.24**
Narrow-leaved Ironbark – Spotted Gum Woodland DNG	3351 -Central Hunter Ironbark - Spotted Gum Forest DNG	-	A small component comprises CEEC - Central Hunter Valley Eucalypt Forest and Woodland	0	37.57 (3.20)*	0	**37.57**
Grey Myrtle – Kangaroo Vine Dry Rainforest and Rusty Fig Dry Rainforest	1614 - Grey Gum – Grey Myrtle – Narrow-leaved Stringybark – Rusty Fig open forest on ranges of the Upper Hunter	-	-	0	7.49 (5.32)*	0	**7.49**
Narrow-leaved Ironbark – Bulloak Open Forest DNG	3431 - Central Hunter Ironbark Grassy Woodland DNG	-	A small component comprises CEEC - Central Hunter Valley	0	56.87	0	**56.87**

Vegetation Community	PCT*	BC Act	EPBC Act	Bowmans Creek Riparian Corridor (ha)	Mountain Block (ha)	Mitchell Hills South (ha)	Total (ha)
			Eucalypt Forest and Woodland				
Disturbed Land		-	-	4.03	6.76 (3.13)*	0	**10.79**
Water Body/Dam		-	-	4.69	0.56 (0.06)*	0	**5.25**
Spotted Gum Forest	3351 -Central Hunter Ironbark - Spotted Gum Forest	-	-	0	0	16.74	**16.74**
Dry Rainforest	1614 - Grey Gum – Grey Myrtle – Narrow-leaved Stringybark – Rusty Fig open forest on ranges of the Upper Hunter	VEC – Lower Hunter Valley Dry Rainforest	-	0	0	8.15	**8.15**
Sheltered Grey Gum – Rough-barked Apple Forest	621 Grey Gum - Rough-barked Apple Alluvial Flat Woodland in the Upper Hunter Valley, mainly Sydney Basin Bioregion	-		0	0	1.21	**1.21**
Regrowth		-	-	0	0	3.89	**3.89**
Derived Grassland		-	-	0	0	9.78	**9.78**

Vegetation Community	PCT*	BC Act	EPBC Act	Bowmans Creek Riparian Corridor (ha)	Mountain Block (ha)	Mitchell Hills South (ha)	Total (ha)
			Total	**185.53**	**168.34**	**40.50**	**394.37**

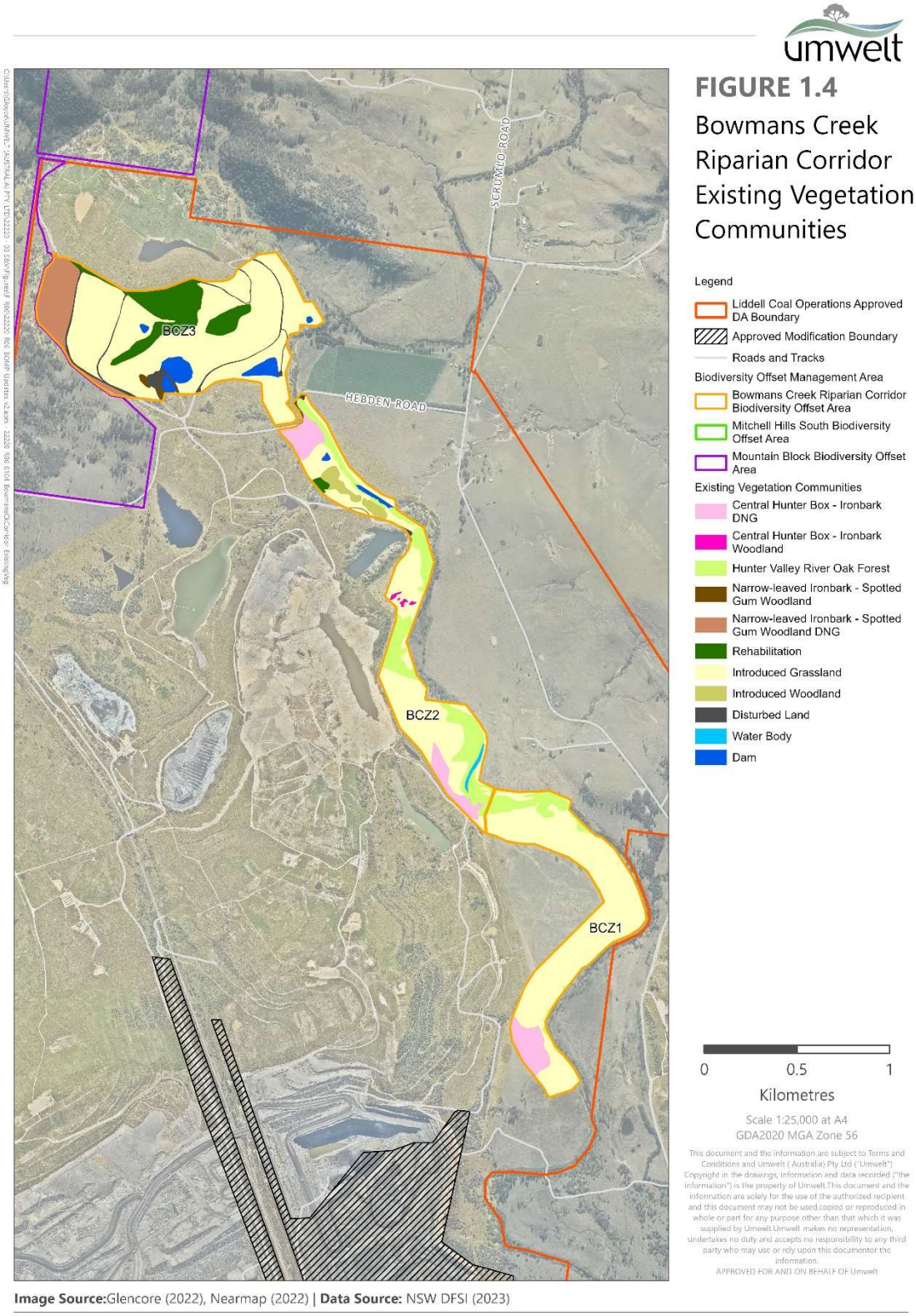

Figure 1-4 - Bowmans Creek Riparian Corridor Existing Vegetation Communities

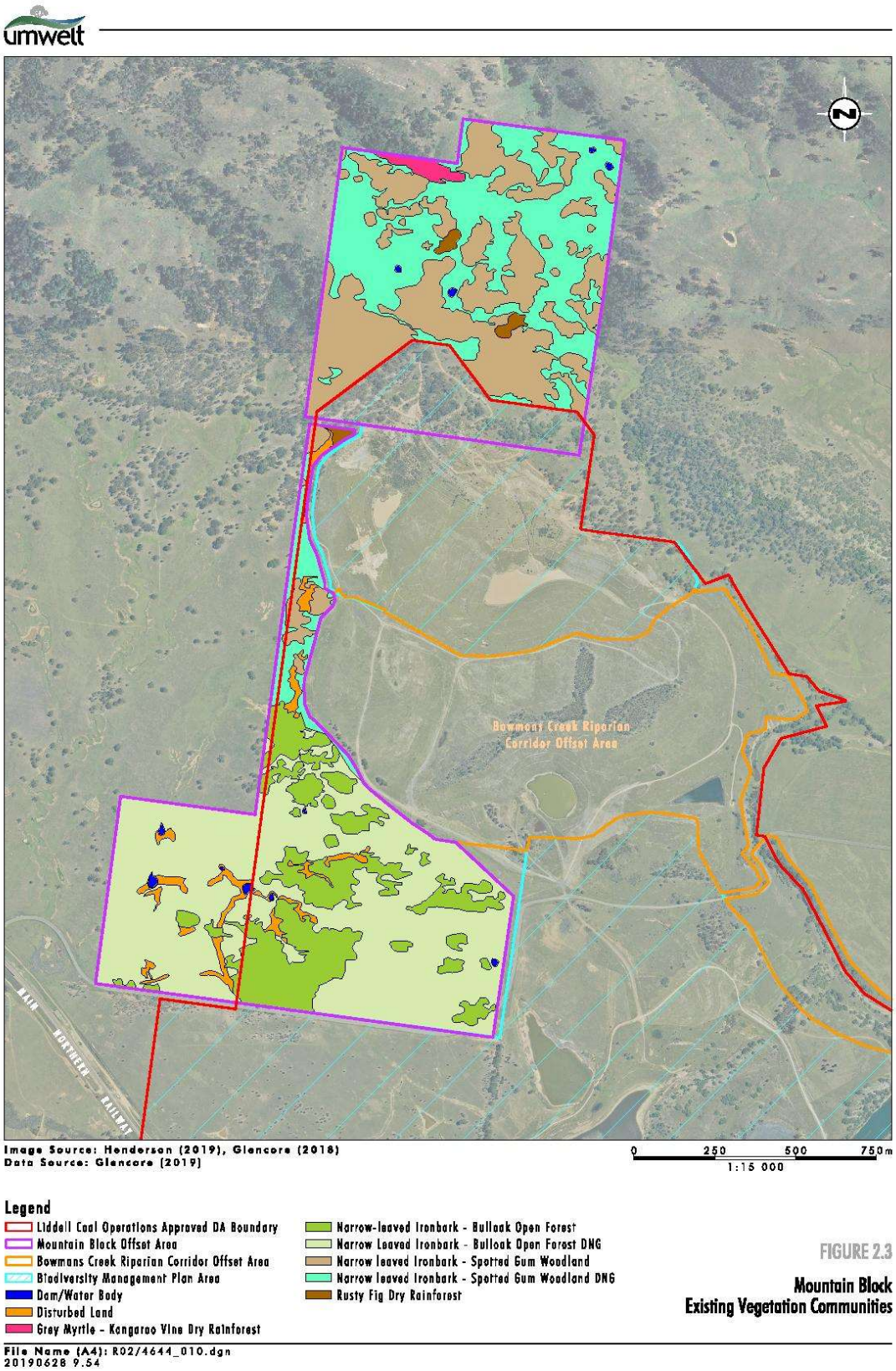

Figure 1-5 - Mountain Block Existing Vegetation Communities

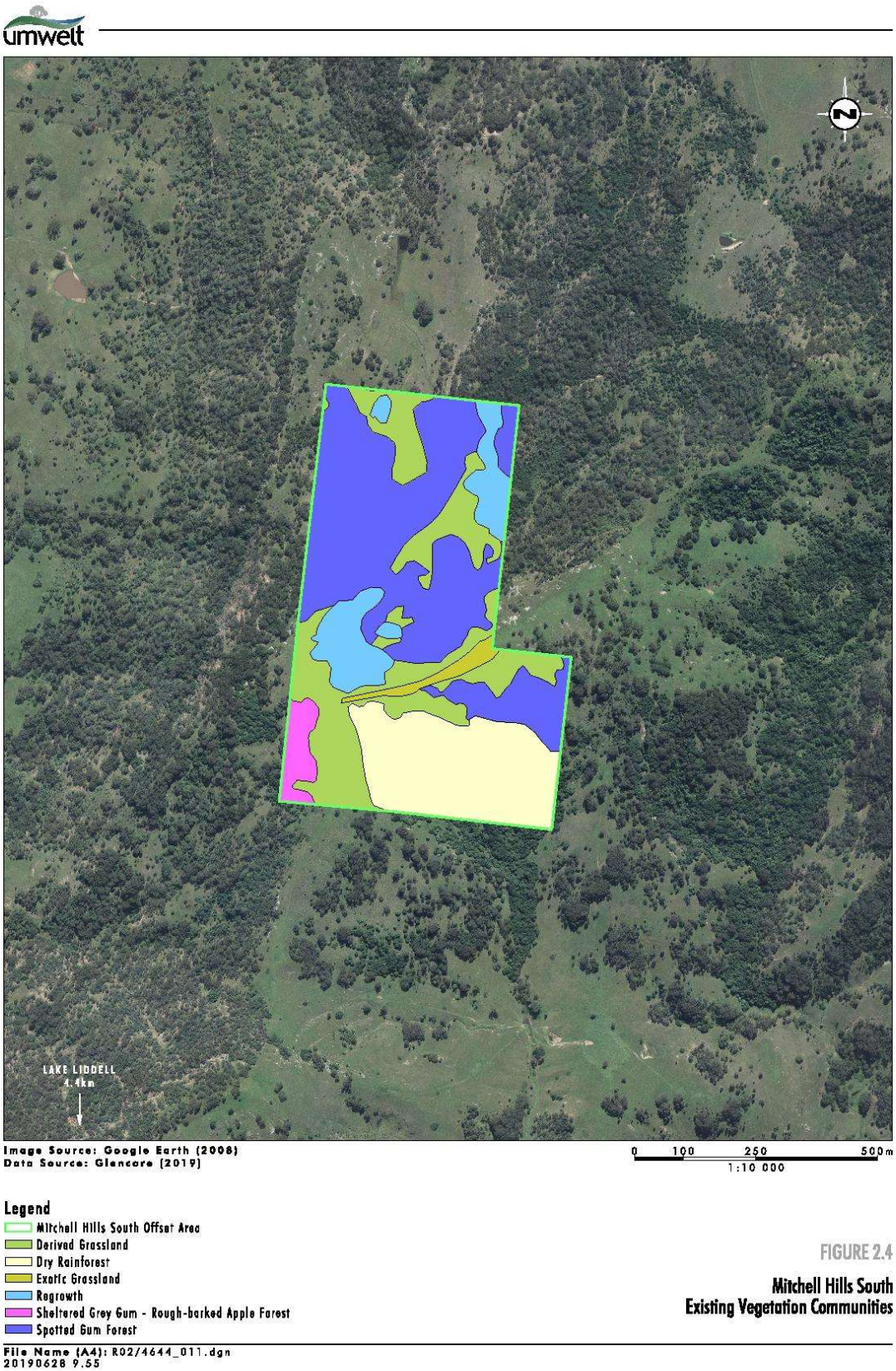

Figure 1-6 - Mitchell Hills South Existing Vegetation Communities

1.12.2 Fauna Habitats and Species

The broad fauna habitat types of grassland, riparian, woodland/forest, dry rainforest and aquatic habitat found within the LCO BOAs are representative of the habitat types occurring broadly across the Hunter Valley floor. All habitat types in the region have been extensively cleared or modified for agriculture, largely for cattle grazing, and mining. Communities occurring on floodplains and more fertile soils on the Hunter Valley floor have been most extensively cleared (Peake 2006). Because of the widespread clearing of habitats in the region, those remaining contain important refuges for a number of fauna species.

Woodland and forests are characterised by a dry environment with little or no standing water. Habitat is provided by a moderately open canopy and a sclerophyllous understorey that ranges from very dense to sparse, while the ground cover is generally sparse and dominated by grasses and forbs.

Dry rainforest/sheltered forest occurs on sheltered slopes and gullies. As a closed forest, dry rainforest contains a dense canopy of rainforest species with emergent mature eucalypts, spotted gums and angophoras. The mid storey is moderately dense to dense, comprising mesic species characteristic of rainforest communities and wet sclerophyll communities, and a sparse ground cover of ferns and grasses is present. Woody debris is relatively common and leaf litter is abundant. Emergent/canopy mature eucalypts contain tree hollows providing habitat for micro-bats, arboreal mammals and hollow-nesting and roosting birds. This resource is moderately common in the sheltered forest and vegetation fringing dry rainforest pockets. The occasional rocky slopes and cliff lines provide roost and nesting habitat for a variety of birds, micro-bats and mammals. Gullies are characteristically rocky and contain large boulders and small cliffs and caves. Cracks and fissures in rocks provide shelter for reptiles and micro-bats. Spaces between and underneath boulders provide shelter for larger mammals

Alluvial forests generally provide denser vegetation cover than woodland and forest habitats. The relatively larger sizes of eucalypt trees supported by the alluvial soils often also provide larger-sized hollows than those found on surrounding, drier slopes and ridges. The alluvial sites also provide ephemeral standing and moving water, with farm dams occurring in some areas. Aquatic habitat provided by farm dams and ephemeral creek lines and drainage lines are found across the LCO BOAs.

Grassland habitats are dominated by a range of native and naturalised perennial grasses and forbs. The health and integrity of the vegetation largely corresponds with the grazing history, particularly grazing intensity with many grassland habitats formed as a result of the clearing of woodland well over 100 years ago. The grass and forb dominated groundcover includes log and stump cover that provides habitat for grassland mammals (small and large), birds and terrestrial reptile species. The highly scattered trees throughout the grassland provided nesting, roosting and perching habitat for bird species, roosting habitat for some micro-bat species and shade for larger grazing mammal species.

1.12.3 Threatened and Migratory Species

A number of threatened flora and fauna species have been recorded across the LCO BOAs. These are identified in ***Table 1-6.***

Table 1-6 - Threatened Species Recorded in LCO Biodiversity Offset Areas

Species	BC Act	EPBC Act	Bowmans Creek Riparian Corridor	Mountain Block	Mitchell Hills South
tiger orchid *Cymbidium canaliculatum*	Endangered Population	-		✓	
grey-crowned babbler *Pomatostomus temporalis temporalis*	V	-	✓	✓	
painted snipe *Rostratula australis*	E	E, Mig	✓		
speckled warbler *Chthonicola sagittata*	V	-	✓	✓	
turquoise parrot *Neophema pulchella*	V	-		✓	
spotted harrier *Circus assimilis*	V			✓	
white-bellied sea eagle *Haliaeetus leucogaster*	V	Mig	✓	✓	
dusky woodswallow *Artamus cyanopterus cyanopterus*			✓		
brush-tailed phascogale *Phascogale tapoatafa*	V			✓	✓
spotted-tailed quoll *Dasyurus maculatus maculatus*	V	E	✓	✓	✓
eastern bentwing-bat *Miniopterus schreibersii oceanensis*	V	-	✓	✓	✓
little bentwing-bat *Miniopterus australis*	V		✓	✓	
eastern freetail-bat *Mormopterus norfolkensis*	V		✓	✓	
large-eared pied bat *Chalinolobus dwyeri*	V	V	✓		

Species	BC Act	EPBC Act	Bowmans Creek Riparian Corridor	Mountain Block	Mitchell Hills South
yellow-bellied sheathtail bat *Saccolaimus flaviventris*	V	-	✓		
rainbow bee-eater *Merops ornatus*	-	Mig	✓		

1.12.4 Introduced Species

The introduced fauna species provided in ***Table 1-7*** have been identified within the BOAs.

Table 1-7 - Introduced Fauna Species Recorded within Biodiversity Offset Areas

Common Name	Scientific name
house mouse	*Mus musculus*
black rat	*Rattus rattus*
pig	*Sus scrofa*
fox	*Vulpes vulpes*
dog/dingo	*Canis familiaris*
hare	*Lepus capensis*
rabbit	*Oryctolagus cuniculus*
common starling	*Sturnus vulgaris*
common myna	*Acridotheres tristis*
cat	*Felis catus*
deer	*Axis sp., Cervus sp., Dama dama*

The introduced flora species provided in ***Table 1-8*** have been identified within the BOAs and have legislative status listed as a having a biosecurity duty under the Biosecurity Act 2015 or as key threatening processes (KTPs) under the BC Act.

Table 1-8 - Introduced Flora Species Recorded within Biodiversity Offset Areas

Common Name	Scientific name	Legislative Listing
African boxthorn	*Lycium ferocissimum*	General biosecurity duty
African lovegrass	*Eragrostis curvula*	General biosecurity duty
African olive	*Olea europaea* subsp. *cuspidata*	General biosecurity duty
		Regional Recommended Measure – Land Area 1
		Invasion of native communities by this species is listed as a KTP under the BC Act
Bathurst burr	*Xanthium spinosum*	General biosecurity duty
Blackberry	*Rubus fruticosus*	General biosecurity duty
		Must not be imported into the State or sold
		Land managers should mitigate the risk of new weeds being introduced to their land.
Blue heliotrope	*Heliotropium amplexicaule*	General biosecurity duty
Blue periwinkle	*Vinca major*	General biosecurity duty
Castor oil	*Ricinus Communis*	General biosecurity duty
Coolatai grass	*Hyparrhenia hirta*	General biosecurity duty
Fireweed	*Senecio madagascariensis*	General biosecurity duty
		Must not be imported into the State or sold
Flaxleaf fleabane	*Conyza bonariensis*	General biosecurity duty
Green cestrum	*Cestrum parquii*	General biosecurity duty
		Regional recommended measures for the Hunter Region
Galenia	*Galenia pubescens*	General biosecurity duty

Common Name	Scientific name	Legislative Listing
Kei apple	*Dovvalis caffra*	General biosecurity duty
Lantana	*Lantana camara*	General biosecurity duty
		Must not be imported into the State or sold
Madeira vine	*Anredera cordifolia*	General biosecurity duty
Paterson's curse	*Echium plantagineum*	General biosecurity duty
		Regional recommended measures for the Hunter Region
Peppercorn	*Schinus mole* var. *areira*	General biosecurity duty
Prickly pear	*Opuntia stricta* var. *stricta*	General biosecurity duty
		Must not be imported into the State or sold
Rhodes grass	*Chloris Gayana*	General biosecurity duty
Saffron thistle	*Carthamus lanatus*	General biosecurity duty
Spear thistle	*Cirsium vulgare*	General biosecurity duty
Spiny emex	*Emex australis*	General biosecurity duty
Tree-of-heaven	*Ailanthus altissima*	General biosecurity duty
Weeping willow	*Salix babylonica*	General biosecurity duty
		Must not be imported into the State or sold
		Must not be imported into the State or sold

KTP	key threatening process
BC Act	Biodiversity Conservation Act 2016
General biosecurity duty	All plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable
Land Area 1	Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. Land Area 2: Land managers should mitigate spread from their land. Land managers should mitigate the risk of new weeds being introduced to their land. Plant should not be bought, sold, grown, carried or released into the environment.

While not having any specific legislative status golden wreath wattle (*Acacia saligna*) is likely to be highly problematic to rehabilitated areas if not appropriately managed.

1.13 Modification 7 Remediation Area

On 12 February 2019, Development Application (DA) 305-11-01 Modification 7 was approved for the minor amendment of the DA boundary. This incorporated a 14.81 hectare portion of the Mountain Block Biodiversity Offset Area (BOA) to facilitate required rehabilitation works on extensive erosion, landform stability issues, and to assist in achieving positive biodiversity outcomes in the medium to long term. The location of the Modification 7 boundary is provided on ***Figure 1-2***.

The Modification 7 Area remediation works was completed in 2020. The total area disturbed within the Mountain Block BOA was 1.6 ha (0.33 ha of PCT 1614 and 1.26 disturbed land). The success of this rehabilitation is monitoredin line with initial establishment monitoring in Section 3.2.2.

Table 1-9 - Vegetation Communities of the Modification 7 Area

Plant Community Type	Status	Area (hectares)	
		Modification 7 Area	**Extent Disturbed 2020**
3351 – Central Hunter Ironbark - Spotted Gum Forest	Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC	3.10	0
3351 – Central Hunter Ironbark - Spotted Gum Forest- DNG	-	3.20	0
1614 – Grey Gum – Grey Myrtle – Narrow-leaved Stringybark – Rusty Fig Open Forest on Ranges of the Upper Hunter	-	5.32	0.33
Disturbed Land	-	3.13	1.26
Water Bodies	-	0.06	0
Total		**14.81**	**1.59**

1.14 Biodiversity Management Targets

Biodiversity management targets form the basis of the BOMP. The proposed management and improvement strategies (***Section 2***) will enable these biodiversity management targets and the conditions of approval to be met. Specific performance indicators and completion criteria will be used to track the success of the BOMP in reaching these targets.

The LCO BOAs will be managed to conserve existing ecological values, with a focus on weed and feral animal control, fencing and regeneration of grassland and disturbed areas to their benchmark communities. The three year targets for the management of the LCO BOAs are to:

- continue detailed rehabilitation works within the Bowmans Creek Riparian Corridor;
- continue establishment of woodland vegetation in grassland and disturbed areas in Mountain Block by way of natural regeneration;
- continue establishment of woodland vegetation in grassland and disturbed areas in Mitchell Hills South by way of natural and assisted regeneration;
- maintain fencing and signage (as necessary) to demarcate boundaries and protect existing vegetation and regeneration/rehabilitation areas from human-induced impacts and unplanned grazing;
- continue to exclude grazing from domestic stock until monitoring has determined land is suitable for grazing;
- manage weed and pest species;
- undertake (as required) and monitor success of habitat augmentation programs completed, with particular emphasis on the spotted-tailed quoll; and
- continued implementation of a monitoring program to assess the success of ongoing management and improvement strategies.

The long term biodiversity management targets for the LCO BOAs are to:

- establish an appropriate long-term conservation mechanism for the LCO BOAs which is agreed upon in consultation with the relevant authorities;
- maintain or improve the existing biodiversity values of the remnant woodland communities in all three areas;
- complete rehabilitation and revegetation works across the currently disturbed or grassland areas (totalling approximately 149.62), within the Bowmans Creek Riparian Corridor;
- establish approximately 101 ha of benchmark native vegetation communities within the currently disturbed or grassland areas of Mountain Block through natural and assisted (if required) regeneration; and
- establish approximately 13 ha of benchmark native vegetation communities within Mitchell Hills South through natural and assisted (if required) regeneration.

Post–regeneration and revegetation vegetation communities are depicted in ***Figure 1-7*** for the Bowmans Creek Riparian Corridor, ***Figure 1-8*** for Mountain Block and ***Figure 1-9*** for Mitchell Hills South. Due to the scale of works required in Bowmans Creek Riparian Corridor, this BOA has been divided into three different management zones: Zone 1, Zone 2 and Zone 3.

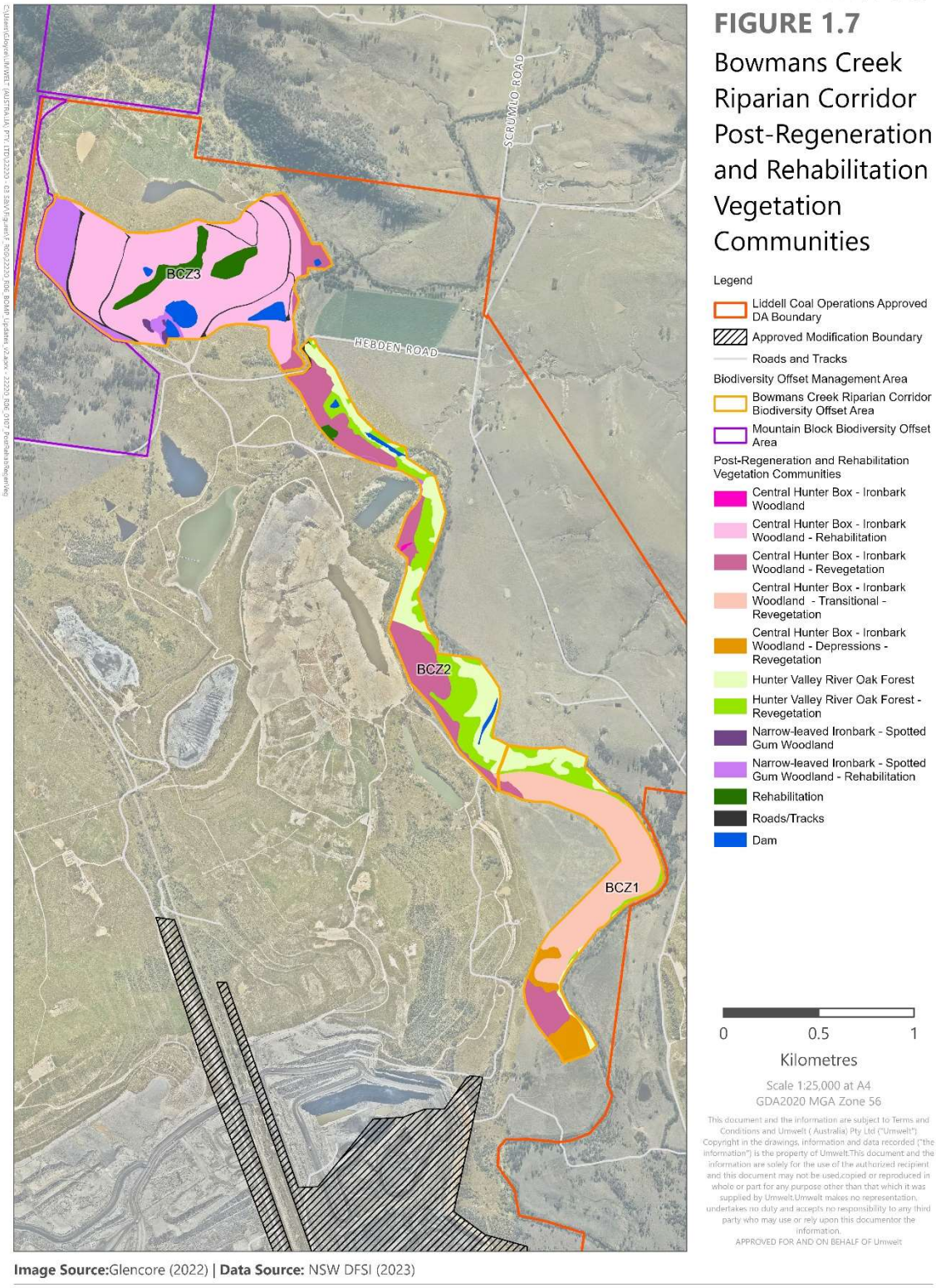

Figure 1-7 - Bowmans Creek Riparian Corridor Post-regeneration and Rehabilitation Vegetation Communities

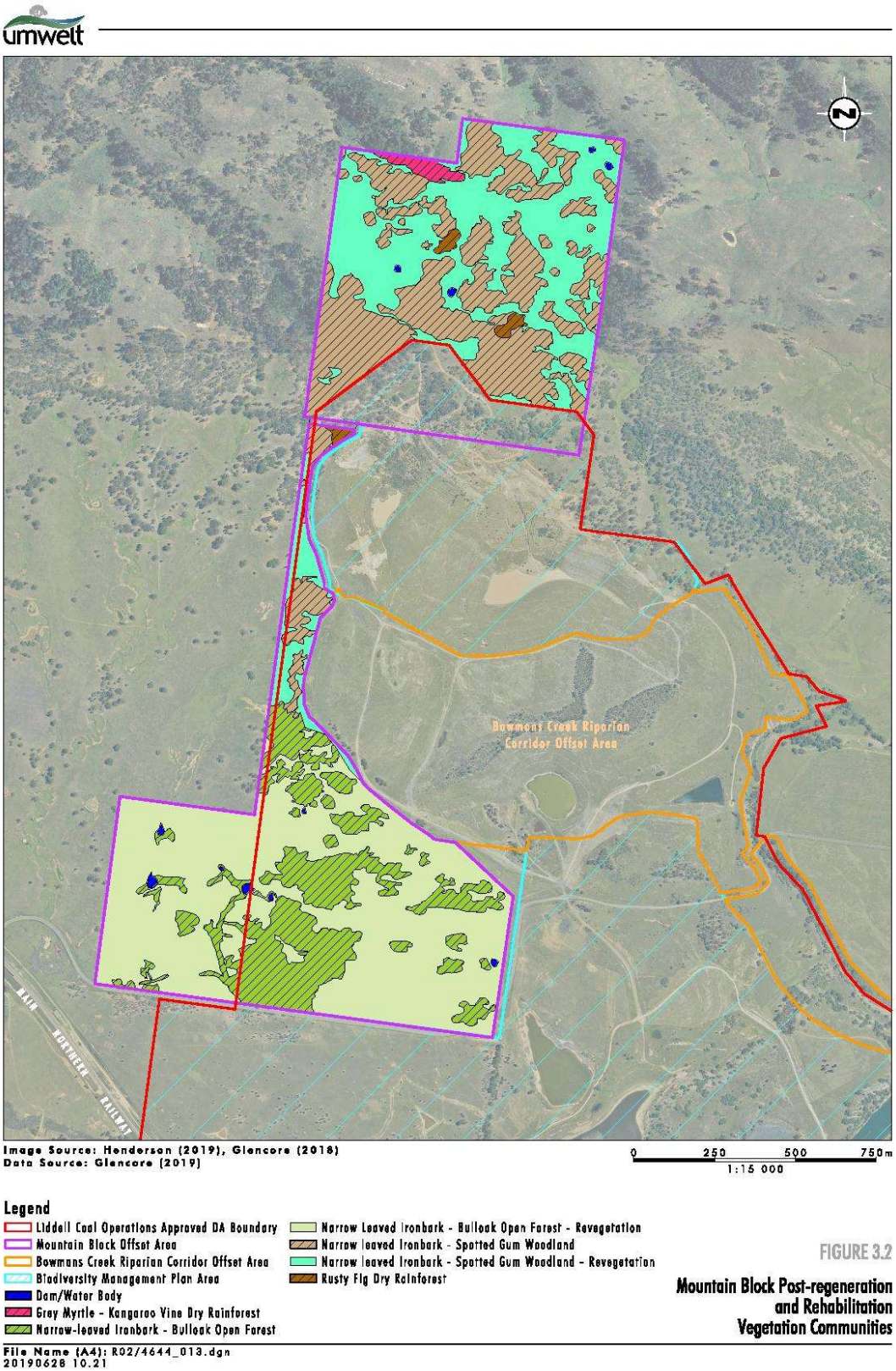

Figure 1-8 - Mountain Block Post-regeneration and Rehabilitation Vegetation Communities

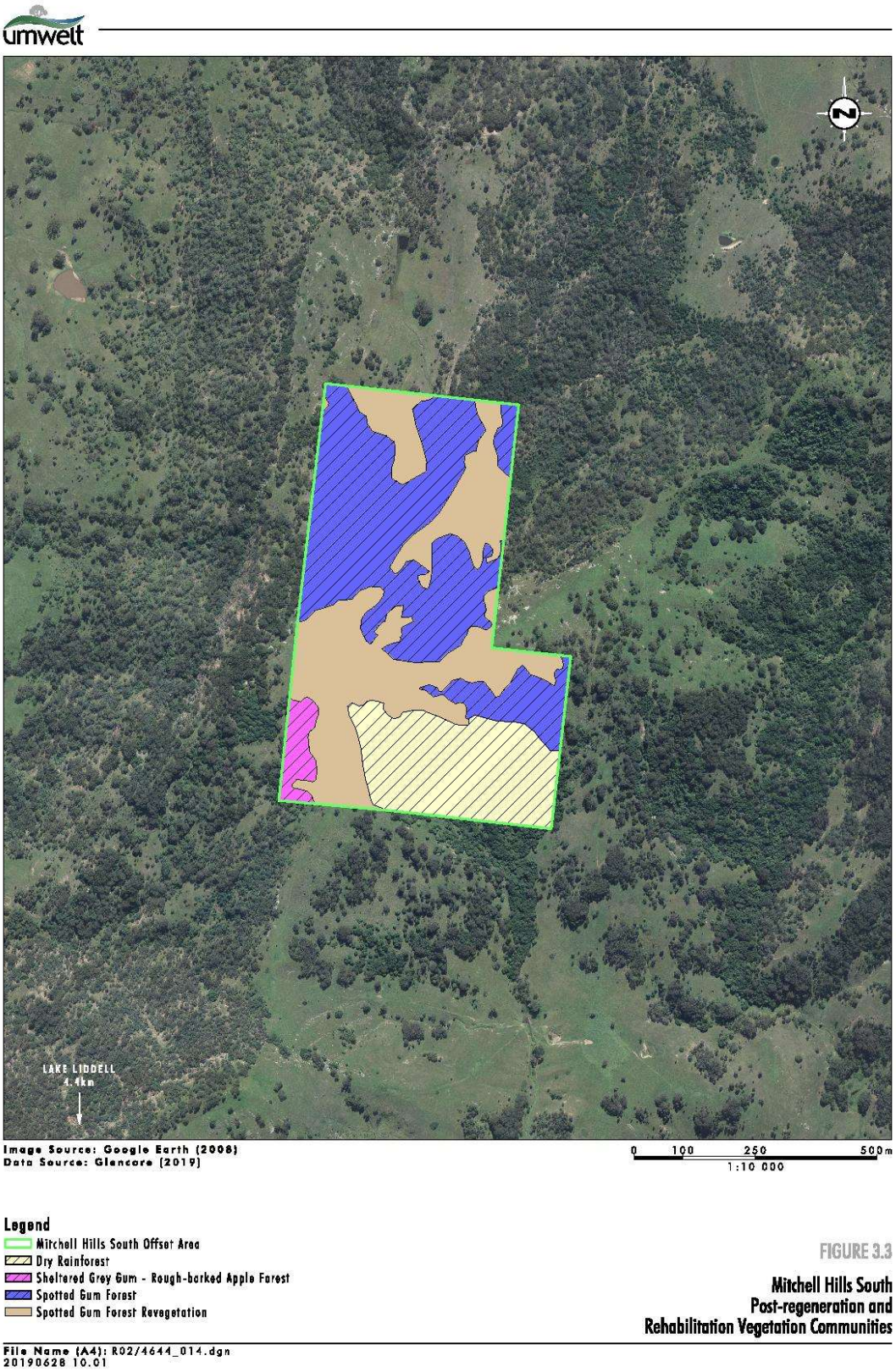

Figure 1-9 - Mitchell Hills South Post-regeneration and Rehabilitation Vegetation Communities

2. Management & Improvement Strategies

The following management and improvement strategies have been developed for the LCO BOAs to ensure that the BOMP objectives and targets in ***Section 1.14*** are met. They will be employed across each of the BOAs, as required. The management actions will prove of benefit to all native flora and fauna species within the biodiversity offset areas, however many are tailored towards benefit for the spotted-tailed quoll, regent honeyeater and swift parrot.

2.1 Pathogen Management

The three key pathogens of relevance to the BOAs include the root rot fungus (Phytophthora cinnamomi), myrtle rust (Pucciniales) and chytridiomycosis (infection by amphibian chytrid fungus). Each of these is listed as a key threatening process (KTP) under the BC Act. Infection of frogs by amphibian chytrid and dieback caused by the root-rot fungus Phytophthora cinnamomi are also KTPs under the EPBC Act.

None of these pathogens are known to occur nor has monitoring or other survey identified reasonable potential for these to be present in the BOAs. If reasonable potential for the presence of these pathogens is identified, the potential should be further investigated by way of targeted sampling/survey to determine if they are present.

Phytophthora multivora is another soil bourne species to be considered in managing pathogens in the BOAs. Although it is not listed as a key threatening species under either the BC Act or EPBC Act, and therefore has no legislation-specific obligation for management, it is also considered. A minor localised infestation was identified in Bowmans Creek Riparian Corridor during 2020.

The following information (including precautionary measures to minimise potential for their occurrence) should be considered in addressing this issue.

2.1.1 Phytophthora cinnamomi

Phytophthora cinnamomi is a soil fungus that attacks the root (and sometimes stem) systems of plants, destroying the ability of the plant to uptake water and nutrients (Commonwealth of Australia 2001). 'Infection of native plants by Phytophthora cinnamomi' is listed as a KTP under the BC Act and 'Dieback caused by the root-rot fungus Phytophthora cinnamomi' is also listed as a KTP under the EPBC Act.

Although not recorded within the BOAs, this pathogen has the potential to be spread onsite as a result of soil movement during earthworks or on infected vehicles. As a precautionary measure, vehicles and machinery should be washed before entering the LCO.

If any areas are reasonably suspected to be infected with this pathogen (areas of unexplained vegetation death, for example), a targeted sampling, diagnosis and management strategy will be designed to address impacts and further spread.

2.1.2 Myrtle Rust

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae is a KTP under the BC Act. This fungus attacks young growth causing plants to become stunted, distorted or necrotic, consequently impacting the viability of the host plant (NSW Scientific Committee 2011).

Although not recorded within the BOAs, this fungi has the potential to be spread onsite as a result of introduction of infected plant material from offsite or other measures.

Presence of myrtle rust is assessed during BOA surveys. Particular attention is paid to the potential presence of this pathogen during biodiversity monitoring works. Myrtle rust is recognisable on the leaves of Myrtaceae species, which includes *Eucalyptus* spp. *Corymbia* spp. and *Angophora* spp., each of which have been identified in the Liddell BOAs. Early identification on susceptible species, if any, will enable occurrences to be managed in order to reduce potential spread.
If myrtle rust is identified as being present, it will require immediate control using an appropriate fungicide.

If any areas of vegetation are reasonably suspected to be infected with this fungus, a targeted sampling, diagnosis and management strategy will be designed to address impacts and further spread.

2.1.3 Chytridiomycosis

Infection of frogs by amphibian chytrid causing the disease chytridiomycosis is listed as a KTP under the BC Act and the EPBC Act. This fungus is an infectious disease affecting amphibians globally and is caused by the amphibian chytrid fungus Batrachocytrium dendrobatidis. It is highly virulent and known to cause anything from erratic deaths of amphibian populations to 100 per cent mortality in other populations (Threatened Species Scientific Committee 2002 and NSW Scientific Committee 2003).

Although not known to occur within the BOAs, this fungus has the potential to be spread onsite as a result of inappropriate amphibian handling during ecological surveys and the transfer of infected amphibians and water containing the fungus between catchments.

Key to the prevention of spread of this pathogen is an appropriate amphibian handling strategy during ecological surveys. Handling amphibians should be avoided during ecological surveys and clearing works (where possible). If unavoidable, amphibians are only to be handled in accordance with Hygiene Protocol for the Control of Disease in Frogs (DECC 2008).

2.1.4 Phytophthora multivora

Phytophthora multivora (PM) is not listed as a KTP under the BC Act or EPBC Act, however the fungus a highly pathogenic soil borne species and has potential to cause serious decline and death of many plant species. PM attacks plants at the roots, leaving a plant susceptible to insects, disease and drought stress by limiting the nutrient and water uptake from the soil. Symptoms of PM include wilting, yellowing or dieback of the infected plant. It travels through water and contaminated soil. Spores may persist in soil indefinitely. (NSW DECCW)

During a targeted investigation into the presence of Phytophthora cinnamomi in 2020, a minor localised infection of Phytophthora multivora was identified at a site in Bowmans Creek Riparian Corridor (DB21 at 315305 E, 6418334 N). Follow up soil sampling was undertaken at this location. Results showed:

- No additional Phytophthora multivora detected;
- Pythium undulatum detected; and
- Phytopythium vexans detected.

The investigation concluded that while the pathogens are unlikely to be cause of river oak dieback in Bowmans Creek Riparian Corridor, but they may pose a threat to revegetation efforts in this section of Bowmans Creek Riparian Corridor if required. LCO will take caution to limit the spread of these pathogens as per the NSW DECCW guidelines for Phytophthora. This primarily focuses on managing water and soil movement, including:

1. Ground disturbance in the identified area to be kept to a minimum.
2. Avoid activities in area when soil is wet and muddy.
3. Controlled access to area.
4. Adhere to hygiene protocols for vehicles, machinery, equipment and persons in area.
5. Treatment of infected plants with the fungicide Phosphonate (Phosphite), if required
6. Monitor changes in localised vegetation and reassess as necessary.

2.2 Cultural Heritage Management

The potential for items of cultural heritage value to be present within the BOAs has been assessed as a component of due diligence program completed for all offset areas. Management strategies relating to Aboriginal cultural heritage sites and values within the BOAs are contained within the most current Liddell Aboriginal Cultural Heritage Management Plan (ACHMP).

The ACHMP documents management strategies that enable the regeneration/revegetation within BOAs which contain Aboriginal cultural heritage sites, developed in consultation with the LCO Registered Aboriginal Parties (RAPs). The LCO ACHMP contains cultural heritage protocols will be developed to inform employees and contractors about how to identify and manage risk to cultural heritage values and to report potential finds.

A Ground Disturbance Permit (GDP) is required for all activities on previously undisturbed land and includes a review of cultural heritage impacts.

Table 2-1 outlines the performance and completion criteria for managing Cultural Heritage across all LCO BOAs.

Table 2-1 - Cultural Heritage Management Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Bowmans Creek Riparian Corridor	Detailed rehabilitation planning for the Bowmans Creek Riparian Corridor	Implement plan as required.	Implement plan as required.	Implement plan as required.	Cultural heritage is appropriately considered within rehabilitation

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
	managing outcomes of cultural heritage assessment.				works in Bowmans Creek Riparian Corridor.
All biodiversity offset areas	Implement protocols for identification of potential cultural heritage issues, including how to avoid or mitigate impacts.	Implement protocol.	Implement protocol.	Implement protocol.	Protocol developed and implemented.

2.3 Fencing and Signage

LCO will ensure that all BOAs have boundary fencing of appropriate design and condition. This will ensure that areas of remnant vegetation and rehabilitation/regeneration areas will be appropriately protected from human-induced impacts such as damage from vehicles or trampling, increased rubbish dumping, unplanned grazing and alteration to normal fauna behaviour patterns due to human presence.

Fencing and access control including deterrent methods such as locked gates will be used to protect existing vegetation from accidental disturbance and will clearly demarcate areas of vegetation to be protected. In areas where fencing is deemed as being unsuitable, appropriate signage will be used in its place. Signage will exclude access (where appropriate), instruct vehicles to remain on formed tracks only, or highlight sensitive ecological areas to be avoided.

Any new fencing will use no barbed wire on the upper strands, and as little barbed wire generally as possible. This will ensure as minimal impact on native species as possible. The minimal usage of barbed wire from fencing will minimise potential injury or death of fauna species, particularly macropods and gliding or flying mammals and threatened micro-bats. Fencing design will also consider the use of as few wire strands as practical to reduce potential for fauna entanglement.

In addition, any new fencing will use plain wire on the bottom strand and this strand will be of a height that allows faunal passage underneath. It is noted however, that this design will need to ensure that cattle cannot push underneath the bottom strand and thus gain access to the BOAs.
In the first year of the operation of this BOMP, LCO conducted an inspection of the BOAs to map existing fencing, assess condition and identify areas where new fencing is needed or repairs needed for existing fencing. This mapping also identified redundant fencing that required removal. Existing fencing that was deemed unnecessary has now been removed.

In onsite areas where road-based traffic is passing through or in proximity to known spotted-tailed quoll habitat, LCO has installed information signage indicating the potential presence of this species, these signs will be maintained for throughout the life of mine.

Table 2-2 outlines the performance and completion criteria for managing fencing and signage across all LCO BOAs.

Table 2-2 - Fencing and Signage Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Repair boundary fences, restricting unauthorised access to property and controlling livestock movements	All boundary fences in place and gates are secured.	All boundary fences in place and gates are secured.	All boundary fences in place and gates are secured.	All biodiversity offset areas will have boundary fencing of appropriate design and condition.

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Any new fencing does not have barbed wire on upper strands and as little barbed wire generally as possible. The bottom strand will be plain wire and elevated to allow faunal passage (while maintaining cattle exclusion).	New fences are installed without barbed wire on upper strands and an elevated plain wire bottom strand.	New fences are installed without barbed wire on upper strands and an elevated plain wire bottom strand.	New fences are installed without barbed wire on upper strands and an elevated plain wire bottom strand.	New fences are constructed with as little barbed wire as possible, with none on upper strands and an elevated plain wire bottom strand.
All biodiversity offset areas	Inspections of fences every two months to identify condition.	Inspections undertaken every two months. Damaged critical fences to be repaired within 1 week (temporary if needed), final repairs and non-critical repairs to be completed in 1 month.	Inspections undertaken every two months. Damaged critical fences to be repaired within 1 week (temporary if needed), final repairs and non-critical repairs to be completed in 1 month.	Inspections undertaken every two months. Damaged critical fences to be repaired within 1 week (temporary if needed), final repairs and non-critical repairs to be completed in 1 month.	All fences in functional condition.
All biodiversity offset areas	Information signage for the spotted-tailed quoll.	Informational signage is maintained.	Informational signage is maintained.	Informational signage is maintained.	Information signage for the spotted-tailed quoll is maintained.

2.4 Grazing Management

The majority of vegetation within the BOAs displays some level of impact from grazing, whether by domestic stock, feral animals (such as rabbits and pigs) or by native animals (such as macropods). The intensity of this impact varies throughout the BOAs, with the vegetation across the areas displaying grazing impacts ranging from slight to moderately severe. The grassland formation shows the highest level of impact, however all vegetation formations show some degree of disturbance from grazing.

In principle, LCO intends that grazing domestic stock within the BOAs will be avoided, however it is recognised that targeted strategic grazing may assist to manage key risks such as weeds and bushfire and help achieve desired ecological outcomes. These practices would occur only where they do not interfere with the required regeneration/rehabilitation of the BOAs, and would only occur for short periods of time, as necessary, following consideration of monitoring results. Fencing will be used to restrict grazing to target areas as required.

The following general grazing management principles will be adopted in areas suitable for grazing within the BOAs where monitoring information recommends grazing as a management tool:

- manage stocking rates and monitor grazing areas to ensure that overgrazing does not occur and that ecological values are not compromised;
- prevent stock access into regeneration/rehabilitation areas by fencing;
- implement a stock rotation principles to ensure that adequate time is allowed for between grazing rotations to allow grasses to regenerate;
- regularly inspect and maintain shared boundary fences with grazing areas to minimise incidences of un-authorised stock access into offset areas;
- Active regeneration areas are monitored to determine the impacts of grazing and ground disturbance from native and feral pest species. Bi-monthly Biodiversity Inspections indicate the presence and impact of vertebrate pests on active regeneration. These inspections are used to schedule vertebrate pest management in rehabilitation and biodiversity offset areas (typically bi-annually). Kangaroo management activities are completed in consultation with NPWS.

As part of the ongoing monitoring program, if a restricted level of barbed wire on fencing is shown to fail to exclude stock from sensitive areas, additional measures that pose minimal impact to native fauna will be investigated and implemented.

Table 2-3 outlines the performance and completion criteria for managing stock grazing across all LCO BOAs.

Table 2-3 - Grazing Management Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offsets	All stock to be removed from biodiversity offset areas.	No stock grazing unless required based on monitoring results.	No stock grazing unless required based on monitoring results.	No stock grazing unless required based on monitoring results.	Grazing has not occurred in biodiversity offset areas unless determined as needed by monitoring results.
All biodiversity offsets	Minimum bi-monthly inspections to determine presence of rogue stock and assess condition of fences.	To be completed bi-monthly.	To be completed bi-monthly.	To be completed bi-monthly.	Completion of inspection reports that include records of stock grazing.
All biodiversity offsets	Remove reported rogue stock and repair damaged fences.	Action and remove reported rogue stock and repair damaged fences.	Action and remove reported rogue stock and repair damaged fences.	Action and remove reported rogue stock and repair damaged fences.	No rogue stock in biodiversity offset areas and fences in functional condition.

2.5 Track Maintenance

Where feasible, access to work areas will be confined to existing tracks. Prior to the construction of new access tracks / roads within the BOAs (including any works requiring additional ground disturbance), due diligence ecological inspections will be undertaken by a suitably qualified ecologist to search for threatened flora species, endangered populations and important habitat for threatened fauna species, such as hollow-bearing trees and dams. Any ground disturbance will be carried out under the Ground Disturbance Permit process. Should these be identified, LCO will implement measures to minimise impacts on these features, including the redesign of the layout of access tracks/roads. The measures to be undertaken to minimise impacts on these features include:

- designing the access tracks for the minimisation of environmental impacts including:
  - minimising the length and width of the track;
- undertaking pre-clearance surveys (through the GDP process) in the proposed areas for track construction to determine constraints and avoidance options;

- where clearance of habitat trees is required, undertaking clearing activities in accordance with site procedures including the LCO Tree Felling and Topsoil Stripping Procedure; and
- topsoil stripped for the construction and maintenance of tracks will be stockpiled onsite for reuse (such as in rehabilitation areas).

In accordance with the Rural Fires Act 1997, in the event of a declared bushfire emergency, all efforts will be made to reduce and/or eliminate the fire hazard/risk. This may include the construction of emergency access tracks/roads to enable fire fighting personnel access to the fire front and/or the construction of fire breaks without undertaking a due diligence assessment prior to clearing activities.

Erosion and sediment control structures as outlined in ***Section 2.13*** will, where necessary, be established in conjunction with any tracks constructed through the BOAs. Construction of erosion and sediment control structures will also be considered in the maintenance of access tracks. All unnecessary tracks have now been rehabilitated.

The condition of tracks will be assessed during biannual (twice yearly) inspections, with maintenance works undertaken as necessary.

Table 2-4 outlines the performance and completion criteria for managing track maintenance across all LCO BOAs.

Table 2-4 - Track Maintenance Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	New access tracks (only where necessary) are subject to due diligence assessments.	Complete due diligence assessments for new access tracks to minimise impact on biodiversity, where possible.	Complete due diligence assessments for new access tracks to minimise impact on biodiversity, where possible.	Complete due diligence assessments for new access tracks to minimise impact on biodiversity, where possible.	New access tracks are only constructed where necessary, and are subject to due diligence inspections

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Minimum twice yearly (nominally in March and September) inspections to identify track conditions.	Inspections undertaken nominally in March and September. Action and repair track damage.	Inspections undertaken nominally in March and September. Action and repair track damage.	Inspections undertaken nominally in March and September. Action and repair track damage.	Tracks maintained in good usable condition.

2.6 Pest Management

LCO will complete pest management activities across the LCO BOAs, with a particular focus on the Bowmans Creek Riparian Corridor. This area is more heavily disturbed than the Mountain Block and Mitchell Hills South Offset Areas.

Known pest species from these areas are provided in ***Table 1-7***. These species may impact on native fauna species through predation and competition for resources such as food, shelter, and breeding sites.

Foxes, feral cats and wild dogs represent a substantial threat to the ongoing persistence of the spotted-tailed quoll in the BOAs, as well as the broader Foy Brook area. Targeted and intensive control of such predators will be a key factor in mitigating current impacts on this species in the local area.

LCO currently implements feral animal control measures, including a combination of targeted shooting, trapping and baiting practices. Remote cameras are also used to collect information on presence/abundance of these species. These measures are generally implemented on a reactive basis, when monitoring or opportunistic sightings identify species requiring control.

Currently, baiting practices involve 1080 baits buried in mounds as well as free baiting (non-poisoned baits) in areas around known spotted-tailed quoll habitat. Bait mounds in areas of potential spotted-tailed quoll habitat are monitored by remote cameras to gather data on which species are accessing and taking the baits. This assists in gathering data on potential impacts to non-target species such as the spotted-tailed quoll. Thus far, this process has recorded spotted-tailed quolls investigating bait mounds, however not taking any baits. The cameras also assist in attributing the tracks and digging signs at the mounds to particular species.

These measures serve to control most feral animal species relevant to general area, particularly foxes, feral dogs, feral cats, rabbits and pigs. The current frequency of these measures is responsive to monitoring results, opportunistic sightings and abundance.

LCO commit to completion of inspections for signs of feral animals in all BOAs every two months. The implementation of control methods will be defined from the outcomes of these inspections, including target species, timing, duration and the most appropriate methods to be employed. The outcomes of these inspections will feed into the ongoing review and response process.

The feral animal control measures used are tailored based on the outcomes of this data. New feral animal control measures (particularly baiting techniques) are regularly considered.

Current practices for the management of these species will be reconsidered with a specific focus on the protection of the spotted-tailed quoll population in this area. Particular focus will be paid to adopting feral animal control measures (particularly foxes and wild dogs) that have minimal direct or indirect impact on this species.

Regular monitoring of revegetation and regeneration areas will be undertaken to determine the impact of feral animals, particularly on vegetation establishment. Feral animal control works will be undertaken periodically to ensure the suppression of feral animals, and will consider ecological impacts.

Vertebrate pest control will use best practice methods, and include follow-up monitoring and control as required. If monitoring shows a substantial increase in the density of any known feral fauna species or the occurrence of a previously unrecorded feral fauna species is discovered, LCO will seek expert advice on appropriate management and control options.

Table 2-5 outlines the performance and completion criteria for managing pest species across all LCO BOAs.

Table 2-5 - Pest Management Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Complete feral animal inspections of biodiversity offset areas every two months to document sighting and abundance records. This will then inform ongoing control actions (as needed), including timing, frequency, target species and methods to be used.	Inspections completed every two months, followed by implementation of required control methods, as required.	Inspections completed every two months, followed by implementation of required control methods, as required.	Inspections completed every two months, followed by implementation of required control methods, as required.	Biodiversity offset areas are inspected for feral animal diversity and abundance every two months. Control measures are implemented in response to outcomes of the inspections. Measures are being taken to control feral animals in the biodiversity offset areas.
All biodiversity offset areas	Develop and implement an annual pest animal action plan.	Develop and implement pest animal action plan. Stable or downward trend in population size recorded.	Develop and implement pest animal action plan. Stable or downward trend in population size recorded.	Develop and implement pest animal action plan. Stable or downward trend in population size recorded.	Strategies from action plans are implemented and targets are achieved. Stable or downward trend in population size recorded.
All biodiversity offset areas	Particular action is paid to managing foxes, feral cats, feral dogs and pigs in order to protect the spotted-tailed quoll population in this area.	Implementation of favoured fox, feral cat, feral dog and pig control measures.	Implementation of favoured fox, feral cat, feral dog and pig control measures.	Implementation of favoured fox, feral cat, feral dog and pig control measures.	Monitoring demonstrates that fox, feral cat, feral dog and pig control methods are being effective in managing target species.

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Presence of pest animals	As evidenced by monitoring, pest animal presence in revegetation/ rehabilitation areas does not pose a risk to establishment of vegetation.	As evidenced by monitoring, pest animal presence in revegetation/ rehabilitation areas does not pose a risk to establishment of vegetation.	As evidenced by monitoring, pest animal presence in revegetation/ rehabilitation areas does not pose a risk to establishment of vegetation.	Feral fauna diversity of revegetation/ rehabilitation areas is commensurat e with remnant vegetation
All biodiversity offset areas	Develop a vertebrate pest control register to document when and where each control method is implemented.	Update and maintain vertebrate pest control register.	Update and maintain vertebrate pest control register.	Update and maintain vertebrate pest control register.	Pest animal control register is maintained and up to date.

2.7 Weed Management

The presence of weed species has the potential to be a major hindrance to rehabilitation and regeneration activities and the potential to enhance edge effects on remnant vegetation within the BOAs. In addition to this, the presence of weed species has the potential to significantly decrease the value of vegetation to native species, particularly threatened species.

LCO commit to completion of weed inspections of all BOAs every two months to record the presence of noxious weed species. Bowmans Creek Riparian Corridor is known to contain the highest levels of weed infestations. Mitchell Hills South and Mountain Block offset areas are known to contain fewer weed species requiring management actions. The implementation of control methods will be defined from the outcomes of this inspection, including timing, duration and the most appropriate methods to be employed. The outcomes of this inspection will feed into the ongoing review and response process.

Weed control will be conducted in accordance with current LCO management practices, which require:

- regular site inspections to identify areas of weed infestation and type of weed species;
- for areas recently subjected to assisted regeneration works, site inspections should occur every quarter for the first two years and then triennially afterwards;
- for remnant vegetation site inspections should occur annually;

- development and implementation of a control plan applicable to the circumstances, which may include manual removal, spot spraying, boom spraying, aerial spraying or biological control. These will be undertaken in target areas identified during site inspections and prioritise:
  - treatment of entire infestations where possible;
  - re-treatment of recurring infestations at regular intervals;
  - annual monitoring of key weed infestations;
  - annual monitoring for new infestations; and
  - mapping of key weed infestations following monitoring to track progress and focus control activities where necessary;
- prompt rehabilitation of land post disturbance; and
- early establishment and maintenance of native species.

Vehicle movements have been identified as having particular potential to spread invasive weed species for which LCO implement the vehicle hygiene practices to manage. Vehicle hygiene practices include avoidance of vehicles or equipment trafficking on any vegetation. Where avoidance is not possible, the vegetation, works and potential for spread of weeds are assessed and appropriate controls, such as vehicle wash down, are implemented.

As part of ongoing task coordination, LCO will ensure that machinery movements throughout the BOAs do not prove a major source of weed spread or infestation. This issue will be considered as part of the existing ground disturbance permit and risk assessment processes and will ensure that this issue is regularly raised with staff.

In recognition of key species with particular potential to impact LCO and Greater Ravensworth sites, a number of strategies have been developed to target these undesired species including the Coolatai and African Lovegrass Strategy and Rhodes Grass Management Strategy.

If a substantial increase in the density of any known weed species or the occurrence of a previously unrecorded weed species is discovered, LCO will seek advice (from specialist consultants such as ecologists, agronomists, local land services etc. as appropriate) on the management and control options for that species and endeavour to minimise its impact on native flora and fauna. Where broad scale weed control has occurred, suitable native or pasture species will be sown to prevent weed regrowth.

Table 2-6 outlines the performance and completion criteria established for managing weeds across the LCO BOAs.

Table 2-6 - Weed Management Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All BOA's	Complete weed inspections of every two months to document diversity and abundance	Inspections completed every two months, followed by implementation of required	Inspections completed every two months, followed by implementation of required	Inspections completed every two months, followed by implementation of required	Weed densities in rehabilitation/regeneration areas are no worse than those in remnant vegetation (analogue) sites.

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
	of noxious weed records.	control methods, as required.	control methods, as required.	control methods, as required.	There are no significant weed infestations that are identified as a risk to rehabilitation or regeneration areas. Regular inspections are undertaken for weed species inspections and outcomes are documented.

2.8 Revegetation Activities

A major focus of the BOMP is to return grasslands and disturbed lands (excluding necessary access roads) to woodland vegetation. The broad objective is the establishment of local native communities that are self-sustaining over the long term.

Three types of revegetation activities are used in the BOAs to achieve the objectives:

1. Natural regeneration
2. Assisted regeneration
3. Rehabilitation

The revegetation strategy used for each area is determined by the current condition and regenerative capacity of the areas to be returned to their benchmark communities. More disturbed areas require greater intervention. Each BOA uses a combination of at least two revegetation activities.

These works will serve to improve the current vegetated connectivity across each site, as well as to adjoining remnant vegetation in the local area. These works will also serve to increase existing fauna habitat in the area, with particular focus on the spotted-tailed quoll, however also providing increased habitat for a number of other threatened species as a result of increasing the amount of eucalypt-dominated woodlands.

A series of completion criteria have been developed for revegetation areas based on LCO monitoring data for remnant sites, which has been used as the revegetation benchmark. The local data provides a realistic expectation for recovered vegetation areas in the local area, in comparison to BioNet Vegetation Classification Plant Community Type (PCT) data (OEH 2018). The remnant monitoring dataset was collected over several years including different climate variations and will ensure that the revegetated areas reflect the biodiversity values of their remnant counterparts. The completion criteria are provided in ***Table 2-7.***

The criteria generally follow the categories provided for the current BioNet Vegetation Classification Benchmarks. Areas which have been rehabilitated should aim to be within 50 percent compatibility of their relevant PCT benchmarks. PCT Benchmark vegetation is determined to be 100 percent representative of the relevant community types. The BOAs are scored using the BAM methodology in **Section 3.3.2**. The nominal 50 percent compatibility is subject to revision succeeding the implementation of BAM monitoring methodology. Areas which are revegetated and regenerated should consider PCT benchmarks as well as the use of more appropriate local data (MALD).

Table 2-7 - PCT Completion Criteria for Revegetated Areas

Item	Values [1]		
	PCT 3431	PCT 3315	PCT 4081
Benchmark Data			
Native Tree Richness[1]	5	5	4
Native Shrub Richness[1]	12	8	10
Grass and Grass-like Richness[1]	11	12	8
Forb Richness[1]	11	14	10
Fern Richness[1]	2	2	3
Other Richness[1]	5	4	4
Tree Cover (PFC)[1]	55	52	39
Shrub Cover (PFC)[1]	34	15	10
Grass and Grass-like	66	59	35

Item	Values [1]		
	PCT 3431	**PCT 3315**	**PCT 4081**
Cover (PFC) [1]			
Forb Cover (PFC)[1]	8	9	6
Fern Cover (PFC)[1]	1	1	1
Other Cover (PFC)[1]	4	4	1
Total Length Fallen Logs[1]	45	40	36
Litter Cover[1]	65	40	24
MALD			
Native Flora Species Richness[2]	8 to 35	7 to 39	9 to 25
Introduced Species Richness[2]	5 to 26	3 to 19	11 to 31
Native Overstorey (% Cover) [2]	7.7 to 25	4.5 to 22	7 to 38.5

Item	Values [1]		
	PCT 3431	**PCT 3315**	**PCT 4081**
Native Mid Storey (>1m to <overstorey) (%)[2]	0 to 13	0 to 12	0 to 1
Native Grass Cover (%)[2]	2 to 68	16 to 66	0 to 66
Native Shrub Cover (%)[2]	0 to 6	0 to 12	0 to 2
Native Other Cover (%)[2]	2 to 22	10 to 36	0 to 10
Exotic Plant Cover (%)[2]	0 to 86	0 to 52	70 to 88
Bare Ground/Rock (%)[2]	1 to 86	5 to 24	0 to 12
Percentage of overstorey regenerating[2]	100	100%	1 to 100
Number of hollow	0 to 7	0 to 2	2 to 4

Item	Values [1]				
	PCT 3431			PCT 3315	PCT 4081
-bearing trees[2]					
For All Areas					
	PCT 3431			PCT 3315	PCT 4081
	Central Hunter Box Ironbark Woodland	**Central Hunter Box Ironbark Woodland - Transitional**	**Central Hunter Box Ironbark Woodland - Depressions**		
Vegetation Composition	A minimum of 10 of the 38 characteristic flora species contained in the Central Hunter Grey Box – Ironbark Woodland Final Determination (NSW Scientific Committee 2010a) is present in a standard 20 m x 20 m floristic sampling plot.			A minimum of 11 of 44 characteristic flora species contained in the Central Hunter Ironbark – Spotted Gum – Grey Box Forest Final Determination (NSW Scientific Committee 2010b) is present in a standard 20 m x 20 m floristic	

Item	Values [1]				
	PCT 3431			PCT 3315	PCT 4081
				sampling plot.	
Vegetation Structure	Within a standard 20 m x 20 m floristic sampling plot tree (TG) foliage cover is between 10% and 70% AND grass (GG) and forb (FG) growth forms are present.				
Self-sustainability (Litter)	Litter cover is between the 10th and 90th percentile of values from suitable reference sites1, or an ongoing trend toward this target range is observed.				
Self-sustainability (Recruitment)	The number of second generation trees are ≥10th percentile of values recorded at suitable reference sites4.				
Self-sustainability (Weeds/Plant Competition)	Cover of 'high threat exotic' (HTE) species is ≤ 90th percentile of values observed at suitable reference sites4.				
Indicative* Species present in canopy[3]	Narrow-leaved ironbark (*Eucalyptus crebra*) and/or grey box (*Eucalyptus*	Narrow-leaved ironbark (*Eucalyptus crebra*) and/or grey	A mix of grey box (*Eucalyptus moluccana*), forest red gum (*Eucalyptus tereticornis*) and rough-barked apple (*Angophora floribunda*)	Spotted gum (*Corymbia maculata*) and/or narrow-leaved ironbark (*Eucalyptus crebra*)	Predominantly river oak (*Casuarina cunninghamiana* fringing the creekline),

Item	Values [1]					
	PCT 3431				PCT 3315	PCT 4081
	moluccana) and/or	box (*Eucalyptus moluccana*) and/or rough – barked apple (*Angophora floribunda*)				
Less dominant canopy species present	Kurrajong (*Brachychiton populneus*)		Forest red gum (*Eucalyptus tereticornis*)	Lesser extent of narrow-leaved ironbark (*Eucalyptus crebra*) on upper slopes	-	Rough-barked apple (*Angophora floribunda*) and forest red gum (*Eucalyptus tereticornis*) throughout transitioning to a dominant occurrence on the wider floodplains
Indicative* species present in	Bulloak (*Allocasuarina luehm*	Sparse occurrence of thos	Sparse occurrence of those specified for Central Hunter Box Ironbark Woodland		Coffee bush (*Breynia oblongifolia*) Violet nightshade	Creeping saltbush (*Atriplex semibaccata*)

Item	Values [1]					
	PCT 3431				PCT 3315	PCT 4081
midstorey[3]	*annii*), blackthorn (*Bursaria spinosa*), mock olive (*Notelaea microcarpa*), *Dodonaea viscosa*, *Acacia* falcata, *Acacia implexa*, *Acacia amblygona*	e specified for Central Hunter Box Ironbark Woodland			(*Solanum brownii*)	
Indicative* species present in groundcover[3]	Rock fern (*Cheilanthes sieberi*) *Lomandra filiformis* Speargrass (*Austrostipa scabra*) Barbed wire grass (*Cymbopogon refractus*) Blue trumpet (*Brunoniella australis*) Yellow-burr daisy (*Calotis lappulacea*)		Rock fern (*Cheilanthes sieberi*) *Lomandra filiformis* Spear grass (*Austrostipa scabra*) Barbed wire grass	Weeping grass (*Microlaena stipoides)* Slender bamboo grass (*Austrostipa verticillata*)	Barbed wire grass (*Cymbopogon refractus*) Weeping grass (*Microlaena stipoides*) Kangaroo grass (*Themeda triandra*) Rock fern (Cheilanthes sieberi) Basket grass	Slender bamboo grass (*Austrostipa verticillata*) Weeping grass (*Microlaena stipoides*) Stinging nettle (*Urtica incisa*) Swamp dock (*Rumex brownii*) Slender rats tail grass

Item	Values [1]				
	PCT 3431			PCT 3315	PCT 4081
	Kidney weed (*Dichondra repens*) Amulla (*Eremophila debilis*)	(*Cymbopogon refractus*) Yellow-burr daisy (*Calotis lappulacea*) Kidney weed (*Dichondra repens*) Amulla (*Eremophila debilis*)	Rock fern (*Cheilanthes sieberi*) Speargrass (*Austrostipa scabra*) Climbing saltbush (*Einadia nutans*) Kidney weed (*Dichondra repens*) Slender rats tail grass (*Sporobolus creber*)	(*Oplismenus aemulus*) Whiteroot (*Pratia purpurascens*) Blue trumpet (*Brunoniella australis*) Many-flowered mat-rush (*Lomandra multiflora*)	(*Sporobolus creber*)
Soil stability	The soil is stable with no significant erosion concerns.				

Item	Values [1]		
	PCT 3431	**PCT 3315**	**PCT 4081**
Tree Health	More than 75 % of trees are healthy and growing as indicated by long term monitoring		
Native fauna presence	Rehabilitation monitoring confirms target native fauna species are recorded utilising habitats.		
Woodland Establishment	Survey confirms that 266.14 ha of woodland has been established		

Notes to Table:

PCT 3431- Central Hunter Ironbark Grassy Woodland

PCT 3315 – Central Hunter Ironbark - Spotted Gum Forest

PCT 4081 – Northwest River Oak – River Red Gum Forest

[1] Ranges determined using benchmarks from VIS PCTs for an average rainfall year (as at July 2023)

[2] Whether completion criteria are met to be determined using plot-based data BAM data

[3] Whether completion criteria are met to be determined over a larger area than a 20 m by 20 m plot

* Species were considered indicators if they are provided by either the BioNet Vegetation Classification Database or the NSW Scientific Committee Final Determination (2010) and have been identified in LCO reference sites and/or known to occur in the Liddell locality.

The above PCT completion criteria can be refined after the completion of this three year BOMP term to reflect ongoing monitoring data as required.

As interim performance criteria, monitoring undertaken at regeneration / revegetation / rehabilitation areas should be showing data trending towards the range of attributes of remnant reference sites.

Rehabilitation activities in Bowmans Creek Riparian Corridor will target the establishment of a riparian strip that is predominantly consistent with ***Figure 1-7***.

2.8.1 Natural Regeneration

Natural regeneration will be used in some areas of the Mitchell Hills South and Mountain Block BOAs in order to return existing grassland and disturbed areas to their benchmark communities. This will relate to approximately 14.4 ha within Mitchell Hills South and 102.2 ha within Mountain Block.

The key actions proposed to facilitate natural regeneration are:

- weed control and pest management (more intensive management may be required in assisted natural regeneration areas until a stable and resilient ecosystem is established); and
- removal of all stock grazing activities.

The current grassland areas within the BOAs have a high natural recovery potential and therefore assisted regeneration will be facilitated only where natural regeneration is deemed (through monitoring) to require assistance.

Areas of grassland and disturbance will be managed back to woodland consistent with the surrounding vegetation. ***Table 2-8*** provides the anticipated outcomes of the regeneration activities in these BOAs.

Table 2-8 - Target Passive Regeneration Communities

Vegetation Community	BC Act	EPBC Act	Mountain Block (ha)	Mitchell Hills South (ha)
Narrow-leaved Ironbark Spotted Gum Woodland	EEC	Possibly CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+42.55	0
Narrow-leaved Ironbark – Bulloak Open Forest	EEC	Some components will possibly comprise CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+59.61	0
Narrow-leaved Ironbark Spotted Gum Woodland DNG	-	Some components will comprise CEEC - Central Hunter Valley Eucalypt Forest and Woodland	-37.57	0
Narrow-leaved Ironbark – Bulloak Open Forest DNG	-	Some components will possibly comprise CEEC - Central Hunter Valley Eucalypt Forest and Woodland	-56.87	0
Rusty Fig Dry Rainforest/Grey Myrtle – Kangaroo Vine Dry Rainforest	-	-	-0.98	0
Disturbed Land	-	-	-6.76	0
Spotted Gum Forest	-	-	0	+14.36
Derived Grassland	-	-	0	-9.78
Exotic Grassland	-	-	0	-0.73
Regrowth	-	-	0	-3.89

Note: All values have been rounded up to the nearest two decimal places. All values subject to minor mapping/GIS-based variation.

The existing mapping of the current extent of grassland and disturbed areas targeted for regeneration has been refined to assist in tracking the progress of the regeneration and to confirm the proposed target benchmark communities are appropriate and achievable.

If monitoring results reveal that these actions alone are not resulting in the performance indicators and completion criteria being met (or trending towards being met), corrective actions will be imposed and implemented. Corrective actions are likely to involve assisted regeneration strategies as described in the following section.

Table 2-9 outlines the performance and completion criteria for natural regeneration across the LCO BOAs.

Table 2-9 - Natural Regeneration Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Mountain Block and Mitchell Hills South	Mapping of areas naturally regenerating and subject to revegetation works to track if natural/assisted regeneration is on track to meet final hectare goals.	Revised in ongoing monitoring works, as needed.	Revised in ongoing monitoring works, as needed.	Revised in ongoing monitoring works, as needed.	Accurate mapping of regeneration areas.
Mountain Block and Mitchell Hills South	Management of regeneration progress is responsive to monitoring outcomes.	Monitoring of regeneration areas.	Monitoring of regeneration areas.	Monitoring of regeneration areas.	Monitoring results are used to inform ongoing regeneration planning, including implementation of assisted regeneration if natural regeneration is not progressing sufficiently.

2.8.2 Assisted Regeneration

Where resilience is depleted or absent, assisted regeneration methods will be employed, in addition to natural regeneration, to facilitate the return of woodland communities to the grassland and disturbed areas. The need for assisted regeneration is assessed minimum three yearly from the commencement of the BOMP implementation, drawing on results from monitoring and inspections.

Assisted regeneration methods to supplement species diversity in strata that are lacking biodiversity value may include:

- introducing tree, shrub and groundcover species by
- tubestock planting
- brush matting or
- direct seeding.
- thinning of excessively dense pioneer species such as Acacia sp. to allow a greater diversity of species to colonise

The selection of plant species used in the assisted regeneration strategy is vital to the process of creating a vegetation community that is consistent both structurally and floristically with the target benchmark communities. Selection of plant species used in revegetation activities should draw on the floristic results of monitoring in reference sites, in consultation with a qualified and experienced consultant.

Table 2-10 outlines the performance and completion criteria for managing assisted regeneration across the Mountain Block and Mitchell Hills South BOAs.

A list of recommended species for planting is provided in ***Appendix A***.

Table 2-10 - Assisted Regeneration Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Mountain Block and Mitchell Hills South	Review need for assisted regeneration where outcomes of natural regeneration is deemed lacking.	Assess progress/outcomes of natural regeneration and assess and implement assisted regeneration measures as required.	Assess progress/outcomes of natural regeneration and assess and implement assisted regeneration measures as required.	Assess progress/outcomes of natural regeneration and assess and implement assisted regeneration measures as required.	Assisted regeneration is implemented if natural regeneration is deemed lacking.

2.8.3 Rehabilitation Works

Due to its current high levels of weeds and other forms of disturbance, the Bowmans Creek Riparian Corridor and disturbed areas in the north of Mountain Block will require higher levels of effort to return target vegetation communities.

Rehabilitation activities in Bowmans Creek Riparian Corridor will target the establishment of a riparian strip that is predominantly consistent with ***Figure 1-7.***

Due to the various previous land uses of this area and their associated land management requirements, the Bowmans Creek Riparian Corridor is split into three management zones (see ***Figure 1-7***).

Rehabilitation works in all of the management zones for this corridor have been planned in detail, and are updated based on on-going monitoring results. The rehabilitation works have occurred in Bowmans Creek BOA since 2017. The works will also assist in preventing bank erosion along Bowmans Creek.

Rehabilitation works include a combination of:

- earthworks,
- weed control and
- tree plantings adjacent to the creek line
- stabilisation.

The details of the required works will be developed in consideration of the following principles:

- all planting or seeding within rehabilitation areas will be designed with structural and floristic diversity suitable to meet the benchmark vegetation community targets;
- where practicable, rehabilitation will involve the use of local provenance seed that will either be utilised for direct seeding or for the propagation of tubestock for planting;
- rehabilitation areas will be subject to a formal care and maintenance program that will be developed to include the control of weeds, replacement of failed plantings, bushfire management etc;

- rehabilitation areas will be subject to formal monitoring program (success/failure, as well as floristic monitoring) that will be developed to include a feedback loop to achieve continual improvement in the methodology and results.

Table 2-11 shows the rehabilitation targets for the Bowmans Creek Riparian Corridor. These are depicted in ***Figure 1-7*** also. The program is continually reviewed with the aim of achieving an effective, sustainable rehabilitation outcome. During 2023 a thorough review of revegetation works carried out to date was undertaken with monitoring showing revegetation establishment success being relatively low and few areas trending towards the targeted outcomes despite effort and expenditure. Various factors were assessed including ground preparation, planting methodology, climatic impacts, weed competition, possible unfavourable substrates and post establishment maintenance. Along with improvements to ground preparation and maintenance methodologies it was determined that based on analysis of landscape features such as soil and position in the landscape, combined with the ongoing threat of exotic weed cover persisting on high nutrient alluvium, the extent of area suitable for Central Hunter Box-Ironbark Woodland (CHBIW) revegetation was less than originally proposed in the BOMP (139.31ha). As such, a recommended reduction of 17.9ha of CHBIW target, replaced by 17.9ha of Hunter Valley River Oak Forest revegetation has been adopted. Whilst not directly related to the implementation of the BOMP, it should be noted with regards to addressing the deficit of CHBIW to meet minimum of 731ha across site (DA305-11-01 Schedule 3 Condition 37 and EPBC 2013/6908 Condition 5), an additional 17.9ha will be added to the footprint of mine rehabilitation planned to be returned to CHBIW under the Rehabilitation Management Plan.

Future reviews may refine these targets further as an outcome of the monitoring program..

Table 2-11 - Bowmans Creek Riparian Corridor Rehabilitation Targets

Vegetation Community	BC Act	EPBC Act	Bowmans Creek Riparian Corridor (ha)
Central Hunter Box – Ironbark Woodland – Rehabilitation	EEC	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+58.71
Central Hunter Box – Ironbark Woodland – Revegetation	EEC	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+29.90
Central Hunter Box – Ironbark Woodland – Transitional Revegetation	EEC	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+27.90
Central Hunter Box – Ironbark Woodland – Depressions Revegetation	EEC	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+4.89
Narrow-leaved Ironbark Spotted Gum Woodland	EEC	CEEC - Central Hunter Valley Eucalypt Forest and Woodland	+9.76
Hunter Valley River Oak Forest	-	-	+18.46

Note: All values have been rounded up to the nearest two decimal places. All values subject to minor mapping/GIS-based variation.

Within each target vegetation community, the density of plantings will be varied to create a variegated landscape to increase the value of rehabilitation for local fauna species. The range of densities for each vegetation community will remain within the documented natural variation levels of each vegetation community.

As per ***Section 1.13***, an area within the Mountain Block BOA was rehabilitated in 2020 where the offset area interfaced with mining rehabilitation.

Areas subject to rehabilitation or assisted regeneration will be monitored on an annual basis. This monitoring will occur where seeding and/or planting occurs and will focus on the initial germination and establishment of seedlings, particularly in terms of survival, species diversity and abundance. This annual monitoring will also assess rehabilitation/active regeneration areas to identify early signs of other issues requiring management (such as weeds, pests and erosion). Further detail is provided in ***Section 3.2.2.***

Table 2-12 outlines the performance and completion criteria for managing rehabilitation that is specific to the Bowmans Creek Riparian Corridor and Mountain Block BOAs. Detailed completion criteria for rehabilitation areas are provided within the ***Rehabilitation Management Plan*** (RMP) (*LIDOC-90533967-6178).*

Table 2-12 - Rehabilitation Works Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Bowmans Creek Riparian Corridor Mountain Block Offset Area	Develop detailed performance criteria for all management zone types.	Refine criteria developed based on annual monitoring of analogue sites if necessary.	Refine criteria developed based on annual monitoring of analogue sites if necessary.	Refine criteria developed based on annual monitoring of analogue sites if necessary.	Criteria developed (Table 2-8)
Bowmans Creek Riparian Corridor Mountain Block Offset Area	Implement rehabilitation/ revegetation program.	Implementation of plan.	Implementation of plan.	Implementation of plan.	Rehabilitation and revegetation plan implemented.
Bowmans Creek Riparian Corridor	Positive feedback loop from monitoring results.	Feedback from monitoring is incorporated into ongoing review and improvement of plan.	Feedback from monitoring is incorporated into ongoing review and improvement of plan.	Feedback from monitoring is incorporated into ongoing review and improvement of plan.	Monitoring outcomes considered in continual review and improvement of plan.

2.9 Habitat Augmentation

Habitat enhancement works will be completed in order to increase habitat complexity for threatened fauna species, particularly the spotted-tailed quoll.

Activities include:

- installation of nest boxes
- habitat feature salvage
- spotted-tailed quoll habitat enhancement

The habitat augmentation activities have their own completion criteria.

These works are primarily within Bowmans Creek Corridor as this area has reduced habitat value, as a result of its previous land uses and proximity to mining activities.

The condition and habitat value of Mountain Block and Mitchell Hills South Offset Areas are much higher as these areas have been subject to much less disturbance and contain better quality and more diverse vegetation communities. These latter areas will be subject to habitat enhancement works if monitoring identifies a dearth of key habitat features.

Habitat augmentation will be undertaken within the rehabilitation and regeneration areas (once of appropriate age), and within any areas of existing vegetation deemed lacking in critical habitat features. The aim of augmenting habitat within these areas is to increase the specific habitat features required by target threatened species and their prey (as necessary), thereby improving the quality of the habitat so it is able to support greater numbers of those species.

Specific habitat features are those that can be a limiting factor to population thresholds, and can include hollows, log/boulder piles, complex ground strata and specific foraging resources. Such features will be installed relative to the density within the remnant woodland areas. It is noted that the known spotted-tailed quoll breeding den located along Bowmans Creek is within one such constructed timber pile.

Native vegetation communities generated through revegetation activities are also likely to provide suitable habitat once of a suitable age.

2.9.1 Nest Boxes

Hollow-bearing trees are critical to the survival of several threatened species known to occur in the LCO area. The availability of suitable hollows within a landscape is a recognised limiting factor to the survival of hollow-dependent species. In particular, the loss of suitable hollows is a major factor contributing to the listing of many threatened species under the State and Commonwealth threatened species legislation.

To address the loss of hollows from onsite clearing activities, the following will be undertaken:

- accurate recording of hollows lost (including size ranges) during the pre-clearing process;
- staged mitigation of hollow loss by placing nest boxes (with characteristics informed by the pre-clearance process)in secure vegetation of the surrounding BOAs; and
- placement of nest boxes within the regeneration and rehabilitation sections of the BOAs.

It is noted that clearing activities within the pit footprint were completed in 2020. Any further clearing activities will be as a result of maintenance or rehabilitation activities which are expected to be minor.

Nest boxes will be placed into rehabilitation and regeneration areas once they reach suitable maturity and where natural hollow or nesting structures are deemed lacking. Alternatively, nest boxes can be fixed to poles to expedite the return of hollow-dependent species to these areas. A range of hollow sizes and classes will be provided, thus increasing the quality of habitat for target threatened species. The number and types of nest boxes to be established in the BOAs will be determined through monitoring and comparison to benchmark communities. Each tree hollow suitable for use by fauna species that is removed for mining will be replaced with a nest box in rehabilitation areas. Nest boxes will be regularly monitored and maintained to monitor usage by hollow-dependent species and their condition.

The timing of the nest box installation works will be progressive, based on staged clearing works within the approved modification area. This staged approach will safeguard the nest box program as being informed by the pre-clearing process, ensuring comparable number and sizes of nest boxes are installed in the BOAs and rehabilitation areas. Replacement of hollows lost (with nest boxes) will occur within six months of each discrete clearing event, to ensure that seasonal breeding opportunities are not lost.

2.9.2 Habitat Feature Salvage

The salvage and relocation of hollow logs, fallen timber and boulders will be undertaken to augment habitat complexity.

Habitat features such as boulders, hollow logs and hollow-bearing trees will be identified during pre-clearing surveys, and salvaged as part of the clearing process, where suitable and feasible to do so. Salvaged features will then be stockpiled for use in regeneration/rehabilitated areas to increase habitat value and complexity, thus making them more suitable for native fauna colonisation (particularly that of threatened species).

Habitat augmentation will focus on the provision of specific habitat features for key threatened species which require specific habitat features (other than tree hollows) to provide adequate foraging, roosting or breeding habitat. Examples of specific habitat features include, but are not limited to:

- hollow logs, fallen timber and boulders to provide shelter and foraging habitat which may be used by the spotted-tailed quoll for denning and latrines; and
- fallen timber and stumps to provide perch sites which may be used by the hooded robin (Melanodryas cucullata cucullata) and brown treecreeper (Climacteris picumnus victoriae).

When habitat features are being relocated, care should be taken not to damage the native vegetation at the location it is being relocated to.

The salvage process will be an ongoing one (as with nest box installation), as it relies on the progress of the clearing within the approved modification area. In a similar manner, the deployment of stockpiled habitat features will be dependent on the progress of rehabilitation/regeneration works. This will be completed progressively, once rehabilitation/regeneration works are completed within discrete areas.

2.9.3 Spotted-tailed Quoll Habitat Enhancement

Given the known presence of a spotted-tailed quoll population, the following habitat enhancement measures will be undertaken that are specific to assisting the persistence of this species in the Bowmans Creek Riparian Corridor, and broader local area:

- salvage of hollow-bearing trees (and non-hollow bearing trees if sufficient resources are lacking), hollow logs and stumps felled during construction works and placement as log piles within areas

of regeneration and rehabilitation (particularly along drainage lines). This will increase the amount of potential foraging and denning habitat for this species throughout the BOAs. It is notable that the current breeding den is located in such a log pile;

- salvage and placement of large rocks and boulders into piles as further potential denning habitat; and
- installation of antechinus nest boxes within the Bowmans Creek Riparian Corridor to support prey for spotted-tailed quolls populations.

2.9.4 Completion Criteria

Table 2-13 outlines the performance and completion criteria for managing habitat augmentation across the LCO BOAs.

Table 2-13 - Habitat Augmentation Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Bowmans Creek Riparian Corridor, Mitchell Hills and Mountain Block	Nest boxes present to improve habitat value for native fauna.	Established nest boxes are subject to regular monitoring as identified in Section 3.6.8 and maintenance.	Established nest boxes are subject to regular monitoring as identified in Section 3.6.8 and maintenance.	Established nest boxes are subject to regular monitoring as identified in Section 3.6.8 and maintenance.	Nest boxes are monitored and maintained.
All biodiversity offset areas	Habitat and hollow augmentation will occur in Mountain Block and Mitchell Hills South offset areas if monitoring identifies a dearth of key habitat features such as log piles or boulder piles.	Habitat augmentation, if required.	Habitat augmentation, if required.	Habitat augmentation, if required.	All biodiversity offset areas have suitable levels of key habitat features, when compared (through monitoring) to remnant vegetation features.

2.10 Translocation Works

The only threatened flora species recorded within the Approved Modification Area is the tiger orchid (*Cymbidium canaliculatum*). This species is listed as an endangered population in the Hunter catchment. A single tiger orchid has been recorded within the Approved Modification Area. This individual has been translocated into the secure Mountain Block BOA. Any other tiger orchids

identified during the pre-clearing process are also translocated into secure BOAs in accordance with the LCO Salvage and Translocation Procedure.

The detailed salvage and translocation procedure has been developed from similar works occurring for this species elsewhere in the Hunter Valley, and from continued feedback and improvement recommendations. It has also considered the procedures and recommendations within Guidelines for the Translocation of Threatened Plants in Australia (Vallee et at., 2004). This is provided in detail within the BMP (LCO 2017), including selection criteria for the recipient site, the salvage and translocation process and monitoring requirements for translocated individuals. As such, the BMP should be referred to for detail in all related tasks.

No other threatened flora species are anticipated to occur at LCO, however in the event that they are identified during the pre-clearing procedure, LCO will liaise with suitably qualified personnel regarding appropriate strategies for their salvage/translocation or propagation.

It is noted that clearing activities within the pit footprint were completed in 2020. Any further clearing activities will be as a result of maintenance or rehabilitation activities which are expected to be minor. ***Table 2-14*** outlines the performance and completion criteria for managing translocation of tiger orchids or other threatened species across the LCO BOAs.

Table 2-14 - Translocation Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Translocation of tiger orchids or other threatened flora species (if encountered during pre-clearing process) to biodiversity offset areas. Methods to be adopted are detailed within the Biodiversity Management Plan.	Tiger orchids are salvaged and translocated according to the process in the BMP as needed.	Tiger orchids are salvaged and translocated according to the process in the BMP as needed.	Tiger orchids are salvaged and translocated according to the process in the BMP as needed.	Tiger orchids (or other threatened flora species if encountered) are salvaged and translocated into biodiversity offset areas in accordance with the Biodiversity Management Plan.

2.11 Creek and Drainage Line Protection

Creek line protection and rehabilitation works will be undertaken within the Bowmans Creek Riparian Corridor. Works that will be undertaken within the Bowmans Creek Riparian Corridor will include:

- fencing to prevent access by humans and livestock;

- rehabilitation and revegetation works;
- bank stabilisation works on the LCO side of the creek as required (noting that parts of the eastern side of the creek are under private ownership);
- bushfire management; and
- regular monitoring for biodiversity management and erosion issues attributable to anthropogenic activity.

Each of these actions will ensure that the biodiversity and environmental values (including water quality) are protected and enhanced.

Drainage values will be protected by way of regular inspections for erosion and will identify areas requiring reparation works. Reparation works should include, but not necessarily be limited to native vegetation plantings. Any remediation of areas of erosion should be subject to follow-up monitoring inspections as well as follow-up remediation as necessary.

Table 2-15 outlines the performance and completion criteria for managing creek and drainage line protection across the Bowmans Creek Riparian Corridor BOA.

Table 2-15 - Creek and Drainage Line Protection Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 10	Year 12	
Bowmans Creek Riparian Corridor	Rehabilitation works to address stabilisation and erosion issues, as necessary.	Implementation, as needed.	Implementation, as needed.	Implementation, as needed.	Creek bank is stable and erosion issues are addressed.

2.12 Seed Collection

A seed collection and handling program aimed at maximising the viability and diversity of local seed in the revegetation mix will be implemented as part of the rehabilitation and regeneration program. Where able, revegetation will involve the use of local provenance seed that will either be utilised for direct seeding or for the propagation of tubestock for planting. However, where adverse seasonal conditions (i.e. drought) or other factors may affect the availability of local provenance seed (such as lack of remnant vegetation as a seed source), supplementation with non-local provenance seed may be required.

The existing woodland vegetation of the LCO BOAs will provide a valuable source of native seed. If assisted revegetation activities are required, this seed resource will be utilised where practical and without causing damage the vegetation of these biodiversity offset areas.

Seeds will be harvested by suitably qualified personnel and stored in accordance with the FloraBank (2013) guidelines. These include recommended practices for native seed collection, drying, extraction, leaning and storing native seed in order to maximise its longevity and viability for revegetation practices. Record keeping should include (as per FloraBank Guideline 4) as a minimum:

- identification;

- collection date;
- collector;
- species;
- collection voucher;
- plants sampled;
- population origins;
- site name;
- location name; and
- map reference/coordinates.

Table 2-16 outlines the performance and completion criteria for managing seed collection across the LCO BOAs.

Table 2-16 - Seed Collection Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Where suitable remnant vegetation is available, implementation of seed collection and handling program for use in revegetation /rehabilitation works.	Monitoring identifies potential seed sources. Seeds are collected, stored and handled according to appropriate program. Collected seed resources are used in revegetation/ rehabilitation works.	Monitoring identifies potential seed sources. Seeds are collected, stored and handled according to appropriate program. Collected seed resources are used in revegetation/ rehabilitation works.	Monitoring identifies potential seed sources. Seeds are collected, stored and handled according to appropriate program. Collected seed resources are used in revegetation/ rehabilitation works.	Rehabilitation /revegetation works use seeds collected onsite, thus maintaining as much genetic similarity (local provenance) as possible.

2.13 Erosion, Sedimentation and Salinity

LCO completes erosion and sediment control works in the BOAs in accordance with the LCO Erosion and Sediment Control Plan (included with the LCO Water Management Plan). These works prevent loss of valuable topsoil and sedimentation of local waterways.

Owing to a high vegetation cover across most of the LCO BOAs, erosion is not currently a significant management issue. Inspections of any areas of erosion concerns are included in routine inspection surveys, targeting riparian areas and sites with limited vegetation cover.

If an area of significant erosion concern is identified, appropriate short term erosion and sediment controls will be implemented and longer term stabilisation actions such as vegetation establishment will be investigated.

Erosion issues identified to date are located in the gullies of southern paddocks of Mountain Block. Due to the presence/potential presence of artefacts in gullies, earthworks are not proposed, in their place a trial using hydromulch has been undertaken.

The rehabilitation/revegetation process has the potential to create erosion issues through the removal of ground covering vegetation and disturbing the soil profile. Minimising the area of exposed soil and ripping along contours will limit the amount of erosion in revegetation areas. All revegetation areas and watercourses will be monitored for evidence of erosion and corrective actions (e.g. remedial earthworks, groundcover planting, and soil amelioration) will be implemented where required.

Erosion and sediment mitigation will be put in place by LCO prior to any rehabilitation/revegetation works, construction activities (such as access tracks), as well as for any areas of identified erosion concern. Controls will be developed in accordance with relevant guidelines for erosion and sediment control, including:

- Managing Urban Stormwater: Soils and Construction (the Blue Book) Volume 1 (Landcom 2004); and
- Managing Urban Stormwater: Soils and Construction (the Blue Book) Volume 2E Mines and Quarries (Landcom 2008).

Measures put in place include, but are not necessarily be limited to:

- catch drains to capture run-off from disturbed areas and direct runoff into sediment dams;
- clean water diversion banks and drains;
- sediment dams; and
- silt fences, hay bales or other sediment control structures.

The following general erosion and sediment management measures are implemented:

- rehabilitated areas will be of appropriate slope and have appropriate drainage structures;
- disturbed areas will be stabilised by progressive rehabilitation as soon as practicable;
- construction of drainage controls such as table drains at roadsides will be undertaken;
- erosion and sediment controls that are not performing adequately will be repaired or redesigned.

The measures related to land rehabilitation are detailed further in the ***LCO Rehabilitation Management Plan***.

Salinity has not been identified as an issue of concern within the LCO BOAs to date. Given that these sites have high vegetation cover it is not likely to become a management issue. However, any evidence suggesting the land is affected by salinity should be documented and the appropriate management and remediation strategies implemented.

Table 2-17 outlines the performance and completion criteria for managing erosion, sedimentation and salinity across the Mountain Block BOA.

Table 2-17 - Erosion, Sedimentation and Salinity Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
Mountain Block	Control of erosion in southern paddocks	Utilise hydromulch or soft controls of eroded areas where able to .	Utilise hydromulch or soft controls where able to l.	Utilised hydromulch or soft controls where able to.	Eroded southern gullies were controlled by way of hydromulch or soft controls where able to .
Mountain Block	Monitor completed erosion works and action repairs if required.	Monitor completed erosion works and action repairs if required.	Monitor completed erosion works and action repairs if required.	Monitor completed erosion works and action repairs if required.	Erosion control works are stable and successful.

2.14 Bushfire Management

Bushfire management within the BOAs will be undertaken in accordance with the ***LCO Bushfire Management Plan*** (LIDOC-90533967-5406). Appropriate management of the LCO BOAs will ensure the protection of life and property while providing the necessary protection to the significant ecological features of the area. The Bushfire Management Plan contains details on:

- bushfire hazard assessment
- bushfire risk assessment
- bushfire risk management and
- an implementation plan.

Table 2-18 outlines the performance and completion criteria for bushfire management across the LCO BOAs.

Table 2-18 - Bushfire Management Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 10	Year 12	
All biodiversity offset areas	Bushfire Management Plan implementation	Implementation of requirements of Bushfire Management Plan.	Implementation of requirements of Bushfire Management Plan.	Implementation of requirements of Bushfire Management Plan.	Bushfire risk is managed according to an updated Bushfire Management

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 10	Year 12	
					Plan which allows for appropriate protection of life and property, as well as identified significant ecological features.

3. Offset Monitoring Program

3.1 Monitoring Objectives

In relation to the management of the LCO BOAs, the broad objectives of the ecological monitoring program are to:

- assess for compliance of remnant, rehabilitated and regenerating vegetation against preliminary and long-term performance indicators
- identify any potential loss of biodiversity values over the LCO BOAs
- document the ecological characteristics of remnant woodland vegetation in the BOAs to establish a baseline for developing accurate performance indicators and completion criteria for the regeneration/revegetation/rehabilitation of grassland and disturbed areas
- assess the recovery of grassland/disturbed areas
- assess the presence of threats such as significant populations of pest fauna species or weed infestations
- identify the need for additional or corrective management measures to achieve the performance indicators and completion criteria.

3.2 Monitoring Sites

3.2.1 Permanent Monitoring Sites

The sites provided in ***Table 3-1*** are proposed to continue to be monitored as permanent monitoring sites in the BOAs. ***Figure 3-1*** displays the locations of the existing monitoring sites within the BOAs. These sites will each be monitored at the frequencies and in the seasons identified in ***Table 3-1.*** It is intended that this monitoring will continue for the life of mine (being 2028) or until sites are deemed redundant. It is intended that the monitoring program is split over two years, with monitoring of half of the sites occurring in alternate years. Monitoring works will include, floristic monitoring (comprising

both BBAM (every year) and BAM monitoring (every alternate year)), photo monitoring, pathogen visual assessment, fauna monitoring, habitat assessment and landscape function analysis (LFA) monitoring.

Table 3-1 - Permanent Monitoring Sites

Biodiversity Offset Area	Site Name	Descriptor	Monitoring Type	Monitoring Frequency	Monitoring Season
Mountain Block	W04	Remnant[1] – Narrow-leaved Ironbark – Bulloak Open Forest	Flora (BBAM and BAM), General Fauna	Biennial – Year A	Spring/Summer
	W05	Remnant – Narrow-leaved Ironbark – Spotted Gum Woodland	Flora (BBAM and BAM), General Fauna	Biennial – Year B	Spring/Summer
	WR03	Regeneration – Narrow-leaved Ironbark – Bulloak Open Forest DNG	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year A	Spring/Summer
	WR04	Regeneration – Narrow-leaved Ironbark – Bulloak Open Forest DNG	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year B	Spring/Summer
	WR05	Regeneration – Narrow-leaved Ironbark – Spotted Gum Woodland DNG	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year A	Spring/Summer
Bowmans Creek Riparian Corridor	W06	Remnant - Narrow leaved Ironbark – Spotted Gum Woodland	Flora (BBAM and BAM), General Fauna	Biennial – Year B	Spring/Summer
	R02 (Existing site)	Remnant - Hunter Valley River Oak Forest	Flora (BBAM and BAM), General Fauna	Biennial – Year A	Spring/Summer
	W07	Remnant – Central Hunter Box – Ironbark Woodland	Flora (BBAM and BAM), General Fauna	Biennial – Year B	Spring/Summer

Biodiversity Offset Area	Site Name	Descriptor	Monitoring Type	Monitoring Frequency	Monitoring Season
	WR06	Revegetation – Central Hunter Box - Ironbark DNG	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year A	Spring/Summer
	WR07	Revegetation – Narrow leaved Ironbark – Spotted Gum Woodland DNG	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year B	Spring/Summer
	WR08	Rehabilitation – Introduced Grassland	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year A	Spring/Summer
	WR09	Rehabilitation – Introduced Grassland	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year B	Spring/Summer
Mitchell Hills South	W08	Remnant – Spotted Gum Forest	Flora (BBAM and BAM), General Fauna	Biennial – Year A	Spring/Summer
	W09	Remnant – Spotted Gum Forest	Flora (BBAM and BAM), General Fauna	Biennial – Year B	Spring/Summer
	WR10	Regeneration– Derived Grassland	Flora (BBAM and BAM), General Fauna, LFA	Biennial - Year A	Spring/Summer
	WR11	Regeneration – Regrowth	Flora (BBAM and BAM), General Fauna, LFA	Biennial – Year B	Spring/Summer
All	NA	Nest box locations – as installed	Nest Box Monitoring	Biennial[2] – Years A and B	Spring/Summer

[1] Remnant monitoring sites refer to analogue or control sites within existing vegetation used as the baseline floristics and condition with which we will compare the rehabilitation/regeneration sites against.

Please note also that these sites have been named in a manner such as that they may be monitored in tandem with monitoring sites specified within the BMP.

2 – Nest boxes are monitored on a biennial basis, with half of installed boxes monitored in Year A, and the other half monitored in Year B.

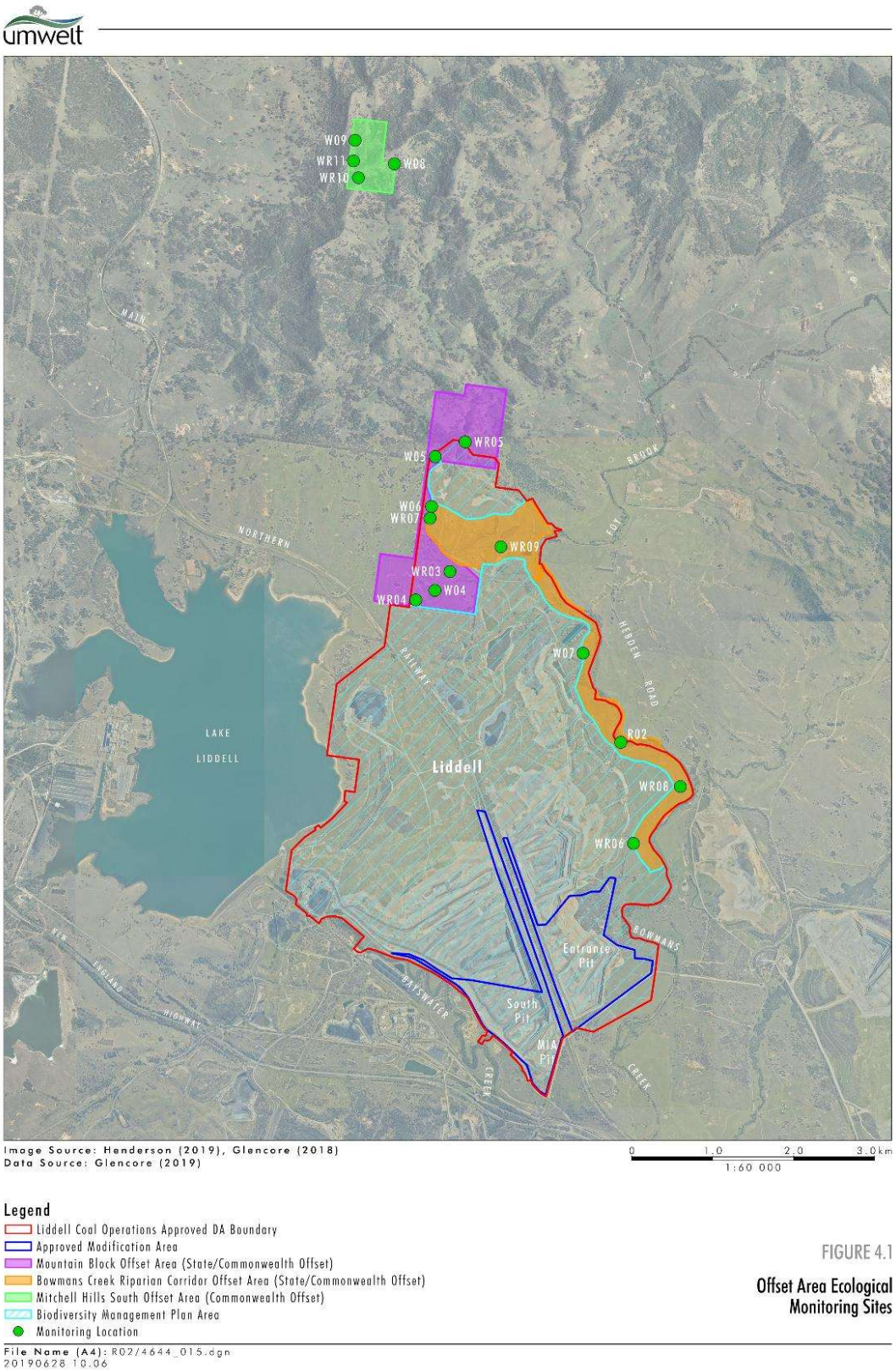

Figure 3-1 - Offset Area Ecological Monitoring Sites

3.2.2 Initial Establishment Monitoring (IEM) and Long Term Monitoring (LTM) Locations

Initial Establishment Monitoring (IEM) takes place annually in areas subject to BOA revegetation, active regeneration and rehabilitation, with a focus on the initial emergence and establishment of seedlings and tubestock. The purpose of this monitoring is to identify the range of key species establishing, presence of weed species and any other management issues that may hinder further development of the site such as erosion.

To ensure monitoring adequately captures revegetation performance at the various locations, the spatial distribution of IEM sites are reviewed when scoping the annual monitoring program. Results are summarised in the annual monitoring report to track trajectory performance and further revegetation activities required. ***Figure 3-2*** displays the current IEM and LTM monitoring locations at of 2025

Further IEM monitoring sites will be added into the program when new areas of rehabilitation or revegetation are undertaken.

These areas will be progressively converted to Long Term Monitoring (LTM) locations once the vegetation is more than three years established.

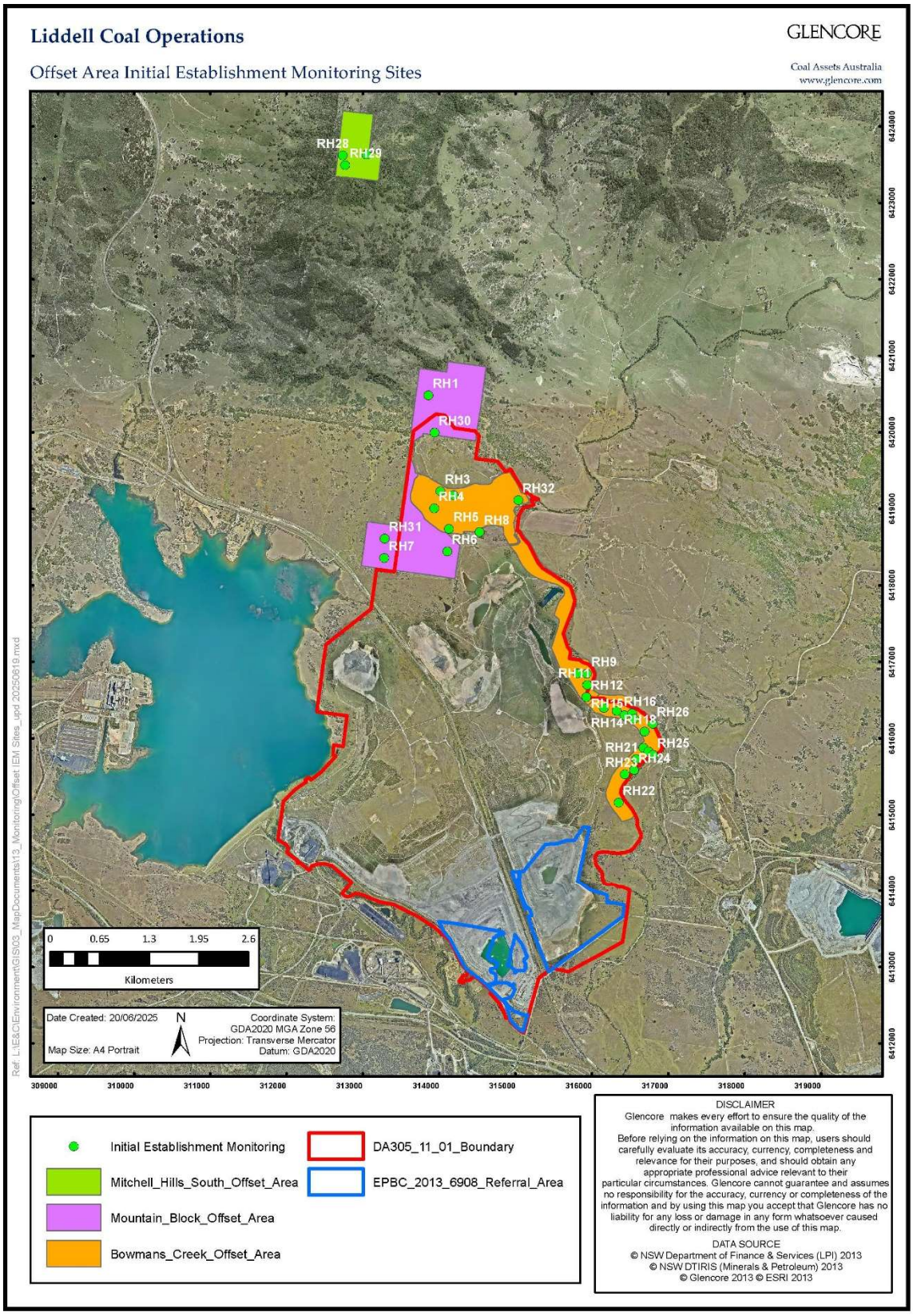

Figure 3-2 - Offset Area IEM Monitoring Sites

3.3 Flora Monitoring

Floristic monitoring will be undertaken at each of the permanent flora monitoring sites according to the frequency outlined in Table 3-1. This monitoring will be completed in a manner consistent with either the BioBanking Assessment Methodology (BBAM) (OEH 2014) or with the Biodiversity Assessment Methodology (BAM) (OEH 2017) as described in ***Sections 3.3.1 and 3.3.2***.

Data collected will be analysed to identify changes in floristic diversity and abundance over time. Analyses will also be completed to compare rehabilitation/regeneration sites to their suitable benchmark/analogue sites. This will assist in tracking the progression of rehabilitation/regeneration sites in relation to performance criteria.

3.3.1 BioBanking Assessment Methodology (BBAM)

For the BBAM plots, the following will be assessed

- 50 metre transect
- 50 metre by 20 metre plot with a
  - 20 metre by 20 metre sub-plot
- Floristic monitoring will include documentation of the following:
  - Along the 50 metre transect
  - Native overstorey percent foliage cover at 5 metre increments
  - Native mid storey percent foliage cover at 5 metre increments
  - Native shrub percent foliage cover at 1 metre increments
  - Native grass percent foliage cover at 1 metre increments
  - Native other percent foliage cover at 1 metre increments
  - Exotic percent foliage cover at 1 metre increments
  - Bare ground percent cover at 1 metre increments
- In the whole vegetation zone (50 metre by 20 metre area):
  - Hollow-bearing tree count
  - Log length count
  - Evidence of natural recruitment
- In the 20 metre by 20 metre plot:
  - Full floristic diversity, including cover and abundance for all vascular flora
  - Occurrence and abundance of weeds.

In addition to BBAM methodology, an assessment will be made of:

- percent cover of cryptogam cover and leaf litter along the transect
- general vegetation health
- estimate of the number of healthy trees present (in this instance “healthy” is defined as having 0-5% canopy foliage dead/absent or brown with dieback not apparent)
- Signs of disturbance by stock or humans

- Evidence of feral animals
- Impacts from mining.

3.3.2 Biodiversity Assessment Methodology (BAM)

BAM monitoring will consist of a 50 metre transect, 50 metre by 20 metre plot, with a 20 metre by 20 metre sub-plot and five 1 metre by 1 metre sub-plots.

At each plot/transect, roughly 45 to 60 minutes will be spent searching for all vascular flora species present within the 20 x 20 m plot. Searches of each 20 x 20 m plot will be generally undertaken through parallel transects from one side of the plot to another. Most effort will be spent on examining the groundcover, which usually supports well over half of the species present, however the composition of any shrub, mid-storey, canopy and emergent layers will also be thoroughly examined.

For each flora species recorded in the plot, the following data will be collected in accordance with Table 2 of the BAM (OEH 2017):

- Stratum/layer in which the species occurs
- Growth form
- Scientific name and common name
- Cover and
- Abundance.

The following attributes will be recorded at each floristic plot, in accordance with the BAM (OEH 2017) to determine the condition of the vegetation zone:

- Composition – native plant species richness by growth form (within the 20 x 20 m plot)
- Structure – estimate foliage cover of native and exotic species by growth form (within the 20 x 20 m plot)
- Function – (within the 20 x 50 m plot) including, number of large trees, presence or otherwise of tree stem size classes, presence or otherwise of canopy species regeneration, length of fallen logs, percentage cover for litter (recorded from five 1 x 1 m plots), number of trees with hollows and high threat exotic cover.

In addition to BAM methodology, an assessment will be made of percent cover of bare ground/rock cover of the plot, as well as an estimate of the number of healthy trees present (in this instance "healthy" is defined as having 0-5% canopy foliage dead/absent or brown with dieback not apparent).

3.4 Habitat Assessment

Habitat assessment will also be undertaken in each 50 metre by 20 metre plot. Habitat features recorded at each site will include:

- general vegetation health;
- evidence of natural seedling recruitment;
- occurrence and abundance of weed species;
- structure and floristics of vegetation cover;
- signs of disturbance (by stock, people or feral animals);
- nature and extent of erosion;

- evidence of fire;
- characteristic of ground cover (e.g. leaf litter, rocks, logs and soil);
- nectar or fruit resources and perch sites;
- water resources; and
- secondary evidence of fauna use such as scats, tree scratches or diggings.

3.5 Photo Monitoring

Photo monitoring will be undertaken at each permanent flora monitoring location facing north, south, east and west at the start of the 50 metre transect.

3.6 Fauna Monitoring

Fauna monitoring will be undertaken at each of the 16 permanent monitoring locations, according to the frequency outline in ***Table 3-1***. Fauna monitoring to be undertaken at each of the 16 permanent fauna monitoring sites will include:

- minimum of 20 minutes diurnal bird survey (species-time approach);
- targeted winter bird surveys (for the regent honeyeater and swift parrot);
- four full night Anabat surveys (micro-bats);
- one person hour of diurnal herpetofauna surveys;
- one person hour of spotlighting surveys;
- one call-playback session; and
- baited remote camera traps to be deployed for two weeks (targeted to spotted-tailed quoll).

Each of these is described in greater detail below.

3.6.1 Diurnal Woodland Bird Surveys

Diurnal woodland bird surveys will consist of slow walking transects over an approximate 2 hectare area surrounding the site. These surveys will take place within the first four hours/ last four hours of sunlight and will be in accordance with the species-time curve approach (DEC 2004). Surveys will be undertaken for a minimum of 20 minutes; after which every new species that is recorded triggers a further 5 minutes of survey.

All bird species identified during this time will be recorded as well as detailed on whether the bird identified was within, outside or flying over the site.

3.6.2 Targeted Winter Bird Surveys

Targeted winter bird surveys will be undertaken at monitoring sites with appropriate feed tree species for the regent honeyeater (*Anthochaera phrygia*) and swift parrot (*Lathamus discolor*). These surveys will consist of an initial call playback session followed by a slow walking transect.

Calls will be broadcast using a directional loud hailer and commence with a quiet listening period of approximately five minutes. Each species call will then be played for a minimum of four minutes followed by a listening period of two minutes before the beginning of the next species call.

The slow walking transect will then be undertaken in the same manner as that for the diurnal woodland bird surveys.

3.6.3 Micro-Bat Surveys

Micro-bat surveys will be undertaken with Anabat devices equipped with a recording device for each permanent monitoring location and will be placed along a flyway over a riparian body. Micro-bat surveys will comprise four full survey nights of Anabat surveys for each site. Anabats will be set to record all micro-bat calls prior to dusk until after dawn.

3.6.4 Diurnal Herpetofauna Surveys

Targeted diurnal searches will be conducted for reptile and amphibian species (herpetofauna) within an approximate 2 hectare area of each of the 16 monitoring sites as well as at blue-billed duck monitoring sites. One person hour of diurnal herpetofauna surveys will be undertaken for each site. Searches will comprise a slow walking meander searching areas of likely habitat such as under rocks and logs, in bark at the base of trees, around water resources and in man-made features.

3.6.5 Spotlighting Surveys

Spotlighting will target nocturnal mammal, birds and herpetofauna. One person hour of spotlighting surveys will be conducted at each of the seven monitoring sites within an approximate 2 hectare area of each site. Spotlighting will consist of slow walking meanders undertaken after sunset.

3.6.6 Call Playback Surveys

Call playback sessions will be undertaken at each of the seven monitoring locations using a directional loud hailer. Calls will be broadcast for the powerful owl (*Ninox strenua*), masked owl (*Tyto novaehollandiae*), eastern grass owl (*Tyto longimembris*), koala (*Phascolarctos cinereus*) and squirrel glider (*Petaurus norfolcensis*).

Call playback sessions will commence with a quiet listening period of five minutes. Each call was played for a minimum of two minutes followed by a listening period of two minutes. If a response or unclear noise was heard the call was repeated.

3.6.7 Baited Remote Camera Traps (Including Spotted-tailed Quoll) Monitoring

Spotted-tailed quoll monitoring is to be undertaken at each monitoring site and will consist of baited motion sensing remote cameras. At each of the sixteen monitoring sites, single baited remote camera stations will be positioned in an area of high fauna activity. The camera will be set to record five photographs each time it is triggered. These sites will be situated in areas including but not limited to:

- remnant vegetation;
- rehabilitated/regenerated vegetation;
- areas of known spotted-tailed quoll activity;
- known spotted-tailed quoll denning locations; and
- established log and boulder piles.

All baited remote camera stations will be left in-situ for a two week period. Baited remote cameras will be downloaded and analysed at the completion of the two weeks.

3.6.8 Nest Box Monitoring

All nest boxes installed within the BOMP area are subject to monitoring for condition and content. This occurs on a rotating biennial monitoring program where half of all nest boxes installed at LCO are monitored one year and the second half are monitored the subsequent year. Details recorded for nest box monitoring is as follows:

- Content, including:
  - whether they are being used by target species;
  - signs of presence such as nesting material or feathers;
  - predator use;
  - presence of native fauna; and
  - presence of non-target species such as bees, wasps and introduced bids.
- Condition, including:
  - collapsing joints;
  - missing lids;
  - bowing timber;
  - perishing timber; and
  - tree attachment.

Additional nest box monitoring surveys will be undertaken where new nest boxes are installed as habitat enhancement measures. These will be undertaken annually for the first two years after installation and then be included in the biennial monitoring .

3.7 Landscape Function Analysis Monitoring

Landscape function analysis (LFA) is a technique used to monitor the health of landscapes, particularly in areas of disturbance. LFA uses simple visual assessment of both physical and biological landscape components (mostly in relation to surface hydrology) that can be readily replicated over time in order to determine any changes to the quality of the landscape within a site.

LFA monitoring will be undertaken at the permanent rehabilitation monitoring sites in accordance with LFA methodology (Tongway and Hindley 2005). This monitoring will be undertaken along the 50 metre transect utilised for the floristic monitoring.

LFA monitoring will comprise dividing the transect into patches/interpatches based on ground cover types, and for each ground cover type undertaking five replicates of the following 11 key soil condition features:

- rain splash protection;
- perennial vegetation cover;
- litter cover, origin and degree of decomposition;
- cryptogam (non seed-bearing plants) cover;
- crust brokenness;
- erosion features;
- deposited materials;

- microtopography;
- surface resistance to erosion;
- soil texture; and
- slaking characteristics.

The data collected from the above soil condition features will then be entered into a spreadsheet that calculates the critical values for stability, infiltration and nutrient functions for each site.

3.8 Pathogen Visual Assessment

All permanent monitosing sites will be visually assessed for potential presence of pathogens including *Phytophthora cinnamomic*, Myrtle rust and Chytrid fungus.

3.9 Completion Criteria

Table 3-2 - Ecological Monitoring Performance and Completion Criteria

Relevant Offset Area	Action	Performance Criteria			Completion Criteria
		Year 10	Year 11	Year 12	
All biodiversity offset areas	Undertake floristic, fauna and nest box monitoring program	Monitoring program completed and reported	Monitoring program completed and reported	Monitoring program completed and reported	Monitoring programs completed and results reported.
All biodiversity offset areas	Undertake annual rehabilitation monitoring (IEM and LTM as relevant) of LCO rehabilitation and active regeneration areas	Annual monitoring completed	Annual monitoring completed	Annual monitoring completed	Annual monitoring completed.
All biodiversity offset areas	Native fauna presence in rehabilitation /regeneration areas	Fauna monitoring completed	Fauna monitoring completed	Fauna monitoring completed	Fauna monitoring confirms that native fauna species are recorded within rehabilitation/regeneration areas.

4. Adaptive Management

4.1 Adaptive Management Process

Adaptive management of the BOMP will be responsive to any new and relevant data that may arise through the monitoring described in ***Section 3***, legislative change or any other studies completed across the LCO BOAs. This will enable a flexible approach to management commitments, allowing ongoing feedback and refinement of the BOMP. Adaptive management will be a key mechanism to address the risks to the successful implementation of the BOMP. Adaptive management steps include regular review of the BOMP, including adaptation of targets and performance indicators, recognising potential risks to the successful implementation of the BOMP and having a framework in place for corrective actions.

4.2 Review of BOMP

As per the requirements of Schedule 5 Condition 10 of DA 305-11-01 Mod 7, the BOMP is to undergo an internal review and revision (if necessary) within 3 months of the submission of the Annual Review, an incident report, audit or modification to the conditions of consent. Where the BOMP is revised, it must be submitted to the Secretary for approval within 2 months, unless an alternative timeframe is agreed.

Each review will seek opportunities to improve the management strategies and further develop and forecast the longer term performance indicators and completion criteria.

5. Progressive Development of Targets and Performance Indicators

The performance indicators and completion criteria in ***Section 1.7*** apply to management years 10, 11 and 12 of the BOMP implementation (2024 - 2027). The targets and performance indicators adapt and change as targets are met and new management challenges arise. Every three years, they will be assessed and redeveloped as appropriate in response to monitoring outcomes and the success or otherwise of the management and improvement strategies. Modifications to the targets and performance indicators will be recorded in a revised BOMP.

The completion criteria which have been fulfilled are provided in ***Appendix B***.

5.1 Potential Risks and Corrective Actions

There are a number of potential risks, or situations where performance indicators and completion criteria may not be achieved. A list of potential situations where biodiversity conservation objectives of this BOMP may not be met is provided in Table 5-1, along with potential corrective actions. This list is adapted from Rawlings et al (2010).

Table 5-1 - Biodiversity Trigger, Action and Response Plan

Management Aspect	Key Element	Trigger	Potential Corrective Action
General Management	Protection of Remnant Vegetation	Unauthorised stock access.	Identify access points and repair fences appropriately. Communicate with agricultural managers and adjacent landholders to emphasise areas where stock are not permitted.
	Weed Management	Infestations of noxious and environmental weeds are increasing or new species detected.	Adapt weed management plan and modify strategies accordingly.
	Feral Fauna Management	Infestations of pest animals are increasing or new species detected.	Adapt pest management plan and modify strategies accordingly.
Revegetation and Rehabilitation Success	Species composition	No regeneration of plants, or indicator species missing from any strata.	Assess fencing and ensure there is no un-authorised stock access or native fauna (i.e. grazing kangaroos). Control exotic weeds and pest animals to reduce competition. If deemed necessary, instigate active revegetation techniques including direct seeding or tubestock planting, following appropriate ground preparation.
	Native flora diversity	Flora species diversity is not on a trajectory consistent with target community.	Targeted weed control. Instigate active revegetation techniques including direct seeding or tubestock planting, following appropriate ground preparation such as weed control, ripping and auguring. Revegetate with high diversity patches. Assesses adequacy of soil present as an appropriate growth medium.
	Native fauna diversity	Fauna species diversity of rehabilitated areas is inconsistent with reference communities.	Control feral predators. Increase habitat features of target fauna species (i.e. nest

Management Aspect	Key Element	Trigger	Potential Corrective Action
			boxes, specific foraging resources, log and rock piles etc).
	Tree cover	Low or no tree cover.	Plant/direct seed trees at appropriate rate using minimal ground disturbance.
	Survivorship	Tree dieback (from insect pressure, herbicide drift, water stress/adverse climatic conditions).	Revegetate with dense shrubs to increase diversity and insectivorous birds. Avoid using defoliants near woodlands when windy. Increase patch size through revegetation. Do not fertilise and prevent fertiliser drift. Review active regeneration techniques and consider adjustment of preparation techniques. Consider need for additional infill planting to meet active regeneration targets. Assess requirement for intervention such as watering.
	Weed management	Patches of exotic annual and perennial grasses occur.	Spot spray small clumps. Investigate suitability to undertake a spring burn. Monitor and maintain control.
	Weed management	Exotic broadleaf weeds abundant or dominant.	Use bush regeneration principles to manage. Use broadleaf herbicides in accordance with best practice guidelines. Hand weed if appropriate.
	Weed management	Tree and shrubs present but dense exotic ground cover.	Densely plant trees and shrubs to outcompete with the exotic ground covers. Spot spray small clumps or hand remove exotic ground covers around native ground covers.
	Native flora diversity	Dense stands of colonising tree or shrub	Assess whether thinning is necessary.

Management Aspect	Key Element	Trigger	Potential Corrective Action
		species dominate regeneration or revegetation areas.	Leave if patches are small and plants are native. Thin manually if appropriate. Leave woody debris in-situ to enhance habitat value.
Habitat Enhancement	Habitat Enhancement	Scarcity of key habitat features present in relation to reference sites.	Add habitat features such as logs or branches. Increase the number of vegetation layers in the patch. Establish nesting boxes for target species.
	Habitat salvage	Habitat features salvaged are damaged during salvage or during stockpiling.	Investigate machinery and equipment currently being used to salvage and translocate habitat features. Update protocols based on findings. Investigate adequacy of storage emplacement areas of features. Revise locations if necessary.
Bushfire Management	Bushfire Management	Unplanned bushfire event occurs.	Review procedures in place and update Bushfire Management Plan based on findings. Monitor plant succession after bushfire event.

6. Reporting and Documentation Requirements

LCO prepares an annual review (AR) which documents the monitoring methods and results for the calendar year. The intent of this report will be to provide a comparison of the data collected with previous monitoring events and to provide (where necessary) ongoing management recommendations and ameliorative methods to ensure the biodiversity management within the BOAs are subject to a positive feedback loop.

The AR is submitted to Department of Planning, Housing and Infrastructure (DPHI) for review Monitoring data is tabulated for simple presentation, with the relevant performance criteria in one column, and the results in the next column. All other reporting will be undertaken in accordance with the requirements of the LCO Environmental Management Strategy.

The reporting requirements for the various management strategies of the BOMP, including reporting frequency and timing, are identified in ***Table 6-1.***

Table 6-1 - BOMP Reporting Requirements

Report	Frequency	Requirements	Personnel
Biodiversity offset area inspection records	Records from bi-monthly inspections	Complete a drive over and inspection, investigating aspects such as fence and gate condition, signage, access track condition, weeds, rubbish dumping, erosion and sedimentation, observations of stock and any other general observations	Competent site personnel
Weed management report	Annually	Report on areas worked, timing of works, techniques used, any issues encountered, recommendations and the control program for the subsequent year.	LCO/Weed management contractor
Feral animal management report	Annually	Report on timing of works, techniques used, data on kills or bait update, any issues encountered, maps and data on the areas of impact and population estimates per species, recommendations and the control program for the subsequent year/s. In the report, monitoring results of area of impact and population size estimates should be compared to previous years of monitoring to identify any trends in vertebrate pest control performance.	LCO/Feral animal management contractor
Biodiversity monitoring reporting	Annually	Consultant to compile and analyse results of flora and fauna monitoring completed each year and to compare against performance criteria for this strategy.	Prepared by consultant
LCO Annual Review	Annually	Summarise operational and environmental activities for the previous year including annual review requirements, review of compliance withRMP, PA, DoEE and other approvals and description of non-compliance/exceedances, rehabilitation progress, comprehensive monitoring results and complaints information.	Prepared by consultant or competent site personnel

7. Conservation Bond and Implementation Costs

A Conservation Bond for the LCO BOAs is required by DPHI in accordance with DA 305-11-10 Schedule 3 Condition 30 of the project approval. The purpose of this bond is to cover the cost of the management of land required to be set aside as an offset area, should the mine consent holder be unable or unwilling to continue management of the land. The Conservation Bond value is based on all the activities identified in the approved BOMP, for a period of three years, being the life of the plan.

The Conservation Bond will be calculated and submitted in accordance with the ***Draft Hunter Valley Coal Mines – Best Practice Guidelines for Biodiversity Offset Management Plans*** (DPE, 2014).

8. BOMP Checklist and Implementation Schedule

A checklist summarising the BOMP actions required across the LCO BOAs and their schedule for implementation for the 3 year period is provided in ***Table 8-1***. Reference to the relevant sections of this BOMP should be made for more detail.

Table 8-1 - Checklist and Implementation Schedule for the LCO BOMP (Years 10, 11 and 12)

Actions	Timeframe
Management and Improvement Actions	
Routine inspection and maintenance of fences.	Inspect every **2 months**. Detailed survey to be conducted **twice yearly**. Maintenance is required throughout the life of the BOMP.
Remove non-strategic stock grazing activities from across all LCO biodiversity offset areas.	Inspect for presence every **2 months**. Unauthorised stock access to be continually managed.
Routine inspection and maintenance of tracks.	**Twice yearly** inspections. Maintenance is required throughout the life of the BOMP.
Establish an effective annual pest control program across all LCO biodiversity offset areas, as necessary.	Implement throughout **Year 10**, **Year 11** and **Year 12**. Annually review and revise.
Establish an effective annual weed control program across all LCO biodiversity offset areas, as necessary.	Implement throughout **Year 10**, **Year 11** and **Year 12**. Annually review and revise.
Undertake weed and pest control activities across all LCO biodiversity offset areas, as necessary.	**Year 10, Year 11** and **Year 12.** Concentrate efforts in DNG areas to assist natural regeneration.
Establish woodland vegetation in areas of derived native grassland (DNG) through assisted natural regeneration.	Implement assisted natural regeneration activities (weed and pest control, stock removal etc.) in **Years 10-12**. Assess progress towards performance indicators and completion criteria during the **Year 12** review of the BOMP (incorporating results of inspections and monitoring). Review the need for further active revegetation methods after **Year 12** if natural regeneration is not progressing appropriately.
Enhance habitat features in regeneration and remnant vegetation areas	Implement as recommended by monitoring reports in **Years 10-12**.

Actions	Timeframe
Active revegetation activities	Continue during **Years 1012** as per monitoring recommendations. The need for active revegetation will be assessed at each 3 year revision of the BOMP.
Offset rehabilitation areas	Implement for Bowmans Creek Corridor in **Years 10-12**.
Monitoring Actions	
Ecological Monitoring	Continue annual surveys in Spring in **Years 10-12** and undertaken as per **Section 3.** Winter migratory bird monitoring to continue annually in winter of **Years 10-12**.
General inspections across all biodiversity offset areas	Bi-monthly for all Offset Areas in **Years 10-12**.
Reporting and Documentation Actions	
Accurate records are being maintained substantiating all activities and monitoring relating to implementation of the BOMP.	Ongoing from **Year 1**.
Collate data on actions implemented and results of inspections and monitoring into the Annual Review.	Annually from **Year 1**.
Annual Monitoring Report	Following completion of each monitoring period, within 3 months of each monitoring survey event, commencing **Year 1**.
Update BOMP, including a revision of management actions, performance indicators and completion criteria.	Every **3 years** from commencement (earlier if deemed necessary).

9. Document Information

9.1 Related Documents

Related documents, listed in ***Table 9-1***, are internal documents directly related to or referenced from this document.

Table 9-1 - Related Documents

Number	Title
LIDOC-90533967-3687	Biodiversity Management
LIDOC-90533967-3776	Indirect Offset
LIDOC-90533967-6178	Rehabilitation Management Plan
LIDOC-90533967-3694	Water Management
LIDOC-90533967-506	Tree Felling and Topsoil Stripping Procedure
LIDOC-90533967-3607	Aboriginal Cultural Heritage Management Plan
LIDOC-90533967-5406	Bushfire Management Plan
LIDOC-90533967-3944	Biodiversity Monitoring Inspection

9.2 References

Reference information, listed in ***Table 9-2***, is information that is directly related to the development of this document or referenced from within this document.

Table 9-2 - Reference Information

Reference	Title
Commonwealth of Australia 2001	Commonwealth of Australia 2001. Threat Abatement Plan for Dieback Caused by the Root-rot Fungus *Phytophthora cinnamomi*.
DEC 2004	Department of Environment Conservation (DEC) 2004. Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities. Working Draft, November 2004.
DP&E 2014	Department of Planning and Environment 2014. *Hunter Valley Coal Mines: Best Practice Guidelines for Biodiversity Offset Management Plans.*
DECC 2008	DECC 2008. *Hygiene Protocol for the Control of Disease in Frogs*. Information Circular Number 6. DECC (NSW), Sydney South.
Hawley & Brunton 1995	Hawley, S.P. and Brunton, J.S, 1995. *Newcastle Coalfield. Notes to Accompany the Newcastle Coalfield Geology Map*. Department of Mineral Resources, Sydney.

Reference	Title
Landcom 2004	Landcom 2004. Managing Urban Stormwater: Soils and Construction (the Blue Book) Volume 1.
Landcom 2008	Landcom 2008. Managing Urban Stormwater: Soils and Construction (the Blue Book) Volume 2E Mines and Quarries.
LCO 2015	Liddell Coal Operations 2017. Biodiversity Management Plan.
Long and Nelson 2004	Long, K. and Nelson, J. 2008. *National Recovery Plan for the Spotted-tailed Quoll Dasyurus maculatus*. Department of Sustainability and Environment, Melbourne.
NSW Scientific Committee 2003	NSW Scientific Committee 2003. Infection of frogs by amphibian chytrid causing the disease chytridiomycosis - key threatening process listing. Accessed February 2014 from: http://www.environment.nsw.gov.au/animals/AmphibianChytridKTPListing.htm.
NSW Scientific Committee 2011	NSW Scientific Committee 2011. Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae - key threatening process listing. Accessed February 2014 from: http://www.environment.nsw.gov.au/determinations/exoticrustfungiFD.htm.
OEH 2011	Office of Environment and Heritage 2011. Sydney Basin Bioregion *http://www.environment.nsw.gov.au/bioregions/SydneyBasinBioregion.htm*
OEH 2014	Office of Environment and Heritage, 2014. *Biobanking Assessment Methodology*. Office of Environment and Heritage for the NSW Government, 59 Goulburn Street, Sydney NSW 2000.
OEH 2017	Biodiversity Assessment Method, August 2017
Peake 2006	Peake, T. C. 2006. The Vegetation of the Central Hunter Valley, New South Wales. A Report on the Findings of the Hunter Remnant Vegetation Project. Final Draft Hunter – Central Rivers Catchment Management Authority, Paterson.
Sivertsen et al 2011	Sivertsen, D., Roff, A., Somerville, M., Thonell, J., and Denholm, B. 2011. Hunter Native Vegetation Mapping. Geodatabase Guide (Version 4.0, Internal Report for the Office of Environment and Heritage, Department of Premier and Cabinet, Sydney, Australia.
SLR 2015	SLR Consulting 2015. Mining Operations Plan. Prepared for Liddell Coal Operations.
Threatened Species Scientific Committee 2002	Threatened Species Scientific Committee 2002. Infection of amphibians with chytrid fungus resulting in Chytridiomycosis. Accessed February 2014 from: http://www.environment.gov.au/node/14584.
Tongway and Hindley 2005	Tongway, D. and Hindley, L. 2005. Landscape function analysis: procedures for monitoring and assessing landscapes with special reference to minesites and rangelands. CSIRO Sustainable Ecosystems, Canberra.

Reference	Title
Umwelt 2011	Umwelt (Australia) Pty Limited 2011. *Bushfire Management Plan.* Prepared on behalf of Liddell Coal Operations Pty Limited.
Umwelt 2013a	Umwelt (Australia) Pty Limited 2013a. *Ecological Assessment – Liddell Coal Operations Extension Project.* Prepared on behalf of Liddell Coal Operations Pty Limited.
Vallee et al 2004	Vallee, L., Hogbin, T., Monks, L., Makinson, B., Matthes, M., and Rossetto M. 2004. Guidelines for the Translocation of threatened plants in Australia. Second Edition. Australian Network for Plant Conservation, Canberra
Umwelt 2018	Umwelt (Australia) Pty Limited 2018. Ecological Assessment – Liddell Coal Operations DA305-11-01 Modification 7
DECCW	NSW Department of Environment Climate Change and Water. n.d. Stamp out the spread of phytophora dieback.

9.3 Change Information

Table 9-3 - Change Information

Version	Date	Review team (consultation)	Change Summary
1.0	March 2015	Umwelt, LCO	New document to meet conditions of consent for DA305-11-01 and EPBC Approval 2013/6908.
2.0	November 2015	Umwelt/LCO	Update to address OEH and DoE comments.
3.0	December 2015	Umwelt/LCO	Minor updates to Section 3.3, 3.14 & 3.15 as per NSW DPE review comments.
4.0	23/12/ 2015	B de Somer, H Simms	Update varied EPBC Approval Condition 6 details in Section 1.3 and Section 2.2.
5.0	21/01/2016	L Barben, H Simms	Update to include Appendix C – DPE Correspondence and inclusion of approval letter dated 20.01.2016
6.0	October 2016		Document migration to new SharePoint.
7.0	11/07/2017	B de Somer, J Young	Update Bowmans Ck Riparian Corridor boundary, affecting multiple sections; append DPE approval.
8.0	18/07/2018	Umwelt, J Young, M Henderson	Updated to reflect changes associated with Conservation Agreement preparation, repealment of TSC Act, repealment of the Noxious Weeds Act, and refinement of performance and completion criteria. H Simms – transferred to current template.

Version	Date	Review team (consultation)	Change Summary
9.0	June 2019	B de Somer, H Frazer, Umwelt	Reviewed against section 8.1.4 of DA 305-11-01 Modification 7 Environmental Assessment and modified DA conditions. Updated as per 2019 Independent Environmental Audit recommendations specifically: • Updated Section 2.5.4 to include introduced species identified in 2018*;* • Update Section 3.4 to discuss potential management strategies for overabundant native species • Update Section 3.7 to include discussion of vehicle hygiene management; and • Reviewed and updated flora monitoring methodology in Section 4; and Updated Section 4.6.8 Nest Box Monitoring to include be biannual monitoring Updated Section 10.2 with additional related documents. Included new Section 2.6 on implications of the Modification 7 approval. Update to climate data in Section 2.3. Updates to table 6.1.
10.0	June 2020	L Depczynski, B de Somer	Export to new template Changes to document structure Heading wording changes Conservation Agreement details (executed since last plan) Recent monitoring results included Completion criteria achieved Revegetation activity descriptions clarified and split out for clarity Detail added on habitat augmentation Removal of Appendix A – DPIE Correspondence. This information is now tracked in the DPIE Major Projects portal.
11.0	June 2021	L Depczynski, B de Somer	Section 1.7 – updated performance indicators & completion criteria for next 3-year period (Year 7, 8 & 9) Section 1.8, 1.13 & 2.6 – update for completed works in Mod 7 remediation area completed in 2020. Section 2.1 – addition of new pathogen to consider for management based on monitoring results

Version	Date	Review team (consultation)	Change Summary
			Section 2.9.4 - Habitat feature salvage completion criteria moved from in text to Appendix B. Section 8 – checklist/schedule updated to match reviewed completion criteria Minor administrative updates throughout document that refer to works undertaken within the last 3-year period.
12.0	25/08/2022	L Ingram, B de Somer	Full review. Section 1.13 – further detail added regarding management and monitoring of DA Mod 7 area Adjust Table 2-13 to remove reference of DA Mod 7 area to be transferred back under BOMP management. Add section 3.2.2 initial establishment monitoring including Fig 3-2. Updates approved by DPE on 15/09/2022.
13.0	22/12/2023 20/01/2025	B de Somer C Merrick C Parkins (Umwelt)	Full review. Section 2. 8 – revised for revised target vegetation communities for Bowmans Creek Riaprian Corridor. Separation of Central Hunter Grey Box Ironbark Woodland into three target subcommunities based on landscape position, substrate and degree of vegetation disturbance. Reduction of 17.9ha CHBIW and replace with HVROF. Section 3.2.2 – updated section on the details of the IEM and LTM monitoring program. Version 13 submitted to federal DCCEEW under condition 22 of EPBC Approval 2013/6908 reflecting. No additional changes to those listed above.
14.0	25/08/2025	S Pigott L Ingram	Full Review. Updates to reflect cessation of mining activities and commencement of closure activities. Review and minor wording updates to completion criteria. Redundant tracks and pathogen monitoring moved to Appendix B.

Appendix A - Recommended Planting List

The following list contains native vascular flora recommended for planting in rehabilitation and revegetation areas as indicated in the Biodiversity Offset Management Plan (BOMP). This list includes recommended species plantings as per recommendations in State and Commonwealth Consent Conditions and Approvals as well as native plant species that are currently known to occur within the BOAS.

Names of classes and families follow a modified Cronquist (1981) System.

The following abbreviations or symbols are used in the list:

subsp. subspecies; and

var. variety.

All vascular plants recorded or collected were identified using keys and nomenclature in Harden (1992, 1993, 2000 & 2002) and Wheeler et al. (2002). Where known, changes to nomenclature and classification have been incorporated into the results, as derived from PlantNET (Botanic Gardens Trust 2023), the online plant name database maintained by the National Herbarium of New South Wales. Common names used follow Harden (1992, 1993, 2000 & 2002) where available, and draw on other sources.

It should be noted that approval DA 3015-11-01 Mod 5 also indicates that rehabilitation works should include establishment of Narrow-leaved Ironbark - Bulloak Open Forest endangered ecological community (EEC). However as this EEC is not listed under the Biodiversity Conservation Act 2016 (BC Act) or listed as a Plant Community Type, it has been assumed that plantings for this community will primarily comprise those in the final determination for Central Hunter Grey Box – Ironbark Woodland EEC, with supplementary plantings from the species currently known to occur on site.

When selecting species for undertaking planting activities, preference should be given to species that are known as endemic to the Liddell local area, in addition to being diagnostic under relevant scientific determinations and the VIS Classification (2023). Other species from these tables can be used, but preferentially in lower abundance (or when local seedstock to preferred species is not available).

Table B-1 - Recommended Species for Areas Proposed for Return to Central Hunter Box- Ironbark Woodland

Family	***Scientific Name***	**Common Name**	**Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species**	**Species Previously Recorded at LCO or in BOAs**	**Central Hunter Box – Ironbark Woodland EEC[1], [2], [3]**			**Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)**
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Species Recommended for Low-lying and Wetland Areas								
Araliaceae	*Hydrocotyle laxiflora*	stinking pennywort	FG				X	
Cyperaceae	*Schoenoplectus mucronatus*		GG	X				
Cyperaceae	*Scleria mackaviensis*		GG				X	
Hydrocharitaceae	*Ottelia ovalifolia*	swamp lily	W	X				
Juncaceae	*Juncus continuus*		GG				X	
Juncaceae	*Juncus homalocaulis*		GG				X	
Juncaceae	*Juncus subsecundus*		GG				X	
Juncaceae	*Juncus usitatus*		GG	X			X	L (Depressions)

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Central Hunter Box – Ironbark Woodland EEC[1], [2], [3]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Marsileaceae	*Marsilea mutica*	nardoo	FG	X				
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass	GG	X	X	X	X	D (Depressions)
Poaceae	*Oplismenus aemulus*	basket grass	GG	X			X	L (Depressions)
Poaceae	*Paspalum distichum*	water couch	GG	X				
Poaceae	*Phragmites australis*	common reed	GG	X				
Polygonaceae	*Rumex brownii*	swamp dock	FG		X		X	L
Typhaceae	*Typha orientalis*	broad-leaved cumbungi	GG	X				
Plantaginaceae	*Gratiola pedunculata*		FG	X				
Species Recommended for Woodland Areas								

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Central Hunter Box – Ironbark Woodland EEC[1], [2], [3]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Anthericaceae	*Arthropodium milleflorum*	pale vanilla-lily	FG	X	X		X	
Anthericaceae	*Arthropodium minus*		FG				X	
Anthericaceae	*Arthropodium sp. B*		FG				X	
Anthericaceae	*Laxmannia compacta*		FG		X		X	
Anthericaceae	*Laxmannia gracilis*	slender wire lily	FG				X	
Asphodelaceae	*Bulbine bulbosa*	native leek	FG		X			
Asphodelaceae	*Stypandra glauca*	nodding blue lily	FG				X	
Asphodelaceae	*Xanthorrhoea acaulis*		OG				X	
Asparagaceae	*Lomandra bracteata*		GG		X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asparagaceae	*Lomandra confertifolia*	mat-rush	GG	X	X		X	
Asparagaceae	*Lomandra filiformis*	wattle matt-rush	GG	X	X		X	SD (CHBIW and Transitions)
Lomandraceae	*Lomandra glauca*		G				X	
Lomandraceae	*Lomandra longifolia*	honey reed	GG				X	
Asparagaceae	*Lomandra multiflora*	many-flowered mat-rush	GG	X				L (all areas)
Asparagaceae	*Lomandra multiflora* subsp. *multiflora*	many-flowered mat-rush	GG	X	X	X	X	L (all areas)
Commelinaceae	*Commelina cyanea*	native wandering Jew	FG	X	X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Commelinaceae	*Murdannia graminea*		FG				X	
Cyperaceae	*Carex appressa*		GG				X	
Cyperaceae	*Carex inversa*	knob sedge	GG	X	X		X	L
Cyperaceae	*Carex fascicularis*	tassel sedge	GG		X		X	
Cyperaceae	*Cyperus fulvus*	sticky sedge	GG				Xx\	
Cyperaceae	*Cyperus gracilis*	slender flat sedge	GG	X	X	X	X	L
Cyperaceae	*Cyperus laevis*		GG				X	
Cyperaceae	*Fimbristylis dichotoma*	common fringe-sedge	GG	X	X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Cyperaceae	*Gahnia aspera*		GG		X		X	
Cyperaceae	*Scleria mackaviensis*		GG		X			
Poaceae	*Aristida jerichoensis*		GG				X	
Poaceae	*Aristida leptopoda*		GG				X	
Poaceae	*Austrostipa ramosissima*		GG				X	
Poaceae	*Austrostipa setacea*		GG				X	
Poaceae	*Aristida acuta*		GG				X	
Poaceae	*Aristida ramosa*	purple wiregrass	GG	X	X	X	X	SD (CHBIW and Transitions)
Poaceae	*Aristida vagans*	threeawn speargrass	GG	X	X		X	L

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Austrostipa aristiglumis*		GG		X			
Poaceae	*Austrostipa scabra*	speargrass	GG	X	X	X	X	D (all area)
Poaceae	*Austrostipa verticillata*	slender bamboo grass	GG	X	X		X	L (CHBIW and Transitions) D (Depressions)
Poaceae	*Bothriochloa biloba*	lobed bluegrass	GG		X		X	
Poaceae	*Bothriochloa decipiens*	red grass	GG	X	X	X	X	L (all areas)
Poaceae	*Bothriochloa macra*	red grass	GG	X	X		X	
Poaceae	*Chloris divaricata* var. *divaricata*		GG				X	
Poaceae	*Chloris truncata*	windmill grass	GG	X	X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Chloris ventricosa*	tall chloris	GG	X	X	X	X	L (all areas)
Poaceae	*Cymbopogon refractus*	barbed wire grass	GG	X	X	X	X	D (CHBIW and Transitions)
Poaceae	*Cynodon dactylon*	common couch	GG	X	X		X	L
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland bluegrass	GG		X		X	L
Poaceae	*Dichelachne crinita*	plumegrass	GG				X	
Poaceae	*Dichelachne micrantha*	shorthair plumegrass	GG		X		X	L (CHBIW)
Poaceae	*Digitaria brownii*	cotton panic grass	GG		X		X	
Poaceae	*Digitaria divaricatissima*	umbrella grass	GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Digitaria diffusa*	open summer grass	GG	X	X		X	L
Poaceae	*Digitaria hubbardii*		GG					
Poaceae	*Digitaria ramularis*		GG					
Poaceae	*Echinopogon caespitosus*	tufted hedgehog grass	GG				X	
Poaceae	*Echinopogon intermedius*	hedgehog grass	GG				X	
Poaceae	*Echinopogon ovatus*	hedgehog grass	GG		X		X	
Poaceae	*Elymus scaber*		GG				X	
Poaceae	*Enneapogon gracilis*		GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Enteropogon acicularis*		GG	X			X	
Poaceae	*Entolasia marginata*	bordered panic	GG				X	
Poaceae	*Entolasia stricta*	wiry panic	GG				X	
Poaceae	*Eragrostis alveiformis*		GG				X	
Poaceae	*Eragrostis benthamii*		GG				X	
Poaceae	*Eragrostis brownii*	Brown's lovegrass	GG	X	X		X	
Poaceae	*Eragrostis elongata*	clustered lovegrass	GG				X	
Poaceae	*Eragrostis lacunaria*	purple lovegrass	GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Eragrostis leptostachya*	paddock lovegrass	GG	X	X	X	X	L (all areas)
Poaceae	*Eragrostis molybdea*		GG		X			
Poaceae	*Eragrostis parviflora*	weeping lovegrass	GG				X	
Poaceae	*Eragrostis sororia*		GG				X	
Poaceae	*Eragrostis trachycarpa*		GG				X	
Poaceae	*Eriochloa pseudoacrotricha*	early spring grass	GG	X			X	
Poaceae	*Eulalia aurea*		GG				X	
Poaceae	*Heteropogon contortus*	bunch speargrass	GG		X			
Poaceae	*Imperata cylindrica*	blady grass	GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Lachnagrostis billardierei* subsp. *billardierei*		GG				X	
Poaceae	*Leptochloa asthenes*		GG				X	
Poaceae	*Notodanthonia longifolia*		GG		X			
Poaceae	*Panicum effusum*	poison panic	GG	X	X		X	
Poaceae	*Panicum queenslandicum*		GG				X	
Poaceae	*Panicum simile*	two-colour panic	GG	X			X	
Poaceae	*Panicum subxerophilum*		GG		X			
Poaceae	*Paspalidium constrictum*		GG				X	
Poaceae	*Paspalidium criniforme*		GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Paspalidium gracile*	slender panic	GG	X	X		X	L (all areas)
Poaceae	*Paspalidium distans*		GG				X	
Poaceae	*Poa affinis*		GG				X	
Poaceae	*Poa labillardierei* var. *labillardierei*	tussock	GG				X	
Poaceae	*Poa sieberiana*	tussock poa	GG	X			X	
Poaceae	*Rytidosperma bipartita*	wallaby grass	GG	X	X		X	L
Poaceae	*Rytidosperma caespitosum*		GG				X	
Poaceae	*Rytidosperma fulvum*	wallaby grass	GG	X	X		X	L
Poaceae	*Rytidosperma longifolium*	long-leaved wallaby grass	GG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Rytidosperma monticola*		GG				X	
Poaceae	*Rytidosperma racemosa*		GG	X	X		X	
Poaceae	*Rytidosperma setaceum*	smallflower wallaby grass	GG				X	
Poaceae	*Rytidosperma tenuior*		GG	X			X	
Poaceae	*Sporobolus creber*	slender rat's tail grass	GG	X	X	X	X	D (Depressions)
Poaceae	*Sorghum leiocladum*	wild sorghum	GG				X	
Poaceae	*Themeda triandra*	kangaroo grass	GG	X	X		X	
Poaceae	*Tragus australianus*		GG		X			
Poaceae	*Tripogon loliiformis*	fiveminute grass	GG					

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Pteridaceae	*Adiantum hispidulum*	rough maindenhair fern	GG				X	
Pteridaceae	*Asplenium flabellifolium*	necklace fern	EG				X	
Pteridaceae	*Cheilanthes austrotenuifolia*	rock fern	EG				X	
Pteridaceae	*Cheilanthes distans*	bristly cloak fern	EG	X	X	X	X	
Pteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	poison rock fern	EG	X	X	X		L (all areas)
Ophioglossaceae	*Ophioglossum lusitanicum*	adders tongue	EG				X	
Xanthorrhaceae	*Xanthorrhoea acaulis*		OG		X			
Dicots								

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Acanthaceae	*Brunoniella australis*	blue trumpet	FG	X	X	X	X	L (CHBIW)
Acanthaceae	*Brunoniella pumilo*		FG				X	
Acanthaceae	*Rostellularia adscendens* subsp. *adscendens*		FG		X		X	
Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	FG	X			X	
Amaranthaceae	*Alternanthera sp. A*		FG				X	
Apiaceae	*Centella asiatica*	pennnywort	FG	X			X	
Apiaceae	*Daucus glochidiautus*	native carrot	FG	X			X	
Apiaceae	*Hydrocotyle laxiflora*	stinking pennywort	FG		X			
Apocynaceae	*Marsdenia viridiflora* subsp. *viridiflora*	native pear	OG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Apocynaceae	*Parsonsia eucalyptophylla*		OG				X	
Asteraceae	*Brachyscome angustifolia*		FG				X	
Asteraceae	*Brachyscome ciliaris*		FG				X	
Asteraceae	*Brachyscome microcarpa*		FG				X	
Asteraceae	*Brachyscome multifida*	rocky daisy	FG				X	
Asteraceae	*Calocephalus citreus*	lemon beauty-heads	FG	X	X		X	L
Asteraceae	*Calotis cuneata*	mountain Burr-daisy	FG	X			X	
Asteraceae	*Calotis cuneifolia*	purple burr-daisy	FG		X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Calotis hispida*		FG				X	
Asteraceae	*Calotis lappulacea*	yellow burr-daisy	FG	X	X	X	X	SD (CHBIW and Transitions)
Asteraceae	*Cassinia aculeata*	dolly bush	SG	X				
Asteraceae	*Cassinia cunninghamii*		SG				X	
Asteraceae	*Cassinia quinquefaria*		SG		X	X	X	L (CHBIW)
Asteraceae	*Cassinia sifton*		SG				X	
Asteraceae	*Cassinia uncata*		SG				X	
Asteraceae	*Chrysocephalum apiculatum*	common everlasting	FG	X	X	X	X	L (CHBIW and Transitions)
Asteraceae	*Chrysocephalum semipapposum*		SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Cotula australis*	common cotula	FG		X		X	L (Depressions)
Asteraceae	*Cymbonotus lawsonianus*	bear's ear	FG	X			X	
Asteraceae	*Eclipta platyglossa*		FG				X	
Asteraceae	*Epaltes australis*	spreading nut-heads	FG				X	
Asteraceae	*Euchiton involucratus*	star cudweed	FG	X			X	
Asteraceae	*Euchiton sphaericus*		FG	X			X	
Asteraceae	*Glossocardia bidens*	cobblers tack	FG		X		X	
Asteraceae	*Lagenophora gracilis*		F		X		X	
Asteraceae	*Lagenophora stipitata*	blue bottle-daisy	FG	X			X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Leiocarpa leptolepis*	pale plove-daisy	FG		X			
Asteraceae	*Leptorhynchos squamatus*		FG				X	
Asteraceae	*Leptinella filicula*		FG				X	
Asteraceae	*Minuria leptophylla*		FG				X	
Asteraceae	*Olearia elliptica* subsp. *elliptica*	sticky daisy-bush	SG		X		X	
Asteraceae	*Ozothamnus diosmifolius*	rice flower	SG				X	
Asteraceae	*Senecio diaschides*		FG				X	
Asteraceae	*Senecio quadridentatus*		FG					
Asteraceae	*Sigesbeckia australis*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Sigesbeckia orientalis* subsp. *orientalis*	Indian weed	FG	X	X		X	L
Asteraceae	*Solenogyne bellioides*		FG		X		X	
Asteraceae	*Triptilodiscus pygmaeus*	common sunray	FG		X			
Asteraceae	*Vernonia cinerea* var. *cineria*		FG		X		X	
Asteraceae	*Vittadinia cervicularis*		FG				X	
Asteraceae	*Vittadinia cuneata*	Fuzzweed	FG	X	X	X	X	L (all areas)
Asteraceae	*Vittadinia dissecta*		FG				X	
Asteraceae	*Vittadinia muelleri*	Fuzzweed	FG	X			X	
Asteraceae	*Vittadinia pterochaeta*		FG	X			X	
Asteraceae	*Vittadinia pustulata*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Vittadinia sulcata*		FG				X	
Bignoniaceae	*Pandorea pandorana* subsp. *pandorana*	wonga wonga vine	OG				X	
Boraginaceae	*Cynoglossum australe*		FG				X	
Brassicaceae	*Cardamine paucijuga*		FG				X	
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell	FG	X	X		X	
Campanulaceae	*Wahlenbergia gracilenta*	Annual Bluebell	FG	X				
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell	FG	X	X		X	L
Campanulaceae	*Wahlenbergia luteola*		FG		X		X	
Campanulaceae	*Wahlenbergia littoricola*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Campanulaceae	*Wahlenbergia planiflora*		FG				X	
Campanulaceae	*Wahlenbergia stricta*		FG				X	
Casuarinaceae	*Allocasuarina gymnanthera*		TG				X	
Casuarinaceae	*Allocasuarina littoralis*	black she-oak	TG				X	
Casuarinaceae	*Allocasuarina luehmannii*	Bulloak	TG	X	X	X	X	D L (Transitional and Depressions)
Casuarinaceae	*Allocasuarina verticillata*	drooping sheoak	TG				X	
Casuarinaceae	*Casuarina glauca*	swamp oak	TG				X	
Celestracae	*Denhamia silvestris*	orange bark	SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Chenopodiaceae	*Atriplex semibaccata*	creeping saltbush	SG				X	
Chenopodiaceae	*Chenopodium carinatum*		FG				X	
Chenopodiaceae	*Chenopodium cristatum*		FG				X	
Chenopodiaceae	*Chenopodium glaucum*		FG				X	
Chenopodiaceae	*Chenopodium melanocarpum*	black crumbweed	FG		X		X	
Chenopodiaceae	*Dysphania pumilio*	small crumbweed	FG				X	
Chenopodiaceae	*Einadia hastata*	berry saltbush	FG	X	X		X	L
Chenopodiaceae	*Einadia nutans*	climbing saltbush	FG	X	X	X	X	L (Depressions)
Chenopodiaceae	*Einadia polygonoides*		FG		X		X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Chenopodiaceae	*Einadia trigonos*	fishweed	FG	X	X		X	L
Chenopodiaceae	*Enchylaena tomentosa*	ruby saltbush	SG	X	X		X	
Chenopodiaceae	*Maireana enchylaenoides*	wingless bluebush	FG		X		X	
Chenopodiaceae	*Maireana microcarpa*		SG				X	
Chenopodiaceae	*Maireana microphylla*		SG	X	X		X	L
Chenopodiaceae	*Sclerolaena birchii*	galvanised burr	SG				X	
Clusiaceae	*Hypericum gramineum*	small St John's wort	FG	X	X			
Clusiaceae	*Hypericum perforatum*	St. Johns wort	FG	X				
Colchicaceae	*Wurmbea biglandulosa*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Colchicaceae	*Wurmbea dioica* subsp. *dioica*		FG				X	
Convolvulaceae	*Convolvulus erubescens*	blushing bindweed	OG		X		X	
Convolvulaceae	*Convolvulus graminetinus*		OG				X	
Convolvulaceae	*Dichondra repens*	kidney weed	FG	X	X	X	X	SD (all areas)
Convolvulaceae	*Dichondra sp. A*		FG				X	
Convolvulaceae	*Evolvulus alsinoides*		FG				X	
Convolvulaceae	*Polymeria calycina*		OG				X	
Crassulaceae	*Crassula sieberiana*	Australian stonecrop	FG		X		X	
Cupressaceae	*Callitris endlicheri*	black cypress pine	TG		X	X	X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Dilleniaceae	*Hibbertia acicularis*		SG				X	
Dilleniaceae	*Hibbertia diffusa*		SG				X	
Dilleniaceae	*Hibbertia linearis*		SG				X	
Dilleniaceae	*Hibbertia obtusifolia*	hoary guinea flower	SG		X		X	
Dilleniaceae	*Hibbertia pedunculata*		SG				X	
Epacridaceae	*Melichrus urceolatus*	Urn Heath	SG	X		X		
Ericaceae	*Acrotriche rigida*		SG		X			
Ericaceae	*Astroloma humifusum*	native cranberry	SG				X	
Ericaceae	*Styphelia triflora*	pink five-corner	SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Ericaceae	*Leucopogon juniperinus*	prickly beard heath	SG					
Ericaceae	*Leucopogon muticus*	blunt beard heath	SG				X	
Ericaceae	*Lissanthe strigosa*	peach heath	SG				X	
Ericaceae	*Melichrus urceolatus*	urn heath	SG				X	
Euphorbiaceae	*Chamaesyce dallachyana*		FG				X	
Euphorbiaceae	*Euphorbia drummondii*	caustic weed	FG	X	X		X	L
Euphorbiaceae	*Euphorbia planiticola*	plains spurge	FG		X		X	
Euphorbiaceae	*Phyllanthus hirtellus*	thyme spurge	SG				X	
Euphorbiaceae	*Phyllanthus virgatus*		FG	X	X	X	X	L (all areas)

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Caesalpinioideae)	*Cassia aciphylla*	sprawling cassia	SG	X				
Fabaceae (Caesalpinioideae)	*Senna artemisioides form taxon 'zygophylla'*		SG		X			
Fabaceae (Faboideae)	*Chorizema parviflorum*	eastern flame pea	SG				X	
Fabaceae (Faboideae)	*Cullen tenax*	emu grass	SG				X	
Fabaceae (Faboideae)	*Daviesia acicularis*		SG				X	
Fabaceae (Faboideae)	*Daviesia genistifolia*	broom bitter pea	SG	X			X	
Fabaceae (Faboideae)	*Daviesia ulicifolia*	gorse bitter pea	SG	X			X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Faboideae)	*Oxytes brachypodum*	large tick-trefoil	OG	X	X		X	L
Fabaceae (Faboideae)	*Desmodium rhytidophyllum*		OG				X	
Fabaceae (Faboideae)	*Grona varians*	slender tick-trefoil	OG	X	X	X	X	L (all areas)
Fabaceae (Faboideae)	*Glycine canescens*		OG				X	
Fabaceae (Faboideae)	*Glycine clandestina*		OG	X	X		X	L
Fabaceae (Faboideae)	*Glycine microphylla*		OG				X	
Fabaceae (Faboideae)	*Glycine stenophita*		OG		X			

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Faboideae)	*Glycine tabacina*	glycine	OG	X	X	X	X	L (all areas)
Fabaceae (Faboideae)	*Glycine tomentella*		OG				X	
Fabaceae (Faboideae)	*Hardenbergia violacea*	false sarsaparilla	OG	X	X		X	L
Fabaceae (Faboideae)	*Hovea longipes*		SG		X			
Fabaceae (Faboideae)	*Indigofera australis*	Australian indigo	SG				X	
Fabaceae (Faboideae)	*Jacksonia scoparia*	dogwood	SG		X			
Fabaceae (Faboideae)	*Podolobium ilicifolium*	prickly shaggy pea	SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Faboideae)	*Pultenaea microphylla*		SG	X			X	
Fabaceae (Faboideae)	*Pultenaea spinosa*	spiny bush-pea	SG				X	
Fabaceae (Faboideae)	*Rhynchosia minima*		FG		X			
Fabaceae (Faboideae)	*Swainsona galegifolia*	smooth-darling pea	FG		X		X	
Fabaceae (Faboideae)	*Templetonia stenophylla*	leafy templetonia	SG	X	X		X	
Fabaceae (Faboideae)	*Zornia dyctiocarpa*	zornia	FG	X				
Fabaceae (Mimosoideae)	*Acacia binervia*	coast myall	TG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Mimosoideae)	*Acacia amblygona*	fan wattle	SG		X		X	D L (Transitional and Depressions)
Fabaceae (Mimosoideae)	*Acacia bulgaensis*	Bulga wattle	SG			X		
Fabaceae (Mimosoideae)	*Acacia deanei*		SG				X	
Fabaceae (Mimosoideae)	*Acacia decora*	western golden wattle	SG	X	X		X	L
Fabaceae (Mimosoideae)	*Acacia doratoxylon*	currawang	SG				X	
Fabaceae (Mimosoideae)	*Acacia falcata*	hickory wattle	SG	X	X		X	D L (Transitional and Depressions)

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Mimosoideae)	*Acacia gunnii*	ploughshare wattle	SG		X			
Fabaceae (Mimosoideae)	*Acacia implexa*	hickory wattle	SG	X	X		X	D L (Transitional and Depressions)
Fabaceae (Mimosoideae)	*Acacia leiocalyx* subsp. *leiocalyx*		SG					
Fabaceae (Mimosoideae)	*Acacia melvillei*	myall	SG		X			
Fabaceae (Mimosoideae)	*Acacia paradoxa*	kangaroo-thorn	SG		X		X	
Fabaceae (Mimosoideae)	*Acacia parvipinnula*	silver-stemmed wattle	SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Mimosoideae)	*Acacia pendula*	weeping myall	SG		X	X	X	
Fabaceae (Mimosoideae)	*Acacia salicina*	cooba	TG	X			X	
Fabaceae (Mimosoideae)	*Acacia spectabilis*		SG				X	
Fabaceae (Mimosoideae)	*Acacia ulicifolia*	prickly Moses	SG				X	
Fabaceae (Mimosoideae)	*Acacia uncinata*	gold-dust wattle	SG				X	
Fabaceae (Mimosoideae)	*Acacia vestita*	weeping boree	SG				X	
Fabaceae (Mimosoideae)	*Neptunia gracilis f. gracilis*	trigger plant	FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Geraniaceae	*Geranium homeanum*		FG	X			X	L
Geraniaceae	*Geranium solanderi*	native geranium	FG	X			X	L
Geraniaceae	*Pelargonium inodorum*		FG				X	
Goodeniaceae	*Goodenia glabra*		FG				X	
Goodeniaceae	*Goodenia hederacea*	forest goodenia	FG				X	
Goodeniaceae	*Goodenia macbarronii*		FG				X	
Goodeniaceae	*Goodenia ovata*		FG				X	
Goodeniaceae	*Goodenia pinnatifida*		FG				X	
Goodeniaceae	*Goodenia rotundifolia*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Goodeniaceae	*Brunonia australis*	blue pincushion	FG	X			X	
Haloragaceae	*Haloragis heterophylla*		FG				X	
Haloragaceae	*Haloragis serra*		FG		X			
Hypericaceae	*Hypericum gramineum*	small St John's wort	FG				X	
Hypoxidaceae	*Hypoxis hygrometrica*	golden weather grass	FG				X	
Lamiaceae	*Ajuga australis*	Austral bugle	FG		X	X	X	L
Lamiaceae	*Mentha diemenica*		FG				X	
Lamiaceae	*Mentha satureioides*	native pennyroyal	FG	X			X	
Lamiaceae	*Plectranthus graveolens*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Lamiaceae	*Plectranthus parviflorus*		FG				X	
Lamiaceae	*Salvia plebeia*	Austral sage	FG		X			
Lamiaceae	*Spartothamnella juncea*	bead bush	SG		X			
Lamiaceae	*Teucrium junceum*		SG				X	
Linaceae	*Linum marginale*		FG				X	
Lamiaceae	*Scutellaria humilis*	dwarf skullcap	FG				X	
Lobeliaceae	*Pratia purpurascens*	whiteroot	FG	X	X		X	L
Sterculeacea	*Brachychiton populneus* subp. *populneus*	kurrajong	TG	X	X	X	X	SD
Malvaceae	*Abutilon oxycarpum*		FG				X	
Malvaceae	*Melhania oblongifolia*		SG		X			

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Malvaceae	*Sida corrugata*	corrugated sida	FG	X	X		X	
Malvaceae	*Sida cunninghamii*		FG				X	
Malvaceae	*Sida filiformis*		FG				X	
Malvaceae	*Sida hackettiana*		FG				X	
Malvaceae	*Malvastrum coromandelianum*	prickly malvastrum	FG		X		X	
Meliaceae	*Melia azedarach*	white cedar	TG	X			X	
Myoporaceae	*Eremophila debilis*	Amulla	FG	X	X	X	X	SD (Transitions and Depressions)
Myrsinaceae	*Myrsine variabilis*		TG				X	
Myrtaceae	*Angophora floribunda*	rough-barked apple	TG	X	X	X	X	D (Depressions)

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
								D (Transitional)
Myrtaceae	*Corymbia maculata*	spotted gum	TG				X	
Myrtaceae	*Eucalyptus albens*	White box	TG				X	
Myrtaceae	*Eucalyptus blakelyi*	Blakely's red gum	TG				X	
Myrtaceae	*Eucalyptus crebra*	narrow-leaved Ironbark	TG	X	X	X	X	D SD (Depressions)
Myrtaceae	*Eucalyptus dawsonii*	slaty box	TG				X	
Myrtaceae	*Eucalyptus dwyeri*	Dwyer's red gum	TG				X	
Myrtaceae	*Eucalyptus fibrosa*	Red ironbark	TG				X	
Myrtaceae	*Eucalyptus glaucina*	slaty red gum	TG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Myrtaceae	*Eucalyptus microcarpa*	grey box	TG				X	
Myrtaceae	*Eucalyptus moluccana*	grey box	TG	X	X	X	X	D SD (Depressions)
Myrtaceae	*Eucalyptus punctata*	grey gum	TG				X	
Myrtaceae	*Eucalyptus tereticornis*	forest red gum	TG	X			X	D (Depressions) SD (Transitional)
Myrtaceae	*Leptospermum polygalifolium*	tantoon	SG				X	
Myrtaceae	*Melaleuca decora*		SG				X	
Myrtaceae	*Melaleuca sieberi*		SG				X	
Myrtaceae	*Melaleuca thymifolia*		SG				X	
Myrtaceae	*Micromyrtus ciliata*		SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Nyctaginaceae	*Boerhavia dominii*	tarvine	OG		X			
Oleaceae	*Notelaea longifolia*	large mock olive	SG				X	
Oleaceae	*Notelaea microcarpa var. microcarpa*	mock olive	SG	X	X	X	X	D L (Transitional and Depressions)
Oxalidaceae	*Oxalis chnoodes*		FG				X	
Oxalidaceae	*Oxalis exilis*		FG				X	
Oxalidaceae	*Oxalis radicosa*		FG		X			
Oxalidaceae	*Oxalis perennans*		FG	X			X	
Oxalidaceae	*Oxalis radicosa*		FG				X	
Phormiaceae	*Dianella caerulea*	blue flax-lily	FG	X	X		X	L

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Phormiaceae	*Dianella longifolia*	blueberry lily	FG	X	X		X	L
Phormiaceae	*Dianella revoluta*	blue flax-lily	FG	X			X	
Phormiaceae	*Dianella revoluta* var. *revoluta*	blue flax-lily	FG		X			
Phormiaceae	*Dianella tasmanica*		FG				X	
Phyllanthaceae	*Breynia oblongifolia*	coffee bush	SG	X	X	X	X	
Phyllanthaceae	*Poranthera microphylla*		FG				X	
Pittosporaceae	*Bursaria spinosa*	blackthorn	SG		X	X	X	L (all areas)
Plantaginaceae	*Plantago debilis*		FG	X	X		X	L
Plantaginaceae	*Plantago gaudichaudii*	narrow plantain	FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Plantaginaceae	*Plantago hispida*		FG		X		X	
Polygalaceae	*Polygala japonica*		FG				X	
Proteaceae	*Grevillea montana*		SG				X	
Portulacaceae	*Portulaca oleraceae*		FG				X	
Proteaceae	*Hakea sericea*	needlebush	SG					
Proteaceae	*Persoonia linearis*	narrow-leaved geebung	SG				X	
Proteaceae	*Persoonia elliptica* subsp. *elliptica*		SG				X	
Ranunculaceae	*Clematis aristata*	old man's beard	OG				X	
Ranunculaceae	*Clematis glycinoides*		OG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Rhamnaceae	*Alphitonia excelsa*	red ash	TG				X	
Rhamnaceae	*Cryptandra amara*	bitter cryptandra	SG				X	
Rosaceae	*Acaena ovina*		FG				X	
Rosaceae	*Rubus parvifolius*	native raspberry	SG				X	
Rubiaceae	*Asperula conferta*	common woodruff	FG	X	X		X	L
Rubiaceae	*Opercularia diphylla*		FG				X	
Rubiaceae	*Opercularia hispida*		FG				X	
Rubiaceae	*Opercularia varia*		FG				X	
Rubiaceae	*Galium binifolium*		FG				X	

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Rubiaceae	*Galium gaudichaudii*		FG				X	
Rubiaceae	*Galium leiocarpum*		FG				X	
Rubiaceae	*Galium leptogonium*		FG				X	
Rubiaceae	*Galium liratum*		FG				X	
Rubiaceae	*Pomax umbellata*		FG				X	
Rubiaceae	*Psydrax odorata*	shiny-leaved canthium	SG		X		X	
Rutaceae	*Geijera salicifolia*		SG				X	
Santalaceae	*Choretrum sp. A*		SG				X	
Santalaceae	*Exocarpos cupressiformis*	native cherry	SG				X	
Santalaceae	*Exocarpos strictus*		SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Santalaceae	*Santalum lanceolatum*	northern sandalwood	SG		X		X	
Sapindaceae	*Dodonaea triangularis*		SG				X	
Sapindaceae	*Dodonaea viscosa*	sticky hop bush	SG	X	X	X	X	L
Scrophulariaceae	*Myoporum montanum*	water bush	SG	X	X		X	L
Scrophulariaceae	*Veronica calycina*		FG				X	
Scrophulariaceae	*Veronica plebeia*	trailing speedwell	FG	X	X		X	
Solanaceae	*Nicotiana megalosiphon subsp. megalosiphon*		SG		X			
Solanaceae	*Solanum americanum*		FG				X	
Solanaceae	*Solanum campanulatum*		SG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Central Hunter Box – Ironbark Woodland EEC[1], [2], [3]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Solanaceae	*Solanum brownii*		SG				X	
Solanaceae	*Solanum cinereum*	Narrawa burr	FG		X	X	X	
Solanaceae	*Solanum elegans*		FG		X			
Solanaceae	*Solanum stelligerum*		SG				X	
Solanaceae	*Solanum prinophyllum*	forest nighshade	FG				X	
Stackhousiaceae	*Stackhousia muricata*	western stackhousia	FG	X	X		X	L
Stackhousiaceae	*Stackhousia viminea*	slender stackhousia	FG	X	X		X	L
Thymeleaceae	*Pimelea curviflora*	rice flower	SG	X	X		X	L
Thymeleaceae	*Pimelea curviflora* var. *sericea*	rice flower	SG		X			

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Central Hunter Box – Ironbark Woodland EEC[1], [2], [3]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Thymeleaceae	*Pimelea latifolia*	rice flower	SG				X	
Thymeleaceae	*Pimelea linifolia*	rice flower	SG				X	
Verbenaceae	*Clerodendrum tomentosum*	hairy Clerodendrum	TG	X				
Verbenaceae	*Verbena gaudichaudii*		FG		X			

[1] Requirement for rehabilitation from DA 305-11-01

[2] Requirement for rehabilitation under 2013-6908 Approval

[3] This includes requirements for Central Hunter Box – Ironbark – Angophora Dominated Rehabilitation, Central Hunter Box – Ironbark – Ironbark Dominated Rehabilitation and Narrow-leaved Ironbark – Bulloak Open Forest. However in each of those instances, greater emphasis should be placed on presence of rough-barked apple (Angophora floribunda), narrow-leaved ironbark (Eucalyptus crebra) and bulloak (Allocasuarina luehmannii) respectively in the canopy species.

Note this species list excludes mistletoes, vines and orchids or plants otherwise unsuitable for planting Species in **Bold** print are recommended by OEH

Table A-1 - Recommended Species for Areas Proposed for Return to Central Hunter Box- Ironbark Woodland and Narrow-leaved Ironbark Spotted Gum Woodland

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Monocots								
Anthericaceae	*Arthropodium milleflorum*	pale vanilla-lily	FG	X	X		X	
Anthericaceae	*Arthropodium minus*		FG				X	
Anthericaceae	*Arthropodium* sp. B		FG				X	
Anthericaceae	*Laxmannia gracilis*	slender wire lily	FG		X	X	X	
Commelinaceae	*Commelina cyanea*	native wandering Jew	FG	X	X		X	
Commelinaceae	*Commelina ensifolia*		FG				X	
Commelinaceae	*Murdannia graminea*	grass lily	FG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Araliaceae	*Hydrocotyle laxiflora*	stinking pennywort	FG				X	
Araliaceae	*Hydrocotyle sibthorpioides*		FG				X	
Asparagaceae	*Arthropodium fimbriatus*		FG				X	
Asparagaceae	*Arthropodium strictus*		FG				X	
Asparagaceae	*Eustrephus latifolius*	wombat berry	GG	X			X	
Asparagaceae	*Lomandra confertifolia*		GG				X	
Asparagaceae	*Lomandra filiformis*	wattle matt-rush	GG	X	X		X	L
Asparagaceae	*Lomandra glauca*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asparagaceae	*Lomandra longifolia*	honey reed	GG	X	X		X	
Asparagaceae	*Lomandra multiflora*	many-flowered mat-rush	GG	X			X	L
Asparagaceae	*Lomandra multiflora* subsp. *multiflora*		GG	X	X	X		L
Asphodeleaceae	*Caesia parviflora*	pale grass lily	FG				X	
Asphodeleaceae	*Xanthorrhoea media*	grass tree	OG				X	
Cyperaceae	*Carex breviculmis*		GG				X	
Cyperaceae	*Carex inversa*	knob sedge	GG	X			X	
Cyperaceae	*Cyperus fulvus*		GG				X	
Cyperaceae	*Cyperus gracilis*	slender flat-sedge	GG	X			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Cyperaceae	*Cyperus laevis*		GG				X	
Cyperaceae	*Cyperus polystachyos*		GG				X	
Cyperaceae	*Fimbristylis dichotoma*	common fringe-sedge	GG	X	X		X	
Cyperaceae	*Lepidosperma gunnii*		GG				X	
Cyperaceae	*Lepidosperma laterale*		GG				X	
Cyperaceae	*Gahnia aspera*	rough saw sedge	GG				X	
Cyperaceae	Schoenus apogon	fluke bog rush	GG				X	
Cyperaceae	*Scleria mackaviensis*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Iridaceae	*Patersonia sericea*	silky purple-flag	FG				X	
Juncaceae	*Juncus continuus*		GG				X	
Juncaceae	*Juncus subsecundus*		GG				X	
Juncaceae	*Juncus usitatus*		GG				X	
Poaceae	*Aristida acuta*		GG				X	
Poaceae	*Aristida jerichoensis*		GG				X	
Poaceae	*Aristida leichhardtiana*		GG	X				
Poaceae	*Aristida lignosa*		GG		X			
Poaceae	*Aristida queenslandica* var. *queenslandica*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Aristida ramosa*	purple wiregrass	GG	X	X		X	SD
Poaceae	*Aristida vagans*	threeawn speargrass	GG	X	X		X	
Poaceae	*Aristida warburgii*		GG				X	
Poaceae	*Austrostipa ramosissima*		GG				X	
Poaceae	*Austrostipa scabra*	speargrass	GG	X			X	
Poaceae	*Austrostipa setacea*		GG				X	
Poaceae	*Austrostipa verticillata*	slender bamboo grass	GG	X			X	SD
Poaceae	*Bothriochloa biloba*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Bothriochloa decipiens*	red grass	GG	X			X	
Poaceae	*Bothriochloa macra*	red grass	GG	X	X		X	
Poaceae	*Cenchrus caliculatus*		GG				X	
Poaceae	*Centrolepis strigosa subsp. strigosa*		GG				X	
Poaceae	*Chloris divaricata* var. *divaricata*		GG				X	
Poaceae	*Chloris ventricosa*	tall chloris	GG	X			X	
Poaceae	*Chloris truncata*	wndmill grass	GG	X			X	
Poaceae	*Cymbopogon refractus*	barbed wire grass	GG	X	X	X	X	D

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Cynodon dactylon*	common couch	GG	X			X	
Poaceae	*Dichelachne micrantha*	shorthair plumegrass	GG		X		X	
Poaceae	*Digitaria brownii*	Brown's grass	GG				X	
Poaceae	*Digitaria diffusa*	open summer grass	GG	X			X	
Poaceae	*Digitaria divaricatissima*		GG				X	
Poaceae	*Digitaria parviflora*		GG				X	
Poaceae	*Digitaria ramularis*		GG				X	
Poaceae	*Echinopogon caespitosus* var. *caespitosus*	tufted hedgehog grass	GG		X	X	X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Echinopogon intermedius*		GG				X	
Poaceae	*Echinopogon ovatus*	hedgehog grass	GG		X		X	
Poaceae	*Elymus scaber*	wheatgrass	GG				X	
Poaceae	*Enteropogon acicularis*		GG	X			X	
Poaceae	*Entolasia marginata*	bordered panic	GG		X		X	
Poaceae	*Entolasia stricta*	wiry panic	GG		X	X	X	
Poaceae	*Eragrostis alveiformis*		GG				X	
Poaceae	*Eragrostis brownii*	Brown's lovegrass	GG	X			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Eragrostis elongata*	clustered lovegrass	GG				X	
Poaceae	*Eragrostis lacunaria*	purple lovegrass	GG				X	
Poaceae	*Eragrostis leptocarpa*	drooping lovegrass	GG		X		X	
Poaceae	*Eragrostis leptostachya*	paddock lovegrass	GG	X	X		X	
Poaceae	*Eriochloa pseudoacrotricha*	early spring grass	GG	X				
Poaceae	*Imperata cylindrica*	blady grass	GG				X	
Poaceae	*Lachnagrostis aemula*		GG				X	
Poaceae	*Leptochloa decipiens*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Oplismenus aemulus*	basket grass	GG	X			X	L
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass	GG	X	X	X	X	SD
Poaceae	*Panicum effusum*	poison panic	GG	X			X	
Poaceae	*Panicum queenslandicum*		GG				X	
Poaceae	*Panicum simile*	two-colour panic	GG	X			X	
Poaceae	*Paspalidium aversum*		GG				X	
Poaceae	*Paspalidium distans*		GG		X	X	X	
Poaceae	*Paspalidium gracile*		GG				X	
Poaceae	*Poa sieberiana*	tussock poa	GG	X			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Poa labillardierei*		GG	X			X	D
Poaceae	*Rytidosperma bipartitum*		GG				X	
Poaceae	*Rytidosperma carphoides*	short wallaby grass	GG	X				
Poaceae	*Rytidosperma fulvum*	wallaby grass	GG	X	X		X	
Poaceae	*Rytidosperma longifolium*		GG				X	
Poaceae	*Rytidosperma monticola*		GG				X	
Poaceae	*Rytidosperma pallidum*		GG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Rytidosperma pilosum*		GG				X	
Poaceae	*Rytidosperma racemosa*		GG	X			X	
Poaceae	*Rytidosperma semiannulare*		GG				X	
Poaceae	*Rytidosperma setaceum*		GG				X	
Poaceae	*Rytidosperma tenuior*		GG	X	X		X	
Poaceae	*Sorghum leiocladum*	wild sorghum	GG				X	
Poaceae	*Sporobolus caroli*	fairy grass	GG				X	
Poaceae	*Sporobolus creber*	slender rat's tail grass	GG	X			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Poaceae	*Sporobolus elongatus*	slender rats tail grass	GG		X		X	
Poaceae	*Tetrarrhena juncea*	wiry ricegrass	GG				X	
Poaceae	*Themeda triandra*	kangaroo grass	GG		X	X	X	SD
Pteridaceae	*Cheilanthes austrotenuifolia*	rock fern	FG				X	
Pteridaceae	*Cheilanthes distans*	bristly cloak fern	FG	X	X		X	L
Pteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	poison rock fern	FG	X	X	X	X	L
Zamiaceae	*Macrozamia flexuosa*		OG				X	
Dicots								

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Acanthaceae	*Brunoniella australis*	blue trumpet	FG	X			X	L
Acanthaceae	*Brunoniella pumilo*		FG				X	
Acanthaceae	*Pseuderanthemum variabile*		FG				X	
Acanthaceae	*Rostellularia adscendens*		FG				X	
Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	FG	X				
Amaranthaceae	*Alternanthera sp. A*		FG				X	
Apiaceae	*Centella asiatica*	pennnywort	FG	X			X	
Apiaceae	*Platysace ericoides*		FG				X	
Apiaceae	*Daucus glochidiautus*	native carrot	FG		X		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Apocynaceae	*Marsdenia viridiflora* subsp. *viridiflora*	native pear	OG				X	
Apocynaceae	*Parsonsia straminea*	common silkpod	OG				X	
Araliaceae	*Polyscias sambucifolia*	elderberry ash	SG				X	
Asphodeleaceae	*Geitonoplesium cymosum*	scrambling lily	OG				X	
Asphodeleaceae	*Tricoryne elatior*	yellow rush-lily	FG				X	
Asphodeleaceae	*Stypandra glauca*	nodding blue lily	FG				X	
Asteraceae	*Brachyscome microcarpa*		FG					
Asteraceae	*Brachyscome multifida*	rocky daisy	FG		X	X	X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Calocephalus citreus*	lemon beauty-heads	FG	X			X	
Asteraceae	*Calotis cuneata*	mountain Burr-daisy	FG	X			X	
Asteraceae	*Calotis cuneifolia*	purple burr-daisy	FG		X	X	X	
Asteraceae	*Calotis dentex*		SG				X	
Asteraceae	*Calotis lappulacea*	yellow burr-daisy	FG	X	X		X	
Asteraceae	*Cassinia aculeata*	dolly bush	SG	X	X		X	L
Asteraceae	*Cassinia cunninghamii*		SG				X	
Asteraceae	*Cassinia quinquefaria*		SG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Cassinia sifton*		SG				X	
Asteraceae	*Cassinia uncata*		SG				X	
Asteraceae	*Centipeda minima subsp. minima*		FG				X	
Asteraceae	*Chrysocephalum apiculatum*	common everlasting	FG	X	X	X	X	
Asteraceae	*Chrysocephalum semipapposum*		FG				X	
Asteraceae	*Coronidium scorpioides*		FG				X	
Asteraceae	*Cotula australis*		FG				X	
Asteraceae	*Cymbonotus lawsonianus*	bear's ear	FG	X			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Eclipta platyglossa*		FG				X	
Asteraceae	*Epaltes australis*	spreading nut-heads	FG		X		X	
Asteraceae	*Euchiton involucratus*	star cudweed	FG	X			X	
Asteraceae	*Euchiton sphaericus*		FG	X	X		X	L
Asteraceae	*Glossocardia bidens*	cobblers tack	FG		X		X	
Asteraceae	*Lagenophora gracilis*	slender lagenophora	FG				X	
Asteraceae	*Lagenophora stipitata*		FG				X	
Asteraceae	*Lagenifera stipitata*	blue bottle-daisy	FG	X				

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Minuria leptophylla*		FG				X	
Asteraceae	*Olearia elliptica* subsp. *elliptica*	sticky daisy-bush	SG				X	
Asteraceae	*Ozothamnus diosmifolius*	rice flower	SG		X			
Asteraceae	*Pimelea curviflora*		SG				X	
Asteraceae	*Pimelea linifolia*	slender rice flower	SG				X	
Asteraceae	*Podolepis jaceoides*	showy copper-wire daisy	FG				X	
Asteraceae	*Pseudognaphalium leteo-album*	Jersey cudweed	FG		X		X	
Asteraceae	*Rhodanthe anthemoides*	chamomile sunray	FG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Senecio prenanthoides*		FG				X	
Asteraceae	*Senecio quadridentatus*		FG				X	
Asteraceae	*Sigesbeckia orientalis* subsp. *orientalis*	Indian weed	FG				X	
Asteraceae	*Solenogyne bellioides*		FG				X	
Asteraceae	*Veronica calycina*	hairy speedwell	FG				X	
Asteraceae	*Vernonia cinerea* var.*cineria*		FG		X	X	X	L
Asteraceae	*Veronica plebeia*	Trailing speedwell	FG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Asteraceae	*Vittadinia cervicularis*		FG				X	
Asteraceae	*Vittadinia condyloides*		FG				X	
Asteraceae	*Vittadinia cuneata*	fuzzweed	FG	X			X	
Asteraceae	*Vittadinia dissecta*	dissected New Holland daisy	FG				X	
Asteraceae	*Vittadinia hispidula*		FG				X	
Asteraceae	*Vittadinia muelleri*	fuzzweed	FG	X				
Asteraceae	*Vittadinia pterochaeta*	rough fuzzweed	FG	X				
Asteraceae	*Vittadinia pustulata*		FG				X	
Asteraceae	*Vittadinia sulcata*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Bignoniaceae	*Pandorea pandorana* subsp. *pandorana*	wonga wonga vine	OG				X	
Boraginaceae	*Cynoglossum australe*		FG				X	
Campanulaceae	*Lobelia purpurascens*	whiteroot	FG	X	X	X		L
Campanulaceae	*Wahlenbergia communis*	Tufted bluebell	FG	X	X	X	X	L
Campanulaceae	*Wahlenbergia gracilenta*	Annual bluebell	FG	X				
Campanulaceae	*Wahlenbergia gracilis*	Australian bluebell	FG	X	X	X	X	L
Campanulaceae	*Wahlenbergia luteola*		FG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Campanulaceae	*Wahlenbergia planiflora*		FG				X	
Campanulaceae	*Wahlenbergia stricta*		FG				X	
Casuarinaceae	*Allocasuarina littoralis*		TG				X	
Casuarinaceae	*Allocasuarina luehmannii*	bulloak	TG	X	X	X	X	L
Casuarinaceae	*Allocasuarina torulosa*	forest oak	TG				X	
Casuarinaceae	*Allocasuarina verticillata*		TG				X	
Casuarinaceae	*Casuarina cunninghamiana* subsp. *cunninghamiana*	river oak	TG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Casuarinaceae	*Casuarina glauca*	swamp oak	TG				X	
Celastraceae	*Denhamia silvestris*		SG		X		X	
Celastraceae	*Stackhousia muricata*		FG				X	
Celastraceae	*Stackhousia viminea*		FG				X	
Chenopodiaceae	*Dysphania pumilio*		FG				X	
Chenopodiaceae	*Einadia hastata*		FG				X	
Chenopodiaceae	*Einadia nutans*	climbing saltbush	FG	X			X	
Chenopodiaceae	*Einadia trigonos*	fishweed	FG	X			X	
Chenopodiaceae	*Enchylaena tomentosa*	ruby saltbush	SG	X			X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Chenopodiaceae	*Maireana enchylaenoides*		FG				X	
Chenopodiaceae	*Maireana microphylla*		SG	X				
Clusiaceae	*Hypericum gramineum*	small St John's wort	FG	X	X	X		L
Clusiaceae	*Hypericum perforatum*	St. Johns wort	FG	X				
Convolvulaceae	*Calystegia marginata*		OG				X	
Convolvulaceae	*Dichondra repens*	kidney weed	FG	X	X	X	X	L
Convolvulaceae	*Dichondra sp. A*		FG				X	
Convolvulaceae	*Convolvulus erubescens*	bushing bindweed	OG				X	

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Convolvulaceae	*Polymeria calycina*		OG				X	
Crassulaceae	*Crassula colorata* var. *acuminata*		FG				X	
Crassulaceae	*Crassula decumbens* var. *decumbens*		FG				X	
Crassulaceae	*Crassula sieberiana*		FG				X	
Cupressaceae	*Callitris endlicheri*	black cypress pine	TG				X	
Dilleniaceae	*Hibbertia aspera*	rough guinea flower	SG				X	
Dilleniaceae	*Hibbertia diffusa*	wedge guinea flower	SG		X		X	
Dilleniaceae	*Hibbertia fasciculata*		SG		X		X	

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Dilleniaceae	*Hibbertia linearis*		SG		X		X	
Dilleniaceae	*Hibbertia monogyna*		SG				X	
Dilleniaceae	*Hibbertia obtusifolia*	hoary guinea flower	SG		X		X	
Dilleniaceae	*Hibbertia pedunculata*		SG				X	
Dilleniaceae	*Hibbertia riparia*	erect guinea flower	SG				X	
Epacridaceae	*Melichrus urceolatus*	urn Heath	SG	X	X	X		L
Ericaceae	*Leucopogon juniperinus*	prickly beard heath	SG		X		X	
Ericaceae	*Lissanthe strigosa*	peach heath	SG		X	X	X	
Ericaceae	*Melichrus urceolatus*	Urn heath	SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Ericaceae	*Styphelia triflora*	pink five-corner	SG				X	
Euphorbiaceae	*Euphorbia drummondii*	caustic weed	FG	X			X	
Euphorbiaceae	*Euphorbia pappillifolia*		FG				X	
Euphorbiaceae	*Euphorbia planiticola*		FG				X	
Euphorbiaceae	*Phyllanthus hirtellus*	thyme spurge	SG		X			
Euphorbiaceae	*Phyllanthus virgatus*		FG	X	X			
Fabaceae (Caesalpinioideae)	*Cassia aciphylla*	sprawling cassia	SG	X				
Fabaceae (Faboideae)	*Bossiaea neo-anglica*		SG				X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Faboideae)	*Bossiaea prostrata*		FG				X	
Fabaceae (Faboideae)	*Bossiaea rhombifolia*		SG				X	
Fabaceae (Faboideae)	*Bossiaea scortechinii*		SG				X	
Fabaceae (Faboideae)	*Chorizema parviflorum*	eastern flame pea	SG				X	
Fabaceae (Faboideae)	*Crotalaria montana var. angustifolia*		FG				X	
Fabaceae (Faboideae)	*Daviesia acicularis*		SG				X	
Fabaceae (Faboideae)	*Daviesia genistifolia*	Broom bitter Pea	SG	X			X	

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					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Fabaceae (Faboideae)	*Daviesia ulicifolia*	gorse bitter pea	SG	X		X	X	L
Fabaceae (Faboideae)	*Daviesia ulicifolia* subsp. *ulicifolia*		SG		X			
Fabaceae (Faboideae)	*Desmodium brachypodum*	large tick-trefoil	FG	X	X		X	L
Fabaceae (Faboideae)	*Desmodium rhytidophylum*		FG				X	
Fabaceae (Faboideae)	*Desmodium varians*	slender tick-trefoil	OG	X	X	X	X	L
Fabaceae (Faboideae)	*Glycine clandestina*		OG	X	X	X	X	L
Fabaceae (Faboideae)	*Glycine microphylla*		OG				X	

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Fabaceae (Faboideae)	*Glycine tabacina*	glycine	OG	X	X	X	X	L
Fabaceae (Faboideae)	*Glycine tomentella*		OG				X	
Fabaceae (Faboideae)	*Dillwynia retorta*		SG				X	
Fabaceae (Faboideae)	*Hardenbergia violacea*	false sarsaparilla	G	X	X		X	L
Fabaceae (Faboideae)	*Hovea linearis*		FG				X	
Fabaceae (Faboideae)	*Indigofera australis*	Australian indigo	SG		X		X	
Fabaceae (Faboideae)	*Jacksonia scoparia*	dogwood	SG				X	

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Fabaceae (Faboideae)	*Kennedia prostrata*	scarlet coral pea	OG				X	
Fabaceae (Faboideae)	*Lotus australis*	Australian trefoil	FG				X	
Fabaceae (Faboideae)	*Mirbelia platylobioides*		SG				X	
Fabaceae (Faboideae)	*Platylobium formosum*	handsome flat pea	SG				X	
Fabaceae (Faboideae)	*Podolobium ilicifolium*	prickly shaggy pea	SG				X	
Fabaceae (Faboideae)	*Podolobium scandens*	netted shaggy pea	SG				X	
Fabaceae (Faboideae)	*Pultenaea linophylla*	halo bush pea	SG				X	

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Fabaceae (Faboideae)	*Pultenaea microphylla*		SG	X	X		X	
Fabaceae (Faboideae)	*Pultenaea spinosa*	spiny bush-pea	SG		X	X	X	L
Fabaceae (Faboideae)	*Templetonia stenophylla*	leafy templetonia	FG	X			X	
Fabaceae (Faboideae)	*Zornia dyctiocarpa*	zornia	FG	X			X	
Fabaceae (Mimosoideae)	*Acacia amblygona*	fan wattle	SG		X		X	
Fabaceae (Mimosoideae)	*Acacia binervia*		TG				X	
Fabaceae (Mimosoideae)	*Acacia brownii*		SG				X	

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Fabaceae (Mimosoideae)	*Acacia deanei*		SG				X	
Fabaceae (Mimosoideae)	*Acacia decora*	western golden wattle	SG	X			X	
Fabaceae (Mimosoideae)	*Acacia elongata*		SG					
Fabaceae (Mimosoideae)	*Acacia falcata*	hickory wattle	SG	X	X	X	X	L
Fabaceae (Mimosoideae)	*Acacia filicifolia*		SG				X	
Fabaceae (Mimosoideae)	*Acacia implexa*	hickory wattle	SG	X			X	
Fabaceae (Mimosoideae)	*Acacia irrorata*		SG				X	

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Fabaceae (Mimosoideae)	*Acacia leiocalyx* subsp. *leiocalyx*		SG				X	
Fabaceae (Mimosoideae)	*Acacia paradoxa*		SG				X	
Fabaceae (Mimosoideae)	*Acacia parvipinnula*	silver-stemmed wattle	SG		X	X	X	
Fabaceae (Mimosoideae)	*Acacia salicina*	cooba	TG	X			X	
Fabaceae (Mimosoideae)	*Acacia ulicifolia*		SG				X	
Geraniaceae	*Geranium homeanum*		FG	X				
Geraniaceae	*Geranium solanderi*	native geranium	FG	X			X	L

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Goodeniaceae	*Goodenia hederacea* subsp. *hederacea*	forest goodenia	FG		X		X	
Goodeniaceae	*Goodenia rotundifolia*		FG		X		X	
Haloragaceae	*Gonocarpus tetragynus*		FG				X	
Haloragaceae	*Haloragis heterophylla*		FG				X	
Hypericaceae	*Hypericum gramineum*	small St Johns wort	FG				X	
Hypoxidaceae	*Hypoxis hygrometrica*	golden weather grass	FG				X	
Lamiaceae	*Ajuga australis*	Austral bugle	FG		X		X	
Lamiaceae	*Mentha diemenica*		FG				X	

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Lamiaceae	*Mentha satureioides*	native pennyroyal	FG	X			X	
Lamiaceae	*Scutellaria humilis*	dwarf skullcap	FG				X	
Lamiaceae	*Teucrium junceum*		SG				X	
Lauraceae	*Cassytha glabella*		OG				X	
Lauraceae	*Cassytha pubescens*		OG				X	
Linaceae	*Linum marginale*		FG				X	
Lobeliaceae	*Lobelia gibbosa*	tall lobelia	FG				X	
Lobeliaceae	*Lobelia purpurascens*	whiteroot	FG				X	
Loganiaceae	*Mitrasacme alsinoides*		FG		X		X	

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Loganiaceae	*Orianthella pusilla*		FG				X	
Malvaceae	*Sida corrugata*	corrugated sida	FG	X			X	
Meliaceae	*Melia azedarach*	white cedar	TG	X			X	
Moraceae	*Ficus rubiginosa*	rusty fig	TG				X	
Myoporaceae	*Eremophila debilis*	Amulla	FG	X	X	X	X	SD
Myrtaceae	*Angophora floribunda*	rough-barked apple	TG				X	
Myrtaceae	*Callistemon linearis*	narrow-leaved bottlebrush	SG				X	
Myrtaceae	*Calytrix tetragona*	common fringe-myrtle	SG				X	
Myrtaceae	*Corymbia maculata*	spotted gum	TG	X	X	X	X	D

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Myrtaceae	*Eucalyptus amplifolia*	cabbage gum	TG				X	
Myrtaceae	*Eucalyptus beyeriana*		TG				X	
Myrtaceae	*Eucalyptus canaliculata*	grey gum	TG		X		X	
Myrtaceae	*Eucalyptus crebra*	narrow-leaved Ironbark	TG	X	X	X	X	D
Myrtaceae	*Eucalyptus eugenioides*		TG				X	
Myrtaceae	*Eucalyptus fergusonii*		TG				X	
Myrtaceae	*Eucalyptus fibrosa*	red ironbark	TG		X	X	X	
Myrtaceae	*Eucalyptus glaucina*	slaty red gum	TG			X	X	

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Myrtaceae	*Eucalyptus globoidea*		TG				X	
Myrtaceae	*Eucalyptus moluccana*	grey box	TG	X	X	X	X	
Myrtaceae	*Eucalyptus punctata*	grey gum	TG				X	
Myrtaceae	*Eucalyptus tereticornis*	forest red gum	TG	X	X	X	X	
Proteaceae	*Grevillea robusta*	silky oak	SG				X	
Myrtaceae	*Kunzea ambigua*	tick bush	SG		X		X	
Myrtaceae	*Kunzea ericoides*		SG				X	
Myrtaceae	*Leptospermum juniperinum*	prickly tea tree	SG				X	
Myrtaceae	*Leptospermum parvifolium*		SG				X	

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Myrtaceae	*Leptospermum polygalifolium*	tantoon	SG				X	
Myrtaceae	*Melaleuca decora*		SG				X	
Myrtaceae	*Melaleuca nodosa*	prickly-leaved paperbark	SG				X	
Myrtaceae	*Melaleuca sieberi*		SG				X	
Myrtaceae	*Melaleuca thymifolia*	thyme honey-myrtle	SG				X	
Myrtaceae	*Sannantha pluriflora*		SG				X	
Oleaceae	*Jasminum volubile*	stiff jasmine	OG				X	
Oleaceae	*Notelaea longifolia*	large mock-olive	TG		X		X	L

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Oleaceae	*Notelaea microcarpa*		TG				X	
Oxalidaceae	*Oxalis chnoodes*		FG		X		X	
Oxalidaceae	*Oxalis exilis*		FG		X		X	
Oxalidaceae	*Oxalis perennans*		FG	X	X		X	
Oxalidaceae	*Oxalis radicosa*		FG				X	
Oxalidaceae	*Oxalis rubens*		FG		X		X	
Phormiaceae	*Dianella caerulea*	blue flax-lily	FG		X		X	
Phormiaceae	*Dianella longifolia*	blueberry lily	FG	X	X		X	
Phormiaceae	*Dianella revoluta* var. *revoluta*	blue flax-lily	FG	X	X	X	X	
Phormiaceae	*Dianella tasmanica*		FG				X	

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Phyllanthaceae	*Breynia oblongifolia*	coffee bush	SG	X	X	X	X	L
Phyllanthaceae	*Phyllanthus gunnii*		SG				X	
Phyllanthaceae	*Phyllanthus hirtellus*		SG				X	
Phyllanthaceae	*Phyllanthus virgatus*		FG				X	
Phyllanthaceae	*Poranthera microphylla*		FG				X	
Pittosporaceae	*Billardiera scandens*	hairy apple berry	V				X	
Pittosporaceae	*Bursaria spinosa*	blackthorn	M		X	X	X	L
Pittosporaceae	*Pittosporum undulatum*	mock orange	M	X			X	
Plantaginaceae	*Plantago debilis*		FG	X	X		X	L

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Plantaginaceae	*Plantago gaudichaudii*	narrow plantain	FG		X		X	
Plantaginaceae	*Plantago hispida*		FG				X	
Polygalaceae	*Polygala japonica*	dwarf milkwort	FG				X	
Proteaceae	*Grevillea montana*		SG		X		X	
Proteaceae	*Hakea sericea*	needlebush	SG		X	X	X	
Proteaceae	*Persoonia linearis*	narrow-leaved geebung	SH	X	X		X	L
Proteaceae	*Persoonia pauciflora*	North Rothbury persoonia	SG		X		X	
Ranunculaceae	*Clematis aristata*	old man's beard	OG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Ranunculaceae	*Clematis glycinoides*	headache vine	OG				X	
Ranunculaceae	*Ranunculus lappaceus*	pastel flower	FG				X	
Rhamnaceae	*Alphitonia excelsa*	red ash	T				X	
Rhamnaceae	*Cryptandra amara*	bitter cryptandra	SG				X	
Rubiaceae	*Asperula conferta*	common woodruff	FG	X	X		X	L
Rubiaceae	*Galium binifolium*		FG				X	
Rubiaceae	*Galium gaudichaudii*		FG				X	
Rubiaceae	*Galium propinquum*	Maori bedstraw	FG	X				

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Rubiaceae	*Opercularia aspera*		FG				X	
Rubiaceae	*Opercularia diphylla*		FG		X	X	X	L
Rubiaceae	*Opercularia hispida*		FG				X	
Rubiaceae	*Opercularia varia*		FG				X	
Rubiaceae	*Pomax umbellata*		FG		X	X	X	
Rubiaceae	*Psydrax odorata*	shiny-leaved canthium	SG				X	
Santalaceae	*Choretrum sp. A*		sG				X	
Santalaceae	*Exocarpos cupressiformis*	native cherry	SG				X	
Santalaceae	*Exocarpos strictus*	dwarf cherry	SG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Sapindaceae	*Dodonaea viscosa*	sticky hop bush	SG	X			X	
Scrophulariaceae	*Myoporum montanum*	water bush	SG	X			X	L
Scrophulariaceae	*Veronica plebeia*	trailing speedwell	FG	X	X			
Solanaceae	*Solanum brownii*	violet nightshade	SG	X			X	L
Solanaceae	*Solanum cinerea*	Narrawa burr	SG	X			X	
Solanaceae	*Solanum papaverifolium*		FG		X		X	
Solanaceae	*Solanum prinophyllum*	forest nightshade	FG	X	X	X	X	L
Solanaceae	*Solanum pungetium*		FG				X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Narrow-Leaved Ironbark – Spotted Gum Woodland EEC[1]			Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	*Scientific Determination (2010)*	*VIS Classification (2023)*	
Solanaceae	*Solanum stelligerum*	devil's needles	SG				X	
Stackhousiaceae	*Stackhousia viminea*	slender stackhousia	FG	X	X	X	X	L
Sterculeacea	*Brachychiton populneus* subp. *populneus*	kurrajong	TG	X			X	
Verbenaceae	*Clerodendrum tomentosum*	hairy Clerodendrum	TG	X			X	
Violaceae	*Hybanthus monopetalus*	slender violet-bush	FG				X	
Vitaceae	*Cayratia clematidea*	native grape	OG				X	

[1] Requirement for rehabilitation from DA 305-11-01

[2] Requirement for rehabilitation under 2013-6908 Approval

[3] This includes requirements for Central Hunter Box – Ironbark – Angophora Dominated Rehabilitation, Central Hunter Box – Ironbark – Ironbark Dominated Rehabilitation and Narrow-leaved Ironbark – Bulloak Open Forest. However in each of those instances, greater emphasis should be placed on presence of rough-barked apple (Angophora floribunda), narrow-leaved ironbark (Eucalyptus crebra) and bulloak (Allocasuarina luehmannii) respectively in the canopy species.

Note this species list excludes mistletoes, vines and orchids or plants otherwise unsuitable for planting. Species in **Bold** print are recommended by OEH

Table B-3 - Recommended Planting List for Areas Proposed for Return to Spotted Gum Forest (in Mitchell Hills South)

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Monocots						
Asparagaceae	*Arthropodium species B*		G		X	
Cyperaceae	*Cyperus gracilis*		G	X		
Cyperaceae	*Cyperus laevis*		G		X	
Cyperaceae	*Fimbristylis dichotoma*	common fringe-sedge	G		X	
Cyperaceae	*Gahnia aspera*		M		X	
Cyperaceae	*Gahnia clarkei*	tall saw-sedge	M	X		
Cyperaceae	*Lepidosperma laterale*	flat sedge	G		X	
Cyperaceae	*Scleria mackaviensis*		G		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Asparagaceae	*Lomandra multiflora* subsp. *multiflora*		G	X	X	
Asparagaceae	*Lomandra longifolia*		G	X	X	SD
Asphodelaceae	*Dianella caerulea*	blue flax lily	G	X	X	
Asphodelaceae	*Dianella revoluta* var. *revoluta*		G	X	X	SD
Pteridaceae	*Adiantum aethiopicum*		G	X	X	L
Pteridaceae	*Adiantum hispidulum var. Hispidulum*		G		X	
Pteridaceae	*Pellaea paradoxa*		G		X	
Pteridaceae	*Pellaea calidirupium*		G		X	
Pteridaceae	*Cheilanthes distans*	bristly cloak fern	G		X	
Pteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	poison rock fern	G	X	X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Commelinaceae	*Commelina cyanea*	native wandering Jew	G		X	
Hypoxidaceae	*Hypoxis hygrometrica*	Golden weather grass	G		X	
Poaceae	*Aristida ramosa*	purple wiregrass	G	X	X	D
Poaceae	*Austrostipa verticillata*	slender bamboo grass				SD
Poaceae	*Bothriochloa decipiens*		G		X	
Poaceae	*Capillipedium spicigerum*		G	X	X	SD
Poaceae	*Cymbopogon refractus*	barbed wire grass	G	X	X	
Poaceae	*Echinopogon ovatus*	hedgehog grass	G		X	
Poaceae	*Dichelachne crinita*		G	X		

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Poaceae	*Dichelachne micrantha*	shorthair plume grass	G		X	
Poaceae	*Digitaria divaricatissimia*		G	X		
Poaceae	*Eragrostis leptostachya*		G		X	
Poaceae	*Entolasia marginata*		G		X	
Poaceae	*Entolasia stricta*		G		X	
Poaceae	*Imperata cylindrica*	blady grass	G		X	
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass	G	X	X	D
Poaceae	*Oplismenus aemulus*	basket grass	G	X	X	L
Poaceae	*Panicum effusum*		G	X		
Poaceae	*Panicum simile*		G		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Poaceae	*Paspalidium distans*		G		X	
Poaceae	*Poa labillardierei*	tussock	G	X	X	D
Poaceae	*Sorghum leiocladum*	wild sorghum	G	X	X	
Poaceae	*Sporobolus creber*	slender rats tail grass	G	X	X	
Poaceae	*Themeda australis*	kangaroo grass	G	X	X	
Dicots						
Acanthaceae	*Brunoniella australis*	blue trumpet	G		X	
Acanthaceae	*Brunoniella pumilio*		G		X	
Acanthaceae	*Pseuderanthemum variabile*	pastel flower	G		X	
Apiaceae	*Daucus glochidiatus*	native carrot	G		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Apiaceae	*Hydrocotyle peduncularis*		G		X	
Araliaceae	*Polyscias sambucifolia*	Elderberry ash	S		X	
Asteraceae	*Brachyscome multifida*	rocky daisy	G		X	
Asteraceae	*Cassinia aculeata*	dolly bush	M		X	
Asteraceae	*Craspedia variabilis*	common Billy buttons	G		X	
Asteraceae	*Cyanthilium cinereum*		G	X	X	L
Asteraceae	*Euchiton sphaericus*		G		X	
Asteraceae	*Glossogyne tannensis*		G		X	
Asteraceae	*Lagenifera stipitata*	blue bottle-daisy	G		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Asteraceae	*Ozothamnus diosmifolius*	rice flower	M		X	
Asteraceae	*Senecio hispidus*		M		X	
Asteraceae	*Sigesbeckia orientalis* subsp. *orientalis*	Indian weed	G	X	X	
Asteraceae	*Vittadinia cuneata*	fuzzweed	G	X		
Asteraceae	*Vittadinia hispidula*		G		X	
Lobeliaceae	*Lobelia purpurascens*	whiteroot	G	X	X	L
Campanulaceae	*Wahlenbergia communis*	tufted bluebell	G		X	
Campanulaceae	*Wahlenbergia gracilis*		G		X	
Casuarinaceae	*Allocasuarina torulosa*	forest oak	S		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Celastraceae	*Denhamia silvestris*	orange bark	S		X	
Convolvulaceae	*Dichondra repens*	kidney weed	G	X	X	SD
Dilleniaceae	*Hibbertia aspera* subsp. *aspera*		G		X	
Dilleniaceae	*Hibbertia diffusa*		M		X	
Dilleniaceae	*Hibbertia obtusifolia*	hoary guinea flower	M	X	X	L
Dilleniaceae	*Hibbertia scandens*		M		X	
Ebenaceae	*Diospyros australis*	black plum	M	X		SD
Ericaceae (Styphelioideae)	*Leucopogon juniperinus*	prickly beard heath	M		X	
Fabaceae (Faboideae)	*Desmodium brachypodum*	large tick-trefoil	M	X	X	
Fabaceae (Faboideae)	*Desmodium rhytidophyllum*		G	X	X	SD

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Fabaceae (Faboideae)	*Desmodium varians*		G	X	X	SD
Fabaceae (Faboideae)	*Glycine clandestina*		G	X	X	
Fabaceae (Faboideae)	*Glycine microphylla*		G		X	
Fabaceae (Faboideae)	*Glycine tabacina*		G	X	X	
Fabaceae (Faboideae)	*Hardenbergia violacea*	false sarsaparilla	G	X	X	
Fabaceae (Faboideae)	*Jacksonia scoparia*	dogwood	M		X	
Fabaceae (Faboideae)	*Kennedia rubicunda*		M		X	
Fabaceae (Faboideae)	*Podolobium ilicifolium*	prickly shaggy pea	M		X	
Fabaceae (Faboideae)	*Pultenaea rosmarinifolia*		M		X	
Fabaceae (Faboideae)	*Pultenaea spinosa*	spiny bush-pea	M		X	
Fabaceae (Faboideae)	*Viminaria juncea*	native broom	M		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Fabaceae (Mimosoideae)	*Acacia implexa*	hickory wattle	M	X	X	SD
Fabaceae (Mimosoideae)	*Acacia irrorata* subsp. *irrorata*	green wattle	M		X	
Fabaceae (Mimosoideae)	*Acacia longifolia subsp. longifolia*		M	X		L
Fabaceae (Mimosoideae)	*Acaia mearnsii*		M	X		L
Fabaceae (Mimosoideae)	*Acacia parvipinnula*	silver stemmed wattle	M		X	
Fabaceae (Mimosoideae)	*Acacia stricta*		M		X	
Fabaceae (Mimosoideae)	*Acacia ulicifolia*		M		X	
Fabaceae (Faboideae)	*Indigofera australis*	Australian indigo	M		X	
Goodeniacea	*Scaevola albida* var. *albda*		G		X	
Hypericaceae	*Hypericum gramineum*	small St Johns wort	G	X	X	L

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Lamiaceae	*Ajuga australis*	Austral bugle	G		X	
Lamiaceae	*Clerodendrum tomentosum*	downy chance tree	M		X	
Lamiaceae	*Plectranthus graveolens*		G		X	
Lamiaceae	*Plectranthus parviflorus*	cockspur flower	G		X	
Lamiaceae	*Scutellaria humilis*	dwarf skullcap	G		X	
Malvaceae	*Brachychiton populneus* subsp. *populneus*	kurrajong	S		X	
Menispermaceae	*Stephania japonica* var. *japonica*	snake vine	M		X	
Moraceae	*Ficus rubiginosa*	rusty fig	S	X		
Myrsinaceae	*Rapanea variabilis*	muttonwood	S		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Myrtaceae	*Angophora floribunda*	rough-barked apple	C	X	X	
Myrtaceae	*Corymbia maculata*	spotted gum	C	X		D
Myrtaceae	*Eucalyptus acmenioides*	white mahogany	C		X	
Myrtaceae	*Eucalyptus blakelyi*	Blakely's red gum	C	X		SD
Myrtaceae	*Eucalyptus blakelyi x tereticornis*		C	X		D
Myrtaceae	*Eucalyptus tereticornis*	Forest red gum	C	X		SD
Myrtaceae	*Eucalyptus canaliculata*	grey gum	C		X	
Myrtaceae	*Eucalyptus crebra*	narrow-leaved ironbark	C		X	
Myrtaceae	*Eucalyptus eugenioides*	thin-leaved stringybark	C		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Myrtaceae	*Eucalyptus globoidea*	white stringybark	C		X	
Myrtaceae	*Eucalyptus moluccana*	grey box	C	X		
Myrtaceae	*Eucalyptus punctata*	grey gum	C	X		SD
Myrtaceae	*Eucalyptus tereticornis*	forest red gum	C	X	X	
Myrtaceae	*Eucalyptus siderophloia*	grey ironbark	C		X	
Myrtaceae	*Eucalyptus sparsifolia*	narrow-leaved stringybark	C	X		
Oleaceae	*Notelaea longifolia*	large mock-olive	M		X	
Oleaceae	*Notelaea microcarpa* var. *microcarpa*	native olive	M	X	X	
Oxalidaceae	*Oxalis perennans*		G		X	
Phyllanthaceae	*Breynia oblongifolia*	coffee bush	M	X	X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Phyllanthaceae	*Phyllanthus gunnii*		M		X	
Phyllanthaceae	*Phyllanthus virgatus*		M		X	
Phyllanthaceae	*Poranthera microphylla*		G		X	
Pittosporaceae	*Billardiera scandens*	hairy apple berry	G		X	
Pittosporaceae	*Bursaria spinosa*	native blackthorn	M	X	X	SD
Pittosporaceae	*Pittosporum revolutum*	wild yellow jasmine	M		X	
Pittosporaceae	*Pittosporum undulatum*	mock orange	M	X	X	
Plantaginaceae	*Plantago debilis*		G		X	
Proteaceae	*Persoonia linearis*	narrow-leaved geebung	M	X	X	L
Rhamnaceae	*Pomaderris lanigera*	woolly pomaderris	M		X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Rubiaceae	*Opercularia diphylla*		G		X	
Rubiaceae	*Opercularia hispida*		G		X	
Rubiaceae	*Pomax umbellata*		G		G	
Rubiaceae	*Galium propinquum*	Maori bedstraw	G		X	
Rubiaceae	*Galium binifolium*		G		X	
Santalaceae	*Exocarpos cupressiformis*	native cherry	M		X	
Sapindaceae	*Dodonaea viscosa* subsp. *angustifolia*	sticky hop bush	M	X		D
Sapindaceae	*Dodonaea viscosa* subsp. *spatulata*	sticky hop bush	M	X		
Sapindaceae	*Dodonaea viscosa* subsp. *viscosa*	sticky hop bush	M	X		
Scrophulariaceae	*Eremophila debilis*	Amulla	G		X	
Scrophulariaceae	*Veronica plebeia*	trailing speedwell	G	X	X	L

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs	Barrington Footslopes Dry Spotted Gum Forest	Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)
					Peake (2006)	
Solanaceae	*Solanum brownii*	violet nightshade	M	X		
Solanaceae	*Solanum prinophyllum*	forest nighshade	G		X	
Solanaceae	*Solanum stelligerum*		M		X	
Stackhousiaceae	*Stackhousia viminea*	slender stackhousia	G		X	
Ulmaceae	*Aphananthe phillippinensis*	native elm	S		X	
Ulmaceae	*Trema tomentosa var. aspera*	poison peach	S		X	

Table B-4 - Recommended Planting List for Areas Proposed for Return to Hunter Valley River Oak Forest

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs		Hunter Valley River Oak Forest		Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)	
						Peake (2006)	VIS Classification (2023)		
Monocots									
Asparagaceae	*Eustrephus latifolius*			wombat berry	FG			X	
Asparagaceae	*Lomandra longifolia*	honey reed	FG	X		X	X	L	
Asparagaceae	*Lomandra multiflora* subsp. *multiflora*				FG			X	
Commelinaceae	*Commelina cyanea*	native wandering Jew	FG	X		X	X		
Cyperaceae	*Carex appressa*	tall sedge	GG	X		X	X	D	
Cyperaceae	*Carex inversa*			knob sedge	GG	X		X	L
Cyperaceae	*Carex incomitata*				GG			X	
Cyperaceae	*Carex tereticaulis*				GG			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs		Hunter Valley River Oak Forest		Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)	
						Peake (2006)	VIS Classification (2023)		
Cyperaceae	*Cyperus bifax*				GG			X	
Cyperaceae	*Cyperus gracilis*				GG			X	
Cyperaceae	*Cyperus vaginatus*				GG			X	
Cyperaceae	*Cyperus victoriensis*				GG			X	
Cyperaceae	*Schoenus apogon*		GG			X			
Cyperaceae	*Schoenoplectus validus*				GG			X	
Juncaceae	*Juncus ochrocoleus*				GG			X	
Juncaceae	*Juncus psammophilus*		GG				X		
Juncaceae	*Juncus subglaucus*				GG			X	
Juncaceae	*Juncus usitatus*				GG			X	

Family	*Scientific Name*	Common Name	Groundcover (G), Midstorey (M), Sub-Canopy (S) Canopy (C) or Wetland (W) Species	Species Previously Recorded at LCO or in BOAs		Hunter Valley River Oak Forest		Recommended Planting Intensity (D (dominant), SD (sub-dominant)) or L (low)	
						Peake (2006)	VIS Classification (2023)		
Poaceae	*Aristida ramosa*			purple wiregrass	GG	X		X	L
Poaceae	*Austrostipa aristiglumis*				GG			X	
Poaceae	*Austrostipa scabra* subsp. *scabra*			speargrass	GG	X		X	D
Poaceae	*Austrostipa verticillata*	slender bamboo grass	GG	X		X	X	D	
Poaceae	*Bothriochloa biloba*				GG			X	
Poaceae	*Bothriochloa decipiens* var. *decipiens*				GG			X	
Poaceae	*Bothriochloa macra*	red grass	GG	X			X	L	
Poaceae	*Chloris ventricosa*	tall chloris	GG	X			X	L	
Poaceae	*Cynodon dactylon*	common couch	GG	X		X	X	L	

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						Peake (2006)	VIS Classification (2023)		
Poaceae	*Dichanthium sericeum*				GG			X	
Poaceae	*Digitaria breviglumis*				GG			X	
Poaceae	*Echinochloa colona*				GG			X	
Poaceae	*Echinochloa telmatophila*		GG			X			
Poaceae	*Echinopogon intermedius*				GG			X	
Poaceae	*Echinopogon ovatus*	hedgehog grass	GG			X	X		
Poaceae	*Eragrostis alveiformis*				GG			X	
Poaceae	*Eragrostis elongata*				GG			X	
Poaceae	*Eragrostis leptostachya*				GG			X	
Poaceae	*Eriochloa pseudoacrotricha*				GG			X	

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						Peake (2006)	VIS Classification (2023)		
Poaceae	*Imperata cylindrica*				GG			X	
Poaceae	*Isolepis congrua*				GG			X	
Poaceae	*Lachnagrostis filiformis*				GG			X	
Poaceae	*Microlaena stipoides* var. *stipoides*	weeping grass	GG	X		X	X	D	
Poaceae	*Oplismenus aemulus*	basket grass	GG	X		X	X	L	
Poaceae	*Panicum effusum*				GG			X	
Poaceae	*Paspalidium distans*				GG			X	
Poaceae	*Paspalidium gracile*				GG			X	
Poaceae	*Paspalidium jubiflorum*				GG			X	
Poaceae	*Paspalum distichum*				GG			X	

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						Peake (2006)	VIS Classification (2023)		
Poaceae	*Phragmites australis*				GG			X	
Poaceae	*Poa labillardierei var. labillardierei*				GG			X	
Poaceae	*Poa sieberiana*				GG			X	
Poaceae	*Rytidosperma monticola*				GG			X	
Poaceae	*Rytidosperma racemosa* var. *racemosa*			wallaby grass	GG	X		X	L
Poaceae	*Sporobolus creber*			slender rats tail grass	GG	X		X	D
Poaceae	*Sporobolus elongatus*				GG			X	
Poaceae	*Urochloa foliosa*				GG			X	
Poaceae	*Urochloa piligera*				GG			X	

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					Peake (2006)	VIS Classification (2023)	
Polygonaceae	*Persicaria decipiens*	slender knotweed	FG		X	X	
Polygonaceae	*Persicaria hydropiper*		FG			X	
Polygonaceae	*Persicaria lapathifolia*		FG			X	
Polygonaceae	*Persicaria prostrata*		FG			X	
Pteridaceae	*Adiantum aethiopicum*		EG			X	
Pteridaceae	*Cheilanthes distans*	poison rock fern	EG			X	
Pteridaceae	*Cheilanthes sieberi* subsp. *sieberi*	poison rock fern	EG	X	X		L
Dicotyledons							
Amaranthaceae	*Alternanthera denticulata*	lesser joyweed	FG			X	

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					Peake (2006)	VIS Classification (2023)		
Amaranthaceae	*Nyssanthes diffusa*		FG		X	X		
Araliaceae	*Hydrocotyle acutiloba*			FG			X	
Araliaceae	*Hydrocotyle sibthorpioides*			FG			X	
Araliaceae	*Trachymene incisa subsp. incisa*			FG			X	
Asteraceae	*Brachyscome dissectifolia*			FG			X	
Asteraceae	*Brachyscome gracilis*			FG			X	
Asteraceae	*Cotula australis*	common cotula	FG		X			
Asteraceae	*Sigesbeckia orientalis* subsp. *orientalis*	Indian weed	FG		X	X		
Asteraceae	*Solenogyne bellioides*		FG		X			
Asteraceae	*Vittadinia cuneata*			FG			X	

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						Peake (2006)	VIS Classification (2023)		
Bignoniaceae	*Pandorea pandorana* subsp. *pandorana*			wonga wonga vine	OG			X	
Boraginaceae	*Cynoglossum australe*		FG	X		X		L	
Brassicaceae	*Lepidium fasciculatum*				FG			X	
Campanulaceae	*Wahlenbergia communis*				FG			X	
Campanulaceae	*Wahlenbergia gracilis*				FG			X	
Caryophyllaceae	*Stellaria pungens*	prickly starwort	FG			X			
Casuarinaceae	*Casuarina cunninghamiana subsp. cunninghamiana*	river oak	TG	X			X	D	
Casuarinaceae	*Casuarina glauca*	swamp oak	TG			X			
Chenopodiaceae	*Atriplex semibaccata*			creeping saltbush	SG			X	SD

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						Peake (2006)	VIS Classification (2023)		
Chenopodiaceae	*Dysphania pumilio*				FG			X	
Chenopodiaceae	*Einadia hastata*		FG			X	X		
Chenopodiaceae	*Einadia nutans*				FG			X	
Chenopodiaceae	*Einadia polygonoides*				FG			X	
Chenopodiaceae	*Einadia trigonos*				FG			X	
Chenopodiaceae	*Maireana microcarpa*				SG			X	
Chenopodiaceae	*Maireana microphylla*				SG			X	
Chenopodiaceae	*Salsola australis*				FG			X	
Convolvulaceae	*Convolvulus erubescens*	blushing bindweed	OG			X			
Convolvulaceae	*Dichondra repens*	kidney weed	FG	X		X	X	L	

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						Peake (2006)	VIS Classification (2023)		
Convolvulaceae	*Dichondra sp. A*				FG			X	
Cupressaceae	*Callitris glaucophylla*				TG			X	
Euphorbiaceae	*Euphorbia drummondii*			caustic weed	FG			X	
Euphorbiaceae	*Phyllanthus lacunarius*				SG			X	
Fabaceae (Faboideae)	*Glycine tabacina*				OG			X	
Fabaceae (Faboideae)	*Glycine clandestina*				OG			X	
Fabaceae (Faboideae)	*Glycine tomentella*				OG			X	
Fabaceae (Faboideae)	*Indigofera australis*			Australian indigo	SG			X	
Fabaceae (Mimosoideae)	*Acacia falcata*	sickle wattle	SG	X		X		L	

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					Peake (2006)	VIS Classification (2023)	
Fabaceae (Mimosoideae)	*Acacia longifolia*	Sydney golden wattle	SG		X		
Fabaceae (Mimosoideae)	*Acacia paradoxa*	kangaroo thorn	SG		X		
Fabaceae (Mimosoideae)	*Acacia salicina*		TG			X	
Fabaceae (Mimosoideae)	*Acacia stenophylla*		SG			X	
Geraniaceae	*Erodium crinitum*		FG			X	
Geraniaceae	*Geranium solanderi* var. *solanderi*	native geranium	FG	X	X	X	D
Haloragaceae	*Haloragis heterophylla*		FG			X	
Lamiaceae	*Plectranthus parviflorus*	cockspur flower	FG		X		

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						Peake (2006)	VIS Classification (2023)		
Lobeliaceae	*Pratia purpurascens*	whiteroot	FG	X		X	X	L	
Malvaceae	*Sida corrugata*				FG			X	
Malvaceae	*Sida trichopoda*				FG			X	
Malvaceae	*Abutilon oxycarpum*				FG			X	
Malvaceae	*Malvastrum coromandelianum*			prickly malvastrum	FG			X	
Meliaceae	*Melia azedarach*			white cedar	TG	X		X	L
Menispermaceae	*Stephania japonica* var. *discolor*			snake vine	OG			X	
Moraceae	*Ficus coronata*	sandpaper fig	TG			X			
Myrsinaceae	*Rapanea variabilis*	muttonwood	SG			X			

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						Peake (2006)	VIS Classification (2023)		
Myrtaceae	*Backhousia myrtifolia*	ironwood	TG			X			
Myrtaceae	*Angophora floribunda*	rough-barked apple	TG	X		X	X	SD	
Myrtaceae	*Callistemon sieberi*				SG			X	
Myrtaceae	*Callistemon viminalis*			river bottlebrush	SG			X	
Myrtaceae	*Eucalyptus blakelyi*			Blakely's red gum	TG			X	
Myrtaceae	*Eucalyptus camaldulenis*			River red gum	TG			X	
Myrtaceae	*Eucalyptus melliodora*			yellow box	TG			X	
Myrtaceae	*Eucalyptus tereticornis*	forest red gum	TG	X		X		SD	

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						Peake (2006)	VIS Classification (2023)		
Myrtaceae	*Leptospermum brachyandrum*				SG			X	
Myrtaceae	*Melaleuca bracteata*				SG			X	
Nyctaginaceae	*Boerhavia dominii*			tarvine	OG			X	
Oleaceae	*Notelaea microcarpa*				TG			X	
Oleaceae	*Notelaea venosa*	velvet mock-olive	SG			X			
Oxalidaceae	*Oxalis chnoodes*				FG			X	
Oxalidaceae	*Oxalis exilis*				FG			X	
Oxalidaceae	*Oxalis radicosa*				FG			X	
Oxalidaceae	*Oxalis perennans*				FG			X	
Pittosporaceae	*Bursaria spinosa*			native blackthorn	SG			X	

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						Peake (2006)	VIS Classification (2023)		
Plantaginaceae	*Plantago debilis*		FG	X		X	X	L	
Plantaginaceae	*Plantago gaudichaudii*	narrow plantain	FG			X			
Polygonaceae	*Rumex brownii*			swamp dock	FG	X		X	D
Portulacaceae	*Portulaca oleracea*				FG			X	
Ranunculaceae	*Clematis glycinoides*				FG			X	
Rosaceae	*Rubus parifolius*			native raspberry	FG			X	
Rubiaceae	*Asperula conferta*			common woodruff	FG			X	
Rubiaceae	*Galium propinquum*	Maori bedstraw	FG			X			

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					Peake (2006)	VIS Classification (2023)	
Scrophulariaceae	*Myoporum montanum*	water bush	SG		X		
Solanaceae	*Solanum americanum*			SG			X
Solanaceae	*Solanum opacum*			SG			X
Solanaceae	*Solanum prinophyllum*	forest nighshade	FG		X		
Ulmaceae	*Trema tomentosa*	native peach	TG		X		
Urticaceae	*Parietaria debilis*			Nntive pellitory FG			X
Urticaceae	*Urtica incisa*	stinging nettle	FG	X	X	X	SD
Verbenaceae	*Verbena gaudichaudii*			FG			X
Violaceae	*Melicytus dentatus*	tree violet	SG			X	
Vitaceae	*Cayratia clematidea* native grape	OG		X			

Appendix B -Fulfilled Completion Criteria

The following completion criteria have been fulfilled as a result of management actions undertaken.

Relevant Offset Area	Action	Completion Criteria	Year Action Completed
Habitat Augmentation			
All biodiversity offset areas	Salvage of habitat features (particularly for the spotted-tailed quoll) such as hollow-bearing trees, logs, stumps, large rocks and boulders.	Suitable habitat features identified during the pre-clearing process are salvaged. Salvaged features are either re-instated into areas with low levels of habitat features or stockpiled appropriately for later use. Timber or boulder piles will be constructed in riparian areas and areas of regeneration, revegetation and/or rehabilitation (as appropriate) to provide potential quoll denning habitat.	Appropriate habitat features have been salvaged. Salvaged habitat features are re-instated into areas of remnant vegetation lacking in habitat features or into rehabilitated vegetation. Appropriate spotted-tailed quoll habitat has been salvaged and placed into onsite rehabilitation areas. Habitat features that have been salvaged and are yet to be re-instated are in appropriate storage. Appropriate documentation is available of any habitat features salvaged.
Fencing and Signage			
All biodiversity offset areas	Install or repair boundary fences restricting unauthorised access to property and controlling livestock movements	All biodiversity offset areas will have boundary fencing of appropriate design and condition.	Main fencing completed during year 1 (2015) with minor boundary change rectification work completed in year 3 (2017)

Relevant Offset Area	Action	Completion Criteria	Year Action Completed
All biodiversity offset areas	Removal of redundant fences.	Redundant fences removed.	Mapping of redundant fences completed in year 1 (2015), with removal commencing during year 1 and being completed in year 3 (2017)
All biodiversity offset areas	Information signage for the spotted-tailed quoll.	Information signage for the spotted-tailed quoll has been installed and maintained.	Signage installation completed during year 1 (2015)
Creek and Drainage Line Protection			
Bowmans Creek Riparian Corridor	Fencing/protection of LCO controlled side of riparian corridor.	Riparian areas are adequately fenced/protected against damage from uncontrolled human or livestock access.	Bowmans Creek Riparian Corridor fenced during 2015
Regeneration and Revegetation Establishment			
All biodiversity offset areas	Mapping of appropriateness of target community for regeneration/revegetation and rehabilitation areas.	Target vegetation communities are appropriate to position in landscape and substrate.	Completed during year 2 (2016)
Bushfire Management			
All biodiversity offset areas	The bushfire management plan will be updated as a result of the modification*	The bushfire management plan was updated as a result of the modification*	The bushfire management plan was updated in 2016 to reflect the outcomes of Modification 5.
Conservation Mechanism			
All biodiversity offset areas	Establish an appropriate long-term conservation mechanism for the LCO BOAs	A Conservation Agreement for each BOA is approved and registered on land title.	Agreements executed in May 2019 and registered on title by October 2019.

Relevant Offset Area	Action	Completion Criteria	Year Action Completed
Tracks and Maintenance			
All biodiversity offset areas	Rehabilitation of unnecessary access tracks.	Tracks no longer required will be rehabilitated.	A review of tracks determined all remaining are required for access through the offset areas.
Pathogen Manegement			
All biodiversity offset areas	If reasonable potential for pathogens is identified in the biodiversity offset areas, appropriate pathogen monitoring and management protocols are developed and implemented.	Methods to identify potential pathogens are considered in monitoring program design (if reasonable potential of pathogen presence is identified onsite. Signs of pathogen presence (or potential presence) are immediately reported. If suspected to be onsite, detailed management actions are developed and implemented. There is no onsite infestation of *Phytophthora cinnamomi,* Myrtle rust or Chytridiomycosis.	Visual assessment included in monitoring program to identify presence of potential pathogens.