Biodiversity Management Plan

Dubbo Quarry

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East Coast Ecology

DOCUMENT CONTROL

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GLOSSARY

Acronym/ Term	Definition
BAM	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCD	Biodiversity Conservation Division
BC Regulation	*Biodiversity Conservation Regulation 2017* (NSW)
BDAR	Biodiversity Development Assessment Report
Biodiversity Offsets	Management actions that are undertaken to achieve a gain in biodiversity values on areas of land in order to compensate for losses to biodiversity from the impacts of development
BMP	Biodiversity Management Plan
BOS	Biodiversity Offset Strategy
CEEC	Critically Endangered Ecological Community
Conditions	Ministers Conditions of Approval
Disturbance Area	The area directly impacted, shown in **Figure 1**
DPE	New South Wales Department of Planning and Environment (formerly DPIE)
DPIE	New South Wales Department of Planning, Industry and Environment (formerly OEH)
EIS	Environmental Impact Statement Dubbo Quarry Continuation Project, prepared by EMM Consulting Pty Limited on behalf of Holcim (Australia) Pty Limited, 2021
EP&A Act	*Environmental Planning and Assessment Act 1979* (NSW)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
km	Kilometres
LGA	Local Government Area
m	metres
MNES	A matter of national environmental significance (MNES) is any of the nine defined components protected by a provision of Part 3 of the EPBC Act (Commonwealth).

Acronym/ Term	Definition
Native Vegetation	Means any of the following types of plants native to New South Wales: (a) trees (including any sapling or shrub), (b) understorey plants, (c) groundcover (being any type of herbaceous vegetation), (d) plants occurring in a wetland
PCT	New South Wales Plant Community Type
Project Area	The entire site area, shown in **Figure 1**
TEC	Threatened Ecological Community
Threatened species, populations and ecological communities	Species, populations and ecological communities specified in Schedules 1 and 2 of the BC Act 2016
TPZ	Tree Protection Zone: A specified area above and below ground and at a given distance from the trunk set aside for the protection of a tree's roots and crown to provide for the viability and stability of a tree to be retained where it is potentially subject to damage by development
WBYB	White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered Ecological Community)

1. INTRODUCTION

1.1 Purpose and Scope

The purpose of this Biodiversity Management Plan (BMP) is to provide a framework for the implementation of biodiversity management actions, procedures, controls and monitoring programs for the life of the Dubbo Quarry Continuation Project (from pre-operation, during operation, through to closure and post-closure). Specifically, the BMP will provide feasible measures to be implemented during operations to avoid and minimise impacts to biodiversity, which includes protecting adjacent areas of White Box Yellow Box (WBYB) and threatened species habitat to be retained.

The BMP will apply to all vegetation and habitat removal within the approved disturbance area. The target audiences for the BMP are quarry staff, subcontractors, and any other relevant stakeholders. The plan forms part of the Environmental Management Strategy (EMS). It is informed by the following documents:

- Biodiversity legislation and regulation
- Minister's Conditions of Approval (hereafter 'Conditions') issued by the NSW Minister of Planning and Environment SSD 10417
- Mitigation and management commitments contained in the following assessment and planning documentation:
    - Dubbo Quarry Continuation Project Environmental Impact Statement, prepared for Holcim (Australia) Pty Ltd (EMM, January 2021) (the EIS)
    - Submissions Report – Part 1 (EMM, 2021)
    - Dubbo Quarry Continuation Amendment Fisheries Submission (DPI, 2022), and
    - DPIE Water and NRAR – EIS response (DPIE, 2021).

1.2 Consultation

In accordance with Part B, Condition 49(b), this BMP has been prepared in consultation with the Biodiversity Conservation Division (BCD) of the Department of Planning and Environment (DPE). The BMP was prepared to the satisfaction of the Planning Secretary.

Preliminary consultation for the BMP and Biodiversity Offset Strategy (BOS) began in March 2023.

1.3 Regulatory Requirements

The EMS contains details of the legislation, regulation, guidelines and standards that are relevant to the Dubbo Quarry Continuation Project.

1.4 Permits and Licences

Holcim currently hold Environment Protection Licence (EPL) No. 2212 for the scheduled activity of extractive activities, which is updated from time to time. The EPL details the Conditions which must be complied with when undertaking the extractive activities works.

Ecologists undertaking field work in accordance with this BMP are required to hold Scientific Licence under Part 2 of the BC Act (including Animal Ethics Approval under the *Animal Research Act 1985*) for fauna

handling/ rescue and survey work. Where rescued fauna requires rehabilitation and care only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used.

1.5 Guidelines

The guidelines considered in the development and implementation of this management plan include:

- National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland, Department of Environment, Climate Change and Water NSW (2011)
- Identification Guidelines for Endangered Ecological Communities: White box - yellow box - Blakely's red gum woodland, Department of Environment and Climate Change (2007)
- Final Determination for White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland, NSW Threatened Species Scientific Committee (2020), and
- NSW National Parks & Wildlife Service. Policy for the Translocation of Threatened Fauna in NSW: Policy and Procedure Statement No. 9 Threatened Species Unit, Hurstville NSW (2001).

1.6 Minister's Conditions of Approval

The Conditions relevant to this plan are detailed in **APPENDIX A**. A cross reference is also included to indicate where the Condition is addressed in this plan or other project management documents.

2. PROJECT ENVIRONMENT

The following section summarises existing terrestrial flora and fauna within and adjacent to the disturbance area including species, communities and habitats based on the information contained in Section 6.4 and Appendix F of the EIS. Appendix F consists of the Biodiversity Development Assessment Report (BDAR) (EMM, 2020). The area assessed as part of the BDAR consisted of the area directly impacted by the project (disturbance area) and additional areas within the project area that were avoided due to biodiversity values, as shown on **Figure 1**.

2.1 Site Description

The quarry is located within Dubbo Regional Local Government Area (LGA) approximately 5 kilometres (km) south-east of the Dubbo Central Business District. The quarry is accessed via Sheraton Road which connects to the Mitchell Highway approximately 2km north-west of the quarry.

The project area exists within a rural landscape and does not include any biodiversity corridors mapped by Council or by DPE. The Dubbo Local Environmental Plan 2011 maps woodland areas within project area as of high biodiversity value; however, this is not linked to an identified connectivity corridor.

2.2 Native Vegetation

The project area is almost entirely composed of cropped land, being regularly tilled and sown. Very small patches of woodland also occur, though the groundcover is dominated by exotic species. The majority of the land outside of the disturbance area will continue to operate under its current land use. The proposed haul road disturbance area, linking the proposed southern disturbance area to the existing quarry, includes areas of derived native grassland and areas of higher quality woodland associated with the vegetation either side of Eulomogo Creek. Canopy species include Blakely's Red Gum (*Eucalyptus blakelyi*), Yellow Box (*Eucalyptus melliodora*) and White Cypress Pine (*Callitris columellaris*) (EMM, 2020).

2.2.1 Plant Community Types

Plant Community Types (PCTs) are the NSW classification used to identify plant communities. Site investigations undertaken as part of the EIS identified the presence of two (2) PCTs within the project area:

- PCT 599: Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion, and
- PCT 81 - Western Grey Box - cypress pine shrub grass shrub tall woodland in the Brigalow Belt South Bioregion.

2.2.2 Threatened Ecological Communities

One (1) Threatened Ecological Community (TEC) was identified within the project area:

- White Box Yellow Box Blakely's Red Gum Woodland – listed as a Critically Endangered Ecological Community (CEEC) under the BC Act and EPBC Act.

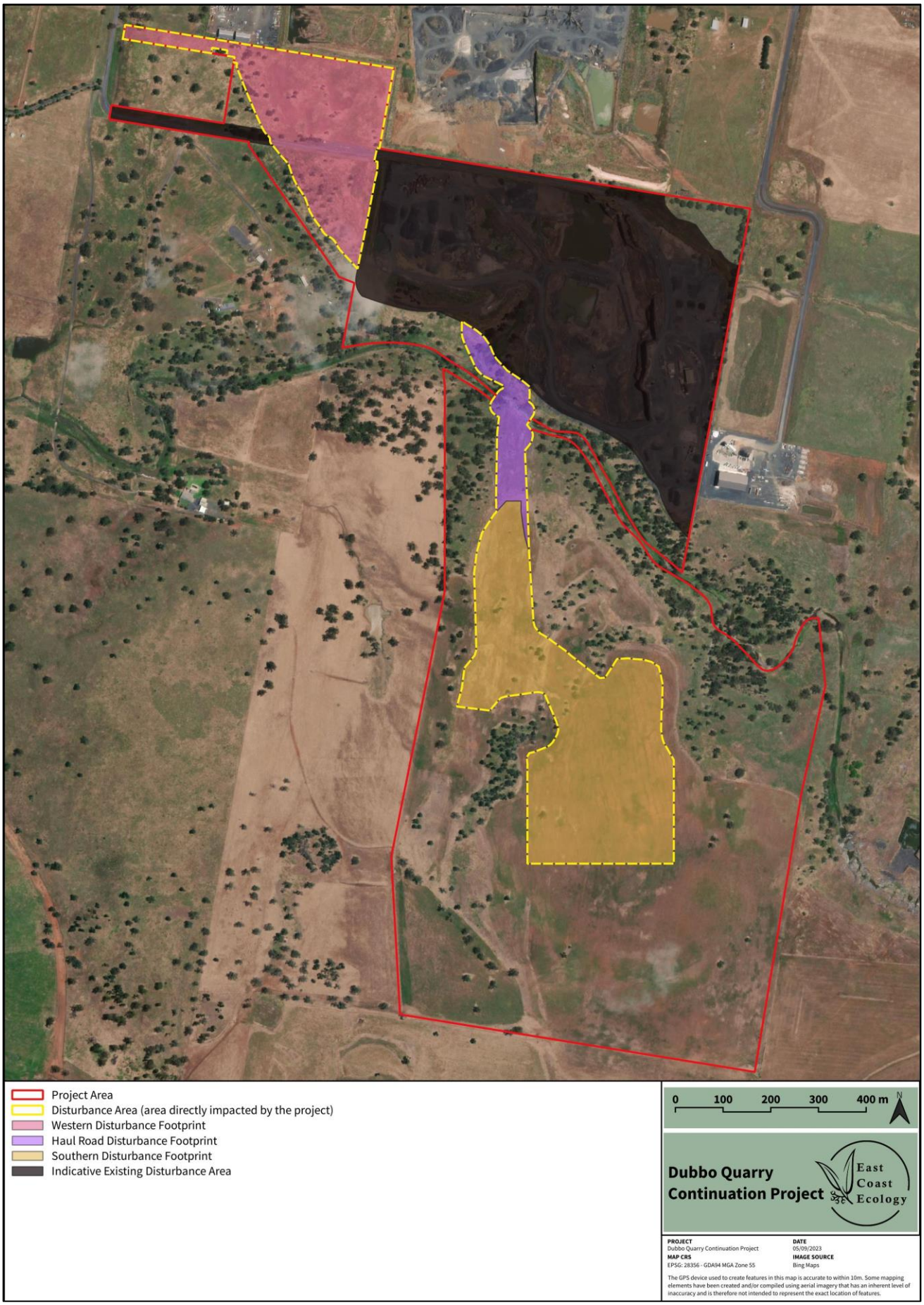

Figure 1. The direct disturbance footprint and the broader project area.

2.3 Threatened Flora Species

Based on habitat constraints, four (4) threatened flora species listed under the BC Act or EPBC Act were identified as having potential to occur within the project area (**Table 1**). No threatened flora species were recorded in the project area during field surveys for the EIS.

Table 1. Threatened flora species with the potential to occur within the project area.

Common Name	Scientific Name	BC Act Status	EPBC Act Status
Bluegrass	*Dichanthium setosum*	Vulnerable	Vulnerable
Scant Pomaderris	*Pomaderris queenslandica*	Endangered	Not listed
Silky Swainson-pea	*Swainsona sericea*	Vulnerable	Not listed
Tylophora	*Tylophora linearis*	Vulnerable	Endangered

2.4 Fauna Habitats

The majority of the project area is cleared, consisting of cultivated and grazed land. These areas have low habitat value, with biodiversity values largely limited to the intermittent foraging resources for transient species such as seed eating birds. These areas are unlikely to provide important habitat for any threatened species. Derived native grasslands are present within the project area. These areas have the potential to provide foraging resources for insectivorous and seed eating birds.

Cracks and crevices, and rocky areas, provide potential shelter for reptiles. Woodland areas of the disturbance area comprise medium sized canopy species, dominated by Blakely's Red Gum, Yellow Box and White Cypress Pine. Hollows are present in several of the trees, mostly of small sizes, suited to nesting *Platycercus eximius* (Eastern Rosellas) and other smaller species. Few medium and large hollows are present, limiting the habitat value for larger arboreal mammals and hollow nesting birds. Both Blakely's Red Gum and Yellow Box are likely to provide intermittent foraging resources for nectivorous birds, when in flower.

Woodland within the disturbance area has been impacted by agricultural practices with grazing, partial clearance of canopy and complete clearance of midstory species. In many areas surface rocks and woody debris has also been cleared and placed in discrete stockpiles. As a consequence of this disturbance, structural complexity within the woodland areas has been reduced substantially and reducing its function for several threatened species. The exotic shrub, *Lycium ferocissimum* (African Boxthorn), is prevalent which provides dense and thorny shelter for small birds such as *Malurus cyaneus* (Superb Fairy Wren). The shrub is also known to provide shelter for invasive fauna such as *Vulpes vulpes* (European Fox) and *Oryctolagus cuniculus* (European Rabbit).

Hollow-bearing trees were prevalent within and surrounding the project area with 526 hollow-bearing trees recorded. The disturbance footprint has largely avoided dense patches of hollow-bearing trees, with a total of 17 that will require removal.

2.4.1 Threatened Fauna

Based on habitat constraints, 12 threatened fauna species as listed under the BC Act or EPBC Act were identified as having potential to occur within the project area (**Table 2**). No threatened fauna species were recorded in the project area during field surveys for the EIS. However, three (3) threatened fauna species were observed in habitat adjacent to the project area (**Table 2**).

Table 2. Threatened fauna with the potential to occur within the project area.

Common Name	Scientific Name	BC Act	EPBC Act	Observed?
Squirrel Glider	*Petaurus norfolcensis*	Vulnerable	Not listed	No
Koala	*Phascolarctos cinereus*	Endangered	Endangered	No
Bush Stone-curlew	*Burhinus grallarius*	Endangered	Not listed	No
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	Vulnerable	Vulnerable	No
Little Eagle	*Hieraaetus morphnoides*	Vulnerable	Not listed	No
Square-tailed Kite	*Lophoictinia isura*	Vulnerable	Not listed	No
Barking Owl	*Ninox connivens*	Vulnerable	Not listed	No
Masked Owl	*Tyto novaehollandiae*	Vulnerable	Not listed	No
Pink-tailed Legless Lizard	*Aprasia parapulchella*	Vulnerable	Vulnerable	No
Grey-crowned Babbler	*Pomastostomus temporalis temporalis*	Vulnerable	Not listed	Yes. Recorded at six (6) locations outside of the project area. Nests identified at one (1) location).
Superb Parrot	*Polytelis swainsonii*	Vulnerable	Vulnerable	Yes. Four (4) individuals observed flying over the project area.
Yellow-Bellied Sheathtail Bat	*Saccolaimus flaviventris*	Vulnerable	Not listed	Yes. One (1) individual observed outside of the project area while spotlighting.

2.4.2 Pest Species

There are a number of pest fauna that occur, or have the potential to occur, within the project area, including:

- *Bos taurus* (domestic Cattle)
- *Felis catus* (feral Cat)
- *Lepus capensis* (Brown Hare)
- *Rattus rattus* (Black Rat) – confirmed present
- *Capra hircus* (feral Goat)
- *Sus scrofa* (feral Pig)

- *Mus musculus* (House Mouse)
- *Oryctolagus cuniculus* (European Rabbit)
- *Vulpes vulpes* (Red Fox) – confirmed present

2.5 Weeds

Evidence of weeds was recorded across the project area, with a total of 50 exotic species identified. Some areas showed considerable infestations by African Boxthorn. This species is a weed of national significance (WoNS) and is also listed as a priority weed for the Central West. In addition to the general biosecurity duty, priority measures prohibit dealings, and it must not be imported into the state or sold.

2.6 Impacts and Offsetting

The main impacts to terrestrial biodiversity from the project include:

- Loss and modification of habitat from direct impacts (vegetation clearing as per **Table 3**)
- Fragmentation of habitats and associated impacts to connectivity and fauna movement
- Increased noise, vibration and dust levels, and erosion
- Artificial lighting impacting nocturnal species behaviour
- Increase in weeds and pathogens
- Earth moving and landform reshaping, and
- Collision with infrastructure causing injury or fatality to fauna.

Table 3. Vegetation clearing.

Vegetation Community	Condition Class	Area (ha)	Credit Requirements
Zone 1: 599 - Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Medium	0.64	21
Zone 2: 599 - Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Other (similar condition to Zone 1 but canopy dominated by White Cypress Pine)	1.25	37
Zone 2: 599 - Blakely's Red Gum – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Poor	1.18	24
Zone 4: 599 - Blakely's Red Gum- – Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	DNG	2.75	45
Zone 5: Exotic grassland	-	5.55	0
Paddock trees: 599 - Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	-	-	5

2.6.1 Payment to the Biodiversity Conservation Fund

Under the NSW Biodiversity Offsets Scheme, development proponents may choose to pay into the Biodiversity Conservation Fund (BCF) as an alternative to retiring biodiversity credits to meet their project offset obligation. Payment to the Biodiversity Conservation Trust (BCT), the entity that manages and controls the BCF, will ensure the project meets the offset obligations as determined in Consent condition B48.

Payment into the BCF, to offset the residual impacts of the project, will be completed prior to the commencement of vegetation and habitat clearing. Following payment, a letter will be prepared for submission to the Department of Planning and Environment to provide verification of meeting the Consent condition B48.

The BCT issued a charge quote statement for the project on 6th February 2023, for payment into the BCF. The charge quote is valid until the 5th February 2026.

3. ENVIRONMENTAL MANAGEMENT MEASURES

3.1 Management Zones

The project area has been divided into four (4) Management Zones (MZ), which are reflective of different management actions (**Figure 2**):

- MZ 1: the disturbance footprint
- MZ 2: the proposed bund wall revegetation area
- MZ 3: the proposed tree screening and revegetation area, and
- MZ 4: the remaining areas that will not be disturbed.

Table 5 outlines the management measures and mitigation strategies that are to be undertaken within each MZ and during each stage of the project (pre-quarrying, quarrying, and post-quarrying phases) to mitigate the potential impacts associated with biodiversity, as identified in the EIS and Conditions. The responsibility of each management measure and mitigation strategy lies with the Quarry Manager, who may engage contractors to implement the work on an as-needed basis.

A Biodiversity Offset Strategy (BOS) has been prepared as a separate report (ECE, 2023) that outlines how Holcim intends to offset the residual impacts on the project.

3.2 Vegetation Zones

The Vegetation Zones (VZ) that are referred to in this BMP (**Figure 3** - **Figure 5**) have been extracted from the EIS and include:

- VZ 1: PCT 599 (Derived Native Grassland)
- VZ 2: PCT 599 (moderate)
- VZ 3: PCT 599 (other)
- VZ 4: PCT 599 (poor), and
- VZ 5: PCT 81 (moderate).

3.3 Revegetation Areas

Management Zone 2 and 3 will be revegetated to enhance biodiversity and provide a screen between the quarry and sensitive receivers. Using species characteristic of PCT 599, MZ 2 will be revegetated with native groundcovers only, whereas MZ 3 will include canopy, sub-canopy, understorey and ground strata. Benchmark values for species richness and cover are provided in **Table 4**. Benchmark values for leaf litter = 30%, length of fallen logs = 41m and large trees = 2.

Table 4. Benchmark values for PCT 599.

Metric	Tree	Shrub	Grass	Forb	Fern	Other
Richness	3	4	10	12	1	2
Cover	18	2	43	7	0	1

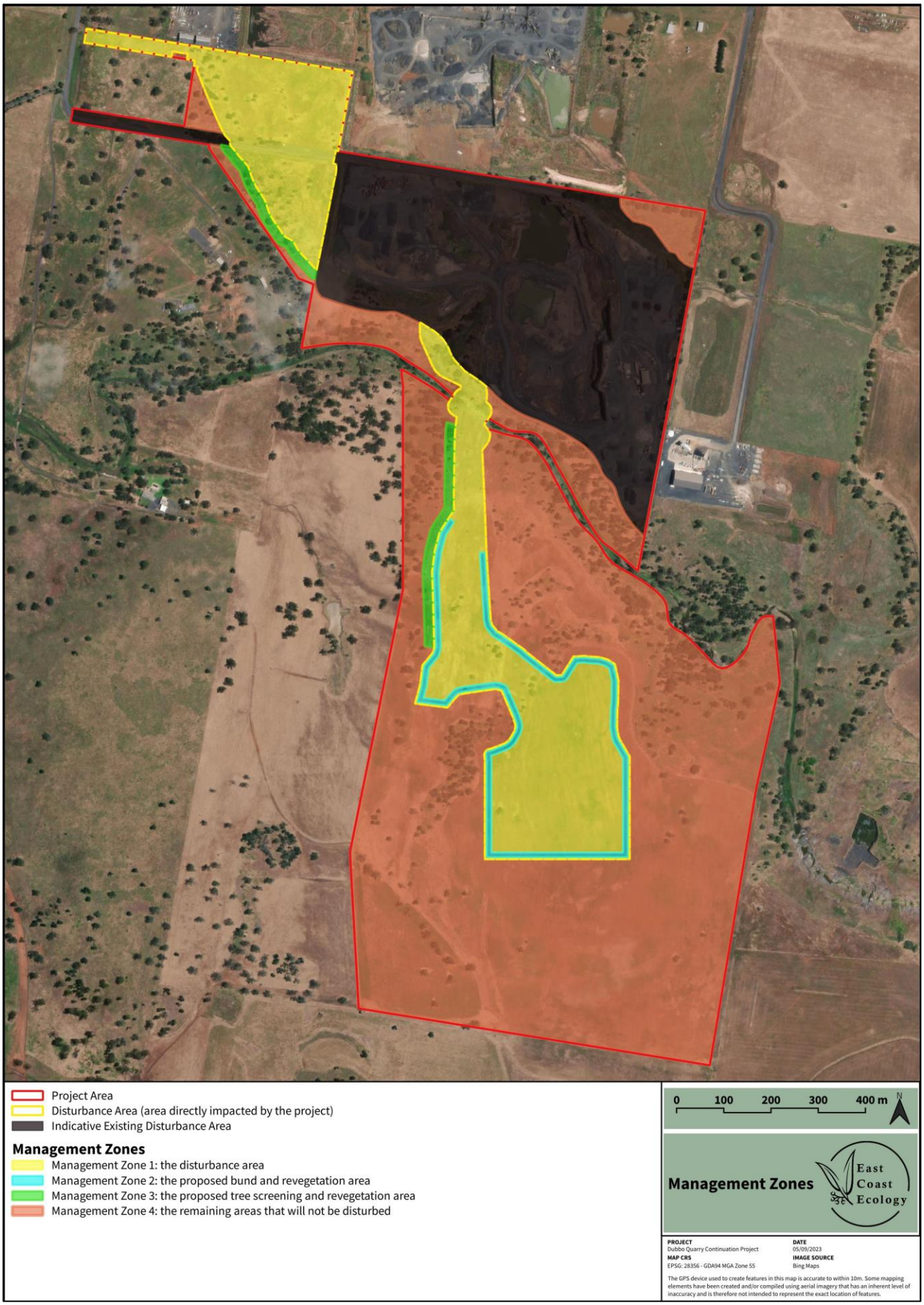

Figure 2. Management Zones.

Table 5. Management and Mitigation.

Project Stage	Management Measures & Mitigation Strategies	Applicable Management Zone(s)
Pre-Quarrying / Disturbance Phase	**<u>Habitat Salvage (Tree Hollow and Soil)</u>** ▪ Before clearing commences, all habitat trees (e.g. trees with hollows or nests) are to be checked and assessed by a trained ecologist to ensure that threatened fauna are not harmed. The ecologist is to consider breeding/ habitat periods for the specific hollow when providing advice (see **APPENDIX B**) ▪ Fallen timber would be left in place or moved to a nearby area (MZ 3 or 4) to retain fauna habitat ▪ Where practical, removed hollow bearing trees or individual hollow- bearing sections (whichever is most suitable or achievable) will be remounted in retained areas. The locations of remounted hollows will be undertaken with the assistance of an ecologist and documented, and will not be placed within 100 metres of the disturbance area ▪ In the event habitat tree removal cannot be avoided, clearance should occur outside of identified breeding seasons wherever possible, to be determined by a trained ecologist ▪ Remounted hollow trees or sections would be inspected to check the adequacy of the mounting ▪ Relocate frog habitat (e.g. rocks and logs) from within the riparian zone to nearby riparian areas ▪ Stripped topsoil will be placed in stockpiles in depths of up to approximately three metres and will be seeded with a cover crop of locally-native grasses if they are to remain in place for longer than approximately six months. Where possible, stripped topsoil may be used to facilitate revegetation efforts in MZ 2 and 3.	MZ 1 and 2 (salvage) MZ 2, 3 and 4 (relocation)
Pre-Quarrying/ Disturbance Phase	**<u>Marking Disturbance Boundaries</u>** Installation of the disturbance boundary fencing or flagging to be undertaken prior to vegetation disturbance activities. Reference to the relevant map (e.g. environmental sensitivities control map) to be utilised by workforce. The Work Supervisor or Quarry Manager must conduct regular inspections (e.g. fortnightly) of the disturbance boundary fencing or flagging to ensure all fencing is in place and is clearly visible as per the environmental sensitivities control map. The Work Supervisor or Quarry Manager must: ▪ discuss the disturbance boundaries and any environmental controls with the work crew and operators, and document the outcomes of the discussion in the SWMS ▪ ensure all biodiversity related risks and controls are clearly communicated and understood by all	MZ 1

Project Stage	Management Measures & Mitigation Strategies	Applicable Management Zone(s)
	▪ complete a pre-start checklist and ensure a pre-disturbance document has been completed prior to commencing work in a given area, and ▪ all pre-disturbance documents must be completed in accordance with the project's document management requirements.	
Pre-Quarrying/ Disturbance Phase	**Collection and Propagation of Seed** A variety of indigenous native seed shall be collected from within the disturbance area prior to clearing activities, for propagation and use in MZ 2 and 3. The objective for seed picking is to collect seed colonising shrubs, forbs and grasses from the disturbance area. The scope will be limited by the available seed stock at the time of collection. For staged clearing, all seed collection is to be undertaken prior to vegetation clearing of the area to be cleared. Seed collection (and propagation) should commence as soon as practicable (when grasses are in seed). If native seeds cannot be sourced from within the disturbance area, local nurseries can be used. Information including location, date, species collected will be recorded at the time of collection.	MZ 1 and 2 (collection) MZ 2 and 3 (use)
Pre-Quarrying/ Disturbance Phase & Quarrying Phase	**Weed Management** ▪ Bi-annual (twice a year) control of African Boxthorn until performance criteria are met (**Table 6**) ▪ Flagging or management signs will be erected at strategic locations prior to any clearing activities to restrict access to infested areas and ensure personnel use designated access tracks ▪ Ensure that the location of biosecurity risks and control requirements are communicated to all personnel in the site induction ▪ Manage the potential spread and/ or any existing infestations on-site through the establishment of biosecurity controls ▪ Where applicable (e.g. soil or vegetation laden plant), contractors must declare in writing all vehicles and machinery are thoroughly washed to remove all soil/ mud and plant material prior to entering site, and ▪ Weed free declarations will be procured from all suppliers of offsite fill material used during operation or revegetation.	MZ 2, 3 and 4
Pre-Quarrying/ Disturbance Phase & Quarrying Phase	**Control of Pest Species** ▪ Monitoring will be undertaken every two years and consist of six baited camera traps deployed within MZ 3 and 4, across seven nights	MZ 3 and 4

Project Stage	Management Measures & Mitigation Strategies	Applicable Management Zone(s)
	▪ Pest species abundance will be measured by total number of detections. Detections are defined as the presence of a pest species on a given camera in a night. This will avoid counting multiple presences of the same individual on the same camera in the same night.	
Pre-Quarrying/ Disturbance Phase	**<u>Identification of Unexpected TECs or Threatened Species</u>** All quarry staff/ contractors (undertaking cleaning/ stripping activities) will be made aware of potentially occurring threatened species during their site induction. If any threatened species or threatened ecological community is unexpectedly encountered during clearing activities the 'Unexpected Threatened Species Finds Procedure' provided in **APPENDIX C** will be followed and advice sought from the BCD. Advice from the Quarry Manager or Project Ecologist can be sought if status (threatened or protected) of encountered species is unknown.	MZ 1 and 2
Quarrying Phase	**<u>Fauna Protection</u>** ▪ Personnel are not permitted to intentionally feed, harass, harm, injure or kill fauna ▪ Fauna will only be handled by approved and trained handlers (see **APPENDIX D**) ▪ All vegetation and habitat to be cleared will be completed following pre-clearing surveys by an ecologist (see **APPENDIX B**) ▪ All vegetation and habitat removal will be undertaken under the supervision of an ecologist (see **APPENDIX B**) ▪ Place spoil, from works in the riparian zone, in a manner that allows opportunity for any burrowing frog species to survive and self-relocate	MZ 1 and 2

Quarrying Phase	**<u>Enhancing Biodiversity</u>**
	
	Existing vegetation, vegetation connectivity and fauna habitat will be improved throughout the project area through (**Figure 3** - **Figure 5**):
	
	▪ Control and management of all priority weeds
	▪ Relocation of hollow logs and coarse woody debris from within the disturbance footprint
	▪ Use of salvaged hollows for fauna habitat
	▪ Revegetation areas:
	  ◦ Vegetating the bund with native grasses.
	  ◦ Establishment of vegetation screening, which consists of canopy, sub-canopy, understorey and ground strata.
		MZ 2, 3 and 4

Project Stage	Management Measures & Mitigation Strategies	Applicable Management Zone(s)
	○ Sowing and planting of propagated seeds within MZ 2 and 3. ▪ Monitoring the condition of retained vegetation (Vegetation Zones 1 – 5) and continued improvement of actions proposed in the BMP. Rehabilitation efforts proposed for the project are described in Rehabilitation Management Plan (EMM, 2023).	
Quarrying Phase	**Vegetation and Habitat Removal** No vegetation is to be impacted beyond what has been approved and specifically identified for removal. All effort must be made to minimise the amount of clearing where possible. Vegetation removal can be minimised by adequate demarcation of disturbance boundaries, the use of the same tracks for ingress and egress and using existing cleared/ degraded areas for laydown and stockpiling.	MZ 1
Quarrying Phase	**Bushfire Hazards** Ongoing monitoring of bushfire hazards will be incorporated into the Emergency Management Plan (EMP) for the site. Mitigation measures for managing bushfire hazards are detailed in Appendix C of the EIS (2021) and include: ▪ Safe access to/ from the public road system for fire fighters ▪ Adequate services of water for the protection of buildings ▪ Location of electricity services away from bushland ▪ Landscaping that is designed and managed to minimise flame contact ▪ Consideration of asset protection measures when relocating habitat, and ▪ Adequate storage of hazardous materials.	All zones
Quarrying Phase	**Erosion** The proposed water management system to control erosion within the disturbance area is detailed in the Water Management Plan (EMM, 2023).	MZ 1 and 2
Quarrying Phase	**Vegetation Screening** Vegetation screening will be retained, or established where currently lacking, surrounding the project area, beyond the bund. The flora assemblage used in vegetation screening will consist of species characteristic of WBYB and PCT 599. Plants propagated from seed collection will be used where possible to maintain the genetic integrity of the remnant	MZ 3

Project Stage	Management Measures & Mitigation Strategies	Applicable Management Zone(s)
	vegetation community. When establishing the vegetation screening (MZ 3), it must be a minimum width of 20m and consist of canopy, sub-canopy, understorey and ground strata. The composition and structure of the vegetation within the screening area must not exceed the benchmark values applied to PCT 599.	
Quarrying Phase	**Indirect Impacts to Threatened Flora and Fauna, and TECs** ▪ Appropriate erosion and sedimentation controls will be put in place within the disturbance area and monitored regularly (see Water Management Plan (EMM, 2023)) ▪ Weed infestations will be monitored and managed as described in **APPENDIX E** and **Table 6** ▪ Vehicle washdown procedures will be put in place for vehicles travelling from weed infested areas ▪ Feral species monitoring and control programs will be implemented (see **Table 6**) ▪ The condition of vegetation within the project area will be monitored, with corrective actions implemented where required (**Table 6**), and ▪ A seasonally based monitoring program will be implemented to assess the efficacy of the biodiversity management measures and improve if required.	MZ 2, 3 and 4
Quarrying Phase	**Unpredicted Impacts to Biodiversity** ▪ Any unpredicted impacts to biodiversity must be managed in accordance with the appropriate controls outlined in this table, and monitored/ remedied following the measures in **Table 6**, and ▪ Advice must be sought from BCD, and if relevant the Project Ecologist, for all unpredicted impacts. Where relevant, remedial actions proposed in **Table 6** are to be followed to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible.	All zones
Post-Quarrying Phase	**Completion of Quarrying** ▪ Upon completion of quarrying, the Environment Officer must be consulted before removing the disturbance boundary fencing or flagging ▪ All disturbance boundary fencing must be removed upon completion of the project. Advice will be obtained from an ecologist prior to the removal of the fencing, and ▪ A final review of the BMP and all monitoring sessions will be undertaken to assess the performance of the mitigation and management measures. Rehabilitation efforts proposed for the project are described in Rehabilitation Management Plan (EMM, 2023).	All zones

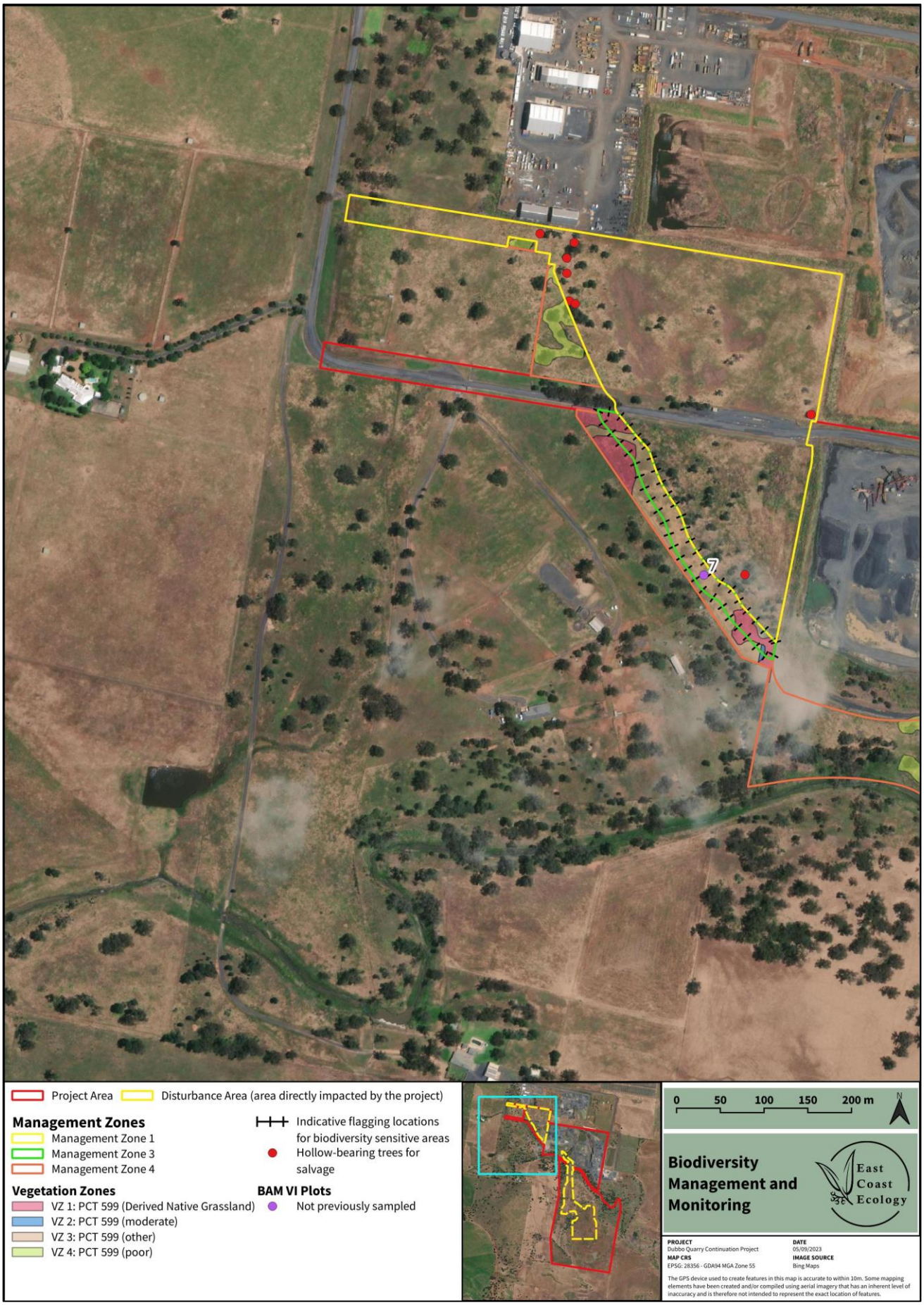

Figure 3. Biodiversity management and monitoring (map 1 of 3).

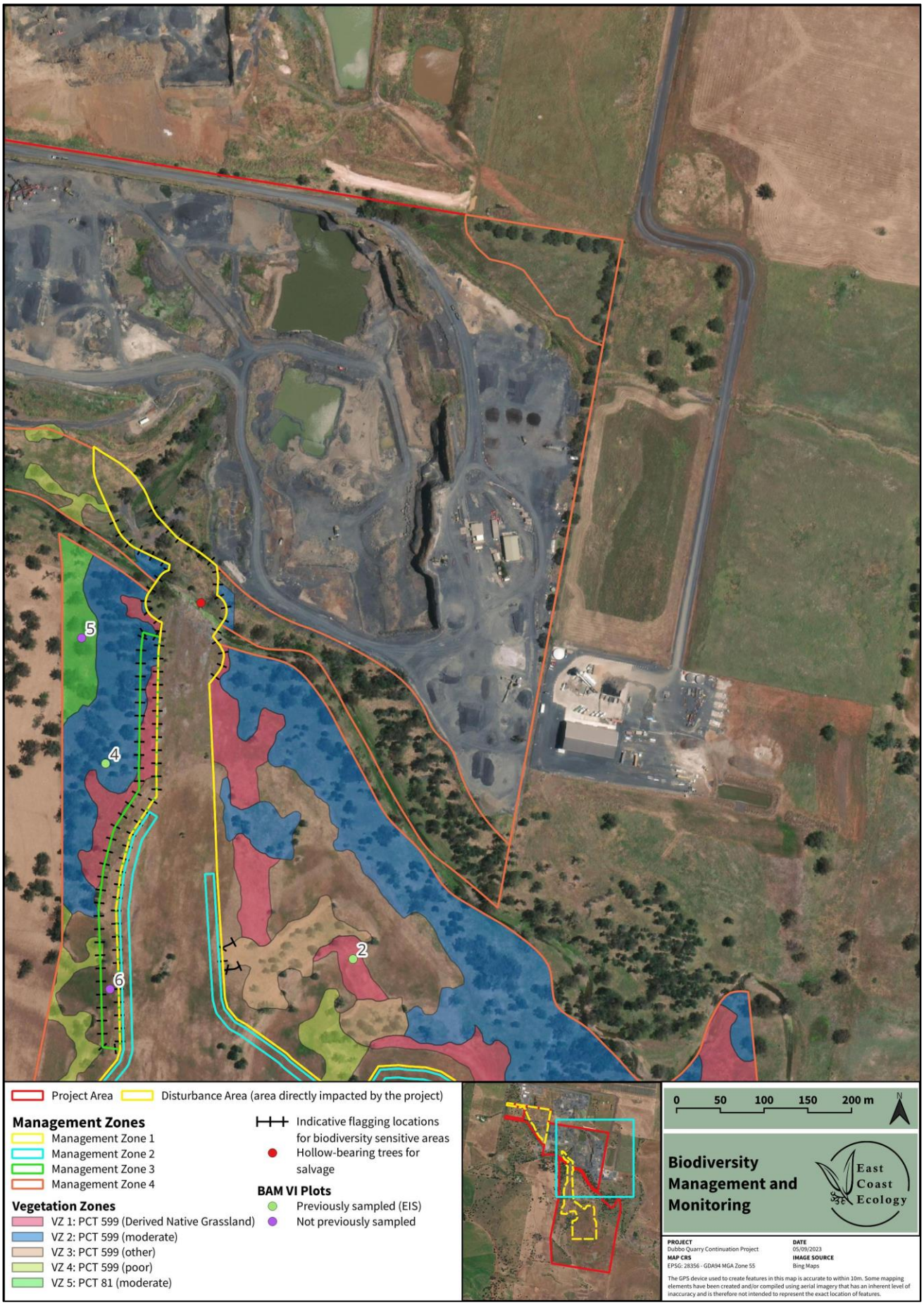

Figure 4. Biodiversity management and monitoring (map 2 of 3).

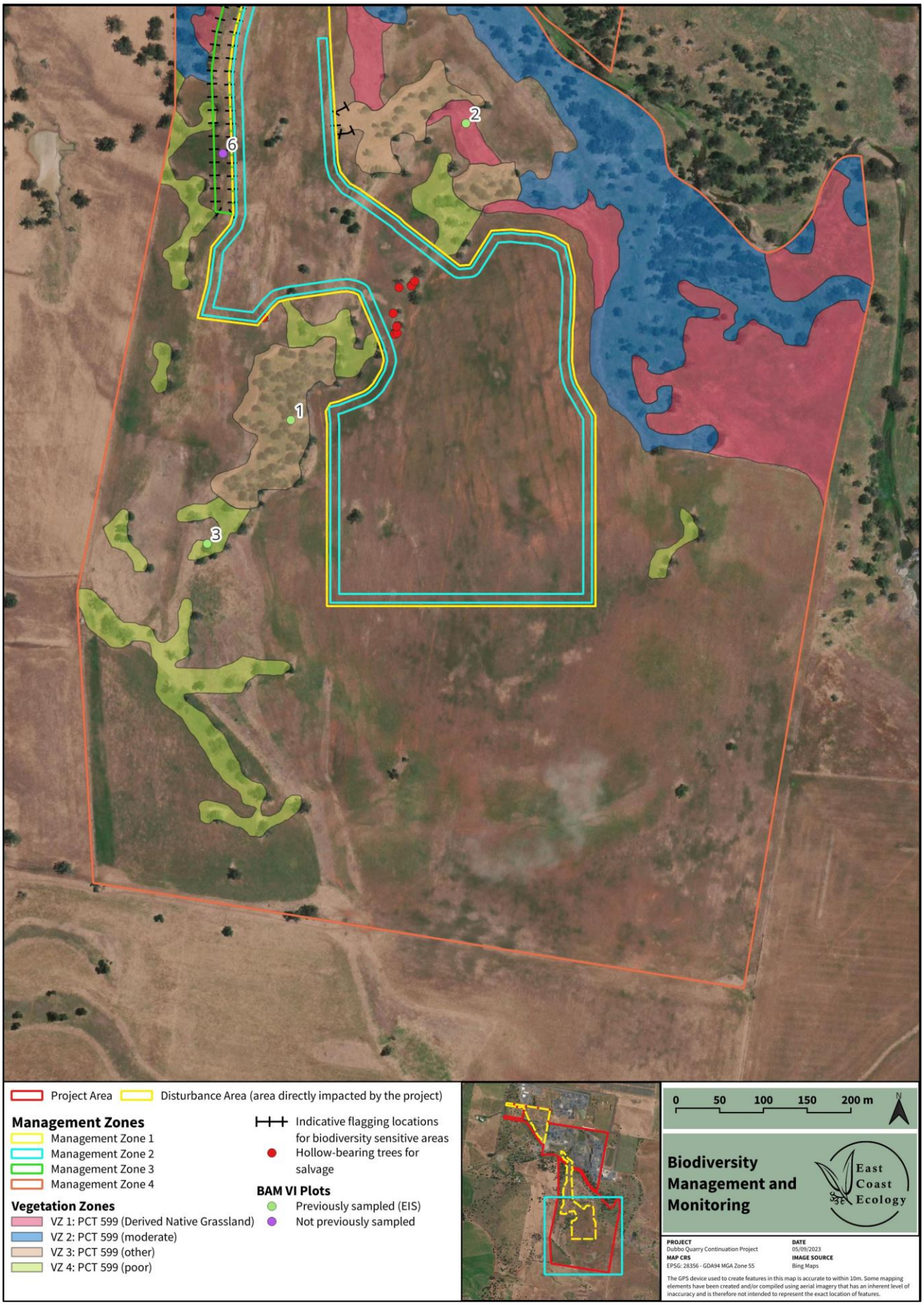

Figure 5. Biodiversity management and monitoring (map 3 of 3).

4. COMPLIANCE MANAGEMENT

4.1 Inspections

Inspections of terrestrial biodiversity aspects will occur for the duration of the project. Regular processes including daily (informal) visual inspections and documented weekly inspections by site staff will be used to inform mitigation measures and environmental controls during the quarrying phase. Where deficiencies in controls or systems are identified, the issue and required action will be managed as described in the EMS (non-construction activities) and a record maintained to demonstrate timely action and close out.

Reviews/ audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls, compliance with this management plan and other relevant approvals, licenses and guidelines. The planned audit process will be detailed within the relevant EMS.

4.2 Performance/ Completion Criteria, Performance Indicators and 'Trigger, Action, Response' Plans

The following sections outline the biodiversity monitoring and reporting to be undertaken during the pre-quarrying, quarrying, and post-quarrying phases of the project (see **Figure 4** - **Figure 5**). Seasonally based monitoring and reporting is required by Condition B49(e), and remedial actions are required by Condition B49(d). The responsibility of monitoring and reporting lies with the Quarry Manager, who may engage contractors to implement the work on an as-needed basis. Where appropriate, short, medium and/ or long-term completion criteria have been detailed.

4.2.1 Indirect Impacts to Threatened Entities

Potential indirect impacts to threatened entities associated with the quarry are an increase in weeds and pest species populations, erosion events and a decline in vegetation condition in adjacent undisturbed areas. The baseline data, performance criteria and measures, and response plan for these indirect impacts are detailed in **Table 6**. Other indirect impacts such as noise, vibration, dust and light spill will be managed in the site EMS.

Reporting requirement: Inclusion of any indirect impacts and corrective actions in the annual monitoring report (spring).

Table 6. Biodiversity monitoring requirements including Trigger, Action, Response Plan.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Habitat Salvage			
Baseline data	17 hollow-bearing trees have been identified within the disturbance area for removal.	MZ 1 and 2	Completed.
Performance criteria/ target	▪ The Project Ecologist will mark all habitat to be salvaged prior to vegetation removal works (**Figure 3** - **Figure 5**) ▪ All marked habitat for salvage will either be relocated as part of the pre-clearing survey or stockpiled for later relocation ▪ As part of the Pre-clearing Survey Report, the Project Ecologist will identify the location of all habitat to be salvaged for the clearing program as well as possible relocation areas, and ▪ The location, and date of storage, of all stored top soil will be recorded.	MZ 1 and 2	During clearing.
Performance/ completion measure	10m of hollow logs or coarse woody debris salvaged and placed within Management Zone 3 or 4, or, installation of artificial hollows at a ratio of 1:1 (from what was removed during clearing) within Management Zone 4.	MZ 3 and 4	Within one year from the commencement of quarrying operations having commenced after a campaign clearing activity.
Annual target	Marked habitat items salvaged from clearing/ disturbance footprint.	MZ 1 and 2	During clearing
Trigger point	Marked habitat was not salvaged from clearing/ disturbance footprint.	MZ 1 and 2	Until completion criteria met after a campaign clearing event.
Corrective actions	A review of the habitat salvage procedure should be undertaken and alternative habitat compensation measures should be investigated (e.g. artificial hollows).	N/A	Within six months of trigger point.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Response	Alternative habitat compensation measures implemented within one year from the commencement of operations. Where artificial hollows are installed as a compensation measure corrective action, they should be maintained (i.e. ensure they are able to function as habitat) for five years.	MZ 3 and 4	Within one year from the commencement of quarrying operations having commenced after a campaign clearing activity.
Reporting requirement	All habitat identified for salvage by the Project Ecologist will be detailed in a Pre-clearing Survey Report (following completion of pre-clearing surveys). Relocated habitat will be detailed (e.g. habitat type, location) within the annual monitoring report.	MZ 3 and 4	Annually until completion criteria met.
Weed Management			
Baseline data	Baseline data are to be collected prior to commencement of operations. Once the baseline data has been collected, this BMP will be updated and submitted to DPE (within 12 months of baseline data collection). Baseline data will be collected as part of the seven (7) BAM monitoring plots (see 'Vegetation Screening' and 'Enhancing Biodiversity' below). Level of infestation within the vegetation zones, shown in **Figure 3** - **Figure 5** (showing the 7 monitoring locations), is to be categorised from the BAM plot data as Very Low (<1%); Low (1-10%); Moderate (11-30%); High (31-60%); and Very High (>60%).	MZ 2, 3 and 4	Collected once prior to completion of clearing campaign.
Performance criteria/ target	Cover of existing priority weeds for vegetation zones with a baseline moderate infestation (or higher) reduced to very low or low categories within one year following the commencement of clearing.	MZ 2, 3 and 4	Within one year from commencement of quarrying operations.
Performance measure	Cover of priority weeds in BAM VI plots.	MZ 2, 3 and 4	Within one year from commencement of quarrying operations.
Completion criteria	Cover of existing priority weeds is less than 10% in each vegetation zone with a baseline moderate infestation (or higher) and no new incursions at the end of life for the quarry.	MZ 2, 3 and 4	End of life for the quarry.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Annual target	All priority weed cover in the very low or low category (≤ 10%). No establishment of new priority weeds.	MZ 2, 3 and 4	Annually (spring).
Trigger point	Priority weed cover increases by more than 50% on baseline data or exceeds 10% within a vegetation zone.	MZ 2, 3 and 4	Until completion criteria met.
Corrective actions	Review weed control procedures. Consider increasing intensity of weed control for the target weed. Conduct weed mapping survey of the project area within three months of implementation of corrective actions to assess the efficacy.	MZ 2, 3 and 4	Within three months of trigger point.
Response	Reduction of priority weed cover to baseline levels for the vegetation zone or below 10% (depending on trigger).	MZ 2, 3 and 4	Within three months of corrective actions.
Reporting requirement	All weed monitoring (undertaken in spring), management and control will be recorded and form part of the annual monitoring report.	MZ 2, 3 and 4	Annually (spring).
Pest Species Management			
Baseline data	Camera trapping undertaken as part of the EIS (Appendix F) recorded five detections of *Vulpes vulpes* (Red Fox) and eight detections of *Rattus rattus* (Black Rat) within the project area. It is likely that other pest mammal species such as *Oryctolagus cuniculus* (European Rabbit) or *Mus musculus* (House Mouse) use the project area habitually or opportunistically.	MZ 3 and 4	Completed.
Performance criteria/ target	No more than eight detections of previously unrecorded pest mammal species. No more than 10 detections of *Vulpes vulpes* (Red Fox) and 16 detections of *Rattus rattus* (Black Rat).	MZ 3 and 4	First round of monitoring (spring 2025).
Performance measure	Number of detections during a monitoring session.	MZ 3 and 4	Every two years (spring).
Completion criteria	Less than 50% increase in detections of known pest mammal species (number of nights detected summed across all camera traps) from baseline levels.	MZ 3 and 4	End of life for the quarry.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Two year target	Less than 100% increase in detections of known pest mammal species (number of nights detected summed across all camera traps) from baseline levels. No more than eight detections of previously unrecorded pest mammal species.	MZ 3 and 4	Every two years (spring).
Trigger point	Equal to, or greater than, 100% increase in detections of known pest mammal species (number of nights detected summed across all camera traps) from baseline levels. More than eight detections of previously unrecorded pest mammal species during a monitoring session.	MZ 3 and 4	Every two years (spring) until completion criteria met.
Corrective actions	Re-sample (undertake monitoring) within 12 months to determine whether the increase is a result of natural population fluctuation or changes in behaviour. If results of re-sampling still meet the trigger point, contact a pest species officer for advice (e.g. active control). If an increase in herbivorous pest species (e.g. rabbits, pigs) are detected in MZ 3, fortification or replacement of plant guards is to be implemented.	MZ 3 and 4	Within 12 months of trigger point.
Response	Reduction of pest mammal species below trigger point.	MZ 3 and 4	Within 12 months of corrective actions.
Reporting requirement	Results of monitoring and any corrective actions to be included in the annual monitoring report for the year the pest monitoring was undertaken.	MZ 3 and 4	Every two years (spring).
Collection and Propagation of Seeds			
Baseline data	N/A	N/A	N/A
Performance criteria/ target	Native seeds collected from a minimum of three native species representative of PCT 599.	MZ 1 and2	Prior to completion of clearing campaign.
Performance measure	Native species representative of PCT 599.	MZ 1 and 2	Prior to completion of clearing campaign.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Completion criteria	Use of propagated/ locally sourced seeds within vegetation screening areas and/ or bund walls within two years of completion of clearing activities.	MZ 2 and 3	Within two years of completion of clearing campaign.
Annual target	Collection and propagation of native seeds.	MZ 1 and 2	Annually (summer).
Trigger point	Seeds unable to be collected or propagated.	MZ 1 and 2	N/A
Corrective actions	Native seed consisting of characteristic PCT 599 species will be sourced from a local nursery or community group.	N/A	Within six months of trigger point.
Response	Native seeds sown within the revegetated areas.	MZ 2 and 3	Within three months of corrective actions.
Reporting requirement	All seed collection and propagation information will form part of the annual monitoring report.	MZ 1, 2 and 3	Annually (spring)
Vegetation Screening			
Baseline data	No baseline data. Baseline data will consist of a vegetation condition score (measured by VI) achieved by the establishment of two BAM plots (numbers 6 and 7) (**Figure 3** - **Figure 5**).	MZ 3	Once in spring (prior to commencement of quarrying operations)
Performance criteria/ target	▪ 90% survival rate of all plantings after one year, and ▪ Gradual and continual increase in VI score. Revegetation efforts must not cause the benchmarks for the mid and upper stratums of community (PCT 599) to be exceeded (see **Table 4**).	MZ 3	Prior to commencement of quarrying operations
Performance measure	Survival of plantings and VI score.	MZ 3	Annually (spring)
Completion criteria	Vegetation Integrity score >50% at the end of life for the quarry.	MZ 3	End of life for the quarry.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Annual target	Vegetation Integrity score increase >5% over 12 months.	MZ 3	Annually (spring)
Trigger point	Decline in species abundance such that it reduces their overall cover (measured by the BAM plot). Decline in species diversity.	MZ 3	Annually (spring)
Corrective actions	Review the relevant management actions. Consider infill planting with species characteristic of PCT 599 sourced from a local nursery or local educational/ land care group. If certain species exceeds the benchmark threshold, advice will be sought from a qualified ecologist for the best course of action.	MZ 3	Within three months of trigger point.
Response	Increase in species diversity and cover above baseline levels.	MZ 3	Within 12 months of trigger
Reporting requirement	All vegetation condition data will be collected annually in spring and detailed within the annual monitoring report.	MZ 3	Annually (spring)
Enhancing Biodiversity (condition of retained vegetation)			
Baseline data	No baseline data. Baseline data will consist of an updated vegetation condition score (measured by Vegetation Integrity (VI) score) calculated by the re-sampling of BAM plots (number 1 – 4) and establishment of one (1) new BAM plot (number 5) shown in **Figure 3** - **Figure 5**.	MZ 4	Once in spring (prior to commencement of quarrying operations)
Performance criteria/ target	No decline in vegetation condition within each vegetation zone.	MZ 4	Annually (spring)
Performance measure	VI score.	MZ 4	Annually (spring)
Completion criteria	Vegetation Integrity score increased by 5% (or more) within each vegetation zone at the end of life for the quarry. If abiotic factors such as drought or flood (i.e. not quarry related) are shown to have impacted the condition of the vegetation, the completion criteria will be that exotic species abundance and cover is less than 50% of baseline levels after 5 years.	MZ 4	End of life for the quarry.

Monitoring Task	Monitoring Details	Applicable Management Zone	Timing/ Frequency
Annual target	No decrease in VI score.	MZ 4	Annually (spring)
Trigger point	Quarry related cause of VI decline below baseline levels.	MZ 4	Annually (spring)
Corrective actions	Efforts to enhance biodiversity (e.g. weed and pest management, habitat salvage) must be reviewed with consideration given to increased efforts for the specific biodiversity components that are lacking or in decline. Should abiotic factors such as drought or flood cause the decline in VI score, consideration should be given to obtaining new baseline VI scores for each zone.	MZ 4	Within six months of trigger
Response	Vegetation Integrity score within 5% of baseline levels, within 12 months.	MZ 4	Within 12 months of corrective actions
Reporting requirement	All vegetation condition data to be detailed within the annual monitoring report.	MZ 4	Annually (spring)

4.3 Reporting Requirements

Reporting requirements in addition to those provided in **section 4** are provided in **Table 7**.

Table 7. Additional reporting requirements.

Reporting Requirements	Frequency/ Timing
Fauna Protection, Vegetation and Habitat Removal ▪ Pre-clearing survey reports will be prepared following pre-clearing surveys of the disturbance area ▪ Pre-clearing survey reports will include information on fauna observed and relocated ▪ A report documenting all information regarding encountered fauna will be prepared following vegetation clearing.	Following pre-clearing surveys (pre-clearing survey report) and clearing supervision (post-clearing report)
A review of the BMP and all monitoring sessions data will be undertaken to assess the performance of the mitigation and management measures.	Once, at the completion of quarrying activities.

5. REVIEW AND IMPROVEMENT

5.1 Continual Improvement

Continuous improvement of the BMP will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets for the purpose of identifying opportunities for improvement. Opportunities for continual improvement are to be assessed and described in the annual monitoring report.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance
- Determine the cause or causes of non-conformances and deficiencies
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies
- Verify the effectiveness of the corrective and preventative actions, and
- Document any changes in procedures resulting from process improvement.

5.2 BMP Review and Updates

In accordance with Condition D5, this BMP will be reviewed, and if necessary revised, within three months of the submission of:

- The submission of an incident report under Condition D7
- The submission of an Annual Review under Condition D9
- The submission of an independent environmental audit under Condition D11
- The approval of any modification of the development consent, and
- The issue of a direction of the Planning Secretary under Condition A2(b) that requires a review.

Review of this BMP will also take place if biodiversity monitoring results indicate that it is warranted or in the event of any significant change to biodiversity management procedures at the quarry. The BMP must be revised to the satisfaction of the Planning Secretary and submitted to the Planning Secretary for approval within six weeks of the review (Condition D6).

The processes described in the EMS will be followed for updating and amending this plan as per Condition D49(e) and D49(f).

A copy of the updated plan and changes will be distributed to all relevant stakeholders.

APPENDIX A – RELEVANT CONDITIONS OF APPROVAL

<table>
<tr><th>Condition</th><th>Condition requirements</th><th>Associated Chapter of the BMP</th></tr>
<tr><td>B48</td><td>The Applicant must retire the biodiversity Ecosystem Credits specified in Table 6 [of the Conditions] prior to commencing vegetation clearing under the consent. The retirement of credits must be carried out in consultation with BCD and in accordance with the Biodiversity Offset Scheme of the BC Act.

Table 6. Biodiversity ecosystem credit requirements
<table>
<tr><th>Credit Type</th><th>Disturbance Area (ha)</th><th>Number of Credits</th></tr>
<tr><td>Ecosystem Credits</td><td></td><td></td></tr>
<tr><td>PCT 599 – Blakely’s Red Gum – Yellow Box grassy tall woodland on the flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion_medium</td><td>0.64</td><td>21</td></tr>
<tr><td>PCT 599 – Blakely’s Red Gum – Yellow Box grassy tall woodland on the flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion_other</td><td>1.25</td><td>37</td></tr>
<tr><td>PCT 599 – Blakely’s Red Gum – Yellow Box grassy tall woodland on the flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion_poor</td><td>1.18</td><td>24</td></tr>
<tr><td>PCT 599 – Blakely’s Red Gum – Yellow Box grassy tall woodland on the flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion_Derived Native Grass</td><td>2.75</td><td>45</td></tr>
</table></td><td>See the Biodiversity Offset Strategy (ECE, 2023)</td></tr>
</table>

Condition	Condition requirements			Associated Chapter of the BMP
	PCT 599 – Blakely's Red Gum – Yellow Box grassy tall woodland on the flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	NA	5	
	Total	**5.82**	**132**	
B49	The Applicant must prepare a Biodiversity Management Plan for the development. The plan must:			This plan
	a) be prepared by a suitably qualified and experienced person/s approved by the Planning Secretary			This plan has been prepared by Principal Ecologist and Accredited Assessor, Dr Jack Tatler (East Coast Ecology). Approval for appointment was given on 31 March 2023.
	b) be in consultation with the BCD			**Section 1.2**
	c) describe the short, medium and long-term completion criteria to:			
	(i) implement the Biodiversity Offset Strategy required under Condition B48			See Biodiversity Offset Strategy (ECE, 2023)
	(ii) manage any remnant vegetation and fauna habitat			**Table 5** & **Section 4.2**
	(iii) manage biodiversity values within existing and future rehabilitation areas			**Table 5** & **Section 4.2**

Condition	Condition requirements	Associated Chapter of the BMP
		See also Rehabilitation Management Plan (EMM, 2023)
d) include a detailed description of the management measures to be implemented on the site to:		
	(i) enhance the quality of existing vegetation, vegetation connectivity and fauna habitat, including through the assisted regeneration and/or targeted revegetation of appropriate canopy, sub-canopy, understorey and ground strata	**Table 5**
	(ii) maximise the salvage of resources, including tree hollows and soil resources, for beneficial reuse including fauna habitat enhancement	**Table 5**
	(iii) minimise the impacts on tree hollows where reasonable and feasible	**Table 5** & **APPENDIX B.**
	(iv) minimise impacts on fauna, including undertaking pre-clearance surveys	**Table 5, APPENDIX B** & **APPENDIX D**.
	(v) manage potential indirect impacts on threatened plant and animal species, endangered ecological communities	**Table 5**
	(vi) control unrestricted access, weed and feral pests, with consideration of actions identified in relevant threat abatement plans	**Table 5**
	(vii) minimise amount of clearing within the approved disturbance area where reasonable and feasible	**Table 5**
	(viii) protect vegetation and fauna habitat outside the approved disturbance area	**Table 5**
	(ix) protecting the Eulomogo Creek riparian vegetation	**Table 5**

Condition	Condition requirements	Associated Chapter of the BMP
	(x) establish and/or retain vegetation screening to minimise the visual impacts of the development on surrounding receivers	**Table 5**
	(xi) control erosion	**Table 5**
	(xii) manage the collection and propagation of seed	**Table 5**
	(xiii)manage bushfire hazards	**Table 5**
	e) include a seasonally-based program to monitor and report on the effectiveness of the above measures and to progressively include improvements in the program that could be implemented to improve biodiversity outcomes	**Section 4.2**
	(f) include remedial actions when the monitoring shows the completion criteria are not being met or when management measures are not being effectively implemented	**Section 4.2**
	(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan	**Section 4.2**
B50	The Applicant must not commence construction or quarrying operations under the consent until the Biodiversity Management Plan is approved by the Planning Secretary	-
B51	The Applicant must implement the approved Biodiversity Management Plan	-
D4	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include:	
	(a) a summary of relevant background or baseline data	**Section 4.2**
	(b) details of:	
	(i) the relevant statutory requirements (including any relevant approval, licence or lease conditions)	**Section 1.4**
	(ii) any relevant limits or performance measures and criteria, and	**Section 4.2**

Condition	Condition requirements	Associated Chapter of the BMP
	(iii) the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures.	**Section 4.2**
	(c) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria	**Section 4.2**
	(d) a program to monitor and report on the:	**Section 4.2 & 5**
	(i) impacts and environmental performance of the development, and	
	(ii) effectiveness of the management measures set out pursuant to Condition A2(c).	
	(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible	**Table 5** & **APPENDIX C**
	(f) a program to investigate and implement ways to improve the environmental performance of the development over time	**Section 5**
	(g) a protocol for managing and reporting any:	**Section 5**
	(i) incident, non-compliance or exceedance of the impact assessment criteria or performance criteria	
	(ii) complaint, or	
	(iii) failure to comply with statutory requirements, and	
	(h) a protocol for periodic review of the plan	**Section 5.2**

APPENDIX B – VEGETATION CLEARING PROCEDURE

Pre-clearing Procedure

This procedure shall be read and used in conjunction with the EMS and the BMP. The following is to occur prior to clearing:

- An ecologist will be engaged for the project
- A clearing and grubbing Environmental Work Method Statement (EWMS) will be developed
- Clearing limits/ Exclusion Zones will be established at least one day prior to clearing commencing and will include the following:
    - The clearing limits will be delineated using signage or highly visible barriers or tape such as flagging, bunting, nightline or other similarly robust and durable material.
    - Tree protection zones (TPZs) (determined by the Project Arborist) will be set up around all trees retained within and adjacent to the disturbance footprint using signage or highly visible barriers or tape such as flagging, bunting, nightline or other similarly robust and durable material.
    - Delineation will be installed consistently through the project to mark boundaries and sensitive areas to reduce the risk of error or misinterpretation of boundaries. This may not be possible in some circumstances due to safe site access requirements.
- Consultation with the ecologist will occur to determine suitable locations for fauna release
- An ecologist will undertake a pre-clearing survey along the proposed clearing areas prior to the commencement of clearing. The ecologist will:
    - Check for the evidence of presence of threatened flora and fauna species.
    - Assess the habitat to be removed and the breeding requirements/ period of Grey-crowned Babbler (breeds between July and February) and Yellow-Bellied Sheathtail Bat (December to mid-March).
    - Flag habitat features, including (but not limited to) nests, hollow bearing trees or large logs using highly visible barriers or tape such as flagging, bunting, nightline or other similarly robust and durable material. As noted above in some circumstances this may not be possible due to site safe access requirements. GPS coordinates for all habitat trees identified will be recorded during the pre-clearing survey.
- A check to ensure clearing limits and other delineation required to be installed prior to clearing, is in place
- Where possible, the project ecologist should capture and/ or remove fauna that have the potential to be disturbed as a result of clearing activities
- Relocate identified fauna into pre-determined habitat identified for fauna release
- Inform clearing contractors of any changes to the sequence of clearing if required
- Prior to any disturbance of waterway banks, a thorough inspection by a qualified ecologist will be undertaken for aquatic fauna and frogs

- Where possible, existing trees and other vegetation should be retained within 15 metres of waterways and drainage lines until immediately before clearing commences in the area, and
- The supervisor, operator and environmental advisor are to walk the clearing footprint prior to commencing clearing.

Clearing Procedure

A two-stage habitat removal process will be implemented and involve the following steps.

Stage 1 – Non-habitat Vegetation/ Tree Removal

In areas where no habitat has been identified, clearing can be undertaken in a single-stage process. This includes the under-scrubbing of non-habitat trees, shrubs and other vegetation. These areas will be rapidly inspected by the project ecologist immediately prior to clearing, to:

- Obtain updated information on fauna and fauna habitat resources present:
    - inspection of trees for any new nests constructed since the pre-clearing surveys.
- Identify any fauna that may have moved into the project area since the initial pre-clearing inspection
- Capture and relocate non-mobile fauna, such as reptiles and frogs and key habitat features such as active bird nests
- If not already collected, record the details for all new Hollow Bearing Trees (HBTs) and trees containing threatened fauna and include GPS location, species, type of habitat feature, size of hollow and type of hollow.

Stage 1 - Non-habitat Vegetation/ Tree Removal allows respite between the initial disturbance and the final removal of habitat features. The changed environment along with the disturbance should encourage resident fauna to individually relocate without human handling. The timing between Stage 1 and Stage 2 clearing should be 24-48 hours (but no longer than 72 hours).

Stage 2 – Habitat Removal

- Nests and on-ground logs will be carefully inspected by an ecologist. Logs should be carefully rolled and inspection beneath the log undertaken
- The project ecologist will be present during removal of all habitat features to capture and relocate any encountered fauna
- Habitat trees (trees with hollows or nests) will be knocked either manually or with machine and then carefully lowered to the ground using a claw attachment (with minimal impact) and nests and hollows inspected by the ecologist
- Any fauna species are to be relocated to habitat identified during the pre-clearing process or, if injured, transported to a veterinarian or wildlife carer
- Where works are undertaken when frogs are active they should be relocated to the nearest area of retained riparian habitat
- Hollow bearing trees and any other cleared vegetation regarded as valuable for relocation and habitat creation/ enrichment are to be salvaged for re-use

- Records are to be kept of all fauna rescue events including locations to where fauna have been relocated. Provide GPS coordinates for such events, and
- Stockpiling/ storage of cleared timber are to be in designated areas and outside the critical root zone of remaining trees.

Post-clearing Report

Post clearing reports will be compiled progressively during the clearing phase of the project and submitted to Holcim. The completed reports will include:

- The name and qualifications of the ecologist present during clearing
- An assessment of the habitat and handling of fauna
- Information on clearing operations, dates, procedures, areas
- Live animal sightings, captures, any releases or injured/ shocked wildlife
- Any dead animals located, and
- Photographs of rescued fauna.

APPENDIX C – THREATENED SPECIES FINDS PROCEDURE

This procedure shall be read and used in conjunction with the EMS and the BMP. Threatened species surveys undertaken as part of the EIS did not identify any threatened flora species within or adjacent to the project area; however, four (4) threatened flora species have a low likelihood of occurrence (**Table 8**):

- *Dichanthium setosum* (Bluegrass)
- *Pomaderris queenslandica* (Scant Pomaderris)
- *Swainsona sericea* (Silky Swainson-pea), and
- *Tylophora linearis*.

Twelve (12) threatened fauna species have the potential to occur, or have been recorded within proximity to the project area (**Table 8**):

- *Petaurus norfolcensis* (Squirrel Glider)
- *Phascolarctos cinereus* (Koala)
- *Burhinus grallarius* (Bush Stone-curlew)
- *Calyptorhynchus lathami* (Glossy Black-Cockatoo)
- *Hieraaetus morphnoides* (Little Eagle)
- *Lophoictinia isura* (Square-tailed Kite)
- *Ninox connivens* (Barking Owl)
- *Tyto novaehollandiae* (Masked Owl)
- *Aprasia parapulchella* (Pink-tailed Legless Lizard)
- *Pomastostomus temporalis temporalis* (Grey-crowned Babbler)
- *Polytelis swainsonii* (Superb Parrot), and
- *Saccolaimus flaviventris* (Yellow-Bellied Sheathtail Bat).

This procedure is applicable to all activities that have the potential impact upon threatened flora and fauna species that have not been assessed and approved.

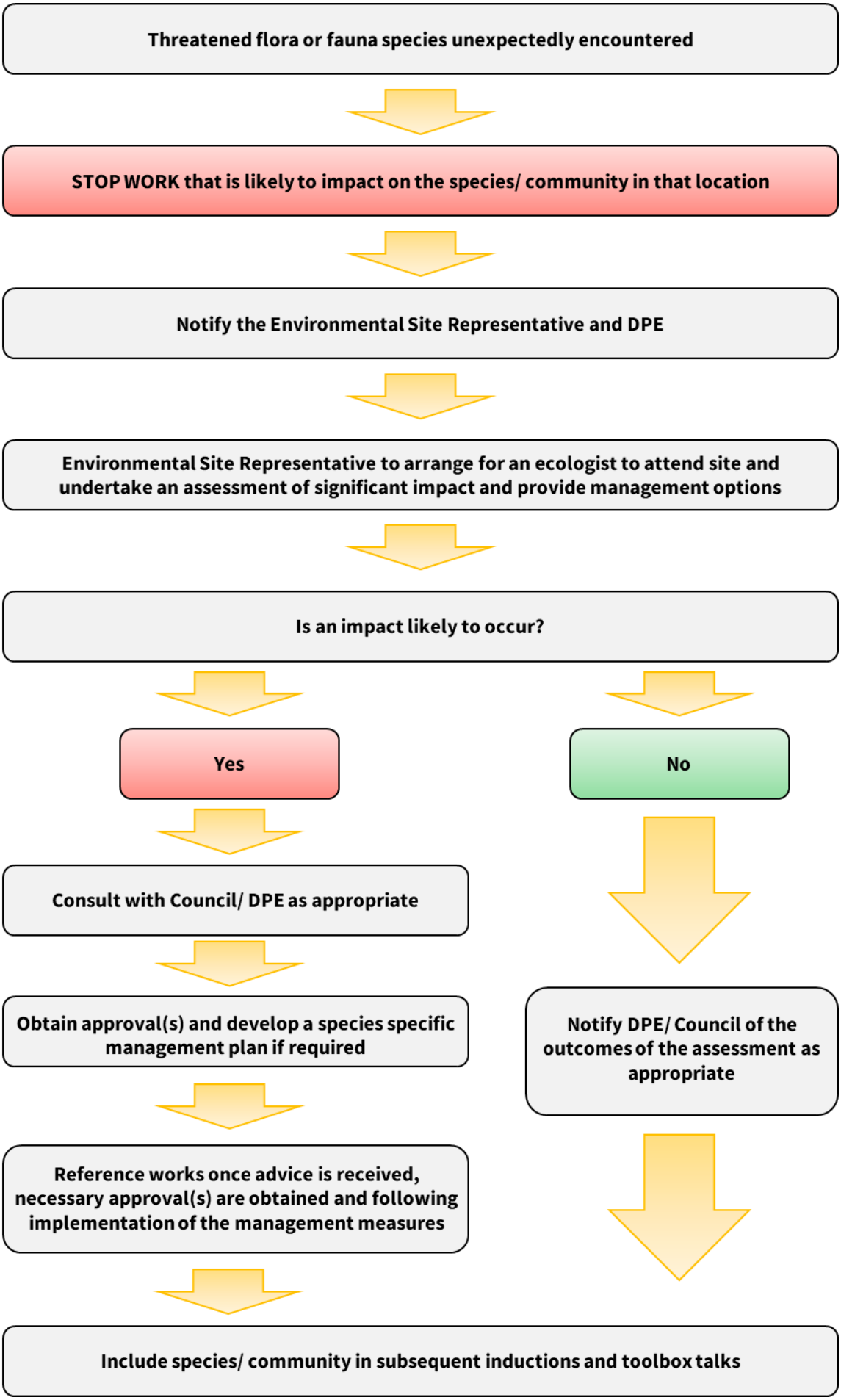
Threatened flora or fauna species unexpectedly encountered
STOP WORK that is likely to impact on the species/ community in that location
Notify the Environmental Site Representative and DPE
Environmental Site Representative to arrange for an ecologist to attend site and undertake an assessment of significant impact and provide management options
Is an impact likely to occur?
Yes
No
Consult with Council/ DPE as appropriate
Obtain approval(s) and develop a species specific management plan if required
Reference works once advice is received, necessary approval(s) are obtained and following implementation of the management measures
Notify DPE/ Council of the outcomes of the assessment as appropriate
Include species/ community in subsequent inductions and toolbox talks

Table 8. Unexpected threatened species descriptions.

Potentially occurring threatened flora and fauna	
Dichanthium setosum **(Bluegrass)**	***Pomaderris queenslandica*** **(Scant Pomaderris)**
	
Dichanthium setosum, Family Poaceae, also known as Bluegrass, is an upright perennial grass less than 1 m tall. It has mostly hairless leaves about 2−3 mm wide. The flowers are densely hairy and clustered together along a stalk in a cylinder shape and appear mostly during summer. The species can form pure swards or occur as scattered clumps.	Scant Pomaderris is a medium-sized shrub 2 - 3m tall. The stems are whitish with tiny star-shaped hair clusters. The leaves are oval to narrow elliptical, 2.5 - 7 cm long and 10 - 25 mm wide. They are shiny on the top and woolly underneath. The small creamy yellow flowers appear during spring-summer.

Potentially occurring threatened flora and fauna	
***Swainsona sericea* (Silky Swainson-pea)**	***Tylophora linearis***
	
The Silky Swainson-pea is a prostrate or erect perennial, growing to 10 cm tall. The stems and leaves are densely hairy. The leaves are up to 7 cm long, composed of 5 - 13 narrow, pointed leaflets, each up to 15 mm long. The purple pea-shaped flowers are to 11 mm long, and are held in groups of up to 8 flowers, on a stem to 10 cm tall. The spring flowers are followed by hairy pods, up to 17 mm long.	Slender, almost hairless twiner with a clear sap. Leaves dark green, linear, 1-5 cm long, 0.5-3 mm wide. Flowers purplish inside, 3-6 mm in diameter, in radiating groups of 3-8. Fruit is cigar shaped, up to 100mm long and approximately 5 mm diameter, hairless.

Potentially occurring threatened flora and fauna	
***Petaurus norfolcensis* (Squirrel Glider)**	***Phascolarctos cinereus* (Koala)**
	
Adult Squirrel Gliders have a head and body length of about 20 cm. They have blue-grey to brown-grey fur above, white on the belly and the end third of the tail is black. There is a dark stripe from between the eyes to the mid-back and the tail is soft and bushy averaging about 27 cm in length. Squirrel Gliders are up to twice the size of Sugar Gliders, their facial markings are more distinct and they nest in bowl-shaped, leaf lined nests in tree hollows. Squirrel Gliders are also less vocal than Sugar Gliders.	The Koala is an arboreal marsupial with fur ranging from grey to brown above, and white below. It has large furry ears, a prominent black nose and no tail. It spends most of its time in trees and has long, sharp claws, adapted for climbing. Adult males weigh 6 - 12 kg and adult females weigh 5 - 8 kg. During breeding, males advertise with loud snarling coughs and bellows.

Potentially occurring threatened flora and fauna	
Burhinus grallarius **(Bush Stone-curlew)**	***Calyptorhynchus lathami*** **(Glossy Black-Cockatoo)**
	
The Bush Stone-curlew stands about 55 cm tall. It has a grey to light brown back, marked with black blotches, and a streaked rump. It has buff and white underparts with dark streaks, and a black band that runs from near its eye down its neck. This species has large, bright yellow eyes and a hunch-shouldered stance on long spindly legs. When disturbed it lies flat on the ground, with its head and neck outstretched. Its call is a loud eerie wailing "wee-loo", mostly heard at night.	The Glossy Black-Cockatoo is a small brown-black cockatoo with a massive, bulbous bill and a short crest. Males have a prominent red tail panel, while that of females is yellow to orange-red. The coloured tail panel is barred black in juvenile birds, with the extent of barring decreasing with age. The female usually has irregular pale-yellow markings on the head and neck, and may have yellow flecks on the underparts and underwing. They are usually seen in pairs or small groups feeding quietly in sheoaks.

Potentially occurring threatened flora and fauna	
***Hieraaetus morphnoides* (Little Eagle)**	***Lophoictinia isura* (Square-tailed Kite)**
	
The Little Eagle is a medium-sized bird of prey that occurs in two colour forms: either pale brown with an obscure underwing pattern, or dark brown on the upper parts and pale underneath, with a rusty head and a distinctive underwing pattern of rufous leading edge, pale 'M' marking and black-barred wingtips. Both forms have a black-streaked head with a slight crest, a pale shoulder band on the upperwings, a rather short and square-tipped barred tail, and feathered legs (OEH 2017). It builds a nest in the canopy of tall trees.	The Square-tailed Kite is a reddish, medium-sized, long-winged raptor, about the size of a Little Eagle or harrier. As with most raptors, there is sexual dimorphism in morphology with females being larger than males. Males weigh approximately 500 g while females weigh 650 g. The Square-tailed Kite has a length of 50-56 cm and wingspan of 130-145 cm. Adults have a white face with thick black streaks on the crown and finer streaks elsewhere. The saddle, rump and central upper tail coverts are blackish with grey-brown barring. The underparts are predominantly grey-brown with black tips on the grey, square-tipped tail and wing edges. A key character in flight is the long fingered, upswept wings with a large white patch at the base of the barred 'fingers'.

Potentially occurring threatened flora and fauna	
***Ninox connivens* (Barking Owl)**	***Tyto novaehollandiae* (Masked Owl)**
	
The Barking Owl is medium-sized owl (42 cm, 650 g), smaller than the similar Powerful Owl and larger than the Southern Boobook. It has bright yellow eyes and no facial-disc. Upperparts are brown or greyish-brown, and the white breast is vertically streaked with brown. The large talons are yellow. Males are typically larger than their mate and have a more square crown. The quick, dog-like 'wook-wook' territorial call is diagnostic, but the yapping of foxes, dogs and even Sugar Gliders is sometimes attributed to this species. Pairs of birds perform call-and-answer duets, the male's tone being the deeper, which often rise to an excited rapid pitch. This species is also famous for a rarely used high-pitched tremulous scream that has earned it the name 'screaming-woman bird'.	A medium-sized owl to 40 - 50 cm long, with dark eyes set in a prominent flat, heart-shaped facial disc that is encircled by a dark border. The feet are large and powerful, with fully feathered legs down to the toes. The owl exists in several colour forms, with wide variation in plumage. The upperparts are grey to dark brown with buff to rufous mottling and fine, pale spots. The wings and tail are well barred. The underparts are white to rufous-brown with variable dark spotting. The palest birds have a white face with a brown patch around each eye; the darkest birds have a chestnut face. The dark form of the Masked Owl is much browner than the Sooty Owl Tyto tenebricosa.

Potentially occurring threatened flora and fauna	
***Aprasia parapulchella* (Pink-tailed Legless Lizard)**	***Pomastostomus temporalis temporalis* (Grey-crowned Babbler)**
	
The Pink-tailed Legless Lizard (also known as the Pink-tailed Worm-lizard) is worm-like, with a dark-brown head and nape, gradually merging with the pale grey or grey-brown body. The tail, nearly as long as its body, is pink or reddish-brown towards the tip. Its snout and tail are both rounded. There are no external ear openings. The broad, non-forked tongue, frequently used to wipe the eyes, and the presence of small hind-limb flaps, distinguishes it from a juvenile snake. Specimens grow to about 25 cm in length.	The Grey-crowned Babbler is the largest of the four Australian babblers, reaching to 30 cm long. Its distinctive bill is scimitar-shaped, long and heavy. The broad white eyebrow and a pale grey crown-stripe are other distinguishing characters. A dark band passes from the bill through the eye, separating the pale throat and brow to giving a 'masked' look. It has dark greyish-brown upperparts and is paler brown on the underparts, grading to a whitish throat. It is distinctive in flight, showing white tips to the tail feathers, and orange-buff patches in the broad, rounded wings. Young birds have dark brown eyes, with the iris becoming paler with age, reaching a yellow colour by about three years. This species has a loud and often repeated ‘ya-hoo’ call which is a duet between the male and female.

Potentially occurring threatened flora and fauna	
***Polytelis swainsonii* (Superb Parrot)**	***Saccolaimus flaviventris* (Yellow-Bellied Sheathtail Bat)**
	
The Superb Parrot is a distinctive large, bright grass-green parrot with a long, narrow tail and sharply back-angled wings in flight. Males have yellow foreheads and throats and a red crescent that separates the throat from the green breast and belly. Females are slightly duller green and have a dull, light blue wash in place of the males' red and yellow markings. It nests in tree hollows.	The Yellow-bellied Sheathtail-bat is a very distinctive, large, insectivorous bat up to 87 mm long. It has long, narrow wings, a glossy, jet-black back, and a white to yellow belly extending to the shoulders and just behind the ear. Characteristically, it has a flattened head and a sharply-pointed muzzle. The tail is covered with an extremely elastic sheath that allows variation in the tail-membrane area. Males have a prominent throat pouch; females have a patch of bare skin in the same place.

APPENDIX D – FAUNA HANDLING AND RESCUE PROCEDURE

This procedure explains the actions to be taken in the event that fauna (including injured, shocked, juvenile or other animals) are discovered on the project site that require handling or rescue during vegetation clearance, soil disturbance and ongoing quarrying activities. This procedure is applicable to all native and introduced fauna species that are found on the project site. All site personnel and subcontractors will be made aware of the actions to be taken in the event that fauna are present on the project. This training will occur on site during the project induction and as required in toolbox talks.

Rescue Procedure

If wildlife are identified within the project area during clearing or quarrying activities that may harm, or has resulted in harm, to the animal or that poses risk to site personnel, the following steps will be taken:

1. Stop all work in the vicinity of the fauna and immediately notify the Site Supervisor/ Environmental Advisor who is to notify the Environmental Manager and/ or Project Ecologist if the latter is present on site.

2. Preferably allow any fauna individuals to leave the area without intervention.

3. Use a qualified ecologist or wildlife carer with specific animal handling experience to carry out any fauna handling.

4. Where necessary to minimise stress to native fauna and/ or remove the risk of further injury before the Project Ecologist or wildlife handler arrives on site, the Environmental Officer may implement the Handling Procedure.

5. If the animal cannot be handled (i.e. venomous reptiles, raptors, bats):

    a) exclude all personnel from the vicinity with fencing and/or signage, and

    b) record the exact location of the animals to be provided to the Project Ecologist or appropriate wildlife handler.

6. Call the Project Ecologist or appropriate rescue agency (refer to contact details provided in below and follow any advice provided. Once the Project Ecologist or wildlife carer arrives at site, they are responsible for the animal and any decisions regarding the care of the animal will be made by that person.

7. In the event that wildlife carers, and/or local veterinary Services cannot be contacted, the injured animal shall be delivered to the relevant agency as soon as possible.

8. If an animal is injured, it will be kept in a quiet, warm and dark place until it can be transferred to a wildlife carer or vet.

9. If any fauna are to be euthanized, it will be undertaken using a suitable technique (e.g. cervical dislocation for small mammals) by a trained and competent personnel (i.e. suitably qualified Project Ecologist or wildlife handler) or will be taken to a veterinarian for euthanasia. The Project Ecologist will consider methods that are humane, painless and rapid.

10. If the fauna species is identified as a threatened species that is not a species for the specific work site identified in the Unexpected Threatened Species Find Procedure, workers must follow the protocol specified in that procedure, including:

a) immediately cease all work likely to affect the threatened species

b) inform the Environmental Manager and the Project Ecologist

c) following consultation with all relevant stakeholders, the Project Ecologist/Environmental Manager will implement any corrective actions and additional safeguards, and

d) following confirmation by the Project Ecologist/ Environmental Manager that all appropriate safeguards have been implemented, quarrying works can recommence.

11. Release of fauna captured during quarrying works, including clearing and associated works, will be undertaken by the Project Ecologist or wildlife handler. If the animal is not injured or stressed, it should be released to an area that is not to be disturbed by the Project quarrying works, in accordance with the following:

a) sites identified as suitable release points by the Project Ecologist or wildlife rescuer

b) release site will contain similar habitat and occur as close to the original capture location as possible

c) if the species is nocturnal, release will be carried out at dusk

d) if the species is arboreal, release will be onto the trunk of a suitable tree

e) release would generally (except in the case of aquatic fauna and amphibians) not be undertaken during periods of heavy rainfall

f) non-native fauna will not be released and will be euthanized, and

g) if the animal has been placed into care due to injury, age (i.e. young) or stress, upon its rehabilitation it will be released in an area that is not to be disturbed by the Project quarrying works, at the discretion of the Project Ecologist or wildlife rescuer.

Reporting Requirements

12. Details of captured and relocated fauna will be recorded either in the Post-clearing Report or on the 'Fauna Rescue Event Record', including:

a) species

b) location and time captured

c) location and time released

d) behaviour and condition upon capture

e) behaviour and condition upon release, and

f) contact details of wildlife carer or vet if the animal was transferred into their care.

Handling Procedure

The Handling Procedure will be implemented only if intervention is necessary (i.e. where fauna is injured or otherwise unable to leave the site without intervention, or to minimise stress to native fauna and/ or remove the risk of further injury. The Project Ecologist will implement the following procedures:

1. Cover larger animals (including their head) with a towel or blanket and, if feasible, place in a cardboard box or cloth/hessian bag.

2. Place smaller animals (mammals, birds, reptiles) separately in a cotton bag, tied at the top.

3. Place frogs/tadpoles separately in a single use zip lock plastic bag with a small amount of water and/or the litter /vegetation in which they were found.

4. Fish and other aquatic life (i.e. turtles) place in plastic aquaria or plastic container with sufficient water.

5. For terrestrial fauna keep the animal in a quiet, warm, ventilated and dark place away from noisy quarrying activities.

6. For aquatic fauna species ensure sufficient amount of water and ensure adequate.

7. Gloves will be worn when handling mammals to protect against scratches and bites.

8. The Hygiene Protocol for the control of disease in frogs (DECCW, 2009) must be followed for all frog handling to prevent pathogen spread amongst individuals and between catchments:

a) single use, non-latex, non-powdered (i.e. nitrile) disposable gloves to be worn when handling individuals if gloves are not available, then avoid touching the frog with bare hands by using implements to transfer to a container

b) healthy frogs are to be placed in separate single-use plastic bags which should be partially inflated and include a small amount of leaf litter or clean (i.e. washed in a 0.1% concentration of a benzalkonium chloride based disinfectant solution such as F10SC at 1:250 dilution and not re-used) damp cloth bag containing a small amount of leaf litter

c) sick or injured individuals would be euthanized immediately, unless there is a high probability of recovery, in which case treatment would be as for healthy frogs

d) handling equipment, hands and boots to be cleaned of all soil and sprayed with a 0.1% concentration of a benzalkonium chloride based disinfectant solution (i.e. F10SC at 1:250 dilution) or a Chlorhexidine based product (e.g. Halamid©) and rinsed when moving between waterbodies

e) frogs and tadpoles are not to be moved between catchments, and

f) dead frogs would be handled only using single-use gloves and buried in situ to avoid movement of pathogens.

9. Snake handling must be as follows:

a) handling of snakes must only be undertaken by a qualified ecologist or wildlife carer with experience in snake handling, and

b) no contact handling techniques (i.e. use a snake hook and bag in opposed to manually handing the snake) are recommended.

10. All handling of bats must be as follows:

a) bats must only be handled by a qualified ecologist or wildlife carer experienced in bat handling and vaccinated against the Australian Bat Lyssavirus (ABLV)

b) gloves must be worn when handling bats, and

c) larger bats would be wrapped in a large towel and handled with wearing elbow length puncture proof gloves.

APPENDIX E - WEED CONTROL

The following weed control/ management strategy applies to all declared priority weeds that were identified during surveys conducted as part of the BDAR (EMM, 2021). The following priority weed was identified within the disturbance area, or has been recorded within adjacent vegetation:

- *Lycium ferocissimum* (African Boxthorn)

African Boxthorn is also classed as Weeds of National Significance (WoNS) by the Australian Government due to its invasiveness, potential for spread and environmental, social and economic impacts (DPI, 2022) (**Table 9** & **Table 10**). A total of 50 exotic flora species were recorded within, and immediately surrounding, the disturbance area. Specific control measures for African Boxthorn are provided in this appendix. Other control measures for priority weeds can be found at https://weeds.dpi.nsw.gov.au/

Table 9. Priority weeds recorded within, and immediately adjacent to, the development footprint.

Scientific Name	Common Name	WoNS	Mandatory Measures	Regional Recommended Measures
Lycium ferocissimum	African Boxthorn	Yes	Must not be imported into the state, sold, bartered, exchanged or offered for sale.	Land managers should mitigate the risk of the plant being introduced to their land. Land managers should mitigate spread of the plant from their land. A person should not buy, sell, move, carry or release the plant into the environment. Land managers should reduce the impact of the plant on assets of high economic, environmental and/ or social value.

Induction and Training

All site personnel and subcontractors will be inducted in the existence of priority weed(s) within the disturbance area, their biosecurity requirements and reporting procedures. This training will occur on site during the project Induction and as required in toolbox talks.

Weed Inspection

Weed inspections will occur within the disturbance area prior to the following works:

- Clearing and grubbing
- Drainage works that may facilitate the distribution of weed seeds (including installation of stormwater drainage channels), and
- When a new weed infestation has been identified.

Mechanical Control of Weeds

Mechanical control methods for weed management on site include:

- Pushing out the plants is the cheapest way to control mature thickets. Remove as many of the roots as possible and burn. Removal of the roots is much easier and more effective when the soil is moist.
- It is important to destroy all plant material after physical removal because:
    - Dead branches still pose a problem because of their thorns and they can harbor pest animals.
    - Unripe fruit on cut branches can still ripen and produce seed.
    - Broken root fragments may sucker and produce new growth.

An infestation might be valuable habitat for native fauna. In this case, use a staged control program. Gradually replace the African Boxthorn with suitable native species.

Chemical Control of Weeds

Herbicides can make the plants lose their leaves and appear dead. New leaves appear and the plant begins to recover. This may happen several times before the plant dies.

Foliar spray:

- When: Usually in spring, after rain when the plant is actively growing.
- Follow-up: In autumn when new seedlings appear. Use other methods to control regrowth or wait until regrowth is over 50 cm high (approximately 18 months old) to repeat spraying.
- Foliar spraying is the most common method of control. Spray the whole bush when the plant is actively growing. This will vary depending on the location and rainfall.
- Do not spray during hot, dry periods or when the plant is stressed from drought, waterlogging, or cold. Foliar sprays are more effective when plants have more leaves.
- For large bushes it is very costly and difficult to obtain good coverage with the herbicide. Consider bulldozing thickets of large bushes and spraying the regrowth.

Basal bark treatment:

- When: Year-round
- Follow-up: If regrowth appears and in autumn when new seedlings emerge.
- Use basal barking for plants with stems up to 5 cm in diameter at the base. Liberally spray the bark around the stem from ground level to 30 cm high, wetting thoroughly to the point of runoff.

Cut stump treatment:

- When: Year-round
- Follow-up: When regrowth appears and in autumn when new seedlings emerge.
- This technique is also appropriate for small infestations in environmentally sensitive locations. It is suitable for plants with small stems and stems over 5 cm diameter at the base.

- Cut each stem off 15 cm above the soil surface. Cover the cut surface with herbicide within 30 seconds. If herbicide is not applied immediately the plant will heal and the herbicide won't work.

Root application:

- When: Year-round
- Follow-up: Revegetate when the residual period is over.
- Take great care when using this technique. This method uses a residual herbicide that will remain active in the soil for some time. Many desirable trees e.g. eucalyptus, are susceptible to the residual herbicides. Do not use this method within a distance of at least twice the height of adjacent desirable trees or shrubs.
- Apply the residual herbicide:
    - directly under the plant, towards the edge of the canopy.
    - under the soil to stop degradation by sunlight and rain washing the herbicide away.
    - when the soil is moist, usually in spring or autumn.

The residual effect may also control seedling regrowth for some time after application.

Stockpiling and Disposal

To reduce the risk of weed infested materials contaminating unaffected areas the following recommendations should be adhered to:

- Weed infested materials will not be stockpiled to native vegetation wherever possible during topsoil stripping operations
- All topsoil and mulch containing potential weed propagules will be used only in areas that contained the weed species prior to clearing
- Weed material and weed contaminated topsoil will be stockpiled during the clearing and grubbing program. The stockpiles will be regularly monitored by the Environmental Advisor and treated for weeds prior to being used in site rehabilitation or landscaping works
- All classified weed material will be handled and disposed of lawfully, and
- All imported material is obtained from a source that is validated as weed and plant pathogen free.

Vehicle, Plant & Equipment Hygiene

All vehicles, plant and equipment must be thoroughly cleaned to remove all soil and plant material prior to being allowed to enter site. Plant and equipment will be checked and cleaned before leaving the worksite that contains priority weeds.

The weed inspection is a two-stage inspection process, specifically:

- Plant, vehicles and equipment are to be inspected by the subcontractor prior to coming to site, and
- Plant, vehicles and equipment are to be inspected by the site representative when machinery is onsite.

Inspections will ensure that no soil and/ or organic matter that may contain weed reproductive material are present in or on areas that are accessible during regular cleaning and maintenance work.

Designated inspection areas will be at the site entrance to prevent the spread of weeds.

Monitoring and Inspections

Weed monitoring will be undertaken on an annual basis during spring. The HSE inspections will include the review of weeds species in the work area inspected. If a new declared species is identified, the extent of the infestation will be determined immediately, and appropriate controls put in place as soon as practicable. The potential sources will be investigated and if possible, mitigation measures to avoid further infestations will be put in place. If required, quarantine measures will be put in place to stop the spread of the infestation.

The following will be included as a minimum in weed management reporting:

- Locations and approximate areas where weed management was carried out
- Treatment methods applied in each area, and
- Species targeted.

The works shall be regularly reviewed by the HSE to ensure compliance with this strategy. This will identify inappropriate weed and pathogen management actions and identify more suitable control measures. If available, observations on the success of control measures and results of each monitoring inspection will be made against the weed management objectives and activities outlined in this strategy.

Table 10. *Lycium ferocissimum* (African Boxthorn). Images courtesy of DPI Weed Wise (https://weeds.dpi.nsw.gov.au/Weeds/AfricanBoxthorn).

Priority Weed Species (DPI, 2022)		
Lycium ferocissimum (African Boxthorn)		

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