

APPENDIX 1

MT ARTHUR COAL FAUNA SURVEY REPORT (NICHE, 2012)




MOUNT ARTHUR COAL

FAUNA SURVEY REPORT

October 2012

DOCUMENT CONTROL

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Front Cover Photograph: Thick-tailed Gecko - *Underwoodisaurus milii* adjacent to the study area.

EXECUTIVE SUMMARY

Niche Environment and Heritage Pty Ltd was commissioned to conduct a fauna survey for areas potentially subject to future expansion of open cut coal mining activities at the Mount Arthur Coal Mine owned by BHP Billiton - Mount Arthur Coal.

The purpose of this study is to provide baseline data and mapping of the fauna values within the proposed mining areas and surrounds.

A fauna survey using a range of methods to target threatened species was carried out over five days in early May 2012. The survey, together with a review of relevant databases for threatened species, informed the list of threatened fauna with the potential to occur within the study area.

A total of 77 vertebrate species were recorded during the field surveys, comprising 44 birds, 25 mammals (including six introduced species), five reptiles and three frogs.

Two threatened species were recorded during the fauna survey: the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Eastern Freetail-bat (*Mormopterus norfolkensis*). The Grey-headed Flying-fox was recorded at five locations within the study area, while the Eastern Freetail-bat was recorded once during the survey. A further three bat species, the Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern Cave Bat (*Vespadelus trouhntoni*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), may have been recorded but call recordings from these species were not of sufficient quality to be certain.

Remnant woodland vegetation within the study area is in moderate to good condition. Fauna habitat throughout the study area has varied conservation importance for threatened fauna species, with the largest patches of remnant vegetation around Mount Arthur providing the greatest conservation value relative to other parts of the study area.

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1 INTRODUCTION

1.1 Background

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Resource Strategies on behalf of Mt Arthur Coal to conduct fauna surveys for areas associated with expansion of open cut coal mining activities at the Mount Arthur Coal site. The study areas are adjacent to existing mining activities or approved mining areas at the Mount Arthur site, which is located approximately 10 kilometres (km) south of Muswellbrook in the Hunter Valley, New South Wales (NSW) (Figure 1).

This fauna survey was conducted concurrently with vegetation mapping surveys across the proposed sites (Hunter Eco, 2012). This report does not contain any discussion or evaluation of potential impacts on threatened fauna for any future development scenario.

1.2 Objectives

The purpose of this study is to provide baseline data and mapping of the fauna values within the study area.

The key objectives of this report are to:

- Describe the fauna and fauna habitats within the study area; and
- Describe and map threatened fauna species or populations listed on the NSW *Threatened Species Conservation Act 1995* (TSC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act) that are known or likely to occur within the study area.

2 METHODS

2.1 Review of Materials

Aerial photography was examined prior to survey to identify habitat types for fauna and determine stratification units for survey design. Two dominant habitat classes were found to occur within the study area comprising Grassy Woodland and Riparian Woodland. There was also a large amount of open grassland.

Database searches, consisting of 10 km searches around the study area (bounding coordinates used: 150.87, -32.205; 151.02, -32.35; 150.84; -32.49; 150.70; -32.35) were conducted in May 2012 to produce a list of potentially occurring threatened and migratory species. The following databases were used:

- NSW National Parks and Wildlife Service Atlas of NSW Wildlife (NSW Office of Environment and Heritage, 2012); and
- Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) Protected Matters Search Tool (SEWPaC, 2012).

2.2 Field Survey

A preliminary site inspection and deployment of bat echolocation recording devices was conducted on 1st of May 2012, with the remainder of field surveys undertaken the following week from 7th of May to 11th of May 2012. The survey design targeted threatened species previously found within 10 km of the study area and with a reasonable chance of occurring on the basis of available habitat types.

Three study areas were surveyed, namely: Study Area A, Study Area B and Study Area C (which comprised three separate areas). The location of the study areas are shown on Figures 1 and 2.

Field surveys incorporated targeted survey using established survey techniques (Table 1) and were based upon: the *Draft Threatened Biodiversity Survey and Assessment Guidelines* (NSW Department of Environment and Conservation [DEC], 2004); *Threatened Species Survey and Assessment Guidelines: Field Survey Methods for Fauna Amphibians for Development and Activities* (NSW Department of Environment, Climate Change and Water, 2009); Commonwealth Department of the Environment, Water, Heritage and the Art (2010a, 2010b, 2010c) survey guidelines for Australia's threatened bats, birds and frogs; and SEWPAC's (2011a, 2011b) survey guidelines for Australia's threatened mammals and reptiles. Opportunistic observations and broad habitat assessments were also performed throughout the study area. Targeted survey procedures and effort are presented in Table 1 and Table 2, respectively.

Targeted survey methods were positioned to include the main habitat types within the study area and maximise spatial coverage. There was a slight bias towards more mature aged forest within the study area so that traps were close to important micro-habitat features such as hollow-bearing trees and hollow logs. Only bird surveys and incidental recordings incorporated grassland habitat.

In addition to targeted survey, incidental searches and observations of fauna use of the study areas were made within each habitat type by examining scats, scratches and other indirect evidence.

Table 1: Targeted fauna survey methods at HVO Proposed Southern Project

Method	Details
Arboreal Elliot trapping	Target fauna - gliders. Elliot B traps were placed along each of four trapping transects. Elliot traps were mounted to trees on a wooden shelf approximately 2 metres (m) above the ground. Traps were baited with a mixture of honey, oats and peanut butter, with creamed honey smeared at the back of the trap. A honey mixture was regularly sprayed on the tree around the trap. Traps were checked each morning and any captured animals were identified and released at the site of capture.
Infra-red camera traps	Target species - Spotted-tailed Quoll and other terrestrial species. Four motion sensing camera traps were placed at ground level at each of four trapping sites. A PVC tube baited with sardines and a mixture of honey, oats and peanut butter was placed in front of the camera traps. Upon recovery, the pictures were individually analysed and animals were identified to the lowest possible taxonomic level.
Hair tubes	PVC hair tubes were attached to trees with packing tape or secured under logs or other debris on the ground. Double sided tape was only adhered to the upper and lateral inner surface of the tubes so as to limit the incidence of 'by catch'. Tubes were baited with sardines (half of the ground tubes) or a mixture of honey, oats and peanut butter (remaining half of ground tubes and all tree tubes). Hair samples were sent to Barbara Triggs for analysis.
Ultrasonic call recording for bats	Three Wildlife Acoustics SM2 Bat detector units were deployed at six sites over ten days along identified potential flyways.
Diurnal bird surveys	2 hectare (ha) bird surveys were conducted across the study area for at least 20 minutes at a time. Birds were identified with the use of 10 X 42 binoculars or from their calls. Where possible surveys were conducted as close as possible to dawn or dusk when bird activity is greatest.
Spotlighting	Spotlighting surveys targeting owls and arboreal mammals were performed predominantly on foot or via a vehicle along roads and tracks.
Call playback	Target species - Powerful Owl, Barking Owl, Masked Owl, Squirrel Glider and Koala. Call-playback sites were established across the study area to enable maximum coverage. After an initial listening period of five minutes calls of the target species were broadcast through a 10 watt megaphone for two - five minutes followed by a five minute listening period and a two minute period of spotlighting.
Stag watching	Stag watches were performed prior to dusk at identified potential owl or mammal nesting/roosting trees or stags.
Koala scat searches	A one hour search was conducted within identified Koala habitat as judged by the presence of favoured feed trees (<i>Eucalyptus tereticornis</i>). Each of the 30 trees were examined for scratches and a one minute search 1 m around the base of the tree was performed looking for scats. This was then repeated for a minute whilst combing through the leaf litter.
Herpetological surveys	Herpetological surveys included spotlighting around aquatic features during nocturnal survey and diurnal targeted searches under rocks, timber, logs and tree bark in identified potential habitat throughout the study area.
Frog chorus survey and aquatic habitat surveys	Frogs were listened for at farm dams and permanent and ephemeral drainage lines throughout the study area. Active searching for frogs using spotlights was also conducted around watercourses.

Table 2: Targeted fauna survey effort within the Mount Arthur modification study area

Survey Method	1 May 2012	7 May 2012	8 May 2012	9 May 2012	10 May 2012	11 May 2012	Total (Method/Site)	Total Effort (Method)
Effort Measured in hours								
Spotlighting								
Study Area A				0.5	1		1.5	9.25
Study Area A*				0.5			0.5	
Study Area B		0.75			1		1.75	
Study Area C (North/Central)		0.5					0.5	
Study Area C (East)		0.75			1.5		2.25	
Study Area C (Central)			1	0.75		1	2.75	
Call-playback and Stag watching								
Study Area A				1.25			1.25	6.5
Study Area B		0.75					0.75	
Study Area C (North)		0.5					0.5	
Study Area C (East)		0.75			1		1.75	
Study Area C (Central)			1.25	1			2.25	
Bird Survey								
Study Area A				0.75	0.5		1.25	6.25
Study Area B			0.5	0.75			1.25	
Study Area C (East)			0.75	0.75	0.75	0.5	2.75	
Study Area C (North)			0.5		0.5		1	
Koala SAT search (Study Area C)					1		1	

Table2: Targeted fauna survey effort within the Mount Arthur modification study area (Continued)

Survey Method	1 May 2012	7 May 2012	8 May 2012	9 May 2012	10 May 2012	11 May 2012	Total (Method/Site)	Total Effort (Method)
Effort measured in days/nights								
Infra Red Cameras								
Study Area A			4	4	4			60
Study Area B		4	4	4	4			
Study Area C (East)		4	4	4	4			
Study Area C (North)		4	4	4	4			
Tree-mounted Elliot Traps (B size)								
Study Area A			5	5	5			75
Study Area B		5	5	5	5			
Study Area C (East)		5	5	5	5			
Study Area C (North)		5	5	5	5			
Hair Tubes								
Study Area A			12	12	12			180
Study Area B		12	12	12	12			
Study Area C (East)		12	12	12	12			
Study Area C (North)		12	12	12	12			
SM2 Bat Echolocation Recorder								
Study Area A	6	1						30
Study Area B			1	1	1			
Study Area C (East)	6	1	1	1	1			
Study Area C (Central)	6	1	1	1	1			

KEY: * = Also included frog census.

2.3 Survey Conditions

The weather was predominantly warm with light breezes during the day followed by cool nights. Bureau of Meteorology records from Jerrys Plains, NSW are presented in Table 3.

Habitat assessments were conducted along each transect and other locations (Section 3.1; Figure 3 - Figure 5). Habitat characteristics and parameters that were assessed included:

- Aspect/slope of the site;
- Dominant vegetation, floristic composition and structure;
- Composition of ground layer (bare earth, litter etc.);
- Presence and relative abundance of key habitat features (e.g. tree hollows, large logs, exfoliating rock, flowering resources, aquatic features);
- Condition and disturbance factors; and
- Vegetation age structure.

Table 3: Weather conditions at Jerry’s Plains (20 km south of study area) during field survey

Date	Min temp (°C)	Max temp (°C)	Rainfall (mm)	9am Temp (°C)	9am wind dir.	9am wind speed (km/h)	3pm Temp (°C)	3pm cloud amount (oktas)	3pm wind dir.	3pm wind speed (km/h)
1/05/2012	4.5	24.5	0	13	E	2	23.5	3	E	2
2/05/2012	6	27	0	13.5	NE	4	26.5	4	WNW	6
3/05/2012	13	24	1.6	16	-	Calm	24	3	N	7
4/05/2012	8	23.5	0	12.5	NW	7	23	3	N	2
5/05/2012	5	24	0	12.5	-	Calm	21.5	2	S	2
6/05/2012	4.5	22	0	12	NW	11	21	1	NW	11
7/05/2012	5.5	22.5	0	10	-	Calm	21.5	7	NW	2
8/05/2012	4	24.5	0	11.5	NNW	7	23.5	0	NNW	2
9/05/2012	5.5	28	0	13.5	NW	9	27	0	NNW	4
10/05/2012	7.5	29.5	0	15	NW	7	28.5	0	NW	4
11/05/2012	7	29	0	15	NW	7	28.5	4	WNW	4

Source: Australian Bureau of Meteorology 2012

2.4 Limitations

The timing of this study (Autumn 2012) may have limited the potential for some frog species to be detected. However, good quality habitat for threatened frog species recorded from the locality (in particular Green and Golden Bell Frog - *Litoria aurea*) was absent from the study area. There was limited suitable habitat for threatened frog species yet the survey was outside of the calling periods for threatened frogs within the locality. Day searches were not considered as effective as night searches given the seasonality and target species.

Survey effort prescribed in the DEC's (2004) *Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities* was not employed for reptiles as threatened reptiles have not been recorded within the locality and potential habitat for threatened reptiles within the study area was limited.

3 RESULTS

3.1 Habitat Assessment and Description

Habitat within the study area is mixed, constituting derived grassland, forest and woodland. Derived grassland supported a mixture of native and exotic grass species and occurs within the study area due to historic clearing of woodland or forest habitats for agriculture. Habitat features and complexity within the existing grassland habitat is limited and generally favours a suite of common native fauna species rather than fauna of conservation significance. A sparse covering of scattered large trees throughout the grassland habitat adds some complexity in the form of canopy features, hollows, stags and logs, although such features are somewhat isolated. Habitat assessment results are provided in Appendix 1.

Woodland and forest vegetation patches cover approximately half of the study area and are variable in condition, structure and habitat features as a result of different disturbance regimes, topography and environmental factors. Habitat assessments were performed throughout six patches along or adjacent to fauna transects (Figures 3 to 5). A description of each of the vegetation patches investigated is shown in Table 4.

Table 4: Habitat assessment of example areas within remnant vegetation patches of the Mount Arthur proposed modification areas.

Habitat Description	Habitat Features/Location	Condition/Recovery Potential
1 – Drainage line with thick <i>Typha</i>	Thick <i>Typha</i> within the portion of the drainage line adjacent to transect within Area A. Potential watering point for a range of fauna. Limited aquatic habitat complexity/features.	Disturbed drainage line near top of catchment. Surrounding vegetation has moderate recovery potential in most areas. The currently altered hydrological regime of the watercourse will remain.
2 - Disturbed forest	Lowland forest around trapping transect of Area A. Moderately dense cover of large older growth trees to 25 m with recent patchy regrowth of mid-storey and understorey vegetation, but mostly native and exotic grasses. Frequent small to medium hollows in older trees. At least two large Spotted Gum and Ironbarks with large hollows (i.e. >30 cm). Occasional logs below larger trees. Some weed infestations present.	Moderate - some recovery of understorey and mid-storey components occurring. Weed invasions threaten in some patches of previous disturbance. Site is partially isolated by surrounding mining activities and agricultural land, depending on fauna mobility.
3 - Disturbed grassy woodland	Disturbed grassy woodland within Area B. Large scattered trees to 20 m over mixed native/exotic ground cover. Limited structural complexity/diversity of vegetation with understorey and mid-storey components largely absent except for some patches of regenerating Bulloke. Hollows present in most large mature trees ranging from small to large. Some logs beneath larger trees.	Poor/moderate - some apparent resilience with patches of regenerating shrubs. Large expanse of paddocks surrounding.

Table4: Habitat assessment of example areas within remnant vegetation patches of the Mount Arthur proposed modification areas (Continued).

Habitat Description	Habitat Features	Condition/Recovery Potential
4 – Forest	Spotted Gum - Grey Box forest around eastern trapping transect of Area C . Moderate-sized patch of mixed age forest with Spotted Gum to 1 m in diameter and 25 m height. Mid-storey of regenerating Eucalyptus. Good pulse of flowering. Patchy understorey with multiple shrub species present. Hollows common throughout at a range of sizes. Occasional large logs. Occasional mistletoe.	Good. Some apparent disturbance through previous clearing, but extent unknown. Recovering woodland with good habitat complexity.
5 – Grassy woodland	Example A - Mixed-age dense grassy woodland patch around northern trapping transect of Area C. Trees to 20 m high and 60 cm diameter. Few very old trees and hollows uncommon. Some regeneration of canopy species but lower strata components have limited cover and diversity. Example B - Mixed-aged open grassy woodland – Area C west of track with northern bat recorder. Hollows and logs uncommon. Limited floristic diversity or feeding resources. Predominantly native grass cover.	Moderate - with good recovery potential.
6 – Grassland	These areas constituted a mix of native and exotic grasses with occasional herbs or forbs. Cover of other vegetative layers such as understorey or canopy was absent or very sparse. These areas were generally highly disturbed and modified due to clearing and grazing.	Poor – with moderate or low recovery potential.
7 – Disturbed	Disturbed areas were generally roads or other infrastructure, or places where significant soil disruption including fill had occurred leading to weed domination.	Poor with very low recovery potential.

Within the remnant vegetation patches of the study area, the predominant habitat type is woodland, with taller forest remnants within Study Area A lacking canopy cover and consequently functioning as woodland or open woodland. The patch of Central Hunter Ironbark-Spotted Gum-Grey Box Forest along the eastern border of Study Area C was the major forest remnant investigated within the study area, which has retained its forest structure.

Larger and better consolidated woodland/forest habitats within the study area offer a variety of micro-habitat features for resident fauna. A high to moderate level of resilience of the different habitat types is apparent in most of the larger denser woodland patches, as evidenced by a moderate diversity of native ground cover and shrubs and a low cover of weeds.

Some regeneration of woodland/forest areas is evident within the study area over recent decades, most notably around Study Area C, with younger trees abundant in some areas coinciding with older remnant trees. The majority of tree hollows and large woody debris is associated with the scattered old remnant trees. Whilst grazing has continued on the site, stocking rates appear to be light and cattle tend not to access the larger patches of regenerating vegetation, leading to better habitat quality in those larger patches.

Mt Arthur Coal 2012 Modification

3.2 Aquatic Habitat Features

Aquatic habitat features within the study area were limited to small ephemeral streams and small farm dams within Study Area C. The ephemeral streams within Study Area C consist of 1st to 2nd order watercourses with an irregular, limited flow regime, being situated at the top of the catchment areas for Saddlers and Quarry Creeks. The low flow regime limits potential aquatic habitat features along the watercourses, although condition is moderate to good.

The drainage line that runs through Study Area A is part of Saddlers Creek and consists of a permanent shallow watercourse. Its catchment has partly been impacted by previous mining works to the east and north, but is largely cleared and used for agriculture. Habitat in this drainage line consists predominantly of thick *Typha* reed beds, with other aquatic macrophytes also present in places. There are no pools free of thick *Typha* growth. The farm dams throughout the study area offer limited habitat values, being largely devoid of aquatic vegetation or other habitat features, but provide a watering point for a range of terrestrial species.

3.3 Fauna

A total of 77 vertebrate species were recorded during the field surveys, comprising 44 birds, 25 mammals (including six introduced species), five reptiles and three frogs (Appendix 2). Most of these species are common and widespread throughout the locality and wider region, including within more disturbed habitats. There was a low diversity of woodland bird species and small native terrestrial mammals were not recorded. Marsupial diversity was very low and the species present were species that are generally common and widespread. Few reptiles were recorded, though targeted survey was limited to opportunistic searches through rocky habitat or around congregations of logs. Both of these habitats were rare within the study area and there were very limited areas of outcropping and exfoliating rock.

The faunal assemblage is likely indicative of the highly modified landscape and presence of introduced predators. The area around Study Area C comprises roughly 500 ha of land with small to medium sized patches of remnant vegetation (the largest approximately 60 ha) largely surrounded by open cut mining and agriculture. There are numerous pathways to the Mount Arthur area providing easy access for introduced predators. Expansive potential source areas for native species, such as Wollemi National Park occur approximately 10-15 km to the southwest of Mount Arthur, but connectivity to this areas is poor, particularly for terrestrial mammals vulnerable to predation.

3.4 Threatened Species

Two threatened species were recorded during the survey: Grey-headed Flying-fox (*Pteropus poliocephalus*) and Eastern Freetail-bat (*Mormopterus norfolkensis*). The Grey-headed Flying-fox was recorded at five locations within the study area, while the Eastern Freetail-bat was recorded once during the survey. A further three bat species may have been recorded but call recordings from these species were not of sufficient quality to be certain or else the calls overlap significantly with other species so that a definitive identification is not possible. These species were Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern Cave Bat (*Vespadelus troughtoni*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*).

Threatened animal species recorded or considered to have a moderate chance of occurring are all mobile species and moderately common within the region in their preferred habitats. These species are listed in Appendix 3. The threatened fauna species recorded within the study area and the co-ordinates where these species were recorded are listed in Table 5.

Table 5: Threatened fauna recorded within the study area

Species	Co-ordinates (GDA 94; MGA Zone 56)		Threatened Species Status ¹	
	Easting	Northing	EPBC Act	TSC Act
Grey-headed Flying-fox - <i>Pteropus poliocephalus</i>	299107	6417731	Vulnerable	Vulnerable
	299018	6417654		
	298396	6417445		
Eastern Freetail-bat - <i>Mormopterus norfolkensis</i>	299019	6417568	-	Vulnerable
	301052	6416618		
Eastern Bentwing-bat (<i>Miniopterus schreibersii oceanensis</i>)*	299019	6417568	-	Vulnerable
	298413	6417671		
	294659	6421162		
	301052	6416618		
Eastern Cave Bat (<i>Vespadelus troughtoni</i>)*	299061	6417594	-	Vulnerable
	294659	6421162		
	301052	6416618		
Eastern False Pipistrelle (<i>Falsistrellus tasmaniensis</i>)*	294659	6421162	-	Vulnerable

¹ Threatened species status under the TSC Act and/or EPBC Act (current as of 4 July 2012).

* Possible record.

4 CONCLUSION

A total of 77 vertebrate species were recorded during the field surveys, comprising 44 birds, 25 mammals (including six introduced species), five reptiles and three frogs.

Two threatened species were recorded during the fauna survey: the Grey-headed Flying-fox (*Pteropus poliocephalus*) and Eastern Freetail-bat (*Mormopterus norfolkensis*). The Grey-headed Flying-fox was recorded at five locations within the study area, while the Eastern Freetail-bat was recorded once during the survey. A further three bat species, the Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*), Eastern Cave Bat (*Vespadelus troughtoni*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*), may have been recorded but call recordings from these species were not of sufficient quality to be certain.

Remnant woodland vegetation within the study area is in moderate to good condition. Fauna habitat throughout the study area has varied conservation importance for threatened fauna species, with the largest patches of remnant vegetation around Mount Arthur providing the greatest conservation value.

5 REFERENCES

- Australian Bureau of Meteorology (2012). Accessed online, May 2012. <<http://www.bom.gov.au/climate/dwo/IDCJDW2066.latest.shtml>>.
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FIGURES

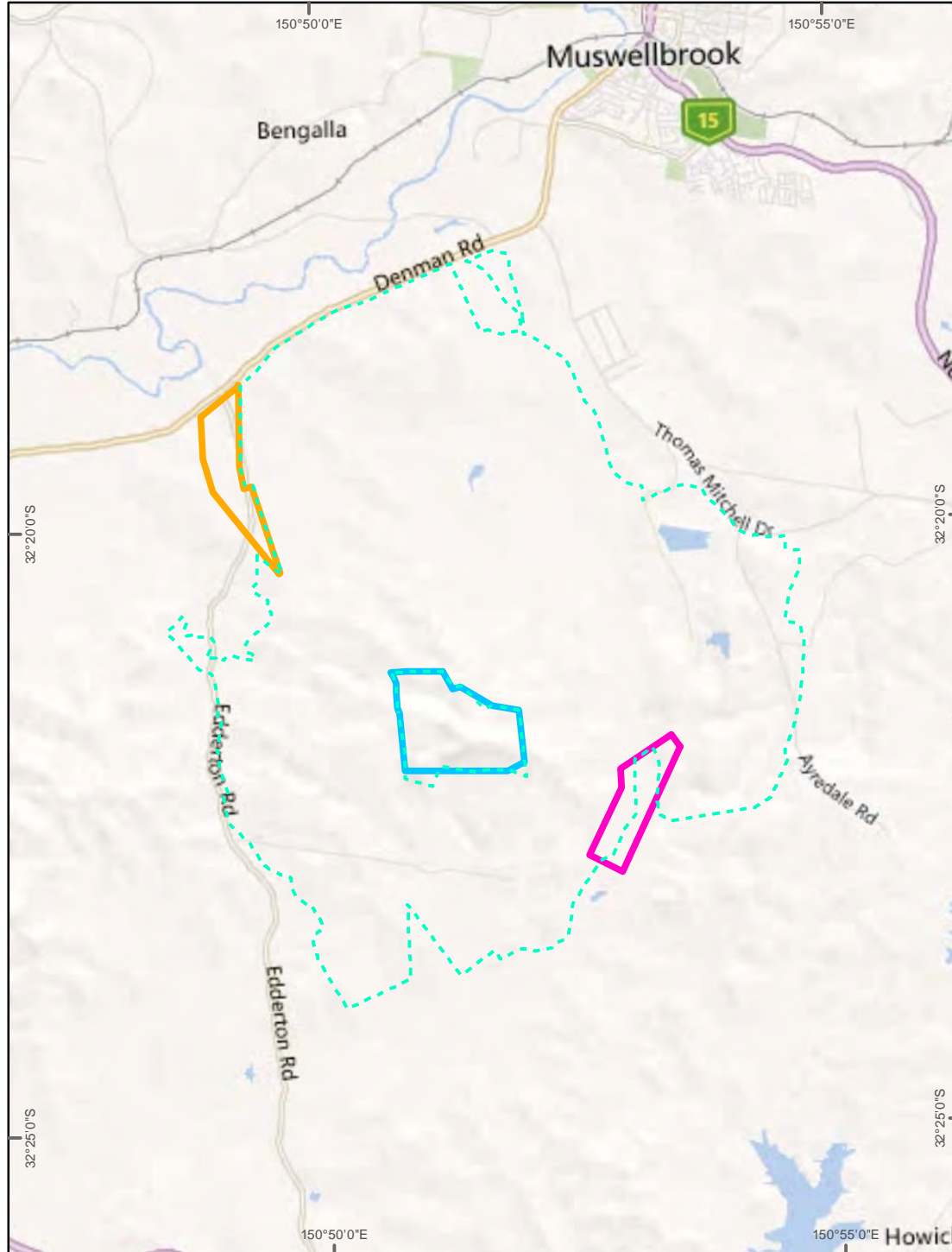
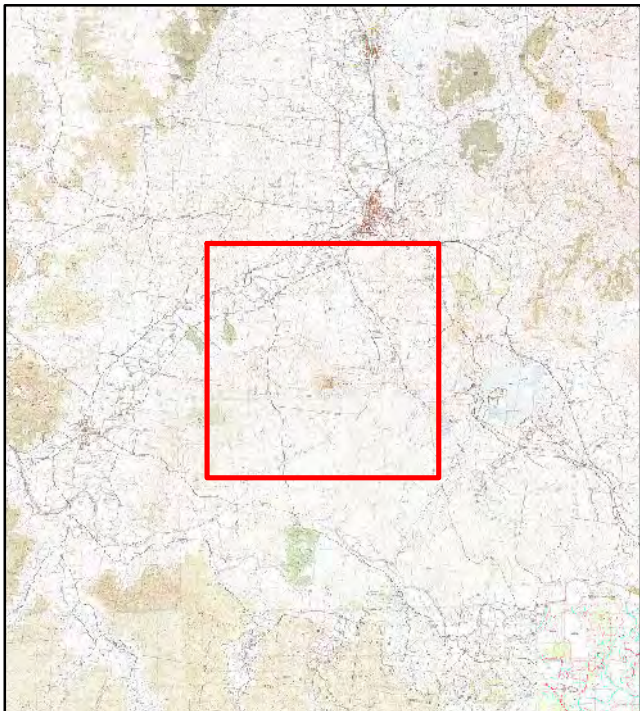
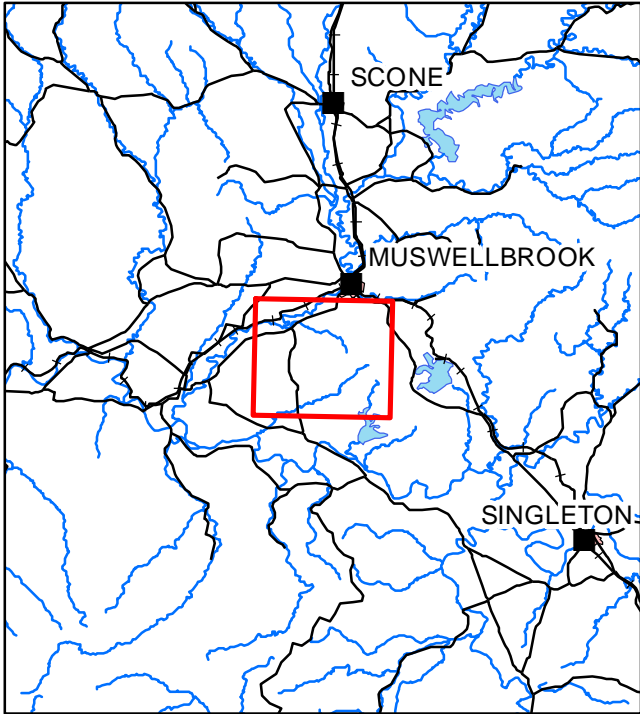


Figure 1: Location Map

Mount Arthur Open Cut Modification

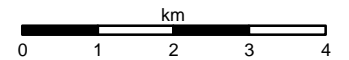
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Project Mgr: RH

Date: 6/07/2012

Approved Disturbance Area

Study Areas

-  Area A
-  Area B
-  Area C



niche
Environment and Heritage

Horizontal Datum:
GDA 1994 MGA Zone 56

Imagery: (c) 2010 Microsoft
and its data suppliers

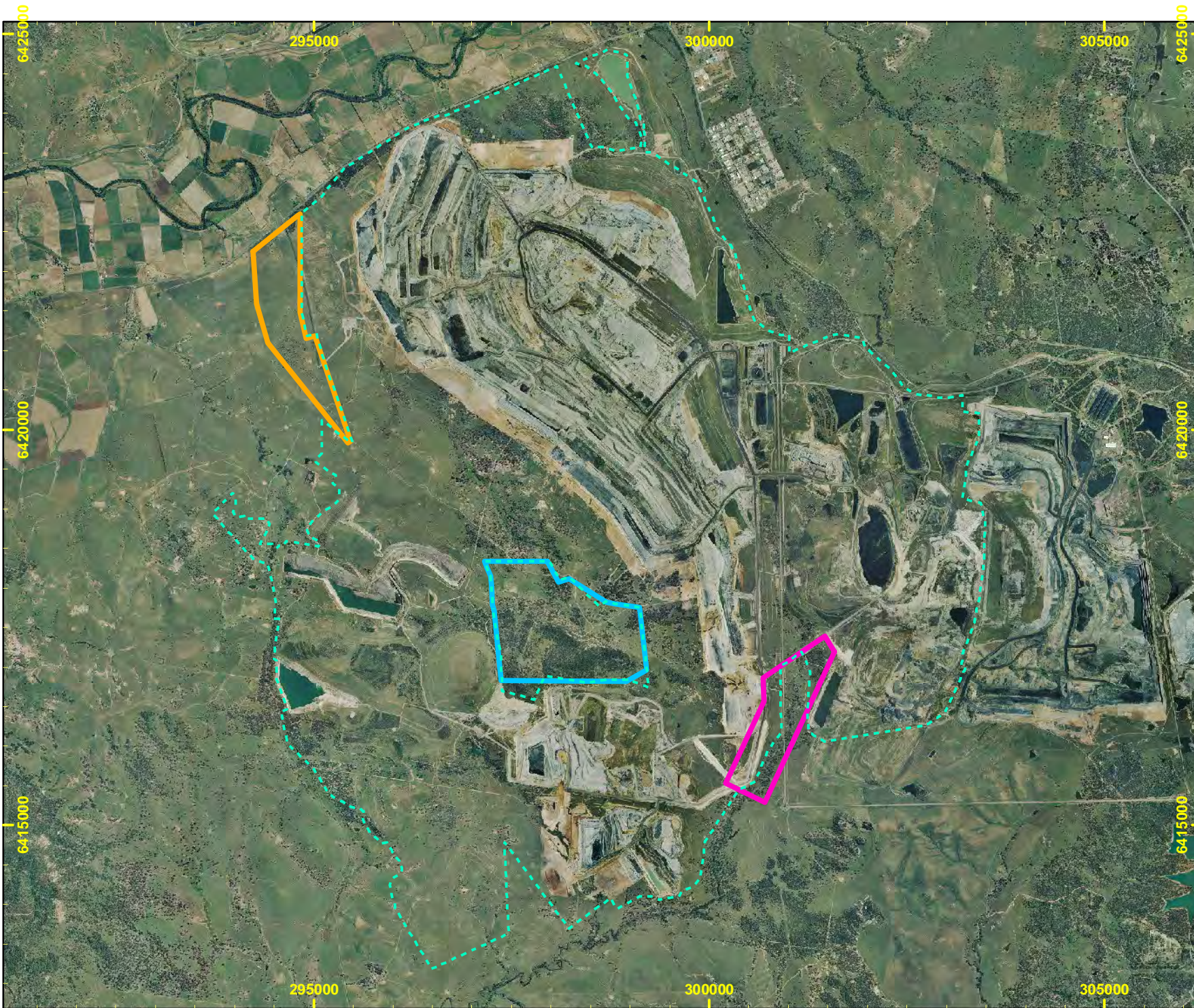


Figure 2: Site Map

Mount Arthur Open Cut Modification

Drawn by: RJ
Project Mgr: RH

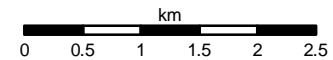
Date: 6/07/2012

Approved Disturbance Area



Study Areas

-  Area A
-  Area B
-  Area C



Horizontal Datum:
GDA 1994 MGA Zone 56

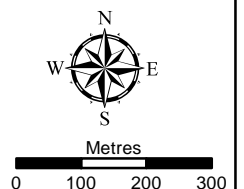
Imagery: (c) BHP



Figure 3: Fauna Habitat Type, Survey Methods and Threatened Species
Mount Arthur Open Cut Modification - Study Area A

Drawn by: RJ
Project Mgr: RH
Date: 23/10/2012

Imagery: (c) BHP



Horizontal Datum: GDA 1994 MGA Zone 56



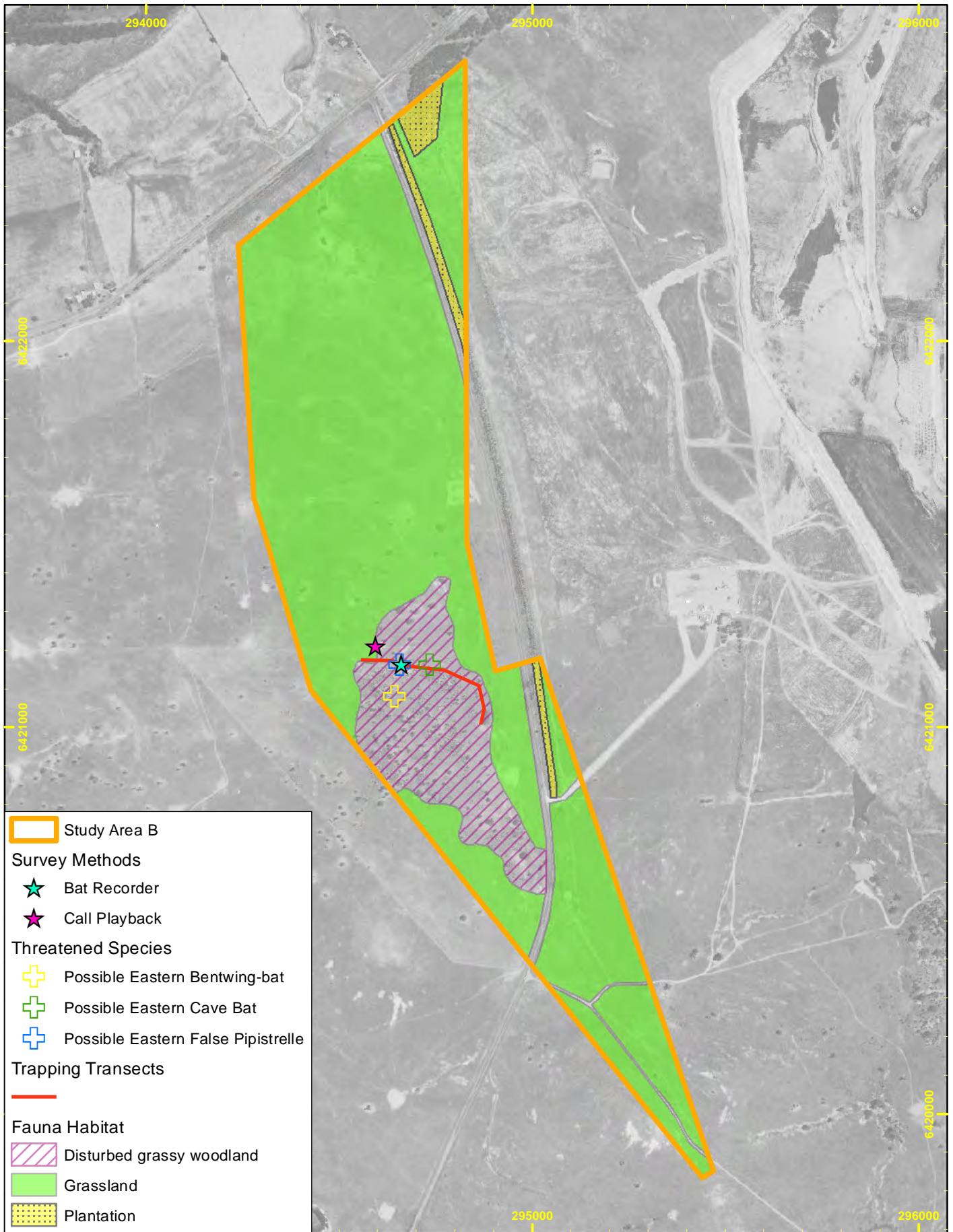
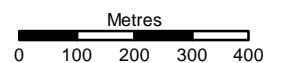


Figure 4: Fauna Habitat Type, Survey Methods and Threatened Species
 Mount Arthur Open Cut Modification - Study Area B

Drawn by: RJ
 Project Mgr: RH
 Date: 6/07/2012

Imagery: (c) BHP



Horizontal Datum: GDA 1994 MGA Zone 56

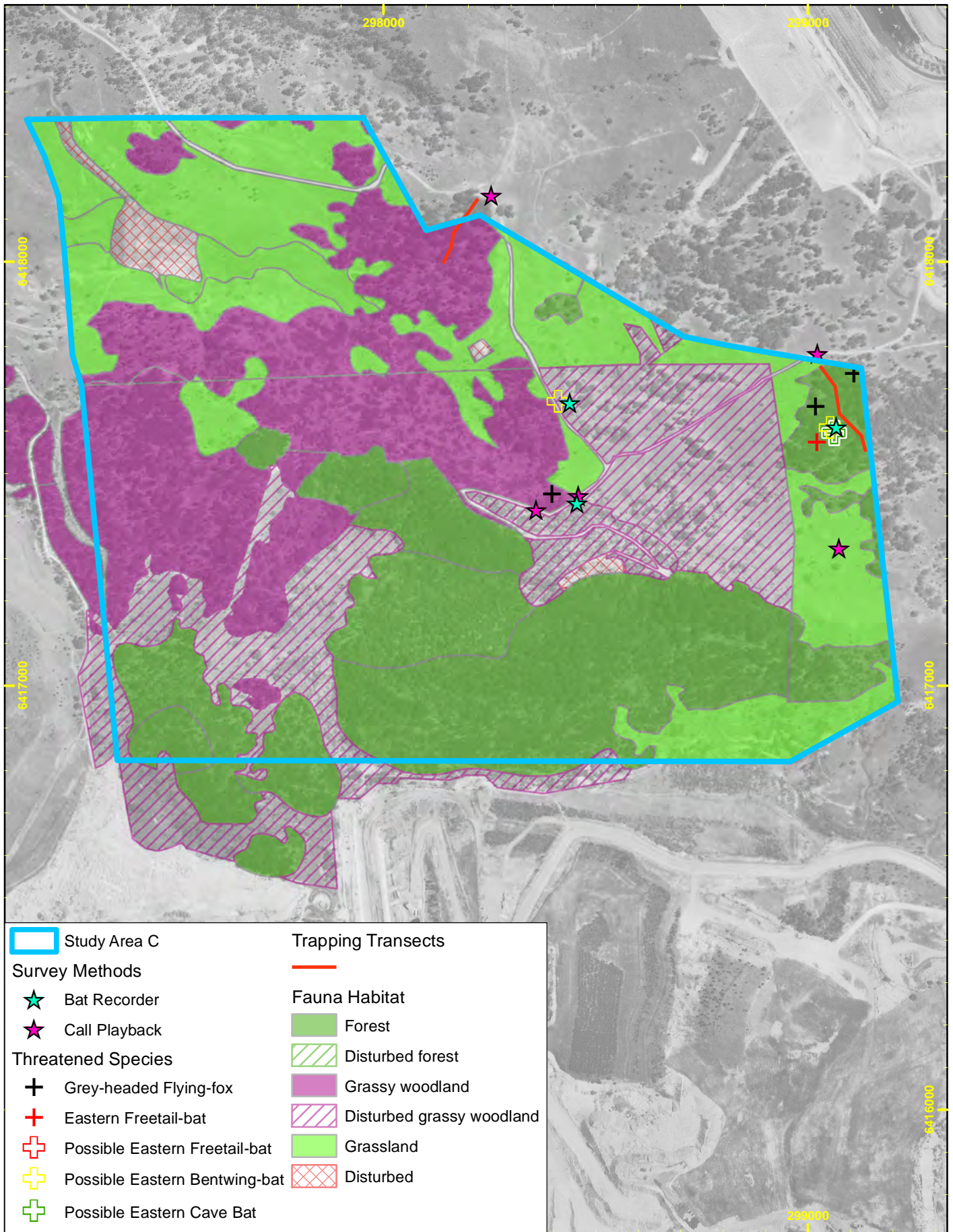
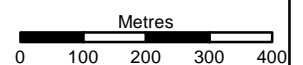


Figure 5: Fauna Habitat Type, Survey Methods and Threatened Species
Mount Arthur Open Cut Modification - Study Area C

Drawn by: RJ
Project Mgr: RH
Date: 23/10/2012

Imagery: (c) BHP



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Environment and Heritage

Horizontal Datum: GDA 1994 MGA Zone 56

APPENDICIES

Appendix 1: Habitat Assessment - Results

Habitat Assessment Sheet: Area A

Habitat Type: Disturbed Spotted Gum, Ironbark, Grey Box Forest

Central Coordinates: 150.885; -32.369

Locality/Geomorphology/Slope: Open depression with gently sloping sides and drainage line. Main drainage to south with east and west facing gentle slopes.

Broad Vegetation Description:

Canopy - moderately dense along transect but patchy throughout, height 20 - 25 metres (m), tree diameter at breast height (d.b.h.) to 1.2 m but more commonly 20 - 40 centimetres (cm). Some very large Narrow-leaved Ironbark (*Eucalyptus crebra*) and Spotted Gum (*Corymbia maculata*) outside of transect.

Midstorey - patchy - height 10 - 18 m. Sparse throughout but locally more dense amongst stands of regenerating trees. Predominantly regenerating *Acacia* spp., *Casuarina* spp. and *Eucalyptus* spp. canopy species.

Understorey - patchy to 2 m mixed native woody shrubs and occasional exotics.

Groundcover: cover 75 - 90%, Predominantly native grasses with occasional disturbance tolerant shrubs and forbs. Areas of exotic grasses (e.g. Coolatai Grass [*Hyparrhenia hirta*]) where previous soil disturbance has occurred mostly around edges. Areas of erosion scald.

Habitat Features:

Occasional tree hollows with larger trees supporting large hollows >30 cm, though these are rare. Occasional logs and woody debris associated with older trees.

Creek provides permanent aquatic habitat throughout with low diversity of aquatic habitat components - almost exclusively shallow water habitat with dense *Typha* growth. Occasionally additional macrophytes, but limited.

Disturbance: Modified vegetation due to degradation of all strata levels though moderate to good recovery potential with good recruitment. Requires management of Coolatai Grass. Past disturbance from cattle with some evidence of continued light disturbance from cattle and rabbits.

Habitat Assessment Sheet: Area B

Habitat Type: Disturbed Grassy Woodland. Paddocks with patchy regeneration and large remnant woodland trees.

Central Coordinates: 150.819; -32.328

Locality/Geomorphology/Slope: Open plain with gentle northerly aspect.

Broad Vegetation Description:

Canopy - sparse and patchy cover, height to 20 m tree d.b.h. to 1.2 m. Slaty Box dominated.

Midstorey - overall low cover with patchy stands of dense regeneration of Bulloke and Eucalyptus species. Height 5 - 10 m.

Understorey - sparse with occasional regenerating *Eucalyptus* spp. and woody shrubs.

Groundcover: moderately dense to dense cover of mixed native and exotic grasses.

Habitat Features:

Occasional hollows and large logs associated with large remnant trees; farm dams within area, but with poor habitat.

Disturbance: Predominantly cleared throughout with continued grazing at moderate levels.

Habitat Assessment Sheet: Area C (Transect 1)

Habitat Type: Spotted Gum-Grey Box Forest

Central Coordinates: 150.865; -32.360

Locality/Geomorphology/Slope: Moderately steep south facing hillslope.

Broad Vegetation Description:

Canopy - height to 25 m tree d.b.h. to 1 m. Spotted Gum (dominant) and Grey Box (*Eucalyptus microcarpa*).

Midstorey - height 10-18 m., moderately dense. Predominantly Spotted Gum.

Understorey - 25 - 50% cover of Blackthorn (*Bursaria spinosa*), Coffee Bush (*Breynia oblongifolia*), *Acacia* spp., species from the Santalaceae family, *Cassinia* spp. and *Notelaea* spp.

Groundcover: 50% cover of mixed native grasses, shrubs and herbs, moderately deep leaf litter patches.

Habitat Features:

Frequent medium and small hollows (<30 cm diameter) and also some nest boxes; surface rock rare becoming more common in gully; large logs common; ephemeral drainage line at bottom of gully with some small pools, but lack of permanent aquatic habitat and no instream macrophytes. Occasional mistletoe, stags and bare branches. Prolific flowering of some individual Spotted Gums.

Disturbance: Apparent previous selective clearing (particularly Ironbark species), but otherwise good condition with intact vegetation at all strata levels and moderate species richness. Limited current cattle disturbance.

Habitat Assessment Sheet: Area C (Transect 2)

Habitat Type: Grassy Woodland - derived community mixed age.

Central Coordinates: 150.855; -32.356

Locality/Geomorphology/Slope: Steep south-west facing slope from ridgetop extending into gully.

Broad Vegetation Description:

Canopy - height to 20 m; max tree d.b.h. 60 cm; Spotted Gum, Grey Box and Forest Red Gum (*Eucalyptus tereticornis*).

Midstorey - height 5 - 15 m Spotted Gum, Grey Box and Forest Red Gum.

Understorey - sparse and patchy Blackthorn and some regenerating canopy species.

Groundcover - Patchy, dominated by native grasses with some herbs shrubs and bare earth patches.

Habitat Features:

Hollows occasional, mistletoe common; logs occasional; stags uncommon; surface rock uncommon though becoming common on opposite side of gully; ephemeral creek at bottom of gully, though permanent pools absent; small farm dams near site.

Disturbance: Previous clearing.

Appendix 2: Fauna Recorded from the Study Area

Common Name	Scientific Name	Conservation Status ¹		Observation Type	Study Area A	Study Area B	Study Area C (North)	Study Area C (East)	Study Area C (Central)	Outside Sites
		TSC Act	EPBC Act							
Amphibians										
Common Eastern Froglet	<i>Crinia signifera</i>				x					
Smooth Toadlet	<i>Uperoleia laevigata</i>			H	x					
Verreaux's Frog	<i>Litoria verreauxii</i>			H	x	x			x	
Reptiles										
Thick-tailed Gecko	<i>Underwoodisaurus milii</i>			O					x	
Southern Rainbow-skink	<i>Carlia tetradactyla</i>					x				
Dark-flecked Garden Sunskink	<i>Lampropholis delicata</i>					x				
Lace Monitor	<i>Varanus varius</i>			CT				x		
Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>				x	x				
Birds										
Brown Quail	<i>Coturnix ypsilophora</i>									x
Nankeen Kestrel	<i>Falco cenchroides</i>				x	x	x			
Australian Hobby	<i>Falco longipennis</i>			O						x
Brown Falcon	<i>Falco berigora</i>					x				
Black-shouldered Kite	<i>Elanus axillaris</i>			O		x				
Wedge-tailed Eagle	<i>Aquila audax</i>				x	x				
Masked Lapwing	<i>Vanellus miles</i>			O, H	x					
Crested Pigeon	<i>Ocyphaps lophotes</i>			O		x				
Galah	<i>Eolophus roseicapillus</i>			H, O, S	x	x		x		
Sulphur-crested Cockatoo	<i>Cacatua galerita</i>			S, O, H	x	x		x		
Crimson Rosella	<i>Platycercus elegans</i>			H, O		x		x		

Common Name	Scientific Name	Conservation Status ¹		Observation Type	Study Area A	Study Area B	Study Area C (North)	Study Area C (East)	Study Area C (Central)	Outside Sites
		TSC Act	EPBC Act							
Eastern Rosella	<i>Platycercus eximius</i>				x	x		x		
Australian King-Parrot	<i>Alisterus scapularis</i>			O				x		
Shining Bronze-Cuckoo	<i>Chalcites lucidus</i>			H					x	
Barn Owl	<i>Tyto alba</i>			O, S, H	x					
Tawny Frogmouth	<i>Podargus strigoides</i>			H					x	
Laughing Kookaburra	<i>Dacelo novaeguineae</i>			O		x				
White-throated Treecreeper	<i>Cormobates leucophaea</i>			H					x	
Superb Fairy-wren	<i>Malurus cyaneus</i>			H, O	x	x	x	x		
Spotted Pardalote	<i>Pardalotus punctatus</i>			H, O			x	x	x	
Striated Pardalote	<i>Pardalotus striatus</i>			H, O	x		x	x	x	
Buff-rumped Thornbill	<i>Acanthiza reguloides</i>			O					x	
Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>			H, O			x	x		
Noisy Miner	<i>Manorina melanocephala</i>			H, O	x	x		x		
Noisy Friarbird	<i>Philemon corniculatus</i>			O/H	x			x		
Rose Robin	<i>Petroica rosea</i>			O/H				x		
Golden Whistler	<i>Pachycephala pectoralis</i>			O/H				x		
Grey Fantail	<i>Rhipidura albiscapa</i>			H, O	x		x	x		
Grey Butcherbird	<i>Cracticus torquatus</i>			H, O				x		
Magpie-lark	<i>Grallina cyanoleuca</i>			O						x
Pied Butcherbird	<i>Cracticus nigrogularis</i>			O/H	x	x		x	x	
Australian Magpie	<i>Cracticus tibicen</i>			H, O, CT				x		
Pied Currawong	<i>Strepera graculina</i>			H, O			x	x		
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>			O	x					
Olive-backed Oriole	<i>Oriolus sagittatus</i>			O		x				
Australian Raven	<i>Corvus coronoides</i>			H, O, CT	x	x		x		

Common Name	Scientific Name	Conservation Status ¹		Observation Type	Study Area A	Study Area B	Study Area C (North)	Study Area C (East)	Study Area C (Central)	Outside Sites
		TSC Act	EPBC Act							
White-winged Chough	<i>Corcorax melanorhamphos</i>			O, H				x		
Common Starling*	<i>Sturnus vulgaris</i>			O		x				
Welcome Swallow	<i>Hirundo neoxena</i>			O	x					
Silvereye	<i>Zosterops lateralis</i>			H, O			x	x		
Mistletoebird	<i>Dicaeum hirundinaceum</i>									
Australian Pipit	<i>Anthus novaeseelandiae</i>			O						x
Red-browed Finch	<i>Neochmia temporalis</i>			H, O			x	x	x	
Zebra Finch	<i>Taeniopygia guttata</i>			H, O	x					x
Mammals										
Short-beaked Echidna	<i>Tachyglossus aculeatus</i>			CT, IO				x		
Common Wombat	<i>Vombatus ursinus</i>			I, O	x			x	x	
Common Brushtail Possum	<i>Trichosurus vulpecula</i>			S, C, HT, ET	x			x	x	
Eastern Grey Kangaroo	<i>Macropus giganteus</i>			O	x	x	x	x	x	
Common Wallaroo	<i>Macropus robustus</i>			O					x	x
Red-necked Wallaby	<i>Macropus rufogriseus</i>			O, HT, CT			x	x	x	
Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	S, H	x			x	x	
Eastern Freetail-bat	<i>Mormopterus norfolkensis</i>	V			?			x		
	<i>Mormopterus 'Species 4' (big penis)</i>					x	x			
White-striped Freetail-bat	<i>Tadarida australis</i>						x	?		
Eastern Bentwing-bat	<i>Miniopterus schreibersii oceanensis</i>	V			?	?	?	?		
Gould's Wattled Bat	<i>Chalinolobus gouldii</i>				?	x	x	?		
Chocolate Wattled Bat	<i>Chalinolobus morio</i>			EC	x	?	x	x		
Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V				?				
Eastern Broad-nosed Bat	<i>Scotorepens orion</i>					?				
Large Forest Bat	<i>Vespadelus darlingtoni</i>					?	?	?		

Common Name	Scientific Name	Conservation Status ¹		Observation Type	Study Area A	Study Area B	Study Area C (North)	Study Area C (East)	Study Area C (Central)	Outside Sites
		TSC Act	EPBC Act							
Southern Forest Bat	<i>Vespadelus regulus</i>						?	x		
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	V			?	?		?		
Little Forest Bat	<i>Vespadelus vulturnus</i>				x	?	?			
Black Rat*	<i>Rattus rattus</i>			CT				x		
Dog*	<i>Canis lupus familiaris</i>									x
Fox*	<i>Vulpes vulpes</i>			CT	x					x
Cat*	<i>Felis catus</i>			O					x	x
Rabbit*	<i>Oryctolagus cuniculus</i>			O, IO, CT	x	x	x	x	x	
European cattle*	<i>Bos taurus</i>			O, CT						

KEY: * = introduced species; CT = Camera Trap; O = Observed; H = Heard; S = Spotlight; IO = Indirect Observation (i.e. burrows, scats etc.); ET = Elliot Trap; Ec = Echolocation recording; HT = Hair Tube.

¹ Threatened and/or migratory species status under the TSC Act and/or EPBC Act (current as of 4 July 2012).

V = Vulnerable; E = Endangered; CE = Critically Endangered; M = Migratory.

Appendix 3: Threatened Fauna Species Potentially Occurring within the Study Area or Surrounds

Note: Highlighted species were located or recorded as possibly occurring during the current survey. Fauna that are exclusively dependant on marine environments, including near shore environments, were removed from the table. Non-referenced habitat information has been sourced from: *Threatened Species Profiles for threatened species, endangered populations and endangered ecological communities listed under the NSW Threatened Species Conservation Act 1999* (NSW Office of Environment and Heritage, 2012).

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
Amphibians			
Green and Golden Bell Frog <i>Litoria aurea</i>	V	E	Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). Optimum habitat includes water-bodies that are un-shaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), have a grassy area nearby and diurnal sheltering sites available.
Booroolong Frog <i>Litoria booroolongensis</i>	E	E	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. Lives along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.
Birds			
Black-necked Stork <i>Ephippiorhynchus asiaticus</i>		E	In Australia, Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, south to central-eastern NSW and with vagrants recorded at scattered sites well away from the coast (for example, near Moree, north-east of Hay and in Victoria). Black-necked Storks are mainly found on shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands. They also forage within or around estuaries and along intertidal shorelines, such as saltmarshes, mudflats and sandflats, and mangrove vegetation.
Australasian Bittern <i>Botaurus poiciloptilus</i>	E	E	The Australasian Bittern is widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.).
Cattle Egret <i>Ardea ibis</i>	M		Occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands (Commonwealth Department of the Environment, Water, Heritage and the Arts [DEWHA] 2012).
Great Egret <i>Ardea alba</i>	M		Terrestrial wetlands, estuarine and littoral habitats and moist grasslands. Inland, prefer permanent water bodies on floodplains; shallows of deep permanent lakes (either open or vegetated), semi-permanent swamps with tall emergent vegetation and herb dominated seasonal swamps with abundant aquatic flora. Also regularly use saline habitats including mangrove forests, estuarine mudflats, salt marshes, bare salt pans, shallows of salt lakes, salt fields and offshore reefs. Breeding requires wetlands with fringing trees in which to build nests including mangrove forest, freshwater lakes or swamps and rivers.

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
White-bellied Sea-eagle <i>Haliaeetus leucogaster</i>	M		A migratory species that is resident to Australia. Found in terrestrial and coastal wetlands; favouring deep freshwater swamps, lakes and reservoirs; shallow coastal lagoons and salt marshes (DEWHA 2012).
Spotted Harrier <i>Circus assimilis</i>		V	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.
Little Eagle <i>Hieraaetus morphnoides</i>		V	Most abundant in lightly timbered areas with open areas nearby. Often recorded foraging in grasslands, crops, treeless dune fields, and recently logged areas. May nest in farmland, woodland and forest in tall trees (DEWHA 2012).
Australian Painted Snipe <i>Rostratula australis</i>	V, M	E	Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (DEWHA 2012).
Latham's Snipe <i>Gallinago hardwickii</i>	M		Typically found on wet soft ground or shallow water with good cover of tussocks. Often found in wet paddocks, seepage areas below dams (Pizzey, 2007).
Little Lorikeet <i>Glossopsitta pusilla</i>		V	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range in NSW, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Mostly occur in dry, open eucalypt forests and woodlands. They feed primarily on nectar and pollen in the tree canopy. Nest hollows are located at heights of between 2 m and 15 m, mostly in living, smooth-barked eucalypts. Most breeding records come from the western slopes.
Turquoise Parrot <i>Neophema pulchella</i>		V	Occurs in open woodlands and eucalypt forests with a ground cover of grasses and under storey of low shrubs. Generally found in the foothills of the Great Divide, including steep rocky ridges and gullies (Higgins, 1999). Nest in hollow-bearing trees, either dead or alive; also in hollows in tree stumps. Prefer to breed in open grassy forests and woodlands, and gullies that are moist.
Swift Parrot <i>Lathamus discolor</i>	E	E	The Swift Parrot occurs in woodlands and forests of NSW from May to August, where it feeds on eucalypt nectar, pollen and associated insects. The Swift Parrot is dependent on flowering resources across a wide range of habitats in its wintering grounds in NSW (DEWHA 2012). This species is migratory, breeding in Tasmania and also nomadic, moving about in response to changing food availability (Pizzey, 1997).
Masked Owl <i>Tyto novaehollandiae</i>		V	Inhabits a diverse range of wooded habitat that provide tall or dense mature trees with hollows suitable for nesting and roosting (Higgins, 1999). Mostly recorded in open forest and woodlands adjacent to cleared lands. Nest in hollows, in trunks and in near vertical spouts or large trees, usually living but sometimes dead (Higgins, 1999). Nest hollows are usually located within dense forests or woodlands. Masked owls prey upon hollow-dependent arboreal marsupials, but terrestrial mammals make up the largest proportion of the diet.
Barking Owl <i>Ninox connivens</i>	-	V	Generally found in open forests, woodlands, swamp woodlands and dense scrub. Can also be found in the foothills and timber along watercourses in otherwise open country (Pizzey, 2007).

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
White-throated Needletail <i>Hirundapus caudacutus</i>	M		An aerial species found in feeding concentrations over cities, hilltops and timbered ranges (Pizzey, 2007).
Rainbow Bee-eater <i>Merops ornatus</i>	M		Usually occurs in open or lightly timbered areas, often near water (DEWHA 2012).
Brown Treecreeper (eastern subspecies) <i>Climacteris picumnus victoriae</i>	-	V	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (<i>Eucalyptus camaldulensis</i>) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses.
Speckled Warbler <i>Pyrholaemus saggitatus</i>		V	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy.
Black-chinned Honeyeater (eastern subspecies) <i>Melithreptus gularis gularis</i>	-	V	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (<i>Eucalyptus sideroxylon</i>), White Box (<i>E. albens</i>), Inland Grey Box (<i>E. microcarpa</i>), Yellow Box (<i>E. melliodora</i>) and Forest Red Gum (<i>E. tereticornis</i>). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks and tea-trees.
Regent Honeyeater <i>Anthochaera phrygia</i>	E, M	CE	A semi-nomadic species occurring in temperate eucalypt woodlands and open forests. Most records are from box-ironbark eucalypt forest associations and wet lowland coastal forests (Pizzey, 2007).
Hooded Robin (south-eastern form) <i>Melanodryas cucullata cucullata</i>		V	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.
Scarlet Robin <i>Petroica boodang</i>		V	The Scarlet Robin's range includes all state capitals. Occurs in forests, woodlands; and heavier vegetation when breeding. During autumn and winter occurs in more open and Cleared areas. It has dispersive or locally migratory seasonal movements. Is conspicuous in open and suburban habitats.
Grey-crowned Babbler (eastern subspecies) <i>Pomatostomus temporalis temporalis</i>		V	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
Diamond Firetail <i>Stagonopleura guttata</i>		V	Feeds exclusively on the ground, on ripe and partly-ripe grass and herb seeds and green leaves, and on insects (especially in the breeding season). Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Eucalyptus pauciflora Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities.
Varied Sittella <i>Daphoenositta chrysoptera</i>		V	Inhabits wide variety of dry eucalypt forests and woodlands, usually with either shrubby under storey or grassy ground cover or both, in all climatic zones of Australia. Usually in areas with rough-barked trees, such as stringybarks or ironbarks, but also in paperbarks or mature Eucalypts with hollows.
Black-faced Monarch <i>Monarcha melanopsis</i>	M		A migratory species found during the breeding season in damp gullies in temperate rainforests. Disperses after breeding into more open woodland (Pizzey, 2007).
Satin Flycatcher <i>Myiagra cyanoleuca</i>	M		Migratory species that occurs in coastal forests, woodlands and scrubs during migration. Breeds in heavily vegetated gullies (Pizzey, 2007).
Mammals			
Spotted-tailed (Eastern) Quoll <i>Dasyurus maculatus maculatus</i>	E	V	Uses a range of habitats including sclerophyll forests and woodlands, coastal heathlands and rainforests. Habitat requirements include suitable den sites, including hollow logs, rock crevices and caves, an abundance of food and an area of intact vegetation in which to forage.
Koala <i>Phascolarctos cinereus</i>	V	V	Inhabits eucalypt forests and woodlands. The suitability of these forests for habitation depends on the size and species of trees present, soil nutrients, climate and rainfall.
Squirrel Glider <i>Petaurus norfolcensis</i>		V	Generally occurs in dry sclerophyll forests and woodlands but is absent from dense coastal ranges in the southern part of its range. Requires abundant hollow bearing trees and a mix of eucalypts, banksias and acacias. There is only limited information available on den tree use by Squirrel gliders, but it has been observed using both living and dead trees as well as hollow stumps. Within a suitable vegetation community at least one species should flower heavily in winter and one species of eucalypt should be smooth barked. Endangered population in the Wagga Wagga LGA.
Brush-tailed Rock-wallaby <i>Petrogale penicillata</i>	V	E	Found in rocky areas in a wide variety of habitats including rainforest gullies, wet and dry sclerophyll forest, open woodland and rocky outcrops in semi-arid country. Commonly sites have a northerly aspect with numerous ledges, caves and crevices.
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	V	V	This species is a canopy-feeding frugivore and nectarivore of rainforests, open forests, woodlands, melaleuca swamps and banksia woodlands. Bats commute daily to foraging areas, usually within 15 km of the day roost although some individuals may travel up to 70 km.

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
Yellow-bellied Sheathtail-bat <i>Saccolaimus flaviventris</i>		V	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn.
Eastern Freetail-bat <i>Mormopterus norfolkensis</i>		V	Most records are from dry eucalypt forests and woodlands to the east of the Great Dividing Range. Appears to roost in trees, but little is known of this species' habits (Allison and Hoye 1995; Churchill 1998).
Little Bent-wing Bat <i>Miniopterus australis</i>		V	Coastal north-eastern NSW and eastern Queensland (Churchill, 2008). Little Bent-wing Bat is an insectivorous bat that roosts in caves, in old mines, in tunnels, under bridges, or in similar structures. They breed in large aggregations in a small number of known caves and may travel 100s km from feeding home ranges to breeding sites (Law, 1996). Little Bent-wing Bat has a preference for moist eucalypt forest, rainforest or dense coastal banksia scrub where it forages below the canopy for insects.
Eastern Bentwing-bat <i>Miniopterus schreibersii oceanensis</i>		V	Broad range of habitats including rainforest, wet and dry sclerophyll forest, paperbark forest and open grasslands. Roost in caves and man made habitats and under road culverts.
Soith-eastern Long-eared Bat <i>Nyctophilus corbeni</i>	V	V	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bullock Allocasuarina leuhmanni and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.
Large-eared Pied Bat <i>Chalinolobus dwyeri</i>	V	V	Located in a variety of drier habitats, including the dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range. Can also be found on the edges of rainforests and in wet sclerophyll forests (Churchill, 1998). This species roosts in caves and mines in groups of between 3 and 37 individuals (Churchill, 1998).
Eastern False Pipistrelle <i>Falsistrellus tasmaniensis</i>		V	Inhabit sclerophyll forests, preferring wet habitats where trees are more than 20 m high (Churchill, 1998). Two observations have been made of roosts in stem holes of living eucalypts. There is debate about whether or not this species moves to lower altitudes during winter, or whether they remain sedentary but enter torpor (Menkhorst, 1995). This species also appears to be highly mobile and records showing movements of up to 12 km between roosting and foraging sites.
Large-footed Myotis (Southern Myotis) <i>Myotis macropus (adversus)</i>		V	Occurs in most habitat types as long as they are near permanent water bodies, including streams, lakes and reservoirs. Commonly roost in caves, but can also roost in tree hollows, under bridges and in mines (Churchill 1998).

Species	Conservation Status ¹		Habitat
	EPBC Act	TSC Act	
Greater Broad-nosed Bat <i>Scoteanax rueppellii</i>		V	Prefer moist gullies in mature coastal forests and rainforests, between the Great Dividing Range and the coast. They are only found at low altitudes below 500 m (Churchill, 1998). In dense environments they utilise natural and human-made opening in the forest for flight paths. Creeks and small rivers are favoured foraging habitat. This species roosts in hollow tree trunks and branches (Churchill, 1998).
Eastern Cave Bat <i>Vespadelus trougtoni</i>		V	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. Cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals.
New Holland Mouse <i>Pseudomys novaehollandiae</i>	V	-	Coastal heath and dry sclerophyll forest and woodland.f

¹ Threatened and/or migratory species status under the TSC Act and/or EPBC Act (current as of 4 July 2012).

V = Vulnerable; E = Endangered; CE = Critically Endangered; M = Migratory.

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APPENDIX 2

FLORA AND FAUNA PREVIOUSLY RECORDED WITHIN THE MT ARTHUR
COAL MINE

FLORA

Family Name	Scientific Name	Common Name	Status ¹
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet	
	<i>Pseuderanthemum variabile</i>	Pastel Flower	
	<i>Rostellularia adscendens</i> var. <i>adscendens</i>		
Adiantaceae	<i>Adiantum aethiopicum</i>	Common Maidenhair	
	<i>Cheilanthes austrotenuifolia</i>	Rock Fern	
	<i>Cheilanthes distans</i>	Bristly Cloak Fern	
	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	Mulga Fern	
Aizoaceae	* <i>Galenia pubescens</i>	Galenia	
	<i>Tetragonia tetragonioides</i>	New Zealand Spinach	
Alismataceae	<i>Damasonium minus</i>	Starfruit	
Alliaceae	* <i>Nothoscordum borbonicum</i>	Onion Weed	
Amaranthaceae	* <i>Alternanthera pungens</i>	Khaki Weed	
	* <i>Amaranthus quitensis</i>	South American Amaranth	
	* <i>Gomphrena celosioides</i>	Gomphrena Weed	
	<i>Ptilotus semilanatus</i>		
Anthericaceae	<i>Arthropodium milleflorum</i>	Pale Vanilla-lily	
	<i>Arthropodium minus</i>		
	<i>Dichopogon fimbriatus</i>	Nodding Chocolate Lily	
	<i>Dichopogon strictus</i>	Chocolate Lily	
	<i>Laxmannia compacta</i>		
	<i>Thysanotus patersonii</i>	Twining Fringe-Lily	
Apiaceae	<i>Thysanotus tuberosus</i>	Common Fringe-lily	
	* <i>Cyclospermum leptophyllum</i>	Slender Celery	
	* <i>Foeniculum vulgare</i>	Fennel	
	<i>Centella asiatica</i>	Indian Pennywort	
	<i>Daucus glochidiatus</i>	Native Carrot	
Apocynaceae	<i>Hydrocotyle laxiflora</i>	Stinking Pennywort	
	<i>Parsonsia eucalyptophylla</i>	Gargaloo	
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>	Narrow-leaved Cotton Bush	
	* <i>Gomphocarpus physocarpus</i>	Balloon Cotton Bush	
Asphodelaceae	* <i>Asphodelus fistulosus</i>	Onion Weed	
Aspleniaceae	<i>Asplenium flabellifolium</i>	Necklace Fern	
Asteraceae	* <i>Ambrosia artemisiifolia</i>	Annual ragweed	
	* <i>Ambrosia tenuifolia</i>	Lacy Ragweed	
	* <i>Arctotheca calendula</i>	Capeweed	
	* <i>Aster subulatus</i>	Wild Aster	
	* <i>Bidens pilosa</i>	Cobbler's Pegs	

Family Name	Scientific Name	Common Name	Status ¹
	* <i>Carduus nutans</i>	Nodding Thistle	
	* <i>Carthamus lanatus</i>	Saffron Thistle	
	* <i>Chondrilla juncea</i>	Skeleton Weed	
	* <i>Cirsium vulgare</i>	Spear Thistle	
	* <i>Conyza bonariensis</i>	Flaxleaf Fleabane	
	* <i>Conyza sumatrensis</i>		
	* <i>Coreopsis lanceolata</i>	Coreopsis	
	* <i>Crepis capillaris</i>	Smooth Hawksbeard	
	* <i>Dimorphotheca ecklonis</i>	Cape Daisy	
	<i>Euchiton involucratus</i>	Star Cudweed	
	* <i>Galinsoga parviflora</i>	Potato Weed	
	* <i>Gamochaeta coarctata</i>		
	* <i>Gamochaeta purpurea</i>	Purple Cudweed	
	* <i>Hedypnois rhagadioloides</i>	Cretan Weed	
	* <i>Lactuca saligna</i>	Willow-leaved Lettuce	
	* <i>Lactuca serriola</i>	Prickly Lettuce	
	* <i>Onopordum acanthium</i> subsp. <i>acanthium</i>	Scotch Thistle	
	* <i>Senecio madagascariensis</i>	Fireweed	
	* <i>Silybum marianum</i>	Variegated Thistle	
	* <i>Soliva sessilis</i>	Bindyi	
	* <i>Sonchus oleraceus</i>	Common Sowthistle	
	* <i>Tagetes minuta</i>	Stinking Roger	
	* <i>Taraxacum officinale</i>	Dandelion	
	* <i>Tragopogon porrifolius</i>	Salsify	
	* <i>Xanthium spinosum</i>	Bathurst Burr	
	* <i>Bidens subalternans</i>	Greater Beggar's Ticks	
	<i>Brachyscome linearifolia</i>		
	<i>Brachyscome multifida</i>	Cut-leaved Daisy	
	<i>Calocephalus citreus</i>	Lemon Beauty-heads	
	<i>Calotis cuneifolia</i>	Purple Burr-Daisy	
	<i>Calotis lappulacea</i>	Yellow Burr-daisy	
	<i>Cassinia arcuata</i>	Sifton Bush	
	<i>Cassinia quinquefaria</i>		
	<i>Chrysocephalum apiculatum</i>	Common Everlasting, Yellow Buttons	
	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting	
	<i>Cotula australis</i>	Common Cotula	
	* <i>Cotula coronopifolia</i>	Water Buttons	
	<i>Craspedia variabilis</i>		
	<i>Cymbonotus lawsonianus</i>	Bear's Ear	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Euchiton gymnocephalus</i>		
	<i>Euchiton sphaericus</i>		
	* <i>Facelis retusa</i>	Annual Trampweed	
	<i>Glossocardia bidens</i>	Cobbler's Tack	
	<i>Gnaphalium sphaericum</i>		
	* <i>Hypochaeris radicata</i>	Catsear	
	<i>Lagenophora stipitata</i>	Blue Bottle-daisy	
	<i>Minuria leptophylla</i>		
	<i>Olearia elliptica</i>	Sticky Daisy Bush	
	<i>Ozothamnus diosmifolius</i>	White Dogwood	
	<i>Podolepis jaceoides</i>	Showy Copper-wire Daisy	
	<i>Pseudognaphalium luteoalbum</i>	Jersey Cudweed	
	<i>Senecio hispidulus</i>	Hill Fireweed	
	<i>Senecio quadridentatus</i>	Cotton Fireweed	
	<i>Sigesbeckia orientalis</i>		
	<i>Solenogyne bellioides</i>		
	<i>Vernonia cinerea</i> var. <i>cinerea</i>		
	<i>Vittadinia cuneata</i>	Fuzzweed	
	<i>Vittadinia cuneata</i> f. <i>cuneata</i>		
	<i>Vittadinia muelleri</i>		
	<i>Vittadinia pterochaeta</i>	Rough Fuzzweed	
	<i>Vittadinia sulcata</i>		
	<i>Vittadinia triloba</i>		
Bignoniaceae	<i>Pandorea pandorana</i>	Wonga Wonga Vine	
Boraginaceae	<i>Cynoglossum australe</i>		
	<i>Cynoglossum suaveolens</i>		
Brassicaceae	* <i>Capsella bursa-pastoris</i>	Shepherd's Purse	
	* <i>Hirschfeldia incana</i>	Buchan Weed	
	* <i>Lepidium africanum</i>		
	* <i>Lepidium bonariense</i>		
	* <i>Rapistrum rugosum</i>	Turnip Weed	
	<i>Lepidium pseudohyssopifolium</i>	Peppergrass	
	* <i>Raphanus raphanistrum</i>	Wild Radish	
Cactaceae	* <i>Harrisia martinii</i>	Moonlight Cactus	
	* <i>Opuntia aurantiaca</i>	Tiger Pear	
	* <i>Opuntia humifusa</i>	Creeping Pear	
	* <i>Opuntia stricta</i>	Common Prickly Pear	
	* <i>Opuntia stricta</i> var. <i>stricta</i>	Common Prickly Pear	
Campanulaceae	<i>Wahlenbergia communis</i>	Tufted Bluebell	
	<i>Wahlenbergia gracilis</i>	Australian Bluebell	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Wahlenbergia luteola</i>		
	<i>Wahlenbergia stricta</i>	Tall Bluebell	
Caryophyllaceae	* <i>Agrostemma githago</i>	Corn Cockle	
	* <i>Cerastium glomeratum</i>	Mouse-ear Chickweed	
	* <i>Petrorhagia nanteuillii</i>		
	* <i>Petrorhagia velutina</i>		
	* <i>Polycarpon tetraphyllum</i>	Four-leaved Allseed	
	* <i>Silene gallica</i>	French Catchfly	
	* <i>Silene nocturna</i>		
	* <i>Spergularia rubra</i>	Sandspurry	
	<i>Cerastium fontanum</i>	Mouse-ear Chickweed	
	* <i>Paronychia brasilliana</i>	Chilean Whitlow Wort	
	<i>Stellaria flaccida</i>		
Casuarinaceae	<i>Allocasuarina luehmannii</i>	Bulloak	
	<i>Allocasuarina torulosa</i>	Forest Oak	
	<i>Allocasuarina verticillata</i>	Drooping Sheoak	
	<i>Casuarina cunninghamiana</i>	River Oak	
	<i>Casuarina glauca</i>	Swamp Oak	
Celastraceae	<i>Maytenus silvestris</i>	Narrow-leaved Orangebark	
Chenopodiaceae	<i>Atriplex semibaccata</i>	Creeping Saltbush	
	<i>Einadia hastata</i>	Berry Saltbush	
	<i>Einadia nutans</i> subsp. <i>linifolia</i>		
	<i>Einadia polygonoides</i>		
	<i>Einadia trigonos</i>	Fishweed	
	<i>Enchylaena tomentosa</i>	Ruby Saltbush	
	<i>Maireana microphylla</i>	Small-leaf Bluebush	
	<i>Salsola kali</i> var. <i>kali</i>		
	<i>Sclerolaena birchii</i>	Galvanized Burr	
Chloanthaceae	<i>Spartothamnella juncea</i>	Bead Bush	
Clusiaceae	* <i>Hypericum perforatum</i>	St. Johns Wort	
	<i>Hypericum gramineum</i>	Small St John's Wort	
Commelinaceae	<i>Commelina cyanea</i>	Native Wandering Jew	
	<i>Commelina ensifolia</i>	Scurvy Grass	
	<i>Murdannia graminea</i>	Grass Lily	
Convolvulaceae	<i>Convolvulus erubescens</i>	Blushing Bindweed	
	<i>Dichondra repens</i>	Kidney Weed	
	<i>Evolvulus alsinoides</i> var. <i>decumbens</i>		
Crassulaceae	* <i>Bryophyllum delagoense</i>	Mother of millions	
	<i>Crassula decumbens</i> var. <i>decumbens</i>		

Family Name	Scientific Name	Common Name	Status ¹
	<i>Crassula sieberiana</i>	Australian Stonecrop	
Cupressaceae	<i>Callitris endlicheri</i>	Black Cypress Pine	
Cyperaceae	* <i>Cyperus eragrostis</i>	Umbrella Sedge	
	* <i>Cyperus rotundus</i>	Nutgrass	
	* <i>Cyperus tenellus</i>		
	<i>Bolboschoenus caldwellii</i>		
	<i>Carex inversa</i>		
	<i>Cyperus fulvus</i>	Sticky Sedge	
	<i>Cyperus gracilis</i>	Slender Flat-sedge	
	<i>Eleocharis acuta</i>		
	<i>Eleocharis dulcis</i>		
	<i>Fimbristylis dichotoma</i>	Common Fringe-sedge	
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Hoary guinea flower	
Euphorbiaceae	<i>Beyeria viscosa</i>	Pinkwood	
	<i>Breynia oblongifolia</i>	Coffee Bush	
	<i>Chamaesyce drummondii</i>	Caustic Weed	
	<i>Phyllanthus similis</i>		
	<i>Phyllanthus virgatus</i>		
	<i>Poranthera microphylla</i>		
Fabaceae (Caesalpinioideae)	<i>Senna aciphylla</i>	Sprawling Cassia	
	<i>Senna clavigera</i>		
Fabaceae (Faboideae)	* <i>Medicago polymorpha</i>	Burr Medic	
	* <i>Medicago sativa</i>	Lucerne	
	* <i>Medicago truncatula</i>	Barrel Medic	
	* <i>Melilotus indicus</i>	Hexham Scent	
	* <i>Trifolium arvense</i>	Haresfoot Clover	
	* <i>Trifolium campestre</i>	Hop Clover	
	* <i>Trifolium dubium</i>	Yellow Suckling Clover	
	* <i>Trifolium repens</i>	White Clover	
	* <i>Trifolium subterraneum</i>	Subterraneum Clover	
	* <i>Vicia sativa</i>		
	<i>Bossiaea heterophylla</i>	Variable Bossiaea	
	<i>Bossiaea prostrata</i>		
	<i>Bossiaea rhombifolia</i> subsp. <i>rhombifolia</i>		
	<i>Daviesia acicularis</i>		
	<i>Daviesia genistifolia</i>	Broom Bitter Pea	
	<i>Desmodium brachypodum</i>	Large Tick-trefoil	
	<i>Desmodium gunnii</i>	Slender Tick-trefoil	
	<i>Desmodium varians</i>	Slender Tick-trefoil	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Glycine clandestina</i>		
	<i>Glycine microphylla</i>	Small-leaf Glycine	
	<i>Glycine tabacina</i>		
	<i>Hardenbergia violacea</i>	False Sarsaparilla	
	<i>Hovea linearis</i>		
	<i>Indigofera australis</i>	Australian Indigo	
	<i>Jacksonia scoparia</i>	Dogwood	
	<i>Swainsona galegifolia</i>	Smooth Darling Pea	
	<i>Templetonia stenophylla</i>	Leafy Templetonia	
	<i>Zornia dyctiocarpa</i> var. <i>dyctiocarpa</i>	Zornia	
Fabaceae (Mimosoideae)			
	* <i>Acacia podalyriifolia</i>	Queensland Silver Wattle	
	* <i>Acacia saligna</i>	Golden Wreath Wattle	
	* <i>Mimosa pudica</i>	Common Sensitive Plant	
	<i>Acacia amblygona</i>	Fan Wattle	
	<i>Acacia binervia</i>	Coast Myall	
	<i>Acacia decora</i>	Western Silver Wattle	
	<i>Acacia excelsa</i>	Ironwood	
	<i>Acacia falcata</i>		
	<i>Acacia genistifolia</i>	Early Wattle	
	<i>Acacia gunnii</i>	Ploughshare Wattle	
	<i>Acacia implexa</i>	Hickory Wattle	
	<i>Acacia melanoxylon</i>	Blackwood	
	<i>Acacia melvillei</i> - <i>homalophylla</i>		
	<i>Acacia paradoxa</i>	Kangaroo Thorn	
	<i>Acacia parramattensis</i>	Parramatta Wattle	
	<i>Acacia parvipinnula</i>	Silver-stemmed Wattle	
	<i>Acacia pendula</i>	Boree	EP (TSC Act)
	<i>Acacia salicina</i>	Cooba	
Gentianaceae			
	* <i>Centaurium erythraea</i>	Common Centaury	
	* <i>Centaurium tenuiflorum</i>		
	<i>Schenkia spicata</i>	Spike Centaury	
Geraniaceae			
	* <i>Erodium botrys</i>	Long Storksbill	
	* <i>Erodium cicutarium</i>	Common Storksbill	
	<i>Erodium crinitum</i>	Blue Storksbill	
	<i>Geranium dissectum</i>		
	<i>Geranium solanderi</i> var. <i>solanderi</i>		
	<i>Pelargonium inodorum</i>		
Goodeniaceae			
	<i>Goodenia ovata</i>	Hop Goodenia	
	<i>Goodenia paniculata</i>	Branched Goodenia	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Goodenia pinnatifida</i>		
	<i>Scaevola aemula</i>	Fairy Fanflower	
	<i>Scaevola albida</i> var. <i>albida</i>		
	<i>Scaevola humilis</i>		
Hydrocharitaceae	<i>Ottelia ovalifolia</i>	Swamp Lily	
Hypoxiaceae	<i>Hypoxis hygrometrica</i>	Golden Weather-grass	
Iridaceae	* <i>Romulea rosea</i>	Onion Grass	
Juncaceae	* <i>Juncus acutus</i>	Sharp Rush	
	<i>Juncus usitatus</i>		
	<i>Luzula flaccida</i>		
Lamiaceae	* <i>Marrubium vulgare</i>	White Horehound	
	* <i>Stachys arvensis</i>	Stagger Weed	
	<i>Ajuga australis</i>	Austral Bugle	
	<i>Mentha saturoioides</i>	Native Pennyroyal	
	<i>Plectranthus parviflorus</i>	Cockspur Flower	
	<i>Scutellaria humilis</i>	Dwarf Skullcap	
Lauraceae	* <i>Cinnamomum camphora</i>	Camphor Laurel	
Linaceae	* <i>Linum trigynum</i>	French Flax	
	* <i>Linum usitatissimum</i>	Flax	
	<i>Linum marginale</i>	Native Flax	
Lobeliaceae	<i>Pratia purpurascens</i>	Whiteroot	
Lomandraceae	<i>Lomandra confertifolia</i>	Mat-rush	
	<i>Lomandra filiformis</i>	Wattle Mat-rush	
	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Many-flowered Mat-rush	
	<i>Lomandra glauca</i>	Pale Mat-rush	
	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	
	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>		
Loranthaceae	<i>Amyema cabbagei</i>		
	<i>Amyema miquelii</i>		
	<i>Amyema pendulum</i> subsp. <i>pendulum</i>		
Luzuriagaceae	<i>Eustrephus latifolius</i>	Wombat Berry	
	<i>Geitonoplesium cymosum</i>	Scrambling Lily	
Malvaceae	* <i>Lagunaria patersonia</i>	Norfolk Island Hibiscus	
	* <i>Modiola caroliniana</i>	Red-flowered Mallow	
	* <i>Sida rhombifolia</i>	Paddy's Lucerne	
	<i>Abutilon oxycarpum</i>	Lantern Bush	
	<i>Hibiscus sturtii</i>	Hill Hibiscus	
	<i>Hibiscus sturtii</i> var. <i>sturtii</i>	Hill Hibiscus	
	<i>Sida cordifolia</i>		

Family Name	Scientific Name	Common Name	Status ¹
	<i>Sida corrugata</i>	Corrugated Sida	
	<i>Sida cunninghamii</i>	Ridged Sida	
	<i>Sida filiformis</i>	Fine Sida	
Moraceae	<i>Ficus rubiginosa</i>	Port Jackson Fig	
Myoporaceae	<i>Eremophila debilis</i>	Amulla	
	<i>Eremophila deserti</i>	Turkeybush	
	<i>Myoporum acuminatum</i>	Boobialla	
	<i>Myoporum montanum</i>	Western Boobialla	
	<i>Myoporum parvifolium</i>	Creeping Boobialla	
Myrtaceae	<i>Angophora floribunda</i>	Rough-barked Apple	
	<i>Corymbia maculata</i>	Spotted Gum	
	<i>Eucalyptus albens</i>	White Box	
	<i>Eucalyptus albens</i> x <i>E. moluccana</i>	White/Grey Box hybrid	
	<i>Eucalyptus blakelyi</i>	Blakely's Red Gum	
	<i>Eucalyptus camaldulensis</i>	River Red Gum	EP (TSC Act)
	<i>Eucalyptus canaliculata</i>	Grey Gum	
	<i>Eucalyptus conica</i>	Fuzzy Box	
	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark	
	<i>Eucalyptus dawsonii</i>	Slaty Gum	
	<i>Eucalyptus melliodora</i>	Yellow Box	
	<i>Eucalyptus moluccana</i>	Grey Box	
	<i>Eucalyptus punctata</i>	Grey Gum	
	<i>Eucalyptus tereticornis</i>	Forest Red Gum	
	<i>Melaleuca armillaris</i>	Bracelet Honey-myrtle	
	<i>Melaleuca decora</i>		
	<i>Melaleuca styphelioides</i>	Prickly-leaved Tea Tree	
Nyctaginaceae	<i>Boerhavia dominii</i>	Tarvine	
Oleaceae	* <i>Olea europaea</i> subsp. <i>cuspidata</i>	African olive	
	<i>Jasminum suavissimum</i>		
	<i>Notelaea longifolia</i>	Large Mock-olive	
	<i>Notelaea microcarpa</i>	Native Olive	
	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>	Velvet Mock Olive	
Orchidaceae	<i>Cymbidium canaliculatum</i>	Tiger Orchid	EP (TSC Act)
	<i>Cymbidium suave</i>	Snake Orchid	
	<i>Dendrobium speciosum</i>	Rock Lily	
	<i>Diuris punctata</i>	Purple Donkey Orchid	
	<i>Diuris tricolor</i>	Painted Donkey Orchid	EP (TSC Act)
	<i>Microtis unifolia</i>	Common Onion Orchid	
	<i>Pterostylis mutica</i>	Midget Greenhood	

Family Name	Scientific Name	Common Name	Status ¹
Oxalidaceae	* <i>Oxalis corniculata</i>		
	* <i>Oxalis pes-caprae</i>		
	<i>Oxalis exilis</i>		
	<i>Oxalis perennans</i>		
Phormiaceae	<i>Dianella caerulea</i>	Blue Flax-lily	
	<i>Dianella longifolia</i>	Blue Flax-Lily	
	<i>Dianella revoluta</i> var. <i>revoluta</i>	Blue Flax-Lily	
Pittosporaceae	<i>Billardiera scandens</i>	Hairy Appleberry	
	<i>Bursaria spinosa</i>	Blackthorn	
	<i>Bursaria spinosa</i> subsp. <i>spinosa</i>	Blackthorn	
Plantaginaceae	* <i>Plantago lanceolata</i>	Lamb's Tongues	
	* <i>Plantago myosuroides</i>		
	<i>Plantago debilis</i>		
Poaceae	* <i>Avena barbata</i>	Bearded Oats	
	* <i>Axonopus fissifolius</i>	Narrow-leafed Carpet Grass	
	* <i>Briza minor</i>	Shivery Grass	
	* <i>Bromus catharticus</i>	Prairie Grass	
	* <i>Bromus hordeaceus</i>	Soft Brome	
	* <i>Bromus molliformis</i>	Soft Brome	
	* <i>Chloris gayana</i>	Rhodes Grass	
	<i>Cynodon dactylon</i>	Common Couch	
	* <i>Echinochloa esculenta</i>	Japanese Millet	
	* <i>Ehrharta erecta</i>	Panic Veldtgrass	
	* <i>Eragrostis curvula</i>	African Lovegrass	
	* <i>Hordeum glaucum</i>	Northern Barley Grass	
	* <i>Hordeum leporinum</i>	Barley Grass	
	* <i>Hyparrhenia hirta</i>	Coolatai Grass	
	* <i>Lolium perenne</i>	Perennial Ryegrass	
	* <i>Lolium rigidum</i>	Wimmera Ryegrass	
	* <i>Melinis repens</i>	Red Natal Grass	
	* <i>Panicum maximum</i> var. <i>maximum</i>	Guinea Grass	
	* <i>Paspalum dilatatum</i>	Paspalum	
	* <i>Pennisetum clandestinum</i>	Kikuyu Grass	
* <i>Setaria italic</i>	Foxtail Millet		
* <i>Setaria parviflora</i>			
* <i>Sorghum halepense</i>	Johnson Grass		
<i>Sorghum leiocladum</i>	Wild Sorghum		
* <i>Stenotaphrum secundatum</i>	Buffalo Grass		
* <i>Urochloa mutica</i>	Para Grass		

Family Name	Scientific Name	Common Name	Status ¹
	<i>*Urochloa panicoides</i>	Urochloa Grass	
	<i>*Vulpia bromoides</i>	Squirrel Tail Fesque	
	<i>Aristida jerichoensis</i>	Jericho Wiregrass	
	<i>Aristida personata</i>	Purple wire-grass	
	<i>Aristida ramosa</i>	Purple Wiregrass	
	<i>Aristida vagans</i>	Threeawn Speargrass	
	<i>Austrodanthonia bipartita</i>	Wallaby Grass	
	<i>Austrodanthonia fulva</i>	Wallaby Grass	
	<i>Austrodanthonia racemosa</i>		
	<i>Austrodanthonia racemosa</i> var. <i>obtusata</i>		
	<i>Austrodanthonia racemosa</i> var. <i>racemosa</i>		
	<i>Austrodanthonia richardsonii</i>	Straw Wallaby-grass	
	<i>Austrodanthonia tenuior</i>		
	<i>Austrostipa aristiglumis</i>	Plains Grass	
	<i>Austrostipa scabra</i>	Speargrass	
	<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Speargrass	
	<i>Austrostipa verticillata</i>	Slender Bamboo Grass	
	<i>Bothriochloa biloba</i>		V (EPBC Act)
	<i>Bothriochloa decipiens</i>	Red Grass	
	<i>Bothriochloa decipiens</i> var. <i>decipiens</i>		
	<i>Bothriochloa macra</i>	Red Grass	
	<i>Chloris truncata</i>	Windmill Grass	
	<i>Chloris ventricosa</i>	Tall Chloris	
	<i>Cymbopogon refractus</i>	Barbed Wire Grass	
	<i>Dactyloctenium radulans</i>	Button Grass	
	<i>Dichanthium sericeum</i>	Queensland Bluegrass	
	<i>Dichelachne crinita</i>	Longhair Plumegrass	
	<i>Dichelachne micrantha</i>	Shorthair Plumegrass	
	<i>Digitaria brownii</i>	Cotton Panic Grass	
	<i>Echinopogon ovatus</i>	Forest Hedgehog Grass	
	<i>*Eleusine tristachya</i>	Goose Grass	
	<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheatgrass	
	<i>Enneapogon gracilis</i>	Slender Nineawn	
	<i>Enneapogon nigricans</i>	Niggerheads	
	<i>Enteropogon acicularis</i>		
	<i>Entolasia stricta</i>	Wiry Panic	
	<i>Eragrostis brownii</i>	Brown's Lovegrass	
	<i>Eragrostis leptostachya</i>	Paddock Lovegrass	
	<i>Eriochloa pseudoacrotricha</i>	Early Spring Grass	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Eulalia aurea</i>	Silky Browntop	
	<i>Isachne globosa</i>	Swamp Millet	
	<i>Lachnagrostis filiformis</i>		
	<i>Microlaena stipoides</i>	Weeping Grass	
	<i>Microlaena stipoides</i> var. <i>stipoides</i>		
	<i>Panicum effusum</i>	Hairy Panic	
	<i>Panicum queenslandicum</i>	Yadbila Grass	
	<i>Panicum simile</i>	Two-colour Panic	
	<i>Paspalidium criniforme</i>		
	<i>Paspalidium distans</i>		
	<i>Paspalidium gracile</i>	Slender Panic	
	<i>Paspalum distichum</i>	Water Couch	
	<i>Phragmites australis</i>	Common Reed	
	* <i>Poa annua</i>	Winter Grass	
	<i>Poa labillardierei</i>	Tussock Grass	
	<i>Poa sieberiana</i>		
	<i>Sporobolus creber</i>	Slender Rat's Tail Grass	
	<i>Sporobolus elongatus</i>	Slender Rat's Tail Grass	
	<i>Themeda australis</i>	Kangaroo Grass	
Polygonaceae	* <i>Polygonum arenastrum</i>	Wireweed	
	* <i>Polygonum aviculare</i>	Wireweed	
	<i>Persicaria decipiens</i>	Slender Knotweed	
	<i>Rumex brownii</i>	Swamp Dock	
Portulacaceae	<i>Calandrinia eremaea</i>		
	<i>Portulaca oleracea</i>	Pigweed	
Potamogetonaceae	<i>Potamogeton crispus</i>	Curly Pondweed	
Primulaceae	* <i>Anagallis arvensis</i>	Scarlet/Blue Pimpernel	
Ranunculaceae	<i>Clematis aristata</i>	Old Man's Beard	
	<i>Clematis glycinoides</i> var. <i>glycinoides</i>	Headache Vine	
	<i>Ranunculus inundatus</i>	River Buttercup	
Rhamnaceae	<i>Cryptandra amara</i>	Bitter cryptandra	
	<i>Cryptandra amara</i> var. <i>longiflora</i>		
Rosaceae	<i>Acaena novae-zelandiae</i>	Bidgee-widgee, Biddy Biddy	
	* <i>Rubus fruticosus</i> sp. agg.		
	<i>Rubus parvifolius</i>	Native Raspberry	
Rubiaceae	* <i>Richardia stellaris</i>		
	<i>Asperula conferta</i>	Common Woodruff	
	<i>Galium propinquum</i>	Maori Bedstraw	
	<i>Opercularia aspera</i>	Coarse Stinkweed	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Opercularia diphylla</i>		
	<i>Pomax umbellata</i>		
	<i>Psydrax odorata</i>	Shiny-leaved Canthium	
	<i>Psydrax odorata</i> f. <i>buxifolia</i>		
Rutaceae	<i>Geijera parviflora</i>	Wilga	
Salicaceae	* <i>Salix babylonica</i>	Weeping Willow	
Santalaceae	<i>Exocarpos cupressiformis</i>	Native Cherry	
Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hop-bush	
Scrophulariaceae	* <i>Linaria pelisseriana</i>	Pelisser's Toadflax	
	* <i>Verbascum thapsus</i>	Great Mullein	
	* <i>Verbascum virgatum</i>	Twiggy Mullein	
	<i>Veronica calycina</i>	Hairy Speedwell	
	<i>Veronica plebeia</i>	Trailing Speedwell	
Solanaceae	* <i>Lycium ferocissimum</i>	African Boxthorn	
	* <i>Nicotiana glauca</i>	Tree Tobacco	
	* <i>Solanum nigrum</i>	Black-berry Nightshade	
	* <i>Solanum pseudocapsicum</i>	Madeira Winter	
	<i>Solanum americanum</i>	Glossy Nightshade	
	<i>Solanum amblymerum</i>	Narrawa Burr	
	<i>Solanum brownii</i>	Violet Nightshade	
	<i>Solanum opacum</i>	Green-berry Nightshade	
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender Stackhousia	
Sterculiaceae	<i>Brachychiton populneus</i> subsp. <i>populneus</i>	Kurrajong	
Thymelaeaceae	<i>Pimelea curviflora</i>		
	<i>Pimelea curviflora</i> var. <i>divergens</i>		
	<i>Pimelea curviflora</i> var. <i>sericea</i>		
	<i>Pimelea glauca</i>	Smooth Rice-flower	
	<i>Pimelea linifolia</i>	Slender Rice-flower	
	<i>Pimelea linifolia</i> subsp. <i>linifolia</i>	Queen of the Bush	
Typhaceae	<i>Typha orientalis</i>	Broad-leaved Cumbungi	
Urticaceae	* <i>Urtica dioica</i>	Giant Nettle	
Verbenaceae	* <i>Glandularia aristigera</i>	Mayne's Pest	
	* <i>Lantana montevidensis</i>	Trailing Lantana	
	* <i>Verbena bonariensis</i>	Purpletop	
	* <i>Verbena litoralis</i>		
	* <i>Verbena officinalis</i>	Common Verbena	
	* <i>Verbena rigida</i>	Veined Verbena	
	* <i>Verbena rigida</i> var. <i>rigida</i>	Veined Verbena	
	* <i>Verbena x brasiliensis</i>	Gin Case	
	<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum	

Family Name	Scientific Name	Common Name	Status ¹
	<i>Verbena gaudichaudii</i>		
Violaceae	<i>Melicytus dentatus</i>	Tree Violet	
Viscaceae	<i>Notothixos cornifolius</i>	Kurrajong Mistletoe	
Vitaceae	<i>Cayratia clematidea</i>	Native Grape	
Xanthorrhoeaceae	<i>Xanthorrhoea glauca</i>		

¹ Threatened flora species status listed under the TSC Act and/or EPBC Act (current at 24 January 2013).

V = Vulnerable; EP = Endangered Population.

* Introduced species.

BIRDS

Order	Family	Scientific Name	Common Name	Status ¹
ACCIPITRIFORMES	Accipitridae	<i>Accipiter fasciatus</i>	Brown Goshawk	
		<i>Aquila audax</i>	Wedge-tailed Eagle	
		<i>Circus assimilis</i>	Spotted Harrier	V (TSC Act)
		<i>Elanus axillaris</i>	Black-shouldered Kite	
ANSERIFORMES	Anatidae	<i>Anas gracilis</i>	Grey Teal	
		<i>Anas rhynchotis</i>	Australasian Shoveler	
		<i>Anas superciliosa</i>	Pacific Black Duck	
		<i>Chenonetta jubata</i>	Australian Wood Duck	
		<i>Cygnus atratus</i>	Black Swan	
APODIFORMES	Apodidae	<i>Hirundapus caudacutus</i>	White-throated Needletail	
CAPRIMULGIFORMES	Aegothelidae	<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	
	Podargidae	<i>Podargus strigoides</i>	Tawny Frogmouth	
CHARADRIIFORMES	Charadriidae	<i>Euseiornis melanops</i>	Black-fronted Dotterel	
		<i>Vanellus miles</i>	Masked Lapwing	
CICONIIFORMES	Ardeidae	<i>Egretta novaehollandiae</i>	White-faced Heron	
	Pelecanidae	<i>Pelecanus conspicillatus</i>	Australian Pelican	
COLUMBIFORMES	Columbidae	<i>Ocyphaps lophotes</i>	Crested Pigeon	
CORACIIFORMES	Halcyonidae	<i>Dacelo novaeguineae</i>	Laughing Kookaburra	
		<i>Todiramphus sanctus</i>	Sacred Kingfisher	
		Meropidae	<i>Merops ornatus</i>	Rainbow Bee-eater
CUCULIFORMES	Cuculidae	<i>Cacomantis flabelliformis</i>	Fan-tailed Cuckoo	
		<i>Eudynamys orientalis</i>	Eastern Koel	
		<i>Scythrops novaehollandiae</i>	Channel-billed Cuckoo	
FALCONIFORMES	Falconidae	<i>Falco berigora</i>	Brown Falcon	
		<i>Falco cenchroides</i>	Nankeen Kestrel	
		<i>Falco longipennis</i>	Australian Hobby	
		<i>Falco peregrinus</i>	Perigrine Falcon	
GALLIFORMES	Megapodiidae	<i>Coturnix pectoralis</i>	Stubble Quail	
		<i>Coturnix ypsilophora</i>	Brown Quail	
GRUIFORMES	Rallidae	<i>Fulica atra</i>	Eurasian Coot	
		<i>Gallinula tenebrosa</i>	Dusky Morehen	
		<i>Porphyrio porphyrio</i>	Purple Swamphen	
PASSERIFORMES	Acanthizidae	<i>Acanthiza chrysorrhoa</i>	Yellow-rumped Thornbill	
		<i>Acanthiza nana</i>	Yellow Thornbill	
		<i>Acanthiza pusilla</i>	Brown Thornbill	
		<i>Acanthiza reguloides</i>	Buff-rumped Thornbill	

Order	Family	Scientific Name	Common Name	Status ¹
		<i>Chthonicola sagittata</i>	Speckled Warbler	V (TSC Act)
		<i>Gerygone albogularis</i>	White-throated Gerygone	
		<i>Gerygone fusca</i>	Western Gerygone	
		<i>Gerygone mouki</i>	Brown Gerygone	
		<i>Sericornis frontalis</i>	White-browed Scrubwren	
		<i>Smicronis brevirostris</i>	Weebill	
	Alaudidae	<i>Alauda arvensis</i>	Eurasian Skylark	
		<i>Mirafra javanica</i>	Horsefield's Bushlark	
	Artamidae	<i>Artamus cyanopterus</i>	Dusky Woodswallow	
		<i>Artamus superciliosus</i>	White-browed Woodswallow	
		<i>Cracticus nigrogularis</i>	Pied Butcherbird	
		<i>Cracticus tibicen</i>	Australian Magpie	
		<i>Cracticus torquatus</i>	Grey Butcherbird	
		<i>Strepera graculina</i>	Pied Currawong	
	Campephagidae	<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike	
		<i>Lalage sueurii</i>	White-winged Triller	
	Cisticolidae	<i>Cisticola exilis</i>	Golden-headed Cisticola	
	Climacteridae	<i>Cormobates leucophaea</i>	White-throated Treecreeper	
	Corcoracidae	<i>Corcorax melanorhamphos</i>	White-winged Chough	
	Corvidae	<i>Corvus coronoides</i>	Australian Raven	
		<i>Corvus orru</i>	Torresian Crow	
	Estrildidae	<i>Neochmia temporalis</i>	Red-browed Finch	
		<i>Stagonopleura guttata</i>	Diamond Firetail	V (TSC Act)
		<i>Taeniopygia bichenovii</i>	Double-barred Finch	
		<i>Taeniopygia guttata</i>	Zebra Finch	
	Hirundinidae	<i>Hirundo neoxena</i>	Welcome Swallow	
		<i>Petrochelidon ariel</i>	Fairy Martin	
	Maluridae	<i>Malurus cyaneus</i>	Superb Fairy-wren	
	Meliphagidae	<i>Acanthorhynchus tenuirostris</i>	Eastern Spinebill	
		<i>Anthochaera carunculata</i>	Red Wattlebird	
		<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater	
		<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	
		<i>Lichenostomus virescens</i>	Singing Honeyeater	
		<i>Manorina melanocephala</i>	Noisy Miner	

Order	Family	Scientific Name	Common Name	Status ¹
		<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater	
		<i>Melithreptus lunatus</i>	White-naped Honeyeater	
		<i>Philemon citreogularis</i>	Little Friarbird	
		<i>Philemon corniculatus</i>	Noisy Friarbird	
	Monarchidae	<i>Grallina cyanoleuca</i>	Magpie-lark	
	Motacillidae	<i>Anthus novaeseelandiae</i>	Australasian Pipit	
	Nectariniidae	<i>Dicaeum hirundinaceum</i>	Mistletoebird	
	Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sitella	V (TSC Act)
	Oriolidae	<i>Oriolus sagittatus</i>	Olive-backed Oriole	
	Pachycephalidae	<i>Colluricincla harmonica</i>	Grey Shrike-thrush	
		<i>Pachycephala pectoralis</i>	Golden Whistler	
		<i>Pachycephala rufiventris</i>	Rufous Whistler	
	Pardalotidae	<i>Pardalotus punctatus</i>	Spotted Pardalote	
		<i>Pardalotus striatus</i>	Striated Pardalote	
	Petroicidae	<i>Eopsaltria australis</i>	Eastern Yellow Robin	
		<i>Melanodryas cucullata</i>	Hooded Robin	V (TSC Act)
		<i>Petroica goodenovii</i>	Red-capped Robin	
	Pomatostomidae	<i>Pomatostomus temporalis</i>	Grey-crowned Babbler	V (TSC Act)
	Rhipiduridae	<i>Rhipidura albiscapa</i>	Grey Fantail	
		<i>Rhipidura leucophrys</i>	Willie Wagtail	
	Sturnidae	* <i>Sturnus tristis</i>	Common Myna	
		<i>Sturnus vulgaris</i>	Common Starling	
	Timaliidae	<i>Zosterops lateralis</i>	Silvereye	
PODICIPEDIFORMES	Podicipedidae	<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	
PSITTACIFORMES	Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	
		<i>Cacatua sanguinea</i>	Little Corella	
		<i>Eolophus roseicapillus</i>	Galah	
	Psittacidae	<i>Alisterus scapularis</i>	Australian King Parrot	
		<i>Glossopsitta concinna</i>	Musk Lorikeet	
		<i>Glossopsitta pusilla</i>	Little Lorikeet	V (TSC Act)
		<i>Platycercus adscitus</i>	Pale-headed Rosella	
		<i>Platycercus elegans</i>	Crimson Rosella	
		<i>Platycercus eximius</i>	Eastern Rosella	
		<i>Psephotus haematonotus</i>	Red-rumped Parrot	
STRIGIFORMES	Strigidae	<i>Ninox novaeseelandiae</i>	Southern Boobook	
	Tytonidae	<i>Tyto javanica</i>	Eastern Barn Owl	

¹ Threatened flora species status listed under the TSC Act (current at 24 January 2013).

V = Vulnerable

AMPHIBIANS

Family	Scientific Name	Common Name
Hylidae	<i>Litoria caerulea</i>	Green Tree Frog
	<i>Litoria fallax</i>	Eastern Sedge-frog
	<i>Litoria freycineti</i>	Wallum Rocket Frog
	<i>Litoria latopalmata</i>	Broad-palmed Frog
	<i>Litoria peronii</i>	Peron's Tree Frog
Myobatrachidae	<i>Crinia signifera</i>	Common Eastern Froglet
	<i>Limnodynastes ornatus</i>	Ornate Burrowing Frog
	<i>Limnodynastes peronii</i>	Perons Tree Frog
	<i>Limnodynastes tasmaniensis</i>	Spotted Grass Frog
	<i>Uperoleia laevigata</i>	Smooth Toadlet
	<i>Uperoleia tyleri</i>	Tyler's Toadlet

Note: No species are listed as threatened.

REPTILES

Family	Scientific Name	Common Name
Agamidae	<i>Amphibolurus muricatus</i>	Jacky Lizard
	<i>Pogona barbata</i>	Bearded Dragon
Chelidae	<i>Chelodina longicollis</i>	Long-necked Tortoise
Elapidae	<i>Furina diadema</i>	Red-naped Snake
	<i>Parasuta dwyeri</i>	Dwyers Snake
	<i>Pseudechis guttatus</i>	Blue-bellied Black Snake
	<i>Pseudechis porphyriacus</i>	Red-bellied Black Snake
	<i>Pseudonaja textilis</i>	Eastern Brown Snake
	<i>Rhinoplocephalus nigrescens</i>	Eastern Small-eyed Snake
Gekkonidae	<i>Diplodactylus vittatus</i>	Eastern Stone Gecko
	<i>Oedura robusta</i>	Robust Velvet Gecko
	<i>Underwoodisaurus milii</i>	Thick-tailed Gecko
Scincidae	<i>Carlia tetradactyla</i>	Southern Rainbow Skink
	<i>Ctenotus robustus</i>	Robust Ctenotus
	<i>Ctenotus taeniolatus</i>	Copper-tailed Skink
	<i>Egernia modesta</i>	Eastern Rock-skink
	<i>Egernia striolata</i>	Tree Skink
	<i>Lampropholis delicata</i>	Dark-flecked Garden Sunskink
	<i>Tiliqua scincoides</i>	Eastern Blue-tongued Lizard
Varanidae	<i>Varanus varius</i>	Lace Monitor

Note: No species are listed as threatened.

MAMMALS

Order	Family	Scientific Name	Common Name	Status ¹
ARTIODACTYLA	Bovidae	<i>*Bos Taurus</i>	Cattle	
CARNIVORA	Canidae	<i>*Canis lupus dingo</i>	Dingo	
		<i>*Canis lupus familiaris</i>	Domestic Dog	
		<i>*Vulpes vulpes</i>	Red Fox	
	Felidae	<i>*Felis catus</i>	Cat	
CHIROPTERA	Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tailed Bat	V (TSC Act)
	Molossidae	<i>Mormopterus norfolkensis</i>	East Coast Freetail Bat	V (TSC Act)
		<i>Mormopterus planiceps</i>	Southern Freetail-bat	
		<i>Mormopterus</i> sp.	A Freetail Bat	
		<i>Nyctinomus australis</i>	White-striped Freetail Bat	
	Vespertilionidae	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V (TSC Act) V (EPBC Act)
		<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	
		<i>Chalinolobus morio</i>	Chocolate Wattled Bat	
		<i>Miniopterus schreibersii oceanensis</i>	Eastern Bent-wing Bat	V (TSC Act)
		<i>Myotis macropus</i>	Large-footed Myotis	V (TSC Act)
		<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	
		<i>Nyctophilus</i> sp.	a long-eared bat	
		<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V (TSC Act)
		<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	
		<i>Scotorepens orion</i>	Eastern Broad-nosed Bat	
		<i>Vespadelus pumilus</i>	Eastern Forest Bat	
		<i>Vespadelus regulus</i>	Southern Forest Bat	
		<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V (TSC Act)
		<i>Vespadelus vulturnus</i>	Little Forest Bat	
DASYUROMORPHIA	Dasyuridae	<i>Antechinus stuartii</i>	Brown Antechinus	
DIPROTODONTIA	Macropodidae	<i>Macropus giganteus</i>	Eastern Grey Kangaroo	
		<i>Macropus parma</i>	Parma Wallaby	V (TSC Act)
		<i>Macropus robustus</i>	Common Wallaroo	
		<i>Macropus rufogriseus</i>	Red-necked Wallaby	
		<i>Wallabia bicolor</i>	Swamp Wallaby	
	Petauridae	<i>Petaurus breviceps</i>	Sugar Glider	
		<i>Petaurus norfolcensis</i>	Squirrel Glider	V (TSC Act)

Order	Family	Scientific Name	Common Name	Status ¹
	Phalangeridae	<i>Trichosurus vulpecular</i>	Common Brushtail Possum	
	Pseudocheiridae	<i>Pseudocheirus peregrines</i>	Ring-tailed Possum	
	Vombatidae	<i>Vombatus ursinus</i>	Common Wombat	
LAGOMORPHA	Leporidae	* <i>Lepus</i> sp.	Brown Hare	
		* <i>Oryctolagus cuniculus</i>	European Rabbit	
MONOTREMATA	Tachyglossidae	<i>Tachyglossus aculeatus</i>	Short-beaked Echidna	
PERAMELEMORPHIA	Peramelidae	<i>Isoodon macrourus</i>	Northern Brown Bandicoot	
		<i>Perameles nasuta</i>	Long-nosed Bandicoot	E (TSC Act)
RODENTIA	Muridae	* <i>Mus musculus</i>	House Mouse	
		<i>Rattus fuscipes</i>	Bush Rat	
		* <i>Rattus norvegicus</i>	Black Rat	
		* <i>Rattus rattus</i>	Black Rat	

¹ Threatened flora species status listed under the TSC Act and/or EPBC Act (current at 24 January 2013).

V = Vulnerable; E = Endangered.

* Introduced species.

APPENDIX 3

THREATENED SPECIES DATABASE RECORDS

Appendix 3a Threatened flora species database records

Scientific Name	Common Name	Status ¹		Database		
		TSC Act	EPBC Act	OEH (2013) ²	SEWPaC (2012) ³	Royal Botanic Gardens Sydney and the Domain (2012) ⁴
ASCLEPIADACEAE						
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E	-	•	-
<i>Tylophora linearis</i>	-	V	E	-	•	-
MYRTACEAE						
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V	•	•	-
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V	V	•	-	-
ORCHIDACEAE						
<i>Diuris tricolor</i>	Pine Donkey Orchid	V	-	•	-	•
<i>Prasophyllum</i> sp. Wybong (C.Phelps ORG 5269)	a leek-orchid	-	CE	-	•	-
<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	E	-	•	-
POACEAE						
<i>Bothriochloa biloba</i>	Bluegrass	-	V	•	•	-
<i>Digitaria porrecta</i>	Finger Panic Grass	E	E	-	•	-
RHAMNACEAE						
<i>Pomaderris reperta</i>	Denman Pomaderris	CE	CE	•	•	-
SANTALACEAE						
<i>Thesium australe</i>	Austral Toadflax	V	V	-	•	-
SCROPHULARIACEAE						
<i>Euphrasia arguta</i>	-	CE	CE	-	•	-
THYMELAEACEAE						
<i>Pimelea curviflora</i> var. <i>curviflora</i>	Rice Flower	V	V	•	•	-
ZAMIACEAE						
<i>Macrozamia plurinervis</i>	-	-	V	•	-	-

¹ Threatened flora species status listed under the TSC Act and/or EPBC Act (current at 24 January 2013).

V = Vulnerable; E = Endangered; CE = Critically Endangered

² Office of Environment and Heritage (2013) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 22 January 2013.

³ Department of Sustainability, Environment, Water, Population and Communities (2012) *EPBC Act Protected Matters Search for the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 13 April 2012.

⁴ Royal Botanic Gardens Sydney and the Domain (2012) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 30 May 2012.

Appendix 3b Threatened fauna species database records

Scientific Name	Common Name	Status ¹		Database		
		TSC Act	EPBC Act	OEH (2013) ²	SEWPaC (2012) ³	Birds Australia (2012) ⁴
Amphibians						
HYLIDAE						
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	•	•	-
<i>Litoria booroolongensis</i>	Booroolong Frog	E	E	-	•	-
Birds						
MEGAPODIIDAE						
<i>Leipoa ocellata</i>	Malleefowl	E	V	-	•	-
ANATIDAE						
<i>Oxyura australis</i>	Blue-billed Duck	V	-	•	-	-
<i>Stictonetta naevosa</i>	Freckled Duck	V	-	•	-	-
CICONIIDAE						
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	•	-	-
ARDEIDAE						
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	-	•	-
ACCIPITRIDAE						
<i>Circus assimilis</i>	Spotted Harrier	V	-	•	-	•
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	•	-	•
BURHINIDAE						
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	-	-	•
ROSTRATULIDAE						
<i>Rostratula australis</i>	Australian Painted Snipe	E	V	-	•	-
PSITTACIDAE						
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	•	-	•
<i>Lathamus discolor</i>	Swift Parrot	E	E		•	-
<i>Neophema pulchella</i>	Turquoise Parrot	V	-	•	-	-
TYTONIDAE						
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	•	-	-
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	•	-	-
STRIGIDAE						
<i>Ninox connivens</i>	Barking Owl	V	-	•	-	-
<i>Ninox strenua</i>	Powerful Owl	V	-	•	-	-
CLIMACTERIDAE						
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V	-	•	-	•
ACANTHIZIDAE						
<i>Chthonicola sagittata</i>	Speckled Warbler	V	-	•	-	•

Appendix 3b Threatened fauna species database records (continued)

Scientific Name	Common Name	Status ¹		Database		
		TSC Act	EPBC Act	OEH (2013) ²	SEWPaC (2012) ³	Birds Australia (2012) ⁴
Birds (Continued)						
MELIPHAGIDAE						
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	E	•	•	-
<i>Melithreptus gularis gularis</i>	Black-chinned Honeyeater (eastern subspecies)	V	-	•	-	-
<i>Epthianura albifrons</i>	White-fronted Chat	V	-	-	-	•
PETROICIDAE						
<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	V	-	•	-	•
<i>Petroica boodang</i>	Scarlet Robin	V	-	•	-	-
POMATOSTOMIDAE						
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	-	•	-	•
NEOSITTIDAE						
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	•	-	•
ESTRILDIDAE						
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	•	-	•
Marsupials						
DASYURIDAE						
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	•	•	-
PHASCOLARCTIDAE						
<i>Phascolarctos cinereus</i>	Koala	V	V	•	-	-
PETAURIDAE						
<i>Petaurus norfolcensis</i>	Squirrel Glider	E		•	-	-
MACROPODIDAE						
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	•	•	-
PTEROPODIDAE						
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	•	•	-
EMBALLONURIDAE						
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	V	-	•	-	-
MOLOSSIDAE						
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	-	•	-	-
VESPERTILIONIDAE						
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	•	•	-

Appendix 3b Threatened fauna species database records (continued)

Scientific Name	Common Name	Status ¹		Database		
		TSC Act	EPBC Act	OEH (2013) ²	SEWPaC (2012) ³	Birds Australia (2012) ⁴
Mammals(Continued)						
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	•	-	-
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	•	-	-
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V	-	•	-	-
<i>Myotis macropus</i>	Southern Myotis	V	-	•	-	-
<i>Nyctophilus corbeni</i> (South-eastern form)	Corben's Long-eared Bat	V	V	•	•	-
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	•	-	-
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	-	•	-	-
MURIDAE						
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	-	•	-

Note: Please note that there were no threatened fauna species recorded in Australian Museum (2012) Australian Museum (2012) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 27 April 2012.

¹ Threatened fauna species status listed under the TSC Act and/or EPBC Act (current at 24 January 2013).

V = Vulnerable; E = Endangered; CE = Critically Endangered.

² Office of Environment and Heritage (2013) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 22 January 2013.

³ Department of Sustainability, Environment, Water, Population and Communities (2012) *EPBC Act Protected Matters Search for the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 13 April 2012.

⁴ Birds Australia (2012) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 9 May 2012.

Appendix 3c Migratory species recorded from the databases within and surrounding the Modification

Scientific Name	Common Name	Database				Type of Presence
		OEH (2013) ¹	SEWPaC (2012) ²	Birds Australia (2012) ³	Australian Museum (2012) ⁴	
<i>Anthochaera phrygia</i>	Regent Honeyeater	•	•	•	•	Species habitat may occur within area.
<i>Apus pacificus</i>	Fork-tailed Swift		•			Species or species habitat may occur within area.
<i>Ardea ibis</i>	Cattle Egret	•	•			Species or species habitat may occur within area.
<i>Ardea modesta</i>	Eastern Great Egret	•	•	•		Species or species habitat may occur within area.
<i>Gallinago hardwickii</i>	Latham's Snipe		•	•		Species or species habitat may occur within area.
<i>Haliaeetus leucogaster</i> *	White-bellied Sea-Eagle		•	•		Species or species habitat likely to occur within area.
<i>Hirundapus caudacutus</i> *	White-throated Needletail	•	•	•		Species or species habitat likely to occur within area.
<i>Sterna caspia</i>	Caspian Tern	•				Species or species habitat unlikely to occur within area.
<i>Leipoa ocellata</i>	Malleefowl		•			Species or species habitat unlikely to occur within area.
<i>Merops ornatus</i> *	Rainbow Bee-eater	•	•	•		Species or species habitat may occur within area.
<i>Monarcha melanopsis</i>	Black-faced Monarch		•			Breeding may occur within area.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	•		•		Breeding likely to occur within area.
<i>Rhipidura rufifrons</i>	Rufous Fantail	•		•		Species or species habitat may occur within area.
<i>Rostratula australis</i>	Australian Painted Snipe		•			Species or species habitat unlikely to occur within area.

¹ Office of Environment and Heritage (2013) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 22 January 2013.

² Department of Sustainability, Environment, Water, Population and Communities (2012) *EPBC Act Protected Matters Search for the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 13 April 2012.

³ Birds Australia (2012) *Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 9 May 2012.

⁴ Australian Museum (2012) *Australian Museum (2012) Database Records within the following Search Area: -32.2663, 150.9616; -32.4402, 150.9616; -32.4402, 150.7535; -32.2663, 150.7535*. Data received: 27 April 2012.

* Species recorded in or near the Modification area.

APPENDIX 4

FLORISTIC LIST BY MODIFICATION EXTENSION AREA

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
Acanthaceae						
<i>Rostellularia adscendens</i>		✓	✓			
Adiantaceae						
<i>Adiantum aethiopicum</i>	Common Maidenhair			✓		
<i>Cheilanthes distans</i>	Bristly Cloak Fern		✓			
<i>Cheilanthes sieberi</i>		✓	✓	✓	✓	✓
Aizoaceae						
* <i>Galenia pubescens</i>	Galenia	✓	✓		✓	✓
Anacardiaceae						
* <i>Schinus areira</i>	Pepper Tree				✓	
Anthericaceae						
<i>Caesia parviflora</i>	Pale Grass-lily		✓	✓		
Apiaceae						
<i>Centella asiatica</i>	Indian Pennywort		✓	✓		
<i>Hydrocotyle laxiflora</i>	Stinking Pennywort		✓			
Asclepiadaceae						
* <i>Gomphocarpus fruticosus</i>	Narrow-leaved Cotton Bush	✓	✓	✓	✓	✓
Asparagaceae						
* <i>Asparagus aethiopicus</i>	Asparagus Fern				✓	
Asphodelaceae						
* <i>Asphodelus fistulosus</i>			✓	✓		
Asteraceae						
* <i>Aster subulatus</i>	Wild Aster					✓
* <i>Bidens pilosa</i>	Cobbler's Pegs	✓	✓	✓	✓	✓
<i>Brachyscome ciliaris</i> var. <i>subintegrifolia</i>		✓		✓		
<i>Brachyscome multifida</i> var. <i>dilatata</i>	Cut-leaf Daisy		✓	✓		
<i>Calotis cuneifolia</i>	Purple Burr-Daisy					✓
<i>Calotis hispidula</i>	Bogan Flea		✓			
<i>Calotis lappulacea</i>	Yellow Burr-daisy		✓	✓	✓	✓
* <i>Carthamus lanatus</i>	Saffron Thistle		✓		✓	
<i>Cassinia quinquefaria</i>				✓	✓	
<i>Chrysocephalum apiculatum</i>	Common Everlasting	✓	✓	✓	✓	✓

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
<i>*Cichorium intybus</i>	Chicory	✓				
<i>*Cirsium vulgare</i>	Spear Thistle	✓	✓	✓	✓	✓
<i>*Conyza bonariensis</i>	Flaxleaf Fleabane					✓
<i>*Conyza canadensis</i>				✓		
<i>*Conyza sumatrensis</i>	Tall Fleabane	✓	✓	✓	✓	
<i>Cymbonotus lawsonianus</i>	Bear's Ear		✓	✓		
<i>Euchiton involucratus</i>	Star Cudweed			✓	✓	
<i>Euchiton sphaericus</i>			✓		✓	
<i>Glossocardia bidens</i>	Cobbler's Tack		✓		✓	
<i>*Hypochaeris radicata</i>	Catsear		✓		✓	
<i>*Lactuca saligna</i>	Willow-leaved Lettuce	✓	✓		✓	
<i>*Lactuca sp.</i>						✓
<i>Lagenifera gracilis</i>	Slender Lagenophora		✓			
<i>Minuria leptophylla</i>		✓	✓			
<i>Olearia elliptica</i>	Sticky Daisy Bush			✓		
<i>Senecio diaschides</i>				✓		
<i>Senecio hispidulus</i>	Hill Fireweed				✓	
<i>*Senecio madagascariensis</i>	Fireweed	✓	✓	✓	✓	✓
<i>Senecio quadridentatus</i>	Cotton Fireweed		✓	✓	✓	✓
<i>Sigesbeckia orientalis</i>			✓	✓		
<i>*Sonchus oleraceus</i>	Common Sowthistle	✓	✓		✓	
<i>*Taraxacum officinale</i>	Dandelion		✓	✓	✓	✓
<i>Vittadinia cervicularis</i> f. <i>cervicularis</i>			✓	✓		
<i>Vittadinia cuneata</i> var. <i>cuneata</i>		✓	✓		✓	✓
<i>Vittadinia dissecta</i> var. <i>hirta</i>						✓
<i>*Xanthium occidentale</i>	Noogoora Burr				✓	
Brassicaceae						
<i>*Brassica rapa</i> subsp. <i>sylvestris</i>	Turnip		✓	✓		
<i>*Hirschfeldia incana</i>	Buchan Weed					✓
<i>*Lepidium africanum</i>		✓	✓			✓
<i>Lepidium pseudohyssopifolium</i>	Peppercress		✓			✓
<i>*Sinapis arvensis</i>	Charlock					✓

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
Cactaceae						
<i>*Opuntia stricta</i> var. <i>stricta</i>	Common Prickly Pear	✓	✓	✓	✓	✓
Campanulaceae						
<i>Wahlenbergia communis</i>	Tufted Bluebell	✓	✓	✓	✓	✓
Casuarinaceae						
<i>Allocasuarina littoralis</i>	Black She-oak		✓	✓		
<i>Allocasuarina luehmannii</i>	Bulloak	✓			✓	✓
Celastraceae						
<i>Maytenus silvestris</i>	Narrow-leaved Orangebark			✓		
Chenopodiaceae						
<i>Atriplex semibaccata</i>	Creeping Saltbush	✓	✓			
<i>*Chenopodium album</i>	Fat Hen			✓		
<i>Chenopodium glaucum</i>		✓				
<i>Einadia nutans</i>	Climbing Saltbush		✓	✓	✓	✓
<i>Enchylaena tomentosa</i>	Ruby Saltbush	✓			✓	✓
<i>Maireana microphylla</i>	Small-leaf Bluebush	✓	✓	✓	✓	
<i>Sclerolaena birchii</i>	Galvanized Burr					✓
<i>Sclerolaena muricata</i>	Black Rolypoly	✓	✓	✓	✓	✓
Chloanthaceae						
<i>Spartothamnella juncea</i>	Bead Bush		✓	✓	✓	
Clusiaceae						
<i>Hypericum gramineum</i>	Small St John's Wort				✓	
<i>*Hypericum perforatum</i>	St. Johns Wort				✓	✓
Convolvulaceae						
<i>Convolvulus erubescens</i>	Blushing Bindweed	✓	✓	✓		
<i>Dichondra repens</i>	Kidney Weed	✓	✓	✓	✓	✓
<i>Dichondra</i> species A		✓				
<i>Polymeria calycina</i>			✓		✓	
Cyperaceae						
<i>Carex inversa</i>			✓		✓	✓
<i>Cyperus fulvus</i>	Sticky Sedge				✓	
<i>Cyperus gracilis</i>			✓			
<i>Fimbristylis dichotoma</i>	Common Fringe-sedge		✓	✓	✓	
<i>Scleria mackaviensis</i>			✓			

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
Euphorbiaceae						
<i>Breynia oblongifolia</i>	Coffee Bush			✓	✓	
<i>Chamaesyce drummondii</i>	Caustic Weed		✓			
<i>Phyllanthus gunnii</i>			✓			
<i>Phyllanthus virgatus</i>			✓			
Fabaceae (Caesalpinioideae)						
<i>Senna odorata</i>				✓		
Fabaceae (Faboideae)						
<i>Daviesia genistifolia</i>	Broom Bitter Pea			✓		
<i>Desmodium brachypodum</i>	Large Tick-trefoil				✓	
<i>Desmodium gunnii</i>	Slender Tick Trefoil		✓	✓		
<i>Desmodium rhytidophyllum</i>			✓	✓		
<i>Desmodium varians</i>	Slender Tick-trefoil		✓	✓		
<i>Glycine clandestina</i>		✓			✓	
<i>Glycine microphylla</i>	Small-leaf Glycine			✓	✓	
<i>Glycine tabacina</i>		✓	✓	✓	✓	✓
<i>Hardenbergia violacea</i>	False Sarsaparilla		✓	✓	✓	
* <i>Medicago minima</i>	Woolly Burr Medic					✓
* <i>Medicago orbicularis</i>	Button Medic		✓			
* <i>Medicago sativa</i>	Lucerne	✓				
* <i>Mellilotus indicus</i>						✓
<i>Swainsona galegifolia</i>	Smooth Darling Pea			✓		
* <i>Trifolium incarnatum</i>	Crimson Clover	✓				
* <i>Trifolium</i> sp.						✓
* <i>Trifolium subterraneum</i>	Subterraneum Clover				✓	
Fabaceae (Mimosoideae)						
<i>Acacia cultriformis</i>	Knife-leaved Wattle		✓			
<i>Acacia decora</i>	Western Golden Wattle	✓	✓			✓
<i>Acacia falcata</i>					✓	
<i>Acacia implexa</i>	Hickory Wattle		✓			
<i>Acacia maidenii</i>	Maiden's Wattle		✓	✓		
<i>Acacia salicina</i>	Cooba		✓	✓	✓	✓
Gentianaceae						
* <i>Centaurium erythraea</i>	Common Centaury		✓			✓

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
<i>*Centaurium tenuiflorum</i>			✓	✓		
<i>Geranium solanderi</i>	Native Geranium	✓	✓	✓		
<i>Scaevola albida</i>	Pale Fan-flower		✓			
Juncaceae						
<i>*Juncus acutus</i>	Sharp Rush				✓	✓
Lamiaceae						
<i>Ajuga australis</i>	Austral Bugle		✓			
<i>*Mentha pulegium</i>	Pennyroyal		✓			
<i>Mentha saturoioides</i>	Native Pennyroyal		✓	✓	✓	✓
<i>Scutellaria humilis</i>	Dwarf Skullcap		✓	✓		
<i>Teucrium</i> species A		✓				
Linaceae						
<i>Linum marginale</i>	Native Flax		✓	✓	✓	✓
<i>*Linum trigynum</i>	French Flax	✓	✓	✓	✓	✓
Lobeliaceae						
<i>Isotoma fluviatilis</i> subsp. <i>fluviatilis</i>	Swamp Isotome		✓	✓		
Lomandraceae						
<i>Lomandra confertifolia</i>	Mat-rush	✓	✓	✓	✓	✓
<i>Lomandra filiformis</i> subsp. <i>filiformis</i>	Wattle Mat-rush		✓			
<i>Lomandra longifolia</i>	Spiny-headed Mat-rush	✓	✓		✓	
<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	Many-flowered Mat-rush	✓	✓	✓	✓	✓
Luzuriagaceae						
<i>Geitonoplesium cymosum</i>	Scrambling Lily		✓	✓		
Malvaceae						
<i>Abutilon oxycarpum</i>	Lantern Bush		✓			✓
<i>*Modiola caroliniana</i>	Red-flowered Mallow	✓	✓			
<i>Sida corrugata</i>	Corrugated Sida	✓	✓	✓		✓
<i>Sida cunninghamii</i>	Ridged Sida	✓				
<i>*Sida rhombifolia</i>	Paddy's Lucerne			✓		
<i>*Sida spinosa</i>						✓
Moraceae						
<i>Ficus rubiginosa</i>	Port Jackson Fig, Rusty Fig				✓	
Myoporaceae						
<i>Eremophila debilis</i>	Amulla		✓	✓	✓	
<i>Myoporum montanum</i>	Western Boobiolla		✓	✓	✓	

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
Myrtaceae						
<i>Angophora floribunda</i>	Rough-barked Apple		✓	✓		
<i>Corymbia maculata</i>	Spotted Gum		✓	✓	✓	
<i>Eucalyptus blakelyi</i>	Blakely's Red Gum			✓		✓
<i>Eucalyptus dawsonii</i>	Slaty Gum	✓				
<i>Eucalyptus moluccana x albens</i>	Grey Box		✓	✓	✓	✓
<i>Eucalyptus punctata</i>	Grey Gum			✓		
<i>Eucalyptus tereticornis</i>	Forest Red Gum				✓	
Oleaceae						
<i>Notelaea microcarpa</i>	Native Olive		✓	✓	✓	
Oxalidaceae						
<i>Oxalis chnoodes</i>			✓			✓
<i>Oxalis perennans</i>			✓	✓		
<i>Oxalis</i> sp.					✓	✓
Phormiaceae						
<i>Dianella caerulea</i>	Blue Flax-lily		✓			
<i>Dianella longifolia</i>	Blue Flax-lily		✓			
<i>Dianella revoluta</i>	Blue Flax-lily		✓	✓	✓	✓
<i>Dianella tasmanica</i>	Tasman Flax-lily			✓		
Pittosporaceae						
<i>Bursaria spinosa</i>	Blackthorn	✓	✓	✓	✓	✓
Plantaginaceae						
<i>Plantago gaudichaudii</i>	Narrow Plantain		✓	✓		
* <i>Plantago lanceolata</i>	Lamb's Tongues			✓		
Poaceae						
* <i>Aira cupaniana</i>	Silver Hairgrass				✓	
<i>Aristida acuta</i>			✓			
<i>Aristida calycina</i>			✓		✓	
<i>Aristida personata</i>	Purple Wire-grass	✓	✓		✓	
<i>Aristida ramosa</i>	Purple Wiregrass		✓			
<i>Austrodanthonia fulva</i>	Wallaby Grass		✓			✓
<i>Austrodanthonia setacea</i>	Smallflower Wallaby-grass		✓	✓	✓	
<i>Austrostipa aristiglumis</i>	Plains Grass	✓				
<i>Austrostipa scabra</i>	Speargrass		✓			
<i>Austrostipa scabra</i> subsp. <i>falcata</i>		✓	✓	✓	✓	✓
<i>Austrostipa scabra</i> subsp. <i>scabra</i>	Speargrass		✓	✓	✓	✓
<i>Austrostipa verticillata</i>	Slender Bamboo Grass	✓	✓		✓	✓

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
<i>Bothriochloa biloba</i>		✓	✓			
<i>Bothriochloa decipiens</i>	Red Grass	✓	✓	✓	✓	✓
<i>Bothriochloa macra</i>	Red Grass	✓	✓			✓
* <i>Bromus catharticus</i>	Praire Grass		✓	✓	✓	✓
* <i>Bromus molliformis</i>	Soft Broome		✓	✓		
* <i>Chloris gayana</i>	Rhodes Grass	✓	✓	✓		
<i>Chloris truncata</i>	Windmill Grass		✓	✓	✓	✓
<i>Chloris ventricosa</i>	Tall Chloris	✓	✓	✓	✓	✓
<i>Cymbopogon refractus</i>	Barbed Wire Grass	✓	✓	✓	✓	✓
* <i>Cynodon dactylon</i>	Common Couch	✓	✓		✓	✓
<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Queensland Bluegrass	✓	✓	✓	✓	✓
<i>Dichelachne crinita</i>	Longhair Plumegrass	✓	✓	✓	✓	✓
<i>Dichelachne rara</i>			✓			
<i>Digitaria brownii</i>	Cotton Panic Grass	✓	✓	✓	✓	✓
<i>Digitaria diffusa</i>	Open Summer Grass	✓				
<i>Digitaria divaricatissima</i>	Umbrella Grass	✓	✓			
<i>Digitaria ramularis</i>			✓			✓
<i>Elymus scaber</i> var. <i>scaber</i>	Common Wheatgrass	✓		✓		
<i>Enneapogon gracilis</i>	Slender Nineawn		✓			
<i>Enneapogon nigricans</i>	Niggerheads		✓			
<i>Enteropogon acicularis</i>		✓				
<i>Eragrostis alveiformis</i>		✓			✓	✓
<i>Eragrostis brownii</i>	Brown's Lovegrass	✓				
<i>Eragrostis lacunaria</i>	Purple Lovegrass	✓		✓	✓	
<i>Eragrostis leptostachya</i>	Paddock Lovegrass	✓	✓	✓	✓	✓
<i>Eriochloa pseudoacrotricha</i>	Early Spring Grass	✓			✓	✓
<i>Eulalia aurea</i>	Silky Browntop	✓	✓	✓	✓	✓
* <i>Hyparrhenia hirta</i>	Coolatai Grass		✓	✓	✓	✓
* <i>Lolium multiflorum</i>	Italian Ryegrass		✓			✓
* <i>Lolium perenne</i>	Perennial Ryegrass			✓		
* <i>Melinis repens</i>	Red Natal Grass				✓	✓
<i>Microlaena stipoides</i>	Weeping Grass		✓	✓	✓	✓
<i>Panicum effusum</i>	Hairy Panic	✓	✓			✓
* <i>Panicum maximum</i> var. <i>maximum</i>	Guinea Grass					✓
<i>Panicum queenslandicum</i>	Yadbila Grass	✓	✓	✓	✓	✓
<i>Panicum simile</i>	Two-colour Panic		✓			
<i>Paspalidium distans</i>		✓	✓		✓	

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
<i>*Paspalum dilatatum</i>	Paspalum	✓	✓	✓	✓	✓
<i>Paspalum distichum</i>	Water Couch				✓	✓
<i>*Pennisetum clandestinum</i>	Kikuyu Grass				✓	
<i>*Phalaris arundinacea</i> var. <i>arundinacea</i>	Reed Canary Grass					✓
<i>*Setaria parviflora</i>	Slender Pigeon Grass					✓
<i>Sporobolus caroli</i>	Fairy Grass	✓				
<i>Sporobolus creber</i>	Slender Rat's Tail Grass	✓	✓	✓	✓	✓
<i>Themeda australis</i>	Kangaroo Grass		✓	✓		✓
Polygalaceae						
<i>Polygala japonica</i>	Dwarf Milkwort		✓			
Polygonaceae						
<i>Persicaria decipiens</i>	Slender Knotweed				✓	
<i>Persicaria subsessilis</i>	Hairy Knotweed				✓	
<i>*Polygonum arenastrum</i>	Wireweed	✓				
<i>Rumex brownii</i>	Swamp Dock		✓	✓		
Primulaceae						
<i>*Anagallis arvensis</i>	Scarlet/Blue Pimpernel	✓	✓	✓	✓	✓
Ranunculaceae						
<i>Clematis glycinoides</i>	Headache Vine		✓	✓	✓	
Rhamnaceae						
<i>Cryptandra amara</i>	Bitter cryptandra				✓	
Rosaceae						
<i>Acaena ovina</i>			✓	✓		
<i>Rubus parvifolius</i>	Native Raspberry			✓		
Rubiaceae						
<i>Asperula conferta</i>	Common Woodruff		✓	✓	✓	✓
<i>*Galium aparine</i>	Goosegrass					✓
<i>Galium propinquum</i>	Maori Bedstraw		✓	✓		
<i>Psydrax odorata</i>	Shiny-leaved Canthium		✓			
Santalaceae						
<i>Exocarpos strictus</i>	Dwarf Cherry			✓		
Sapindaceae						
<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>	Narrow-leaved Hopbush			✓		
Scrophulariaceae						
<i>*Verbascum virgatum</i>	Twiggy Mullein		✓		✓	
<i>Veronica plebeia</i>	Trailing Speedwell		✓	✓	✓	✓

Family and Scientific Name	Common Name	Modification Area				
		A	B	C	D	E
Solanaceae						
<i>*Lycium ferocissimum</i>	African Boxthorn			✓		✓
<i>Solanum elegans</i>	Spiny Kangaroo Apple		✓			
<i>*Solanum nigrum</i>	Black-berry Nightshade		✓			
<i>*Solanum physalifolium</i> var. <i>nitidibaccatum</i>				✓	✓	
<i>Solanum prinophyllum</i>	Forest Nightshade		✓			
<i>Solanum</i> sp.			✓			
Stackhousiaceae						
<i>Stackhousia muricata</i>	Western Stackhousia		✓			
Sterculiaceae						
<i>Brachychiton populneus</i>	Kurrajong		✓	✓	✓	
Thymelaeaceae						
<i>Pimelea curviflora</i> var. <i>gracilis</i>			✓	✓		
Typhaceae						
<i>Typha orientalis</i>	Broad-leaved Cumbungi				✓	
Verbenaceae						
<i>*Verbena bonariensis</i>	Purpletop		✓	✓		✓
<i>*Verbena rigida</i>		✓				✓
Xanthorrhoeaceae						
<i>Xanthorrhoea glauca</i>				✓		

* Introduced species.

APPENDIX 5
VEGETATION SAMPLE PLOT DATA

Family Name	Scientific Name	Plot and Cover-Abundance Scores									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Acanthaceae	<i>Rostellularia adscendens</i> var. <i>adscendens</i>		3								
Adiantaceae	<i>Cheilanthes sieberi</i>			2	2		1	1		1	
Aizoaceae	* <i>Galenia pubescens</i>	1		1	3	3		2		1	
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>	1					1		4		
Asteraceae	* <i>Bidens pilosa</i>		3								
Asteraceae	* <i>Carthamus lanatus</i>		2				1			1	
Asteraceae	* <i>Cirsium vulgare</i>		2	1							
Asteraceae	* <i>Conyza sumatrensis</i>		1			1	1	1			
Asteraceae	* <i>Senecio madagascariensis</i>	1	1	1		1	1	1	1	1	
Asteraceae	<i>Brachyscome ciliaris</i> var. <i>subintegrifolia</i>							1			
Asteraceae	<i>Chrysocephalum apiculatum</i>					1		2			
Asteraceae	* <i>Lactuca saligna</i>		1	1							
Asteraceae	<i>Vittadinia cuneata</i> f. <i>cuneata</i>			1							
Brassicaceae	* <i>Lepidium africanum</i>				1	2		1			
Cactaceae	* <i>Opuntia stricta</i> var. <i>stricta</i>						1				
Campanulaceae	<i>Wahlenbergia communis</i>			1						1	1
Casuarinaceae	<i>Allocasuarina luehmannii</i>			4	5	3		1			
Chenopodiaceae	<i>Atriplex semibaccata</i>				1	1					
Chenopodiaceae	<i>Chenopodium glaucum</i>				1						
Chenopodiaceae	<i>Enchylaena tomentosa</i>				1	2					
Chenopodiaceae	<i>Maireana microphylla</i>				1	2	1	1			
Chenopodiaceae	<i>Sclerolaena muricata</i>					1					
Convolvulaceae	<i>Convolvulus erubescens</i>		1								
Convolvulaceae	<i>Dichondra repens</i>										1
Convolvulaceae	<i>Dichondra</i> species A	1									
Cyperaceae	<i>Fimbristylis dichotoma</i>			1	1		1				
Fabaceae (Faboideae)	* <i>Medicago sativa</i>	1									
Fabaceae (Faboideae)	* <i>Trifolium incarnatum</i>		1								
Fabaceae (Faboideae)	<i>Glycine clandestina</i>			1							
Fabaceae (Faboideae)	<i>Glycine tabacina</i>			1			3			1	1
Fabaceae (Mimosoideae)	<i>Acacia decora</i>									1	
Geraniaceae	<i>Geranium solanderi</i>				1						
Lamiaceae	<i>Teucrium</i> species A		1								
Linaceae	* <i>Linum trigynum</i>	1									

Family Name	Scientific Name	Plot and Cover-Abundance Scores									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Lomandraceae	<i>Lomandra confertifolia</i>			1	1			1	1		
Lomandraceae	<i>Lomandra longifolia</i>									2	
Lomandraceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>			1							
Malvaceae	* <i>Sida rhombifolia</i>				1	1	1	1	1	1	1
Malvaceae	<i>Sida corrugata</i>				1			1			1
Myrtaceae	<i>Eucalyptus dawsonii</i>					1		3	1		
Plantaginaceae	* <i>Plantago lanceolata</i>	1	2	2	1	2	2		1	2	2
Poaceae	* <i>Bromus catharticus</i>		1								
Poaceae	* <i>Bromus molliformis</i>		1								
Poaceae	* <i>Lolium perenne</i>		1						1		
Poaceae	* <i>Paspalum dilatatum</i>								1	1	
Poaceae	<i>Aristida personata</i>							1			
Poaceae	<i>Aristida ramosa</i>	3	3	4	4	1	2	3	5	2	2
Poaceae	<i>Austrodanthonia fulva</i>	2					1	2	1	1	
Poaceae	<i>Austrostipa aristiglumis</i>		1								
Poaceae	<i>Austrostipa scabra</i> subsp. <i>falcata</i>				1	1	1	1		1	
Poaceae	<i>Austrostipa verticillata</i>		2		1	1					
Poaceae	<i>Bothriochloa biloba</i>	2	3				3		2	3	6
Poaceae	<i>Bothriochloa decipiens</i>		1	2	1	1		1			
Poaceae	<i>Bothriochloa macra</i>	1				2					
Poaceae	<i>Chloris truncata</i>					2	1	1			
Poaceae	<i>Chloris ventricosa</i>			1	2	2	2	1	2		
Poaceae	<i>Cymbopogon refractus</i>	1		1	1					1	
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	3				1	2	1	3	3	1
Poaceae	<i>Dichelachne crinita</i>	1									
Poaceae	<i>Digitaria brownii</i>		1	1	1	1	1		1	1	1
Poaceae	<i>Digitaria diffusa</i>									1	
Poaceae	<i>Digitaria divaricatissima</i>		1								
Poaceae	<i>Elymus scaber</i> var. <i>scaber</i>									1	
Poaceae	<i>Enteropogon acicularis</i>							1		1	
Poaceae	<i>Eragrostis alveiformis</i>			2		2		2			
Poaceae	<i>Eragrostis benthamii</i>					2					
Poaceae	<i>Eragrostis brownii</i>			1							
Poaceae	<i>Eragrostis lacunaria</i>										1
Poaceae	<i>Eragrostis leptostachya</i>			1	1						
Poaceae	<i>Eriochloa pseudoacrotricha</i>					2	1	1		1	
Poaceae	<i>Eulalia aurea</i>			1	1				2	1	
Poaceae	<i>Panicum effusum</i>	1		1		1	1				

Family Name	Scientific Name	Plot and Cover-Abundance Scores									
		A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
Poaceae	<i>Panicum queenslandicum</i>	2	2	1		2	1	2	1	2	2
Poaceae	<i>Paspalidium distans</i>		1	1	1		1				
Poaceae	<i>Sporobolus caroli</i>	1									
Poaceae	<i>Sporobolus creber</i>	3		1	2	3	3	3	2	3	1
Polygonaceae	* <i>Polygonum arenastrum</i>				1						
Polygonaceae	<i>Rumex brownii</i>									1	
Primulaceae	* <i>Anagallis arvensis</i>		1								
Verbenaceae	* <i>Verbena rigida</i>	1									

* Introduced species.

Family Name	Scientific Name	Plot and Cover-Abundance Scores										
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Acanthaceae	<i>Rostellularia adscendens</i>								1			
Acanthaceae	<i>Rostellularia adscendens</i> var. <i>adscendens</i>				1							
Adiantaceae	<i>Cheilanthes distans</i>		1			1						
Adiantaceae	<i>Cheilanthes sieberi</i>	1		1	2	2	1	1	1		1	2
Aizoaceae	* <i>Galenia pubescens</i>						1			2		
Anthericaceae	<i>Caesia parviflora</i>					1						
Apiaceae	<i>Centella asiatica</i>					1						
Apiaceae	<i>Hydrocotyle laxiflora</i>						1	1				
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>	2	1	1	1		2	2	1	1	2	2
Asphodelaceae	* <i>Asphodelus fistulosus</i>		1						2	1		
Asteraceae	* <i>Bidens pilosa</i>			1						1		
Asteraceae	* <i>Carthamus lanatus</i>									1		
Asteraceae	* <i>Cirsium vulgare</i>	2	1					2	1	4	3	1
Asteraceae	* <i>Conyza sumatrensis</i>					1			1	5	2	2
Asteraceae	* <i>Hypochaeris radicata</i>										1	
Asteraceae	* <i>Senecio madagascariensis</i>	3	1	1	2	2	3	3	2		2	2
Asteraceae	* <i>Sonchus oleraceus</i>				1							
Asteraceae	* <i>Taraxacum officinale</i>						4	3				
Asteraceae	<i>Brachyscome multifida</i> var. <i>dilatata</i>				1							
Asteraceae	<i>Calotis hispidula</i>										1	
Asteraceae	<i>Calotis lappulacea</i>		2	2	2	3			3			2
Asteraceae	<i>Chrysocephalum apiculatum</i>	2			1		2	3	2		1	2
Asteraceae	<i>Cymbonotus lawsonianus</i>	1				1						
Asteraceae	<i>Euchiton sphaericus</i>	1		1	1						1	1
Asteraceae	<i>Glossocardia bidens</i>		1	1					1			1
Asteraceae	* <i>Lactuca saligna</i>						1			1		1
Asteraceae	<i>Lagenifera gracilis</i>				1							
Asteraceae	<i>Minuria leptophylla</i>										1	
Asteraceae	<i>Senecio quadridentatus</i>					1			1	2	1	1
Asteraceae	<i>Sigesbeckia orientalis</i>		1			1			1			1
Asteraceae	<i>Vittadinia cervicularis</i> var. <i>cervicularis</i>											2
Asteraceae	<i>Vittadinia cuneata</i> f. <i>cuneata</i>	2	2		1	2	2	2	2		2	
Brassicaceae	* <i>Brassica rapa</i> subsp. <i>sylvestris</i>									1		
Brassicaceae	* <i>Lepidium africanum</i>		1									
Brassicaceae	<i>Lepidium pseudohyssopifolium</i>		1									

Family Name	Scientific Name	Plot and Cover-Abundance Scores										
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Cactaceae	<i>*Opuntia stricta var. stricta</i>						1				1	1
Campanulaceae	<i>Wahlenbergia communis</i>		1			1	1	1	1	1	1	
Casuarinaceae	<i>Allocasuarina littoralis</i>				1							
Chenopodiaceae	<i>Atriplex semibaccata</i>		1	1								
Chenopodiaceae	<i>Einadia nutans</i>		1									
Chenopodiaceae	<i>Maireana microphylla</i>	1	1						1			
Chloanthaceae	<i>Spartothamnella juncea</i>		2	1	2	3			1			1
Convolvulaceae	<i>Convolvulus erubescens</i>								1			1
Convolvulaceae	<i>Dichondra repens</i>	2	2	2	2	2	2	1	2	2		1
Convolvulaceae	<i>Polymeria calycina</i>		1	1	1	1						
Cyperaceae	<i>Carex inversa</i>									3		
Cyperaceae	<i>Cyperus gracilis</i>		1			1			1			1
Cyperaceae	<i>Fimbristylis dichotoma</i>	1										
Cyperaceae	<i>Scleria mackaviensis</i>		1									
Euphorbiaceae	<i>Chamaesyce drummondii</i>			1							1	
Euphorbiaceae	<i>Phyllanthus gunnii</i>		1									
Euphorbiaceae	<i>Phyllanthus virgatus</i>											1
Fabaceae (Faboideae)	<i>Desmodium gunnii</i>		1	1	2	1						
Fabaceae (Faboideae)	<i>Desmodium rhytidophyllum</i>										1	
Fabaceae (Faboideae)	<i>Desmodium varians</i>					1						
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	1	2	1			1		2		1	
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>								1			
Fabaceae (Mimosoideae)	<i>Acacia cultriformis</i>		3									1
Fabaceae (Mimosoideae)	<i>Acacia decora</i>			2								3
Fabaceae (Mimosoideae)	<i>Acacia implexa</i>				2							
Fabaceae (Mimosoideae)	<i>Acacia salicina</i>								2			
Gentianaceae	<i>*Centaurium erythraea</i>						1	1			1	1
Gentianaceae	<i>*Centaurium tenuiflorum</i>										1	
Geraniaceae	<i>Geranium solanderi</i>				2			1		1		
Goodeniaceae	<i>Scaevola albida</i>											1
Lamiaceae	<i>Ajuga australis</i>		1			1			2			
Lamiaceae	<i>Mentha satureioides</i>	2		1			1	2			3	2
Lamiaceae	<i>Scutellaria humilis</i>					1						
Linaceae	<i>*Linum trigynum</i>	1										
Linaceae	<i>Linum marginale</i>			1			1				1	1
Lobeliaceae	<i>Isotoma fluviatilis</i> subsp. <i>fluviatilis</i>				1							
Lomandraceae	<i>Lomandra confertifolia</i>	2	3	2	1	3	1	1	3		2	2

Family Name	Scientific Name	Plot and Cover-Abundance Scores										
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Lomandraceae	<i>Lomandra filliformis</i> subsp. <i>filliformis</i>				1							
Lomandraceae	<i>Lomandra longifolia</i>								3			
Lomandraceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	2	3	1	2	1		1				2
Luzuriagaceae	<i>Geitonoplesium cymosum</i>		2		1							
Malvaceae	* <i>Modiola caroliniana</i>									2		
Malvaceae	* <i>Sida rhombifolia</i>	1	1	1		1	3	2	1	4	2	2
Malvaceae	<i>Abutilon oxycarpum</i>		1									
Malvaceae	<i>Sida corrugata</i>		2	2		1	1	1	2			1
Myoporaceae	<i>Eremophila debilis</i>		2	1		1		1				1
Myoporaceae	<i>Myoporum montanum</i>					1			3			1
Myrtaceae	<i>Corymbia maculata</i>				2							
Myrtaceae	<i>Eucalyptus moluccana</i>		2	4	2	2			4			4
Oleaceae	<i>Notelaea microcarpa</i>		2	2	1	3						1
Oxalidaceae	<i>Oxalis chnoodes</i>	1	1						1			
Oxalidaceae	<i>Oxalis perennans</i>					1						
Phormiaceae	<i>Dianella caerulea</i>								1			
Phormiaceae	<i>Dianella longifolia</i>		1					1				1
Phormiaceae	<i>Dianella revoluta</i>				1							
Phormiaceae	<i>Dianella tasmanica</i>		1	1	1							
Pittosporaceae	<i>Bursaria spinosa</i>		1		1	1		1	1			
Plantaginaceae	* <i>Plantago lanceolata</i>	2		1		2	3				2	1
Plantaginaceae	<i>Plantago gaudichaudii</i>	1	2			1	1		2			1
Poaceae	* <i>Bromus catharticus</i>									1		
Poaceae	* <i>Hyparrhenia hirta</i>										1	
Poaceae	* <i>Paspalum dilatatum</i>	1		1			2	3			1	1
Poaceae	<i>Aristida acuta</i>								1	1		
Poaceae	<i>Aristida personata</i>		3	4					3			
Poaceae	<i>Aristida ramosa</i>	3		5		1		3		2	4	3
Poaceae	<i>Austrodanthonia fulva</i>	1		2	2	2			2		1	1
Poaceae	<i>Austrodanthonia setacea</i>				3							
Poaceae	<i>Austrostipa scabra</i>		2									
Poaceae	<i>Austrostipa scabra</i> subsp. <i>falcata</i>							1	2			1
Poaceae	<i>Austrostipa scabra</i> subsp. <i>scabra</i>			1		1			2			
Poaceae	<i>Austrostipa verticillata</i>									5		1
Poaceae	<i>Bothriochloa biloba</i>										3	
Poaceae	<i>Bothriochloa decipiens</i>	1	2			1	1	2		1		1
Poaceae	<i>Bothriochloa macra</i>						1		1			

Family Name	Scientific Name	Plot and Cover-Abundance Scores										
		B1	B2	B3	B4	B5	B6	B7	B8	B9	B10	B11
Poaceae	<i>Chloris truncata</i>			1								
Poaceae	<i>Chloris ventricosa</i>	4	2	2	1	3	2	2	3	1	4	3
Poaceae	<i>Cymbopogon refractus</i>	2	2	2		2	1		1		1	1
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	2		2			1				2	1
Poaceae	<i>Dichelachne crinita</i>	1										
Poaceae	<i>Dichelachne rara</i>					1						
Poaceae	<i>Digitaria brownii</i>		2				1	1	3	1		2
Poaceae	<i>Digitaria divaricatissima</i>										1	
Poaceae	<i>Digitaria ramularis</i>								1			
Poaceae	<i>Elymus scaber</i> var. <i>scaber</i>		1									
Poaceae	<i>Enneapogon gracilis</i>		1									
Poaceae	<i>Enneapogon nigricans</i>								1			
Poaceae	<i>Eragrostis leptostachya</i>			1	1							
Poaceae	<i>Microlaena stipoides</i>								1	1		1
Poaceae	<i>Panicum effusum</i>		1			2	1		2			
Poaceae	<i>Panicum queenslandicum</i>	3	1	2	2		1		2	3	1	3
Poaceae	<i>Panicum simile</i>								1			
Poaceae	<i>Paspalidium distans</i>		1	1					1	1		
Poaceae	<i>Sporobolus creber</i>	1					1				1	2
Poaceae	<i>Themeda australis</i>	2			1				3			3
Polygalaceae	<i>Polygala japonica</i>				1							
Polygonaceae	<i>Rumex brownii</i>	1					1			1		
Primulaceae	* <i>Anagallis arvensis</i>		1	1	1			1	1	1	1	
Ranunculaceae	<i>Clematis glycinoides</i>			1	1	1						1
Rosaceae	<i>Acaena ovina</i>	2		1	1		3	3			1	1
Rubiaceae	<i>Asperula conferta</i>	2	1		1	1	1	1			2	2
Rubiaceae	<i>Galium propinquum</i>		1			1						
Rubiaceae	<i>Psydrax odorata</i>		2	2	1	1						3
Scrophulariaceae	* <i>Verbascum virgatum</i>										1	
Scrophulariaceae	<i>Veronica plebeia</i>				1	1		1		1		
Solanaceae	* <i>Solanum nigrum</i>								1	2		1
Solanaceae	<i>Solanum elegans</i>					1						
Solanaceae	<i>Solanum</i> sp.								1			
Stackhousiaceae	<i>Stackhousia muricata</i>							1				
Sterculiaceae	<i>Brachychiton populneus</i>			1		2			1			3
Thymelaeaceae	<i>Pimelea curviflora</i>	1										2
Verbenaceae	* <i>Verbena bonariensis</i>									2	1	

* Introduced species.

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		C1	C2	C3	C4	C5	C6
Acanthaceae	<i>Rostellularia adscendens</i> var. <i>adscendens</i>		1				
Adiantaceae	<i>Cheilanthes sieberi</i>	2			1	1	2
Anthericaceae	<i>Caesia parviflora</i>					1	
Apiaceae	<i>Centella asiatica</i>	2				1	
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>		1	1	3	1	
Asphodelaceae	* <i>Asphodelus fistulosus</i>			1			
Asteraceae	* <i>Bidens pilosa</i>		1		1	1	
Asteraceae	* <i>Cirsium vulgare</i>		1	1	3	1	
Asteraceae	* <i>Conyza sumatrensis</i>		1			1	1
Asteraceae	* <i>Conyza canadensis</i>	1					
Asteraceae	<i>Euchiton involucratus</i>	1					
Asteraceae	* <i>Senecio madaqascariensis</i>	2	1	3	2		1
Asteraceae	* <i>Taraxacum officinale</i>		2			1	
Asteraceae	<i>Brachyscome multifida</i> var. <i>dilatata</i>	1					
Asteraceae	<i>Calotis lappulacea</i>		1	2	1	1	
Asteraceae	<i>Cassinia quinquefaria</i>	1	1				
Asteraceae	<i>Chrysocephalum apiculatum</i>		1		1		
Asteraceae	<i>Cymbonotus lawsonianus</i>		1	1	1		
Asteraceae	<i>Olearia elliptica</i>	3	2				
Asteraceae	<i>Senecio diaschides</i>		1				
Asteraceae	<i>Senecio quadridentatus</i>	1	1				
Asteraceae	<i>Sigesbeckia orientalis</i>		1	1	1	1	1
Asteraceae	<i>Vittadinia cervicalis</i> var. <i>cervicalis</i>			1			
Brassicaceae	* <i>Brassica rapa</i> subsp. <i>sylvestris</i>			1			
Cactaceae	* <i>Opuntia stricta</i> var. <i>stricta</i>			1	1	1	1
Campanulaceae	<i>Wahlenbergia communis</i>				1		
Celastraceae	<i>Maytenus silvestris</i>						3
Chenopodiaceae	<i>Einadia nutans</i>	1	1				
Chenopodiaceae	<i>Maireana microphylla</i>			1			
Chloanthaceae	<i>Spartothamnella juncea</i>	1	1			2	2
Convolvulaceae	<i>Convolvulus erubescens</i>						1
Convolvulaceae	<i>Dichondra repens</i>	2	2	2	1	2	2
Euphorbiaceae	<i>Breynia oblongifolia</i>					3	

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		C1	C2	C3	C4	C5	C6
Fabaceae (Caesalpinioideae)	<i>Senna odorata</i>					3	
Fabaceae (Faboideae)	* <i>Medicago orbicularis</i>		1	1			
Fabaceae (Faboideae)	<i>Daviesia genistifolia</i>					3	1
Fabaceae (Faboideae)	<i>Desmodium gunnii</i>		1		1	2	2
Fabaceae (Faboideae)	<i>Desmodium rhytidophyllum</i>						1
Fabaceae (Faboideae)	<i>Desmodium varians</i>		1			1	
Fabaceae (Faboideae)	<i>Glycine microphylla</i>	1					1
Fabaceae (Faboideae)	<i>Glycine tabacina</i>			1	2		
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>		1				
Fabaceae (Faboideae)	<i>Swainsona galegifolia</i>		1				
Fabaceae (Mimosoideae)	<i>Acacia maidenii</i>		1				3
Gentianaceae	* <i>Centaurium tenuiflorum</i>		1				
Geraniaceae	<i>Geranium solanderi</i>		1				
Lamiaceae	<i>Mentha satuireioides</i>			1	3	1	
Linaceae	* <i>Linum trigynum</i>			1			
Linaceae	<i>Linum marginale</i>		1		1		
Lobeliaceae	<i>Isotoma fluviatilis</i> subsp. <i>fluviatilis</i>	1					
Lomandraceae	<i>Lomandra confertifolia</i>	2	3				1
Lomandraceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	1	1				1
Luzuriagaceae	<i>Geitonoplesium cymosum</i>	1	1			1	2
Malvaceae	* <i>Sida rhombifolia</i>			2	1	1	
Malvaceae	<i>Sida corrugata</i>		1	2			
Myoporaceae	<i>Eremophila debilis</i>						1
Myoporaceae	<i>Myoporum montanum</i>		2	1	1	1	1
Myrtaceae	<i>Angophora floribunda</i>	2					
Myrtaceae	<i>Corymbia maculata</i>					4	5
Myrtaceae	<i>Eucalyptus blakelyi</i>	3	5				
Myrtaceae	<i>Eucalyptus moluccana</i>	2					
Oleaceae	<i>Notelaea microcarpa</i>	4	3			4	3
Oxalidaceae	<i>Oxalis perennans</i>	1				1	
Phormiaceae	<i>Dianella longifolia</i>	1	2		1	1	1

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		C1	C2	C3	C4	C5	C6
Phormiaceae	<i>Dianella tasmanica</i>	1	1			1	1
Pittosporaceae	<i>Bursaria spinosa</i>	1	1				1
Plantaginaceae	* <i>Plantago lanceolata</i>		1			1	
Plantaginaceae	<i>Plantago gaudichaudii</i>					1	
Poaceae	* <i>Hyparrhenia hirta</i>				1		
Poaceae	* <i>Paspalum dilatatum</i>		1			1	
Poaceae	<i>Aristida personata</i>		1	3			
Poaceae	<i>Aristida ramosa</i>	2	3			3	
Poaceae	<i>Austrodanthonia fulva</i>			1			
Poaceae	<i>Austrodanthonia setacea</i>	4	1			1	3
Poaceae	<i>Austrostipa scabra</i> subsp. <i>falcata</i>			1			
Poaceae	<i>Austrostipa scabra</i> subsp. <i>scabra</i>	1				1	
Poaceae	<i>Bothriochloa decipiens</i>		1				
Poaceae	<i>Chloris truncata</i>			1			
Poaceae	<i>Chloris ventricosa</i>			3	3		
Poaceae	<i>Cymbopogon refractus</i>	1	1	1	1	2	2
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>			3	2		
Poaceae	<i>Dichelachne crinita</i>	1	1	1			
Poaceae	<i>Digitaria brownii</i>			1	1		
Poaceae	<i>Eragrostis lacunaria</i>				1		
Poaceae	<i>Eragrostis leptostachya</i>	1					
Poaceae	<i>Microlaena stipoides</i>					2	2
Poaceae	<i>Panicum queenslandicum</i>			2	1		
Poaceae	<i>Sporobolus creber</i>			1			
Poaceae	<i>Themeda australis</i>	2					
Primulaceae	* <i>Anagallis arvensis</i>	1	1	1		1	1
Ranunculaceae	<i>Clematis glycinoides</i>	1	1			2	2
Rosaceae	* <i>Acaena ovina</i>	1				1	
Rosaceae	<i>Rubus parvifolius</i>	1					
Rubiaceae	<i>Asperula conferta</i>	2	1	1			
Rubiaceae	<i>Galium propinquum</i>	1				1	1
Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>angustifolia</i>	2					
Scrophulariaceae	<i>Veronica plebeia</i>					1	2
Solanaceae	<i>Solanum physalifolium</i> var. <i>nitidibaccatum</i>	1					1
Sterculiaceae	<i>Brachychiton populneus</i>					1	1

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		C1	C2	C3	C4	C5	C6
Verbenaceae	<i>*Verbena bonariensis</i>				1		

* Introduced species.

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		D1	D2	D3	D4	D5	D6
Adiantaceae	<i>Cheilanthes sieberi</i>	2	2	2	2	2	2
Aizoaceae	* <i>Galenia pubescens</i>			3		3	
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>	2	1	1		1	
Asteraceae	* <i>Bidens pilosa</i>	1	3				1
Asteraceae	* <i>Carthamus lanatus</i>					1	
Asteraceae	* <i>Cirsium vulgare</i>	1	1	1		1	
Asteraceae	* <i>Conyza sumatrensis</i>	1					
Asteraceae	<i>Euchiton involucratus</i>		1				
Asteraceae	* <i>Hypochoeris radicata</i>						1
Asteraceae	* <i>Senecio madagascariensis</i>	2	2	3	3	2	2
Asteraceae	* <i>Taraxacum officinale</i>	1	1		2		
Asteraceae	* <i>Xanthium occidentale</i>		2				
Asteraceae	<i>Calotis lappulacea</i>		1		1		2
Asteraceae	<i>Chrysocephalum apiculatum</i>	1	1	1	1	2	2
Asteraceae	<i>Glossocardia bidens</i>					1	
Asteraceae	* <i>Lactuca saligna</i>		1				
Asteraceae	<i>Senecio hispidulus</i>		1				
Asteraceae	<i>Senecio quadridentatus</i>	1	1				
Asteraceae	<i>Vittadinia cuneata</i> f. <i>cuneata</i>		1		1		
Cactaceae	* <i>Opuntia stricta</i> var. <i>stricta</i>			1		1	1
Campanulaceae	<i>Wahlenbergia communis</i>	1	1		1	1	1
Casuarinaceae	<i>Allocasuarina luehmannii</i>				1		1
Chenopodiaceae	<i>Einadia nutans</i>					1	2
Chenopodiaceae	<i>Enchylaena tomentosa</i>		1				1
Chloanthaceae	<i>Spartothamnella juncea</i>		1				
Clusiaceae	* <i>Hypericum perforatum</i>	1					
Clusiaceae	<i>Hypericum gramineum</i>	1					
Convolvulaceae	<i>Dichondra repens</i>	1	2		2	2	2
Convolvulaceae	<i>Polymeria calycina</i>		1				
Cyperaceae	<i>Carex inversa</i>	1			1		
Cyperaceae	<i>Cyperus fulvus</i>		1				
Fabaceae (Faboideae)	* <i>Trifolium subterraneum</i>		1				
Fabaceae (Faboideae)	<i>Desmodium brachypodium</i>				1		
Fabaceae (Faboideae)	<i>Desmodium rhytidophyllum</i>	1					
Fabaceae (Faboideae)	<i>Glycine clandestina</i>	1					
Fabaceae (Faboideae)	<i>Glycine microphylla</i>		1				
Fabaceae (Faboideae)	<i>Glycine tabacina</i>					1	
Fabaceae (Faboideae)	<i>Hardenbergia violacea</i>		3				

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		D1	D2	D3	D4	D5	D6
Fabaceae (Mimosoideae)	<i>Acacia salicina</i>	2	1		2		1
Lamiaceae	<i>Mentha saturoioides</i>	3			1	2	
Linaceae	* <i>Linum trigynum</i>					1	
Linaceae	<i>Linum marginale</i>				1		
Lomandraceae	<i>Lomandra confertifolia</i>				2		
Lomandraceae	<i>Lomandra longifolia</i>		1		2		
Lomandraceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>						1
Malvaceae	* <i>Sida rhombifolia</i>	2		3	2	2	1
Myoporaceae	<i>Eremophila debilis</i>	1			1		
Myrtaceae	<i>Angophora floribunda</i>				1		
Myrtaceae	<i>Corymbia maculata</i>		2		2		4
Myrtaceae	<i>Eucalyptus moluccana</i>						1
Myrtaceae	<i>Eucalyptus tereticornis</i>		5		4		
Oxalidaceae	<i>Oxalis</i> sp.			1		1	1
Phormiaceae	<i>Dianella longifolia</i>	1					
Phormiaceae	<i>Dianella tasmanica</i>		3				1
Plantaginaceae	* <i>Plantago lanceolata</i>	3	2	2		5	2
Poaceae	* <i>Aira cupaniana</i>					1	
Poaceae	* <i>Chloris gayana</i>	2	2				
Poaceae	<i>Cynodon dactylon</i>		3		1		
Poaceae	* <i>Hyparrhenia hirta</i>					2	
Poaceae	* <i>Lolium multiflorum</i>		1				
Poaceae	* <i>Paspalum dilatatum</i>	2	2	1	2	2	1
Poaceae	<i>Aristida calycina</i>					1	
Poaceae	<i>Aristida personata</i>		3				1
Poaceae	<i>Aristida ramosa</i>	1	1	3	5		1
Poaceae	<i>Austrodanthonia fulva</i>		1		1		1
Poaceae	<i>Austrodanthonia setacea</i>		1				
Poaceae	<i>Austrostipa scabra</i> subsp. <i>falcata</i>						1
Poaceae	<i>Austrostipa scabra</i> subsp. <i>scabra</i>						2
Poaceae	<i>Austrostipa verticillata</i>	1		3			
Poaceae	<i>Bothriochloa decipiens</i>		1		1	1	2
Poaceae	<i>Chloris ventricosa</i>	3	3		2	3	3
Poaceae	<i>Cymbopogon refractus</i>	1	1		1	1	2
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	1	2				1
Poaceae	<i>Dichelachne crinita</i>		1				
Poaceae	<i>Digitaria brownii</i>	2		2		3	2
Poaceae	<i>Elymus scaber</i> var. <i>scaber</i>						1

Family Name	Scientific Name	Plot and Cover-Abundance Scores					
		D1	D2	D3	D4	D5	D6
Poaceae	<i>Eragrostis alveiformis</i>						1
Poaceae	<i>Eragrostis lacunaria</i>				1		
Poaceae	<i>Eragrostis leptostachya</i>				1		
Poaceae	<i>Eriochloa pseudoacrotricha</i>				1	1	
Poaceae	<i>Eulalia aurea</i>	1					
Poaceae	<i>Microlaena stipoides</i>	1	2	4	1	1	3
Poaceae	<i>Panicum queenslandicum</i>	2	1	2	2	2	2
Poaceae	<i>Paspalidium distans</i>	1			1		
Poaceae	<i>Sporobolus creber</i>	2			1	1	1
Primulaceae	* <i>Anagallis arvensis</i>	1	1				
Ranunculaceae	<i>Clematis glycinoides</i>		3		1		
Rubiaceae	<i>Asperula conferta</i>	3			1	1	1
Scrophulariaceae	<i>Veronica plebeia</i>	1	1		1		1
Solanaceae	* <i>Lycium ferocissimum</i>		1		1		1
Solanaceae	<i>Solanum physalifolium</i> var. <i>nitidibaccatum</i>				1		
Sterculiaceae	<i>Brachychiton populneus</i>		2				

* Introduced species.

Family Name	Scientific Name	Plot and Cover-Abundance Scores						
		E1	E2	E3	E4	E5	E6	E7
Adiantaceae	<i>Cheilanthes sieberi</i>	1		1	2	1		2
Aizoaceae	* <i>Galenia pubescens</i>			3		1	1	
Asclepiadaceae	* <i>Gomphocarpus fruticosus</i>						1	
Asteraceae	* <i>Aster subulatus</i>		1					
Asteraceae	* <i>Bidens pilosa</i>	1				1		1
Asteraceae	* <i>Carthamus lanatus</i>					2		
Asteraceae	* <i>Cirsium vulgare</i>	1	3		1	2		
Asteraceae	* <i>Conyza bonariensis</i>	1						
Asteraceae	* <i>Lactuca sp.</i>		1					
Asteraceae	* <i>Senecio madagascariensis</i>	3	3	1	3	2	1	2
Asteraceae	* <i>Taraxacum officinale</i>	1	1			1		
Asteraceae	<i>Calotis cuneifolia</i>					1		
Asteraceae	<i>Calotis lappulacea</i>				1	2		
Asteraceae	<i>Chrysocephalum apiculatum</i>			1	2	2		3
Asteraceae	<i>Senecio quadridentatus</i>	1				1	1	1
Asteraceae	<i>Vittadinia cuneata</i> f. <i>cuneata</i>					1		
Asteraceae	<i>Vittadinia dissecta</i> var. <i>hirta</i>	2						
Brassicaceae	* <i>Hirschfeldia incana</i>			1				
Brassicaceae	* <i>Lepidium africanum</i>							1
Brassicaceae	* <i>Sinapis arvensis</i>						1	
Brassicaceae	<i>Lepidium pseudohyssopifolium</i>			1				1
Cactaceae	* <i>Opuntia stricta</i> var. <i>stricta</i>					1		
Campanulaceae	<i>Wahlenbergia communis</i>	1		1				
Casuarinaceae	<i>Allocasuarina luehmannii</i>							1
Chenopodiaceae	<i>Einadia nutans</i>					1		
Chenopodiaceae	<i>Enchylaena tomentosa</i>			1				1
Chenopodiaceae	<i>Sclerolaena birchii</i>		1					
Clusiaceae	* <i>Hypericum perforatum</i>	2			3			
Convolvulaceae	<i>Dichondra repens</i>	1				2	1	
Cyperaceae	<i>Carex inversa</i>			1				
Cyperaceae	<i>Fimbristylis dichotoma</i>	1						
Fabaceae (Faboideae)	* <i>Medicago minima</i>						1	
Fabaceae (Faboideae)	* <i>Melilotus indicus</i>						1	
Fabaceae (Faboideae)	* <i>Trifolium sp.</i>						2	
Fabaceae (Faboideae)	<i>Desmodium rhytidophyllum</i>			1				
Fabaceae (Faboideae)	<i>Glycine tabacina</i>	1						
Fabaceae (Mimosoideae)	<i>Acacia decora</i>							1


Family Name	Scientific Name	Plot and Cover-Abundance Scores						
		E1	E2	E3	E4	E5	E6	E7
Fabaceae (Mimosoideae)	<i>Acacia salicina</i>					4		
Gentianaceae	* <i>Centaurium erythraea</i>					1	1	
Juncaceae	* <i>Juncus acutus</i>		3					
Lamiaceae	<i>Mentha saturoioides</i>			2				
Linaceae	* <i>Linum trigynum</i>			1				
Linaceae	<i>Linum marginale</i>	2		1		1		1
Lomandraceae	<i>Lomandra confertifolia</i>	2		2	2	2		3
Lomandraceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	2				1		1
Malvaceae	* <i>Modiola caroliniana</i>						1	
Malvaceae	* <i>Sida rhombifolia</i>			2	1	3	1	2
Malvaceae	<i>Abutilon oxycarpum</i>			1				
Malvaceae	<i>Sida corrugata</i>			1				
Malvaceae	* <i>Sida spinosa</i>			1				
Myrtaceae	<i>Eucalyptus blakelyi</i>					4		
Myrtaceae	<i>Eucalyptus moluccana</i>							1
Oxalidaceae	<i>Oxalis chnoodes</i>					1		
Oxalidaceae	<i>Oxalis</i> sp.	1						
Plantaginaceae	* <i>Plantago lanceolata</i>	1	1	3	3	3	3	
Poaceae	* <i>Aira cupaniana</i>							1
Poaceae	* <i>Chloris gayana</i>		1	1			2	
Poaceae	<i>Cynodon dactylon</i>	1	6	1		1		
Poaceae	* <i>Hyparrhenia hirta</i>	3				3	1	
Poaceae	* <i>Melinis repens</i>					1	1	
Poaceae	* <i>Panicum maximum</i> var. <i>maximum</i>						1	
Poaceae	* <i>Paspalum dilatatum</i>	3	1	1	3	3	1	1
Poaceae	* <i>Phalaris arundinacea</i> var. <i>arundinacea</i>					1		
Poaceae	* <i>Setaria parviflora</i>	2						
Poaceae	<i>Aristida personata</i>	3		3				
Poaceae	<i>Aristida ramosa</i>	2	1			2		2
Poaceae	<i>Austrodanthonia fulva</i>	2			1	2		1
Poaceae	<i>Austrostipa scabra</i> subsp. <i>falcata</i>	1		3		2		
Poaceae	<i>Austrostipa scabra</i> subsp. <i>scabra</i>						1	
Poaceae	<i>Austrostipa verticillata</i>					3		
Poaceae	<i>Bothriochloa decipiens</i>			1			1	
Poaceae	<i>Bothriochloa macra</i>	2						2
Poaceae	<i>Chloris ventricosa</i>	3	1			2		2
Poaceae	<i>Cymbopogon refractus</i>	2		1	2	2	1	1
Poaceae	<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	2		3	3	2	4	
Poaceae	<i>Dichelachne crinita</i>	1			1	1		


Family Name	Scientific Name	Plot and Cover-Abundance Scores						
		E1	E2	E3	E4	E5	E6	E7
Poaceae	<i>Digitaria brownii</i>	1					1	
Poaceae	<i>Digitaria ramularis</i>			1				
Poaceae	<i>Eragrostis alveiformis</i>			2				1
Poaceae	<i>Eragrostis leptostachya</i>					1		
Poaceae	<i>Eriochloa pseudoacrotricha</i>			1				
Poaceae	<i>Microlaena stipoides</i>	2				1		
Poaceae	<i>Panicum effusum</i>							1
Poaceae	<i>Panicum queenslandicum</i>	3		2	2	2		2
Poaceae	<i>Sporobolus creber</i>	2		2			2	1
Poaceae	<i>Themeda australis</i>	2			3			1
Polygonaceae	<i>Rumex brownii</i>	1						
Primulaceae	* <i>Anagallis arvensis</i>			1		1	1	
Rubiaceae	<i>Asperula conferta</i>	1	1		1			
Scrophulariaceae	<i>Veronica plebeia</i>	1		1	1			
Solanaceae	* <i>Lycium ferocissimum</i>			1		1		
Solanaceae	<i>Solanum prinophyllum</i>	1						1
Verbenaceae	* <i>Verbena bonariensis</i>	1		1	1		1	
Verbenaceae	* <i>Verbena rigida</i>	1			2	2		

* Introduced species.

APPENDIX 6
VEGETATION COMMUNITY PROFILES

The following are summary descriptions of the vegetation communities that were recorded within the Modification area.

VEGETATION COMMUNITY	Derived Native Grassland (^A Box-Gum and ^B Unknown)
HRVP MAP UNIT	N/A
CONSERVATION STATUS	^A White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC listed under the EPBC Act ^A White Box Yellow Box Blakely's Red Gum Woodland EEC listed under the TSC Act ^B None
RECORDED IN	All Modification areas
Plots: 30	Mean diversity: 27.2 species
	
DESCRIPTION	
Canopy	None
Shrubs	None
Ground	<i>Aristida ramosa</i> , <i>Aristida personata</i> , <i>Chloris ventricosa</i> , <i>Sporobolus creber</i> , <i>Dichanthium sericeum</i> , <i>Bothriochloa decipiens</i> , <i>Bothriochloa biloba</i> , <i>Panicum queenslandicum</i> , <i>Hyparrhenia hirta</i> , <i>Digitaria brownii</i>
Climbers and creepers	<i>Glycine tabacina</i>
Weeds – low to high abundance	* <i>Senecio madagascariensis</i> , * <i>Hyparrhenia hirta</i>
Significant Species	<i>Bothriochloa biloba</i>

VEGETATION COMMUNITY	Central Hunter Box – Ironbark Woodland
HRVP MAP UNIT	MU10
CONSERVATION STATUS	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC listed under the EPBC Act White Box Yellow Box Blakely's Red Gum Woodland EEC listed under the TSC Act
RECORDED IN	Modification Areas B and C
Plots: 6	Mean diversity: 49 species
	
DESCRIPTION	
Canopy	<i>Eucalyptus albens</i> x <i>E. moluccana</i>
Shrubs	<i>Acacia cultriformis</i> , <i>Psydrax odorata</i> , <i>Spartothamnella juncea</i> , <i>Notelaea microcarpa</i> , <i>Acacia decora</i> , <i>Bursaria spinosa</i>
Ground	<i>Aristida ramosa</i> , <i>Aristida personata</i> , <i>Lomandra confertifolia</i> , <i>Austrostipa scabra</i> subsp. <i>falcata</i> , <i>Bothriochloa decipiens</i> , <i>Eremophila debilis</i> , <i>Pimelea curviflora</i> var. <i>gracilis</i>
Climbers and creepers	<i>Geitonoplesium cymosum</i> , <i>Polymeria calycina</i> , <i>Desmodium gunnii</i>
Weeds – low abundance	* <i>Senecio madagascariensis</i>
Significant Species	None recorded

VEGETATION COMMUNITY	Central Hunter Box – Ironbark Woodland Wybong Slaty Box Variant
HRVP MAP UNIT	MU10
CONSERVATION STATUS	Not threatened
RECORDED IN	Modification Area A
Plots: 4	Mean diversity: 27 species



DESCRIPTION

Canopy	<i>Eucalyptus dawsonii</i> , <i>Allocasuarina luehmannii</i>
Shrubs	<i>Maireana microphylla</i>
Ground	<i>Aristida ramosa</i> , <i>Chloris ventricosa</i> , <i>Sporobolus creber</i> , <i>Bothriochloa biloba</i> , <i>Eriochloa pseudoacrotricha</i> , <i>Glycine tabacina</i>
Climbers and creepers	<i>Glycine clandestina</i> , <i>Glycine tabacina</i>
Weeds – moderate abundance	* <i>Galenia pubescens</i> , * <i>Plantago lanceolata</i>
Significant Species	<i>Bothriochloa biloba</i>

VEGETATION COMMUNITY	Upper Hunter Hills Box – Ironbark – Red Gum Woodland
HRVP MAP UNIT	MU9
CONSERVATION STATUS	Not threatened
RECORDED IN	Modification Area C
Plots: 2	Mean diversity: 44 species



DESCRIPTION	
Canopy	<i>Eucalyptus blakelyi</i> , <i>Eucalyptus albens</i> x <i>E. moluccana</i> , <i>Angophora floribunda</i> , <i>Brachychiton populneus</i>
Shrubs	<i>Notelaea microcarpa</i> , <i>Olearia elliptica</i> , <i>Dodonaea viscosa</i> , <i>Myoporum montanum</i> , <i>Spartothamnella juncea</i> , <i>Psydrax odorata</i> ,
Ground	<i>Austrodanthonia setacea</i> , <i>Asperula conferta</i> , <i>Aristida ramosa</i> , <i>Centella asiatica</i>
Climbers and creepers	<i>Rubus parvifolius</i> , <i>Geitonoplesium cymosum</i> , <i>Clematis glycinoides</i> , <i>Hardenbergia violacea</i> , <i>Desmodium varians</i> , <i>Desmodium gunnii</i>
Weeds – low abundance	* <i>Senecio madagascariensis</i> , * <i>Plantago lanceolata</i>
Significant Species	None recorded

VEGETATION COMMUNITY	Hunter Lowlands Red Gum Forest
HRVP MAP UNIT	MU24
CONSERVATION STATUS	Hunter Lowland Redgum Forest in the Sydney Basin and NSW North Coast Bioregions EEC
RECORDED IN	Modification Area D
Plots: 2	Mean diversity: 45 species



DESCRIPTION

Canopy	<i>Eucalyptus tereticornis</i> , <i>Eucalyptus punctata</i> , <i>Corymbia maculata</i> , <i>Brachychiton populneus</i>
Shrubs	<i>Spartothamnella juncea</i> , <i>Acacia salicina</i>
Ground	<i>Dianella tasmanica</i> , <i>Aristida personata</i> , <i>Chloris ventricosa</i>
Climbers and creepers	<i>Clematis glycinoides</i> , <i>Hardenbergia violacea</i> , <i>Veronica plebeia</i> , <i>Glycine microphylla</i> , <i>Polymeria calycina</i>
Weeds – moderate abundance	* <i>Cynodon dactylon</i> , * <i>Bidens pilosa</i> , * <i>Chloris gayana</i> , * <i>Paspalum dilatatum</i>
Significant Species	None recorded

VEGETATION COMMUNITY	Central Hunter Ironbark – Spotted Gum – Grey Box Forest – Grassy Variant
HRVP MAP UNIT	MU27
CONSERVATION STATUS	Central Hunter Ironbark - Spotted Gum - Grey Box Forest in the NSW North Coast and Sydney Basin Bioregions EEC
RECORDED IN	Proposed Modification Area D
Plots: 1	Mean diversity: 39 species



DESCRIPTION	
Canopy	<i>Corymbia maculata</i> , <i>Eucalyptus albens</i> x <i>E. moluccana</i>
Shrubs	<i>Acacia salicina</i> , <i>Allocasuarina luehmannii</i>
Ground	<i>Chloris ventricosa</i> , <i>Microlaena stipoides</i> , <i>Digitaria brownii</i> , <i>Austrostipa scabra</i> subsp. <i>scabra</i>
Climbers and creepers	<i>Veronica plebeia</i>
Weeds – low abundance	* <i>Plantago lanceolata</i> , * <i>Senecio madagascariensis</i> , * <i>Lycium ferocissimum</i>
Significant Species	None recorded

VEGETATION COMMUNITY	Central Hunter Ironbark – Spotted Gum – Grey Box Forest – Shrubby Variant
HRVP MAP UNIT	MU27
CONSERVATION STATUS	Central Hunter Ironbark - Spotted Gum - Grey Box Forest in the NSW North Coast and Sydney basin Bioregions EEC
RECORDED IN	Modification Areas B and C
Plots: 2	Mean diversity: 30 species



DESCRIPTION

Canopy	<i>Corymbia maculata, Brachychiton populneus</i>
Shrubs	<i>Notelaea microcarpa, Daviesia genistifolia, Senna baronfieldii, Breyenia oblongifolia, Spartothamnella juncea, Acacia maidenii, Maytenus sylvestris, Bursaria spinosa</i>
Ground	<i>Aristida ramosa, Microlaena stipoides, Dichondra repens, Austrodanthonia setacea</i>
Climbers and creepers	<i>Clematis glycinoides, Geitonoplesium cymosum, Desmodium gunnii,</i>
Weeds – low abundance	* <i>Anagallis arvensis</i>
Significant Species	None recorded

VEGETATION COMMUNITY	Hunter Valley Weeping Myall Woodland
HRVP MAP UNIT	MU19
CONSERVATION STATUS	Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion EEC
RECORDED IN	Proposed Modification Area A
Plots: 2	Mean diversity: 28 species



DESCRIPTION

Canopy	None
Shrubs	<i>Acacia pendula</i>
Ground	<i>Sporobolus creber</i> , <i>Dichanthium sericeum</i> subsp. <i>sericeum</i> , <i>Bothriochloa biloba</i>
Climbers and creepers	<i>Desmodium rhytidophyllum</i>
Weeds – low abundance	* <i>Senecio madagascariensis</i>
Significant Species	<i>Acacia pendula</i> , <i>Bothriochloa biloba</i>

VEGETATION COMMUNITY	<i>Typha</i> Dominated Drainage Line
HRVP MAP UNIT	N/A
CONSERVATION STATUS	None
RECORDED IN	Modification Area D
Plots: None	Mean diversity: N/A
[No image]	
DESCRIPTION	
Canopy	None
Shrubs	None
Ground	<i>Typha orientalis</i>
Climbers and creepers	None
Weeds – low to high abundance	* <i>Cynodon dactylon</i> * <i>Xanthium occidentale</i>
Significant Species	None

VEGETATION COMMUNITY	N/A
HRVP MAP UNIT	N/A
CONSERVATION STATUS	None
RECORDED IN	Modification Area A
Plots: N/A	Mean diversity: N/A



DESCRIPTION

Canopy	None
Shrubs	None
Ground	Grassy, typical of surrounding derived grassland
Climbers and creepers	
Weeds – low to high abundance	* <i>Chloris gayana</i> , * <i>Bidens pilosa</i>
Significant Species	None

VEGETATION COMMUNITY	N/A
HRVP MAP UNIT	N/A
CONSERVATION STATUS	None
RECORDED IN	Modification Area E
Plots: 1	Mean diversity: 14 species



DESCRIPTION	
Canopy	None
Shrubs	None
Ground	* <i>Juncus acutus</i> , * <i>Cynodon dactylon</i> , * <i>Senecio madagascariensis</i> , * <i>Cirsium vulgare</i>
Climbers and creepers	None
Weeds –high abundance	* <i>Juncus acutus</i> , * <i>Cynodon dactylon</i> , * <i>Senecio madagascariensis</i> , * <i>Cirsium vulgare</i>
Significant Species	None

APPENDIX 7

SPECIES AND LOCATION OF HABITAT TREES

Coordinates are GDA94 MGA Zone 56

Modification Area	Species	Easting	Northing
Area A	Bullock	294621	6421398
	Bullock	294739	6420860
	Bullock	294844	6420796
	Dead Stag	294718	6421218
	Dead Stag	294621	6421445
	Dead Stag	294626	6421305
	Dead Stag	294598	6421285
	Dead Stag	294542	6421415
	Dead Stag	294523	6421399
	Dead Stag	294488	6421393
	Dead Stag	294372	6421358
	Dead Stag	294419	6421302
	Dead Stag	294485	6421299
	Dead Stag	294496	6421339
	Dead Stag	294602	6421161
	Dead Stag	294511	6421123
	Dead Stag	294432	6421105
	Dead Stag	294646	6421112
	Dead Stag	294585	6421074
	Slaty Box	294796	6421244
	Slaty Box	294774	6421383
	Slaty Box	294773	6421514
	Slaty Box	294767	6421523
	Slaty Box	294687	6421540
	Slaty Box	294670	6421311
	Slaty Box	294704	6421300
	Slaty Box	294692	6421275
	Slaty Box	294692	6421229
	Slaty Box	294626	6421227
	Slaty Box	294617	6421258
	Slaty Box	294415	6421355
	Slaty Box	294555	6421331
	Slaty Box	294490	6421253
	Slaty Box	294589	6421175
	Slaty Box	294715	6420834
	Slaty Box	294895	6420757
Slaty Box	294985	6420675	

Area	Species	Easting	Northing
Area A (Continued)	Slaty Box	294882	6421027
	Slaty Box	294869	6421125
	Slaty Box	294775	6421151
	Slaty Box	294664	6421156
	White/Grey Box	294759	6421451
	White/Grey Box	294574	6421402
	White/Grey Box	294506	6421402
	White/Grey Box	294428	6421415
	White/Grey Box	294327	6421475
	White/Grey Box	294503	6421249
	White/Grey Box	294486	6421152
Area B	Dead Stag	297886	6417992
	Dead Stag	298157	6418004
	Dead Stag	298116	6417743
	Dead Stag	297703	6418159
	Dead Stag	297488	6418230
	Dead Stag	297549	6418249
	White/Grey Box	298225	6417874
	White/Grey Box	298158	6417860
	White/Grey Box	298115	6417902
	White/Grey Box	298132	6417917
	White/Grey Box	298096	6417916
	White/Grey Box	298028	6417910
	White/Grey Box	298006	6417883
	White/Grey Box	297990	6417877
	White/Grey Box	297952	6417887
	White/Grey Box	297910	6418001
	White/Grey Box	297945	6418016
	White/Grey Box	297976	6418008
	White/Grey Box	298019	6418014
	White/Grey Box	298040	6418004
	White/Grey Box	298136	6418041
	White/Grey Box	298171	6418015
	White/Grey Box	298192	6418016
	White/Grey Box	298171	6418073
	White/Grey Box	298014	6418091
	White/Grey Box	297933	6418091
	White/Grey Box	297921	6418076
	White/Grey Box	297842	6418064
	White/Grey Box	297880	6418098

Area	Species	Easting	Northing
Area B (Continued)	White/Grey Box	297934	6418116
	White/Grey Box	297964	6418139
	White/Grey Box	297981	6418139
	White/Grey Box	297905	6418235
	White/Grey Box	297965	6418250
	White/Grey Box	297958	6418251
	White/Grey Box	297451	6418236
	White/Grey Box	297355	6417894
	White/Grey Box	297945	6418016
	White/Grey Box	297976	6418008
	White/Grey Box	298019	6418014
	White/Grey Box	298040	6418004
	White/Grey Box	298136	6418041
	White/Grey Box	298171	6418015
	White/Grey Box	298192	6418016
	White/Grey Box	298171	6418073
	White/Grey Box	298014	6418091
	White/Grey Box	297933	6418091
	White/Grey Box	297921	6418076
	White/Grey Box	297842	6418064
	White/Grey Box	297880	6418098
	White/Grey Box	297934	6418116
	White/Grey Box	297964	6418139
	White/Grey Box	297981	6418139
	White/Grey Box	297905	6418235
	White/Grey Box	297965	6418250
	White/Grey Box	297958	6418251
	White/Grey Box	297451	6418236
White/Grey Box	297355	6417894	
Area C	Dead Stag	299015	6417645
	Dead Stag	299075	6417585
	Spotted Gum	298987	6417718
	Spotted Gum	299063	6417726
	Spotted Gum	299048	6417673
	Spotted Gum	299037	6417613
	Spotted Gum	299072	6417637
	Spotted Gum	299070	6417650
	Spotted Gum	299124	6417667
	Spotted Gum	299121	6417650
	Spotted Gum	299097	6417618

Area	Species	Easting	Northing
Area C (Continued)	Spotted Gum	299078	6417578
	Spotted Gum	299070	6417549
	Spotted Gum	299157	6417454
	Spotted Gum	299140	6417439
	Spotted Gum	299136	6417430
	Dead Stag	299015	6417645
	Dead Stag	299075	6417585
	Spotted Gum	298987	6417718
	Spotted Gum	299063	6417726
	Spotted Gum	299048	6417673
	Spotted Gum	299037	6417613
	Spotted Gum	299072	6417637
	Spotted Gum	299070	6417650
	Spotted Gum	299124	6417667
	Spotted Gum	299121	6417650
	Spotted Gum	299097	6417618
	Spotted Gum	299078	6417578
	Spotted Gum	299070	6417549
	Spotted Gum	299157	6417454
	Spotted Gum	299140	6417439
Spotted Gum	299136	6417430	
Area D	Dead Stag	301031	6416697
	Dead Stag	301143	6416581
	Dead Stag	301100	6417072
	Grey Gum	301013	6416459
	Grey Gum	300994	6416432
	Grey Gum	301009	6416394
	Redgum	300995	6416438
	Redgum	300988	6416398
	Redgum	301154	6416538
	Spotted Gum	301055	6416668
	Spotted Gum	301076	6416589
	Spotted Gum	301080	6416582
	Spotted Gum	300990	6416479
	Spotted Gum	300958	6416393
	Spotted Gum	301007	6416445
	Spotted Gum	300996	6416442

Area	Species	Easting	Northing
Area D (Continued)	Spotted Gum	301024	6416288
	Spotted Gum	301115	6416396
	Spotted Gum	301113	6416427
	Spotted Gum	301126	6416620
	Spotted Gum	301218	6416853
	White/Grey Box	300991	6416428
	White/Grey Box	301012	6416368

APPENDIX 8

SADDLERS CREEK AND MIDDLE DEEP CREEK FLORA AND FAUNA
SURVEY REPORT

Saddlers Creek and Middle Deep Creek

Flora and Fauna Survey Report

By Hunter Eco

January 2013

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1 Introduction

This is a report of the ecological attributes of three areas to determine whether all or part of these areas might be appropriate for offsetting habitat that would be lost through proceeding with the proposed Mt Arthur Coal Modification:

- Saddlers Creek East (35 hectares [ha]) located along Saddlers Creek;
- Saddlers Creek South (103 ha) located further down Saddlers Creek; and
- Middle Deep Creek (410 ha) located in the Timor district in the upper Hunter.

A map showing these locations is provided in **Figure 1**.

2 Field Survey Methods

Field data were collected from the three areas in June 2012 and September 2012 (**Table 1**).

Table 1 Field data collection times

Survey Area	Field Data Collection Dates
Saddlers Creek East	19/6/2012, 18/9/2012
Saddlers Creek South	19/6/2012
Middle Deep Creek	22/6/2012, 9-12/9/2012

2.1 Vegetation Communities and Flora

A vegetation map was prepared from ground-truthed point data, floristic plot data and ground-truthed community boundary determination. The applied methods were developed by, Bell and Driscoll NSW Department of Environment, and Climate Change (DECC) (2008). Ground-truthed vegetation data were collected during meanders through the study area. Vegetation community types were determined by matching floristic content of the ground-truthed data to the species provided in the Peake Hunter Remnant Vegetation Project (HRVP) (2006) classification.

Vegetation community classification would generally be supported by data collected from standard 20 metre square (0.04 ha) floristic plots in which all species were identified and their abundance given a score based on the modified Braun-Blanquet 1-6 scale. However, field work was conducted at times when a large number of plants were either not present or could not be identified. This was particularly the case for grasses with most species having no fertile material, but also applied to small flowering annual and perennial herbs.



Figure 1 The location of sites

Rather than collect plot data, floristic lists were compiled for different vegetation types through the use of long meanders during which all species that could be were identified.

Data analysis was then conducted using hierarchical agglomerative clustering (Primer 6: Clarke and Gorley 2001) with presence only data input. Data from the floristic plots that were collected during the survey of the proposed Modification area were converted to presence only and comparison was made with data from the areas surveyed during this survey period.

2.2 Fauna

All birds seen and heard were recorded as well as all mammals and reptiles. Spotlighting was conducted on three nights at Middle Deep Creek with particular attention being given to areas with flowering eucalypts. Two camera traps were placed at Middle Deep Creek, one at a small pond and the other on an animal pathway, to record any passing wildlife. The cameras were left recording for three days and nights.

More detailed fauna investigation was not conducted at Saddlers Creek East because it was continuous with the habitat that had recently been subject of a fauna survey by Niche (2012). At Saddlers Creek South, the habitat was too sparse for a fauna survey to be useful.

2.3 Hollow Trees

The location (geographic coordinates using a hand-held global positioning system [GPS]) and species of all trees with habitat hollows was recorded in Saddlers Creek East. There were no such trees in Saddlers Creek South. At Middle Deep Creek, there were too many trees with habitat hollows to record in a reasonable time.

3 Field Survey Results

Table 2 provides a summary of the species recorded in Saddlers Creek East and Middle Deep Creek during the survey. Detailed transects were not conducted across Saddlers Creek South because it consisted primarily of open grassland with a few scattered trees. The significant findings in that area were the Lobed Blue Grass (*Bothriochloa biloba*) (listed as Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* [EPBC Act]) in the open grassland and a large stand of Weeping Myall (*Acacia pendula*) which is a component of the Endangered Population *Acacia pendula (a tree) in the Hunter Catchment* and the *Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion* endangered ecological community (EEC), both of which are listed as threatened under the NSW *Threatened Species Conservation Act, 1994* (TSC Act). Flora and fauna species recorded within these areas are provided in **Appendices 1 and 2**.

Table 2 Summary of flora and fauna species recorded

Saddlers Creek East			
	Total Species	Exotic	Threatened Species listed under the TSC Act
Flora			
Creekline habitat	54	20	0
Grassy woodland habitat	51	13	0
Combined habitats	82	24	0
Fauna			
Birds	15	0	0
Mammals	4	1	0
Reptiles	1	0	0
Middle Deep Creek			
Flora			
Drainage line habitat	41	7	0
White Box habitat	41	5	0
Blakely's Red Gum habitat	32	4	0
Combined habitats	102	12	1
Fauna			
Birds	64	0	7
Mammals	12	6	2
Reptiles	1	0	0

3.1 Saddlers Creek East

The vegetation associated with the creek itself consisted of Hunter Lowland Redgum Forest (MU24) dominated by Forest Red Gum (*Eucalyptus tereticornis*) and Rough-barked Apple (*Angophora floribunda*) along with some localised Yellow Box (*Eucalyptus melliodora*), Blakely's Red Gum (*Eucalyptus blakelyi*) and Swamp Oak (*Casuarina glauca*). Small tree-covered areas adjoining the riparian habitat were dominated by hybrid White Box with the occasional Spotted Gum (*Corymbia maculata*), Yellow Box (*Eucalyptus melliodora*) and Narrow-leaved Ironbark (*Eucalyptus crebra*). *Eucalyptus tereticornis* occasionally extended in to these areas. At one location against the creekline there were a small number of Grey Box (*Eucalyptus moluccana*). Overall, these areas were considered to be representative of *Central Hunter Box – Ironbark Woodland* (MU10). The open grassland would probably have been derived from this (MU10). There was only one location near the riparian habitat that contained a few *Bothriochloa biloba* otherwise, the dominant grasses were *Aristida* spp. and *Austrostipa* spp.

Floristic details from the survey can be found in **Appendix 1** and site photographs can be seen in **Appendix 3**.

3.2 Saddlers Creek South

Saddlers Creek South had very little patch vegetation most of which contained hybrid White Box/Grey Box. The most significant patch consisted of what appeared to be *Acacia pendula* (non pendulous) (MU19), about 10 m tall and previously unrecorded (**Appendix 3**). There was also a patch of low regrowth with a similar *Acacia* spp. about 200 m away from the large group of trees. These two groups combined could be representative of the endangered population *Acacia pendula* (a tree) in the Hunter catchment, and the Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion EEC listed under the TSC Act.

There were scattered patches of Lobed Blue Grass (*Bothriochloa biloba*) (listed as Vulnerable under the EPBC Act) across the open grassland of this area. Other grass species were Queensland Blue Grass (*Dichanthium sericeum*), *Aristida* spp., Western Rat-tail Grass (*Sporobolus creber*) and Yadbila Grass (*Panicum queenslandicum*).

3.3 Middle Deep Creek

Four vegetation communities were recorded within Middle Deep Creek:

- White Box grassy woodland (MU11);
- Blakely's Red Gum grassy woodland (MU11);
- Narrow incised drainage line habitat; and
- Derived native grassland (MU11).

In summary, the overall dominant tree species of White Box (*Eucalyptus albens*) and Blakely's Red Gum (*Eucalyptus blakelyi*) in grassy woodland were consistent with the following threatened ecological communities (TEC):

- *White Box Yellow Box Blakely's Red Gum Woodland* occurring within the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands and NSW South Western Slopes Bioregions listed as an EEC under the TSC Act.
- *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed as a critically endangered ecological community (CEEC) under the EPBC Act.

The narrow incised drainage line habitat was tightly restricted being only 5 – 10 m wide, was not present in all drainage lines and was mostly restricted to the upper drainage line. Occasionally, associated with this habitat were the canopy trees Rough-barked Apple (*Angophora floribunda*) and Thin-leaved Stringy-bark (*Eucalyptus eugenioides*). Three quarters of the land consisted of open grassland that contained varying amounts of *Aristida* species, Red Grass (*Bothriochloa decipiens*) (no Queensland Blue Grass [*Bothriochloa biloba*] was encountered) *Dichanthium sericeum*, Western Rat-tailed Grass (*Sporobolus creber*) and Plump Windmill Grass (*Chloris ventricosa*).

The surrounding woodland TEC habitat means that a large amount of the grassland would be consistent with the *White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland* TEC. **Figure 2** shows the vegetation mapped.

Thirteen Tiger Orchids (*Cymbidium canaliculatum*) were recorded, being part of the NSW listed *Endangered population of the orchid Cymbidium canaliculatum R. Br. in the Hunter Catchment* listed under the TSC Act. A search of data from the Atlas of NSW Wildlife from within a 10 km radius of Middle Deep Creek revealed that the Tiger Orchid was the only threatened flora species recorded.

Floristic details from the survey can be found in **Appendix 2** and photos of Middle Deep Creek can be found in Appendix 4..

The Atlas of NSW Wildlife, from within a 10 km radius of Middle Deep Creek (**Table 3**) reported 10 bird, three marsupial, one bat and one amphibian threatened species. Seven of the reported bird species and one of the marsupial species were recorded during the surveys. In addition the Grey-headed Flying-fox (*Pteropsis poliocephalus*) was recorded.

The threatened Squirrel Glider (*Petaurus norfocensis*) was found feeding in White Box blossom during spotlighting. The habitat appeared to be suitable for the threatened Brush-tailed Phascogale (*Phascogale penicillata*), Spotted-tailed Quoll (*Dasyurus maculatus*), Yellow-bellied Glider (*Petaurus australis*), and perhaps the Common Planigale (*Planigale maculata*).

Of the species listed in **Table 3** there was no suitable habitat for the Brush-tailed Rock Wallaby (*Petrogale penicillata*) and the Booroolong Frog (*Litoria booroolongensis*). The Little Eagle (*Hieraaetus morphnoides*) and Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*) could be found there along with other threatened insectivorous bats so far not recorded.

The White Box were flowering and had attracted flocks of Noisy Friarbird (*Philemon corniculatus*) and Musk Lorikeet (*Glossopsitta concinna*). This resource (as well as Blakely's Red Gum when in flower) could also attract the threatened Swift Parrot (*Lathamus discolor*) and Regent Honeyeater (*Anthochaera phrygia*). The woodland habitat was also suited to the Scarlet Robin (*Petroica boodang*) and Flame Robin (*Petroica phoenicea*).

Figure 2 shows the location of the recorded threatened species.

Table 3 Fauna records from within a 10 km radius of Middle Deep Creek

Family	Scientific Name	Common Name	NSW Status
BIRDS			
Accipitridae	<i>Hieraaetus morphnoides</i>	Little Eagle	V
Psittacidae	<i>Glossopsitta pusilla</i>	Little Lorikeet	V
Climacteridae	<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V
Acanthizidae	<i>Chthonicola sagittata</i>	Speckled Warbler	V
Pomatostomidae	<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V
Neosittidae	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V
Petroicidae	<i>Melanodryas cucullata cucullata</i>	Hooded Robin (south-eastern form)	V
Petroicidae	<i>Petroica boodang</i>	Scarlet Robin	V
Petroicidae	<i>Petroica phoenicea</i>	Flame Robin	V
Estrildidae	<i>Stagonopleura guttata</i>	Diamond Firetail	V
MARSUPIALS			
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V
Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V
Macropodidae	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E
MICROCHIROPTERAN BATS			
Vespertilionidae	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V
AMPHIBIANS			
Hylidae	<i>Litoria booroolongensis</i>	Booroolong Frog	E

Source: Atlas of NSW Wildlife June 2012

Bold indicates species recorded at Middle Deep Creek

V = vulnerable and E = endangered

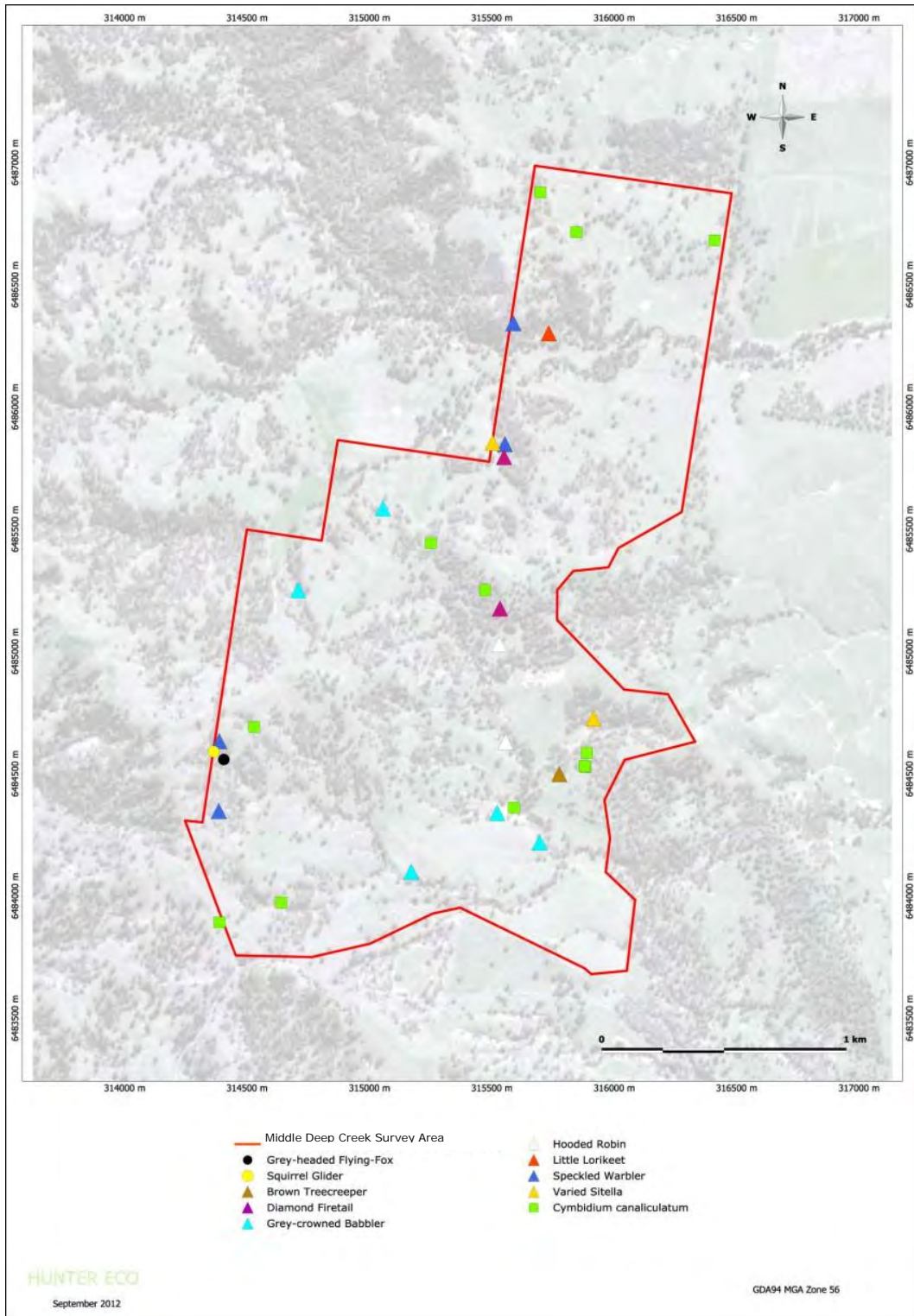


Figure 2 The location of threatened species recorded across the Middle Deep Creek survey area

3.4 Data Analysis

As described in Section 1, hierarchical agglomerative clustering was applied to presence only floristic data from:

- Saddlers Creek East;
- Middle Deep Creek;
- Proposed Modification Area D; and
- Combined data from box-gum habitat in proposed Modification Area B.

The Kulczynski similarity measure for presence absence data was used (Clarke and Gorley 2001). The aim was to determine whether the habitat in the current survey areas was similar to the habitat that is to be lost in the proposed Modification areas.

An examination of the resulting dendrogram (**Figure 3**) shows the following:

- At the coarsest level of the analysis (similarity 25), the Middle Deep Creek habitat was similar to habitat in proposed Modification areas B and D and these were different to Saddlers Creek East habitat;
- At a finer level (similarity 45) the two Middle Deep Creek woodland habitats were similar but different from the drainage line habitat. The two Modification Area D habitats were similar but different from the box-gum habitat in Modification Area B. The two habitats in Saddlers Creek East were similar but different to all others.

The data suggest that a reason for Saddlers Creek East showing as different to the other sampled vegetation is probably because Swamp Oak (*Casuarina glauca*), Yellow Box (*Eucalyptus melliodora*), Blakely's Red Gum (*Eucalyptus blakelyi*) and Narrow-leaved Iron-bark (*Eucalyptus crebra*) are present in that area and not in proposed Modification Area D. *Eucalyptus crebra* is present in Area D but was not recorded in sample plots from that area.

From this analysis it is reasonable to conclude that the habitat in the survey areas is similar to that in the proposed Modification Areas B and D.

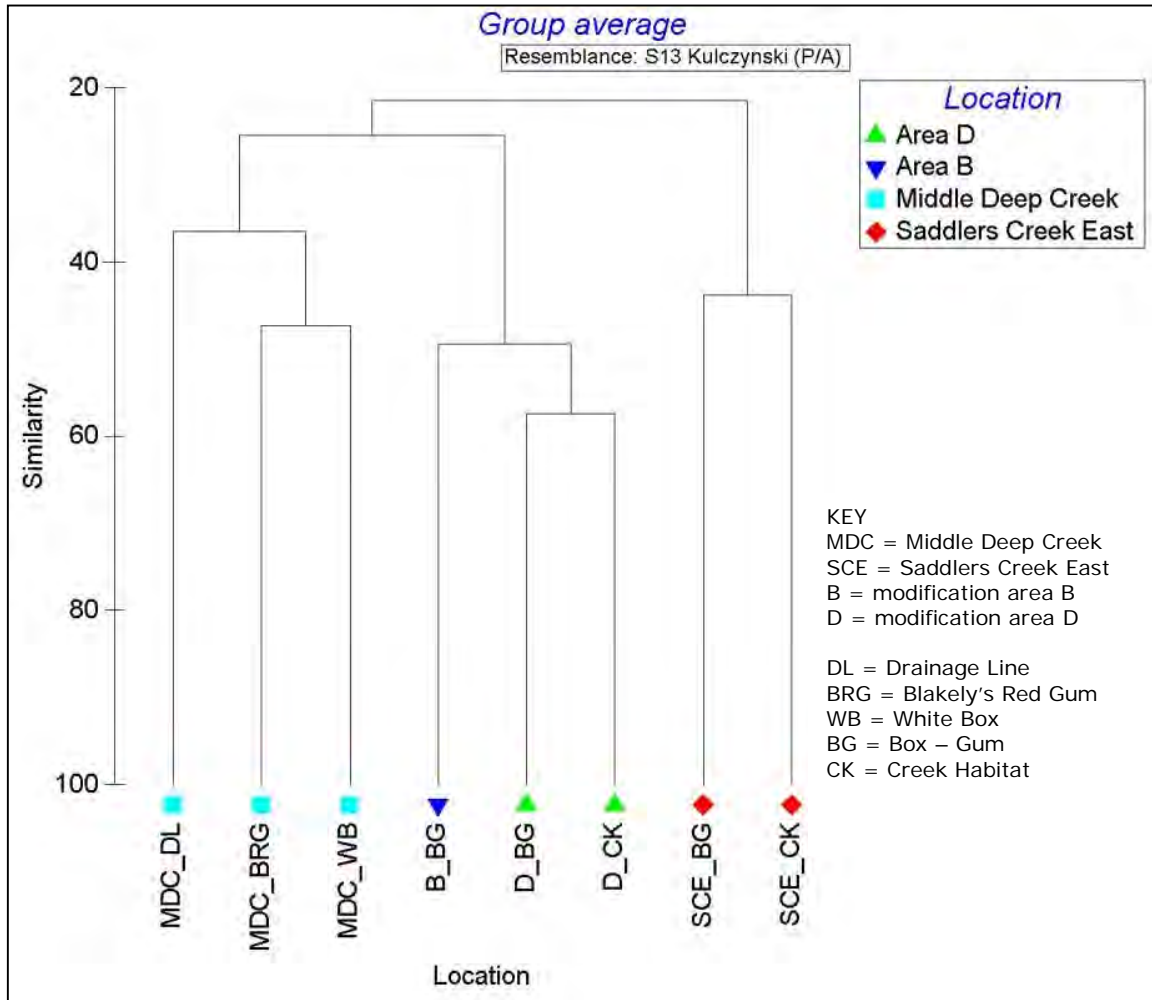


Figure 3 Dendrogram showing the similarity between sampled habitats

3.5 Vegetation Communities

Based on a floristic comparison with the community profiles provided in Peake (2006) Table 4 shows the communities mapped in the survey areas. **Figures 4** and **5** provide vegetation maps of Saddlers Creek and Middle Deep Creek.

Table 4 Vegetation communities

Community	Area (ha)
Saddlers Creek East and South	
MU10 Central Hunter Box - Ironbark Woodland ^{1, 2, 3}	7
MU10 Central Hunter Box - Ironbark Woodland (Derived grassland) ^{2, 3}	120
MU19 Hunter Valley Weeping Myall Woodland ⁴	0.40
MU24 Hunter Lowlands Redgum Forest ⁵	11
Middle Deep Creek	
MU11 Upper Hunter White Box – Ironbark Grassy Woodland (White Box dominant) ^{2, 3}	74
MU11 Upper Hunter White Box – Ironbark Grassy Woodland (Blakely's Red Gum dominant) ^{2, 3}	29
MU11 Upper Hunter White Box – Ironbark Grassy Woodland (Derived grassland) ^{2, 3}	307

¹ NSW EEC Central Hunter Grey Box – Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions

² NSW EEC White Box Yellow Box Blakely's Red Gum Woodland

³ Commonwealth CEEC White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland

⁴ NSW EEC Hunter Valley Weeping Myall Woodland of the Sydney Basin Bioregion

⁵ NSW EEC Hunter Lowland Red Gum Forest in the Sydney Basin and New South Wales North Coast Bioregions

MU10 Central Hunter Box - Ironbark Woodland

A small amount of this community was present in Saddlers Creek East. It was dominated by White Box (*Eucalyptus albens*) along with some Narrow-leaved Ironbark (*Eucalyptus crebra*). **Appendix 3** provides floristic details.

MU11 Upper Hunter White Box – Ironbark Grassy Woodland

Recorded only in Middle Deep Creek, there was no ironbark present but in most other respects the content matched the formal profile. As **Figure 5** shows, the community was readily subdivided into areas clearly dominated by a canopy of White Box (*Eucalyptus albens*) and areas dominated by Blakely's Red Gum (*Eucalyptus blakelyi*). **Appendix 2** provides floristic details.

MU19 Hunter Valley Weeping Myall Woodland

Recorded in Saddlers Creek South and consisted of about 40 large trees of the non-pendulous form of the Hunter *Acacia pendula* group. There was a considerable amount of suckering regrowth that included a smaller patch about 200 m from the main patch.

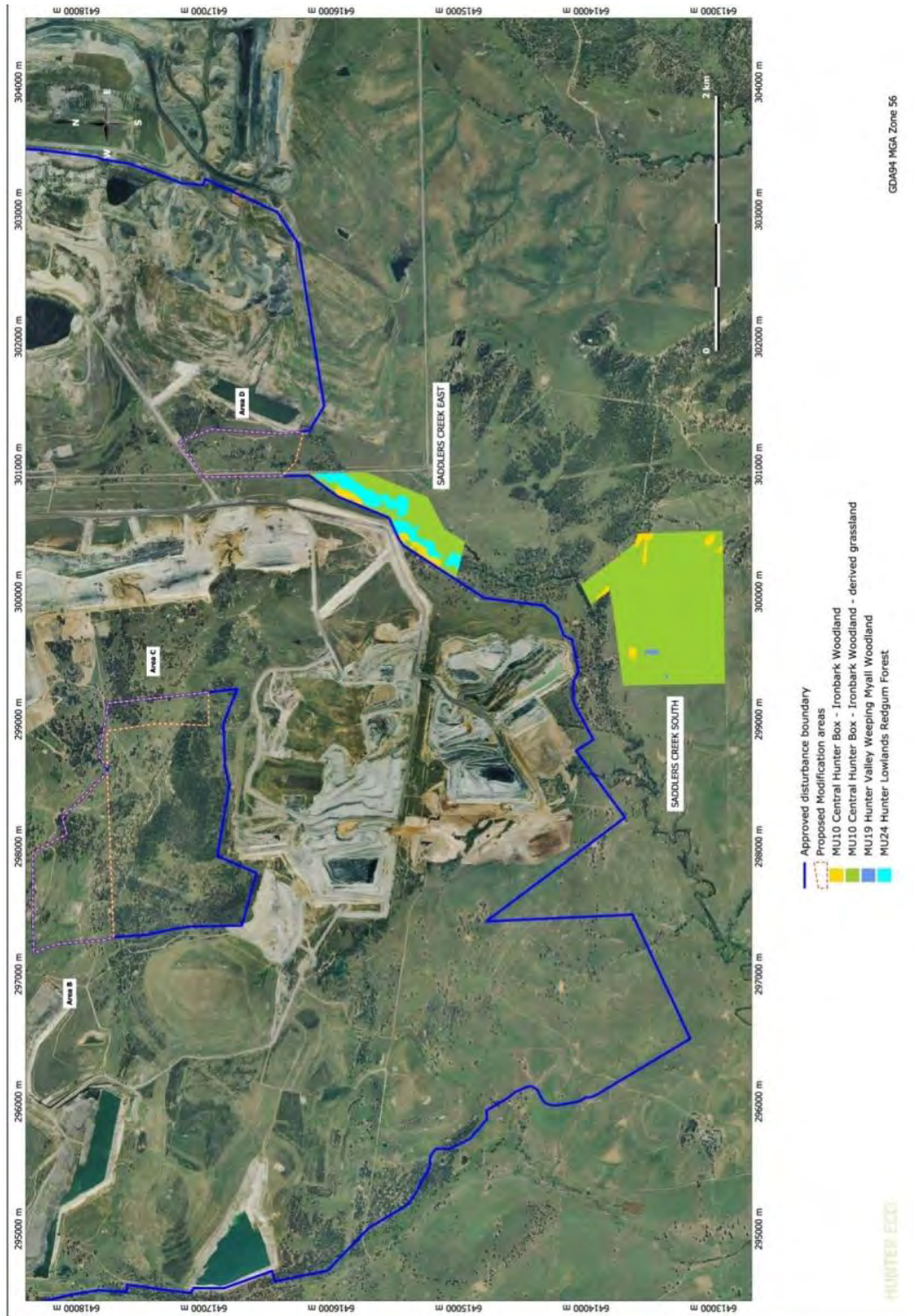


Figure 4 The vegetation mapped across Saddlers Creek survey areas

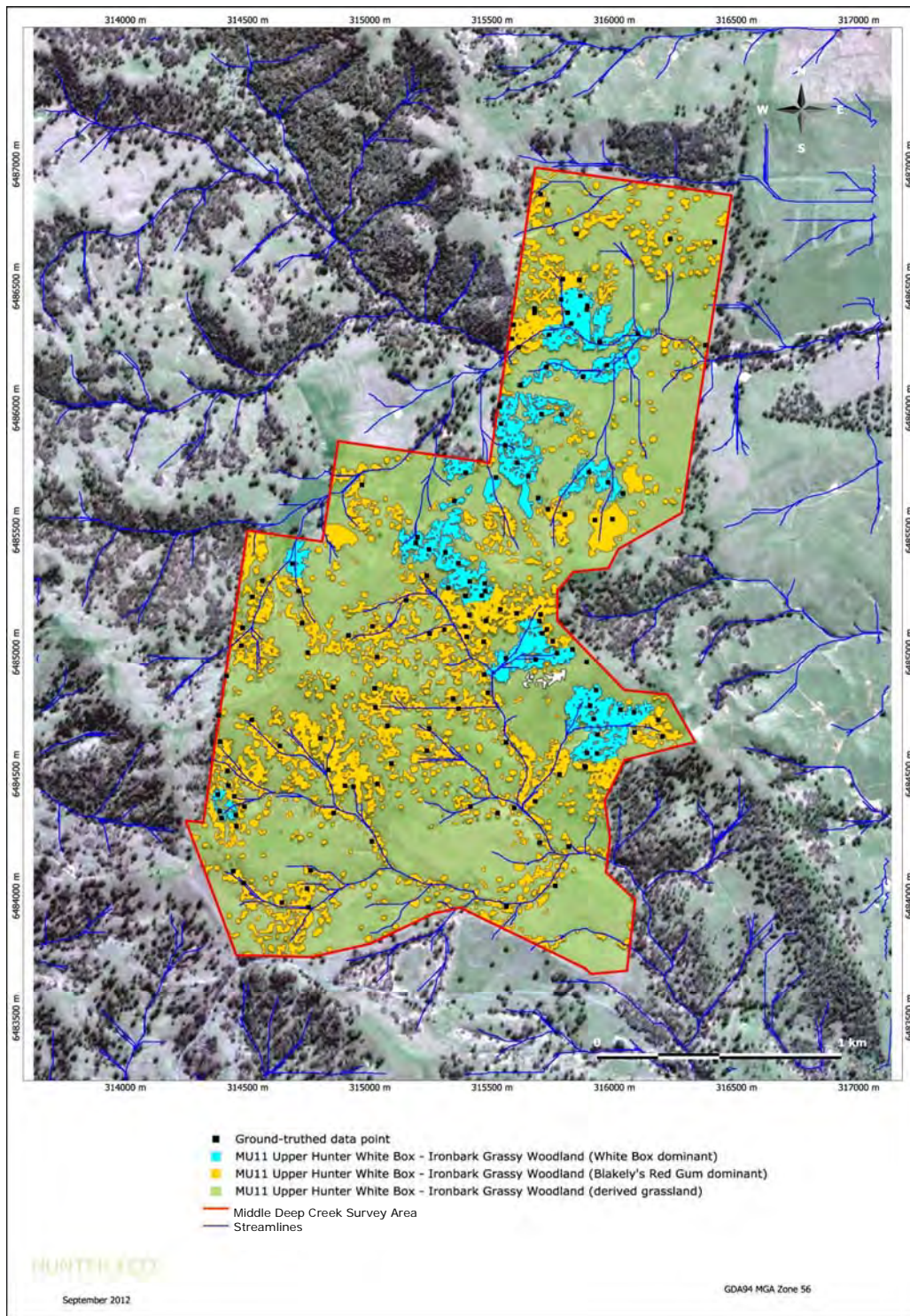


Figure 5 The vegetation mapped across the Middle Deep Creek survey area

MU24 Hunter Lowlands Red Gum Forest

This community in Saddlers Creek East was a continuation of the same community within proposed Modification Area D. The main canopy species were Forest Red Gum (*Eucalyptus tereticornis*) and Rough-barked Apple (*Angophora floribunda*); there were also a number of Yellow Box (*Eucalyptus melliodora*). **Appendix 1** provides further floristic detail.

3.6 Habitat Condition

Apart from the obvious fact of long-term clearing and grazing, there were areas that will benefit from targeted rehabilitation:

Saddlers Creek East has a heavily eroded area of about 3 ha (**Figure 6** and **Appendix 3**). There are also a number of weeds needing to be controlled, in particular Mother of Millions (*Bryophyllum* sp.) and African Boxthorn (*Lycium ferocissimum*), both of which are declared noxious weeds in the Upper Hunter County Council control area.

Middle Deep Creek also has heavily eroded areas totalling over 5 ha (**Figure 7** and **Appendix 4**). While there are a number of weed species present, Sweet briar (*Rosa rubiginosa*) is a declared noxious weed needing to be kept under control. This plant is common but not rampant and a targeted spraying program should substantially reduce its numbers.



Figure 6 Location of heavily eroded areas in Saddlers Creek East

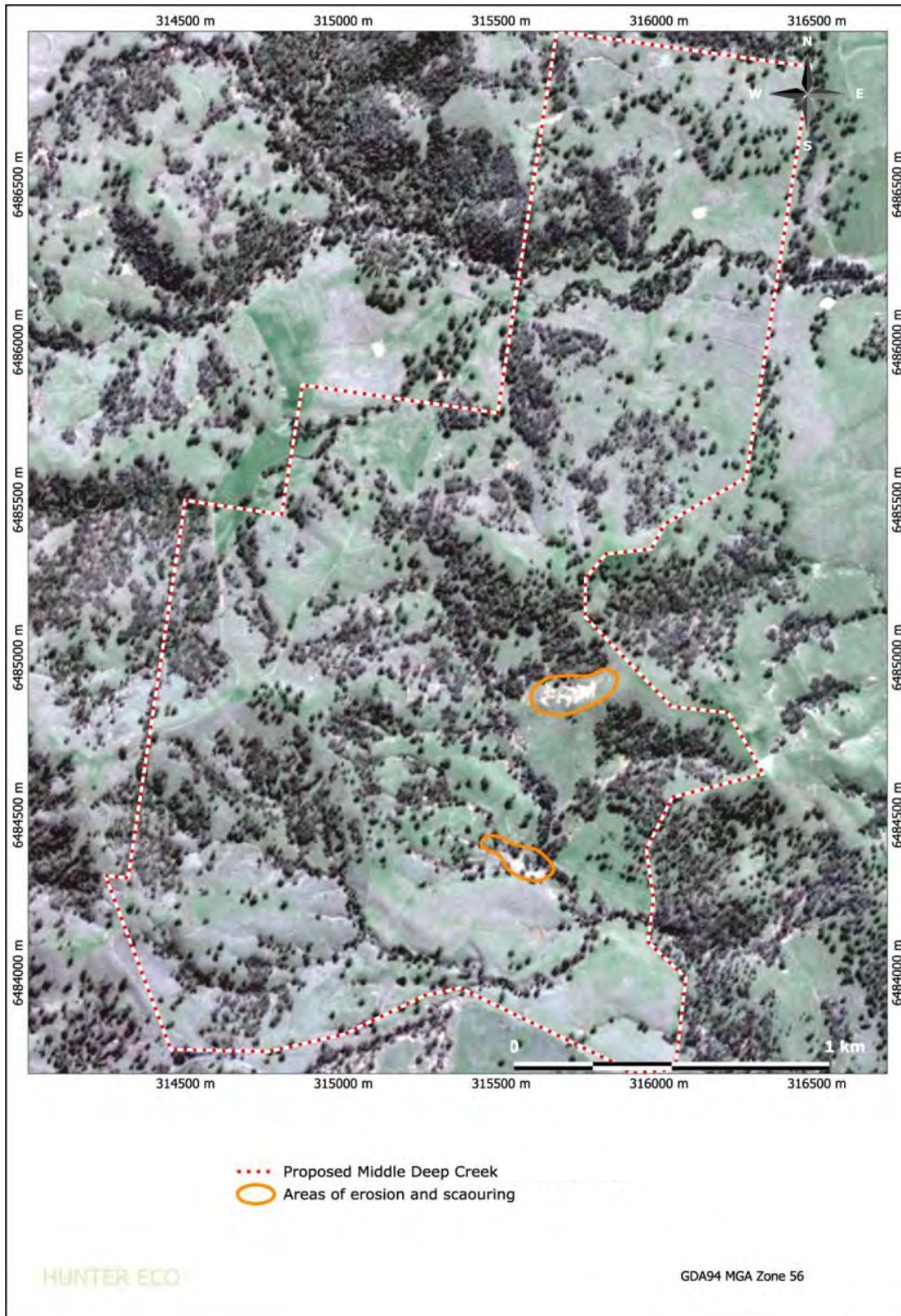


Figure 7 Location of heavily eroded areas in Middle Deep Creek

4 Conclusion

In combination, the habitat in the survey areas has been shown to be similar in most respects to that which would be lost if the proposed Mt Arthur Coal Modification were to proceed. The respective habitats are similar both in terms of vegetation communities described in the regional classification of Peake (2006) and their equivalent NSW State and Commonwealth threatened ecological communities. Middle Deep Creek contains several threatened bird and mammal species and significant representation of the Hunter Valley Tiger Orchid endangered population.

Over 75% of the survey areas consisted of derived native grassland, cleared of canopy, and subjected to long-term grazing. Implementation of an appropriate management plan would result in a significant increase in habitat quality and faunal diversity as woodland regenerated.

5 References

Department of Environment and Climate Change (2008) *Vegetation of the Cessnock-Kurri Region, Survey, Classification & Mapping, Cessnock LGA, New South Wales*, Department of Environment and Climate Change (NSW), Sydney.

Niche Environment and Heritage (2012) *Mount Arthur Coal Fauna Survey Report*.

Peake, T.C. (2006). *The Vegetation of the Central Hunter Valley, New South Wales. A report on the findings of the Hunter Remnant Vegetation Project*. Hunter–Central Rivers Catchment Management Authority, Paterson.

Appendix 1 Saddlers Creek East Flora and Fauna Details

Saddlers Creek East Creekline Meander Flora Species

Aizoaceae	Moraceae
<i>*Galenia pubescens</i>	<i>Ficus rubiginosa</i>
Asclepiadaceae	Myoporaceae
<i>*Gomphocarpus fruticosus</i>	<i>Myoporum montanum</i>
<i>*Gomphocarpus physocarpus</i>	Myrtaceae
Asteraceae	<i>Angophora floribunda</i>
<i>*Cirsium vulgare</i>	<i>Corymbia maculata</i>
<i>*Senecio madagascariensis</i>	<i>Eucalyptus albens</i>
<i>*Taraxacum officinale</i>	<i>Eucalyptus melliodora</i>
<i>*Xanthium occidentale</i>	<i>Eucalyptus moluccana</i>
<i>Cassinia quinquefaria</i>	<i>Eucalyptus tereticornis</i>
Cactaceae	Oleaceae
<i>*Opuntia stricta</i>	<i>Notelaea microcarpa</i>
Campanulaceae	Plantaginaceae
<i>Wahlenbergia communis</i>	<i>*Plantago lanceolata</i>
<i>Wahlenbergia luteola</i>	Poaceae
Casuarinaceae	<i>*Cynodon dactylon</i>
<i>Casuarina glauca</i>	<i>*Lolium perenne</i>
Chenopodiaceae	<i>*Pennisetum clandestinum</i>
<i>Maireana microphylla</i>	<i>Austrostipa verticillata</i>
Chloanthaceae	<i>Bothriochloa decipiens</i>
<i>Spartothamnella juncea</i>	<i>Chloris ventricosa</i>
Crassulaceae	<i>Cymbopogon refractus</i>
<i>*Bryophyllum delagoense</i>	<i>Phragmites australis</i>
Fabaceae (Mimosoideae)	Primulaceae
<i>Acacia salicina</i>	<i>*Anagallis arvensis</i>
Gentianaceae	Ranunculaceae
<i>*Centaurium erythraea</i>	<i>Clematis glycinoides</i>
Geraniaceae	Rosaceae
<i>Geranium solanderi</i>	<i>Rubus moluccanus</i>
Juncaceae	Rubiaceae
<i>*Juncus acutus</i>	<i>Asperula conferta</i>
Linaceae	<i>Psydrax odorata</i>
<i>*Linum trigynum</i>	Santalaceae
<i>Linum marginale</i>	<i>Exocarpos cupressiformis</i>
Lomandraceae	Solanaceae
<i>Lomandra longifolia</i>	<i>*Lycium ferocissimum</i>
<i>Lomandra multiflora</i>	Sterculiaceae

Luzuriagaceae	<i>Brachychiton populneus</i>
<i>Geitonoplesium cymosum</i>	Typhaceae
Malvaceae	<i>Typha orientalis</i>
* <i>Sida rhombifolia</i>	Verbenaceae
<i>Sida corrugata</i>	* <i>Verbena bonariensis</i>

Saddlers Creek East Grassy Woodland Flora Species

Adiantaceae	Myrtaceae
<i>Cheilanthes sieberi</i>	<i>Corymbia maculata</i>
Aizoaceae	<i>Eucalyptus blakelyi</i>
* <i>Galenia pubescens</i>	<i>Eucalyptus crebra</i>
Anthericaceae	<i>Eucalyptus punctata</i>
<i>Caesia parviflora</i>	<i>Eucalyptus tereticornis</i>
Asteraceae	Oleaceae
* <i>Cirsium vulgare</i>	<i>Notelaea microcarpa</i>
* <i>Senecio madagascariensis</i>	Phormiaceae
* <i>Xanthium occidentale</i>	<i>Dianella tasmanica</i>
<i>Cassinia quinquefaria</i>	Pittosporaceae
<i>Chrysocephalum apiculatum</i>	<i>Bursaria spinosa</i>
<i>Cymbonotus lawsonianus</i>	Plantaginaceae
Bignoniaceae	* <i>Plantago lanceolata</i>
<i>Pandorea pandorana</i>	<i>Plantago gaudichaudii</i>
Chenopodiaceae	Poaceae
<i>Maireana microphylla</i>	* <i>Briza minor</i>
Chloanthaceae	* <i>Chloris gayana</i>
<i>Spartothamnella juncea</i>	* <i>Hyparrhenia hirta</i>
Convolvulaceae	* <i>Pennisetum clandestinum</i>
<i>Dichondra repens</i>	<i>Austrodanthonia fulva</i>
Euphorbiaceae	<i>Austrostipa setacea</i>
<i>Breynia oblongifolia</i>	<i>Austrostipa verticillata</i>
Fabaceae (Faboideae)	<i>Elymus scaber</i>
<i>Hardenbergia violacea</i>	<i>Panicum queenslandicum</i>
<i>Swainsona galegifolia</i>	<i>Sporobolus creber</i>
Fabaceae (Mimosoideae)	<i>Themeda australis</i>
<i>Acacia falcata</i>	Primulaceae
Linaceae	* <i>Anagallis arvensis</i>
<i>Linum marginale</i>	Ranunculaceae
Lomandraceae	<i>Clematis glycinoides</i>
<i>Lomandra confertifolia</i>	Solanaceae
<i>Lomandra longifolia</i>	* <i>Cestrum aurantiacum</i>
<i>Lomandra multiflora</i>	* <i>Lycium ferocissimum</i>

Malvaceae		Sterculiaceae
<i>*Sida rhombifolia</i>		<i>Brachychiton populneus</i>
<i>Sida corrugata</i>		Thymelaeaceae
Myoporaceae		<i>Pimelea linifolia</i>
<i>Myoporum montanum</i>		

Saddlers Creek East Combined Floristic List

Adiantaceae		Myoporaceae
<i>Cheilanthes sieberi</i>		<i>Myoporum montanum</i>
Aizoaceae		Myrtaceae
<i>*Galenia pubescens</i>		<i>Angophora floribunda</i>
Anthericaceae		<i>Corymbia maculata</i>
<i>Caesia parviflora</i>		<i>Eucalyptus albens</i>
Asclepiadaceae		<i>Eucalyptus blakelyi</i>
<i>*Gomphocarpus fruticosus</i>		<i>Eucalyptus crebra</i>
<i>*Gomphocarpus physocarpus</i>		<i>Eucalyptus melliodora</i>
Asteraceae		<i>Eucalyptus moluccana</i>
<i>*Cirsium vulgare</i>		<i>Eucalyptus punctata</i>
<i>*Senecio madagascariensis</i>		<i>Eucalyptus tereticornis</i>
<i>*Taraxacum officinale</i>		Oleaceae
<i>*Xanthium occidentale</i>		<i>Notelaea microcarpa</i>
<i>Cassinia quinquefaria</i>		Phormiaceae
<i>Chrysocephalum apiculatum</i>		<i>Dianella tasmanica</i>
<i>Cymbonotus lawsonianus</i>		Pittosporaceae
Bignoniaceae		<i>Bursaria spinosa</i>
<i>Pandorea pandorana</i>		Plantaginaceae
Cactaceae		<i>*Plantago lanceolata</i>
<i>*Opuntia stricta</i>		<i>Plantago gaudichaudii</i>
Campanulaceae		Poaceae
<i>Wahlenbergia communis</i>		<i>*Briza minor</i>
<i>Wahlenbergia luteola</i>		<i>*Chloris gayana</i>
Casuarinaceae		<i>*Cynodon dactylon</i>
<i>Casuarina glauca</i>		<i>*Hyparrhenia hirta</i>
Chenopodiaceae		<i>*Lolium perenne</i>
<i>Maireana microphylla</i>		<i>*Pennisetum clandestinum</i>
Chloanthaceae		<i>Austrodanthonia fulva</i>
<i>Spartothamnella juncea</i>		<i>Austrostipa setacea</i>
Convolvulaceae		<i>Austrostipa verticillata</i>
<i>Dichondra repens</i>		<i>Bothriochloa decipiens</i>
Crassulaceae		<i>Chloris ventricosa</i>
<i>*Bryophyllum delagoense</i>		<i>Cymbopogon refractus</i>

Euphorbiaceae	<i>Elymus scaber</i>
<i>Breynia oblongifolia</i>	<i>Panicum queenslandicum</i>
Fabaceae (Faboideae)	<i>Phragmites australis</i>
<i>Hardenbergia violacea</i>	<i>Sporobolus creber</i>
<i>Swainsona galegifolia</i>	<i>Themeda australis</i>
Fabaceae (Mimosoideae)	Primulaceae
<i>Acacia falcata</i>	* <i>Anagallis arvensis</i>
<i>Acacia salicina</i>	Ranunculaceae
Gentianaceae	<i>Clematis glycinoides</i>
* <i>Centaurium erythraea</i>	Rosaceae
Geraniaceae	<i>Rubus moluccanus</i>
<i>Geranium solanderi</i>	Rubiaceae
Juncaceae	<i>Asperula conferta</i>
* <i>Juncus acutus</i>	<i>Psydrax odorata</i>
Linaceae	Santalaceae
* <i>Linum trigynum</i>	<i>Exocarpos cupressiformis</i>
<i>Linum marginale</i>	Solanaceae
Lomandraceae	* <i>Cestrum aurantiacum</i>
<i>Lomandra confertifolia</i>	* <i>Lycium ferocissimum</i>
<i>Lomandra longifolia</i>	Sterculiaceae
<i>Lomandra multiflora</i>	<i>Brachychiton populneus</i>
Luzuriagaceae	Thymelaeaceae
<i>Geitonoplesium cymosum</i>	<i>Pimelea linifolia</i>
Malvaceae	Typhaceae
* <i>Sida rhombifolia</i>	<i>Typha orientalis</i>
<i>Sida corrugata</i>	Verbenaceae
Moraceae	* <i>Verbena bonariensis</i>
<i>Ficus rubiginosa</i>	

Saddlers Creek East Fauna Species

Birds	Mammals and Reptiles
Accipitridae	Leporidae
Black-shouldered Kite	Rabbit
<i>Elanus axillaris</i>	<i>*Oryctolagus cuniculus</i>
Artamidae	Macropodidae
Australian Magpie	Eastern Grey Kangaroo
<i>Gymnorhina tibicen</i>	<i>Macropus giganteus</i>
Grey Butcherbird	Phalangeridae
<i>Cracticus torquatus</i>	Common Brushtail Possum
Cacatuidae	<i>Trichosurus vulpecula</i>
Galah	Tachyglossidae
<i>Cacatua roseicapilla</i>	Echidna
Sulphur-crested Cockatoo	<i>Tachyglossus aculeatus</i>
<i>Cacatua galerita</i>	Varanidae
Corvidae	Lace Monitor
Australian Raven	<i>Varanus varius</i>
<i>Corvus coronoides</i>	
Falconidae	
Nankeen Kestrel	
<i>Falco cenchroides</i>	
Halcyonidae	
Laughing Kookaburra	
<i>Dacelo novaeguineae</i>	
Hirundinidae	
Welcome Swallow	
<i>Hirundo neoxena</i>	
Maluridae	
Superb Fairy-wren	
<i>Malurus cyaneus</i>	
Meliphagidae	
Noisy Miner	
<i>Manorina melanocephala</i>	
Pardalotidae	
Striated Pardalote	
<i>Pardalotus striatus</i>	
Phasianidae	
Brown Quail	
<i>Coturnix ypsilophora</i>	
Psittacidae	
Australian King-Parrot	
<i>Alisterus scapularis</i>	
Eastern Rosella	
<i>Platycercus eximius</i>	

Saddlers Creek East Habitat Hollow Trees Species and Location Coordinates

Species	Easting	Northing	Species	Easting	Northing	
Dead Stag	300914	6415975	<i>Eucalyptus albens</i>	300296	6415268	
	300913	6416083		300316	6415262	
	300286	6415029		300320	6415255	
	300277	6415027		300336	6415242	
<i>Eucalyptus albens</i>	300884	6415909		300458	6415393	
	300913	6415955		300459	6415411	
	300850	6415947		300473	6415418	
	300845	6415940		300487	6415460	
	300839	6415914		300471	6415469	
	300808	6415869		<i>Eucalyptus blakelyi</i>	300215	6415087
	300746	6415785			300412	6415375
	300755	6415665	<i>Eucalyptus crebra</i>	300664	6415623	
	300766	6415714	<i>Eucalyptus melliodora</i>	300778	6415806	
	300768	6415697		300739	6415732	
	300762	6415601		300746	6415719	
	300724	6415526	<i>Eucalyptus punctata</i>	300901	6416077	
	300725	6415517	<i>Eucalyptus tereticornis</i>	300910	6416093	
	300716	6415517		300811	6416038	
	300708	6415403		300778	6415922	
	300632	6415415		300759	6415847	
	300404	6415291		300780	6415823	
	300392	6415281		300731	6415785	
	300382	6415281		300697	6415785	
	300403	6415251		300712	6415752	
	300410	6415231		300707	6415718	
	300384	6415242		300680	6415700	
	300382	6415229		300669	6415672	
	300387	6415214		300672	6415653	
	300382	6415212		300678	6415631	
	300374	6415203		300693	6415639	
	300311	6415197		300721	6415661	
	300308	6415193		300743	6415653	
	300302	6415194		300781	6415669	
	300300	6415192	300755	6415634		
	300301	6415176	300694	6415486		
	300263	6415066	300736	6415485		
	300198	6415185	300740	6415418		
300233	6415175	300745	6415379			
300253	6415163	300742	6415387			

<i>Eucalyptus albens</i>	300260	6415162	<i>Eucalyptus tereticornis</i>	300434	6415322
	300251	6415179		300313	6415208
	300220	6415194		300284	6415148
	300218	6415207		300267	6415064
	300232	6415244		300319	6415250
	300285	6415237		300370	6415299
	300301	6415261		300475	6415414

Appendix 2 Middle Deep Creek Flora and Fauna Details

Middle Deep Creek Drainage Line Meander Floristic List

Adiantaceae	Fabaceae (Mimosoideae)
<i>Adiantum aethiopicum</i>	<i>Acacia paradoxa</i>
<i>Cheilanthes sieberi</i>	Geraniaceae
<i>Pellaea falcata</i> var. <i>falcata</i>	<i>Geranium solanderi</i>
Apiaceae	Lomandraceae
<i>Daucus glochidiatus</i>	<i>Lomandra confertifolia</i>
Asteraceae	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>
* <i>Bidens pilosa</i>	Luzuriagaceae
* <i>Cirsium vulgare</i>	<i>Eustrephus latifolius</i>
* <i>Conyza</i> sp.	<i>Geitonoplesium cymosum</i>
* <i>Euchiton involucratus</i>	Myrtaceae
* <i>Taraxacum officinale</i>	<i>Eucalyptus albens</i>
<i>Cassinia quinquefaria</i>	<i>Eucalyptus blakelyi</i>
<i>Sigesbeckia australiensis</i>	Oleaceae
<i>Sigesbeckia orientalis</i> subsp. <i>orientalis</i>	<i>Notelaea microcarpa</i>
Bignoniaceae	Orchidaceae
<i>Pandorea pandorana</i>	<i>Pterostylis pedunculata</i>
Cactaceae	Oxalidaceae
* <i>Opuntia stricta</i>	<i>Oxalis chnoodes</i>
Campanulaceae	Pittosporaceae
<i>Wahlenbergia communis</i>	<i>Bursaria spinosa</i>
Convolvulaceae	Poaceae
<i>Dichondra repens</i>	<i>Poa</i> sp.
Cyperaceae	Primulaceae
<i>Cyperus sphaeroideus</i>	* <i>Anagallis arvensis</i>
Fabaceae (Faboideae)	Ranunculaceae
<i>Desmodium brachypodum</i>	<i>Clematis glycinoides</i> var. <i>glycinoides</i>
<i>Desmodium gunnii</i>	Rosaceae
<i>Desmodium varians</i>	<i>Rubus parvifolius</i>
<i>Glycine clandestina</i>	
<i>Glycine microphylla</i>	
<i>Glycine tabacina</i>	
<i>Hardenbergia violacea</i>	
<i>Trifolium</i> sp.	

* Denotes introduced species

Middle Deep Creek White Box Meander Floristic List

Apiaceae	Lomandraceae
<i>Centella asiatica</i>	<i>Lomandra confertifolia</i>
Asphodelaceae	<i>Lomandra filiformis subsp. filiformis</i>
<i>Bulbine bulbosa</i>	<i>Lomandra multiflora</i>
Asteraceae	Myrtaceae
* <i>Cirsium vulgare</i>	<i>Eucalyptus albens</i>
* <i>Conyza sp.</i>	Oleaceae
<i>Brachyscome microcarpa</i>	<i>Notelaea microcarpa</i>
<i>Cassinia quinquefaria</i>	Oxalidaceae
<i>Helichrysum scorpioides</i>	<i>Oxalis chnoodes</i>
<i>Leptorhynchos squamatus subsp. A</i>	Pittosporaceae
<i>Olearia elliptica</i>	<i>Bursaria spinosa</i>
Colchicaceae	Poaceae
<i>Burchardia umbellata</i>	* <i>Hordeum leporinum</i>
<i>Wurmbea biglandulosa</i>	<i>Aristida ramosa</i>
Convolvulaceae	<i>Chloris ventricosa</i>
<i>Convolvulus erubescens</i>	<i>Cymbopogon refractus</i>
<i>Dichondra repens</i>	<i>Dichelachne crinita</i>
Epacridaceae	<i>Panicum queenslandicum</i>
<i>Melichrus urceolatus</i>	Primulaceae
Fabaceae (Faboideae)	* <i>Anagallis arvensis</i>
<i>Glycine microphylla</i>	Ranunculaceae
<i>Glycine tabacina</i>	<i>Ranunculus lappaceus</i>
<i>Templetonia stenophylla</i>	Rhamnaceae
Fabaceae (Mimosoideae)	<i>Cryptandra spinescens</i>
<i>Acacia decora</i>	Rubiaceae
<i>Acacia paradoxa</i>	<i>Asperula conferta</i>
Geraniaceae	Thymelaeaceae
<i>Geranium solanderi</i>	<i>Pimelea curviflora</i>
Lamiaceae	<i>Pimelea linifolia</i>
* <i>Salvia verbenaca</i>	
<i>Mentha satureioides</i>	

* Denotes introduced species

Middle Deep Creek Blakely's Red Gum Meander Floristic List

Adiantaceae		Lomandraceae
<i>Cheilanthes sieberi</i>		<i>Lomandra confertifolia</i>
Asteraceae		<i>Lomandra filiformis subsp. coriacea</i>
* <i>Bidens pilosa</i>		<i>Lomandra multiflora</i>
* <i>Cirsium vulgare</i>		Myrtaceae
* <i>Conyza sp.</i>		<i>Eucalyptus blakelyi</i>
<i>Cassinia quinquefaria</i>		Oleaceae
<i>Chrysocephalum apiculatum</i>		<i>Notelaea microcarpa</i>
<i>Glossocardia bidens</i>		Oxalidaceae
Clusiaceae		<i>Oxalis sp.</i>
<i>Hypericum gramineum</i>		Phormiaceae
Convolvulaceae		<i>Dianella longifolia</i>
<i>Dichondra repens</i>		Poaceae
Epacridaceae		<i>Aristida ramosa</i>
<i>Melichrus urceolatus</i>		<i>Austrostipa verticillata</i>
Euphorbiaceae		<i>Bothriochloa decipiens</i>
<i>Poranthera microphylla</i>		<i>Chloris ventricosa</i>
Fabaceae (Faboideae)		<i>Cymbopogon refractus</i>
<i>Glycine tabacina</i>		<i>Dichanthium sericeum</i>
Fabaceae (Mimosoideae)		<i>Eragrostis sp.</i>
<i>Acacia paradoxa</i>		<i>Panicum effusum</i>
Geraniaceae		<i>Panicum queenslandicum</i>
<i>Geranium solanderi</i>		Primulaceae
Lamiaceae		* <i>Anagallis arvensis</i>
<i>Mentha satureioides</i>		

* Denotes introduced species

Middle Deep Creek Combined Floristic List

Adiantaceae	Geraniaceae
<i>Adiantum aethiopicum</i>	<i>Geranium solanderi</i>
<i>Cheilanthes sieberi</i>	Lamiaceae
<i>Pellaea falcata</i> var. <i>falcata</i>	* <i>Salvia verbenaca</i>
Apiaceae	<i>Ajuga australis</i>
<i>Centella asiatica</i>	<i>Mentha satureioides</i>
<i>Daucus glochidiatus</i>	Lomandraceae
Asphodelaceae	<i>Lomandra confertifolia</i>
<i>Bulbine bulbosa</i>	<i>Lomandra filiformis</i> subsp. <i>coriacea</i>
Asteraceae	<i>Lomandra filiformis</i> subsp. <i>filiformis</i>
* <i>Bidens pilosa</i>	<i>Lomandra multiflora</i>
* <i>Cirsium vulgare</i>	Luzuriagaceae
* <i>Conyza</i> sp.	<i>Eustrephus latifolius</i>
* <i>Euchiton involucratus</i>	<i>Geitonoplesium cymosum</i>
* <i>Senecio madagascariensis</i>	Myrtaceae
* <i>Taraxacum officinale</i>	<i>Angophora floribunda</i>
<i>Brachyscome microcarpa</i>	<i>Eucalyptus albens</i>
<i>Cassinia quinquefaria</i>	<i>Eucalyptus blakelyi</i>
<i>Chrysocephalum apiculatum</i>	<i>Eucalyptus eugenioides</i>
<i>Cymbonotus lawsonianus</i>	Oleaceae
<i>Glossocardia bidens</i>	<i>Notelaea microcarpa</i>
<i>Helichrysum scorpioides</i>	Orchidaceae
<i>Leptorhynchos squamatus</i> subsp. <i>A</i>	<i>Cymbidium canaliculatum</i>
<i>Olearia elliptica</i>	<i>Pterostylis pedunculata</i>
<i>Sigesbeckia australiensis</i>	Oxalidaceae
<i>Sigesbeckia orientalis</i> subsp. <i>orientalis</i>	<i>Oxalis chnoodes</i>
<i>Triptilodicus pygmaeus</i>	<i>Oxalis</i> sp.
Bignoniaceae	Phormiaceae
<i>Pandorea pandorana</i>	<i>Dianella longifolia</i>
Cactaceae	Pittosporaceae
* <i>Opuntia stricta</i>	<i>Bursaria spinosa</i>
Campanulaceae	Poaceae
<i>Wahlenbergia communis</i>	* <i>Hordeum leporinum</i>
<i>Wahlenbergia luteola</i>	* <i>Lolium perenne</i>
Chenopodiaceae	<i>Aristida ramosa</i>
<i>Maireana microphylla</i>	<i>Austrostipa verticillata</i>
Clusiaceae	<i>Bothriochloa decipiens</i>
<i>Hypericum gramineum</i>	<i>Chloris ventricosa</i>
Colchicaceae	<i>Cymbopogon refractus</i>

<i>Burchardia umbellata</i>	<i>Dichanthium sericeum</i>
<i>Wurmbea biglandulosa</i>	<i>Dichelachne crinita</i>
Convolvulaceae	<i>Eragrostis sp.</i>
<i>Convolvulus erubescens</i>	<i>Imperata cylindrica</i>
<i>Dichondra repens</i>	<i>Panicum effusum</i>
Cupressaceae	<i>Panicum queenslandicum</i>
<i>Callitris endlicheri</i>	<i>Poa sp.</i>
<i>Callitris glaucophylla</i>	<i>Sporobolus creber</i>
Cyperaceae	Primulaceae
<i>Cyperus sphaeroideus</i>	* <i>Anagallis arvensis</i>
Epacridaceae	Ranunculaceae
<i>Melichrus urceolatus</i>	<i>Clematis glycinoides var. glycinoides</i>
Euphorbiaceae	<i>Ranunculus lappaceus</i>
<i>Poranthera microphylla</i>	Rhamnaceae
Fabaceae (Faboideae)	<i>Cryptandra amara var. longiflora</i>
<i>Daviesia genistifolia</i>	<i>Cryptandra spinescens</i>
<i>Desmodium brachypodum</i>	Rosaceae
<i>Desmodium gunnii</i>	<i>Rubus parvifolius</i>
<i>Desmodium varians</i>	Rubiaceae
<i>Glycine clandestina</i>	* <i>Sherardia arvensis</i>
<i>Glycine microphylla</i>	<i>Asperula conferta</i>
<i>Glycine tabacina</i>	Sapindaceae
<i>Hardenbergia violacea</i>	<i>Dodonaea viscosa subsp. angustifolia</i>
<i>Pultenaea microphylla</i>	Thymelaeaceae
<i>Swainsona galegifolia</i>	<i>Pimelea curviflora</i>
<i>Swainsona parviflora</i>	<i>Pimelea linifolia</i>
<i>Templetonia stenophylla</i>	Violaceae
<i>Trifolium sp.</i>	<i>Viola betonicifolia</i>
Fabaceae (Mimosoideae)	
<i>Acacia decora</i>	
<i>Acacia melanoxyton</i>	
<i>Acacia paradoxa</i>	

* Denotes introduced species

Middle Deep Creek Bird Species

Accipitridae	Meliphagidae cont.
Wedge-tailed Eagle	Scarlet Honeyeater
<i>Aquila audax</i>	<i>Myzomela sanguinolenta</i>
Aegothelidae	White-naped Honeyeater
Australian Owlet-nightjar	<i>Melithreptus lunatus</i>
<i>Aegotheles cristatus</i>	White-plumed Honeyeater
Anatidae	<i>Lichenostomus penicillatus</i>
Australian Wood Duck	Yellow-faced Honeyeater
<i>Chenonetta jubata</i>	<i>Lichenostomus chrysops</i>
Grey Teal	Meropidae
<i>Anas gracilis</i>	Rainbow Bee-eater
Artamidae	<i>Merops ornatus</i>
Australian Magpie	Neosittidae
<i>Gymnorhina tibicen</i>	Varied Sittella V-TSCAct
Dusky Woodswallow	<i>Daphoenositta chrysoptera</i>
<i>Artamus cyanopterus</i>	Oriolidae
Grey Butcherbird	Olive-backed Oriole
<i>Cracticus torquatus</i>	<i>Oriolus sagittatus</i>
Pied Butcherbird	Pachycephalidae
<i>Cracticus nigrogularis</i>	Grey Shrike-thrush
Pied Currawong	<i>Colluricincla harmonica</i>
<i>Strepera graculina</i>	Rufous Whistler
White-browed Woodswallow	<i>Pachycephala rufiventris</i>
<i>Artamus superciliosus</i>	Pardalotidae
Cacatuidae	Brown Gerygone
Galah	<i>Gerygone mouki</i>
<i>Cacatua roseicapilla</i>	Speckled Warbler V-TSCAct
Sulphur-crested Cockatoo	<i>Chthonicola sagittata</i>
<i>Cacatua galerita</i>	Spotted Pardalote
Campephagidae	<i>Pardalotus punctatus</i>
Black-faced Cuckoo-shrike	Striated Pardalote
<i>Coracina novaehollandiae</i>	<i>Pardalotus striatus</i>
Climacteridae	Striated Thornbill
Brown Treecreeper (eastern subspecies) V-TSCAct	<i>Acanthiza lineata</i>
<i>Climacteris picumnus victoriae</i>	Weebill
White-throated Treecreeper	<i>Smicrornis brevirostris</i>
<i>Cormobates leucophaeus</i>	White-throated Gerygone
Columbidae	<i>Gerygone olivacea</i>
Brush Bronzewing	Yellow-rumped Thornbill

<i>Phaps elegans</i>	<i>Acanthiza chrysorrhoa</i>
Crested Pigeon	Passeridae
<i>Ocyphaps lophotes</i>	Diamond Firetail V-TSCAct
Corcoracidae	<i>Stagonopleura guttata</i>
White-winged Chough	Double-barred Finch
<i>Corcorax melanorhamphos</i>	<i>Taeniopygia bichenovii</i>
Corvidae	Petroicidae
Australian Raven	Eastern Yellow Robin
<i>Corvus coronoides</i>	<i>Eopsaltria australis</i>
Dicaeidae	Hooded Robin V-TSCAct
Mistletoebird	<i>Melanodryas cucullata</i>
<i>Dicaeum hirundinaceum</i>	Jacky Winter
Dicruridae	<i>Microeca fascinans</i>
Grey Fantail	Podargidae
<i>Rhipidura fuliginosa</i>	Tawny Frogmouth
Magpie-lark	<i>Podargus strigoides</i>
<i>Grallina cyanoleuca</i>	Podicipedidae
Restless Flycatcher	Australasian Grebe
<i>Myiagra inquieta</i>	<i>Tachybaptus novaehollandiae</i>
Satin Flycatcher	Pomatostomidae
<i>Myiagra cyanoleuca</i>	Grey-crowned Babbler (eastern subspecies) V-TSCAct
Willie Wagtail	<i>Pomatostomus temporalis temporalis</i>
<i>Rhipidura leucophrys</i>	Psittacidae
Halcyonidae	Australian King-Parrot
Laughing Kookaburra	<i>Alisterus scapularis</i>
<i>Dacelo novaeguineae</i>	Crimson Rosella
Maluridae	<i>Platycercus elegans</i>
Superb Fairy-wren	Eastern Rosella
<i>Malurus cyaneus</i>	<i>Platycercus eximius</i>
Meliphagidae	Little Lorikeet V-TSCAct
Brown-headed Honeyeater	<i>Glossopsitta pusilla</i>
<i>Melithreptus brevirostris</i>	Musk Lorikeet
Fuscous Honeyeater	<i>Glossopsitta concinna</i>
<i>Lichenostomus fuscus</i>	Strigidae
Noisy Friarbird	Southern Boobook
<i>Philemon corniculatus</i>	<i>Ninox novaeseelandiae</i>
Noisy Miner	Tytonidae
<i>Manorina melanocephala</i>	Barn Owl
Red Wattlebird	<i>Tyto alba</i>
<i>Anthochaera carnunculata</i>	

Middle Deep Creek Mammal and Reptile Species

MAMMALS
Canidae
Dog
<i>*Canis lupus familiaris</i>
Fox
<i>*Vulpes vulpes</i>
Cervidae
Sambar Deer
<i>*Cervus unicolor</i>
Leporidae
European Brown Hare
<i>*Lepus sp.</i>
Rabbit
<i>*Oryctolagus cuniculus</i>
Macropodidae
Common Wallaroo
<i>Macropus robustus</i>
Eastern Grey Kangaroo
<i>Macropus giganteus</i>
Red-necked Wallaby
<i>Macropus rufogriseus</i>
Petauridae
Squirrel Glider V-TSC Act
<i>Petaurus norfolcensis</i>
Phalangeridae
Common Brushtail Possum
<i>Trichosurus vulpecula</i>
Pteropodidae
Grey-headed Flying-fox V-TSC Act
<i>Pteropus poliocephalus</i>
Suidae
Pig
<i>*Sus scrofa</i>
REPTILES
Agamidae
Bearded Dragon
<i>Pogona barbata</i>

* Denotes introduced species

Appendix 3 Saddlers Creek Site Photographs



Saddlers Creek East creekline habitat



Saddlers Creek East erosion



Saddlers Creek South Weeping Myall Woodland stand and surrounding grassland

Appendix 4 Middle Deep Creek site photographs



White Box Grassy Woodland



Blakely's Red Gum Grassy Woodland



Incised drainage line habitat



Tiger Orchid (*Cymbidium canaliculatum*)



Eroded hillside