BIODIVERSITY OFFSET MANAGEMENT PLAN

Whitehaven Regional Biodiversity Offset Site

Prepared for
Whitehaven Coal Pty Ltd
28 August 2013

Biodiversity Offset Management Plan

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Abbreviations

ABBREVIATION	DESCRIPTION
BOA	Biodiversity Offset Area
BOMP	Biodiversity Offset Management Plan
CoA	Conditions of Approval
DECCW	NSW Department of Environment, Climate Change and Water (now OEH)
DEWHA	Commonwealth Department of Environment Water Heritage and Arts (now DSEWPaC)
DSEWPaC	Australian Government Department of Sustainability, Environment, Water, Population and Communities
DNG	Derived Native Grasslands
DP&I	NSW Department of Planning and Infrastructure
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
MZs	Management Zones
NPWS	NSW National Parks and Wildlife Service (part of OEH)
OEH	NSW Office of Environment and Heritage
PA	Project Approval
TSC Act	NSW *Threatened Species Conservation Act 1995*
WBYBBRG	White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands
Whitehaven Coal	Whitehaven Coal Pty Ltd
4WD	Four Wheel Drive

Executive Summary

This Biodiversity Offset Management Plan (BOMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) on behalf of Whitehaven Coal Pty Ltd (Whitehaven Coal) in accordance with Project Approval (PA) EPBC 2010/5502 under the *Environment Protection and Biodiversity Conservation* Act (EPBC) *1999*. PA EPBC 2010/5502 requires that an Offset Management Plan for the Whitehaven Regional Offset site be prepared within 12 months of the approval, i.e. by 21 December 2012.

This BOMP was submitted to DSEWPaC on the 20 December 2012 with comments not received from DSEWPaC until 23 July 2013. The BOMP has been revised in response to these comments.

The Biodiversity Offset Area (BOA) consists of two adjoining properties known as 'Yarrari' and 'Belah' which are located on the western fall of the Kelvin Range, approximately 20 kilometres (km) north-north-east of Gunnedah and have an area of 1,523.9 hectares (ha). The BOA is 1,495.3 ha in area, excluding part of the road reserves and disturbed lands around the homesteads, and comprises four biometric vegetation types in various condition states:

- White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions derived native grassland (350 ha, mostly tree-less with minor to moderate weed occurrences)
- White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions (487 ha, largely intact and weed free)
- White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (474 ha largely intact and weed free)
- Semi-evergreen vine thicket of basalt hills of the NSW north western slopes (176 ha, largely intact and weed free)

The White Box grassy woodland vegetation type is consistent with the EPBC Act listed endangered ecological community White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands (WBYBBRG).

The BOA was protected on title by the registration of a Biobank Agreement under Part 7A Division 2 of the NSW *Threatened Species Conservation* Act (TSC) *1995* on 28 June 2012. The biodiversity management actions to improve and maintain the biodiversity values of the Biobank Site are as set out in Annexure C of the Biobank Agreement (**Appendix A**). This BOMP has been prepared to address the additional requirements included in PA EPBC 2010/5502 and assist Whitehaven Coal understand and implement the terms of the Biobank Agreement.

The PA for the extension to Rocglen Mine requires 231.4 ha of Regent Honeyeater and Swift Parrot habitat and 153 ha of White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands to be protected and managed in perpetuity for conservation. The BOA is far in excess of this area as different parts of the Biobank Site are also being used to meet offset requirements for other Whitehaven Coal projects, however will be managed as a single site. A section of the Biobank site has been identified as representing these EPBC Act approval requirements.

There are several key threatening processes that are affecting the site, the most significant being large populations of feral goats and the resulting lack of natural regeneration. Cattle and sheep grazing were

removed from the property in June 2008 to allow the natural regeneration process to commence, although this was been delayed by drought conditions between 2008 and 2011.

The management of these threatening processes and others has been addressed in **Section 3** of this management plan, which provides information on the range of management actions that need to be implemented to manage this Biobank site in accordance with the Biobanking Agreement and PA. Associated with this, the management techniques described in **Appendix C** will assist the landowner/manager with the management of the Biobank site. Methods for monitoring the success of management actions, including performance criteria for each management action, are provided in **Section 5** and a risk assessment with contingency measures in **Section 4**.

Whitehaven Coal will appoint a Property Manager to be responsible for the coordination and implementation of all management requirements arising from this management plan and the Biobank Agreement. The Property Manager will also be responsible for approving any access or activities at the Biobank site to ensure that they are consistent with the objectives of the management plan and not contrary to the Biobank Agreement.

Finally, it is noted that Whitehaven Coal has had discussions with the NSW Office of Environment and Heritage (OEH) regarding their intention to transfer the property to the National Parks estate as an addition to the Kelvin Aboriginal Area. Should such a land dedication be made and accepted by the NSW Minister for the Environment, the balance of funds held in the Biobanking Trust Fund would be transferred to the Minister in accordance with Section 36 of the *Threatened Species Conservation (Biodiversity Banking) Regulation 2008* to provide for the ongoing management of the reserve. Based on the current condition of the property and the management regime proposed in this management plan, it is expected that the property would be in a suitable condition to transfer in approximately 10 years (2022) subject to satisfactory regeneration of the derived native grassland (DNG) areas.

1 Introduction

This Biobank Offset Management Plan (BOMP) has been prepared by Eco Logical Australia Pty Ltd (ELA) on behalf of Whitehaven Coal Pty Ltd (Whitehaven Coal). The proposed Biobank site consists of two adjoining properties known as 'Yarrari' and 'Belah' which are located on the western fall of the Kelvin Range, approximately 20 kilometres (km) north-north-east of Gunnedah (**Figure 1).** Yarrari, the northernmost block consists of Lot 36 Dp754950 of 922.21 hectares (ha) and a former crown road reserve (Lot 1 Dp247949 of 3.56 ha). The adjoining block to the south, Belah, consists of Lot 36 Dp754950 of 592.34 ha and a former crown road reserve (Lot 2 Dp728391 of 5.79 ha). These properties, including the two road reserves have been acquired by Whitehaven Coal to provide biodiversity offsets for future operations and are registered in the name of Whitehaven Coal Pty Ltd (**Figure 2 & 3**).

In particular, this BOMP identifies the specific management actions which the landholder will be required to carry out (**Section 3** and **Appendix D**) which are also included as Annexure C to the Biobanking Agreement that has been registered on the title of the land (**Appendix A**). It is noted that management actions beyond the scope of this BOMP may be carried out at the discretion of the landholder so long as they are not inconsistent with the objectives of this management plan or the Biobank Agreement.

1.1 OBJECTIVES OF THE BIODIVERSITY OFFSET MANAGEMENT PLAN

The objectives of this BOMP are to meet the conditions of approval for the Rocglen Mine Extension Project and provide a guide to the land manager to:

- Identify that there will be a binding in perpetuity covenant on future use of the land subject to the biobank agreement
- That the biobanking agreement (and thus this associated BOMP), will prevail and apply should the biobanking assessment methodology be amended or replaced in the future
- Provide a clear, concise, staged and instructional working document for the in-perpetuity management of the site
- Improve the condition of the site to as near as possible to benchmark condition for the native vegetation of the site utilising expert knowledge of resilience in natural landscapes and through specific bushland restoration techniques
- Minimise the impacts of key threats to the site through specific management actions. Key threats include the weeds *Lycium ferocissimum* (African Boxthorn), *Opuntia* sp. (Prickly Pear.) and the feral herbivores *Capra hircus* (Feral Goat) and other feral animals
- Outline monitoring, performance evaluation and reporting procedures that are practical and able to be implemented and understood by the prospective land manager
- That there will be an obligation for ongoing annual reports and compliance fees to OEH

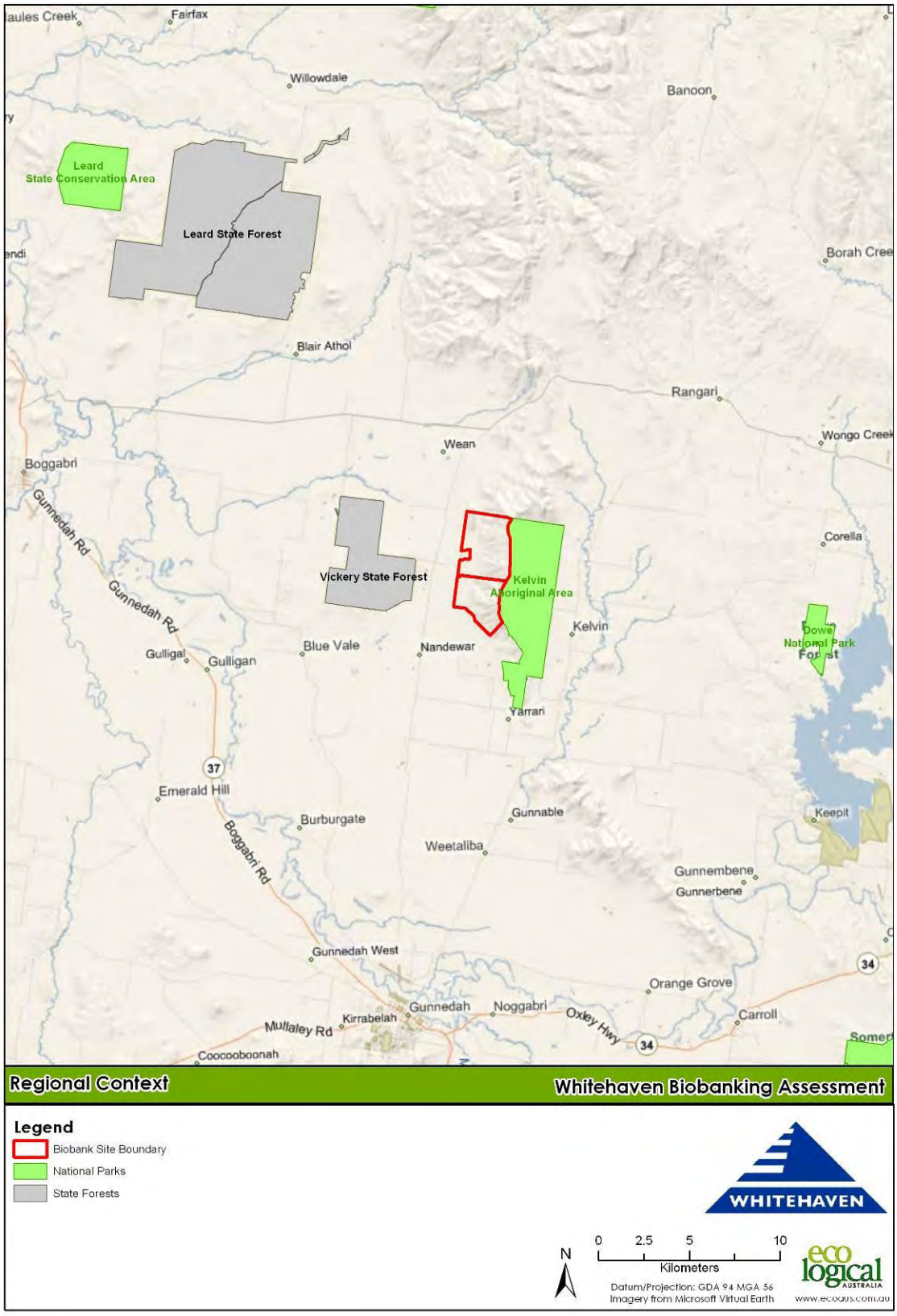

Figure 1: Regional context

Figure 2: Biobank Site Boundary

Figure 3: Detail of Biobank Site Boundary and Road Reserves

1.2 APPROVAL CONDITIONS

The DSEWPaC approval for the Rocglen Mine Extension Project (EPBC Ref 2010/5502) requires no less than:

- 231.4 ha of habitat for the *Anthochaera Phrygia* (Regent Honeyeater*)* and *Lathamus discolor* (Swift Parrot); and
- 153 ha of White Box – Yellow Box – Blakely's Red Gum grassy woodlands and derived native grasslands

to be protected by a legally binding conservation covenant to provide enduring protection of the offset site and to be registered within two years of the project approval (i.e. by 21 December 2013).

Table 1 provides a summary of the relevant biodiversity offset conditions from the DSEWPaC approval and how/where the requirement has been addressed in this BOMP.

Table 1: Compliance with DSEWPaC Approval Conditions

EPBC REF 2010/5502 REQUIREMENT	SECTION ADDRESSED
1. Must register a legally binding conservation covenant over the Whitehaven Regional Biodiversity Offset site within two years of the date of approval.	Biobank Agreement registered on title on 28 June 2012 in accordance with Part 7A of the TSC Act 1995. Signed Biobank Agreement at **Appendix A** of this BOMP.
2. Must prepare and submit an Offset Management Plan for the Whitehaven Regional Biodiversity Offset Site within 12 months of approval (i.e. 21 December 2012).	BOMP submitted to DSEWPaC 20 December 2012. Comments received from DSEWPaC 23 July 2033. Final BOMP submitted to DSEWPaC for approval 20 September 2013
BOMP must include: 2.a. a textual description and map to clearly define the location and boundaries of the Whitehaven Regional Biodiversity Offset Site. Accompanied by an ESRI attributed shapefile.	Section 2. Figures 1, 2 and 3. ESRI shape files provided on CD at **Appendix L**.
2.b. details of management actions to protect and enhance the extent and condition of habitat values of the offset site, including rehabilitation, weed control, fire management, erosion and sediment control, management of livestock, and any restrictions on access.	Section 3 and **Appendix D**.
2.c. the timing, responsibilities and performance criteria for management actions.	**Appendix D** (Works program), Section 1.4 (Management Responsibilities), Section 5, Table 12 (Performance Criteria).
2.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.
2.e. a process to report to DSEWPaC the progress of management actions undertaken in the Whitehaven Regional Biodiversity Offset Site and the outcomes of those actions, including any need for improved management and actions to undertake such	Sections 7 & 8.

EPBC REF 2010/5502 REQUIREMENT	SECTION ADDRESSED
improvements.	
2.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.	Section 4.
2.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 1.4

1.3 BIOBANK REGISTRATION

A Biobank Assessment was completed in accordance with the Biobanking Assessment Methodology & Operational Manual (DECC 2009) and submitted to OEH in 2010 (ELA 2009a). The Biobank site was registered on 28 June 2012. The Biobank site has been assessed as generating 13,754 ecosystem credits (**Table 2**).

The Biobank Agreement has been registered to meet the biodiversity offset requirements for several Whitehaven Coal projects in the Gunnedah area. **Table 2** summarises the number of credits that will be retired to meet the offset requirements for the Canyon, Rocglen and Tarrawonga mines as well as the Rocglen Mine Extension Project (EPBC Act REF 2010/5502). **Figure 5** shows the proportion of the BioBank site that has been identified to represent the EPBC Act approval condition.

The 1,402 White Box – Yellow Box – Blakely's Red Gum (WBYBBRG) ecosystem credits to be retired for the Rocglen Extension project are equivalent to approximately 153 ha of the offset site (1,402 credits retired / 9.17 credits generated per ha).

The 331 WBYBBRG (intact woodland), 1,073 White Box – White Cypress Pine shrubby open forest and 564 White Cypress Pine – Narrow-leaved Ironbark shrub/grass open forest ecosystem credits are equivalent to 34.12, 143.07 and 54.23 (total 231.42 ha) of potential habitat for Regent Honeyeater and Swift Parrot.

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Table 2: Vegetation types and number of credits generated at Whitehaven Regional Biobank Site

Ecosystem credits to be retired for Rocglen Mine Extension Project are highlighted in green.

Vegetation Type	Area (ha)	Credits Generated	Rocglen Offset	Canyon Offset	Tarrawonga 2005 Offset	Tarrawonga Mod 1 Offset	Rocglen 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	**4,065**	**82.39%**
Cleared land (roads, tracks, trails, dams)	7.60	0							
Credits to be retired	**1,495.30**	**13,754**	**589**	**1,655**	**2,731**	**3,051**	**4,859**	**12,885**	**93.68%**
Area Equivalent (ha)		**9.198/ha**	**64.04**	**179.93**	**273.00**	**331.70**	**528.27**	**1,400.85**	

1.4 MANAGEMENT RESPONSIBILITIES

Whitehaven Coal is responsible for the implementation of this BOMP in accordance with the Conditions of Approval (CoA) under the EPBC Act Ref 2010/5502 and the terms of the registered Biobank Agreement (**Appendix A**).

Whitehaven Coal has appointed a **Property Manager** who is responsible for controlling access to the offset area and provide onsite security to deter unauthorised access. The **Group Environment Manager** is responsible for the coordination and implementation of this plan and ensure that management activities are consistent with the objectives of this plan and not contradictory to the project approvals (**Table 3**).

Management actions beyond the scope of this BOMP may be carried out at the discretion of the Property Manager/Group Environment Manager as long as they are consistent with this BOMP and the Biobank Agreement. In accordance with Condition 6 of the approval, any actions contrary to the approved BOMP and/or Biobank Agreement require the prior written Commonwealth Ministerial approval of the varied strategy. The varied activity shall not commence until the Minister has approved the revised plan in writing.

Table 3: Accountabilities for implementing the Management Plan

POSITION	RESPONSIBILITY	REPORTING
Whitehaven Group Environmental Manager	Adequate, compliant implementation of the BOMP in the BOA Timely delivery of quality annual reporting in accordance with the BOMP.	Technical Services Manager, Whitehaven Coal Operations Pty Ltd
Whitehaven Coal assigned Property Manager	Timely, proficient implementation of management actions using qualified, experienced contractors where required in adherence with BOMP protocols, risk management, annual visual inspections and annual reporting.	Whitehaven Group Environmental Manager

2 Description of the Biodiversity Offset Area

2.1 LOCATION IN A REGIONAL CONTEXT

The Biobank site includes the 'Yarrari' property, Lot 36 Dp754950 (922.21 ha) and the adjoining block to the south, 'Belah', Lot A DP 405391 (592.34ha) and two former crown road reserves purchased by Whitehaven Coal, Lots 1 Dp 247949 and Lot 2 Dp 728391 (3.56 and 5.79 ha respectively). These properties are located approximately 20 km north-north east of Gunnedah (**Figures 1, 2 & 3**) on the western fall of the Kelvin Range.

The total area of the two properties and two road reserves is 1,523.9 ha. The area of the Biobank site is 1,495.3 ha (which includes parts of the two former crown road reserves but excludes approximately 25.85 ha around the Yarrari homestead and 1 ha around the dilapidated Belah homestead). The properties are both owned by Whitehaven Coal Pty Ltd.

2.2 CLIMATIC INFORMATION

The Gunnedah area is influenced by a temperate weather system and experiences warm summer and mild winter temperatures. Summer maximum temperatures are experienced in January with an average maximum of 34.0 degrees Celsius ($^{\circ}$C) (daily) and minimum of 18.3°C (nightly). Winter minimums are experienced in July with an average maximum of 16.9°C (daily) and minimum of 3.0°C (nightly). The average rainfall is 617 millimetres (mm) per year with the greatest falls received in January (71 mm) and the lowest falls in April (38 mm).

2.3 VEGETATION

The site has been previously mapped during various vegetation mapping exercises, including the Nandewar Western Regional Agreement Bioregion vegetation mapping project, by Geoff Cunningham Natural Resource Consultants (2008) and the Namoi CMA regional vegetation communities mapping project (ELA 2009b). This mapping has been reviewed and extensively ground truthed by Eco Logical Australia ecologists Dr Lachlan Copeland and Hamish MacKinnon during August and September 2009 as part of the Biobank Assessment (**Figure 4**). Each vegetation types is represented in various condition states (i.e. intact woodland or DNG (**Figure 5**).

Four Biometric vegetation types have been mapped on site, these being:

- Semi-evergreen vine thicket of basalt hills of the NSW north western slopes
- White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions
- White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (equivalent to the EPBC Act listed WBYBBRG and derived grassland EEC)
- White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Vegetation types were mapped across the entire property, and trimmed to the Biobank site boundary after the mapping was completed. The area of each Biometric vegetation type (and condition state)

within the Biobank site boundary is shown in **Table 4**. White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions and White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion each occupy over 30% of the Biobank site. White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions occupies 23.6%, while Semi-evergreen vine thicket of basalt hills of the NSW north western slopes occupies 11.8%.

Table 4: Area and condition of each Biometric vegetation types on Biobank site

BIOMETRIC VEGETATION TYPE	INTACT AREA (HA)	DERIVED GRASSLAND (HA)	AREA OF SITE (%)
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	176.2	0	11.8
White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	486.8	0	32.6
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	79.0	271.6	23.5
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	453.9	20.2	31.7
Total	**1,195.9**	**291.8**	**100.0**
Cleared land (dams, tracks, trails)	7.6		

A total of 173 plant species (138 native and 35 exotic species) were recorded in 41 biometric plots (see **Appendix B** for a complete species list) undertaken on the site. It is likely that additional species are present on the Biobank site and will be recorded during future assessments and annual monitoring.

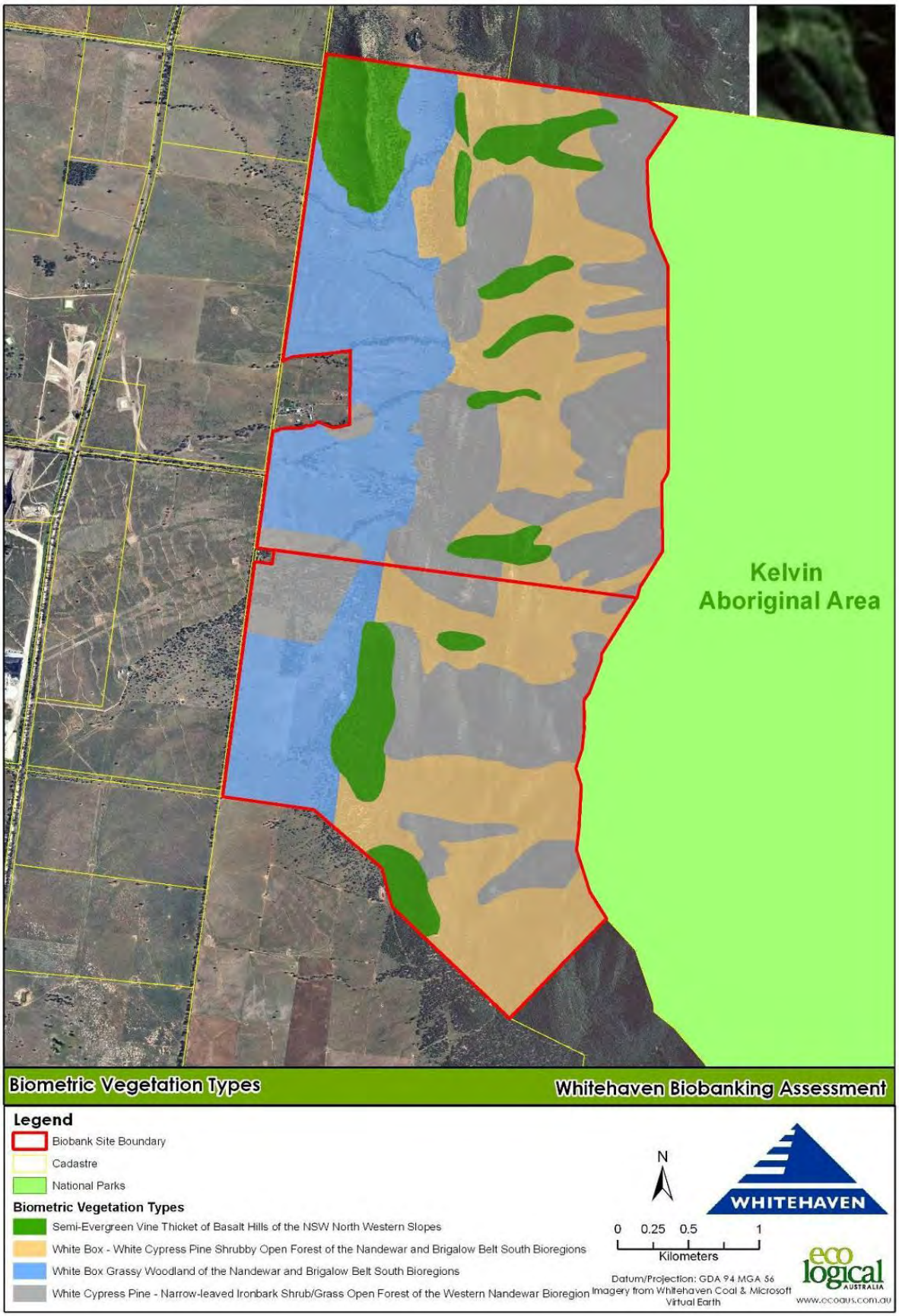

Figure 4: Biometric vegetation types mapped on Biobank site

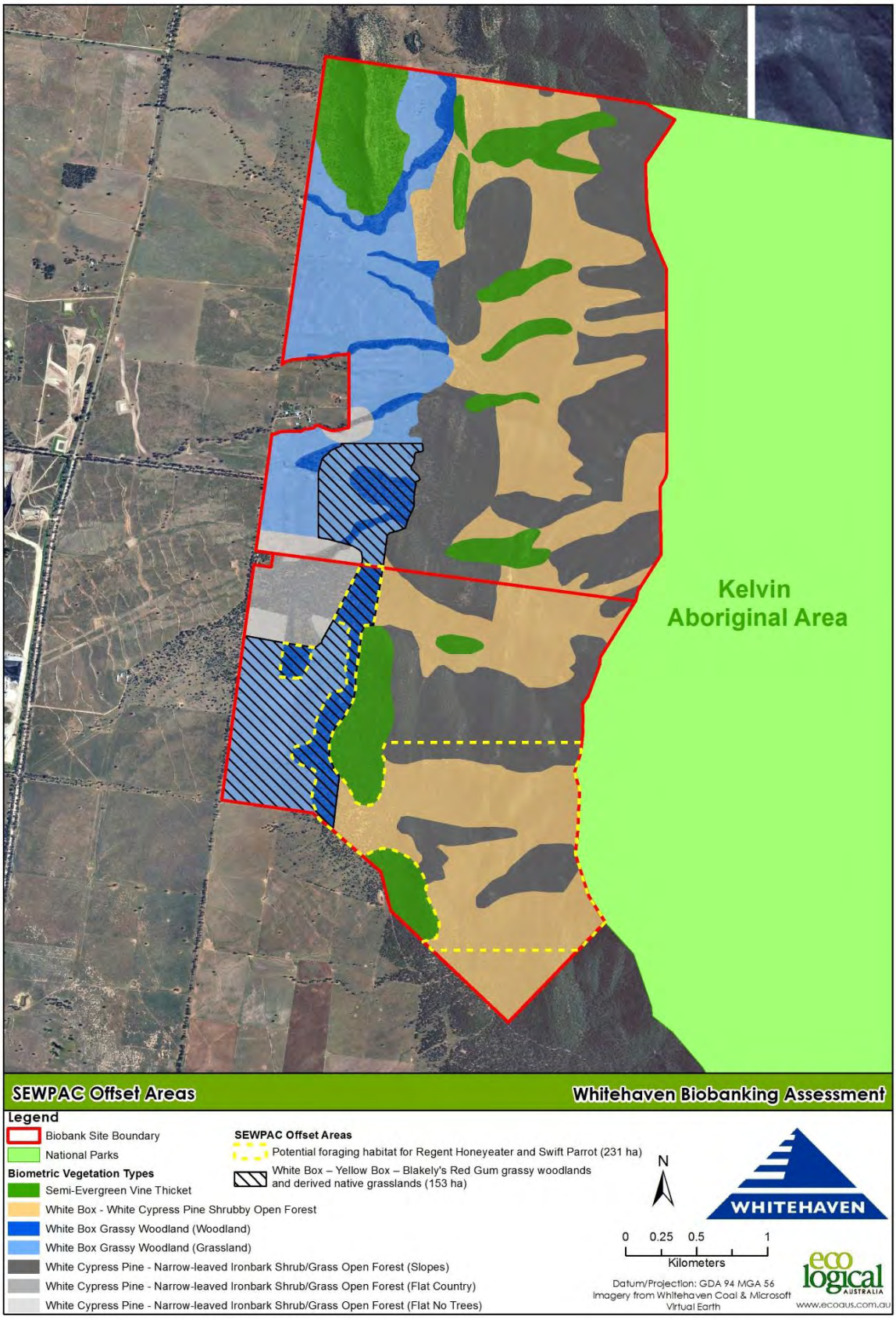

Figure 5: Vegetation Condition across Biobank site and EPBC Act offset areas

2.4 VEGETATION DESCRIPTIONS

2.4.1 White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions

This community occurs in the steeper country in the eastern two thirds of the offset area. It is dominated by *Eucalyptus albens* (White Box)) and *Callitris glaucophylla* (White Cypress Pine) with occasional trees of *E. crebra* (Narrow-leaved Ironbark), *Casuarina cristata* (Belah) and, in the rockier areas, *E. dwyeri* (Dwyer's Red Gum). Beneath the tree layer is a relatively dense shrub layer of *Geijera parviflora* (Wilga), regenerating *Callitris glaucophylla* (White Cypress Pine), *Olearia* sp. aff. *elliptica* (Sticky Daisy Bush), *Beyeria viscosa* (Wallaby Bush), *Notelaea microcarpa* (Native Olive) and *Eremophila mitchellii*(Budda). The ground layer is often quire bare or with a sparse cover of native grasses such as *Aristida* sp. (Wiregrass), *Austrostipa scabra* (Rough Speargrass) and *A. verticillata* (Slender Bamboo Grass). Native vines such as *Pandorea pandorana* (Wonga Vine) and *Parsonsia eucalyptophylla* (Gargaloo) are often scattered throughout the ground and shrub layers (**Figure 6**).

Figure 6: White Box – White Cypress Pine shrubby open forest

2.4.2 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

This community is very similar to the White Box - White Cypress Pine shrubby open forest but with a different species of Eucalypt dominating the canopy layer. In some areas both White Box and Narrow-leaved Ironbark occur sympatrically at similar densities and these areas represent a community intermediate between the two shrubby vegetation types. As with the White Box Shrubby Woodland, the shrubby Ironbark community is mostly on the steep slopes in the eastern two thirds of the offset area. The floristic composition (e.g. associated shrubs, herbs, vines and grasses) is essentially the same as that described above for the shrubby White Box woodland.

In the flatter areas on the western side some small areas of this community are found although it is less common than White Box. These small Ironbark-dominated areas are still quite shrubby but have fewer White Cypress Pines, and we have therefore treated these western areas as a different zone within the same Biometric Vegetation Type. Some of this flatter country has been cleared for grazing but there are still occasional trees and shrubs scattered throughout and these give a clue as to what the vegetation would have been like prior to clearing. The groundlayer in these semi-cleared areas is denser than in the timbered areas and has a higher proportion of weedy/exotic species. Of these, *Carthamus lanatus* (Saffron Thistle) is probably the most common. The disturbed areas are also

characterised by a layer of low native saltbush shrubs with *Sclerolaena birchii* (Galvanised Burr) and *Maireana microphylla* (Cotton Saltbush) being the most common. These hardy native species are indicative of areas subject to a long history of grazing and occur in the cleared areas at a much higher density than in the adjacent timbered country. After a close inspection of the groundcover species it is apparent that the majority of the groundcover is still composed of native species rather than weeds and for this reason these treeless areas are best referred to as "treeless" or "degraded" rather than "Cleared" (**Figure 7**).

Figure 7: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open Forest

2.4.3 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

On most of the flatter areas in the western third of the two properties the vegetation prior to European settlement would have most likely been White Box grassy woodland. Following a long history of disturbance there is now an artificially high incidence of low shrubs (e.g. Galvanised Burr and Cotton Saltbush) which are probably more common now as a result of overgrazing. Wilga is also relatively common in this community although it is usually considered to be a small tree rather than a shrub. The ground layer is usually grassy and is dominated by Wiregrass, (Rough Speargrass, Slender Bamboo Grass, *Bothriochloa* sp. (Red Grass) (and Lovegrass (*Eragrostis* sp.).

Cunningham (2008) described cleared areas in the western third of the properties as "Open Crop and Pasture Land" but we believe it is best to classify them as degraded woodland communities or "derived grassland" that have had all or most of their trees removed. The majority of these treeless areas would have been dominated by White Box and, like the treeless Ironbark areas, the groundcover is still greater than 50% native. Several Medics and Clovers are present (*Medicago* spp. and *Trifolium* spp.) and in warmer periods (e.g. early to mid-summer) it is possible that the exotic cover will be roughly equal to the native groundcover but during the August/September surveys all of the treeless areas had native groundcover outnumbering the exotic groundcover by approximately 2:1 (**Figure 8**).

Figure 8: White Box Grassy Woodland

2.4.4 Semi-evergreen vine thicket of basalt hills of the NSW north western slopes

Cunningham (2008) recognised two communities ("Belah on Sloping Soils" and "Dry Rainforest [Semi-evergreen Vine Thicket]") which we believe should be combined into a single community, namely Semi-evergreen Vine Thicket. Our field inspection suggests that these two communities share the same shrub and groundcover species and, in addition, that occasional trees of Belah emerge from Cunningham's mapped vine thickets. The Semi-evergreen Vine Thicket, as recognised and mapped by ELA, usually occurs in slightly more sheltered areas such as in gullies and at the base of rocky slopes. The most common small trees and shrubs include Wilga, Wild Orange, Quinine Bush, *Alectryon oleifolius* (Western Rosewood), *Croton phebalioides* (Western Croton), Sticky Wallaby Bush, Native Olive and *Spartothamnella juncea* (Bead Bush). Vines are relatively important in this community but few in species with only Wonga Vine, *Jasminum lineare* (Native Jasmine), *Parsonsia eucalyptophylla* (Gargaloo) and *Marsdenia pleiadenia* being common. The ground layer is usually sparse in the vine thickets with a reasonable number of native forbs but relatively few grasses. Although the title of this community (using the exact Biometric terminology) implies that the vine thicket should be on basalt, the community present on the offset area is still a good match for Semi-evergreen Vine Thicket even though the substrate is a mixture of conglomerate and metasediments rather than basalt. Cleared areas are best thought of as poor quality/highly degraded Narrow-leaved Ironbark Shrubby Woodland (**Figure 9**).

Figure 9: Semi-evergreen Vine Thicket

2.5 THREATENED FLORA AND FAUNA

Threatened flora and fauna were not systematically surveyed as a part of the Biobanking assessment. No threatened flora were recorded either within the Biobank plots or incidentally on the site. However, three TSC Act threatened fauna species have previously been recorded on site or were observed during the Biobank Assessment, the Koala (*Phascolarctos cinereus*), Grey-crowned Babbler (*Pomatostomus temporalis temporalis*) and Speckled Warbler (*Pyrrholaemus sagittatus*).

A review of Atlas of NSW Wildlife Records indicates that several other threatened fauna species are likely to be present on site and have been recorded during regional assessment in the adjacent Kelvin Aboriginal Area (**Table 5**).

Table 5: Threatened species recorded in region and on site

SCIENTIFIC NAME	COMMON NAME	RECORDED IN REGION#	RECORDED ON SITE
Ardeotis australis	Australian Bustard	Yes	Unlikely
Burhinus grallarius	Bush Stone-curlew	Yes	Potential
Calyptorhynchus lathami	Glossy Black-cockatoo	Yes	Likely
Cercartetus nanus	Eastern Pygmy-possum	Yes	Likely
Chalinolobus dwyeri	Large-eared Pied Bat	Yes	Likely
Chalinolobus picatus	Little Pied Bat	Yes#	Likely
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Yes#	Likely
Dasyurus maculatus	Spotted-tailed Quoll	Yes	Likely
Grantiella picta	Painted Honeyeater	Yes	Likely
Hoplocephalus bitorquatus	Pale-headed Snake	Yes	Yes
Lathamus discolor	Swift Parrot	Yes	Likely
Lophoictinia isura	Square-tailed Kite	Yes	Likely
Macropus dorsalis	Black-striped Wallaby	Yes	Potential
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Yes#	Likely

SCIENTIFIC NAME	COMMON NAME	RECORDED IN REGION#	RECORDED ON SITE
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Yes	Likely
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Yes	Likely
Neophema pulchella	Turquoise Parrot	Yes#	Likely
Ninox connivens	Barking Owl	Yes	Likely
Nyctophilus timoriensis	Greater Long-eared Bat (south eastern form)	Yes	Potential
Petaurus norfolcensis	Squirrel Glider	Yes	Likely
Phascogale tapoatafa	Brush-tailed Phascogale	Yes	Likely
Phascolarctos cinereus	Koala	Yes#	Yes
Polytelis swainsonii	Superb Parrot	Yes	No
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Yes	Yes
Pteropus poliocephalus	Grey-headed Flying-fox	Yes	Likely
Pyrrholaemus sagittatus	Speckled Warbler	Yes	Yes
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Yes	Potential
Stagonopleura guttata	Diamond Firetail	No	KAA
Tyto novaehollandiae	Masked Owl	No	KAA
Underwoodisaurus sphyrurus	Border Thick-tailed Gecko	Yes#	Likely
Vespadelus troughtoni	Eastern Cave Bat	Yes	Potential
Anthochaera phrygia (formerly known as *Xanthomyza phrygia)*	Regent Honeyeater	Yes#	Likely

 # Recorded in adjacent Kelvin Aboriginal Area as part of Cypress Pine-Ironbark Regional Study and from NSW Wildlife Atlas records.

2.6 INTRODUCED FLORA

Thirty-five exotic species were recorded in the biometric condition plots **(Appendix B**). The most abundant weed species recorded across the site include, *Lycium ferocissimum* (African Boxthorn) and *Opuntia* spp. (Prickly Pear and Tiger Pear). These species are generally in very low – low abundance. Other significant weed species include *Xanthium occidentale* (Noogoora Burr), *Marrubium vulgare* (Horehound) and *Schinus areira* (Pepper Tree) which are in very low abundance. All of these species, except Horehound, are listed as noxious weeds under the NSW *Noxious Weeds Act 1993* in the Gunnedah Local Government Area.

The Consol cultivar of African Lovegrass (*Eragrostis curvula*) has been planted in the paddocks along the eastern side of the Biobank site (Management Zone 1). In these paddocks the species is the dominant ground cover however makes up less than 50% of the ground cover with between 10-15 native species also recorded.

3 Management Strategies

3.1 PROPERTY PLAN

The following sections of the BOMP outlines a property plan for the purposes of managing the Biobank site for conservation. The Biobank Site has been divided into management zones (MZs) according to condition and resilience, and therefore similar intervention and recovery strategies. The zones are described below and illustrated in **Figure 10**.

Ecological resilience is defined as the capacity to recover from disturbance. The resilience of the site was categorised as follows:

- High resilience – sufficient native vegetation remaining in-situ to enable the natural regeneration of native vegetation. Low levels of management is required to facilitate restoration (Management Zone 3)
- Moderate resilience – native vegetation is present, but native species richness may need augmenting and supplementary tree / shrub plantings may be required if natural regeneration fails or is not adequate. Low levels of management is required to facilitate restoration (Management Zone 2)
- Low resilience –the over-storey has been removed or remains only as isolated paddock trees. Ground cover, whilst containing native species also contains significant cover of pasture species (in particular Eragrostis curvula). Active management is required to facilitate restoration (Management Zone 1)

Zones 2 and 3 have moderate to high levels of resilience and only require minor intervention works including weed/feral animal control, implementing a sensitive fire management regime and supplementary canopy plantings (MZ2) if natural regeneration is not sufficient.

Zone 1 has relatively low levels of resilience (the ability for native vegetation to naturally regenerate) and will require intervention through weed/feral animal control and extensive revegetation works, particularly in areas where *Eragrostis curvula* is present.

The BOMP has been designed to be part of an 'adaptive management' framework, whereby should any one aspect of the BOMP be identified as performing poorly against the performance criteria, then additional aspects of the BOMP are to be implemented to ensure positive outcomes are achieved.

The revegetation methodologies provided are indicative only and used as a basis for developing management actions. Whitehaven Coal has the ability to vary the specified revegetation methodology because of issues with availability of numbers and diversity of species and/or equipment/labour. Also opportunities for direct seeding will be undertaken in circumstances that allow and rates/densities may be modified given changes in environmental conditions (either natural regrowth or poor soil moisture etc).

Across the biobank site there are nine old dams which contain no native vegetation or contain weeds. These dams will be progressively filled in as they provide a watering source for Feral Pigs and Feral Goats and interrupt the natural flow regime of ephemeral creeks. No signs of soil erosion were observed on the site.

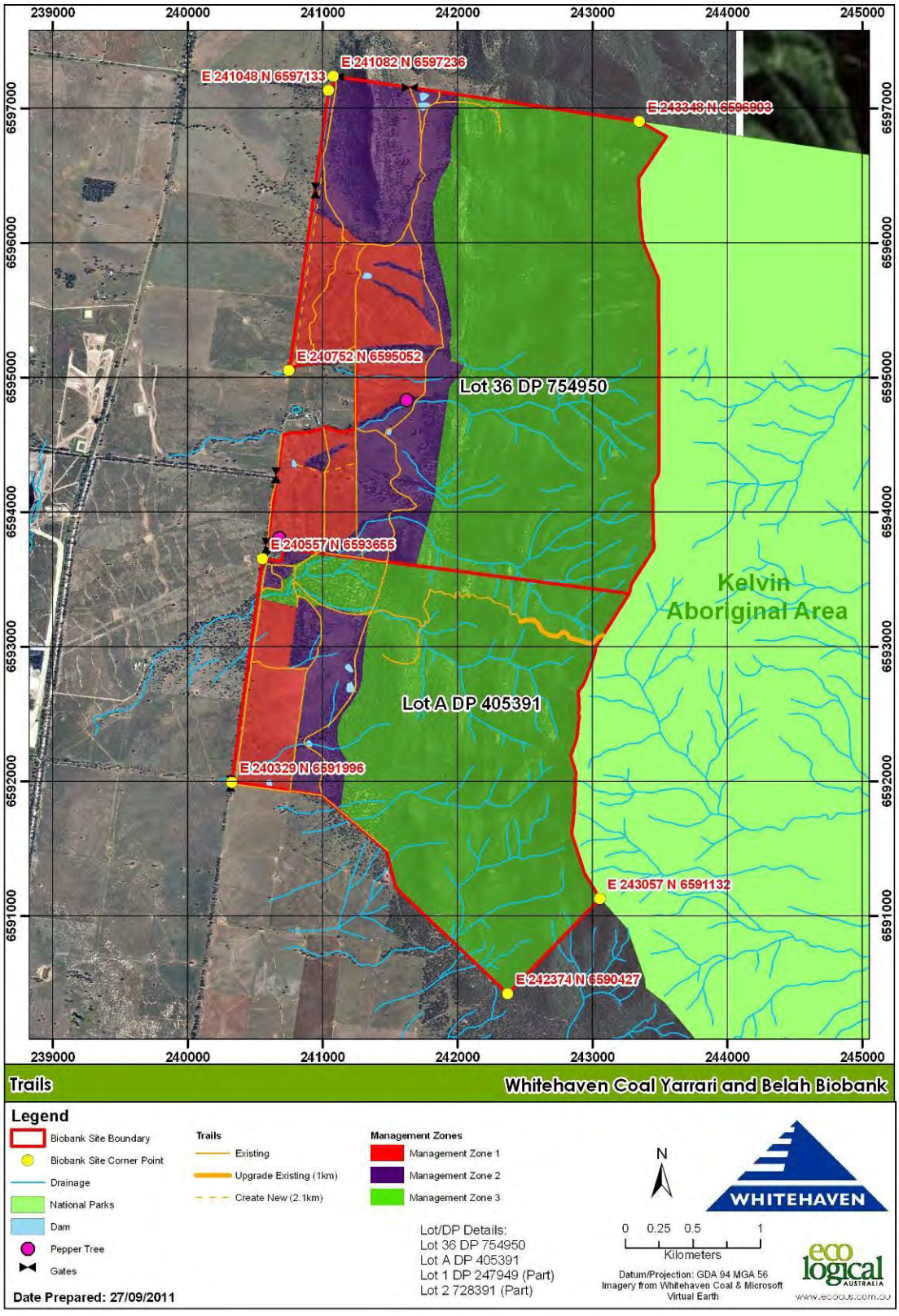

Figure 10: Biobank site Management Zones

3.2 MANAGEMENT STRATEGIES

This section describes the MZs at the Biobank site and sets the strategic management objectives and actions for each zone.

The number of native species (species richness) for each vegetation type reflects the results of field surveys undertaken in 2009. Conservation management actions to improve native species richness aim to restore species richness to benchmark values over time (**Table 7**).

3.2.1 MZ1 – Low Resilience

Management Zone 1 (MZ1) is 194.3 hectares and located on the eastern side of the Biobank site. The ground layer consists of native grasses and low shrubs, with the over-storey largely absent. Parts of MZ1 have high densities of Consul grass (*Eragrostis curvula*), an exotic cultivar and will need specific treatment.

The resilience of this zone is generally considered low-moderate as the ground layer has the ability to regenerate naturally, other than where Consul grass is dominant, but the resilience of the over storey is largely unknown. There has been no natural tree regeneration since grazing was removed in 2008. Native species in White Box grassy woodland plots averaged 12-13 (benchmark 23) and in White Cypress pine – Narrow-leaved Ironbark 13-14 (benchmark 30). The strategy is to remove grazing and undertake weed control works, including targeted control of Consol Grass, in this management zone, with no supplementary plantings for four years. If no or inadequate regeneration of the over-storey (White Box *Eucalyptus albens*) and shrub layer occurs within three years, revegetation will be required using tube stock from year four at a density of 30-40 trees per hectare (with an expected loss of up to 50%) resulting in a tree canopy cover of between 5-10% (benchmark for White Box grassy woodland (Rawlings *et al.* 2010). Enhancement plantings of ground cover grasses and forbs would be assessed from year five. The need to implement supplementary plantings in years 4 and 5 will be determined on an annual basis by a qualified and experienced restoration ecologist/bush regenerator and the decision documented in the annual implementation report (Section X).

Management actions in this zone include:

- Conduct baseline mapping of the distribution of Consol Grass to inform extent and location of weed management interventions (Year 1)
- Conservation grazing to reduce biomass of Consol Grass and fire hazard until enhancement plantings in year four
- Spraying Consol Grass with selective herbicide during summer growing months to avoid impacts to winter growing native grasses in paddocks between Yarrari and Belah homesteads to monitor effectiveness of control measure
- Develop and implement targeted weed management strategy. It is likely that there will be a significant weed seed bank from previous agricultural land uses and weed management will need to respond to prevailing seasonal conditions that determine species dominance
- Targeted weed control of any noxious weeds including African Boxthorn, Prickly Pear and Pepper trees
- Develop and implement a Vertebrate Pest Management and Monitoring Plan (VPMMP). Targeted control of foxes, rabbits, goats and pigs is required across the whole BOA
- Control of over abundant native herbivores in consultation with adjacent landholders (including OEH)
- Targeted revegetation of the DNG from year four, if required, using tube stock (trees/shrub species) or direct seeding (ground cover) with local provenance seed species with two follow up watering events (subject to seasonal conditions) and fertilizer

pellet to enhance native tree/shrub diversity and increase fauna habitat values including for Swift Parrot and Regent Honeyeater
- Progressive filling in of dams, revegetation and stabilisation/erosion control measure as appropriate
- Management of human disturbance including signage (and compliance checks) to prevent unauthorised entry/use

3.2.2 MZ2 – Moderate Resilience

Management Zone 2 (MZ2) is 87.4 ha and located on the lower slopes of the range. Throughout this area the ground layer is intact with some over storey present. There are large areas with no over-storey present. Native species richness in White Box grassy woodlands averaged 22 species in this zone. It is expected that this management zone has a moderate level of resilience and it is anticipated that over-storey species will naturally regenerate throughout this management zone. The strategy is to undertake weed control works in this management zone, with no revegetation for four years. If no regeneration of the over storey (White Box) occurs within three years, revegetation will be required using White Box tube stock at a density of 30-40 trees per hectare (with an expected loss of up to 50%) resulting in a tree canopy cover of between 5-10%.

Management actions in this zone include:

- Exclude grazing
- Management of human disturbance including signage (and compliance checks) to prevent unauthorised entry/use
- Targeted weed control of any noxious weeds including African Boxthorn and Prickly Pear.
- Develop and implement a Vertebrate Pest Management and Monitoring Plan. Targeted control of foxes, rabbits, goats and pigs required across whole BOA
- Supplementary planting of trees, if required, from year four in accordance with planting schedule in instances where monitoring indicates that natural regeneration is poor or inadequate to achieve benchmark stocking rates. Revegetation species selection, density and methods are outlined in **Table 7** and Annexure C of **Appendix A**
- Revegetation in MZ2 aims to enhance vegetation condition and restore connectivity for flora and fauna species including Swift Parrot and Regent Honeyeater
- Progressive filling in of dams, revegetation and stabilisation/erosion control measure as appropriate

3.2.3 MZ3 – High Resilience

Management Zone 3 (MZ3) is 1,025.7 ha and is the eastern two – thirds of the property. This area has high levels of resilience with very low levels of weed invasion. Native species richness in plots for all three vegetation communities is already at or near benchmark condition. The over-storey is dominated by White Cypress Pine (*Callitris glaucophylla*) and White Box with Wallaby Bush (*Beyeria viscosa*), Native Olive (*Notelaea microcarpa*) and Budda (*Eremophila mitchellii*) in the mid storey and a sparse ground cover of native grasses such as Wiregrass (*Aristida* sp.), Rough Speargrass (*Austrostipa scabra*) and Slender Bamboo Grass (*A. verticillata*).

The occasional Prickly Pear can be found in this Management Zone. This will be controlled by plants being dug out with the waste disposed off site.

Management actions in this zone include:

- Grazing exclusion to promote/maintain understorey recovery
- Management of human disturbance including signage (and compliance checks) to prevent unauthorised entry/use
- Retain dead timber (prevent fire wood collection)
- Minor weed removal and ongoing monitoring to compliment adjacent areas. Opuntia stricta noted in areas
- Targeted control of foxes, rabbits, goats and pigs required across whole BOA

3.3 MANAGEMENT ACTIONS

This section outlines the management actions that will be undertaken at the Biobank Site, in accordance with Annexure C of the Biobanking Agreement (**Appendix A**), including addressing the requirements identified in PA EPBC 2010/5502. These management actions apply to the entire Biobank site, not just those parts that meet the DSEWPaC approval requirements.

The objective of all management actions is to improve and maintain the biodiversity values of the BOA to reach benchmark condition for all habitat attributes over time. The conservation management strategy has been designed to enhance structural diversity and compositional diversity (species richness) of the remnant vegetation to provide flora and fauna habitat to offset the direct and indirect impacts of the Rocglen Mine Extension Project, in particular, potential foraging habitat for Swift Parrot and Regent Honeyeater.

3.3.1 Management of access and human disturbance

The management of human disturbances includes managing illegal access to prevent recreational 4WD, trail bikes, horse riding, rubbish dumping and unauthorised grazing and shooting (pigs/goats) on the Biobank site. It also identifies actions that are permitted to be undertaken in the Biobank site for its management. Avoiding soil disturbance is an effective means to prevent weed establishment (McIntyre *et al.* 2002).

Recreational 4WD, trail bikes, horse riding and rubbish dumping has the ability to damage or destroy native vegetation, disturb the soil making it vulnerable to weed invasion, introduce new weed species to the site, displace fauna and reduce the biodiversity of the Biobank site. These human disturbances may be caused accidentally by the land owner/manager or by illegal/unauthorised access and the prevention of these disturbances is important for the protection of biodiversity within the Biobank site.

These disturbances will be managed by maintaining boundary fences to a stock proof standard at all times in conjunction with neighbours, locking all gates with neighbouring properties, the erection of Biobank signage on all gates and ongoing dialogue with neighbours so that neighbours are aware of the new management objectives of the property and the consequences to Whitehaven Coal if the Biobank sites is not managed in accordance with this management plan.

Human disturbances which are permitted are the maintenance of the existing track network on the Biobank site so they can continually be used for the management of the Biobank site (including wildfire control) and passive recreational activities that are authorised by the property manager (e.g. bush walking, bird watching).

Whitehaven Coal will appoint a Biobank Site Property Manager who will be responsible for coordinating the implementation and reporting on all aspects of the Biobank Agreement and this management plan. The approval of the Property Manager must be obtained for any access to or activities on or in the Biobank site. Ideally, the Property Manager will reside on the Biobank site in the

Homestead that has been excluded from the area subject to the agreement as an ongoing presence of staff on site is the most effective deterrence to unauthorised access.

3.3.2 Retention of regrowth and remnant native vegetation

Remnant native vegetation and regrowth is important as it is the key component of the Biobank site. The retention of this native vegetation and its regrowth is important to maintain the biodiversity value of the Biobank site. The clearance of native vegetation, including regrowth, in the Biobank site is not permitted under any circumstances.

Natural regrowth of remnant vegetation will be preferentially retained to promote recovery of native vegetation. Dense patches of native regrowth will be allowed to self thin unless new plantings require regulated control.

Exceptions to this rule include maintenance of fence lines and management tracks associated with the BOA. For example if a tree or shrub is growing through or falls on the fence line this will damage the fence and potentially provide access for livestock to the offset area. This vegetation will be removed using minimal disturbance techniques. All waste from the clearance of this vegetation will remain in situ in the BOA away from any fence lines or management tracks.

3.3.3 Retention of dead timber

Dead standing and fallen timber will be retained in all Management Zones except in designated boundary fire breaks. This will provide micro habitats for roosting, breeding and shelter. In addition to fauna habitat for insects, reptiles, birds, and mammals, fallen timber is recognised as an important successional habitat for specialised colonising plants (DEC 2003).

3.3.4 Management of grazing for conservation

The grazing of the Biobank site by livestock has the potential to suppress the regrowth of native vegetation through physical damage and cause soil compaction and erosion. All management zones will be sensitive to the impacts of stock grazing. Stock grazing is not permitted within the Biobank site other than for short periods in fenced parts of MZ1 in the lead up to Consol Grass control measures being implemented in Years 1-4.

The Biobank site has three rural grazing properties on its southern, western and northern borders. It has been noted that stock occasionally enters the property from these properties.

Accordingly, the landowner will be required to erect stock proof fencing around the Biobank site, and maintain these fences to exclude stock grazing from the Biobank area. The landowner will be required to ensure that all gates that lead to neighbouring properties are locked at all times to prevent stock entering from neighbouring properties and to maintain regular contact with neighbours to ensure that they are aware of this changed management regime, cooperate with this requirement and are sympathetic to the objectives of this management plan.

3.3.5 Weed control

Weeds are a threat to native vegetation by smothering native vegetation, preventing the regeneration of native vegetation, competing for essential resources such as light and water with native vegetation, displacing native fauna through the loss of habitat and altering ecological and physical processes. These impacts contribute to the loss of biodiversity.

The establishment and spread of environmental weeds is a threat to native vegetation on the Biobank site, particularly on the lower flatter cleared areas. The most abundant weed species include Prickly

Pear and African Boxthorn, with small amounts of Noogoora Burr and Horehound. The exotic cultivar Consol Grass (*Eragrostis curvula*) is also prevalent in the paddocks between the two homesteads.

The removal and on-going control of environmental weeds on the Biobank site is required to improve the condition of native vegetation. The control techniques will be undertaken using minimal disturbance control techniques.

The methods of weed control are outlined in Annexure C of the Biobank Agreement (**Appendix A**) with further operational techniques provided in **Appendix C**. It is expected that the Property Manager will engage suitably qualified and experienced conservation land managers to implement the weed control strategies.

The proposed control strategy for Consol Grass involves:

- Light grazing prior to control to remove biomass
- Spraying with a selective herbicide in the paddocks between the two homesteads during the summer growing season to avoid impacts to winter growing native grass species
- Monitoring the effectiveness of control measures before extending to other parts of MZ1
- Supplementary planting of tree and shrub species form year four and direct seeding of ground cover species where there is no natural regeneration

The proposed control strategy for Prickly Pear involves:

- All plants, including seedlings, will be dug out using a shovel, ensuring the disturbed ground is covered with organic material
- All plant material is bagged and disposed off site as it has the ability to regenerate from native vegetative material

The proposed control strategy for African Boxthorn involves:

- The control of African Boxthorn greater than 0.5 metres in height by the cut and paint or drill and fill method (whichever is more suitable) September/October when the plants have a good cover of foliage
- The spot spraying of seedlings and regrowth using a non-selective herbicide when the seedlings have a good coverage of foliage
- All weed waste will remain in situ, where the plant is felled on the property

Other environmental weeds that will be targeted for removal from the Biobank site include Noogora Burr, Horehound and Pepper Tree:

- Dense infestations of Horehound can be controlled by spot spraying using a non-specific herbicide (glyphosate) mixed appropriately with water
- Small infestations can be dug out and bagged immediately and disposed of appropriately off site
- Noogoora Burr can be controlled by spot spraying using a non-specific herbicide (glyphosate) mixed appropriately with water
- Pepper Tree (only one was observed see **Figure 10**) will be controlled by the drill and fill method using a non-specific herbicide

Weed infestations are small (other than Consol Grass) and do not provide wildlife habitat and no revegetation will be required to compensate for the removal of wildlife habitat.

3.3.6 Bushfire management

Prescribed Burning Regime

No prescribed burning will be implemented in MZs 1 and 2 until planted trees are mature and able to withstand the impact of fire (2050). Fire intervals for grassy woodlands and other vegetation types on the Biobank site have been identified as being a minimum of eight years and a maximum of 40 years (Bush Fire Coordinating Committee 2008) other than the Semi-evergreen Vine Thicket where fire should be excluded.

A fire break/ management trail will be maintained along the boundary of MZs 2 and 3 **(Figure 10)** as well as dams near the Yarrari homestead for fire fighting purposes. These firebreaks will be maintained annually.

A large wildfire burnt the majority of MZ3 in 2009. No fires are planned in MZ3 as they would be difficult to control and it is expected that wildfires w ill burn on average within the natural fire regime. Any wildfires that do occur in the BOA in the interim will be managed through an appropriate response from the RFS to extinguish or contain the spread of the fire.

Fire Fighting Equipment

Whitehaven Coal will engage with the local RFS in relation to the site and its intended protection for conservation purposes. This will be to inform local RFS members of the site so they understand:

- potential for fire risk
- access points across the property
- Location of watering points

3.3.7 Erosion & sedimentation control

Erosion and sediment control may be required following the progressive removal of farm dams across the BOA in drainage lines in MZs 1 and 2. All disturbed areas will be sown with a sterile rye crop to prevent erosion and appropriate tree, shrub and ground cover plantings will be used in the rehabilitation of disturbed areas including removed drainage diversion structures.

3.3.8 Soil and water management

Farm dam five (located between the Yarrari and Belah homesteads will be retained for fire fighting, tree watering and goat management purposes.

3.3.9 Retention of rocks

All rocky habitat in the BOA will be retained and will not be removed for any purpose.

3.3.10 Vertebrate pest management

Control of feral animals and over abundant native herbivores will be undertaken in all zones of the BOA. The total grazing pressure from native and feral animals will be monitored annually by estimating population size every three months and assessing impacts on tree regeneration. An adaptive management approach will be implemented.

Feral goats are currently a significant issue in the BOA and are likely to be contributing to the lack of natural regeneration in MZs 1 and 2. Small groups of feral Pigs have also been observed. Rabbits, foxes and feral cats are also likely to be present.

A vertebrate pest control will be implemented in consultation with adjoining landholders (including OEH) for maximum efficacy as per **Appendix D Works Program**. The proposed strategy includes:

- Feral Goats. Progressive closure of watering points, trapping around retained watering points (whilst numbers are high), annual aerial shooting (contributing of funds towards NPWS control program) and opportunistic shooting using a high powered (calibre) rifle as humanely as possible (i.e. a single shot to head). It is noted that over 300 goats were trapped and removed from the property between 2009 and 2011
- Fox. A biannual (autumn and spring) 1080 baiting program with a minimum buried 40 baits spaced 500m apart along management trail network combined with opportunistic shooting and den destruction. Baiting program will be undertaken in conjunction with OEH and other land holders where possible to maximise landscape benefits
- Feral pigs. Ongoing opportunistic shooting by invited/authorised hunters, opportunistic shooting during aerial goat control programs and trapping with invited/authorised hunters
- Feral cat. Opportunistic shooting by invited/authorised hunters and property manager
- Rabbit, pindone baiting (as required) along with opportunistic shooting and warren destruction if found
- Obtaining a permit from OEH for controlled culling (by shooting) Eastern Grey Kangaroos if required

3.3.11 Revegetation strategy

The Revegetation Strategy uses three approaches to encourage and establish native vegetation in MZs 1 and 2 (natural regeneration, direct seeding and planting). The benefits and limitations of each are outlined in **Table 6.**

Table 6: Costs and benefits of revegetation techniques

	Natural regeneration	Direct seeding	Landscape planting
Establishment Cost	(+) Lowest	(+) Moderate	(-) High
Adaption	(+) Plants are well-adapted to the site	(+) Natural look and more diversely structured	(-) Often results in unnatural looking rows
Establishment Timeframe	(-) Potentially the longest establishment timeframe	(-) Moderate establishment times	(+) Fast, more reliable timeframe (+) Revegetation is immediately visible to passers by
Seed Availability and Sources	(-) Needs an adjacent seed source or soil stored seed bank	(-) Requires the largest amount of seed.	(+) Uses small quantities of seed
Health	(+) Establishes healthiest plants	(+) Establishes healthier plants	(-) Health is related to the seed source and maintenance performed

(-) = negative aspect (cost), (+) = positive aspect (benefit), Source ELA (2011b)

The approach recommended for each zone applies adaptive management principles:

- Zone 1: Landscape planting of canopy, shrub and understorey species will be undertaken to improve native species richness, if natural regeneration is not adequate after three years of grazing removal and targeted weed control (see **Section 3.3.5**)
- Zone 2: Natural regeneration to be facilitated by weed management. Landscape planting will only be undertaken to re-establish over-storey and mid storey species if natural regeneration is not observed after three years of commencement of management plan. No planting proposed for understorey species
- Zone 3: Natural regeneration to be facilitated by weed management. No planting is proposed

Wherever possible, the seed for the planting program will be collected from the BOA or other local provenance sources.

Tube stock are to be planted in 'Hiko' cells in autumn and spring to capitalise on greater soil moisture and reduced heat stress with follow up watering as required.

Plant density will depend on the amount of existing vegetation and the results of natural regeneration. All vegetation types are to be managed towards the benchmark range canopy cover per Biometric vegetation type (**Table 7**)). As a guide, a density of one tree per 250 metres squared (m²) (one every 15 m) will achieve a final density of 30-40 trees per ha or a canopy cover of between 5-10%, which is within the benchmark value for the 'White Box grassy woodland' vegetation type (DEC 2008a and Rawlings et al. 2010), assuming a 50% success rate. This planting density allows for time lag to maturation and mixed success of plantings.

Species selection will be determined by parent vegetation type and Annexure C in **Appendix A**.

3.3.12 Maintenance or reintroduction of natural flow regimes

There are many ephemeral creek lines that occur across the Biobank site. The flow of some of these creek lines is impeded by farm dams. These farm dams will be filled in and contoured so as to reduce any impact of erosion. The farm dams will also be direct seeded with a sterile rye crop to prevent soil erosion once the dams have been in filled.

Table 7: Biometric Benchmark Values per Vegetation type

VEG TYPE NAME	NATIVE PLANT SPECIES RICHNESS	NATIVE OVER-STOREY COVER*	NATIVE MID-STOREY COVER *	NATIVE GROUND COVER* (grasses)	NATIVE GROUND COVER * (shrubs)	NATIVE GROUND COVER * (other)	Number of HBTs	Length of fallen logs
White Box – White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregion	26	6-25	6-25	20-30	3-10	3-5	1	15
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	23	6-25	0-5	30-40	0-0	3-5	1	30
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	30	25-40	6-25	20-30	3-10	3-5	2	20
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	35	15-25	25-40	3-20	5-15	3-15	1	15

Cover as % (DECC 2008a), HBT – No. Hollow bearing Trees per 0.1 ha plot

Table 8: Indicative species for revegetation by vegetation type

VEGETATION TYPE	OVERSTOREY	MID-STOREY	UNDERSTOREY (GRASSES)	UNDERSTOREY (HERBS/FORBS)
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	*Eucalyptus albens* *Callitris glaucophylla* *Eucalyptus crebra*	*Alectryon oleifolius, Geijera parviflora, Brachychiton populneus, Myoporum montanum, Notelaea microcarpa* var. *microcarpa*	*Bothriochloa decipiens* *Austrostipa scabra* *Eragrostis leptostachya* *Aristida* sp. *Sporobolus creber* *Chloris truncata* *Cynodon dactylon* *Themeda australis* *Austrodanthonia* sp.*, Panicum effusum,*	*Chrysocephalum apiculatum,* *Vittadina cuneata,* *Cymbonotus lawsonianus*
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	*Callitris glaucophylla* *Eucalyptus crebra* *Eucalyptus albens* *Eucalyptus dealbata* *Alphitonia excelsa*	*Beyeria viscose* *Olearia elliptica* *Notelaea microcarpa* *Acacia triptera* x *cheelii,*	*Austrostipa scabra* *Eragrostis* spp. *Aristida ramose* *Enneapogon* sp. *Cymbopogon refractus* *Austrodanthonia* sp. *Panicum effusum*	*Desmodium brachypodum* *Fimbristylis dichotoma* *Dianella revoluta*
White Box – White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregion	*Callitris glaucophylla* *Eucalyptus albens.* *Eucalyptus creba*	*Beyeria viscose* *Eremophila mitchelli* *Indigofera australis* *Notelaea microcarpa*	*Austrostipa scabra, Eragrostis* sp., *Aristida ramosa, Aristida*sp., *Enneapogon* sp., *Cymbopogon refractus*	*Desmodium brachypodum,* *Lomandra filiformis*

4 Risk Assessment & Contingency Plan

Condition 2.f. of EPBC Act Approval 2010/5502 requires Whitehaven Coal to describe the potential risks to successful management and rehabilitation in the offset area and provide a description of the contingency measures that would be implemented to mitigate these risks.

The following risk assessment considers the impact of risks from management actions in this BOMP. The risk model is based on the Australian Standard ISO 31000:2009 (Standards Australia 2009).

Risk is defined as the effect of uncertainty on objectives (Standards Australia 2009). The likelihood of risk occurring and the level of impact of that risk are used to assess each risk and inform management responses (**Table 9**). The higher the risk score, the more urgent the response. A red colour denotes 'High' environmental significance requiring immediate substantial action. An Orange colour denotes 'Moderate' environmental significance requiring substantial action within 3-6 months. A Yellow colour denotes a 'Low' environmental significance requiring substantial action within 6-12 months.

Table 9: Risk assessment of non-achievement of management plan objectives

		Likelihood of risk occurring		
		Certain	**Likely**	**Less Likely**
Level of Environmental impact	**High**	**9**	**6**	**3**
	Moderate	**6**	**4**	**2**
	Low	**3**	**2**	**1**

To address the risks identified in **Table 9** the Property Manager will:

- Educate Whitehaven Coal staff, contractors and neighbouring property owners/managers of the BOA objectives and location
- Avoid potential impacts by following the recommended protocol in this BOMP for each management action
- Mitigate potential impacts by regular monitoring (**Section 5**) and applying corrective action under an adaptive management framework
- Report incidences and responses in the Annual Report (**Section 7**) to facilitate managerial review and if necessary trigger systemic change of practices

A risk assessment for each of the environmental management issues and risk control (contingency) measures are provided in **Table 10**.

Contingency plans are required if issues of non-compliance, exceedence, or new information about the management of the offset area present comes to light. The responsible agent for each incident, response management actions and reporting requirements are outlined in **Table 11**.

Table 10: Risk assessment

ENVIRONMENTAL ISSUE	RISK SOURCE/POTENTIAL INCIDENTS	POTENTIAL CONSEQUENCE	RECEPTOR/SURROUNDING ENVIRONMENT	POTENTIAL ENVIRONMENTAL IMPACTS	LIKELIHOOD	IMPACT	RISK SCORE	PROPOSED RISK CONTROL(S)
Revegetation	Failure of natural regeneration	Reduced biodiversity values	Remnant vegetation	Unimproved vegetation condition	Likely	Moderate	4	Resources for supplementary landscape plantings in years 6-7
		Additional cost resourcing	Derived Native grasslands		Likely	Moderate	4	Resources for supplementary landscape plantings in years 6-7
	Failure of revegetation plantings	Repeat plantings required	Derived Native grasslands		Likely	Moderate	4	Adequate ground preparation/weed suppression prior to plantings. Plant quality stock. Follow up watering regularly during establishment
Weed control	Spray drift causing accidental death of native flora	Death of native flora	Remnant vegetation	Decreased native species richness in local patches	Likely	High	6	Use experienced contractors. Inform contractors of BOA objectives. Avoid spot spraying in high wind conditions.

ENVIRONMENTAL ISSUE	RISK SOURCE/POTENTIAL INCIDENTS	POTENTIAL CONSEQUENCE	RECEPTOR/SURROUNDING ENVIRONMENT	POTENTIAL ENVIRONMENTAL IMPACTS	LIKELIHOOD	IMPACT	RISK SCORE	PROPOSED RISK CONTROL(S)
	Misidentification of exotic species				Less likely	Low	1	Use experienced qualified contractors.
Feral Animal control	Accidental poisoning	Death of native fauna	Native fauna	Reduced fauna population	Less likely	High	3	Address fauna conflicts in preparation of feral animal control plan. Use alternative methods than poisoning e.g. den ripping, shooting.
Management of disturbance sources	Unauthorised access	Soil disturbance/ compaction	Native ground cover	Increased opportunity for weed invasion	Less likely	Low	1	Install signage to prohibit unauthorised access. Periodic compliance checks. Internal and external education strategy.
		Trampling vegetation		Delayed regeneration	Less likely	Low	1	
		Timber removal	Remnant vegetation (alive/dead)	Reduced fauna habitat	Less likely	High	3	
		Rubbish dumping	BOA	Vegetation smothering Reduced habitat	Less likely	Moderate	2	

ENVIRONMENTAL ISSUE	RISK SOURCE/POTENTIAL INCIDENTS	POTENTIAL CONSEQUENCE	RECEPTOR/SURROUNDING ENVIRONMENT	POTENTIAL ENVIRONMENTAL IMPACTS	LIKELIHOOD	IMPACT	RISK SCORE	PROPOSED RISK CONTROL(S)
				values				
		Cattle grazing	Remnant vegetation	Restricted regeneration Trampling Resource competition	Less likely	High	3	Maintain existing fences and install stock exclusion fencing as required.
		Weed dispersal	BOA	Weed infestations	Less likely	Moderate	2	Apply Introduction to Site protocols for any equipment when moving into and out of BOA
Bushfire Management	Wildfire	Death of native flora/fauna	BOA	Delayed 'improve or maintain' outcomes	Less likely	High	3	Regular liaison with local RFS brigade. Maintain fire equipment on adjacent mine site. Maintain staff fire fighting training.
		Death of young plantings	Revegetation areas		Less likely	High	3	

Table 11: Contingency plan

INCIDENT	RESPONSIBILITY	RESPONSE MANAGEMENT ACTION	REPORTING REQUIREMENTS
New information on BOA	BOA Property Manager	1. Review management actions and adapt BOMP to protect (native) or control (pest) species as appropriate.	1. Inform Group Environmental Manager 2. Report result and response action in BioBank and BOMP annual reports 3. In case of threatened species advise OEH via Biobanking Annual Report and DSEWPaC by BOMP annual reports
Flood	Group Environmental Manager	1. Assess need for replacement fencing, signage. 2. Additional weed control measures may be required following flood.	Report result and response action in Biobank and BOMP annual reports
Wild Fire	Group Environmental Manager	1. Liaise with RFS to control fire 2. Assess need for replacement fencing, signage. 3. Exclude stock and control native herbivores to allow natural regeneration	Report result and response action in Biobank and BOMP annual reports
Erosion	BOA Property Manager	Remove source. Assess need for soil stabilisation works e.g. bunding, rock cages.	Report result and response action in Biobank and BOMP annual reports
Seed failure	BOA Property Manager	1. Repeat collection if season permits 2. Source alternate local provenance stock from native nursery	Report result and response action in Biobank and BOMP annual reports
Revegetation failure	BOA Property Manager	1. Supplementary landscape planting	Report result and response action in Biobank and BOMP annual reports

INCIDENT	RESPONSIBILITY	RESPONSE MANAGEMENT ACTION	REPORTING REQUIREMENTS
Chemical Spills/ Poisoning (Flora/Fauna)	BOA Property Manager	1. Report incidents to Group Environmental Manager 2. Apply risk mitigation measures to avoid reoccurrence	1. Inform Group Environmental Manager 2. Notify OEH and DSEWPaC of response and action taken
Unauthorised Access/ Major Disturbance	BOA Property Manager	3. Fence maintenance (if required) 4. Additional signage 5. Additional spot checks for unauthorised entry	Report result and response action in Biobank and BOMP annual reports
Vegetation Clearing	BOA Property Manager	Report location and extent of clearing. Collect photo evidence. Undertake follow up compliance checks.	Report all illegal clearing to OEH & DSEWPaC

5 Ecological Monitoring

The management of the BOA is designed to be part of an adaptive management framework to achieve conservation objectives in a cost-effective manner. The objective of the BOMP monitoring program is to evaluate the vegetation and fauna habitat condition (in particular as foraging habitat for Swift Parrots and Regent Honeyeater) in the BOA to identify where rehabilitation is performing poorly and additional actions are required. The performance criteria by which the success of the conservation actions will be measured are listed in **Table 12**.

Monitoring will be undertaken over a period of 10 years (or until the Biobank site is transferred to the Minister for the Environment as an addition to the Kelvin Aboriginal Area) and is designed to be consistent with the reporting requirements of the Biobanking Agreement (**Appendices E-J**). The monitoring program is broken up into the following components of annual visual inspections, annual vegetation condition and structure assessment and winter Swift Parrot / Regent Honeyeater monitoring.

Table 12: Biodiversity management performance criteria

MANAGEMENT ACTION	EXPECTED OUTCOME	TARGET	TIMING
Revegetation activities including natural rehabilitation, direct seeding and supplementary planting	Increased native plant diversity	Restore native plant species richness, and native canopy, mid-storey and grass cover to within 75% of benchmark condition (**Table 7**) within specified timeframes and ultimately 100% as part of in perpetuity management	Canopy:15 yrs Midstorey:10 yrs Groundcover: 7 yrs
Management of human disturbance, fencing, signage	Reduction of resource competition and soil disturbance	Site access restricted to approved personnel No timber clearing or removal	<1 yr and throughout project life
Grazing management		Stock exclusion from Biobank Site other than Consol Grass control in MZ1 prior to supplementary planting	<1 yr and throughout project life
Weed management	Reduction in weed cover	New infestations of problem grasses controlled All infestations of noxious weeds managed as per NW Act	6 months after identification of infestation Throughout project life

MANAGEMENT ACTION	EXPECTED OUTCOME	TARGET	TIMING
Feral fauna management	Sustained reduction in feral fauna abundance to minimise impacts to native fauna and habitat restoration activities	Feral fauna control undertaken as per Works program (Appendix D) Fox baiting implemented twice per year Fox baiting implemented 2/yr Feral Goats/Pigs trapped 4/yr (Years 1-3) and then annual, aerial culls conducted annually with OEH (Yr 4 onwards) Rabbit baiting implemented annually or as required)	<1 yr and throughout project life with minimum quarterly inspections (**Section 7 & Appendix F**)

5.1 PROPERTY INSPECTIONS

The Property Manager will ensure regular (quarterly, or in response to incidents) visual inspections of the whole BOA to detect:

- Physical condition of fencing and gates (at least every three months)
- Disturbance factors including fire and unauthorised access e.g. hunting, fire wood collection (every quarter or in response to major incidents)
- Condition of erosion (every 6 months)
- Evidence of waste (every 6 months)
- Success of supplementary plantings (quarterly for first 12 months after planting)
- Presence/activity of feral animal species (Goats, Pigs, Rabbits) informed by regular inspections of the property (at least quarterly) and analysis of results of control measures (i.e. number of baits taken, number of animals shot)
- Grazing pressure from over-abundant native herbivores (quarterly)
- Presence of exotic weed species (as part of weed control measures)

Visual inspections will be undertaken at least quarterly and may occur more frequently if disturbance is detected. Inspection results will be reported annually as part of the Reporting Protocol (**Section 7**). A visual inspection proforma is included at **Appendix F**.

5.2 VEGETATION STRUCTURE AND DIVERSITY MONITORING

5.2.1 Photo Monitoring Points

Twenty five (25) photo monitoring points have been established across the Biobank site in areas of intact vegetation and areas where the greatest change in vegetation structure/condition is expected as a result of the implementation of management actions (areas with DNG) (**Figure 12**). Each photo monitoring point consists of a marked 20 x 20m quadrats at which a photograph has been taken at each corner looking in towards the centre of each plot (Each plot was photographed in September 2009 for baseline comparison (**Appendix G**).

These photo reference points provide a visual reference of changes in the vegetation structure and will be repeated every 12 months.

5.2.2 Mapping extent of woodland

All supplementary plantings will be mapped and the success of canopy, shrub and ground cover establishment evaluated in sample areas, mapped and included in the annual report. Areas of natural regeneration will also be recorded and mapped as part of the visual, inspections routine. Over time this will provide a quantitative estimate of the extent/location of increase in canopy/shrub and native ground cover throughout the Biobank site.

5.2.3 General Flora Surveys

An annual floristic survey will be undertaken each spring at the 25 photo monitoring points in which all vascular plant species observed in 20 x 20m plots will be identified, recorded and compiled into species lists and compared to previous assessment and the benchmarks in **Table 7**.

Biometric plot data will also collected at each plot using the BioBanking assessment methodology. This additional information collected includes:

- A 50m transect along which native over-storey cover, native mid-storey cover, native groundcover (grasses, shrubs and other) and exotic cover will be recorded
- A 50m x 20m quadrat in which the number of trees with hollows, over-storey regeneration and total length of logs will be recorded

This data will also be collated, compared to previous assessments and the benchmarks in **Table 7**.

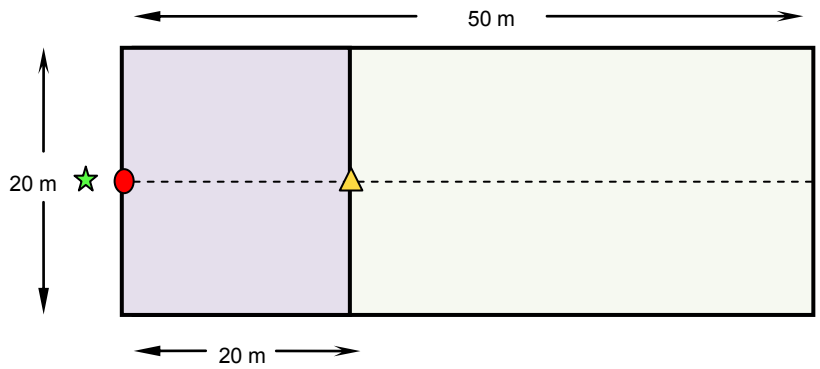

Figure 11: Plot design

All flora monitoring will be undertaken by appropriately qualified, licensed and trained ecologists.

5.3 SWIFT PARROT AND REGENT HONEYEATER MONITORING

Fauna monitoring will be aimed at assessing the suitability of the Biobank site as foraging habitat for the Swift Parrot and Regent Honeyeater and recording use of the area by these species, if any.

The fauna monitoring program therefore consists of targeted surveys for the Swift Parrot and Regent Honeyeater in preferred habitat (i.e. wintering flowering eucalypt species such as White Box).

Winter surveys will be undertaken at times when White Box is flowering (as informed by the visual inspections (**Section 5.1**)) and will consist of a suitably experienced ecologist traversing the Biobank

site when White Box is confirmed flowering to detect the presence and habitat utilisation of either species.

As these species are highly mobile when White Box is flowering and may not remain in any one location for extended periods of time it is unlikely that surveys will detect the species. Ideally, surveys will be conducted when local information (i.e. local bird observers and/or information from the National Recovery teams indicates Swift Parrots and/or Regent Honeyeaters are in the area). In addition to surveys, remote recording devices (e.g. bird song meters) will set up in areas of suitable habitat and left to record bird activity over a 3-4 week period which is then analysed.

All fauna monitoring will be undertaken by appropriately qualified, licensed and trained ecologists

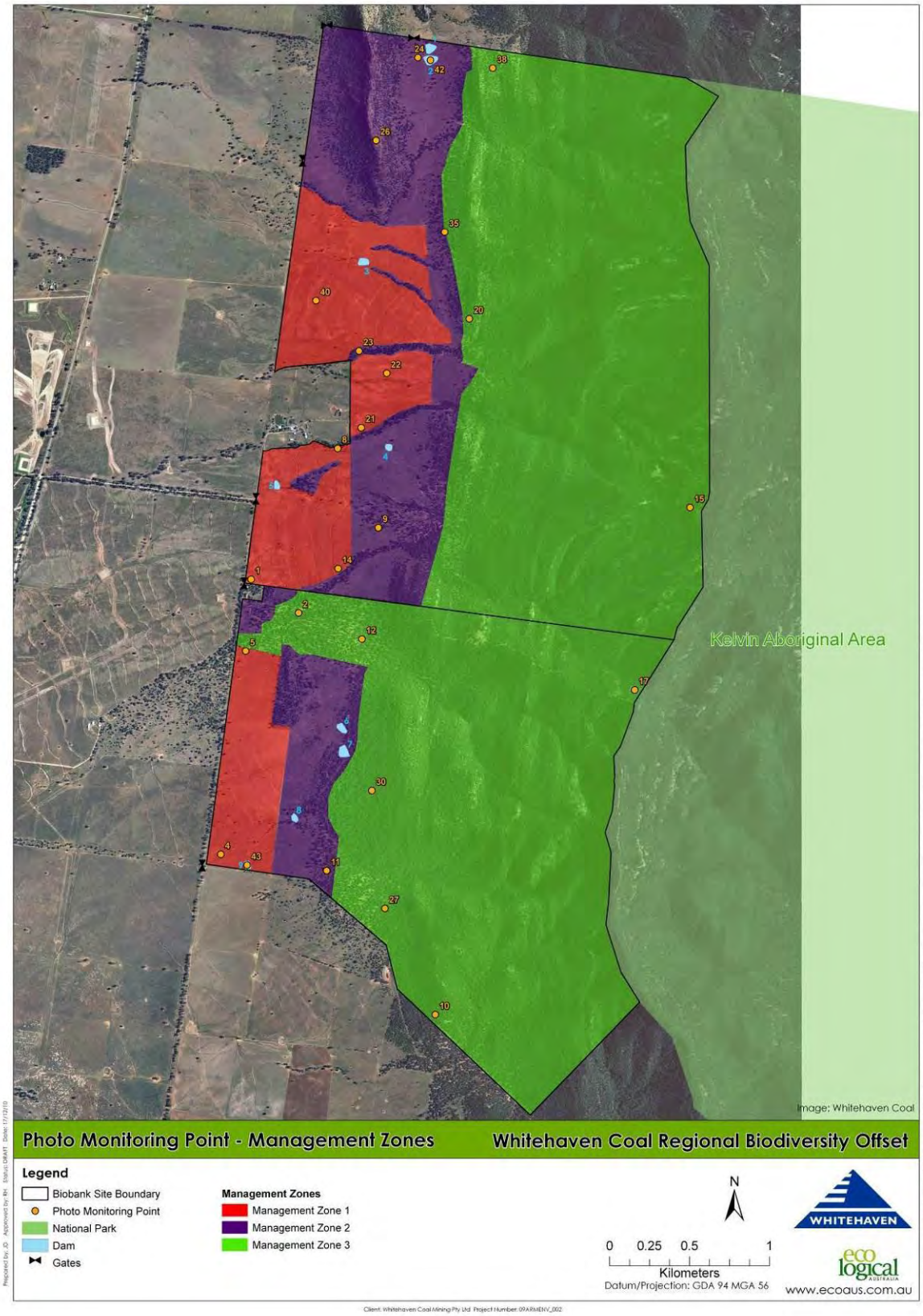

Figure 12: Location of monitoring plots and associated photo monitoring points

6 Training

Whitehaven Coal will ensure that all staff (and contractors) working in the BOA are aware of the site management objectives. The Group Environment Manager will be responsible for the 'training and induction' of any personnel entering the BOA of the relevant management protocols in this BOMP that pertain to their reason for access. It is not envisaged that this will require formal training.

Management actions with specific expertise requiring the use of trained personnel or contractors are set out in **Section 3, Section 5** and **Appendix D.**

7 Reporting

The Biobank Agreement for the offset area requires Whitehaven Coal to prepare and submit an annual report that contains the results of any monitoring, inspections or surveys undertaken in the previous 12 months including details of date, time, location, nature of inspection/activity, name of person undertaking inspection/activity, observations and the photographs from the monitoring plots. (**Appendix E**). The Biobank site requires active management from 1 July 2013 and the first annual report for the period 1 July 2013 to 30 June 2014 will be due in July/August 2014 and every 12 months thereafter.

A series of reporting protocols also need to be completed (**Appendix F - J**)

Annual implementation reports will be the sum total of the previous year's works and observations by the Property Manager. Primarily they will be used to compare the previous year's plan to actual works and to adapt management where applicable. An annual photographic record of the works carried out in each zone will be incorporated into the annual report. The purpose of the implementation report is to demonstrate to OEH whether the Management Actions as agreed are being implemented. This is the landowner's obligation under the Biobank Agreement.

The annual Biobanking report will include the additional actions required by this BOMP including the re-assessment of permanent plots, results of Swift Parrot and Regent Honeyeater activity surveys, mapping woodland regeneration, monitoring grazing pressure and vertebrate pests.

The annual BOA report will be incorporated into the Rocglen Mines' Annual Environmental Management Report (AEMR)/Annual Review reporting period and will consist of two parts:

- Summary of the implementation of management actions within the BOMP including inspection results and review findings
- The results of the flora and fauna monitoring program

A copy of the report will be provided to DSEWPaC consistent with CoA 2e by 31 August each year.

7.1 BOMP IMPLEMENTATION

The annual BOMP implementation report will provide a summary of all the actions implemented during the previous year. Any significant events that occurred during the year (e.g. wildfire, outbreak of any weeds or incidence of any new threats) and any recommended changes to the management actions, their duration, intensity or relative priority identified through the annual review will be included.

7.2 VEGETATION MONITORING REPORTING

Annual vegetation monitoring reporting is to include a written summary of the methodology and the current year's findings for each vegetation plot, including the average results of each variable recorded. Photo monitoring records and field data sheets will be included in an appendix. A flora species list with corresponding plot numbers where species were recorded is also to be included in an appendix.

A discussion section is to be included that compares the results from the current monitoring year with previous years either through actual annual records or a mean value where several previous years are being compared. The annual report is to include statistical graphs illustrating changes in diversity and cover/abundance of each attribute recorded within each management zone.

7.3 FAUNA MONITORING REPORTING

The report is to include the results of surveys/monitoring for Swift Parrot/Regent Honeyeater.

The results of monitoring will be analysed and compared to previous survey results to determine general habitat usage trends (if any).

7.4 REPORT RECOMMENDATIONS AND CONCLUSION

A concluding section is to be prepared within the annual on-site BOA report that highlights and describes significant findings, either positive or negative. Changes to any management recommendations for the following year will also be suggested, in particular the adequacy of natural tree/shrub regeneration and whether supplementary planting needs to be implemented.

8 Review and Audit

8.1 REVIEW

EPBC Act Approval 2010/5502 requires Whitehaven Coal to annually review performance against the BOMP, if the BOMP is revised the revised version will be submitted to DSEWPaC for the Ministers written approval as per condition 6.

Condition 4 requires a report to be published on the Whitehaven Coal website addressing compliance with the approval conditions and implementation of any management plans as specified in the conditions within three months of the anniversary of commencement of construction (i.e. by 21 March of each year).

To facilitate the annual review of the BOMP, a Review Protocol has been developed **Appendix K** to be completed by the Group Environment Manager. Annual reviews will be conducted to assess the effectiveness of management strategies against the objectives of this BOMP. A review protocol for the BOMP will be completed annually with the annual implementation and monitoring report. The findings of the annual review of the BOMP will be reported to Whitehaven Coal management and in the AEMR/Annual Review, and if required the BOMP will be updated for DP&I and the Federal Ministers approval.

In general, the BOMP will be revised due to:

- Deficiencies being identified
- Outcomes from the Annual Review
- Recommendations from the Annual on-site BOA Report
- Changing environmental requirements
- Improvements in knowledge or new technology becomes available
- Change in legislation or relevant approvals
- Change in the activities or operations associated with Rocglen Mine operations

8.2 AUDITING

Condition 5 of EPBC Act Approval 2010/5502 requires Whitehaven Coal, if directed by the Minister, to conduct an independent audit of the conditions of approval, including this BOMP. The Independent audit must be approved by the Minister prior to the commencement of the audit.

References

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Appendix A: Biobank Agreement

BioBanking
Biodiversity Banking and Offsets Scheme

Biobanking agreement
ID number: 43

Under the
Threatened Species Conservation Act 1995

for

Whitehaven Coal Mining Pty Limited
(ABN 68 124 425 396)
for
"Yarrari" and "Belah" properties, Wean Road, Kelvin
Lot 36 in Deposited Plan 754950,
Lot 2 in Deposited Plan 728391,
Lot A in Deposited Plan 405391, and
Lot 1 in Deposited Plan 247949.

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Version 1.3 September 2011

Appendix B: Flora Species Recorded in Floristic Plots (September 2009)

Abutilon oxycarpum	*Indigofera australis*
Abutilon sp.	*Jasminum lineare*
Acacia cheelii	*Korthalsella rubra* subsp. *giejericola*
Alectryon oleifolius	*Lepidium africanum**
Alectryon sp.	*Leptochloa* sp.
Alphitonia excelsa	*Linaria* sp.*
Amyema sp.	*Lomandra filiformis*
Ancistrachne uncinulata	*Lomandra longifolia*
*Arenaria leptoclados**	*Lomandra multiflora* subsp. *multiflora*
Aristida caput-medusae	*Lycium ferocissimum**
Aristida sp.	*Maireana enchylaenoides*
Aristida sp.2	*Maireana microphylla*
Arthropodium sp.	*Malva* sp.*
Arthropodium sp.	*Malvastrum coromandelianum*
Asplenium flabellifolium	*Marrubium vulgare**
Austrodanthonia racemosa var. *obtusata*	*Marsdenia pleiadenia*
Austrodanthonia sp.	*Marsdenia viridiflora* subsp. *viridiflora*
Austrostipa ramosissima	*Maytenus cunninghamii*
Austrostipa scabra subsp. *scabra*	*Medicaga sativa**
Avena sp.*	*Medicago laciniata**
Beyeria viscosa	*Medicago* sp.*
Bothriochloa sp.	*Medicago* sp.2*
Brachychiton populneus subsp. *populneus*	*Microlaena stipoides*
Brachycome sp.	*Myoporum montanum*
Brunoniella australis	*Notelaea microcarpa* var. *microcarpa*
*Buglossodies arvensis**	*Notodanthonia longifolia*
Bursaria spinosa subsp. *spinosa*	*Nyssanthes diffusa*
Callitris endlicheri	*Nyssanthes erecta*
Callitris glaucophylla	*Nyssanthes* sp.
Calotis lappulacea	*Olearia* sp. aff. *elliptica*
Capparis lasiantha	*Oligochaetochilus* sp.
*Capsella bursa-pastoris**	*Opuntia aurantiaca**
Carex incomitata	*Opuntia stricta* var. *stricta**
Carex inversa	*Oxalis sp.*
*Carthamus lanatus**	*Pandorea pandorana*
Casuarina cristata	*Panicum effusum*

Chamaesyce sp.	*Parietaria debilis*
Cheilanthes distans	*Parsonsia eucalyptophylla*
Cheilanthes sieberi subsp. *sieberi*	*Parsonsia lanceolata*
Chloris truncata	*Paspalidium* sp.
Chloris ventricosa	*Pellaea falcata*
Clematis microphylla	*Petrorhagia* sp.*
Cotula australis	*Phyllanthus subcrenulatus*
Crassula sieberiana	*Pimelea neo-anglica*
Crassula sp.	*Pleurosorus* sp.
Croton phebalioides	*Poa sieberiana*
Cymbopogon refractus	*Prostanthera cruciflora*
Cyperus gracilis	*Psydrax odorata*
Dendrophthoe sp.	*Rumex brownii*
Desmodium brachypodum	*Salsola kali* var. *kali*
Desmodium gunnii	*Salvia reflexa**
Desmodium varians	*Scleria mackaviensis*
Dichondra repens	*Sclerolaena birchii*
Dichondra sp.	*Scutellaria humilis*
Digitaria sp.	*Senna barclayana*
Dipodium sp.	*Senna coronilloides*
Dodonaea viscosa subsp. *angustistifolia*	*Sida corrugata*
*Echium plantagineum**	*Sida cunninghamii*
Ehretia membranifolia	*Sida* sp.
Einadia hastata	*Sida spinosa*
Einadia polygonoides	*Sida trichopoda*
Einadia sp.	*Sigesbeckia orientalis* subsp. *orientalis*
Einadia trigonos	*Silybum marianum**
Enneapogon nigricans	*Sisymbrium irio*
Enteropogon acicularis	*Sisymbrium* sp.*
*Eragrostis cilianensis**	*Solanum parvifolium*
Eragrostis leptostachya	*Sonchus oleraceus**
Eragrostis sp.	*Spartothamnella juncea*
Eremophila mitchellii	*Sporobolus creber*
Eucalyptus albens	*Swainsona galegifolia*
Eucalyptus crebra	*Tetragonia tetragonioides*
Eucalyptus dwyeri	*Teucrium corymbosum*
Eucalyptus melliodora	*Themeda australis*
Euchiton sp.	*Tribulus terrestris**
Fumaria sp.*	*Trifolium* sp.*
Galium migrans	*Urtica incisa*
Galium propinquum	*Urtica urens**
Galium sp.	*Verbascum virgatum**
Gamochaeta sp.*	*Vittadinia cuneata* var. *cuneata*

Geijera parviflora	*Vittadinia muelleri*
Geranium sp.	*Vulpia* sp.*
Glossogyne tannensis	*Wahlenbergia communis*
Glycine tabacina	*Zygophyllum apiculatum*
Hedypnois rhagadioloides subsp. *cretica**	
Hibiscus sturtii	
*Hordeum leporinum**	
Hordeum sp.*	
Hymenochilus muticus	
*Hypochaeris glabra**	
*Hypochaeris radicata**	

Appendix C: Implementation Methods

Weed Control

All weed management works outlined in **Section 3**, have been costed on the basis that suitably qualified and experienced bush regeneration contractors will be engaged by Whitehaven Coal to conduct all management activities. Details of specific weed control techniques to be used such as hand pulling weeds, grass control and the use of herbicides are described in detail in Muyt (2001).

The following is a description of appropriate methods should the landowner decide to carry out the management actions.

Weed Treatment

Weed control techniques within the biobank site will be undertaken using minimal disturbance techniques so as to prevent minimal disturbance to the soil. Disturbance to the soil will result in increased weed germination and potentially lead to soil erosion.

Hand Pulling

Hand pulling of weeds includes:

- Selecting the most appropriate tool for the weed being removed (if required)
- Minimise soil disturbance by controlling weeds when the soil is moist
- Control plants before fruits or other propagules develop
- Remove excess soil from the root system when there is no risk of spreading vegetative material
- Cover disturbed soil or gaps with leaf litter and twigs
- Ensure bulbs, corms, tubers, rhizomes or stolons are carefully dug out. Bag all propagules before removing them off-site (Muyt 2001)

Herbicide Use

Herbicides are required for use for the spraying of herbaceous and re-shooting woody weeds. Only a non-specific herbicide (i.e. glyphosate) will be used for this work. Herbicide use near waterways is not permitted as all waterways are ephemeral. No spraying will be undertaken in the vicinity of any waterways with flowing water.

Spot Spraying

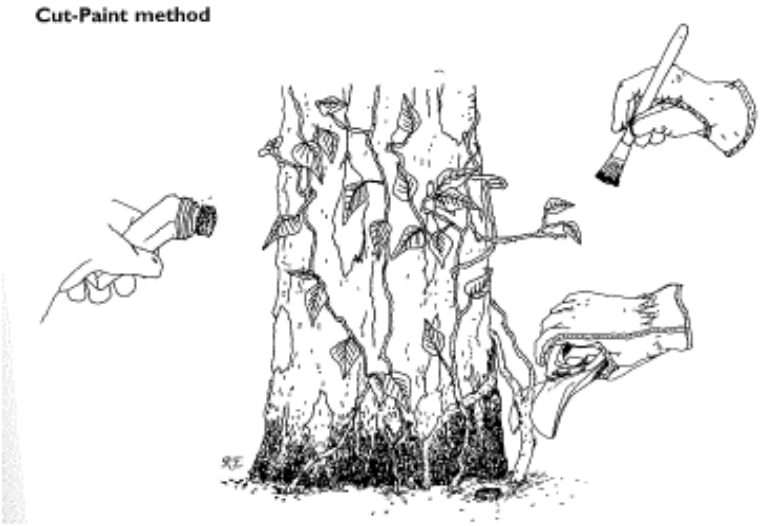
Spot spraying will be required for seedlings and the regrowth of the woody weed African Boxthorn, as well as Horehound and Noogoora Burr. These species will be controlled using a non-selective herbicide mixed appropriately with water. When spot spraying, ensure the target plant has been correctly identified and that the target plant is sprayed with the herbicide. Off-target damage should be minimised through the correct identification of target weed species.

Primary Woody Weed Treatment (African Boxthorn)

Cut and Paint Technique

The plant needs to be actively growing with green foliage present. African Boxthorn usually begins actively growing in September and fruiting occurs in autumn and winter. Control will be undertaken during summer months prior to fruiting occurring. The plant needs to be cut horizontally as close to the base as possible and below any branches. Either a chainsaw, handsaw or secateurs can be used to make the cut, depending on the size of the plant. Remove any dirt from the stump and immediately apply the appropriately mixed herbicide directly to the stump using a dabber bottle or brush. Plants may re-sprout and follow up work maybe required.

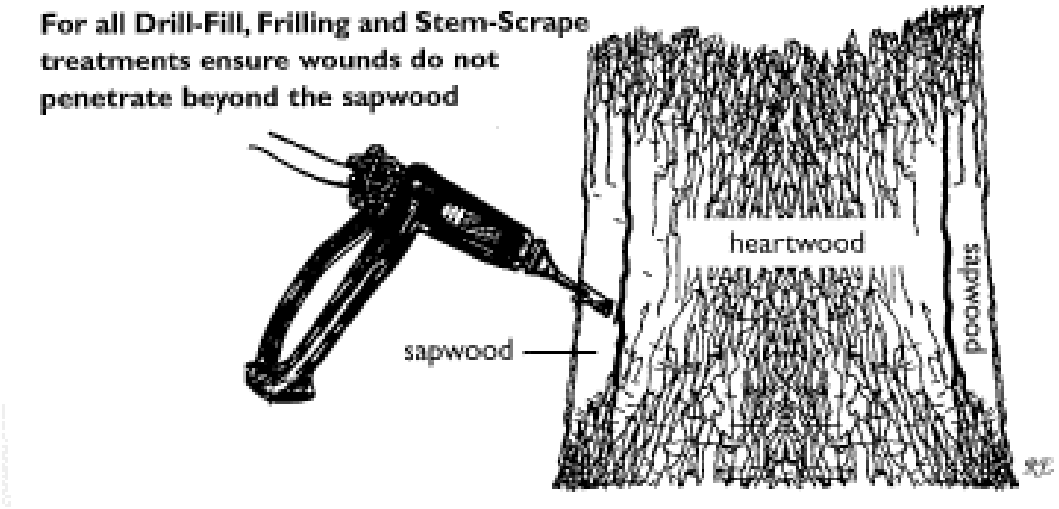
Figure 13 The cut and paint method



Drill and Fill Technique

This method is suitable for the control of large African Boxthorn plants. The drill and fill method involves drilling a hole into the base of a tree below any branches with a hand held drill bill and a 9mm or 10mm drill bit at an angle of 40-60 degrees The hole should only penetrate through the sap wood and not through to the heart wood. The hole should then be filled immediately with the appropriately mixed herbicide. An eye dropper or a squeeze bottle with a narrow nozzle can be used to fill the hole. If the plant re-sprouts follow up work will be required.

Figure 14 The drill and fill technique



The above images have been taken from Muyt (2001).

Secondary and Maintenance Woody Weed Treatment

1. Regrowth of primary treated stumps will be spot sprayed with a non-specific herbicide

Feral Animal Control

Pesticide Baiting

Pesticide Control Orders (PCOs) exist for the use of each of Pindone and 1080 under Part 4 of the NSW *Pesticides Act 1999* and associated regulations. These PCOs stipulate that only Authorised Control Officers are authorised to implement the use of concentrated Pindone and 1080 baits, although ready-made baits can be used by landowners/managers. Furthermore, as of 1 September 2005, training in the use of pesticides has been compulsory if pesticides are used in a job or business (including farming).

The following is a broad outline of the process for using each chemical, notwithstanding the requirement for the operator to be trained in the use of these chemicals. Advice should be sought from DECCW as to the most effective methods to minimise off-target kills and animal ethics in relation to the disposal of un-used bait and carcases.

It is highly recommended that any baiting that takes place on the Biobank site is supported by a strategic off-site baiting program with cooperation from adjacent landowners.

All stock should be removed from the site prior to baiting program (Note that no domestic stock are allowed in the Biobank area).

Pindone (Rabbits)

1. Under take baiting in summer or when there is limited green feed on the biobank site
2. Select appropriate sites – it is recommended to locate sites near known Rabbit harbour
3. Acquire Pindone Baits (mixing of Pindone concentrate must be carried out by an Authorised Control Officer)
4. 'Free feed' rabbits on non-toxic bait prior to baiting commencing
5. Scatter bait in selected locations and repeat dose three to four days apart for the entirety of the baiting treatment period
6. If possible destroy warrens once a kill of the rabbit population has been assured. This prevents recolonisation of warrens

1080 Baits (Foxes and Feral Pigs)

Foxes

1. Seek approval from relevant agencies (e.g. RLPB, Dept Agriculture) for baiting program
2. Notify neighbours
3. Erect signage
4. Acquire 1080 fox baits and feral pig baits
5. Foxes using guidelines developed by DECCW (2008):
    a) Bury baits 8-10 cm below the surface
    b) Place baits at least 500 metres apart or 1 per 10 ha (A minimum of 40 baits will be sufficient for the Whitehaven site)
    c) Conduct baiting in Autumn (juveniles dispersing) and Spring (breeding season)
    d) Check baits regularly and replace taken baits during treatment
    e) Collect and dispose of unused baits after treatment

Feral Pigs

a) Establish bait stations near known areas of Feral Pig occupation (wallows, tracks, feeding areas, etc)
b) Establish a pre-feed program over several months with small, strategically placed piles of grain or other food-stuffs

c) Create muddy or sandy swept pads to identify if Feral Pigs are eating the pre-feed

d) Over months gradually reduce bait stations to encourage Feral Pigs to feed from only a couple of points (or one central point if possible)

e) Place baits at bait stations in clusters and monitor uptake daily and replace taken baits until uptake ceases

f) Collect and dispose of unused baits after treatment

Native Vegetation Re-establishment

Revegetation

1. Provenance plant nursery engaged to collect, propagate and supply locally endemic plants as tube stock
2. Petrol-driven augur used to dig holes
3. Planting to be carried out in August or September, ideally on a cool day and after rain
4. Plants to be planted with fertiliser pellets. One pellet per plant
5. Plants are to be planted slightly below the surrounding surface, so that the 'dish' created around the plant collects and pools water
6. Plants to be watered on the day of planting and twice in the following week
7. Tree-guards are to be installed

Re-introduction of Logs

The reintroduction of logs will occur through time. Logs are not to be sourced from the Biobank site. No logs are to be removed from the Biobank site.

Appendix D: Annual Works Programs

The following works program will be implemented on the Biobank site. Note that management has been staged to occur in three management periods as follows:

- Management Period 1 – Years 1 to 3 (2012/13-2015/16) (**Table 13**)
- Management Period 2 – Years 4 to 6 (2016/17-2018/2020) (**Table 14**)
- Management Period 3 – Years 7 to 9 (2020/21-2022/23 (**Table 15**)

Management actions have been presented as near as possible to a chronological project staging from top to bottom. Many tasks will overlap in their predicted time-frames.

Table 13: Works Program Years 1 - 3

Management Zone	Management Theme	Action Description	Performance Measure (by end of period)	Comments
All	Stock Exclusion	Erect stock proof fencing	6 km of new fencing erected in the first three years	
All	Stock Exclusion	Stock exclusion	Exclusion of stock for Period 1	Stock grazing is completely removed other than in MZ1 prior to African Love Grass Control
All	Control of Feral and/or over-abundant native herbivores	Rabbit control	Annual control program implemented (or more frequently if required) as determined by quarterly inspections and monitoring of rabbit activity	Rabbit control undertaken annually in Summer (as required) and opportunistic warren destruction
All	Control of Feral and/or over-abundant native herbivores	Feral Goat Trapping	Four trapping periods implemented per year	Four trapping periods per year for the first three years
All	Vertebrate Pest management	1080 baiting and shooting of pigs	Feral Pig trapping three times per year for three years	Four trapping periods per year.
All	Vertebrate Pest Management	1080 baiting for Fox Control	Fox baiting undertaken twice annually. Success determined by participation of neighbouring landowners.	Effectiveness of baiting needs to be considered on a landscape scale.
All	Retention of Timber	Retain on-site timber	Demonstrated in photo monitoring points	
MZ1 – Low Density Weeds (194.3 ha)	Consol Grass Control	Targeted Control of Consol Grass via selective herbicide during summer.	Primary removal of Consol Grass in first four years.	Control techniques to be monitored for success prior to applying broadly across MZ1
MZ1 – Low Density Weeds (194.3 ha)	Weed Control	Primary treatment of African Boxthorn, spot spray Noogoora Burr and Horehound and dig out Prickly Pear and dispose of waste of site.	Primary removal of mature Prickly Pear and control of mature African Boxthorn in first three years.	African Boxthorn controlled by the cut and paint method, Prickly Pear to be dug out and disposed off site. Horehound and Noogoora Burr to be spot sprayed using a non-selective herbicide.
MZ2 – Low Density Weeds (87.4 ha)	Weed Control	Primary treatment of African Boxthorn, spot spray Noogoora Burr and Horehound and dig out Prickly Pear and dispose of waste of site.	Primary removal of mature Prickly Pear and control of mature African Boxthorn in first three years.	African Boxthorn to be controlled by the cut and paint method, Prickly Pear to be dug out and disposed off site. Horehound and Noogoora Burr to be spot sprayed using a non-selective herbicide.
MZ3 – very Low Density Weeds (1025.7 ha)	Weed Control	Primary treatment of African Boxthorn and dig out prickly pear and dispose of waste of site.	Primary removal of mature Prickly Pear and control of mature African Boxthorn in first three years.	African Boxthorn to be controlled by the cut and paint method, Prickly Pear to be dug out and disposed off site.
MZ1 – Low Density Weeds (194.3 ha)	Weed Control	Secondary treatment (selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year three.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ2 – Low Density Weeds (87.4 ha)	Weed Control	Secondary treatment (selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 3.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ3 – very Low Density Weeds (1025.7 ha)	Weed Control	Secondary treatment (selective herbicide spray) of African Boxthorn and Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 3.	Regrowth of African Boxthorn to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ 1 & 2	Control of Feral and/or over-abundant native herbivores & Restore a Natural Flows Regime	Remove watering points for feral herbivores, use bull dozer to fill in dams	All dams except No. five have been filled in.	
MZ 1 & 2	Soil Erosion	Stabilise in filled dams using a sterile rye crop	Cover crop has established and there is no active erosion occurring.	
All Zones	Human Disturbance	Trail Maintenance	All tracks navigable by 4WD vehicle to allow management	

Management Zone	Management Theme	Action Description	Performance Measure (by end of period)	Comments
All	Reporting	Implementation and explanation of daily and annual reporting procedures and protocols	Landowner aware of reporting responsibilities Reporting protocol agreed between landowner and OEH	Daily, quarterly and annual report protocol recommended. Daily and quarterly reports to be map-based proformas with tables for work effort, herbicide use, plants, plan for next visit/quarter etc. Annual report to incorporate aforementioned but also photos, recommendations and plan for next year. Must meet OEH biobanking requirements.
All	Reporting	Preparation of annual reports	Quarterly inspection/monitoring and annual reports prepared and submitted to OEH/DSEWPaC	
All	Reporting	Review of proposed management actions for Period 2	Management of site refined and submitted to OEH for endorsement prior to commencement of Period 2.	

Table 14: Works Program years 4 - 6

Management Zone	Management Theme	Action Description	Performance Measure (by end of period)	Comments
All	Stock Exclusion	New fence line to replace stock proof fence	4 km of stock proof fencing established over years 4 and 5	
All	Stock Exclusion	Maintain stock proof fencing	Fencing maintained	
All	Human Disturbance	Remove all internal fences	All internal fences removed by end of yr 3.	Estimated that there are 10km of internal fences
MZ1 & 2	Control of Feral and/or over-abundant native herbivores	Rabbit control	Annual control program implemented (or more frequently if required) as determined by quarterly inspections and monitoring of rabbit activity	Rabbit control undertaken annually in Summer
All	Control of Feral and/or over-abundant native herbivores	Feral Goat trapping and removal costs	Annual trapping program implemented per year	Trapping undertaken once per year. Trapping undertaken will be dependent on success of previous trapping programme.
All	Control of Feral and/or over-abundant native herbivores	Aerial Shooting Feral Goats (with NPWS)	Funds contributed to NPWS to undertake annual aerial cull of feral goats	Shooting undertaken opportunistically. No cost.
All	Vertebrate Pest management	1080 baiting of pigs and opportunistic shooting	Feral pig trapping/baiting and opportunistic shooting undertaken.	Undertake baiting once per year. Success of baiting is dependent on Pig control at a landscape scale (**Appendix 3**).
All	Vertebrate Pest Management	1080 baiting for Fox Control	Baiting undertaken twice annually	Effectiveness of baiting needs to be considered on a landscape scale.
All	Retention of Timber	Retain on-site timber	Demonstrated in photo monitoring points	
MZ1 – Low Density Weeds (194.3 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ2 – Low Density Weeds (87.4 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ3 – Very Low Density Weeds (1025.7 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn and Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out.
MZ! -Revegetation	Enhancement Planting	Enhancement planting of ground cover grasses in yrs 5-6 if natural regeneration not adequate		
MZ1 – Revegetation if no natural regeneration occurs (194.3 ha)	Revegetation	Revegetate with over storey plants using tube stock including fertiliser pellets, tree guards and watering twice. Allow 50% loss (7,735 plants)	50% loss of plantings is acceptable. Additional plantings will only be undertaken if success rate is less than 50%.	Only to be undertaken if natural regeneration is not occurring. Cost includes seed collection, propagation, supply, planting, fertiliser pellets, tree guards and watering twice. All seed must be collected from provenance stock from plants on the property. Plants to be planted in September.
MZ2 – Revegetation if no natural regeneration occurs (87.4 ha)	Revegetation	Revegetate with over storey plants using tube stock including fertiliser pellets, tree guards and watering twice. Allow 50% loss (3,496 plants)	50% loss of plantings is acceptable. Additional plantings will only be undertaken if success rate is less than 50%.	Only to be undertaken if natural regeneration is not occurring. Cost includes seed collection, propagation, supply, planting, fertiliser pellets, tree guards and watering twice. All seed must be collected from provenance stock from plants on the property. Plants to be planted in September.
All Zones	Human Disturbance	Trail Maintenance	All tracks navigable by four wheel drive (4WD) vehicle to allow management	
All	Reporting	Preparation of annual reports	Quarterly inspection / monitoring and annual reports prepared and submitted to OEH/DSEWPaC	
All	Reporting	Review of management plan for Period 3	Management of site refined and submitted to OEH for endorsement prior to commencement of Period 2.	

Table 15: Works Program years 7 - 9

Management Zone	Management Theme	Action Description	Performance Measure (by end of period)	Comments
All	Stock Exclusion	Maintenance cost of stock proof fencing	Fencing maintained and stock excluded	1/20th replacement cost.
All	Human Disturbance	Remove all internal fences	Undertake internal fences removal from years 6-10	Estimated that there are 10km of internal fences
All	Control of Feral and/or over-abundant native herbivores	Rabbit control	Annual control program implemented (or more frequently if required) as determined by quarterly inspections and monitoring of rabbit activity	Rabbit control undertaken in early summer
All	Control of Feral and/or over-abundant native herbivores	Feral Goat trapping and removal costs	Annual trapping program implemented per year	Trapping undertaken once per year. Trapping undertaken will be dependent on success of previous trapping programme
All	Control of Feral and/or over-abundant native herbivores	Aerial Shooting Feral Goats (with NPWS)	Funds contributed to NPWS to undertake annual aerial cull of feral goats	Shooting undertaken opportunistically. No cost.
All	Vertebrate Pest management	1080 baiting of Feral Pigs and opportunistic shooting	Feral pig trapping/baiting and opportunistic shooting undertaken.	Effectiveness of baiting needs to be investigated if not conducted on a landscape scale (**Appendix 3**)
All	Vertebrate Pest Management	1080 baiting for Fox Control	Baiting undertaken twice annually	Effectiveness of baiting needs to be considered on a landscape scale
All	Retention of timber	Retain on-site timber	Demonstrated in photo point monitoring	
MZ1 – Low Density Weeds (194.3 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out
MZ2 – Low Density Weeds (87.4 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn, Noogoora Burr and Horehound plus treatment of Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn, Noogoora Burr and Horehound to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out
MZ3 – Very Low Density Weeds (1025.7 ha)	Weed Control	Secondary treatment (non-selective herbicide spray) of African Boxthorn and Prickly Pear.	Weeds reduced <5% projected foliage cover of weed species by the end of Year 6.	Regrowth of African Boxthorn to be controlled using non-selective herbicide i.e. glyphosate. Prickly Pear to be dug out
MZ1&2 - Revegetation	Supplementary Planting	Undertake supplementary over-story and mid-story plantings in yrs seven to nine if success < 50%	50% success rate of supplementary planting	
All Zones	Human Disturbance	Trail Maintenance		
All	Reporting	Preparation of annual reports	Annual reports prepared and submitted to OEH/DSEWPaC	
All	Reporting	Review of proposed management actions for Year 10 onwards	Management of site refined and submitted to OEH for endorsement.	

Appendix E: Biobank Agreement Annual Report Template

Biobank site annual report					
Location details					
Biobanking agreement ID: OEH to insert Reporting date: dd/mm/yy			Name of landowner/s: name/s Property address: address		
Records of management actions undertaken					
Management action	**Required completion time and frequency**	**Action completed (Yes/No)**	**Actual completion date/s**	**Description of actions undertaken** (including where undertaken, any variations and the reasons for variation)	**Visual observations and other comments** (including reasons for non completion)
1 Management of grazing for conservation					
2 Weed control					
3 Management of fire for conservation					
4 Management of human disturbance					
5 Retention of native vegetation					

6	**Planting or seeding**					
7	**Retention of dead timber**					
8	**Erosion control**					
9	**Retention of rocks**					
10	**Control of feral and overabundant native herbivores**					
11	**Vertebrate pest management**					

Incident or event that has adverse effect on biodiversity values on biobank site

Incident or event (including adverse impacts e.g. natural events)	**Action taken and proposed recommended actions**

Records submitted with this report

☐ Photographs taken at the photo points set in the Biobanking agreement.

☐ Results of the inspections required to be conducted in clause 1.2 of Annexure D to the Biobanking agreement.

☐ Results of any monitoring, inspections or surveys required in Annexures C and D to the Biobanking agreement.

Annual landowner contribution payment (tick one)

☐ I authorise OEH to receive a direct payment of an annual landowner contribution fee of $1,122 from the next management payment made from my biobank site account by the BioBanking Trust Fund

☐	I have attached a payment of the annual landowner contribution fee of $1,122 to this report
☐	I have attached an application to waiver the annual landowner contribution fee Note: the annual contribution by the landowner of a Biobank site can only be waived by the Minister where (a) the owner of the Biobank site has not sold any of the biodiversity credits created for the site, or (b) there are insufficient funds in the Biobank site account relating to the Biobank site to meet the next scheduled management payment when it becomes payable.
☐	I have attached a request to extend the time for payment of the annual landowner contribution fee

Signature and certification

I hereby declare that the information supplied in this report is accurate and complies with the reporting requirements under clause 2 of the Annexure D to the Biobanking agreement.

Note: If the land that forms the Biobank site is owned by multiple persons, each landowner must sign this annual report.

Signed	Signed
Date	Date

Appendix F: Biobank Site Visual Inspection Pro-forma

Who: **Date of Inspection:**

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Whitehaven Regional Biobank Site				
Evidence of disturbance (provide details)				
Physical condition of fencing and gates				
Evidence of erosion (e.g. sheet, rilling, gullying etc.)				
Presence of. weeds				
Evidence of feral animals and pests				
Presence of over-storey regeneration (Y/N)				
Presence of mid-storey regeneration (Y/N)				
Presence of understorey establishment (Y/N)				
Evidence of flowering in Eucalyptus albens				
Grazing pressure from over abundant native herbivores				

INSPECTION ITEM	PHOTO NO.	CO-ORDINATES	COMMENT	ACTION COMPLETED
Stock grazing pressure (measure of native ground cover and rejuvenating native plants)				
Evidence of contamination or other limitations to vegetative establishment (e.g. surface crusting, nutrient deficiency)				

Appendix G: Photo Monitoring Points

WBO 1

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 2

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 4

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

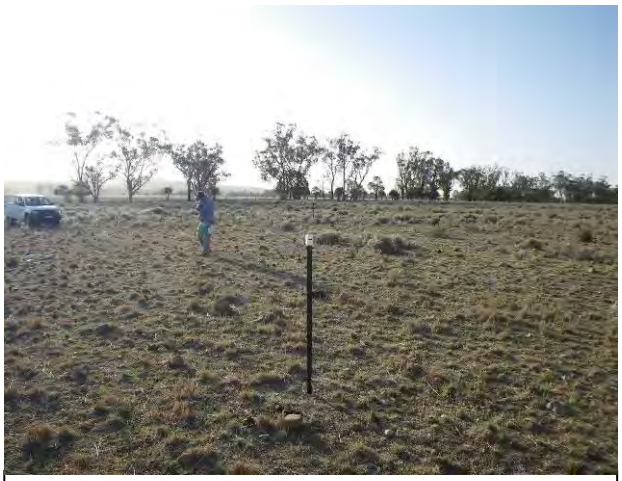


Plate 4. South East Corner

WBO 5

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 8

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 9

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 10

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 11

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 12

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 14

Plate 1. North West Corner

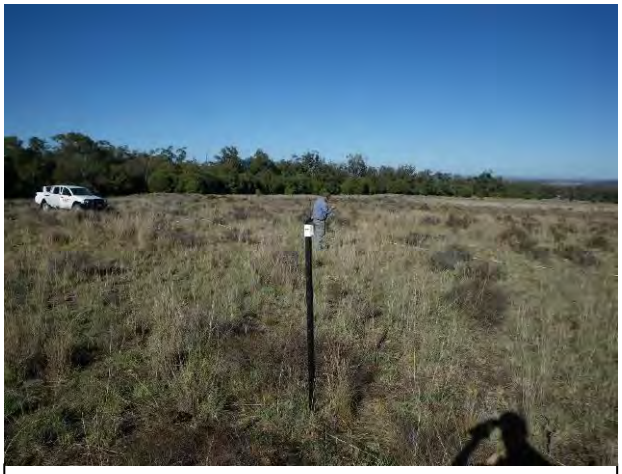


Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 15

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 17

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 20

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 21

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 22

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 23

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 24

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 26

Plate 13. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 27

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 30

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 35

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 38

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

WBO 40

Plate 1. North West Corner

Plate 2. North East Corner

Plate 3. South West Corner

Plate 4. South East Corner

Appendix H: Template for Weed Control

Template for reporting of monitoring activities		
Management zone/s	**Date**	**Observations and assessment of monitoring** This table must include the information for each zone (or groups of zones) which is described in the table titled 'monitoring and inspections of existing and new weeds'.

Diary template for weed control management			
Date	**Management zone/s**	**Description and type of activity undertaken** (e.g. weed control, observation)	**Minor variations** (details and reasons)

Appendix I: Template for Fire Management Activities

Template for reporting of monitoring activities		
Management zone/s	**Date**	**Observations and assessment of monitoring**

Diary template for fire management activities			
Date	**Management zone/s**	**Description of activity undertaken or observation made**	**Minor variations** (details and reasons)

Appendix J: Template for Pest Management Activities

Template for reporting of monitoring activities			
Management zone/s	**Date**	**Current level of impact on vegetation** This column must record impact as Negligible, Minimal, Moderate or High	**Observations and assessment of monitoring**

Diary template for feral and overabundant herbivore management			
Date of activity	**Management zone/s**	**Description and type of activity undertaken** This column must include details of the feral and overabundant herbivores targeted, control techniques applied and numbers controlled.	**Minor variations** (details and reasons)

Appendix K: Review Pro-forma

BOMP SECTION	CLAUSE	COMPLIANT	EVIDENCE/COMMENT	RECOMMENDATION
3.3.1	Manage access & human disturbance • Rubbish dumping • Timber removal/clearing			
3.3.2	Retention of regrowth and remnant vegetation			
3.3.3	Retention of Dead Trees			
3.3.4	Exclusion of Grazing stock • No stock present • Fence Maintenance			
3.3.5	Weed Control • MZ1 • MZ2 • MZ3			
3.3.6	Bushfire Mgt • Annual slashing of firebreaks • Prescribed Fire • Fire Fighting Equipment			
3.3.7	Erosion and Sedimentation Control (if required)			
3.3.8	Soil and Water Management (if required)			
3.3.9	Retention of Rocks			

3.3.10	Vertebrate Pest Management • Foxes (1080 baiting) • Rabbits (warren destruction, baiting if required) • Cats (shooting and/or trapping) • Pigs (shooting & trapping) • Goats (trapping/shooting) • Kangaroos			
3.3.11	In fill plantings • MZ2 (if natural regeneration insufficient)			

Appendix L: GIS shapefiles

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