Australian Government

Department of Climate Change, Energy, the Environment and Water

EPBC 2010/5502

Mr Andrew Wright
Superintendent – Group Biodiversity
Whitehaven Coal Limited
231 Conadilly Street
Gunnedah NSW 2380
AWright@whitehavencoal.com.au

Approval of Offset Management Plan for Rocglen Coal Mine Extension Project, near Gunnedah, New South Wales

Dear Mr Wright

Thank you for your email dated 11 April 2025 to the Department of Climate Change, Energy, the Environment and Water (the department), seeking approval of a revision to the Offset Management Plan required under Condition 2 of the above project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Officers of the department have advised me on the Offset Management Plan and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment and Water (the Minister), I have decided to approve the *Yarrari-Belah Offset Management Plan, Edition 2 Rev. 0, 11 April 2025*.

Now this revised plan has been approved, it must be implemented.

As you are aware, the department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the department on request.

Should you require any further information please contact Tony Dowd by email to PostApproval@dcceew.gov.au.

Yours sincerely

Kate Gowland
Branch Head
Nature Positive Regulation Division | Environment Assessments (NSW, ACT) Branch

18 June 2025

YARRARI/BELAH OFFSET MANAGEMENT PLAN

(Offset Areas approved for the Rocglen Coal Mine EPBC Approval 2010/5502)

Prepared by Whitehaven Coal
ABN: 68 124 425 396

11 April 2025

Document History

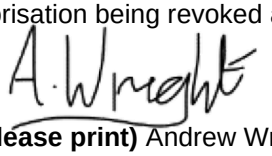
Edition	Rev.	Comments	Date
		Final draft of *Biodiversity Offset Management Plan – Whitehaven Regional Biodiversity Offset Site* (ELA 2013) for Biobank BOA	28 August 2013
1	0	Initial draft of a consolidated WHC BOMP to consolidate and standardise management requirements of subsidiary-owned WHC Biodiversity Offset Areas (Biobank, Kenna, Onsite, Werris and Willeroi) into one Management Plan.	10 March 2023
2	0	Revised draft of standalone Yarrari/Belah OMP for approval of Commonwealth DCCEEW after NSW DPHI requesting individual offset area management plans for each WHC Mining Operation. Where relevant, amendments have been made aligned with other OMP consultation undertaken with the Biodiversity, Conservation and Science Group (BCS) of the NSW DCCEEW and BCT for the Vickery and Maules OMPs to ensure consistency between documents.	21 January 2025
2	0	Final document for submission	11 April 2025

DECLARATION OF ACCURACY

In making this declaration, I:

a) am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations). The offence is punishable on conviction imprisonment or a fine, or both.

b) am authorised to bind Whitehaven Coal to this declaration and have no knowledge of that authorisation being revoked at the time of making this declaration.

Signature 

Full name (please print) Andrew Wright (Group Superintendent - Biodiversity)

Organisation (please print) Whitehaven Coal Mining Limited as the Approval Holder for EPBC 2010/5502

Date: 11 / 04 / 2025

CONTENTS

APPENDICES

FIGURES

TABLES

GLOSSARY AND ABBREVIATIONS

Acronym	Description
ASC	Australian Soil Classification
AWS	Automatic Weather Stations
BA	Biobanking Agreement
BBAM	Biobanking Assessment Method
BC Act	Biodiversity Conservation Act 2016
BCS	Biodiversity, Conservation and Science Group within NSW DCCEEW
BCT	Biodiversity Conservation Trust
BGW	Box Gum Woodland
BOA	Biodiversity Offset Area
BOMP	Biodiversity Offset Management Plan
BOS	Biodiversity Offset Strategy
CCM	Canyon Coal Mine
CDCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water (formerly Department of Agriculture, Water and the Environment [DAWE])
CEEC	Critically Endangered Ecological Community
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment, now Commonwealth Department of Climate Change, Energy, the Environment and Water (CDCCEEW)
DNG	Derived Native Grassland
DPE	Former NSW Department of Planning and Environment, now NSW Department of Planning, Housing and Infrastructure (DPHI) and NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW)
EEC	Endangered Ecological Community
ELA	Eco Logical Australia
EP	Ecoplanning
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
GBD	General Biosecurity Duty
GSG	Greater Soil Group
ha	Hectares
HTE	Hight Threat Exotic
IBRA	Interim Biogeographic Regionalisation for Australia
KTP	Key Threatening Process

Acronym	Description
LGA	Local Government Area
Yarrari and Belah BOA	Encompassing the Yarrari and Belah Offset Properties
NPWS	NSW National Parks and Wildlife Service
NSW	New South Wales
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
NSW DPHI	NSW Department of Planning, Housing and Infrastructure (formerly Office of Environment and Heritage [OEH])
NWRSWMP	North West Regional Strategic Weed Management Plan 2017 – 2022
OEH	Former Office of Environment and Heritage, now NSW Department of Planning, Housing and Infrastructure (DPHI)
OMP	Offset Management Plan
PCT	Plant Community Type
RBOS	Revised Biodiversity Offset Strategy
RFS	NSW Rural Fire Services
RCM	Rocglen Coal Mine
SSD	State Significant Development
TCM	Tarrawonga Coal Mine
TEC	Threatened Ecological Community
VCM	Vickery Coal Mine
VZ	Vegetation Zone
WHC	Whitehaven Coal Limited
WoNS	Weeds of National Significance

EXECUTIVE SUMMARY

Whitehaven Coal Limited (WHC) operates numerous coal mines within the Gunnedah Basin including the Rocglen Coal Mine (RCM). The Yarrari/Belah Offset Management Plan (OMP) has been prepared in accordance with the Commonwealth EPBC Approval 2010/5502 for RCM and provides a plan for the management of the WHC company-owned Biodiversity Offset Area (BOA) (previously referred to as the Biobank) that is comprised of the Belah and Yarrari properties. In addition to this OMP being prepared for EPBC Approval 2010/5502, this BOA has been used to retire Biodiversity Credits for the following WHC Mine Approval Biodiversity Offset Strategies (BOS):

- Rocglen Coal Mine (RCM) EPBC Approval 2010/5502 Condition 2b and NSW PA 10_0015 Schedule 3 Condition 23;
- Canyon Coal Mine (CCM) DA 8-1-2005 MOD2 Schedule 3 Condition 26 & 26A;
- Tarrawonga Coal Mine (TCM) legacy offset requirement from surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33 that is not a part of the contemporary Major Project Approval BOS in PA 11_1047; and
- Vickery Coal Mine (VCM) SSD-7480 Schedule B Condition B59 and EPBC Approval 2016/7649 Conditions 16 and 19.

This OMP describes the management methods to be applied to Yarrari and Belah BOA; that are based on standardised management actions implemented across all other WHC company-owned BOA properties, ensuring contemporary management methods are being applied effectively and efficiently to deliver the required ecological objectives of the various OMPs and in accordance with the State and Commonwealth Approval requirements for the BOA within this OMP.

Pending approval from Commonwealth DCCEEW; this OMP will supersede (in full) the previously approved management plan (Biobank [Whitehaven Regional Biodiversity Offset Site] BOMP [ELA 2013] approved by the former NSW Department of Planning [DoP now known as NSW DPHI] on 9 July 2013 and the former Commonwealth Department of Sustainability, Environment, Water, Population and Communities [DSEWPC now known as DCCEEW] on 23 December 2013).

1 INTRODUCTION

1.1 BACKGROUND

Whitehaven Coal Limited (WHC) operates numerous coal mines within the Gunnedah Basin (**Figure 1.1**) including the Rocglen Coal Mine (RCM). This Offset Management Plan (OMP) has been prepared to address the requirements of Condition 2 of the Commonwealth EPBC Approval 2010/5502 for RCM (approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) and has been guided by the *EPBC Act Environmental Offset Policy* (2012). In addition to this OMP being prepared for EPBC Approval 2010/5502, this OMP has been prepared to address the various State and Commonwealth approvals (Project Approvals and Development Consents under the NSW *Environmental Planning and Assessment Act* [EP&A Act] as well as approvals under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) that have retired Biodiversity Credits against Biobanking Agreement 43**,** comprising the Yarrari and Belah BOA (**Figure 1.2**). Details regarding each mine, its location, ownership and relevant approvals are summarised in **Table 1.1** and legally binding conservation covenant for the BOA is documented in **Table 1.2**.

Table 1.1: WHC Mine Locations, Ownership and NSW/Commonwealth Approval details

Mine	Location	Owner	State (NSW) Approval	Commonwealth EPBC Approval
Rocglen Coal Mine (RCM)	Approximately 22 km north of Gunnedah and 23 km east of Boggabri in the north-west region of NSW	Whitehaven Coal Mining Limited (a wholly owned subsidiary of WHC).	MP 10_0015 MOD 4 (October 2018)	EPBC 2010/5502 (21 December 2011)
Canyon Coal Mine (CCM)	Approximately 27 km north of Gunnedah and 13km to the east-southeast of Boggabri in the north-west region of NSW	Whitehaven Coal Mining Limited (a wholly owned subsidiary of WHC).	DA 8-1-2005 MOD 3 (September 2015)	Not Applicable
Tarrawonga Coal Mine (TCM) legacy offset;	Approximately 39 km north of Gunnedah and 15 km north-east of Boggabri in the north-west region of NSW	Whitehaven Coal Mining Limited (a wholly owned subsidiary of WHC).	Surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33 that is a legacy offset not a part of the contemporary Project Approval BOS in PA 11_1047	Not Applicable
Vickery Coal Mine (VCM)	Approximately 22 km north of Gunnedah and 15km south-east of Boggabri in the north-west region of NSW	Vickery Coal Pty Limited (a wholly owned subsidiary of WHC).	SSD 7480 (12 August 2020)	EPBC 2016/7649 (15 September 2021)

Table 1.2: Relevant Biodiversity Offset Areas (BOA) and Legally Binding Conservation Covenants

Mine	BOA	Offset Properties	Legally Binding Conservation Covenant
RCM	Yarrari & Belah BOA	Yarrari and Belah	Biobanking Agreement (BA) 43
CCM			
TCM*			
VCM			

TCM* - legacy offset requirement from surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33 that is not a part of the contemporary Major Project Approval BOS in MP 11_1047

1.2 APPROVAL CONDITIONS

The approval conditions for the RCM (2010/5502) are summarised in **Table 1.3**. The condition number and where the requirement has been addressed in this OMP is included in **Table 1.3**.

Table 1.3: Compliance with EPBC (2010/5502) approval conditions

Condition Number	Requirement	Relevant OMP Section
1	*The person taking the action must register a legally binding conservation covenant over the Whitehaven Regional Biodiversity Offset Site ("Yarrari" and "Belah") identified in the map at Appendix 1. The mechanism/s must provide enduring protection of the offset site and be registered within 2 years of the date of this approval.*	Section 4.1 addresses the Biodiversity Offset Strategy including credit and minimum area requirements. Section 4.2 addresses offset securement. Section 5.3.4 details the legally binding conservation covenant of the BOA.
2	*The person taking the action must submit to the Minister for approval an Offset Management Plan for the Whitehaven Regional Biodiversity Offset Site within 12 months of the date of this approval. The Offset Management Plan must contain details of measures to offset the impacts to the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community, Regent Honeyeater and Swift Parrot. The Offset Management Plan must be implemented.* *The Offset Management Plan must include, at a minimum, the following information:*	This OMP will be submitted to the Minister for approval.
	(a) A textual description and map to clearly define the location and boundaries of the Whitehaven Regional Biodiversity Offset Site. This must be accompanied with the offset attributes and a shapefile.	Section 1.1 details the property within the BOA. Also see Figure 1.1 and Figure 1.2, showing the location and boundaries

Condition Number	Requirement	Relevant OMP Section
	(b) Details of management actions to protect and enhance the extent and condition of habitat values of the offset site, including, but not limited to rehabilitation, weed control, fire management, erosion and sediment control, management of livestock and any restrictions on access of no less than: *i. 231.4 hectares of habitat for the Regent Honeyeater and Swift Parrot; and* *ii. 153 hectares White Box – Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community;*	Section 4.1.1 details how BA43 meets the BOS approval requirements. Section 5 details the management activities proposed, including: Rehabilitation: Section 5.5 provides details on the revegetation program within the BOA, as well as revegetation works completed Weed control: Section 5.9 provides details on the weed management program within the BOA, including seasonal weed assessment programs. Fire management: Section 5.13 details bushfire management within the BOA, including describing the annual ecological burn program. Erosion control: Section 5.11 provides details on erosion management and annual inspections within the BOA. Exclusion of livestock and restriction of access: Section 5.12 details exclusion of livestock within the BOA. Restriction of access via fencing and inspections is detailed in Section5.3.1. In addition, Section 3.4 details the previous land use history of the site and specifies when destocking occurred. Other monitoring and management actions include: Seed Management: Section 5.4 Ecological Thinning: Section 5.6 Habitat Augmentation: Section 5.7 Heritage Management: Section 5.8 Pest management: Section 5.10
	(c) The timing, responsibilities and performance criteria for management actions;	Section 1.6 discusses the responsibilities of management activities discussed within the OMP. Section 5.2 summarises the implementation schedule. Section 5.16 discusses performance and completion criteria

Condition Number	Requirement	Relevant OMP Section
	(d) a monitoring plan including the undertaking of ecological surveys by a qualified ecologist to assess the success of the management actions measured against identified milestones and objectives;	Section 5.14 discusses the flora monitoring program. Section 5.15 discusses the fauna monitoring program. Section 5.16 discusses performance and completion criteria
	(e) a process to report to the department, the progress of management actions undertaken in the Whitehaven Regional Biodiversity Offset Site and the outcomes of those actions, including identifying any need for improved management and actions to undertake such improvements;	Section 6.2.3 discusses the Commonwealth EPBC approval annual compliance reporting.
	(f) a description of the potential risks to successful management and rehabilitation in the Whitehaven Regional Biodiversity Offset Site and a description of the contingency measures that would be implemented to mitigate these risks; and	Section 5.17 discusses potential risks and contingency measures
	(g) details of the various parties responsible for management, monitoring and otherwise implementing the plan, including their position or status as a separate contractor.	Section 1.5 and Table 1.7 detail the persons responsible for implementation of the OMP, including management and monitoring activities.

The approval conditions for the Project Approval 10_0015 is summarised in **Table 1.4**. The condition number and where the requirement has been addressed in this OMP is included in **Table 1.4**.

Table 1.4: Compliance with Project Approval 10_0015

<table>
<tr><th>Condition Number</th><th>Condition</th><th>Relevant OMP Section</th></tr>
<tr><td colspan="3">SCHEDULE 3: ENVIRONMENTAL PERFORMANCE CONDITIONS</td></tr>
<tr><td colspan="3">Biodiversity Offset</td></tr>
<tr><td>23</td><td>By the end of June 2012, unless the Secretary agrees otherwise, the Proponent shall enter into a Biobanking agreement with the Minister for Environment and Heritage, in accordance with Part 7A of the Threatened Species Conservation Act 1995, to implement the Biodiversity Offset Strategy described in the EA (for the Whitehaven Regional Biobank Site), and summarised in Table 7;
Table 7: Biodiversity Offset Strategy to be implemented at the Whitehaven Regional Biobank Site
<table>
<tr><th>Total Vegetation Clearing</th><th>Minimum Offset to be provided</th></tr>
<tr><td>Total of 95.44 ha of vegetation to be cleared</td><td>• Retirement of 4,859 Ecosystem Credits (including 478 Ecosystem Credits for the clearing of 47.9 ha of the BOS area approved under 06_0198);
• Conservation of the residual BOS area approved under 06_0198 (60 ha), at the existing location within the Whitehaven Regional Biobank Site;
• Conservation of 0.62 ha of White box Grassy Woodland;
• Conservation of 231.42 ha of suitable foraging habitat for the Regent Honeyeater and Swift Parrot; and</td></tr>
</table></td><td>4.1.1</td></tr>
</table>

Condition Number	Condition		Relevant OMP Section
		• *Restoration of 118.33 ha of derived grassland to woodland.*	
	Note: The Whitehaven Regional Biobank Site is shown in Figure 1 in Appendix 4.		

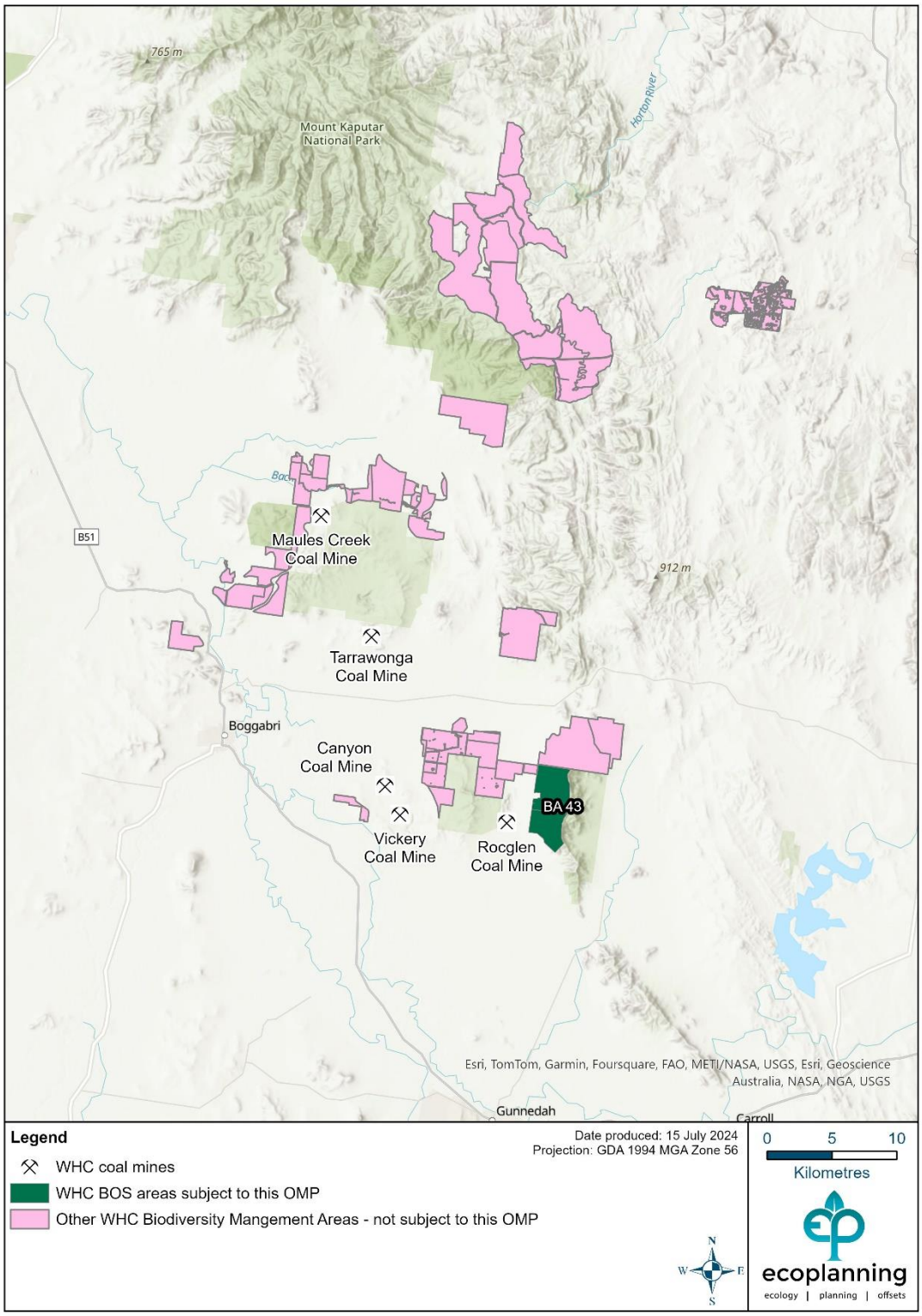


Figure 1.1: Regional setting of WHC coal mines and Biodiversity Offset Strategy (BOS) areas including BA43 for Yarrari and Belah BOA

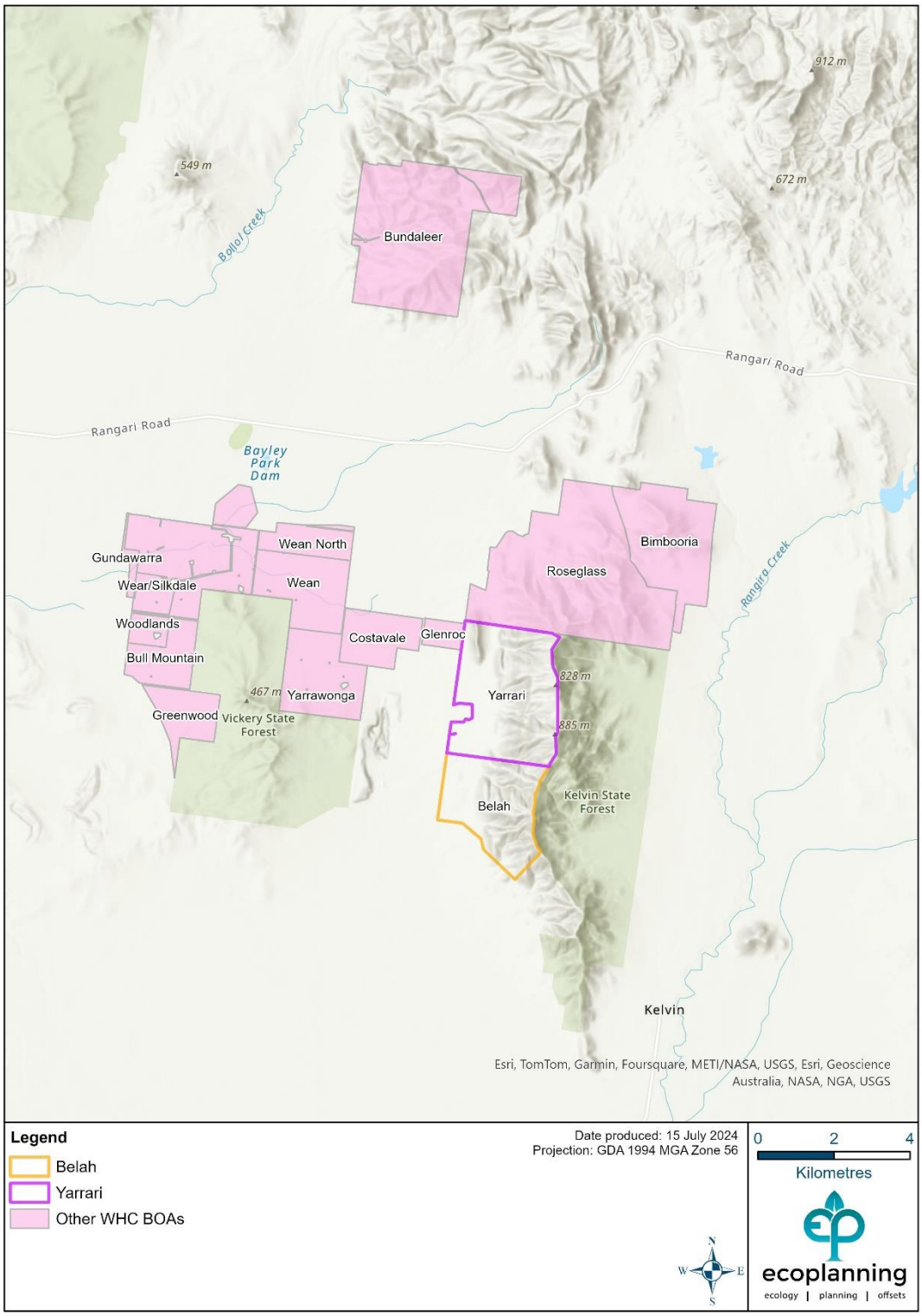


Figure 1.2: Yarrari and Belah BOA as secured by BA43

1.3 SCOPE AND OBJECTIVES

The purpose of this OMP is to provide a consolidated plan for the management of the BOA shown in **Figure 1.1**, in accordance with all relevant Approval requirements outlined in **APPENDIX A:** and **APPENDIX B:** and summarised in **Section 2.** This OMP will provide WHC direction to:

- Identify the land that will be required to be managed in accordance with this OMP;
- Outline the actions for managing biodiversity within the BOA;
- Identify and address approvals and legislative requirements relevant to biodiversity management of the BOA;
- Provide a management framework that will lead to an improvement in the condition of biodiversity across the BOA;
- Identify and minimise the impacts of key threats to biodiversity; and
- Outline the monitoring, performance evaluation and reporting processes to be implemented by WHC personnel.

Upon its approval, this OMP will fully replace the previously approved BOMP for Rocglen Coal Mine (RCM) (**Table 1.5**). This OMP also integrates the requirements of Biobank Agreement 43 securement document.

Table 1.5: Sections of previously approved BOMP to be superseded by this OMP

Previously approved BOMP	Sections of previously approved BOMP to be replaced/superseded	Relative section of this OMP
Biodiversity Offset Management Plan – Whitehaven Regional Biodiversity Offset Site (ELA 2013)	Entire BOMP	Entire OMP

1.4 STRUCTURE OF THE OFFSET MANAGEMENT PLAN

The structure of this plan is as follows:

Section 2 Requirements for the Offset Management Plan

Section 3 Description of the Existing Environment Relevant to the BOA

Section 4 Description of the BOS and Securement

Section 5 Description of the Management Actions to be undertaken within the BOA including Potential Risks and Contingency Measures

Section 6 Description of Reporting and Review Requirements

The following are appended to this OMP:

Appendix A Rocglen Coal Mine relevant State and Commonwealth approval requirements

Appendix B Canyon Coal Mine relevant State approval requirements

Appendix C Key Biometric Annual Performance Criteria for relevant Keith Classes

1.5 CONSULTATION

This OMP will be submitted to Commonwealth Department of Climate Change, the Environment, Energy and Water (CDCCEEW) for approval. Once approved, the following stakeholders outlined in **Table 1.4** will be notified of the approved OMP that have been used to retire Biodiversity Credits from Biobanking Agreement 43 for the relevant NSW Approval required Biodiversity Offset Strategies (BOS).

Consultation by WHC was initially undertaken for the Vickery OMP with the Biodiversity, Conservation and Science Group (BCS) of the NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW), and the BCT. Comments were received from the BCS of NSW DCCEEW on 10 July 2024 and by the BCT on 27 August 2024. To ensure consistency between WHC OMP documents, these comments, where relevant, have been incorporated into the Yarrari/Belah OMP.

Table 1.6: Stakeholders to be notified of approval of this OMP

Stakeholder
NSW DPHI
Biodiversity Conservation Trust
NSW Department of Climate Change, Energy, the Environment and Water (NSWDCCEEW), formerly Office of Environment and Heritage (OEH)

1.6 RESPONSIBILITIES

WHC is responsible for managing, monitoring, implementing and reviewing the management activities specific to the BOA covered by this OMP. **Table 1.7** outlines the key positions and contractors involved with implementing the offset management activities in this OMP (at the time of writing).

Table 1.7: Details of all parties responsible for management, monitoring and implementing the management activities associated with the Yarrari and Belah BOA

Yarrari and Belah Offset Areas Key Contact / Emergency Contact				
Attention: Whitehaven Group Superintendent - Biodiversity biodiversity@whitehavencoal.com.au and 0488 407 000				
Area	**Organisation***	**Position***	**Status***	**Responsibilities***
WHC Biodiversity Offset Areas	WHC	Group Manager/ General Manager	Employee	Obtain and provide adequate resources for the Group Superintendent – Biodiversity to implement the OMP.
	WHC	Group Superintendent – Biodiversity	Employee	To authorise this OMP and undertake associated compliance and reporting requirements. Implement the overall biodiversity strategy on the offset areas; coordinate and supervise biodiversity management and monitoring activities on the offset areas. Initiate review of this OMP.
	WHC	Biodiversity Specialist & Field Officers	Employee	Support the Group Superintendent – Biodiversity and supervise biodiversity management and monitoring activities on the offset areas.

Yarrari and Belah Offset Areas Key Contact / Emergency Contact				
Attention: Whitehaven Group Superintendent - Biodiversity biodiversity@whitehavencoal.com.au and 0488 407 000				
Area	**Organisation***	**Position***	**Status***	**Responsibilities***
	Pest Management Consultant/ Contractor	Scientists & Field Technicians	Contractors	Undertake biodiversity management activities as directed by the Group Superintendent – Biodiversity and Biodiversity Specialist /Field Officers for feral and pest animal monitoring and management/control.
	Land Management & Weed Spraying Contactor	Field Operators & Technicians	Contractors	Undertake biodiversity management activities as directed by the Group Superintendent – Biodiversity and Biodiversity Specialist /Field Officers for weed spraying, habitat augmentation, threatened species, revegetation ground preparation and other minor earthworks and waste/infrastructure removal plus tree planting and maintenance activities.
	Fire & Ecological Burn Contractor	Fire Fighters & Controlled Burn Practitioners	Contractors	Undertake biodiversity management activities as directed by the Group Superintendent – Biodiversity and Biodiversity Specialist /Field Officers for fire management planning, hazard reduction management and ecological burn implementation.
	Ecological Consultant	Ecologists	Contractors	Undertake monitoring as directed by the Group Superintendent – Biodiversity and Biodiversity Specialist /Field Officers for threatened species and ecological community assessment and flora/fauna surveys.

* Role/responsibilities can vary over time by Whitehaven based on ongoing performance, compliance and commercial aspects that change as required.

1.6.1 Incident and Emergency Response

As per Induction and Biodiversity Training (Section 6.5); workers (staff and contractors) must notify WHC of all hazards and incidents as soon as practicable inclusive of whether a safety or health, pollution, material harm or potential for material harm to the environment including if emergency response is required. Initial incident details will be collected and reported to WHC required to make a preliminary report, i.e. Reported Date and Time, Event Date and Time, Event Summary, What Action has been or will be undertaken, and Exact Location (Property).

Where emergency response is required for life threatening situations or for material harm to the environment, workers are to enact and be aware of where Whitehaven Biodiversity Emergency Response Cards (Emergency Call Phone are located with WHC Biodiversity weather stations) including contacting Emergency Services on 000 or 112 or text 106 and then advise Whitehaven Biodiversity when safe to do so.

If the incident is determined to be notifiable under this OMP (irrespective of whether emergency services have been contacted on 000), WHC must contact the following authorities as relevant:

1. CDCCEEW to report a perceived breach of national environment law at environment.compliance@dcceew.gov.au or 1800 110 395

2. Environment Protection Authority Environment Line – 131 555
3. Public Health Units – 1300 066 055
4. Safework NSW – 131 050
5. Local Government
    a. Gunnedah Shire Council – (02) 6740 2100
    b. Narrabri Shire Council i. ii. Business hours – (02) 6799 6866 After hours emergency – 0429 911 111
6. Fire and Rescue NSW – 1300 729 579 (Sydney)
7. NSW Department of Planning and Environment – 1300 420 596
8. Resource Regulator – 1300 814 609

2 REQUIREMENTS FOR THE BIODIVERSITY OFFSET MANAGEMENT PLAN

While this OMP has been prepared for EPBC Approval 2010/5502; this BOA has also been used to retire Biodiversity Credits for the following WHC Mine Approval Biodiversity Offset Strategies (BOS) in accordance with the State and Commonwealth approval documents outlined in **Table 1.1.** Each section of this OMP addresses the conditions of the approval documents as outlined in **Table 2.1**. Detailed compliance tables for each mine, under these instruments, are also included as **APPENDIX A:** and **APPENDIX B:**.

Table 2.1: Approval document conditions addressed within each section of this OMP

WHC Mine	Rocglen		Canyon	Tarrawonga	Vickery	
OMP Section Cross Referenced to applicable condition of Approval documents	EPBC 2010/5502	MP 10_0015 MOD 4	DA 8-1-2005 MOD 3	Surrendered DA 88-4-2005 MOD1	EPBC 2016/7649	SSD 7480
Responsibilities Section 1.6	2c & 2g	N/A	N/A	N/A	N/A	N/A
BOS Section 4	1 & 2	23	26A & 27	33	16 & 19	B58 & B59
Management of Biodiversity Offset Areas Section 5	2b	N/A	N/A	N/A	N/A	N/A
Ecological Management Objectives Section 5.1	2b	N/A	N/A	N/A	N/A	N/A
Biodiversity Offset Area Establishment Section 5.3	2b	N/A	N/A	N/A	N/A	N/A
Seed Management Section 5.4	2b	N/A	N/A	N/A	N/A	N/A

WHC Mine	Rocglen		Canyon	Tarrawonga	Vickery	
OMP Section Cross Referenced to applicable condition of Approval documents	EPBC 2010/5502	MP 10_0015 MOD 4	DA 8-1-2005 MOD 3	Surrendered DA 88-4-2005 MOD1	EPBC 2016/7649	SSD 7480
Revegetation Section 5.5	2b	N/A	N/A	N/A	N/A	N/A
Ecological Thinning Section 5.6	2b	N/A	N/A	N/A	N/A	N/A
Habitat Augmentation Section 5.7	2b	N/A	N/A	N/A	N/A	N/A
Management of Heritage Values Section 5.8	2b	N/A	N/A	N/A	N/A	N/A
Weed Management Section 5.9	2b	N/A	N/A	N/A	N/A	N/A
Pest Animal Management Section 5.10	2b	N/A	N/A	N/A	N/A	N/A
Erosion Control Section 5.11	2b	N/A	N/A	N/A	N/A	N/A
Agricultural Management Section 5.12	2b	N/A	N/A	N/A	N/A	N/A
Bushfire Management Section 5.13	2b	N/A	N/A	N/A	N/A	N/A
Vegetation and Habitat Monitoring Section 5.14	2b	N/A	N/A	N/A	N/A	N/A
Fauna Monitoring Section 5.15	2d	N/A	N/A	N/A	N/A	N/A
Performance and Completion Criteria Section 5.16	2c	N/A	N/A	N/A	N/A	N/A
Potential Risks and Contingency Measures Section 5.17	2f	N/A	N/A	N/A	N/A	N/A
Reporting and Review Section 6	2e	N/A	N/A	N/A	N/A	N/A

S = Schedule of Major Project Approval; C = Condition Number within relevant Schedule (if applicable)

2.1 RELEVANT ENVIRONMENTAL MANAGEMENT PLAN GUIDELINES

This OMP was prepared in consideration of the *Environmental Management Plan Guidelines* (Cth DCCEEW, 2024). The relevant environmental management plan guidelines are presented in **Table 2-2.**

Table 2-2: Environmental Management Plan Guidelines

Guideline	Relevant OMP Section
GENERAL PRINCIPLES FOR THE PREPARATION OF AN ENVIRONMENTAL MANAGEMENT PLAN	
Key principles	
An environmental management plan should:	
• *be balanced, objective and concise*	Throughout this OMP
• *state any limitations that apply, or should apply, to the use of the information in the environmental management plan*	None
• *identify any matter in relation to which there is a significant lack of relevant information or a significant degree of uncertainty*	None
• *include adaptive management strategies for managing uncertainty*	Section 5.17
• *be written in a way that is easily understood by other parties*	Throughout this OMP.
• *clearly present how conclusions about risks have been reached*	Section 5.17 and Appendix C
• *ensure that the person taking the action takes full responsibility for the content and commitments contained in the plan.*	Declaration of Accuracy (Page ii)
Including commitments in management plans	
• *All commitments must be specific and auditable with measurable outcomes and clear timeframes.*	Throughout this OMP
• *To ensure readability, write clearly and avoid long sentences with complex clauses.*	
• *Always use the terms 'will' and 'must', rather than 'should' or 'may' when committing to carry out management actions.*	
• *Avoid use of ambiguous terminology such as 'where possible', 'as required', 'to the greatest extent possible'. If it is necessary to include ambiguous terminology, it should be explained and examples given.*	
• *Clearly explain any technical terms or acronyms used, and/or define them in a glossary.*	
It is also important that commitments or statements within the management plan are consistent with other relevant management plans or conditions of approval.	
Cross-referencing	
Where the plan refers to material in other documents, it should include cross-references that are clear, complete and that specify the document version and date. Use tables, diagrams and maps where their inclusion would provide a better understanding and implementation of the management plan. Link all tables, diagrams and maps into the text through cross-referencing.	Throughout this OMP and Section 7.
CONTENT OF THE ENVIRONMENTAL MANAGEMENT PLAN	
Cover page and declaration of accuracy	
Cover page detailing:	Cover Page
• *EPBC number*	
• *project name*	
• *proponent /approval holder and ACN or ABN*	
• *the proposed/approved action*	
• *location of the action*	

Guideline	Relevant OMP Section
• *date of preparation of the environmental management plan* • *person accepting responsibility for the environmental management plan – signed declaration (see below).*	Declaration of Accuracy (Page ii)
Document version control	
The document version control should be a simple system that ensures that details of all key changes to the document over time are properly recorded. Identified changes should include details of timings, persons responsible and reasons for changes.	Document History Table (Page i)
Table of contents	
Table of contents page detailing: • *all section headings and page numbers* • *all figures, tables, plans and maps (should be numbered)* • *all appendixes (with meaningful titles, including for sub-appendixes if any). If the appendixes contain a collation of data, include summary of the contents.*	Table of Contents (Page ii – vi).
Executive summary or introduction	
The executive summary should note the key elements of the project, the purpose of the document, the main potential impacts and the primary strategies planned to address these impacts.	Executive Summary (Page 1)
Conditions of approval reference table	
When an environmental management plan is prepared after the project has been approved under the EPBC Act, the management plan should include a table detailing the information noted below:	
• *The EPBC Act approval condition requirements the plan is intended to address. These are best presented broken down into each of the individual actions that the conditions require.*	Section 1.2 and Appendix A
• *The section and page numbers which address the approval conditions.*	Section 1.2 and Appendix A
• *A summary of the key commitments relating to each of the approval conditions.*	Section 2, Section 1.2 and Appendix A
Project description	
The environmental management plan should provide a description of the project as this provides context for the plan. The location of all project actions should be described and a map showing their location provided. Basic information on the environment at these locations should also be included as this helps provide the environmental context to which the environmental management plan applies. The plan should include a description of the activities that will be undertaken as part of the project including project details relevant to any approval conditions and with potential impacts on matters protected under the EPBC Act. The plan should distinguish between construction and operational activities, if relevant. A schedule of intended commencement and completion dates should be provided. Projects undertaken in stages should identify each stage in the schedule. Contingency schedules can also be included along with examples of events that could result in the use of the contingency schedules.	Section 1
Objectives	
The environmental outcomes of the plan should be defined. These should be tailored to the environmental issues outlined in the plan.	Section 6
Environmental management roles and responsibilities	
Once an action is approved, the approval holder is responsible for complying with the conditions of approval, including the commitments made in environmental management plans. The plan should define the roles and responsibilities of personnel in charge of the environmental management of the project. The roles and responsibilities of each relevant position should be documented, including the responsibilities of subcontractors. The names of the responsible personnel do not need to be included. Identification of the position titles, roles and responsibilities is sufficient. If the roles and responsibilities are expected to change over time the long-term variations should also be documented.	Section 1.6
Reporting	

Guideline	Relevant OMP Section
An environmental management plan will usually require reporting arrangements for two purposes. Reporting arrangements assist with effective implementation and with external reporting. External reports may include reports on environmental incidences to the regulator, reports to stakeholders, reports to inform reviews of the plan and reports to meet the reporting requirements of the conditions of approval.	Section 6
The description of reporting requirements should include: • *a list of required reports including where appropriate monitoring, environmental incidents, non-compliance, corrective action and auditing* • *a description of the standard report content* • *the schedule or triggers for preparing a report* • *who the report is provided to* • *document control procedures.*	
Reporting commitments should also be consistent with any reporting to us required by the conditions of approval.	
Environmental Training	
All people involved with the project should receive relevant environmental training to ensure they understand their responsibilities when implementing the environmental management plan. People to be trained include those at the site/s of all project activities and operations, including contractors, subcontractors and visitors. The training should be tailored to the role of the individual in the project.	Section 6.5
The environmental management plan should describe the training to be implemented and could include: • *site inductions* • *identification of key points of environmental value and any relevant matters of national environmental significance* • *understanding the requirements of the environmental management plan and the individual's role* • *environmental incident emergency response procedures* • *site environmental controls* • *an outline of the potential consequences of not meeting their environmental responsibilities.*	
Records of all training conducted should be maintained and include: • *the person receiving the training* • *the date the training was received* • *the name of the person conducting the training* • *a summary of the training.*	
Emergency contacts and procedures	
The environmental management plan should identify the key emergency contacts responsible for managing environmental emergencies associated with the project and their contact details. These personnel should have the power to stop and direct works so that they can manage emergencies effectively. In addition, the plan should establish procedures for managing environmental emergencies and ensure that those procedures are implemented and maintained.	Section 1.6
Potential environmental impacts and risks	
Threats to matters protected under the EPBC Act *The environmental management plan should summarise all the identified threats to matters protected under Part 3 of the EPBC Act in the management plan. The matters protected by the EPBC Act include:* • *the 9 matters of national environmental significance (listed in Appendix A)* • *the environment in general (for actions by Commonwealth agencies or actions on Commonwealth land) or the environment on Commonwealth land (for actions outside Commonwealth land).*	Section 4 Section 5.17 Appendix C
The plan should refer to relevant information provided in the EPBC Act assessment documentation, such as an environmental impact statement or preliminary documentation. If the project has already been approved, the plan should detail all new information relevant to the conditions placed on the approval. The key sensitivities of the environmental values potentially impacted by the action should be identified.	
Potential impacts	

Guideline	Relevant OMP Section
The potential impacts section of the plan should focus on identifying, locating and quantifying the potential impacts (direct and indirect) of the project on the matters protected by the EPBC Act. It should discuss: • *the relevant impacts of the project* • *the nature and extent of the potential short-term and long-term effects* • *any uncertainties regarding the predicted impacts.*	
This may include a summary of any relevant information previously provided in assessment documentation, such as an environmental impact statement or preliminary documentation.	
Impacts from relevant stages of the action (for example, pre-construction, construction and operation) should be delineated in this section and should reflect the relevant conditions of approval. It may be necessary to divide the potential impacts into subsections reflecting the stages of the project.	
Risk assessment *Once the potential impacts of the proposal are clearly identified a risk assessment should be undertaken for each potential impact. This means that the likelihood and consequences of each potential impact need to be estimated. An example of a methodology for risk assessment is at Evaluating risk.* *The function of the risk assessment is not to repeat or supersede the original assessment of a project or its conditions of approval. Rather it is to ensure that these risks are effectively translated into actual mitigation and management actions. Impacts with higher risk ratings usually require more management actions and controls. This minimises the likelihood of the risk occurring and reduces the consequences to acceptable levels.*	
Environmental management measures	
The environmental management plan should clearly state how the potential impacts of the proposal will be managed and this information usually forms the bulk of the content of the plan. For each potential impact, the plan should address: • *environmental management activities, controls and performance targets* • *environmental management maps and diagrams* • *monitoring programs with trigger values for corrective actions* • *corrective actions and non-compliance reporting* • *environmental schedules*	Section 5
These topics are described in more detail below. It is helpful if management plans present the information on these topics for one potential impact at a time. This ensures that all the management measures for each potential impact are in the same section of the document and easy to locate.	
Environmental management activities, controls and performance targets *The environmental management plan should describe all the environmental management activities and control measures that will be implemented to avoid or minimise environmental impacts. The description of each measure should also specify the timeframes for implementation and the performance targets or outcomes to be achieved. The timing of measures is often best presented in a timetable. Performance targets and outcomes should be quantitative and auditable.*	Section 5
Environmental management maps and diagrams *Environmental management maps and diagrams are useful visual tools that aid in environmental management activities. Maps can provide useful spatial information about areas that require environmental management. Diagrams can illustrate the design of environmental control measures and the flow of environmental management procedures. For example, a map could be used to show:* • *environmentally sensitive areas on or near a project site* • *vegetation that requires protection* • *buffer zones or 'no-go zones'* • *monitoring locations.*	Figures throughout the OMP.
Environmental monitoring *The environmental management plan should specify how the effectiveness of environmental management measures will be monitored. It should include the methodology, frequency and duration of monitoring activities. It should also include trigger values or conditions under which corrective actions are*	Section 5.14 and 5.15

Guideline	Relevant OMP Section
taken. The plan should also specify if, and when, follow up action is required and how monitoring records will be maintained.	
Corrective actions *The environmental management plan should include procedures for addressing:* • *monitoring results which exceed the trigger values for corrective action* • *potential corrective actions* • *reporting non-compliance with approval conditions to the relevant authority* • *environmental incidents and emergencies.*	Section 5.17 Section 6
The plan should also identify who is responsible for implementing the above procedures. Auditable systems should be developed for recording the implementation of these procedures and their outcomes.	Section 1.6
Audit and review	
Environmental auditing *The environmental management plan should include the schedule or triggers for auditing the implementation and effectiveness of the plan. It should address both internal and external audit requirements including who is responsible for undertaking the audits and reporting the results.*	Section 6.4
Environmental management plan review *The environmental management plan should specify the schedule or triggers for reviews of the plan. A review should assess whether the plan is achieving its objectives and the requirements of any relevant approval conditions. A review should take into account environmental monitoring records, corrective actions and the results of any audits. The plan should also identify who will be responsible for undertaking the review. During the review process, any reasons for varying the environmental management plan should be documented.*	Section 6.3
Review of an environmental management plan would typically be undertaken: • *following significant environmental incidents* • *when there is a need to improve performance in an area of environmental impact* • *periodically for actions undertaken over long timeframes such as one, two or five years.*	Section 6.3
However, if the person taking the action wishes to carry out any activity other than in accordance with the approved management plan specified in the approval conditions, the person taking the action is usually required to submit to us for the Minister's written approval a revised management plan. In these cases, the varied activity should not commence until the Minister has approved the varied management plan in writing. As a guiding principle, the Minister will not approve a varied management plan unless the revised management plan would result in an equivalent or improved environmental outcome over time.	Section 6.3
Glossary	
This should include any acronyms, all terms which are open to different interpretations or terms which are not in common use. Terms which are defined in the approval conditions should retain the same meaning as that used in the conditions.	Page viii
EVALUATING RISK	
The following section sets out a qualitative risk assessment methodology that can be applied to the environmental risks associated with a wide range of projects. It is provided as an example of one approach to risk assessment and the Department does not require that this particular approach be used when preparing an environmental management plan. Further guidance on evaluating and managing risk can be found in AS ISO 31000:2018 Risk management – Guidelines (Standards Australia 2018).	Section 5.17 and Appendix C
Likelihood and consequence	
Each environmental risk should be given a rating in terms of likelihood and consequence using the criteria in the table 1 and table 2 below. These ratings are then combined using the risk rating table to generate a risk rating of low, medium, high or severe.	Appendix C

Guideline	Relevant OMP Section

Table 1 Likelihood

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

Table 2 Consequences

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

Risk rating

Appendix C

You should give each of your risks a likelihood rating and a consequence rating. Using the rating table below you can determine whether your risk is low, medium, high or severe.

The risk rating generated using the above table can be used as a guide to the amount of time and resources that will be required to manage each risk. Risks with 'low' risk ratings will usually require significantly less management than 'medium', 'high' and 'severe' risks.

This is usually reflected in the environmental management plan where issues with higher risk ratings require more detailed information regarding:

- *the description of the risk*
- *the measures and commitments to minimise and manage the risk*
- *the performance objectives and monitoring programs*
- *trigger values for additional action, review and reporting.*

Table 3 Risk Rating

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

FORMAT OF SUBMISSIONS

General

Header and Footer of each page

Each page of the environmental management plan should include the name of the project, the date of the environmental management plan and sequential page numbering. An environmental management plan can be submitted via standard post or electronically. Submissions should be titled 'Environmental Management Plan' with the project name and EPBC approval number.

Guideline	Relevant OMP Section
General requirements for maps, plans and sections	
All maps and sections should conform to the following standards.	Figures throughout the OMP.
• *Scale – an appropriate standard metric scale should be chosen to best represent the information required (for example 1:25 000, 1:10 000 and 1:5000).*	
• *Datum – plans and cross sections should refer to Australian Height Datum.*	
• *Title Block – plans should have a title block in the lower right-hand corner of the sheet with the following information:* – *EPBC number and project name* – *title and number of the plan* – *author* – *scale* – *date* – *source and date of data*	
• *Legend – plans should have a clear and comprehensive legend to identify the symbols and colours used.*	
• *Maps, plans, figures, images and sections should also:* – *use metric measurements throughout* – *show a graphic bar scale* – *show any local grid lines and standards* – *have a north point or orientation of sections* – *include a key.*	
Maps may also be submitted in ESRI Shapefiles containing '.shp', '.shx' and '.dbf' files.	

3 EXISTING ENVIRONMENT RELEVANT TO THE OFFSET AREAS

This section describes the existing environment relevant to the BOA. This section summarises the geography, prevailing climatic conditions; geology, topography and hydrology; land use history; threatened species and ecological communities; and introduced flora and fauna including the key biodiversity values for each relevant strategy such as vegetation community descriptions and mapping.

3.1 GEOGRAPHY

The BOA consists of two properties located adjacent to each other identified as Yarrari and Belah (**Figure 3.1**). The Yarrari and Belah BOA properties are located in the Gunnedah Shire Council local government area (LGA) (**Figure 3.1**). The Boonalla Aboriginal Area is situated on the eastern boundary (**Figure 3.2**). The Belah and Yarrari BOA properties occur partially within the Liverpool Plains sub-region of the Brigalow Belt South IBRA region and partially within the Peel sub-region of the Nandewar IBRA region (**Figure 3.3**).

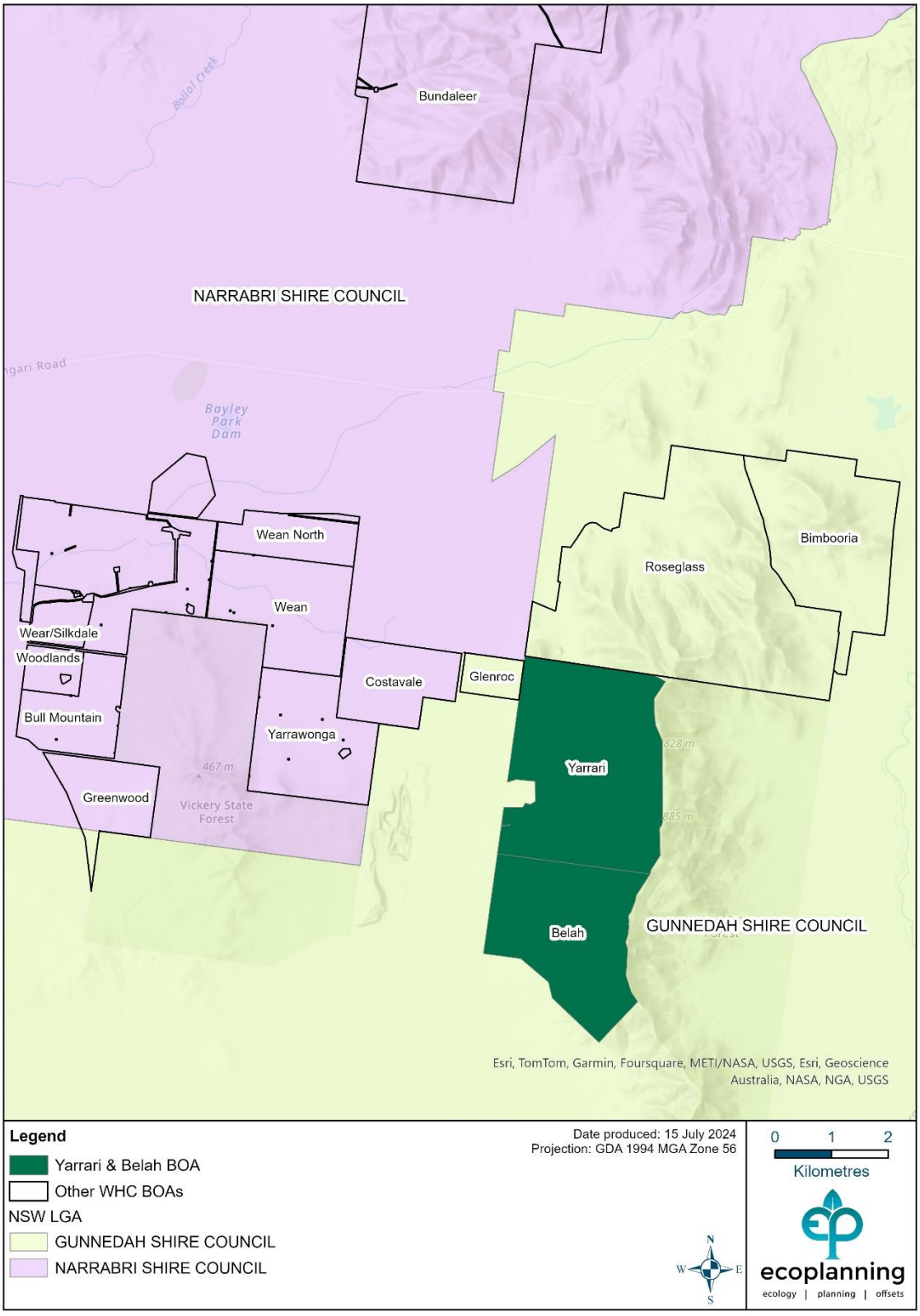


Figure 3.1: Geographical groupings of the BOA and LGA boundaries

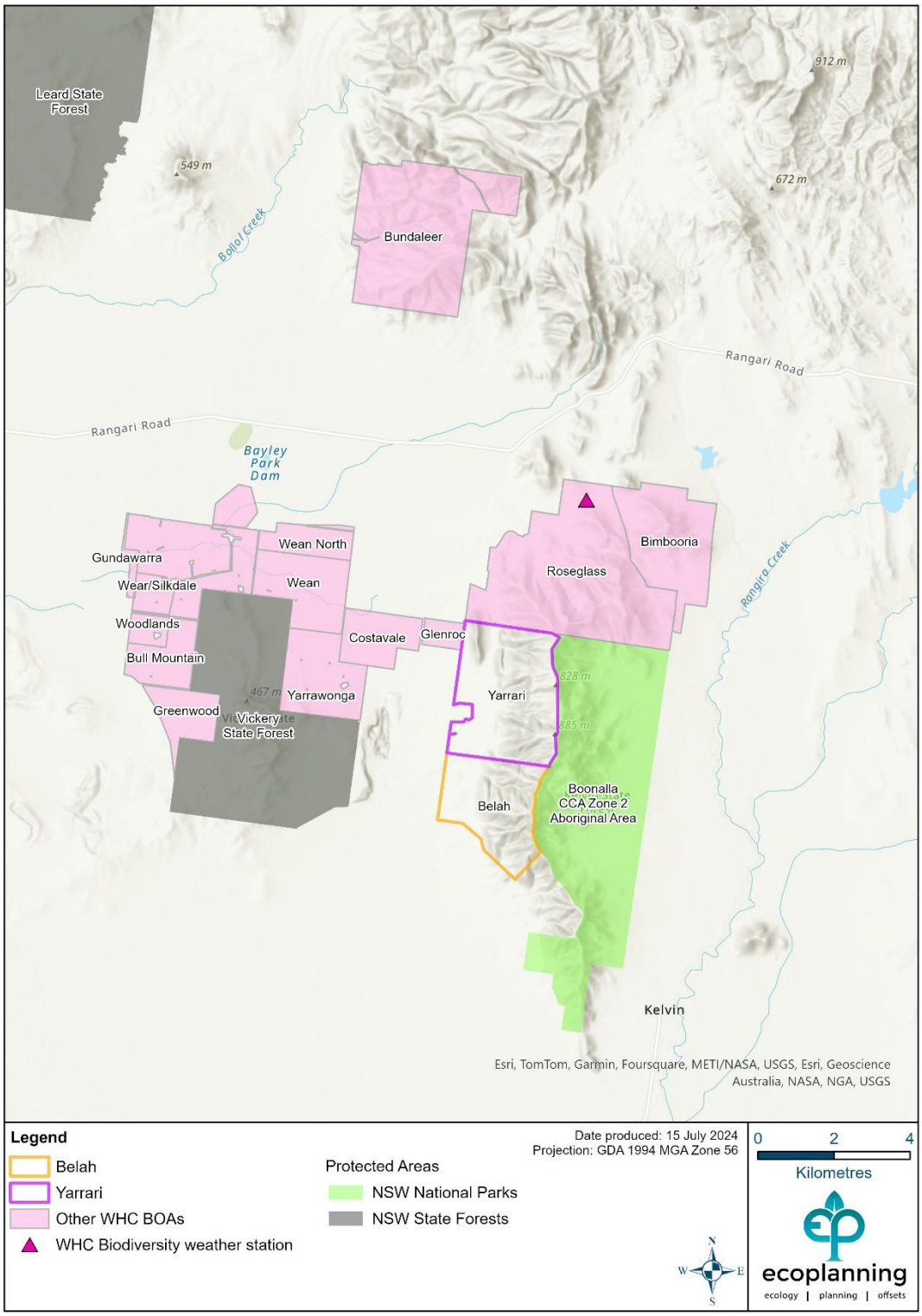


Figure 3.2: Proximity of the BOA properties to Boonalla Aboriginal Area, other BOAs and nearest weather station.

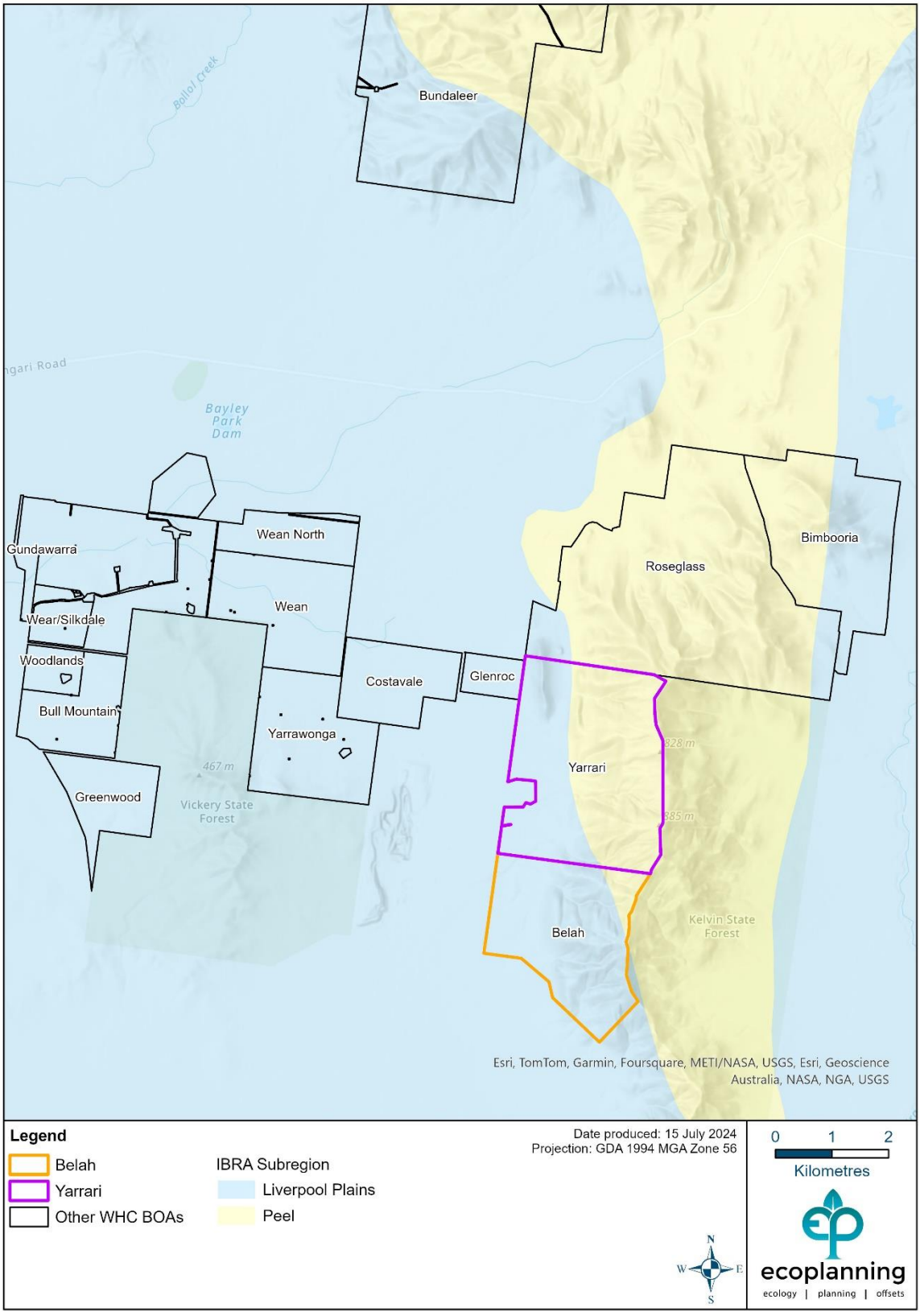


Figure 3.3: IBRA sub-regions of the BOA offset properties

3.2 CLIMATIC INFORMATION

The most central public meteorological station to the BOA is the Gunnedah Airport Automatic Weather Stations (AWS) and Pool sites (BOM 2020). Summer maximum temperatures in Gunnedah reach an average of 34.7°C (daily) and a minimum of 18.6°C (nightly) during January. Winter minimums are experienced in July with an average maximum of 17.4°C and an average minimum of 1.9°C. The average rainfall is 544.9 mm per year with the maximum received in December (82.3 mm) and the minimum in April (21.5 mm). However, recent years have seen extreme conditions. 2019 being the peak of a drought and the driest year in 140 years of records for Gunnedah (Pool) with only 237mm of rain, followed by three years with above average rainfall experienced peaking in 2021 with 990mm of rain recorded.

There is one WHC weather station located adjoining the BOA (shown in **Figure 3.2**) to record more localised weather conditions for reporting purposes. Records from the Roseglass weather station show a maximum monthly average temperature was 34°C in December 2023. Minimum monthly average temperature was 2°C in May 2023. Annual temperature ranges were -5°C to 39°C in 2023. The total annual rainfall in 2023 was 400mm with the maximum in March (114mm) and minimum in May (1mm) (Advitech, 2023).

3.3 GEOLOGY, TOPOGRAPHY AND HYDROLOGY

The Yarrari and Belah BOA properties consist of the Kelvin Range landscape and Liverpool Alluvial Plains to a lesser extent (Mitchell, 2002) (**Figure 3.4**). The geology of the Liverpool Alluvial Plains Mitchell Landscape (Mitchell, 2002) consists of quaternary alluvial plains and outwash fans derived from Tertiary basalts. Permian and Triassic quartz sandstones with minor basalt caps. Undulating hills and sloping plains with alluvial channels and floodplains. Extensive black earths on low angle slopes. Deep black and brown cracking clays, alluvial soils and red or brown texture-contrast soils on slopes below sandstone.

The geology of the Kelvin Range Mitchell Landscape (Mitchell, 2002) consists of steep ranges with wide debris aprons on moderately dipping Carboniferous sandstone, conglomerate, rhyodacite and tuff. Shallow stony sandy loam on ridges and slopes, texture-contrast in rubbly debris on the colluvial apron shifting in colour from red brown on upper slopes to yellow on lower slopes.

The soils of the BOA are mapped as Lithosols, Non-Calcic Brown Soils, Grey Brown and Red Clays, Black Earths, Red Brown Earth (GSG) and Rudosols and Tenosols, Chromosols and Vertosols (ASC).

The topography of the BOA is variable with the minimum and maximum of 323m to 810m.

The BOA is within the Namoi River Catchment (Murray Darling Basin Authority [MDBA], 2024) and natural drainage generally flows to the northwest. The BOA does not have a named watercourse on site but is within the catchment of Driggle Draggle Creek which flows into the Namoi River (DPIE Water, 2024) (**Figure 3.4**).

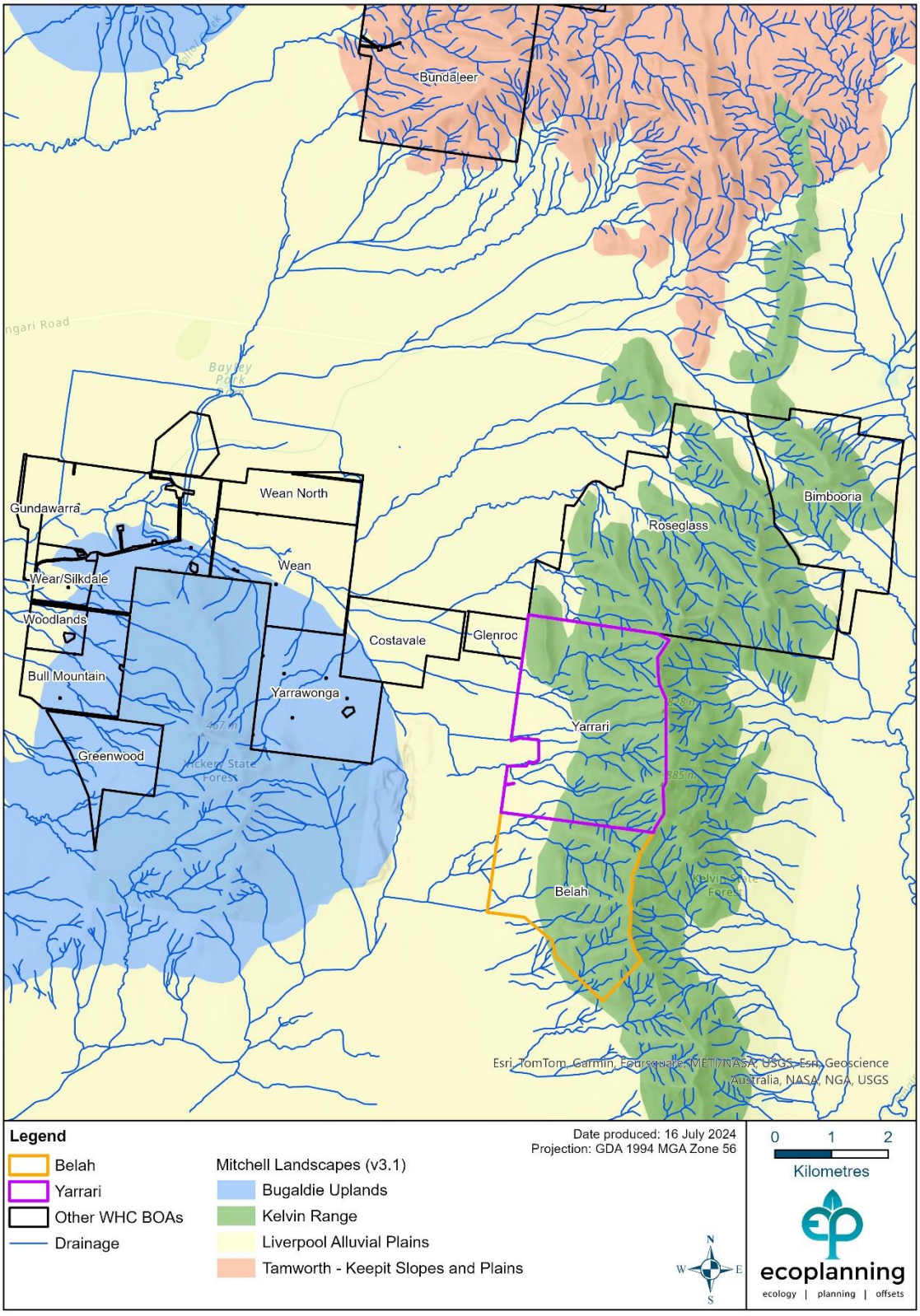


Figure 3.4: Mitchell landscapes and watercourses within and proximate to the BOA.

3.4 PREVIOUS LAND USE HISTORY

The BOA ranged from extensive to minimal agricultural management including grazing and intensive cultivation as evidenced with localised non-native pasture improvement and high weed abundance. The extent of historical clearing of the Yarrari and Belah BOA was the greatest in the west with the steep to very steep eastern two thirds showing high flora and fauna diversity in the remnant and regenerating semi-cleared native vegetation on the Nandewar (Kelvin) Range. Ecosystem resilience reflects this low to high range; with the eastern remnant vegetation adjacent to the Boonalla Aboriginal Area having higher resilience. Biodiversity management commenced in 2013 with the Yarrari and Belah BOA properties being permanently destocked in 2016 when strategic grazing was ceased.

3.5 INTRODUCED FLORA AND FAUNA

At the commencement of Biodiversity Management (Section 3.4; between 2013 and 2016); weed species were widespread across the BOA due to the previous extensive agricultural history. Since that time, through routine weed management; most priority weed species recorded during seasonal weed assessments (Ecoplanning, 2021, 2020a, 2020b) have declined with the remaining key weeds shown below in **Table 3.1**.

Table 3.1: Occurrence of weed species within the BOA

Species Name	Common Name	Priority Weed status for North West Region (LLS 2017)	Weed Threat Category*
Cenchrus ciliaris	Buffel Grass	-	KTP
Echium plantagineum	Paterson's Curse	General Biosecurity Duty	-
Eragrostis curvula	African Lovegrass	General Biosecurity Duty	HTE, KTP
Lycium ferocissimum	African Boxthorn	Regional Recommended Measure. Land managers should mitigate the risk of new weeds being introduced to their land. Land managers should mitigate spread from their land. Land managers reduce impacts from the plant on priority assets.	WoNS
Opuntia stricta	Prickly Pear	Priority Weed - Prohibition on dealings	WoNS, KTP
Xanthium spinosum	Bathurst Burr	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.	HTE

*KTP = Key Threatening Process, WoNS = Weeds of National Significance, HTE = Hight Threat Exotic.

Similarly, at the commencement of Biodiversity Management (between 2013 and 2016), certain pest animals were widespread across the BOA given their previous extended agricultural history. However, since that time, through routine pest animal management; most species have declined in detection within the while others species appear only in discrete areas (**Table 3.2**) as collated from data collected during baseline assessments, annual fauna monitoring and from quarterly pest animal management reports.

Table 3.2: Occurrence of Priority Pest animals within the BOA

Pest animals	Area of Occurrence (properties)
Feral Pig (*Sus scrofa*)	Has been detected in the BOA or is expected to occur within the BOA
Feral Goat (*Capra hircus*)	Has been detected in the BOA or is expected to occur within the BOA

Pest animals	Area of Occurrence (properties)
European Red Fox (*Vulpes vulpes*)	Has been detected in the BOA or is expected to occur within the BOA
European Rabbit (*Oryctolagus cuniculus*)	Has been detected in the BOA or is expected to occur within the BOA
Feral Cat (*Felis catus*)	Has been detected in the BOA or is expected to occur within the BOA

3.6 THREATENED ECOLOGICAL COMMUNITIES, FLORA AND FAUNA

Threatened Ecological Communities

Two threatened ecological communities (TECs) have been mapped within the BOA (**Table 3.3**).

White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (referred to herein as Box-Gum Woodland [BGW]) Critically Endangered Ecological Community (CEEC), under the EPBC and BC Act has been mapped the BOA by Eco Logical Australia (ELA, 2009). The best fit Plant Community Type (PCT) for this community is PCT 1383: White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion. Within the BOA this community generally has a canopy of *Eucalyptus albens* (White Box) and often with *Callitris glaucophylla* (White Cypress Pine). *Geijera parvifolia* (Wilga) is frequently present as a shrubs/small tree. The groudlayer includes a mix of native and exotic grasses and forbs but *Austrostipa scabra* is often present. An indicative photo of the community within the BOA is provided as **Figure 3.5**.

Semi-evergreen Vine Thicket in the Brigalow Belt South and Nandewar Bioregions EEC listed under the BC Act and the corresponding Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions EEC listed under EPBC Act has been mapped within the BOA by (ELA, 2009). The best ft PCT for this community is PCT 147: Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion. Within the BOA this community generally includes Wilga, *Alectryon oleifolius* (Western Rosewood), *Alstonia constricta* (Quinnie Bush) and *Notelea macrocarpa* var. *microcarpa*. As well as occasionally including White Box and *Casuarina cristata* (Belah) as emergent trees. The groundlayer includes a mix of native and exotic grasses and forbs. An indicative photo of the community within the BOA is provided as **Figure 3.6**.

Table 3.3: Threatened Ecological Communities within BOAs

Ecological Community	Threatened Status		Area (ha)
	BC Act	EPBC Act	Yarrari / Belah
Box-Gum Woodland	CEEC	CEEC	351
Semi-evergreen Vine Thicket	EEC	EEC	176

Figure 3.5: Box Gum Woodland CEEC within the BOA.

Figure 3.6: Semi-evergreen Vine Thicket CEEC within the BOA.

Threatened Fauna

All threatened fauna recorded or predicted to occur (based on potential habitat) within the BOA (ELA, 2013 and AMBS, 2024) are shown below in **Table 3.4**.

Table 3.4: Recorded and Predicted Threatened Fauna of the BOA

Scientific Name	Common Name	Status		Habitat Requirements	Occurrence
		BC Act	EPBC Act		
Birds					
Anthochaera phrygia	Regent Honeyeater	CE	E	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	P
Ardeotis australis	Australian Bustard	E	-	Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams.	P
Burhinus grallarius	Bush Stone-curlew	E	-	Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	P
Calyptorhynchus lathami	Glossy Black-cockatoo	E	E	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	P
Chthonicola sagittata	Speckled Warbler	V	-	Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.	Yes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (Eucalyptus camaldulensis) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; fallen timber is an important habitat component for foraging.	P
Grantiella picta	Painted Honeyeater	V	V	Inhabits Boree/ Weeping Myall (Acacia pendula), Brigalow (A. harpophylla) and Box-Gum Woodlands and Box-Ironbark Forests.	P
Lathamus discolor	Swift Parrot	E	E	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations.	P

Scientific Name	Common Name	Status		Habitat Requirements	Occurrence
		BC Act	EPBC Act		
Lophoictinia isura	Square-tailed Kite	V	-	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.	P
Melanodryas cucullata	Hooded Robin (south-eastern form)	V	-	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	P
Melithreptus gularis	Black-chinned Honeyeater (eastern species)	V	-	Upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.	P
Neophema pulchella	Turquoise Parrot	V	-	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland. Nests in tree hollows, logs or posts.	P
Ninox connivens	Barking Owl	V	-	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland.	P
Pomatostomus temporalis	Grey-crowned Babbler	V	-	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions.	Yes
Stagonopleura guttata	Diamond Firetail	V	-	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.	P
Tyto novaehollandiae	Masked Owl	V	-	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	P
Mammals					
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features.	P
Chalinolobus picatus	Little Pied Bat	V	-	Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands, cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.	P

Scientific Name	Common Name	Status		Habitat Requirements	Occurrence
		BC Act	EPBC Act		
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Hollow-bearing trees, fallen logs, other animal burrows, small caves and rock outcrops are used as den sites.	P
Macropus dorsalis	Black-striped Wallaby	E	-	Preferred habitat is characterised by dense woody or shrubby vegetation within three metres of the ground. This dense vegetation must occur near a more open, grassy area to provide suitable feeding habitat.	P
Miniopterus orianae oceanensis	Eastern Bentwing-bat	V	-	Caves used as primary roosting habitat	P
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Variety of vegetation types, including mallee, bulloke Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland.	P
Petaurus norfolcensis	Squirrel Glider	V	-	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas.	P
Phascogale tapoatafa	Brush-tailed Phascogale	V	-	Dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter.	P
Phascolarctos cinereus	Koala	E	E	Inhabit eucalypt woodlands and forests.	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	V	-	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	P
Saccolaimus flaviventris	Yellow-bellied Sheath-tailed Bat	V	-	Tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	P
Vespadelus troughtoni	Eastern Cave Bat	V	-	Cave-roosting species usually found in dry open forest and woodland, near cliffs or rocky overhangs and has been recorded roosting in disused mine workings. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Yes
Reptiles					
Hoplocephalus bitorquatus	Pale-headed Snake	V	-	Found mainly in dry eucalypt forests and woodlands, cypress forest and occasionally in rainforest or moist eucalypt forest. In drier environments, it appears to favour habitats close to riparian areas.	Yes
Uvidicolus sphyrurus	Border Thick-tailed Gecko	V	-	Species often occurs on steep rocky or scree slopes, especially granite.	P

P=Potential, Yes=recorded or observed

4 BIODIVERSITY OFFSET STRATEGY (BOS) AND SECUREMENT

4.1 YARRARI AND BELAH BOS

This section summarises the BOS secured by Biobanking Agreement 43 (that has been used to service the Biodiversity Credit retirement requirements for Approvals associated with RCM/CCM/VCM and TCM legacy offset requirement from surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33 that is not a part of the contemporary Major Project Approval BOS in MP 11_1047), including the key biodiversity values approved, such as vegetation community descriptions and mapping of vegetation condition and fauna habitat.

4.1.1 Biobanking Agreement 43

A summary of the Biodiversity Credit requirements associated with RCM/CCM/VCM, and TCM legacy offset being met by Biobanking Agreement 43 are:

- Retirement of 4,859 Ecosystem Credits as well as 60ha of Native Vegetation plus 0.62ha of White Box Grassy Woodland plus 231.42ha of Regent Honeyeater and Swift Parrot habitat plus restoration of 118.23ha of derived grassland to woodland (RCM PA 10_0015 Schedule 3 Condition 23);
- Implement an offset strategy depicted in the Statement of Environmental Effects or refined version approved by the Secretary; then in addition offset a further 30ha of Bimble Box/Pilliga Grey Box vegetation community (CCM DA 8-1-2005 Schedule 3 Condition 26 & 26A);
- 231.4ha of Regent Honeyeater and Swift Parrot habitat (RCM EPBC Approval 2010/5502 Condition 2b);
- 153ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (RCM EPBC Approval 2010/5502 Condition 2b);
- Retire 5,782 Biodiversity Credits (TCM surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33); and
- Retire 869 BBAM Biodiversity Credits of NA311 converted to 370 BAM Biodiversity Credits PCT459 by Revised Statement of Reasonable Equivalence dated 7 October 2022 (VCM SSD-7480 Condition B59);

To meet these BOS approval requirements; WHC established the Biobanking Agreement 43 (Yarrari and Belah BOA properties; **Figure 4.1**). This OMP updates the previous BOMP (ELA, 2013), which previously covered approximately 1,495.3ha; however high accuracy cadastral survey now has the total area protected as 1500.27ha (Stewart Surveys 2020). This still meets both the Area and Credits biodiversity values required by the above Approvals summarised in **Table 4.1**.

Table 4.1: Vegetation types and number of credits generated by the Yarrari and Belah BOA (ELA 2013).

Vegetation Type	Area (ha)	Credits Generated	RCM Offset	CCM Offset	TCM 2005 Offset	TCM Mod 1 Offset	RCM Extension Offset	VCM Extension Offset	Total Credits Utilised	Proportion Credits Used
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	176.20	1,977		157			1,820		**1,977**	**100.00%**
White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	486.80	3,627	271	534	1,749		1,073		**3,627**	**100.00%**
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	350.60	3,216		964		850	1,402		**3,216**	**100.00%**
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	474.10	4,934	318		982	2,201	564	869	**4,065**	**100%**
Unmapped	7.6	0								
Credits to be retired	**1,495.30**	**13,754**	**589**	**1,655**	**2,731**	**3,051**	**4,859**	**869**	**12,885**	**100%**
Area Equivalent (ha)		**9.198/ha**	**64.04**	**179.93**	**273.00**	**331.70**	**528.27**	**94.48**	**1,400.85**	

4.2 OFFSET SECUREMENT

To meet compliance with securement of the Yarrari & Belah BOS; WHC submitted a Biobank Assessment on 24 March 2010 in accordance with the Biobanking Assessment Methodology (DECCW 2010) for the BOA. The former NSW Office of Environment and Heritage (now regulated by the BCT) advised registration of Biobanking Agreement 43 on 28 June 2012 on title (Lot 36 DP754950, Lot 2 DP728391, Lot A DP405391 and Lot 1 in Deposited Plan 247949) generating 13,754 ecosystem credits (**Table 4.1**) and therefore secured under Part 5 Division 3 of the *Threatened Species Conservation Act 1995* (now repealed and replaced by the *Biodiversity Conservation Act 2016*). NSW Department of Planning & Infrastructure (now NSW DPHI) and DCCEEW were notified on 6 December 2012 and approved on 14 February 2013 and 23 December 2013 respectively that compliance had been achieved with EPBC Approval 2010/5502 Condition 2b and PA 10_0015 Schedule 3 Condition 23, surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33 and DA 8-1-2005 MOD2 Schedule 3 Condition 26 & 26A. The NSW Department of Planning & Infrastructure confirmed that 12,855 ecosystem credits were retired on 28 May 2013, with 869 NA311 Biobanking Biodiversity Credits from Whitehaven Coal Mining Limited owned BA43 Yarrari & Belah Biobanking Agreement retired on 8 December 2022 as like for like with PCT 459. This resulted in a converted total of 370 BAM Ecosystem Credits HBT (as per statement of reasonable equivalence) being retired against the Vickery Coal Mine credit liability as per SSD-7480 Condition B59.

4.3 VEGETATION COMMUNITIES, FAUNA HABITAT AND CONDITION

The existing approved BOS was mapped by Eco Logical Australia (ELA 2009) using Biometric vegetation types. This was contemporised by Ecoplanning (EP 2020), whereby best-fit PCT (and associated Keith Class) and updated condition were added to each Biometric vegetation type and condition (**Table 4.2**), enabling the vegetation mapping to align with the flora monitoring method as outlined in **Section 5.14**. The flora monitoring method divides each BOA into vegetation zones (VZs) based on Keith Class and condition (good, semi-cleared or derived native grassland), with monitoring focused within the largest VZs (**Section 5.14**). No alteration to the original ELA mapping was conducted as the original Biometric vegetation types are used to generate the Biobanking credits as outlined in **Table 4.1.**

The original ELA (2009) vegetation mapping is displayed in **Figure 4.1** and **Table 4.2**, including area of habitat provided for Regent Honeyeater and Swift Parrot plus Box-Gum Woodland CEEC. The modified EP (2020) vegetation mapping (using Keith Class and condition) is displayed in **Figure 5.3** and **Table 4.2**. Note that higher accuracy cadastral mapping of the BOA in 2020 (Stewart Surveys 2020) has resulted in minor variances in the area of vegetation zones, as well as the total area of the Yarrari/Belah BOA.

Table 4.2: Area and condition of each vegetation zone within the BOA.

Approved BOS mapping (ELA 2009)			Revised VZ mapping (EP 2020)		
Biometric vegetation type	**Condition**	**Area**	**Best-fit Plant Community Type (PCT)**	**Vegetation Zone**	**Area***
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	Moderate to Good	176.2	147: Mock Olive - Wilga - Peach Bush - Carissa semi-evergreen vine thicket (dry rainforest) mainly on basalt soils in the Brigalow Belt South Bioregion	Dry Rainforests (Good)	176.05
White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	Moderate to Good	486.8	435: White Box - White Cypress Pine shrub grass hills woodland in the Brigalow Belt South Bioregion and Nandewar Bioregion	North-west Slopes Dry Sclerophyll Forests (Good)	486.45
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Moderate to Good (No Trees)	271.6	1383: White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion	Western Slopes Grassy Woodlands (DNG/Cleared)	254.17
				Western Slopes Grassy Woodlands (Semi-cleared)	16.45
	Moderate to Good (Trees)	79.0		Western Slopes Grassy Woodlands (Good)	78.92
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Moderate to Good (Flat Country)	453.9	1313: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Western Slopes Dry Sclerophyll Forests (Good)	453.65
	Moderate to Good (Slopes)				
	Moderate to Good (Flat No Trees)	20.2		Western Slopes Dry Sclerophyll Forests (DNG/Cleared)	20.19
Total		**1487.7**	**Total**		**1485.88**
Unmapped		7.6	Unmapped		14.39
Total BOA		**1495.3**	**Total BOA**		**1500.27**

*The area of each vegetation zone was revised following high accuracy cadastral mapping of the BOA (Stewart Surveys 2020).

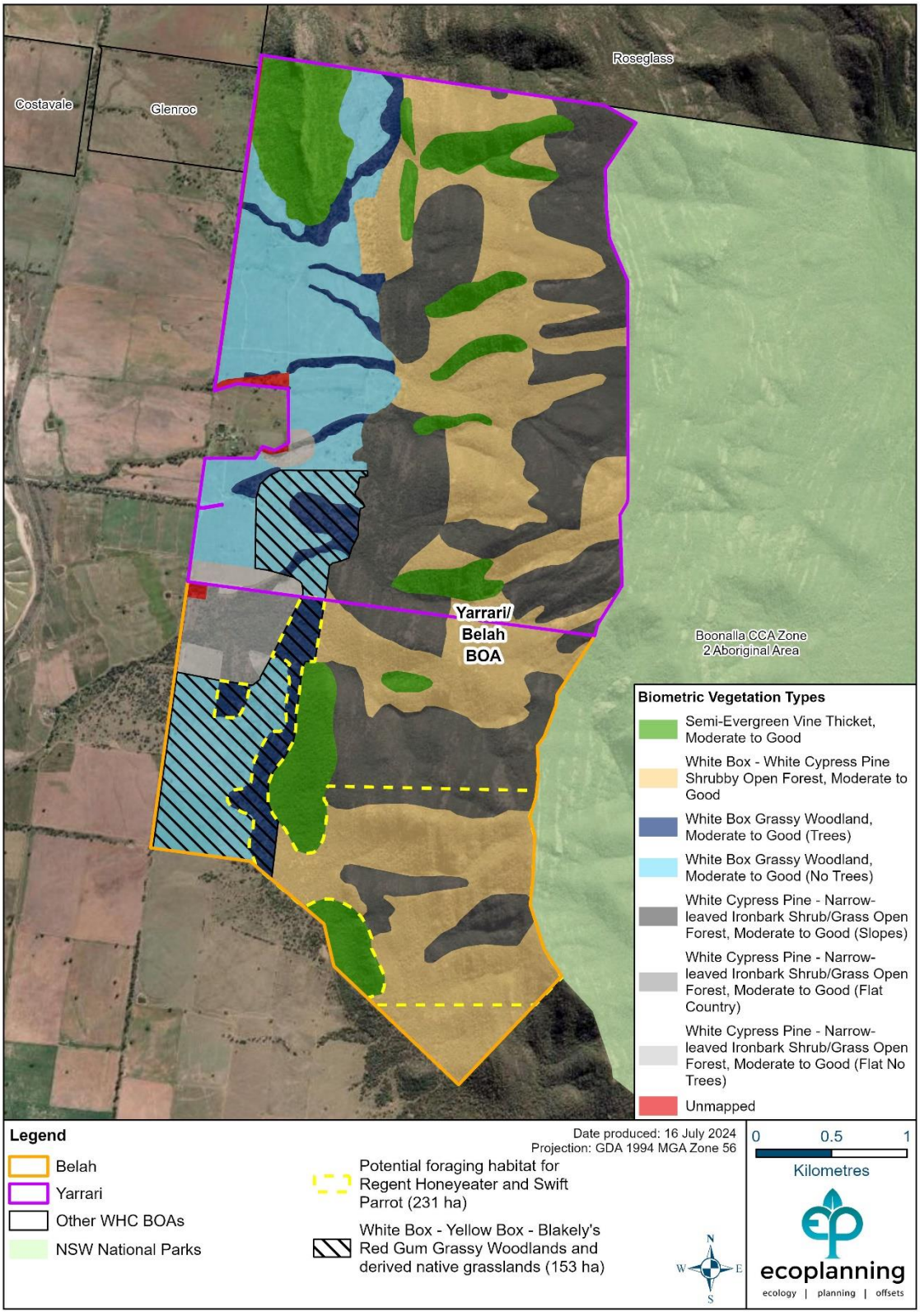


Figure 4.1: Vegetation Communities – Yarrari and Belah BOA (ELA 2009).

5 MANAGEMENT OF THE BIODIVERSITY OFFSET AREAS

This section describes the management measures to be implemented in the BOA. The management regime in the offset areas will be adaptive over time to achieve the ecological management objectives.

5.1 ECOLOGICAL MANAGEMENT OBJECTIVES

The ecological management objectives specific to the BOA are shown below in **Table 5.1**.

Table 5.1: Ecological management objectives specific to each BOA

Mine BOS	Ecological Management Objectives
RCM/CCM/TCM BOS	• protect and enhance existing Box-Gum Woodland CEEC (woodland form) • restore self-sustaining woodland within existing areas of Box-Gum Woodland CEEC (derived native grassland) • protect and enhance existing woodland and forest habitat for Regent Honeyeater and *S*wift Parrot • restore self-sustaining woodland and/or forest within derived native grasslands and 'non-native/Cleared' areas to provide habitat for the above listed threatened species listed under the EPBC Act

5.2 IMPLEMENTATION SCHEDULE

The following **Table 5.2** summarises the management actions described and the frequency/timing of when those actions are to occur.

Table 5.2: OMP Implementation Schedule

Section	Management Action	Frequency and/or Timing
5.3.1	Tracks and Fences	Biannual/as required
5.3.2	Other Offset Infrastructure	Biannual
5.3.3	Signage and Inspections	Biannual/as required
5.3.4	Long Term Security	Complete
5.3.5	Biodiversity Offset Area Divestment	When required
5.4	Seed Management	Seasonal, based on life cycle stage and development of native plants
5.5	Revegetation	Annual (dependent on seasonal conditions)
5.6	Ecological Thinning	As required by assessment
5.7	Habitat Augmentation	As required by assessment
5.8	Heritage Management	Annual
5.9	Weed Management	Seasonal (dependent on seasonal conditions)
5.10	Pest Animal Management	Seasonal (dependent on seasonal conditions)
5.11	Soil Management	Annual
5.12	Agriculture Management	As required
5.13	Bushfire Management	Annual/as required (dependent on seasonal conditions)
5.14	Flora Monitoring	Annual
5.15	Fauna Monitoring	Annual and biennial
5.16	Performance and Completion Criteria	Annual
5.17	Potential Risks and Contingency Measures	As required

5.3 BIODIVERSITY OFFSET AREA ESTABLISHMENT

This section outlines WHC's approach to the demarcation of BOA boundaries for controlling access (including the use of signage) and provision for the long-term security of the offset areas (including provision of conservation bonds) in accordance with the Project and EPBC Act Approvals (**APPENDIX A:** and **APPENDIX B:**).

5.3.1 Tracks and Fences

Access tracks and fence lines are to be located on or adjacent to the actual BOA boundary wherever practicable. The use of existing fences will be maximised in the first instance as the BOA boundary, to reduce additional disturbance. This will secure the BOA by minimising the likelihood of inadvertent grazing, unauthorised disturbance, or unauthorised access into the BOA. Wherever practical, new fencing will prioritise the use of plain wire fencing (minimising the use of barbed wire). Redundant internal fencing within the BOA will be progressively removed overtime.

New access tracks and fences will be located, as required (e.g., for access tracks, fence maintenance or replacement), in consideration of biodiversity (such as threatened species) and heritage constraints. Due diligence inspections will be undertaken prior to any disturbance, and new tracks and fences will be constructed with a maximum 6 m total width.

Ongoing monitoring and site inspections undertaken by WHC will note any damage or disrepair of fences and undertake maintenance/repair as required. If in instances where barbed-wire fencing is being used and is found to be restrictive or damaging to fauna, ecologically-friendly alternatives will be investigated.

5.3.2 Other Offset Infrastructure

Existing infrastructure (such as electricity transmission lines, windmills/water bores and pipes, homesteads and sheds) wholly or partly within the BOA will be retained and managed as required by the relevant owners and/or managers/licensees. Any existing infrastructure no longer required will be progressively removed overtime and any hazardous materials or contaminated land remediated as required.

Existing farm dams within the BOA will be assessed for habitat and if not required for management or habitat; will be filled in. The filled in farm dams will be revegetated to minimise soil erosion.

New infrastructure will be located, as required, in consideration of biodiversity (such as threatened species) and heritage constraints, and due diligence inspections will be undertaken prior to any disturbance.

5.3.3 Signage and Inspections

Signage will be installed on gates and/or other access points into the BOA that identifies the property/domain name as a 'Biodiversity Offset Area', and that authorised access only is allowed.

Routine (6 monthly) inspections will assess fencing, gates, access tracks and signage for maintenance issues and disturbance factors (including fire, unauthorised access and evidence of waste), limited by health and safety considerations, resources, accessibility, weather and/or ground conditions. Maintenance of all access tracks, fences and gates will be undertaken as required.

5.3.4 Long Term Security

The BOA has been secured in perpetuity by an appropriate legal mechanism as set out in **Table 5.3**. Now that securement is complete for the other WHC BOSs and Offset properties, WHC will re-engage with NPWS who have previously shown interest in Offset properties being transferred to National Park Estate including Yarrari and Belah (to Boonalla Aboriginal Area).

Table 5.3: Long-term security provisions for the BOA

Long-term Security Provision	Offset Property	Legally Binding Conservation Covenant	Registered
Biobanking Agreement	Yarrari and Belah	BA43	28/06/2012

5.3.5 Biodiversity Offset Area Divestment

The long-term securement of the Yarrari/ Belah BOA will be for the ownership to be divested at an appropriate time in the future to another organisation best placed for in perpetuity management of lands for biodiversity conservation and restoration. One such divestment option that has been considered in the original BOMP (Eco Logical Australia, 2014) is the transfer to national park estate managed by NSW National Parks and Wildlife Service (NPWS). In a letter dated 16 August 2017, NPWS advised WHC of its interest in the transfer and reservation of BOA properties, subject to payment of an in-perpetuity management fee and based on a certain standard of biodiversity and property condition (i.e. fencing and fire trials constructed, advanced revegetation, infrastructure/waste removed and

hazardous/contaminated material remediated). At the time, transfer negotiations were to be deferred until after securement had been achieved for WHCs other BOAs. Now that WHC has secured all other BOAs being registered on title; therefore WHC will reengage with NPWS regarding transfer to national park estate of those BOA including Yarrari and Belah including transfer of the residual total fund deposit in lieu of in-perpetuity management fee payment. WHC contacted NPWS (Executive Director, Park Operations Inland) in July 2024 following up on NPWS previous consideration of proposed offset transfers to National Park Estate; with NPWS responding in August 2024 confirming a new contact point within NPWS and following handover/background, will be back in contact with WHC in due course.

WHC will seek endorsement from NSW DPHI, NSW DCCEEW and CDCCEEW when a transfer agreement is executed with NPWS, and this OMP will be revised accordingly. For any offset areas not transferred to conservation reserve estate for in perpetuity management by NPWS, WHC will continue to be responsible for the ongoing management in accordance with this OMP until another appropriate organisation best placed for in perpetuity management of lands for biodiversity conservation and restoration is identified (and suitable arrangements are made with that organisation for transfer of such responsibilities).

5.4 SEED MANAGEMENT

WHC coordinates routine seed assessment programs designed to identify, on a seasonal basis, the life cycle and development stages of native plants across the BOA (and other WHC BOAs) to determine the best strategy in order to collect seeds for future revegetation programs. The format of the seed assessments ensures that timely and prioritised seed collection is implemented, and that reporting includes spatial information required by seed collection contractors to undertake the required works. Seed collection will be based on seed assessment results and from other opportunistic observations, but the assessment, collection and propagation will only be undertaken as required depending on the revegetation needs.

Seed collection, management, propagation, storage and record-keeping will be undertaken in consideration of Greening Australia (various dates) *Florabank Guidelines* (http://www.florabank.org.au) and Biobanking Agreement 43 limitations and permissions. Currently accepted best practice, as described in Rawlings *et al.* (2010) for local provenance seed collection includes:

- Collection of seed from several source sites with similar rainfall, soil, altitude, aspect, and slope position to the revegetation site to ensure they are most adapted to the landscape and environmental conditions;
- Collection of seed from between 20-50 plants of each species for genetic diversity; and
- Collection of seed from plants spaced approximately three plant-heights apart to prevent collection of too many closely related seeds.

For seed collection undertaken on site; records will include the species, quantities, dates and locations (in consideration of Florabank Guideline 4 [1999]) and be reported.

5.5 REVEGETATION

The objective of the revegetation program is to increase the area, quality and connectivity of native vegetation and habitats, focusing on assisted natural regeneration and active revegetation methods including direct seeding or seedling planting with consideration given to Biobanking Agreement 43conditions. The revegetation program was prepared following the principles outlined within *Florabank Guidelines* (Greening Australia, various dates) and *A Guide to Managing Box Gum Grassy Woodlands* (Rawlings *et al.,* 2010).

WHC will undertake annual revegetation assessments to identify across the BOA where natural regeneration is not occurring, as well as any underperforming previous revegetation areas to determine what and where any active revegetation or maintenance revegetation is required for the upcoming season of the annual revegetation program.

Annual revegetation assessments will consider key species required to match the mapped or adjoining suitable PCT vegetation communities as well as any natural or physical constraints to revegetation of individual paddocks across the BOA. The information from the annual revegetation assessments will be used to place seed and hiko seedling orders for the required quantity of tree, shrub and ground cover species. Orders will be placed in advance to allow sufficient time for additional seed collection (if required, **Section 5.4**) and for seedling germination/propagation to occur in time for the upcoming annual revegetation program. Flora species indicatively used in areas under active revegetation (**Table 5.4**) include a variety of grasses, shrubs and trees to create a structurally diverse habitat (including species associated for Box-Gum Woodland CEEC; and habitat for the Regent Honeyeater, Swift Parrot and Corben's Long-eared Bat). The annual revegetation program timing is to occur during periods of desirable seasonal conditions (times of opportunistic high soil moisture and moderate diurnal temperature variation).

Ground truthing and mapping of proposed revegetation paddocks will determine what preparation and maintenance works are required for individual revegetation paddocks. Ground preparation methods that can be implemented (where required) include weed control, grass competition maintenance, soil disturbance (i.e., augering, mounding, ripping, harrowing or ploughing) as well as consideration of other ancillary items (i.e. tree guards) that are required to optimise revegetation success and growth/development of seedlings and seeding areas. Post planting inspections will be undertaken progressively to survey performance/quality, methods and results to date including a final end of season survival count of the previous annual revegetation program. All these processes and steps allow progressive learning and adaptive management to be implemented as part of future revegetation programs (**Plate 1**).

Table 5.4: Indicative Revegetation Species List for Key PCTs within the BOA

Common Name	Scientific Name	Common Name	Scientific Name
Trees		Grasses	
Western Rosewood	*Alectryon oleifolius*	Kangaroo Grass	*Themeda triandra*
Red Ash	*Alphitonia excelsa*	Wallaby Grass	*Rytidosperma* spp.
Rough-barked Apple	*Angophora floribunda*	Plains Grass	*Austrostipa aristiglumis*
Whitewood	*Atalaya hemiglauca*	Barbed Wire Grass	*Cymbopogon refractus*
Kurrajong	*Brachychiton populneus*	Slender Bamboo Grass	*Austrostipa verticillata*
#White Cypress Pine	*Callitris glaucophylla*	Slender Rats Tail Grass	*Sporobolus creber*
#Belah	*Casuarina cristata*	Tall Oats Grass	*Themeda avenacea*
*#White Box	*Eucalyptus albens*	Silky Browntop	*Eulalia aurea*
#Apple Box	*Eucalyptus bridgesiana*	Shrubs and Sub-shrubs	
*#Blakely's Red Gum	*Eucalyptus blakelyi*	Western Silver Wattle	*Acacia decora*
#Narrow-leaved Ironbark	*Eucalyptus crebra*	Sticky Wallaby Bush	*Beyeria viscosa*
#River Red Gum	*Eucalyptus cunninghamiana*	Sticky Hop-Bush	*Dodonaea viscosa* ssp. *angustifolia*
Tumbledown Red Gum	*Eucalyptus dealbata*	Wilga	*Geijera parviflora*
Dwyers Red Gum	*Eucalyptus dwyeri*	Black Tea-tree	*Melaleuca bracteata*
Silver-top Stringybark	*Eucalyptus laevopinea*	Forbs	
Red Stringybark	*Eucalyptus macrorhyncha*	Yellow Burr-daisy	*Calotis* spp.
#Silver-leaved Ironbark	*Eucalyptus melanophloia*	*Common Everlasting*	*Chrysocephalum apiculatum*
*#Yellow Box	*Eucalyptus melliodora*	Ruby Saltbush	*Enchylaena tomentosa*
#Western Grey Box	*Eucalyptus microcarpa*	Winter Apple	*Eremophila debilis*
Pilliga Box	*Eucalyptus pilligaensis*	Narrawa Burr	*Solanum cinereum*
Poplar Box	*Eucalyptus populnea*	Fuzz Weed	*Vittadinia* spp.
Manna Gum	*Eucalyptus viminalis*	Blue Bells	*Wahlenbergia* spp.

* Species associated with the Box-Gum Woodland CEEC to create structurally diverse habitat as per the NSW Final Determination and Commonwealth Listing Advice for these communities (TSSC, 2006). # Species associated with habitat for the Regent Honeyeater, Swift Parrot and Corben's Long-eared Bat.

Plate 1: Active Revegetation within Yarrari and Belah BOA

5.5.1 Revegetation Works Completed

Revegetation works have been undertaken across the BOA as outlined in **Table 5.5** and **Figure 5.1**. The restoration commitments outlined below include areas of active revegetation and natural regeneration.

Table 5.5: Extent of revegetation works undertaken within the BOA

BOA	Restoration Commitment (ha) and relevant Approval	Total restoration completed to date	Extent Active Reveg (ha)	Extent Natural Regen (ha)	Area (ha) of new and/or maintenance plantings					
					2017	2018	2019	2020	2021	2022
Yarrari & Belah	281.7 (BA43 MZ1 & MZ2) 118.3* (MP10_0015)	310.1	283	27.1	277	100	130	93	130	0

*Subset of the areas described within CA0060 or BA43 and therefore not added to total figure of 1,980.8 ha

Active revegetation extents (shown in **Table 5.5**) were quantified based on the actual extent of primary revegetation undertaken across the BOA. Differences between areas committed to in the relevant Approvals and the actual extent of active revegetation is identified through Annual Revegetation Assessments. Assessments to date have found that some areas originally committed to, were not suitable for revegetation due to; increased natural regeneration; unsuitably steep or rocky ground; the presence of remnant riparian or paddock trees; identification of heritage sites; identification of threatened flora species (and the erection of enclosures); and the presence of fence lines and access tracks.

Primary revegetation of the BOA is complete. Whilst active primary and secondary revegetation works are continuing, most BOAs have exceeded the explicit restoration commitments within the relevant Approvals (**Table 5.5**).

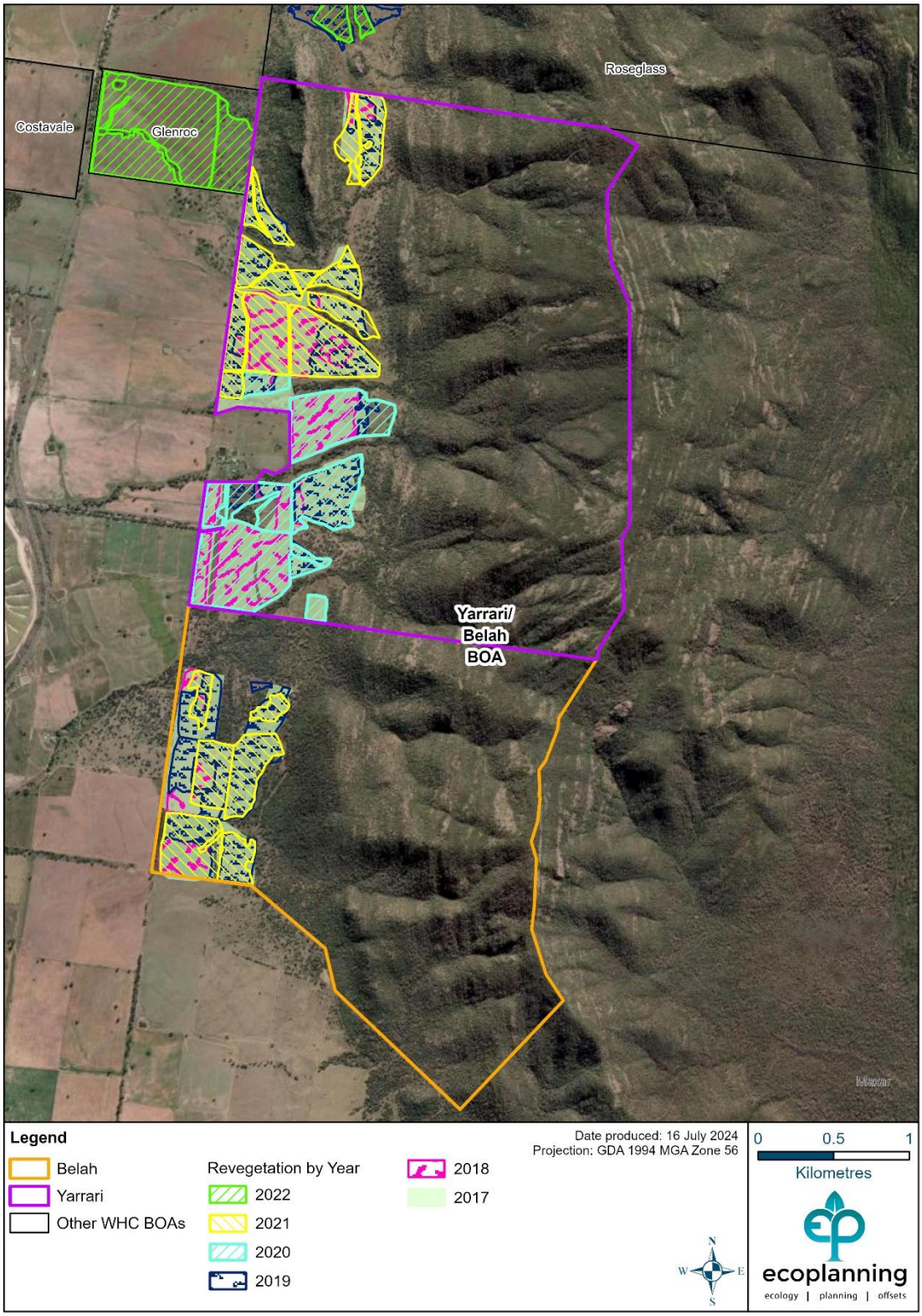


Figure 5.1: Revegetation undertaken across the BOA

5.6 ECOLOGICAL THINNING

Ecological thinning will only be considered in habitats identified as having dense regrowth, in particular *Callitris* species. WHC will undertake ecological thinning assessments to identify areas across the BOA where dense regrowth is impacting on flora and fauna habitat condition or is adverse to natural regeneration/ecological restoration. Initial stages of the ecological thinning assessment concludes that ecological thinning of *Callitris* could not be justified at this point in time without further assessment. If further assessment determines that ecological thinning is required; it will be staged, reflective of existing flora and fauna habitat condition (in consideration of Biobanking Agreement 43conditions).

5.7 HABITAT AUGMENTATION

Habitat augmentation (using salvaged resources or nest boxes) will be undertaken in accordance with Approval conditions and in habitats identified as having low habitat resources. Whitehaven will undertake habitat needs assessments to identify across the BOA where habitat resources are scarce, to determine the extent of habitat augmentation required. Habitat augmentation will be staged, reflective of existing fauna habitat condition and will utilise available salvaged resources such as coarse woody debris, rocky debris and artificial hollows (including nest boxes – the number and type determined by the habitat needs assessment based on signs of use and suitable dimensions required for species and data collected from clearing areas on mine sites) in consideration of Biobanking Agreement 43 conditions.

Where nest boxes are to be installed; they will be made from high quality and durable materials that provide for a long lifespan and of designs that are targeted for hollow-dependent threatened species known to occur in the locality of the offset site such as woodland birds, arboreal mammals and microbats.

A targeted monitoring program is implemented within the BOA with habitat augmentation to survey their use in conjunction with other fauna methods (**Section 5.15**). Monitoring includes targeted camera surveys and external/internal observations of habitat augmentation structures to identify both their use and condition.

5.8 HERITAGE MANAGEMENT

Biodiversity management of heritage sites and values is consistent with the relevant baseline surveys and mine site specific Heritage Management Plans. There is not expected to be any conflict between biodiversity management works in the offset areas and any cultural and historical heritage values and sites by adopting the following measures:

- Any new BOA should have heritage due diligence assessments completed prior to commencing biodiversity management works that cause surface disturbance. In addition, biodiversity management works (such as fire break track maintenance, revegetation ground preparation or infrastructure/asset removal) cultural and historic heritage site locations will be reviewed to avoid being affected;
- Routinely maintain and update the Whitehaven Historical Heritage Register and Spatial Database (Whincop, 2021a) and the Whitehaven Cultural Heritage Register and Spatial Database (Whincop, 2021b);
- All relevant identified cultural and historic heritage sites within offset areas will be demarcated and fenced. To avoid inadvertent disturbance; heritage sites will have demarcation fencing installed and signs that identify the WHC BOA property, type of heritage and site ID, and a Whitehaven contact number provided so that only authorised access can be permitted and all activities must be authorised;
- All relevant identified cultural and historic heritage sites will have an Annual Heritage Site and Fencing Inspection undertaken by appropriately qualified heritage specialists to ensure the

integrity of the fencing and site condition has not compromised and that heritage sites are appropriately managed;

- If any potential heritage sites, remains or artefacts are identified during biodiversity management; the work will immediately stop within the vicinity of the suspected area and appropriately qualified heritage specialists will be engaged and an assessment undertaken to determine what action and reporting is required. Offset areas will need to meet all statutory requirements under the NSW *National Parks and Wildlife Act 1974* and NSW *Heritage Act 1977*.

5.9 WEED MANAGEMENT

WHC aim to promote natural regeneration by reducing weeds so that perennial exotic plant cover (PEPC) does not comprise of more than 20% of flora monitoring plots (aligned with RBS-2 [Umwelt 2017]) by implementing measures aiming to exclude priority weed species listed in the *North West Regional Strategic Weed Management Plan* 2017 – 2022 (NWRSWMP) (LLS, 2017). Priority weed species relevant to the BOA include Weeds of National Significance (WoNS), High Threat Exotics (HTE) and weeds identified within the BC Act and EPBC Act as a Key Threatening Process (KTP).

WHC will manage weeds in accordance with the *NSW Biosecurity Act 2015* that introduced the 'General Biosecurity Duty' (GBD) which requires all land managers and users to ensure as far as is reasonably practicable, that biosecurity risks are prevented, eliminated or minimised. In addition to WHC's GBD responsibility; weed management will be implemented aligned with the NWRSWMP (LLS, 2017) and weed control measures will be guided by published control measures (e.g., DPI, 2018a). The NWRSWMP introduces a risk management approach (based on the weed invasion curve stages of prevention, eradication, containment and asset protection) to prioritise weeds for management based on those weeds that are 'State Level Determined Priority Weeds for the North West Local Land Services Region' and additional 'Regional Priority Weeds'.

The spread and introduction of weeds can be prevented by the practice of weed hygiene measures. WHC will instruct contractor vehicles and equipment entering the offset area (via toolbox talks and other communications including key messages) to be clean and free from weeds and/or seeds. Access to the offset areas will also be controlled as described in **Section 5.3**.

Seasonal weed assessment programs are undertaken across the offset area to identify weed species, extent and condition of any infestations and the opportunity for control/management depending on seasonal conditions. The weed assessments ensure that timely and prioritised weed control is undertaken on a seasonal basis, with information provided directly to contractors to enable targeted weed control and efficient use of resources across the BOA.

A number of environmental and priority weeds are known to occur in the offset areas as listed in **Table 5.6**. Based on seasonal weed assessment results; weed control will target priority weeds and any other environmental weed present in the BOA. If new priority weed species are found, then this will be communicated with WHC mine sites and neighbouring properties/organisations (via toolbox talks and other communications including key messages) and will also be managed in accordance with this OMP.

The *New South Wales Weed Control Handbook* (DPI, 2018b) will be consulted prior to weed control, for recommended techniques for the removal of priority weeds. Relevant methods for controlling priority weeds known to occur in the offset areas are summarised in **Table 5.6**.

Table 5.6: Example Control Methods of Priority Weeds across the BOA

Common Name	Scientific Name	Example Control Methods (DPI, 2018a)[2]
Mother of Millions	*Bryophyllum delagoense*	herbicide application
Paterson's Curse	*Echium plantagineum*	herbicide application
Coolatai Grass	*Hyparrhenia hirta*	physically remove, herbicide application
African Boxthorn	*Lycium ferocissimum*	physically remove, herbicide application
Prickly Pear	*Opuntia* sp.	physical removal, herbicide application
Tiger Pear	*Opuntia aurantiaca*	physical removal, herbicide application
Sweet Briar	*Rosa rubiginosa*	physical removal, herbicide application
Fireweed	*Senecio* spp.	herbicide application
Cockle Burr	*Xanthium occidentale*	physical removal, herbicide application
Bathurst Burr	*Xanthium spinosum*	physical removal, herbicide application

All personnel involved in weed management will be required to hold relevant and valid licences/ permits for weed management works, including a chemical licence to use herbicides and a chainsaw certificate to operate chainsaws (where applicable).

5.10 PEST ANIMAL MANAGEMENT

The overarching objective of the pest animal management program is to ensure that the impacts of pest animals to native species, existing vegetation and revegetation within offset area are minimised. The goal of pest animal management is to achieve an overall reduction in pest animal species and population sizes targeted by control measures implemented across the BOA (in consideration of potential drought conditions and seasonal trends).

WHC aims to apply an even and consistent pest animal management effort by routinely scheduling a rolling monitoring and control programs across the BOA. This standardised approach can also be supplemented with periodic targeted programs that focus on specific areas with high pest animal detection, or, on species which have increasing rates of detection. Both the overall management and targeted programs are planned using data collected from grid based motion detection camera monitoring program, pest animal observations and the results of previous control programs.

Pest animal management will focus on the pest animals recorded from the offset areas (**Table 3.2**). However, if new pest animals are found, those new pest animals will also be managed in accordance with this OMP.

Control measures will be implemented by Pest Control Contractor(s) and/or WHC personnel as required. All personnel involved in pest animal control will be required to hold relevant and valid licences/permits, including any relevant chemical licences for pesticide use or a firearms licence for shooting. Pest animal control will be undertaken in consideration of the control recommendations outlined in the *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).

Table 5.7: Control Methods for Target Pest Animals

Common Name	Scientific Name	Example Control Method	Relevant Documents[2]
Feral Pig	*Sus scrofa*	trapping/ground shooting; and/or ground baiting.	*Threat Abatement Plan for Predation, Habitat Degradation, Competition and Disease Transmission by Feral Pigs* (DotEE, 2017)*; PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).

Common Name	Scientific Name	Example Control Method	Relevant Documents[2]
Feral Goat	*Capra hircus*	trapping/mustering; and/or ground shooting.	*Threat Abatement Plan for Competition and Land Degradation by Unmanaged Goats* (DEWHA, 2008a); and *PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021).
European Red Fox	*Vulpes*	trapping; and/or ground baiting.	*Threat Abatement Plan for Predation by European Red Fox* (DEWHA, 2008b); *NSW Threat Abatement Plan For Predation by The Red Fox (Vulpes vulpes)* (OEH, 2011); *PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).
European Rabbit	*Oryctolagus cuniculus*	warren ripping/fumigation; ground shooting; and/or ground baiting.	*Threat Abatement Plan for Competition and Land Degradation by Rabbits* (DotEE, 2016); *PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).
Brown Hare	*Lepus capensis*	ground shooting.	*Integrated Hare Control* (Department of Environment and Primary Industries [VIC], 2015); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).
Feral Cat	*Felis catus*	trapping; and/or ground shooting.	*Threat Abatement Plan for Predation by Feral Cats* (DotE, 2015); *PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).
Wild Dog	*Canis familiaris*	ground baiting; and/or ground shooting.	*New South Wales Wild Dog Management Strategy 2017-2021* (DPI, 2017); *PestSmart Toolkit* (Centre for Invasive Species Solutions, 2021); and *Ecology and Management of Vertebrate Pests in NSW* (DPI, 2018c).

[1]*Local Land Services Act 2013*

[2]An alternative published method may be used as required.

5.11 EROSION MANAGEMENT

Erosion management is determined by annual inspection programs of known soil degradation (erosion and/or salinity) sites, unsealed tracks and associated drainage structures across the BOA to review appropriate erosion and sediment control measures required in accordance with the Blue Book (*Managing Urban Stormwater: Soils and Construction Volume 1* [Landcom, 2004]) and in consideration of Biobanking Agreement 43 conditions. Should annual inspection programs identify areas of unstable and active erosion or salinity, the soil erosion register will be updated including what (if any) active remediation works are required to be undertaken. Any erosion and sedimentation identified with tracks and associated drainage structures will be maintained through annual fire break track maintenance program.

5.12 AGRICULTURE MANAGEMENT

Agriculture/grazing has been excluded from the offset areas. Stray neighbouring stock will be removed as soon as practicable. Any proposed grazing for high threat weed infestations must be planned in consideration of Biobanking Agreement 43 conditions and aligned with the *Biodiversity Conservation Trust Livestock Grazing Guidelines* (BCT, 2021).

5.13 BUSHFIRE MANAGEMENT

WHC will annually quantify bushfire fuel loads and characterisation of the BOA to assess bushfire hazard of various Offset properties prior to each bushfire season. The assessment will consider human, environment and infrastructure assets within and adjacent to offset areas to quantify an overall bushfire risk, then the feasibility of various hazard reduction methods are considered (for example but not limited to fire exclusion, mechanical fuel reduction such as slashing or undertaking ecological burns) prior to determining annual treatment/actions for each offset property.

Offset properties with moderate to high overall bushfire risks will be prioritised as part of an annual ecological burn program and will be subject to conceptual and strategic fire planning and mapping. Once annual fire planning has identified paddocks feasible to undertake ecological burns, and a burn plan has been prepared, WHC will consult, where required, with relevant stakeholders such NSW Rural Fire Services (RFS), Councils and neighbours/local community as well as NSW Environmental Protection Authority (EPA Approval for Open Burning is required for ecological burns) and NSW Biodiversity Conservation Trust (BCT) in consideration of Biobanking Agreement 43 conditions.

WHC will establish and maintain Access Tracks within the BOA and around the perimeter of the BOA that will serve a dual purpose to passively mitigate fire spreading within or outside of the offset property (where practicable) and containment for bushfires and active ecological burns (as required). Access Tracks will be periodically maintained as zero fuel barriers (preferably mineral earth barriers up to 6 m total width of clearing; acknowledging that between maintenance events some fuel accumulation will occur, not to NSW RFS Fire Trail Standards (November, 2023). Access Tracks will be inspected annually, prior to the fire season (RBS-2, Umwelt, 2017), and maintenance of Access Tracks to be prioritised as required by the inspection.

WHC will undertake an annual ecological burn program of paddocks/burn blocks identified through the above assessment, within the prioritised offset properties, using suitably experienced and capable professionals with adequate firefighting resources and training to safely and competently light and extinguish ecological burns. The location of ecological burns within grasslands (if previous revegetation present, will need to be sufficiently mature to avoided fire impacts) and existing remnant vegetation will be in consideration of Biobanking Agreement 43 and will align with fire intervals outlined by the Bush Fire Coordinating Committee (2008) summarised as:

- intervals for grassy woodlands of 8 to 40 years;
- grasslands 3 to 10 years; and
- dry sclerophyll forest shrub/grass sub-formation of 8 to 50 years.

Ecological burns will aim for low to moderate fire intensity burns, by aiming for cool-season burns, when conditions are suitable (generally autumn to spring) to establish a mosaic of different burn ages and fuel loads. In addition, other burn preparations will be undertaken to mitigate impacts to environmental assets (such as hollow bearing trees) and other constraints identified within mapped burn blocks.

In the event of a bushfire within or adjacent to the BOA; WHC will assist bushfire emergency services and neighbours (such RFS, NPWS and Forestry Corporation NSW) as much as practicable, including but not limited to coordinating access to the BOA as well as facilitating available water sources. WHC will add flora monitoring plots to previously burnt areas to monitor the restoration response and ecological burn treatment management (particularly for BGW).

5.14 FLORA MONITORING

Purpose

Annual flora monitoring will be undertaken by qualified ecologists to gather floristic data that can track changes in vegetation and habitat values within the BOA and report on the effectiveness of management actions and progress made against annual performance and final completion criteria (**Section 5.16**). Flora monitoring will be on an annual basis in spring, when the highest diversity of plants is expected to be present (Rawlings *et al.,* 2010). The season of monitoring plots will be consistent (not rotated) in order to monitor trends in the data and that a similar range of species diversity has been found in other seasons not warranting seasonal surveys.

Monitoring Design

Relevant ecological indicators outlined in **Table 5.8**, based on a modified Biobanking Assessment Methodology (BBAM) (DECCW 2010) are monitored annually at treatment plots (within the BOA) and compared to control plot and reference site data (both outside the BOA) over time.

All monitoring plots (treatment, control and reference) are 0.1 ha (20 x 50 m) inclusive of a 20 x 20 m floristic plot and 50 m transect (see **Figure 5.2**).

To determine whether the ecological management objectives are being achieved, the flora monitoring program aims to collect data that can answer four ecological questions:

1) Do Vegetation Zones (VZs) meet completion criteria?
2) Do treatment plots meet annual performance criteria?
3) Are treatment plots trending towards completion criteria and/or reference state?
4) To what extent are management actions within a vegetation zone effective?

The annual reporting requirements for flora monitoring results are outlined in **Section 6.2**.

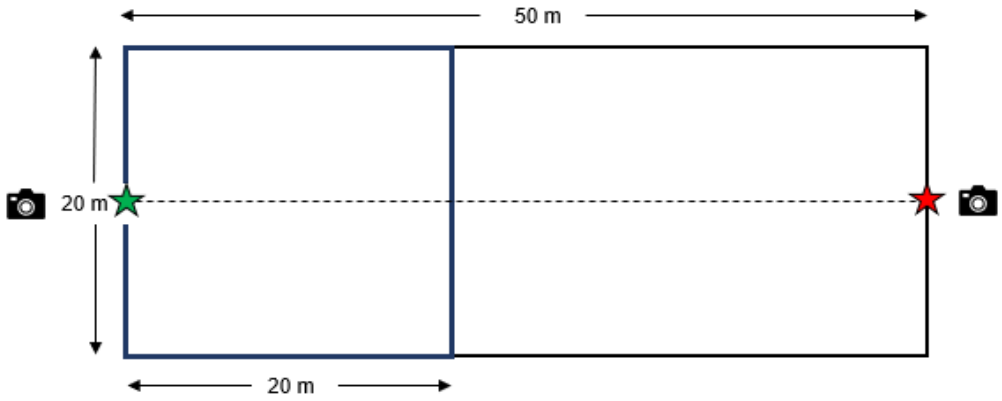


Figure 5.2: 20m x 50m monitoring plot – green star represents start of transect

Table 5.8: Flora monitoring attributes

Monitoring attributes (Ecological indicators)		Assessment technique	BGW condition indicators	Threatened Fauna Habitat value indicators
Native plant species richness (NPS)		Count utilising a species list recorded within 20 x 20m sub-plot (estimate % cover and abundance of each species)	✓	
Native over storey cover (NOS)		10 points along a 50 m transect	✓[1]	✓
Native mid-storey cover (NMS)		10 points along a 50 m transect	✓	
Native ground cover (grasses) (NGCG)		50 points along a 50 m transect	✓	
Native ground cover (shrubs) (NGCS)		50 points along a 50 m transect	✓	
Native ground cover (other) (NGCO)		50 points along a 50 m transect	✓	
Exotic plant cover (EPC) (calculated as % of total ground and mid-storey cover)	mid-storey cover	10 points along a 50 m transect	✓	
	ground cover	50 points along a 50 m transect		
Number of standing trees (dead and alive) with hollows (NTH)		Count within 20 x 50 m plot	✓	✓
Proportion of over-storey species occurring as regeneration (OR)		Observation within 20 x 50 m plot (compared to number of native overstorey species occurring within 50 m radius of plot)	✓	
Total length of fallen logs (FL)		Measured within 20 x 50 m plot	✓	✓
Exotic plant species richness		Count utilising a species list recorded within 20 x 20m sub-plot (estimate % cover and abundance of each species)		
Perennial exotic plant cover (PEPC)		% foliage cover recorded within 20 m x 20 mm sub-plot	✓	
Photo points		2 transect photos per plot, taken at chest height from start and end picket	✓	
Opportunistic observations		Record observations of: natural regeneration of disturbed areas, threatened species, fire events, weeds, pest animals, visitor impact, rubbish, other field notes	✓	✓

[1]Indicator of water stress

The BOA is mapped and stratified into Vegetation Zones (VZs) (shown in **Figure 5.3**) which define areas having the same annual performance criteria, final completion criteria and exposure to BOA adaptive management actions. VZs within the BOA are defined based on:

1) Vegetation Class (Keith 2004) (known herein as Keith Class), and
2) Broad condition state (Good, Semi-cleared, DNG/Cleared)

Treatment plots are established in the largest VZs, where the majority of WHC management actions occur, and are replicated based on Biobanking Assessment Method (BBAM) area threshold

recommendations (OEH 2014). The number of treatment plots within each BOA is shown in **Table 5.9** and **Figure 5.3**.

Table 5.9: Number of flora monitoring plots within the BOA

BOA	Area (ha)	No. VZs to be monitored	No. treatment plots
Yarrari and Belah	1,488	5	32

Control plots are used to monitor the effectiveness of BOA management actions and are located outside the BOA in DNG and/or Semi-cleared areas, within the same Keith Class and IBRA region as the treatment plots to which they are compared. Control plots are situated on land representing a 'business as usual' land management scenario (BCT 2021), where no WHC biodiversity management occurs. Where it is not possible to establish control plots in the same IBRA and Keith Class as treatment plots, control plots within the adjoining IBRA will be used. The comparison of treatment and control plot data aims to account for changes that occur due to background environmental change and indicate whether WHC management actions are effective within each VZ.

Reference plots are located within a 'reference site' outside of the BOA, representing high-quality remnants of Keith Classes monitored within the BOA. The monitoring of reference sites provides local benchmark data for aspirational 100-year targets, achievable beyond WHCs period of management. The comparison of VZ data (with relatively short management history) to the appropriate reference site, is to show that under WHC management VZ restoration is trending towards reference site condition. This gives confidence that it will continue to trend towards reference condition after achievement of completion criteria and the WHC management period ends.

Control and reference sites are to have a minimum of three plots to allow for statistically robust data analysis. Treatment and control plots are permanently marked with star pickets at the start and end of the 50 m transect and at the four corners of the 20 m x 20 m floristic plot. Reference plots will not be permanently marked as they are within public land. The location of the start and end of the 50 m transect have been recorded using a GPS. Figure 5.4 shows the location of the control and reference sites surveyed in parallel with the treatment plots as part of Spring Flora Monitoring.

Data recording and storage

WHC utilises an online/electronic application as the Flora Monitoring Database and Reporting tool. The online application is a custom-designed application, accessible in the field via a tablet or smart phone which is used to electronically record floristic and habitat biometric data. Once the data is uploaded from the field it is stored and visible via a web-based login. The biometric data is stored in the electronic database and can be downloaded as Excel spreadsheets.

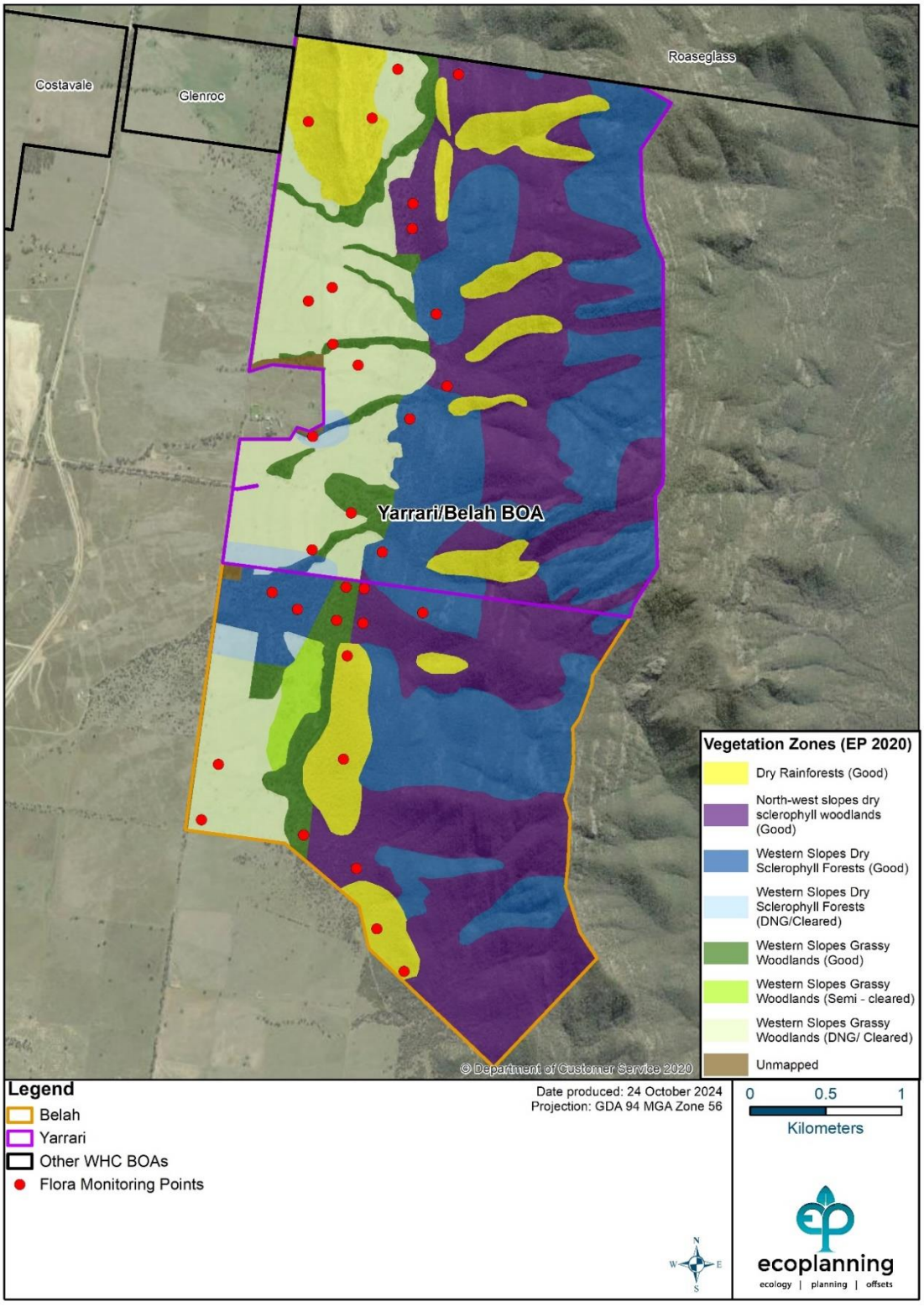


Figure 5.3: Vegetation zones (EP 2020) and monitoring plot locations within the Yarrari/Belah BOA

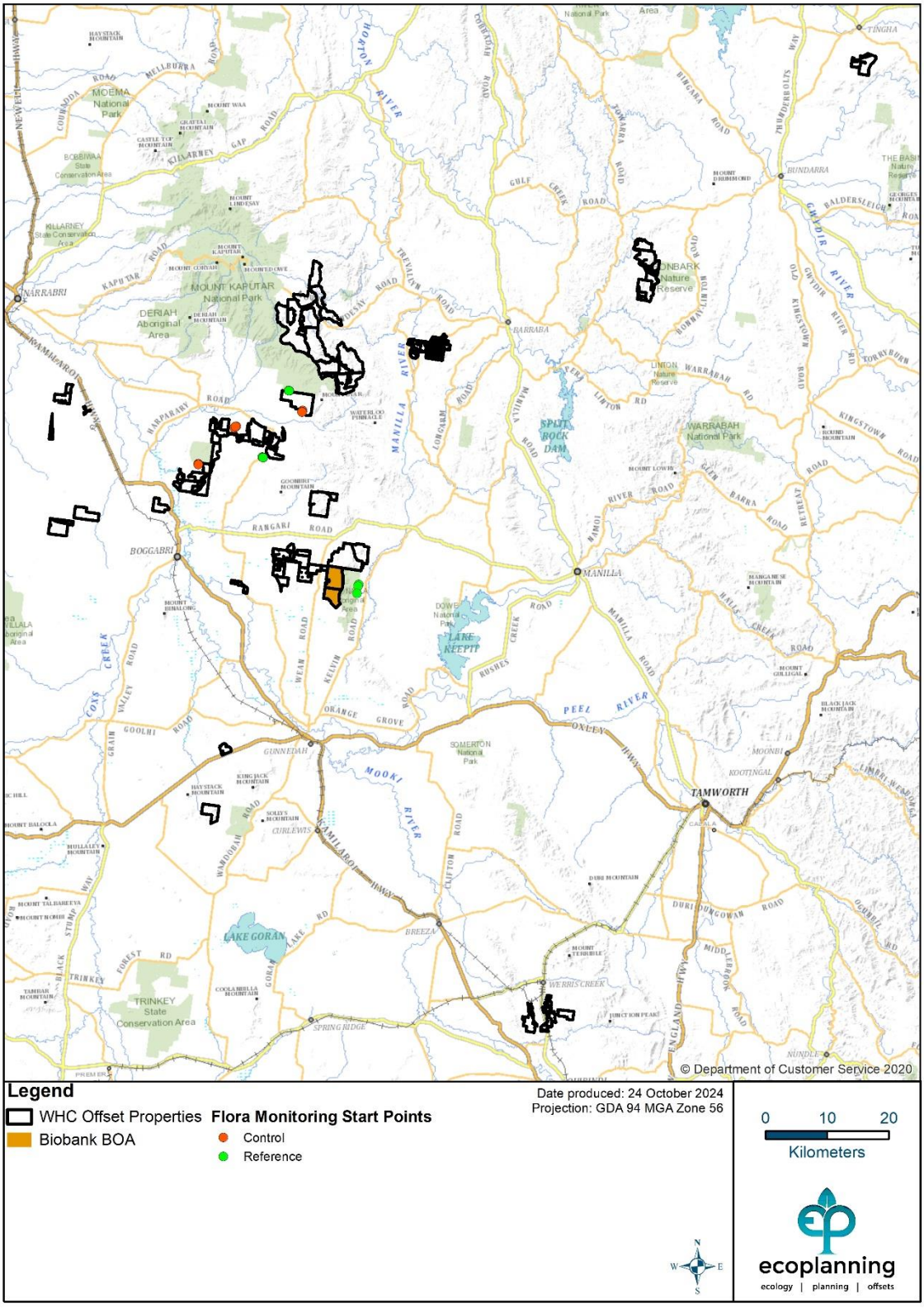


Figure 5.4: Location of control and reference plots associated with the Yarrari/Belah BOA.

5.15 FAUNA MONITORING

A 5-year review of the data collected from the Maules Creek and Willeroi Offset Annual Fauna Monitoring Programs surveyed between 2015 and 2019 (AMBS 2020a) indicated that while general trends in species richness and abundance over time were detected by the current survey methodologies and survey effort, the variance in the data set was extremely high and no meaningful statistical analysis linking changes in species richness and abundance to specific variables was possible. A further review was undertaken for all fauna monitoring methodologies and survey designs used across all WHC BOAs (AMBS 2020b) that identified the existing methods were somewhat effective at detecting fauna species richness and abundance, however there were aspects of each monitoring design and methodology that were contributing to high levels of variance in the data set. The previous monitoring design was struggling to deal with the spatial challenges associated with the large area of BOAs required to be monitored by WHC and the associated variables that were generated as a result of the large area. While the methods would continue to generate indicative species richness and abundance data sets, the data sets would not be sufficiently robust to link changes with specific variables including the management actions currently being undertaken by WHC.

Given the challenges faced by the monitoring projects managed by WHC and the strong desire of WHC to generate statistically robust data on the response of fauna assemblages to biodiversity management strategies; a series of structural modifications to the monitoring programs were implemented. The modifications to survey design and methods were selected after undertaking a thorough review of peer reviewed literature and consulting academic and industry experts in the fields of fauna that were being targeted. The modifications aimed to increase the likelihood that informative data on the influence of biodiversity management actions would be collected. The recommended modifications focused on adjustments to the timing of surveys, the number of survey sites, the number of replicates undertaken at each site, the area focused on by the surveys, and the methodology of the surveys. Specific modifications included:

- Changing the frequency of sampling for some monitoring components from annual to biennial, with the purpose of pooling resources for other structural survey modifications such as increasing the number of survey sites and increasing the number of replicates at each site;
- Designing sites to target specific fauna groups rather than having generic sites focusing on all fauna groups.
- Using the focus on target groups to select appropriate seasons for each survey (i.e. bird surveys conducted early spring independent of microbat surveys which are conducted in summer)
- Selecting sites that better sampled revegetation and non-revegetation treatments
- Targeting surveys on spatially explicit focus areas representative of the broader habitat variability of the BOA but likely to show detectable responses to biodiversity management actions that are influencing fauna response while maximising the chance of revealing total BOA species richness.

Annual monitoring of fauna has therefore been divided into a series of targeted programs focusing on specific fauna guilds. The surveys are primarily designed to detect changes in species richness and abundance over the duration of the management of each property by WHC. In addition to this overall aim, the monitoring program will attempt to evaluate guild and species level responses to revegetation programs, habitat augmentation and pest animal management. The ecological management objectives relevant to the purpose of fauna monitoring are:

- Protect and enhance existing woodland and forest habitat for Regent Honeyeater and Swift Parrot

- Restore self-sustaining woodland and/or forest within derived native grasslands and 'non-native/Cleared' areas to provide habitat for the threatened species listed under the BC Act and EPBC Act

Each survey method will target spatially explicit focus areas. The focus areas were designed to incorporate a matrix of remnant woodland, naturally regenerating woodland and revegetated woodland. As such, properly stratified survey designs should allow for a robust evaluation of fauna assemblage responses to revegetation program by comparing detection to other, non-revegetated habitats. The focus areas are different sizes and in different locations for each fauna guild. The location of all fauna monitoring sites for each BOA are shown in **Figure 5.5**.

5.15.1 Diurnal Bird Surveys

Diurnal bird surveys will be undertaken within target focus areas with the surveys conducted late winter into spring. Each bird survey focus area has been divided into grid areas, with one bird survey site placed within each grid. Bird surveys will be undertaken using a fixed time/area rapid survey design with survey site boundaries defined by having fixed start and end points. Counts of birds will be made for "in plot", "outside plot, same habitat", and "outside plot, different habitat". Survey effort will vary across a biennial schedule. In year one, all sites will be surveyed up to five times and in year two, sites will be surveyed twice. Surveys will be spread between morning and afternoon survey windows, and if possible, on non-consecutive days.

5.15.2 Microbat Surveys

Microbat assemblages will be monitored using a combination of echolocation recorders and harp traps (**Figure 5.5**). Echolocation surveys will target focus areas with each microbat focus area divided into a standardised grid appropriate for each focus area. One echolocation recorder will be placed within each grid and units deployed to start recording 30 minutes before last light and will stop recording 2 hours after last light. Survey effort will vary across a biennial schedule. Most sites will be surveyed once every two years while a selection of sites will be sampled annually to act as a control.

5.15.3Pitfall and Funnel Trap Surveys

Ground dwelling fauna will be monitored using grids of pitfall traps and funnel traps (**Figure 5.5**). Pitfall and funnel trap surveys will be conducted biennially within target focus areas. Pitfall trap arrays will be deployed at each focus area with sites paired between remnant woodland areas and revegetated areas. Revegetated areas will further be paired between augmented habitats and non-augmented habitats. Each pitfall trap array will consist of pitfall traps and funnel traps. Pitfall traps will be plastic buckets with lids dug into the ground. Each bucket will be joined by a drift fence. When the sites are open, the lid will be perched above the bucket to provide shade. Funnel traps will be covered with reflective shields or vegetation to ensure trapped fauna can thermally equilibrate. Trap girds, when open, will be checked in the morning and evening. Sites have been selected to evaluate the response of fauna to revegetation and habitat augmentation through the provision of coarse woody debris and rocks

5.15.4 Motion Detection Camera Survey

A network of motion detection camera sites have been established at the BOA for the purpose of native and pest animal monitoring (**Figure 5.5**). Site selection was designed on an area grid to maximise the even spread of cameras across the entire area of the BOA with a portion of the motion detection cameras to specifically inform pest animal management (**Section 5.9**). The remaining cameras will be activated annually to target native vertebrate fauna. Motion detection camera survey data will be analysed for the following purposes:

1. Native Fauna – Cameras will be used to detect other native species that don't already have targeted survey methods for and will aim to identify longer-term trends in native animal species richness;

2. Pest Animals - Separate to the monitoring for pest animal management, data will be analysed to identify longer-term trends in pest animal occupancy and identify interaction with native fauna trends.

Cameras activated annually will use bait stations comprising of an enclosed PVC pipe on a small star picket with the other cameras to focus on animal activity points.

Separate to the permanent motion detection camera surveys; WHC habitat augmentation installation areas will be monitored using cameras as follows:

1. Nest Boxes – the results of annual ground-based inspections and 5 yearly direct inspections (either climbing or pole cameras to look inside boxes) will inform where and what boxes are to be targeted with seasonally based camera surveys;

2. Coarse Woody & Rock Debris piles – Annual ground-based inspections will inform where and what piles are to be targeted with seasonally based camera surveys.

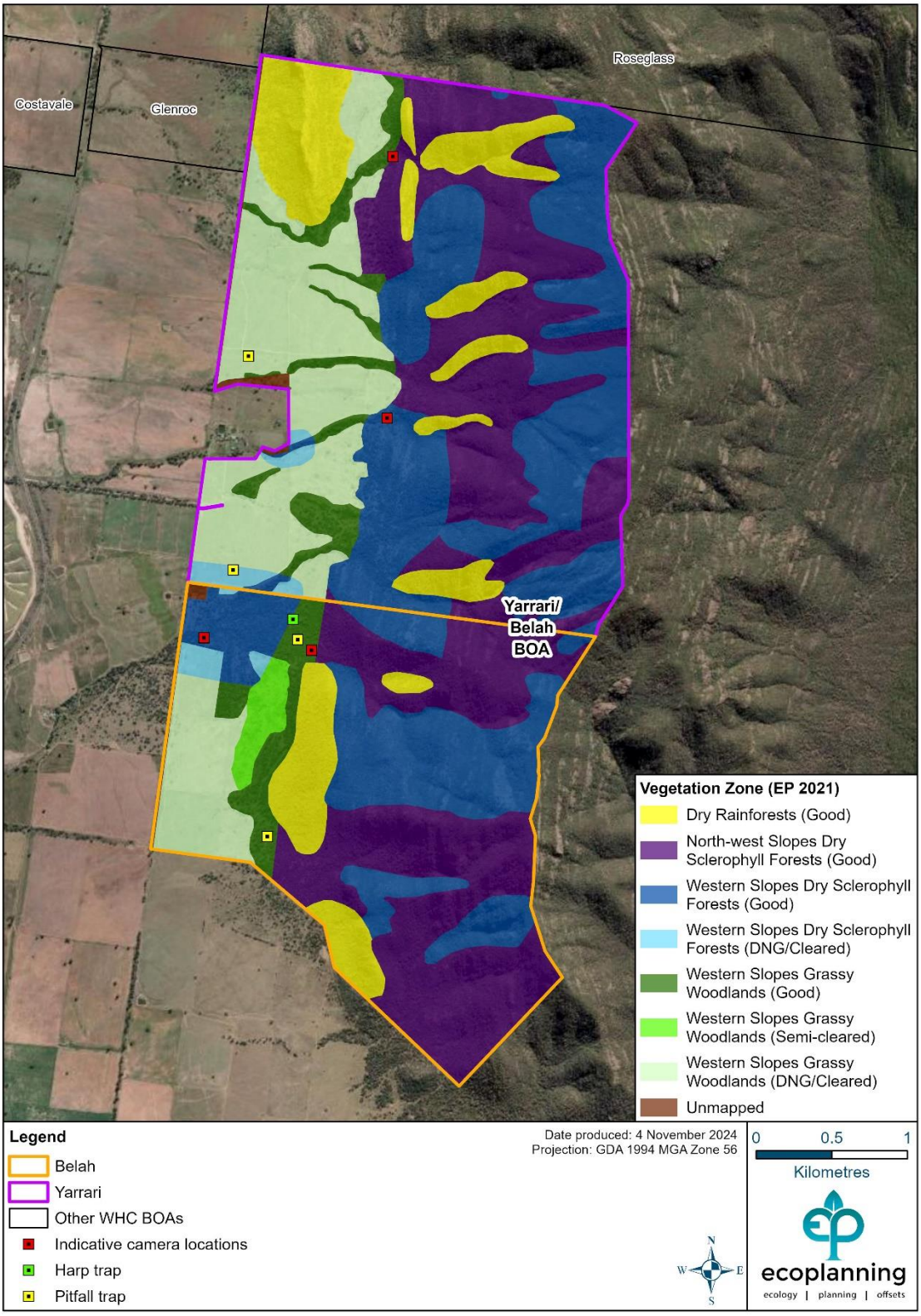


Figure 5.5: Vegetation zones, fauna monitoring sites and indicative camera locations within the BOA.

5.15.5 Winter Bird Survey

The ongoing monitoring for the Regent Honeyeater and Swift Parrot will be undertaken between May and August, coinciding with the likely flowering period for winter-flowering Eucalypts, such as White Box across all WHC BOAs including the Yarrari & Belah BOA. The monitoring program is designed to detect and confirm presence (or absence) of Regent Honeyeater and Swift Parrot in targeted areas with flowering resources to identify the use over time.

The monitoring program is summarised as follows:

1. Trigger point for survey - Starting May each year, relevant personnel will report on any observed presence of Winter flowering eucalypts. This will provide a trigger to initiate the scoping survey. If no trigger is provided, scoping survey to be initiated by the last week in July.
2. Scoping survey - Ecologists traverse the study area noting indicators for survey, such as, flowering eucalypts and/or congregations of nectar feeding birds. Linear, well-connected patches will also be noted. Flower intensity score and patch quality to be used to inform subsequent surveys.
3. Field survey - Ecologists to traverse the study area and conduct bird surveys at previously identified sites (as in the Scoping survey above). Survey effort will be guided by the intensity score at a site. At each site, flowering intensity scores are to be recorded and all bird species (sighted or heard) are to be recorded. A total survey effort cannot be prescribed because this is ultimately dependant on flowering intensity in any one year. However, to meet Commonwealth survey guidelines for targeted surveys (DEWHA 2010), there will be a minimum of 20 hours of bird surveys across 8 days targeted to sampling winter flowering species across all Whitehaven offset areas.

The selection of survey locations for the field survey will prioritise high blossom areas within or adjoining known preferred habitat areas (such as high quality riparian areas although riparian Casuarina species and presence of Mistletoe are essentially a summer resource); presence of positively correlated species and absence of negatively correlated species like despotic/aggressive honeyeater species; and consider previous sighting records as well as the existing mapped and potential habitat areas for these species (**Section 4.3**). The existing Winter Bird Survey timing overlaps with the commencement of Regent Honeyeater breeding season; as well as overlapping with Diurnal Bird Surveys replicating the high survey effort within or adjoining known preferred habitat areas during the breeding season. This will further extend the probability to detect this species.

The application of the above method targeted to the location of and timing for winter flowering trees will enable increased survey effort for nectivorous birds during the optimum seasonal conditions increasing the chance of detection for rare species like Regent Honeyeater and Swift Parrot.

5.16 PERFORMANCE AND COMPLETION CRITERIA

Using SMART principles (outlined below), WHC have defined site-specific final completion and annual performance criteria. These criteria provide quantified metrics to measure (within the BOA) the trajectory toward all relevant ecological management objectives i.e.:

- The restoration of BGW CEEC within existing BGW DNG,
- The restoration of woodland and/or forest within DNG and non-native/Cleared areas,
- The protection and enhancement of existing BGW (woodland form),

- The protection and enhancement of existing woodland and forest habitat for threatened species

SMART principles as outlined in Section 2.1.3 of the RBS-2 (Umwelt 2017) are as follows:

- **S**pecific – specific outcomes relevant to biodiversity matters (i.e., specific biometric attributes);
- **M**easurable – include quantifiable performance measures that can be compared over time (i.e., specific numeric and temporal values for the biometric attributes);
- **A**chievable – realistic goals that can be compared to baseline information (i.e., linked to NSW state-wide benchmark data);
- **R**elevant – outcomes are directly relevant to the biodiversity matter (i.e., biometric attributes directly influenced by management to measure condition either for protection/maintenance or improvement/restoration over time)
- **T**imely – includes specific timeframes for the completion of the outcome (i.e., timeframes align with approval based required management periods).

Performance criteria are interim yearly targets for assessing the performance of WHC Biodiversity management activities at plots, while completion criteria are the desired targets to be attained across a VZ, then maintained (at or above the desired target) averaged across five years. Once achieved; completion criteria indicate that management has been successful at obtaining the desired result towards woodland ecological restoration and annual monitoring can cease. WHC can revise the management descriptions/actions to reflect the lower intensity management required until the end date of the relevant approval has been reached.

Performance and completion criteria have been defined for selected monitoring attributes (shown in **Table 5.10**) that best assess the trajectory toward ecological management objectives. The monitoring attributes below have been selected as they can directly measure the outcome of biodiversity management being implemented towards restorations of the relevant PCT vegetation/endangered ecological communities and are also suitable as surrogates for monitoring improvements over time to woodland and forest habitat quality for key fauna threatened species (such as Regent Honeyeater, *S*wift Parrot and Corben's Long-eared Bat as per relevant Approvals).

Table 5.10: Performance and completion criteria for selected monitoring attributes

Monitoring attribute/ Ecological Indicators	Management Objectives	Performance criteria	Completion criteria
Native plant species richness (NPS)	Protect and enhance existing Box-Gum Woodland CEEC (woodland form).	Native species diversity trending towards benchmark range for the relevant Keith Class (**APPENDIX C**:)	Native species diversity at or above benchmark value for the relevant Keith Class (**Table 5.11**)
Native over storey cover (NOS)	Restore self-sustaining woodland within existing areas of Box-Gum Woodland CEEC (derived native grassland).	Native overstorey cover trending towards benchmark range for the relevant Keith Class (**APPENDIX C**:)	Native overstorey cover within benchmark range for the relevant Keith Class (**Table 5.11**)
Native mid-storey cover (NMS)	Restore self-sustaining woodland and/or forest within derived native grasslands and 'non-native/Cleared' areas to provide habitat for the	Native mid-storey cover trending towards benchmark range for the relevant Keith Class (**APPENDIX C**:)	Native mid-storey cover within benchmark range for the relevant Keith Class (**Table 5.11**)
Native ground cover (grasses) (NGCG)		Native grass groundcover trending towards benchmark range for the relevant Keith Class (**APPENDIX C**:)	Native groundcover grass cover within benchmark range for the relevant Keith Class (**Table 5.11**)

Perennial exotic plant cover (PEPC)	listed threatened species listed under the EPBC Act.	An overall decrease in weed cover compared to the previous year.	Perennial weed cover is less than 20% on average across plots

The benchmark ranges for key biometrics NPS, NOS, NMS and NGCG are sourced from the *BioMetric Vegetation Condition Benchmarks* (OEH, 2017) (**Table 5.11**). These benchmarks are relevant as these were in place at the time of the original Approval and therefore are compatible with the baseline data, subsequent monitoring data, and data collected by WHC in other company-owned offset areas which is based on BBAM (OEH, 2014). These benchmarks have an upper and lower threshold value.

Table 5.11: Key biometric completion criteria values for Keith Classes within the BOA

Keith Class	Relevant PCTs / Biometric ID	Completion criteria (based on BVT benchmark values [OEH, 2017])			
		NPS	NOS	NMS	NGCG
Dry Rainforests	147 (NA199/ BR203)	35	15-25	25-40	3-20
North-west Slopes Dry Sclerophyll Woodlands	435 (NA397/ BR239)	26	6-25	6-25	20-30
Western Slopes Grassy Woodlands	1383 (NA226/ BR240)	23	6-25	0-5	30-40
Western Slopes Dry Sclerophyll Forests	1313 (NA228/ BR242)	30	25-40	6-25	20-30

Annual performance criteria in **APPENDIX C:** are calculated by back-extrapolating lower and upper threshold completion criteria over 20 years to Year 0. Analysis of annual performance data aims to track progress towards the vegetation management objectives and allows for timely intervention with remedial action. Plots that fall below upper or lower threshold annual performance criteria will trigger a review of contingency measures as outlined in **Section 5.17**.

5.17 POTENTIAL RISKS AND CONTINGENCY MEASURES

5.17.1 Contingency Measures

The following Biodiversity Trigger, Action, Response Plan (TARP), consistent with RBS-2 Table 2.4 (Umwelt, 2017), has been aligned to the performance and completion criteria outlined in **Section 5.16**. The TARP shown in **Table 5.12** provides trigger points for contingency measures (corrective actions) to be implemented if the flora monitoring program outlined in **Section 5.14** identifies that performance criteria outlined in **Section 5.16** are not being met. Contingency measures may not be limited to those listed.

Table 5.12: WHC Biodiversity Trigger, Action, Response Plan (TARP)

Aspect	Trigger	Action/Response
Recruiting canopy species	Recruiting canopy species do not meet completion criteria across Good, or Semi-cleared VZs after 10 years following offset establishment	Review factors leading to below benchmark performance. Evaluate whether additional management (i.e., targeted removal of weeds, pest animal control, thinning, burning and/or supplementary planting of seedlings) is required.
	Recruiting canopy species do not meet completion criteria across DNG/Cleared VZs after 15 years following offset establishment	Review factors leading to below benchmark performance. Evaluate whether additional management (i.e. targeted removal of weeds, pest animal control, thinning, burning and/or supplementary planting of seedlings) is required.

Aspect	Trigger	Action/Response
EPBC conformance	BGW treatment plots do not meet completion criteria after 10 years following offset establishment	Review factors leading to below benchmark performance. Evaluate whether additional management (i.e., targeted removal of non-characteristic species and weeds, following supplementary planting with seedlings and/or seed) is required. Consider additional monitoring to examine the establishment of seedlings and seed.
Native species richness (NPS)	1st TIER - Offset treatment plots are below 80% annual performance benchmark following offset establishment	Review factors leading to below benchmark performance. Evaluate whether supplementary planting of appropriate seedlings or seeding is required.
	2nd TIER - Offset treatment plots are below 100% annual performance benchmark value but above 80% annual performance benchmark following offset establishment	Determine whether NPS is increasing or decreasing. If decreasing, investigate factors leading to decrease and monitor for further change.
Native overstorey cover (NOS)	1st TIER - Offset treatment plots are below lower annual performance criteria following offset establishment	For revegetation younger than five years - no action required, continue to monitor. For revegetation older than five years – Review factors leading to below benchmark performance. For revegetation older than five years – Evaluate whether supplementary planting of appropriate seedlings is required.
	2nd TIER - Offset treatment plots are above upper annual performance criteria following offset establishment	Review factors leading to above benchmark performance such as BVT/PCT assigned to the treatment plot and/or VZ. If shown to be an increasing trajectory overtime, evaluate whether additional management is required.
Native mid-storey cover (NMS)	1st TIER - Offset treatment plots are below lower annual performance benchmark following offset establishment	Review factors leading to below benchmark performance. Evaluate whether supplementary planting of appropriate seedlings is required.
	2nd TIER - Offset treatment plots are above upper annual performance benchmark following offset establishment	Review factors leading to above benchmark performance such as BVT/PCT assigned to the treatment site and/or VZ. Evaluate whether additional management is required.
Native groundcover – Grass (NGCG)	1st TIER - Offset treatment plots are below lower annual performance benchmark following offset establishment	Review factors leading to below benchmark performance. If shown to be an increasing trajectory overtime, evaluate whether additional management (i.e., supplementary seeding or weed control) is required.
	2nd TIER - Offset treatment plots are above upper annual performance benchmark following offset establishment	Review factors leading to above benchmark performance such as BVT/PCT assigned to the treatment site and/or VZ. Evaluate whether additional management (i.e., burning) is required.
Perennial exotic plant cover (PEPC)	1st TIER - All offset treatment plots across a VZ show an increase in PEPC	Review factors leading to increase in perennial weed cover. Identify the location of weed infestations and review additional management (i.e. the need for control measures such as broad-acre spraying, spot-spraying, slashing, hand-removal or controlled burns).

Aspect	Trigger	Action/Response
	2nd TIER - Offset treatment plots record PEPC above 20%	Review factors leading to high perennial weed cover. Identify the location of weed infestations and review additional management (i.e. the need for control measures such as broad-acre spraying, spot-spraying, slashing, hand-removal or controlled burns).

6 REPORTING AND REVIEW

In accordance with the various NSW Project/State Significant Development Approvals and EPBC Approvals, this OMP will be effective for the period of effect of each relevant approval. The OMP may be revised from time to time in accordance with those approvals; however once approved, the WHC OMP will be published on each of relevant WHC Mine webpages within one month.

A summary of WHC OMP reporting requirements is provided in **Table 6.1**: .

Table 6.1: Biodiversity Management Reporting frequencies

Aspect	Section	Frequency/Timing
Seed Management	5.4	Annual
Revegetation	5.5	Annual
Ecological Thinning	5.6	Annual
Habitat Augmentation	5.7	Annual
Heritage Management	5.8	Annual
Weed Management	5.9	Annual
Pest Animal Management	5.10	Annual
Soil Management	5.11	Annual
Agriculture Management	5.12	Annual
Bushfire Management	5.13	Annual
Flora Monitoring	5.14	Annual
Fauna Monitoring	5.15	Annual/Biennial
Performance and Completion Criteria	5.16	Annual
Risks and Contingency Measures	5.17	As required

6.1 REPORTING SURVEY DATA

WHC will ensure that survey data will be recorded so as to conform to data standards notified from time to time by CDCCEEW in accordance with EPBC Approval conditions. If requested by the CDCCEEW, WHC will provide all species and ecological survey data and related survey information from ecological surveys undertaken for the relevant Matters of National Environmental Significance. This survey data will be provided within 30 business days of request, or in a timeframe agreed to in writing by CDCCEEW.

WHC will maintain accurate records substantiating all activities and outcomes associated with or relevant to EPBC Approvals, including measures taken to implement the OMP, and make them available upon request to the CDCCEEW.

6.2 REPORTING REQUIREMENTS

The reporting processes outlined in **Table 6.2** will be undertaken on the management and monitoring programs of the BOA.

Table 6.2: Reporting Requirements of the BOA

Reporting Requirement	Reporting Due Date
BCT Biobanking Agreement 43 Annual Reporting (Commonwealth EPBC Approval Performance Reporting)	1 August
NSW Project/State Significant Development Approval Review Reporting (also for relevant Commonwealth EPBC Approvals)	31 March
Commonwealth EPBC Approval Annual Compliance Reporting	22 March

6.2.1 BCT Biobanking Agreement 43 Annual Reporting

To meet the requirements of Biobanking Agreement (BA) 43; WHC is to submit annual reports to the BCT that includes:

- Reporting Template against conditions of the Agreements; and
- Summary of annual Flora Monitoring (including Photo monitoring and Flora Monitoring data).

The Biobanking Agreement report for the RCM BOS for BA43 which will be submitted annually by the 1 August.

6.2.2 NSW Project Approval Annual Review Reporting

RCM is required by Project Approval PA 10_0015 to submit an Annual Review Report by the end of March annually (or an agreed alternate time). Each Annual Review Report outlines the environmental performance over the previous calendar year including a detailed summary of their respective BOS and a summary of biodiversity management implemented during that period including:

- the progress of management activities undertaken in the offset areas;
- the outcome of those management activities;
- any need for improved management; and
- activities to undertake such improved management.

6.2.3 Commonwealth EPBC Approval Annual Compliance Reporting

A report pertaining to the annual compliance will be published on the relevant WHC Mine webpages each year (after the anniversary date of commencement for each respective Mine) in accordance the EPBC Approvals and the end of reporting period and submission deadlines. The end of reporting period for RCM 2010/5502 is 22 December and submission deadline is 22 March.

Non-compliance with any of the conditions will be reported to CDCCEEW at the same time as the compliance report is published.

Both the BCT and Annual Review Reporting will be the processes by which WHC report to CDCCEEW the progress of management activities undertaken in the BOA and the outcome of those activities, including identifying any need for improved management and activities to undertake such improvement in accordance with relevant conditions of the respective EPBC Approvals.

6.3 REVIEW AND REVISION OF THE OFFSET MANAGEMENT PLAN

This OMP will be effective for the period of approval and will be reviewed and revised from time to time in accordance with the relevant NSW and Commonwealth Approvals. An overview of the Commonwealth and NSW revision requirements are provided below.

Commonwealth Requirements

In accordance with relevant the EPBC Approval (RCM 2010/5502), if WHC wishes to carry out any activity otherwise than in accordance with this OMP then WHC will submit a revised OMP to CDCCEEW for the Minister's written approval. The varied activity shall not commence until the Minister has approved the revised plan in writing. The Minister will not approve a revised plan unless the revised plan would result in an equivalent or improved environmental outcome, therefore, should WHC submit a revised OMP for EPBC Act approval WHC will specify in its submission to the Commonwealth how the revised approved OMP meets this requirement.

NSW Requirements

In accordance with the RCM Project Approval 10_0015, the OMP will be reviewed, and revised if necessary to the satisfaction of the NSW Secretary of NSW DPHI, within three months of:

- the submission of an annual review;
- the submission of an incident report;
- the submission of an audit report; or
- any modification to the conditions of the consent (unless the conditions require otherwise).

Further, WHC must comply with reasonable requirements of the Secretary of NSW DPHI in respect of NSW DPHI's assessment of this OMP or the implementation of actions or measures under this OMP, including any reasonable request to amend this OMP.

6.4 BIODIVERSITY AUDIT

6.4.1 Commonwealth Audit

In accordance with Condition 5 of RCM EPBC Approval 2010/5502, upon the direction of the Commonwealth Minister, WHC will ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to the Commonwealth Minister. The independent auditor will be approved by the Commonwealth Minister prior to the commencement of the audit. Audit criteria will be agreed to by the Commonwealth Minister and the audit report will address the criteria to the satisfaction of the Commonwealth Minister.

On 14 February 2024, CDCCEEW commenced an audit to assess compliance conditions of EPBC Approval 2010/5502. The compliance audit was provided records in accordance with Condition 9 of EPBC Approval 2010/5502. The audit found of the 10 Conditions, 4 were complaint, 5 were not applicable, and 1 historically non-compliant but currently compliant. The Compliance Audit Report for the RCM (EPBC Approval 2010/5502) was finalised on 13 November 2024.

6.5 BIODIVERSITY TRAINING

Inductions for staff and contractors to the BOAs will be conducted to make them aware of the environmental issues relevant to WHC. Further targeted training (i.e. fire management) is to be undertaken appropriate to their role and responsibilities. Additional training relevant to this OMP will be undertaken for the Yarrari and Belah BOA for the management of impacts to biodiversity and records will be retained by WHC.

7 REFERENCES

Advitech (2023). Bio Monthly Weather Data.

AMBS Ecology & Heritage (AMBS) (2024). Whitehaven Approved Offsets Threatened Species Database. Prepared for Whitehaven Coal Limited.

AMBS (2020a) 5 – Year Review of the Annual Fauna Monitoring Program Data for the Maules Creek and Tarrawonga Biodiversity Offsets. Prepared by AMBS Ecology & Heritage for Whitehaven Coal Ltd.

AMBS (2020b) Whitehaven Coal Biodiversity Fauna Monitoring Methodology Review. Prepared by AMBS Ecology & Heritage for Whitehaven Coal Ltd.

Australian Government Department of the Environment (DotE) (2015). *Threat abatement plan for predation by feral cats.*

Australian Government Department of the Environment and Energy (DotEE) (2017). *Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa).*

Australian Government Department of the Environment and Energy (DotEE) (2016). *Threat Abatement Plan for Competition and Land Degradation by Rabbits.*

Biodiversity Conservation Trust (BCT) (2021) *Livestock Grazing Guidelines.* Accessed at: https://www.bct.nsw.gov.au/sites/default/files/2022-02/BCT%20livestock%20grazing%20guidelines_Feb%202022.pdf

BOM (2020). *Climate statistics for Australian locations*. Accessed at: http://www.bom.gov.au/climate/averages/tables/cw_055202.shtml.

Bush Fire Coordinating Committee (2008). *Policy no. 1/2008 Bush Fire Risk Management Planning Guidelines for Bush Fire Management Committees.*

Department of Environment, Climate Change and Water NSW (2010). Draft BioBanking Assessment Methodology (version 2).

Department of Planning, Industry and Environment (DPIE) (2024). Water Management (General) Regulation 2018 Hydro Line spatial data. Accessed at: https://www.industry.nsw.gov.au/water/licensing-trade/hydroline-spatial-data

Department of Environment and Primary Industries (VIC) (2015). *Integrated Hare Control.* Accessed at: https://agriculture.vic.gov.au/biosecurity/pest-animals/invasive-animal-management/integrated-hare-control.

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2010). *Survey guidelines for Australia's threatened birds*.

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008a) *Threat Abatement Plan for Competition and Land Degradation by Unmanaged Goats.*

Department of the Environment, Water, Heritage and the Arts (DEWHA) (2008b) *Threat Abatement Plan for Predation by European Red Fox.*

Department of Primary Industries (DPI) (2018a). *New South Wales Invasive Species Plan 2018-2021*

Department of Primary Industries (DPI) (2018b). New South Wales Weed Control Handbook

Department of Primary Industries (DPI) (2018c). *Ecology and Management of Vertebrate Pests in NSW.*

Department of Primary Industries (DPI) (2017) *New South Wales Wild Dog Management Strategy 2017-2021.*

Eco Logical Australia (ELA) 2009. *Regional Vegetation Community Profiles for the Namoi Catchment. Project Report for the Namoi Catchment Management Authority*. Prepared for Whitehaven Coal Limited.

Eco Logical Australia (ELA) (2013). *Biodiversity Offset Management Plan, Whitehaven Regional Biodiversity Offset Site*. Prepared for Whitehaven Coal Limited.

Ecoplanning (2021). *Seasonal Weed Assessment Report – Q1 2021.* Prepared for Whitehaven Coal.

Ecoplanning (2020a). *Seasonal Weed Assessment Report – Q4 2020.* Prepared for Whitehaven Coal.

Ecoplanning (2020b). *Seasonal Weed Assessment Report – Q3 2020.* Prepared for Whitehaven Coal.

Environmental Resources Management (ERM), (2019a). *Canyon Mine IEA – Conditions of Approval Independent Environmental Audit.*

Environmental Resources Management (ERM), (2019b). *Rocglen Mine Independent Environmental Audit (IEA) – Conditions of Approval IEA.*

Florabank (1999). GUIDELINES KEEPING RECORDS ON NATIVE SEED 4.

Keith (2004). *Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT*. Published by NSW Department of Environment and Conservation.

Landcom (2004), *Managing Urban Stormwater: Soils and Construction Volume 1.*

Local Land Services (LLS) (2017). *North West Regional Strategic Weed Management Plan 2017-2022*. Local Land Services - North West.

NSW Office of Environment and Heritage (OEH) (2014). BioBanking Assessment Methodology 2014, Office of Environment and Heritage, Sydney.

NSW Office of Environment and Heritage (OEH) (2017). *BioMetric Vegetation Condition Benchmarks*.

NSW Office of Environment and Heritage (OEH) (2011). *NSW Threat Abatement Plan For Predation by The Red Fox (Vulpes vulpes).*

Mitchell 2002. Descriptions for NSW (Mitchell) Landscapes Version 2 (2002). Accessed at: https://www.environment.nsw.gov.au/research-and-publications/publications-search/nsw-mitchell-landscapes-release-notes

Murray-Darling Basin Authority (MDBA) (2024). Murray Darling Basin Boundary - Water Act 2007. Accessed at: https://data.gov.au/data/dataset/murray-darling-basin-boundary.

PestSmart (Centre for Invasive Species Solutions) (2021). Management toolkits. Accessed at: https://pestsmart.org.au/.

Rawlings, K., Freudenberger, D., and Carr, D. (2010). *A guide to managing Box Gum Grassy Woodlands* Part 3. Department of the Environment, Water, Heritage and the Arts, Canberra, ACT.

Stewart Surveys (2020) Whitehaven Coal, Biobank Biodiversity Offset, Boundary Re-definition Survey.

Threatened Species Scientific Committee (TSSC) (2006). *White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands listing advice and conservation advice.* Accessed at:https://www.dcceew.gov.au/sites/default/files/env/pages/dcad3aa6-2230-44cb-9a2f-5e1dca33db6b/files/box-gum.pdf

Umwelt (2017). Leard Forest Regional Biodiversity Strategy Stage 2 – Strategy Report. Unpublished report for NSW Planning & Environment.

Whincop Archaeology (2021a). *Historical Heritage Management Plan.* Prepared for Whitehaven Coal Ltd

Whincop Archaeology (WHC) (2021b). *Aboriginal Archaeology and Cultural Heritage Management Plan.* Prepared for Whitehaven Coal Ltd

Whitehaven Coal (WHC) (2022a) *Rocglen Mine Rehabilitation Management Plan*.

Whitehaven Coal (WHC) (2022b) *Vickery Coal Mine Rehabilitation Management Plan*.

APPENDIX A: ROCGLEN MINE RELEVANT STATE AND COMMONWEALTH APPROVAL CONDITIONS

Project Approval 10_0015 Requirements

Condition Number	Condition	Relevant OMP Section
SCHEDULE 3: ENVIRONMENTAL PERFORMANCE CONDITIONS		
Biodiversity Offset		
23	*By the end of June 2012, unless the Secretary agrees otherwise, the Proponent shall enter into a Biobanking agreement with the Minister for Environment and Heritage, in accordance with Part 7A of the Threatened Species Conservation Act 1995, to implement the Biodiversity Offset Strategy described in the EA (for the Whitehaven Regional Biobank Site), and summarised in Table 7;* ***Table 7: Biodiversity Offset Strategy to be implemented at the Whitehaven Regional Biobank Site*** ***Total Vegetation Clearing*** / ***Minimum Offset to be provided*** *Total of 95.44 ha of vegetation to be cleared* / • *Retirement of 4,859 Ecosystem Credits (including 478 Ecosystem Credits for the clearing of 47.9 ha of the BOS area approved under 06_0198);* • *Conservation of the residual BOS area approved under 06_0198 (60 ha), at the existing location within the Whitehaven Regional Biobank Site;* • *Conservation of 0.62 ha of White box Grassy Woodland;* • *Conservation of 231.42 ha of suitable foraging habitat for the Regent Honeyeater and Swift Parrot; and* • *Restoration of 118.33 ha of derived grassland to woodland.* *Note: The Whitehaven Regional Biobank Site is shown in Figure 1 in Appendix 4.*	4.1.1

Approval Decision EPBC 2010/5502

Condition Number	Requirement	Relevant OMP Section
1	*The person taking the action must register a legally binding conservation covenant over the Whitehaven Regional Biodiversity Offset Site ("Yarrari" and "Belah") identified in the map at Appendix 1. The mechanism/s must provide enduring protection of the offset site and be registered within 2 years of the date of this approval.*	5.3.4
2	*The person taking the action must submit to the Minister for approval an Offset Management Plan for the Whitehaven Regional Biodiversity Offset Site within 12 months of the date of this approval. The Offset Management Plan must contain details of measures to offset the impacts to the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community, Regent Honeyeater and Swift Parrot. The Offset Management Plan must be implemented.* *The Offset Management Plan must include, at a minimum, the following information:*	
	(h) A textual description and map to clearly define the location and boundaries of the Whitehaven Regional Biodiversity Offset Site. This must be accompanied with the offset attributes and a shapefile.	4.1.1 and Figure 4.1

Condition Number	Requirement	Relevant OMP Section
	(i) Details of management actions to protect and enhance the extent and condition of habitat values of the offset site, including, but not limited to rehabilitation, weed control, fire management, erosion and sediment control, management of livestock and any restrictions on access of no less than: *iii. 231.4 hectares of habitat for the Regent Honeyeater and Swift Parrot; and* *iv. 153 hectares White Box – Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland Ecological Community;*	5
	(j) The timing, responsibilities and performance criteria for management actions;	1.6, 5.2 and 5.16
	(k) a monitoring plan including the undertaking of ecological surveys by a qualified ecologist to assess the success of the management actions measured against identified milestones and objectives;	5.14 and 5.15
	(l) a process to report to the department, the progress of management actions undertaken in the Whitehaven Regional Biodiversity Offset Site and the outcomes of those actions, including identifying any need for improved management and actions to undertake such improvements;	6.2.3
	(m) a description of the potential risks to successful management and rehabilitation in the Whitehaven Regional Biodiversity Offset Site and a description of the contingency measures that would be implemented to mitigate these risks; and	5.17
	(n) details of the various parties responsible for management, monitoring and otherwise implementing the plan, including their position or status as a separate contractor.	1.6

APPENDIX B: CANYON MINE, TARRAWONGA MINE AND VICKERY MINE RELEVANT STATE AND COMMONWEALTH APPROVAL CONDITIONS

Canyon Coal Mine (CCM) Development Consent DA 8-1-2005

Condition Number	Condition	Relevant OMP Section
SCHEDULE 3: SPECIFIC ENVIRONMENTAL CONDITIONS		
FAUNA & FLORA: Offset Strategy		
26A.	*Prior to 30 June 2008, the Applicant shall, in addition to the measures described in condition 26, identify and implement a vegetation offset equivalent to 30 hectares of Bimble Box/Pilliga Grey Box vegetation community, in consultation with the OEH and to the satisfaction of the Secretary.*	4.1.1
27	*Within 12 months of this consent, the Applicant shall implement suitable arrangements to provide long-term security for the offset, to the satisfaction of the Secretary.*	4.2

Tarrawonga Coal Mine (TCM) surrendered DA 88-4-2005 MOD1 Schedule 3 Condition 33

Condition Number	Condition	Relevant OMP Section
SCHEDULE 3: ENVIRONMENTAL PERFORMANCE CONDITIONS		
Long Term Security of Offset		
33	*Within 6 months of the approval of the Biodiversity Offset Strategy, the Applicant shall make suitable arrangements to provide appropriate long-term security for the offset areas in the strategy to the satisfaction of the Director-General.*	4.1.1 and 4.2

Vickery Coal Mine (VCM) Development Consent SSD 7480 (12 August 2020)

<table>
<tr><th>Condition</th><th>Requirement</th><th>Section</th></tr>
<tr><td colspan="3">Stage 2 Biodiversity Offset Strategy</td></tr>
<tr><td colspan="3">Additional Biodiversity Offsets Required – Vickery Extension Project</td></tr>
<tr><td>B58</td><td>In addition to the biodiversity offset requirements in Table 9, within 2 years of the date of commencement of development under this consent, unless otherwise agreed by the Planning Secretary the Applicant must retire biodiversity credits of a number and class specified in Table 10 and Table 11 below to offset the biodiversity impacts of the development.</td><td rowspan="2">4.1.1 refers to retirement of PCT 459 credits</td></tr>
<tr><td>B59</td><td>The retirement of these credits must be carried out in accordance with the NSW Biodiversity Offsets Policy for Major Projects and can be achieved by acquiring or retiring ‘biodiversity credits’ within the meaning of the BC Act.
Table 10: Ecosystem credit requirements
<table>
<tr><th>Ecosystem credits</th><th>Code (BVT)</th><th>Code (PCT)</th><th>Credits Required</th></tr>
<tr><td>Poplar Box Woodland on Alluvial Clay Soils</td><td>NA185</td><td>101</td><td>3,540</td></tr>
<tr><td>Pilliga Box – Poplar Box Shrubby Woodland</td><td>NA324</td><td>397</td><td>6,955</td></tr>
<tr><td>White Box – Silver-leaved Ironbark Shrubby Open Forest</td><td>NA349</td><td>594</td><td>1,795</td></tr>
<tr><td>Narrow-leaved Ironbark – White Box Shrubby Forest</td><td>NA311</td><td>459</td><td>4,025</td></tr>
<tr><td>Mixed Marsh Sedgeland</td><td>NA201</td><td>53</td><td>46</td></tr>
<tr><td>River Red Gum Riparian Tall Woodland</td><td>NA193</td><td>78</td><td>40</td></tr>
</table>
Table 11: Species credit requirements
<table>
<tr><th>Species</th><th>Credits Required</th></tr>
<tr><td>Regent Honeyeater (Anthochaera phrygia)</td><td>3,703</td></tr>
<tr><td>Squirrel Glider (Petaurus norfolcensis)</td><td>1,672</td></tr>
<tr><td>Koala (Phascolarctos cinereus)</td><td>1,308</td></tr>
</table>
Note:
• The credits in Table 10 and Table 11 were calculated in accordance with Framework for Biodiversity Assessment of the NSW Biodiversity Offset Policy for Major Projects (OEH, 2014) and would need to be converted to reasonably equivalent ‘biodiversity credits’, within the meaning of the BC Act, if the credits are to be retired in accordance with the Biodiversity Offsets Scheme of the BC Act. Under this conversion the species credits for the Regent Honeyeater would be converted to ecosystem credits,
Following repeal of the Threatened Species Conservation Act 1995 on 25 August 2017, credits created under that Act are taken to be “biodiversity credits” under the Biodiversity Conservation Act 2016 by virtue of clause 22 of the Biodiversity Conservation (Savings and Transitional) Regulation 2017</td></tr>
</table>

Vickery Coal Mine (VCM) EPBC Approval 2016/7649 (15 September 2021)

Condition	Requirement	Section
Listed Threatened Species		
16	*The approval holder must comply with the State development consent conditions B56- B67, and B101-B106 (to the extent these conditions relate to EPBC Act listed threatened species).*	4.1.1 refers to retirement of PCT 459 credits.
19	*To compensate for impacts on threatened species and communities listed in condition 15, the approval holder must comply with State development consent conditions B56 and B57 and must retire biodiversity credits specified in table 10 and 11 of State development consent conditions B58 and B59.*	

APPENDIX C: KEY BIOMETRIC ANNUAL PERFORMANCE CRITERIA FOR RELEVANT KEITH CLASSES

Table 7.1: Annual performance criteria values for VZs of Dry Rainforests (PCT 147)

Biometric	Threshold - BVT benchmark	Annual performance criteria (Year since offset established/revegetated)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NPS	Lower-80% BVT	1.4	2.8	4.2	5.6	7.0	8.4	9.8	11.2	12.6	14.0	15.4	16.8	18.2	19.6	21.0	22.4	23.8	25.2	26.6	28
	Upper-100% BVT	1.8	3.5	5.3	7.0	8.8	10.5	12.3	14.0	15.8	17.5	19.3	21.0	22.8	24.5	26.3	28.0	29.8	31.5	33.3	35
NOS	Lower – Min. BVT	0.8	1.5	2.3	3.0	3.8	4.5	5.3	6.0	6.8	7.5	8.3	9.0	9.8	10.5	11.3	12.0	12.8	13.5	14.3	15
	Upper – Max. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
NMS	Lower – Min. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
	Upper – Max. BVT	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40
NGCG	Lower – Min. BVT	0.2	0.3	0.5	0.6	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.7	2.9	3
	Upper – Max. BVT	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20

Table 7.2: Annual performance criteria values for VZs of North-west Slopes Dry Sclerophyll Woodlands (PCT 435)

Biometric	Threshold - BVT benchmark	Annual performance criteria (Year since offset established/revegetated)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NPS	Lower-80% BVT	1.0	2.1	3.1	4.2	5.2	6.2	7.3	8.3	9.4	10.4	11.4	12.5	13.5	14.6	15.6	16.6	17.7	18.7	19.8	20.8
	Upper-100% BVT	1.3	2.6	3.9	5.2	6.5	7.8	9.1	10.4	11.7	13.0	14.3	15.6	16.9	18.2	19.5	20.8	22.1	23.4	24.7	26
NOS	Lower – Min. BVT	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6
	Upper – Max. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
NMS	Lower – Min. BVT	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6
	Upper – Max. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
NGCG	Lower – Min. BVT	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20
	Upper – Max. BVT	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30

Table 7.3: Annual performance criteria values for VZs of Western Slopes Grassy Woodlands (PCT 1383)

Biometric	Threshold - BVT benchmark	Annual performance criteria (Year since offset established/revegetated)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NPS	Lower-80% BVT	0.9	1.8	2.8	3.7	4.6	5.5	6.4	7.4	8.3	9.2	10.1	11.0	12.0	12.9	13.8	14.7	15.6	16.6	17.5	18.4
	Upper-100% BVT	1.2	2.3	3.5	4.6	5.8	6.9	8.1	9.2	10.4	11.5	12.7	13.8	15.0	16.1	17.3	18.4	19.6	20.7	21.9	23
NOS	Lower – Min. BVT	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6
	Upper – Max. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
NMS	Lower – Min. BVT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Upper – Max. BVT	0.3	0.5	0.8	1.0	1.3	1.5	1.8	2.0	2.3	2.5	2.8	3.0	3.3	3.5	3.8	4.0	4.3	4.5	4.8	5
NGCG	Lower – Min. BVT	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30
	Upper – Max. BVT	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40

Table 7.4: Annual performance criteria values for VZs of Western Slopes Dry Sclerophyll Forests (PCTs 1313)

Biometric	Threshold - BVT benchmark	Annual performance criteria (Year since offset established/revegetated)																			
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NPS	Lower-80% BVT	1.2	2.4	3.6	4.8	6.0	7.2	8.4	9.6	10.8	12.0	13.2	14.4	15.6	16.8	18.0	19.2	20.4	21.6	22.8	24
	Upper-100% BVT	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30
NOS	Lower – Min. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
	Upper – Max. BVT	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0	18.0	20.0	22.0	24.0	26.0	28.0	30.0	32.0	34.0	36.0	38.0	40
NMS	Lower – Min. BVT	0.3	0.6	0.9	1.2	1.5	1.8	2.1	2.4	2.7	3.0	3.3	3.6	3.9	4.2	4.5	4.8	5.1	5.4	5.7	6
	Upper – Max. BVT	1.3	2.5	3.8	5.0	6.3	7.5	8.8	10.0	11.3	12.5	13.8	15.0	16.3	17.5	18.8	20.0	21.3	22.5	23.8	25
NGCG	Lower – Min. BVT	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20
	Upper – Max. BVT	1.5	3.0	4.5	6.0	7.5	9.0	10.5	12.0	13.5	15.0	16.5	18.0	19.5	21.0	22.5	24.0	25.5	27.0	28.5	30

APPENDIX D: OFFSET RISK ASSESSMENT

Table D-1: Risk Assessment

Risk Factor (Hazard)	Impact (Risk)	Before Management			Action/Control/Risk Mitigation Measure	After Management		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk Level
Substrate	Ground disturbance	C	4	L	• Ground preparation and soil disturbance for revegetation will only be undertaken where required in revegetation (Section 5.5) • Vehicle access will be restricted to designated tracks, except in the case of biodiversity management actions and inspections (Section 5.3); and • Establishment and maintenance of fire breaks around the perimeter of and within the offset areas only where practicable (Section 5.13);	D	4	L
Clearing	Incidental clearing and fragmentation	C	4	L	• Low level management interventions in existing woodland and forest to minimise clearing (Section 5); • Active revegetation will be undertaken to increase the area and connectivity of native vegetation (Section 5.5); and • Ecological thinning will be limited to areas of dense regrowth of *Callitris* spp. (Section 5.6).	D	4	L
Livestock	Grazing by cattle – ground disturbance, remove or destroy seeds, seedlings or plantings	C	2	H	• Agriculture/grazing has been excluded from the offset area (Section 5.12); • Inadvertent grazing from neighbouring stock will be removed as soon as practicable (Section 5.12).	D	3	L

Risk Factor (Hazard)	Impact (Risk)	Before Management			Action/Control/Risk Mitigation Measure	After Management		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk Level
Introduced flora species (weeds)	Weed invasion – perennial and annual grasses, perennial herbs, annual and biennial herbs and woody weeds	C	2	H	• Whitehaven will instruct contractor vehicles and equipment entering the offset area to be clean and free from weeds and/or seeds reduce introduction and spread of weeds (Section 5.9); • Seasonal weed assessment programs will be used to identify weeds and implement timely and prioritised weed control; • Weed control will target priority weed species; • The cover and extent of exotic species will be monitored (Sections 5.9 and 5.15); and • An increase in perennial exotic plant cover will trigger management actions and a review of factors leading to increasing/high weed cover (Section 5.17).	D	3	L
Impacts from Animals (exotics and grazing native animals)	Grazing by feral pigs and goats	B	3	H	• Pest animal abundance is monitored across the offset area (Section 5.10); • Control measures are informed by monitoring results/presence of pest animals (Section 5.10).	B	5	L
	Rabbits and hares	B	3	H	• Pest animal abundance is monitored across the offset area (Section 5.10); • Control measures are informed by monitoring results/presence of pest animals (Section 5.10).	B	5	L
	Grazing native fauna species (e.g. kangaroos)	B	4	M	• Pest animal abundance is monitored across the offset area (Section 5.10); • Control measures are informed by monitoring results/presence of pest animals (Section 5.10).	B	5	L
	Feral foxes	B	3	H	• Pest animal abundance is monitored across the offset area (Section 5.10); • Control measures are informed by monitoring results/presence of pest animals (Section 5.10).	B	5	L
	Deer	C	4	L	• Pest animal abundance is monitored across the offset area (Section 5.10);	B	5	L

Risk Factor (Hazard)	Impact (Risk)	Before Management			Action/Control/Risk Mitigation Measure	After Management		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk Level
					• Control measures are informed by monitoring results/presence of pest animals (Section 5.10).			
	Feral Cat	B	4	M	• Pest animal abundance is monitored across the offset area (Section 5.10); • Control measures are informed by monitoring results/presence of pest animals (Section 5.10).	B	5	L
Fire	Uncontrolled bushfire	B	2	H	• Establishing and maintaining fire breaks around the perimeter of and within the offset areas (Section 5.13); • Fuel loads, bushfire risk and appropriate hazard reduction methods will be assessed annually; • Whitehaven will undertake an annual ecological burn program according to the annual assessment; • Controlled burns may be utilised as a contingency measure within the Trigger Action Response Plan according to annual flora performance criteria (Sections 5.13, 5.15 and 5.17).	D	3	L
Floristics	Poor understorey diversity	C	3	M	• Annual revegetation assessments will determine key species to be planted in order to create a structurally diverse habitat (Section 5.5); • Ecological monitoring (Section 5.15) will assess the diversity of understory species in defined control/treatment plots to determine required contingency measures (Section 5.18); • Supplementary planting of appropriate tubestock or seeding will be undertaken if the contingency measure is triggered (Section 5.18).	D	3	L

Risk Factor (Hazard)	Impact (Risk)	Before Management			Action/Control/Risk Mitigation Measure	After Management		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk Level
Native plant growth	Poor native plant growth/germination	C	3	M	• Annual revegetation assessments will determine key species to be planted in areas requiring active revegetation (Section 5.5); • Vegetation and habitat monitoring will be undertaken to track changes in vegetation and habitat in the offset areas in response to management measures (Section 5.15 and 5.16); • Supplementary planting of appropriate tubestock or seeding will be undertaken if the contingency measure is triggered (Section 5.18).	C	4	L
	Dense overstorey and midstorey revegetation	C	3	M	• Ecological monitoring (Section 5.15) will assess the density of overstorey and midstory vegetation in defined control/treatment plots to determine required contingency measures (Section 5.18); • Ecological thinning will be conducted in areas of dense regrowth of *Callitris* spp. where it has adverse impacts on habitat condition or restoration (Section 5.6).	C	4	L
	Dense grass cover	C	3	M	• Ecological monitoring (Section 5.15) will assess the density of grasses in defined control/treatment plots to determine required contingency measures (Section 5.18).	C	4	L
Fauna habitat	Lack of bush rocks	C	4	L	• Habitat needs assessment will be undertaken to determine the requirements for habitat augmentation (Section 5.7); • Habitat augmentation will use available salvaged resources such as rocky debris.	C	4	L
	Lack of fallen timber/hollow logs	C	4	L	• Habitat needs assessment will be undertaken to determine the requirements for habitat augmentation (Section 5.7); • Habitat augmentation will use available salvaged resources such as coarse woody debris and artificial hollows.	C	4	L
	Lack of structural diversity (including lack of tree hollows)	C	4	L	• Habitat needs assessment will be undertaken to determine the requirements for habitat augmentation (Section 5.7); • Nest box installation (where required) will use high quality, durable materials suited to hollow-dependent threatened species.	C	4	L

Risk Factor (Hazard)	Impact (Risk)	Before Management			Action/Control/Risk Mitigation Measure	After Management		
		Likelihood	Consequence	Risk		Likelihood	Consequence	Risk Level
	Lack of suitable vegetation for foraging and/or roosting	C	4	L	• Habitat needs assessment will be undertaken to determine the requirements for habitat augmentation (Section 5.7); • Nest box installation (where required) will use high quality, durable materials suited to hollow-dependent threatened species.	C	4	L