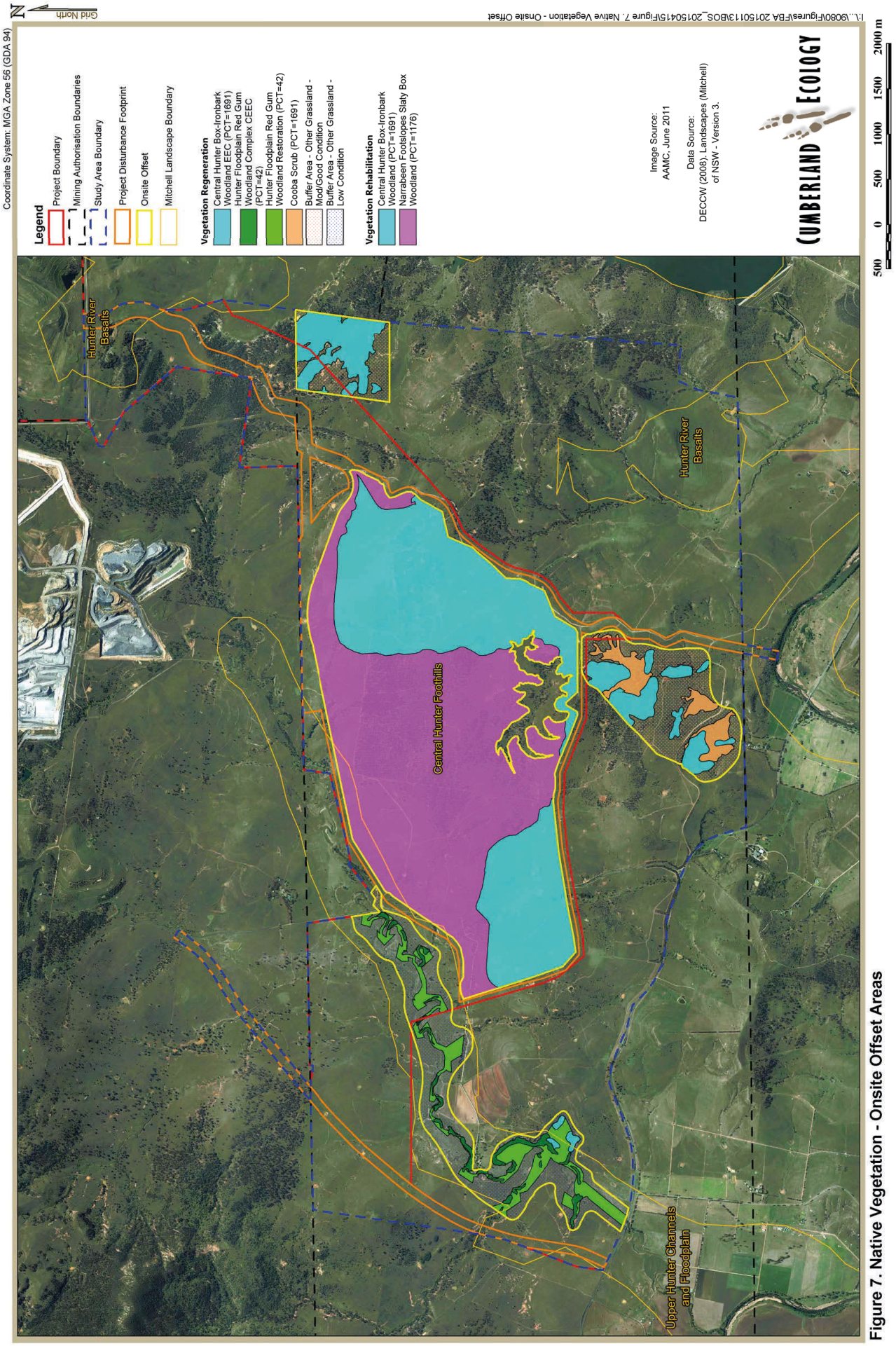


Figure 7. Native Vegetation - Onsite Offset Areas

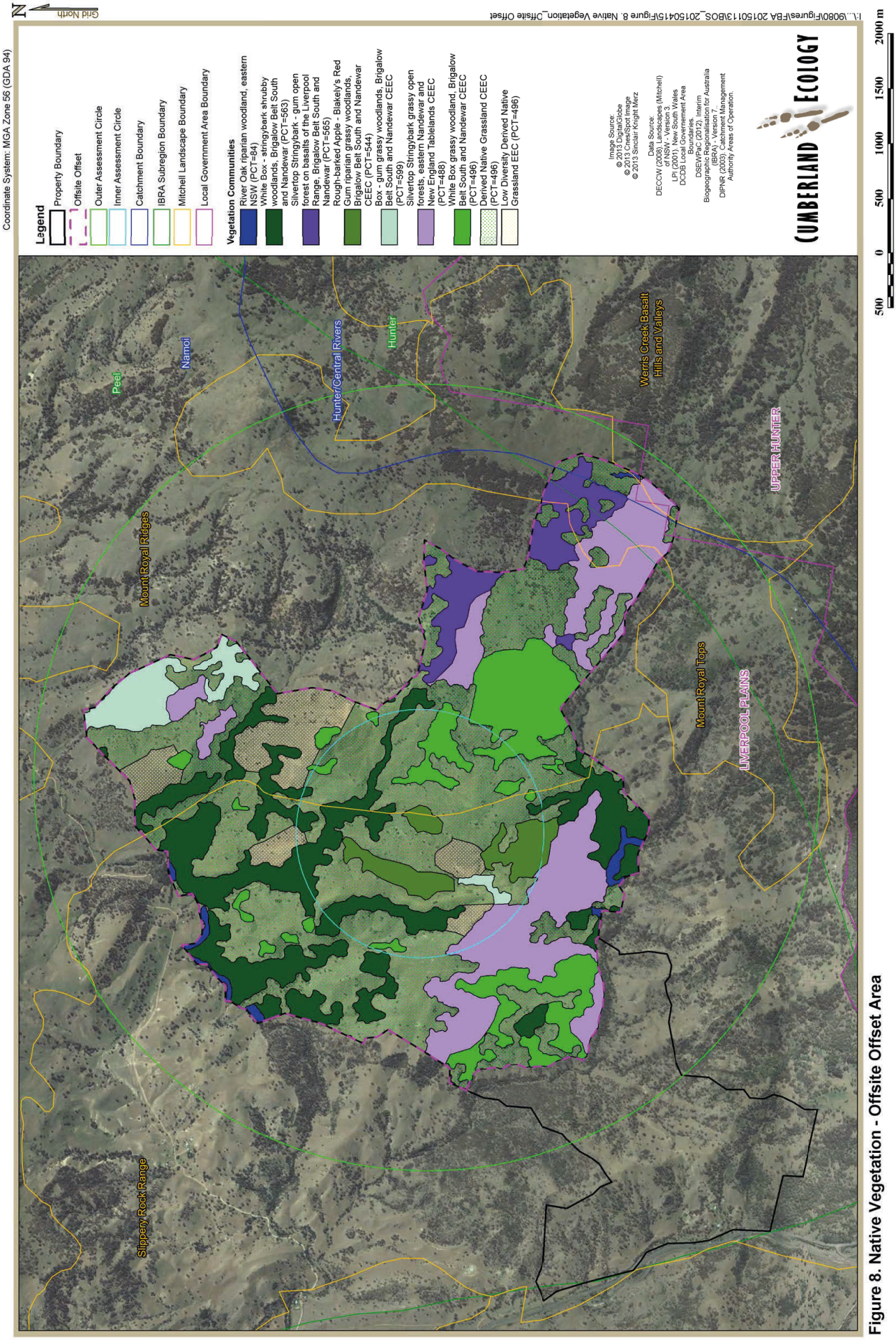


Figure 8. Native Vegetation - Offsite Offset Area

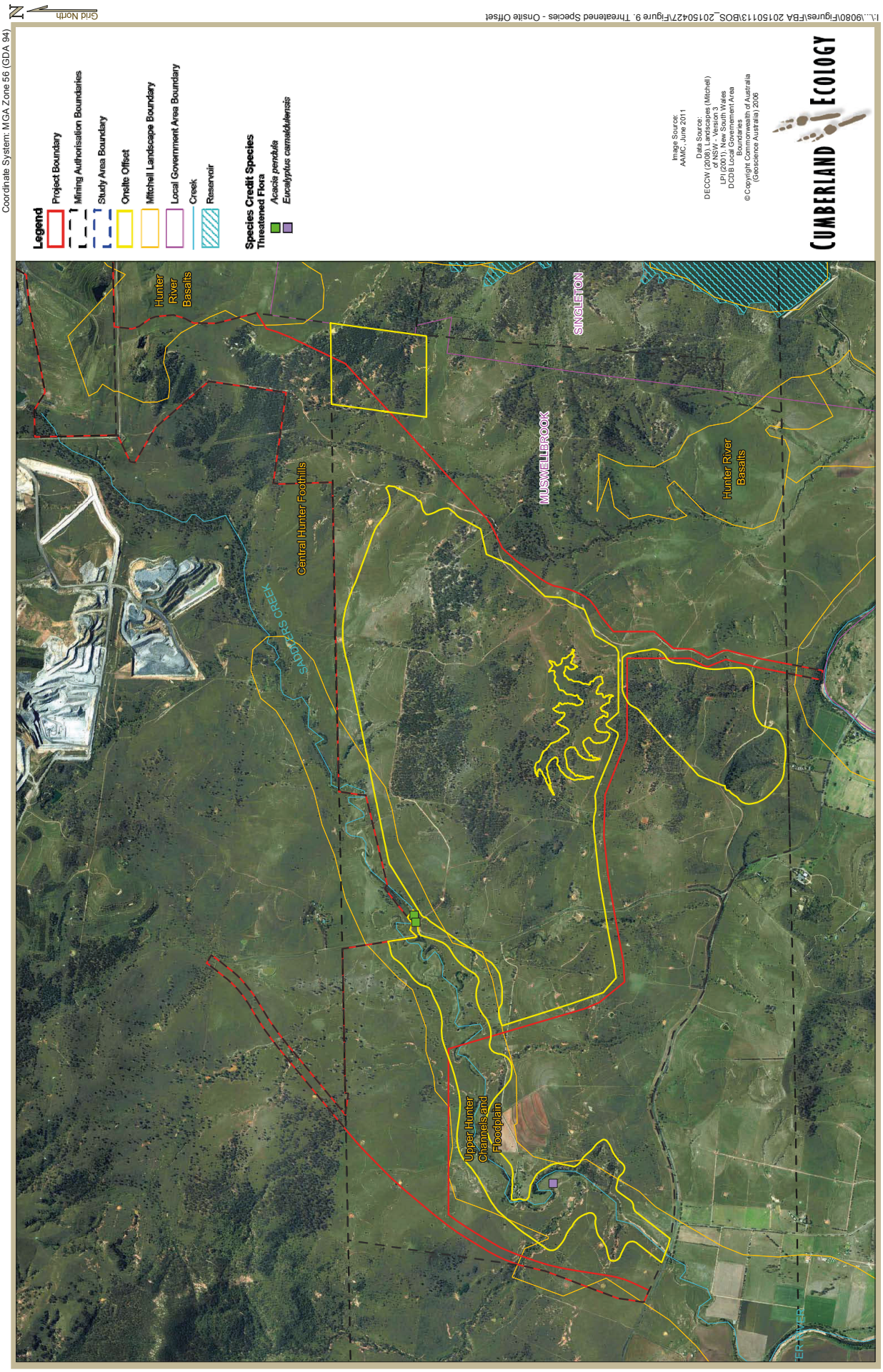


Figure 9. Threatened Species - Onsite Offset Areas

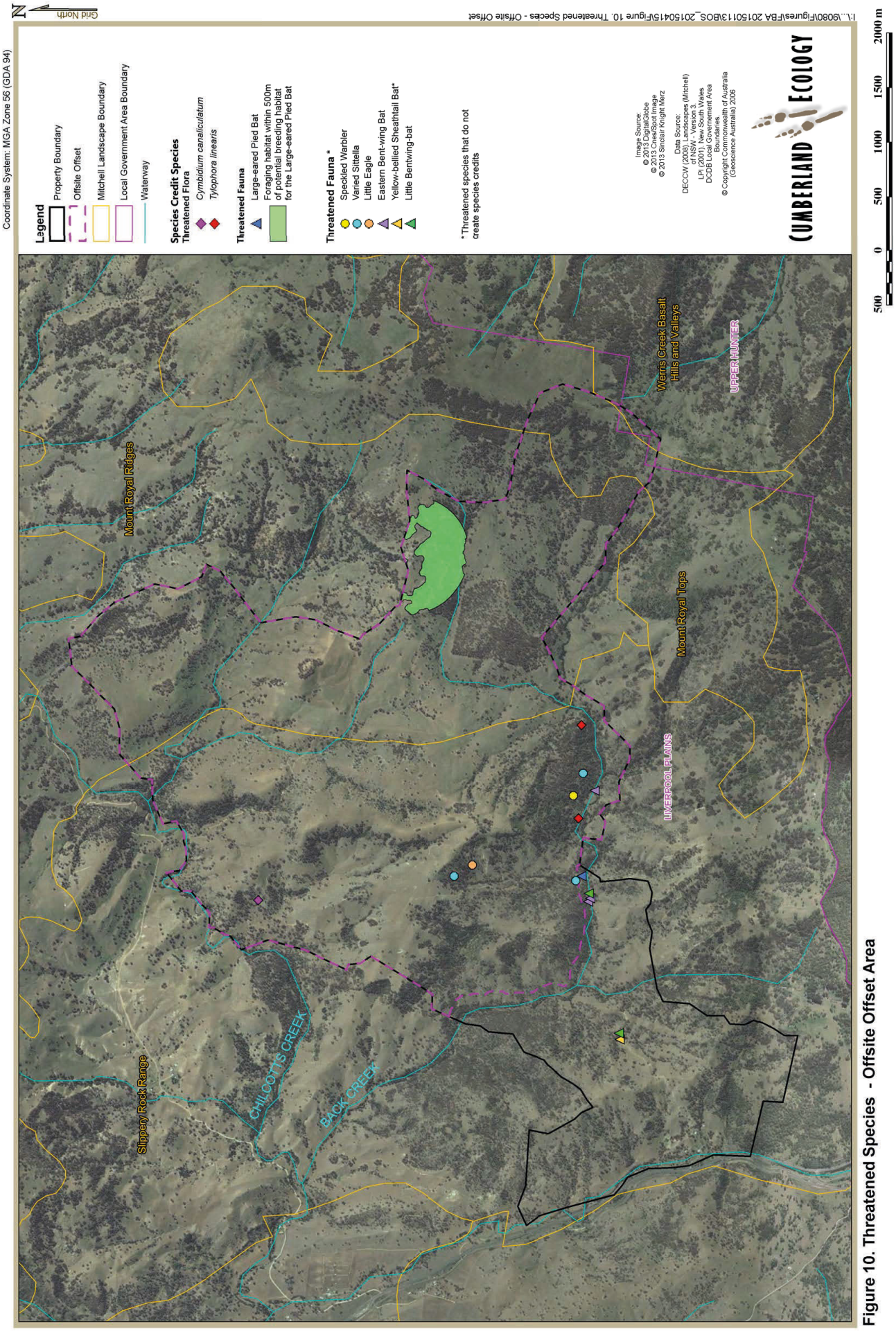


Figure 10. Threatened Species - Offsite Offset Area

Appendix A

Summary of Offsets for MNES

A.1 Introduction

The impacts of the Project on MNES were assessed in the EIS biodiversity assessment report. The EIS biodiversity assessment report concluded that the Project is likely to have a significant impact on the following MNES if mitigation and offsetting measures are not implemented:

- Box-Gum Woodland; and
- Habitat for:
  - Regent Honeyeater;
  - Swift Parrot;
  - Greater Long-eared Bat; and
  - Large-eared Pied Bat.

A.2 Benefits of the Proposed Biodiversity Offset Package

The impact mitigation measures described in the EIS biodiversity assessment report and the proposed Biodiversity Offset Package (BOP) described in this biodiversity offset strategy report are likely to sufficiently ameliorate the potential impacts to the above MNES.

The mitigation measures proposed in the EIS biodiversity assessment report will include pre-clearance and clearance protocols to minimise vegetation loss and collateral damage to surrounding vegetation. It also includes rehabilitation and on site restoration measures to address some of the impacts and to minimise impacts by retaining and salvaging habitat features on site. Management of biodiversity over the life of the Project will be coordinated via the implementation of a Biodiversity Action Plan (BAP), which will guide all facets of biodiversity management and mitigation for the Project.

The management of the onsite offsets will be integrated with the management of other areas of the Study Area through implementation of the BAP in coordination with site-specific offset management plans. The offsite offset property will be managed via a site-specific biodiversity management plan to ensure that conservation objectives are met.

The offsetting strategy for the Project demonstrates that the offsets can provide habitat for all the MNES known or likely to occur in the Study Area, as well as some MNES that are unlikely to occur in the Study Area but may be present in the locality (see **Table A.1** and **Table A.2**). It also demonstrates that there will be a net gain in habitat for MNES in the long term. Due to the staged nature of the Project and to the fact that rehabilitation and restoration works will be carried out concurrently, the BOP is capable of maintaining foraging habitat over the life of the Project for all of the MNES species listed above. Furthermore, provision has been made for regular monitoring to assess the improvement of potential foraging habitat as rehabilitation and restoration works progress.

Table A.1 Summary of Areas in the BOP Compared with the Offset Requirements of the Project

Vegetation Community	IMPACTS				BOP							
	Area of Vegetation within Study Area (ha)	[A] Area of Vegetation within Disturbance Footprint (ha)	Minimum Ratio	[B] Offsets Required (ha)	Saddlers Ck Restoration (ha)		Central Ridgeline (ha)	North-east Area (ha)	Mine Rehabilitation (ha)	Offsite Offset (ha)	[C] Total Offset (ha)	Offset Ratio [C] : [A]
					Existing Available Offsets	Restoration Offsets	Existing Available Offsets	Existing Available Offsets	Calculated at 50% of the available area			
Box - gum grassy woodlands, Brigalow Belt South and Nandewar										54	54	
Hunter Floodplain Red Gum Woodland (CEEC)	39	11	6:1	66	20	62					82	
Rough-barked Apple - Blakely's Red Gum riparian grassy woodlands, Brigalow Belt South and Nandewar										48	48	
Silvertop Stringybark grassy open forests, eastern Nandewar and New England Tablelands										244	244	
Upper Hunter White Box-Ironbark Grassy Woodland	94	4	6:1	23								
White Box grassy woodland, Brigalow Belt South and Nandewar										173	173	
Box-Gum Woodland (CEEC, EPBC Act; EEC, TSC Act)	**133**	**15**	**6:1**	**89**	**20**	**62**				**519**	**601**	**41**
Derived grasslands, Brigalow Belt South and Nandewar										676	676	
Derived Native Grassland-Hunter Floodplain Red Gum Woodland Complex	10	4	6:1	26								
Derived Native Grassland-Upper Hunter White Box-Ironbark Grassy Woodland	159	3	6:1	16								
Low Diversity Derived Native Grassland*										97	97	
Box-Gum Woodland Derived Native Grassland (CEEC, EPBC Act; EEC, TSC Act)	**169**	**7**	**6:1**	**42**						**774**	**774**	**111**
Central Hunter Box-Ironbark Woodland (EEC)	477	151	3:1	453	4		50	59	236		348	
Narrabeen Footslopes Slaty Gum Woodland (VEC)	99	97	3:1	291					328		328	
Other Threatened Woodland and Forest communities	**576**	**248**	**3:1**	**744**	**4**		**50**	**59**	**563**		**676**	**3**
Central Hunter Bulloak Forest Regeneration	56	26	3:1	78								
Cooba Scrub	52	0	3:1	0			35				35	
River Oak riparian woodland, eastern NSW										14	14	
Hunter Valley River Oak Forest	2	2	3:1	6								

Vegetation Community	IMPACTS				BOP							
	Area of Vegetation within Study Area (ha)	[A] Area of Vegetation within Disturbance Footprint (ha)	Minimum Ratio	[B] Offsets Required (ha)	Saddlers Ck Restoration (ha)		Central Ridgeline (ha)	North-east Area (ha)	Mine Rehabilitation (ha)	Offsite Offset (ha)	[C] Total Offset (ha)	Offset Ratio [C] : [A]
					Existing Available Offsets	Restoration Offsets	Existing Available Offsets	Existing Available Offsets	Calculated at 50% of the available area			
Planted Vegetation	8	0	N/A	N/A								
Silvertop Stringybark - gum open forest on basalts of the Liverpool Range, Brigalow Belt South and Nandewar										71	71	
Box - stringybark shrubby woodlands, Brigalow Belt South and Nandewar										268	268	
Other non-listed Forest and Woodland communities	**118**	**28**	**3:1**	**84**			**35**			**352**	**387**	**14**
Other Grassland (DP&E recommended Offset Buffer Areas)	3569	1140	N/A	N/A	166		89	33				
Other Grassland	**3569**	**1140**	**N/A**	**N/A**	**166**		**89**	**33**			**288**	
TOTAL All Vegetation	**4565**	**1438**		**958**	**190**	**62**	**174**	**92**	**563**	**1645**	**2726**	**2**
TOTAL Forest and Woodland Habitat	**827**	**291**		**916**	**24**	**62**	**85**	**59**	**563**	**871**	**1664**	**6**
TOTAL Box-Gum Woodland (EPBC Act listed)	**302**	**22**		**130**	**20**	**62**	**0**	**0**	**0**	**1195**	**1277**	**59**

**Not listed under the EPBC Act*

Table A.2 Habitat Provided by the Biodiversity Offset Package for MNES

Common Name	Preferred Habitat	Used For	Study Area		Offset Areas (ha)			Ratio (x:1)
			Present, or potential to be present	Area of impact on known or potential habitat (ha)	Offsite Offset Property	*Onsite Offset Areas	TOTAL Habitat in Offset Areas	
Communities								
Box-Gum Woodland	-	-	Present	22	1,195	82	1,277	59
Weeping Myall Woodland	-	-	Not present	0	-	-	0	n/a
Plants								
Slaty Red Gum	F, W	-	Low likelihood	291				
Rufous Pomaderris	F, W		Unlikely	0	-	-	0	n/a
Leek-orchid	F, W, G	-	Low likelihood	1,438	1,645	517	2,162	2
Illawarra Greenhood	F, W, G	-	Unlikely	0	-	-	0	n/a
Austral Toadflax	F, W, G	-	Low likelihood	1,438	1,645	517	2,162	2
Birds								
Regent Honeyeater	F, W	Infrequent Foraging; low numbers	Low likelihood (very infrequently)	291	871	229	1,100	4
Swift Parrot	F, W	Infrequent Foraging; low numbers	Present (very infrequently)	291	871	229	1,100	4
Mammals								
Spotted-tailed Quoll	F, W	Foraging; low density	Low likelihood	291	871	229	1,100	4
Koala	F, W	Foraging or movement	Unlikely	0	871	229	1,100	n/a
Grey-headed Flying-fox	F, W	Infrequent Foraging; low numbers	Low likelihood	291	871	229	1,100	4
Greater Long-eared Bat	F, W	Foraging and roosting	Present	291	871	229	1,100	4
Large-eared Pied Bat	F, W	Foraging only	Present	291	871	229	1,100	4
Amphibians								
Green and Golden Bell Frog	Wetland	Foraging and breeding	Unlikely	0	-	82	82	n/a

**Does not include mine rehabilitation.*

Appendix B

Field Survey Methodology

B.1 Onsite Surveys

The Study Area refers to an area of approximately 4,572 ha that includes the proposed Drayton South disturbance footprint, the transport corridor, the Edderton Road realignment, and water pipelines to the Hunter River. The Study Area excludes the existing Drayton Mine, which has been previously assessed by Hansen Bailey (2007) as part of an ecology impact assessment for the Drayton Mine Extension Environmental Assessment.

Surveys of potential onsite offset areas were completed during field studies of the Study Area (see EIS biodiversity assessment report) and include vegetation mapping, general habitat assessments and targeted surveys as part of the survey program for the Study Area. Potential offset areas that were investigated included onsite sections of Saddlers Creek, and vegetation along the primary ridgeline in the Study Area. An assessment of suitable vegetation rehabilitation measures and predicted success of such works was undertaken by Anglo American.

B.2 Offsite Surveys

B.2.1 Preliminary Offsite Field Studies

A high level desktop analysis of suitable areas in which to prioritise searches for candidate offsite offset properties was completed for the Project. This analysis was guided by consideration of the bioregional context of the Project and any potential offset areas, as Bioregions broadly influence flora and fauna assemblages and vegetation complexes. Other important considerations included the following:

- The known occurrence or likely occurrence of Box-Gum Woodland;
- The likely availability of outstanding habitat features for native flora and fauna (including rock outcrops and waterways);
- The enhancement of existing conservation areas (including National Parks and Nature Reserves); and
- Linkages to other offsets.

Preliminary inspections and assessment of a number of properties throughout the Hunter Valley were conducted with due consideration to the above desktop analysis, to ascertain the offset potential of the land for the Project. Notes were made regarding the following: threatened species and their habitat; key habitat features (rock outcrops, streams, etc); major weed infestations; current and historical land use; dominant vegetation types and broad patterns of occurrence; and other relevant attributes or management issues. This work was supplemented with a desktop review of available information of threatened species occurrences in the vicinity of each property.

B.2.2 Detailed Offsite Offset Surveys

Following preliminary inspections of potential candidate offset properties, one property was selected for further field investigation. The investigation involved both a desktop analysis and field surveys to assess the ecological values of the property and its suitability in offsetting the impacts of the Project.

Vegetation mapping and baseline flora and fauna surveys were conducted over a number of sessions in summer (**Table B.1**). The weather observations for these survey periods are listed in **Table B.2** below. The sampling methods and cumulative survey effort completed for the offsite offset are summarised in **Table B.3**.

Table B.1 Summary of Dates for Field Surveys of the Offsite Offset

Dates of Survey	Tasks Completed	Completed By
30 - 31 January, 2012	-BioBanking plot and transect sampling -Arboreal and terrestrial trapping -Bird census -Bat survey -Active diurnal and nocturnal fauna searches -Systematic habitat assessment	Cumberland Ecology
15 - 17 February, 2012	-BioBanking plot and transect sampling -Arboreal and terrestrial trapping -Bat survey -Active diurnal and nocturnal fauna searches -Systematic habitat assessment	Cumberland Ecology
27 Feburary – 2 March, 2012	-BioBanking plot and transect sampling -Hairtube survey -Bat survey -Active diurnal and nocturnal fauna searches -Camera trapping -Systematic habitat assessment	Cumberland Ecology
13 – 14 February, 2013	-BioBanking plot and transect sampling (grassland) -Systematic habitat assessment	Cumberland Ecology
23 Feburary, 2013	-BioBanking plot and transect sampling (grassland) -Systematic habitat assessment	Cumberland Ecology
26 - 28 Feburary, 2013	-BioBanking plot and transect sampling (grassland) -Systematic habitat assessment	Cumberland Ecology
17 - 18 February, 2015	-BioBanking plot and transect sampling -Systematic habitat assessment	Cumberland Ecology

Table B.2 Weather Observations for Offsite Offset Surveys

Date	Min (˚C)	Max (˚C)	Rain (mm)	Notes
30/01/2012	20	28.5	1.4	
31/01/2012	21.1	25.2	2.8	
1/02/2012	16.2	19	30.8	
15/02/2012	12.1	26.3	0	
16/02/2012	9.6	26.9	0	
17/02/2012	9.7	29	0	
27/02/2012	17	27.6	0.8	
28/02/2012	17.4	29.4	0	
29/02/2012	15	30.9	0	Highest temperature for the month
1/03/2012	18.4	30	0	Highest temperature for the month
2/03/2012	16.8	18.7	37.8	
13/02/2013	12.9	23	0	
14/02/2013	11.2	23.8	0	
23/02/2013	14.9	22.1	5.4	
26/02/2013	17.2	25.5	0	
27/02/2013	17	26.9	0	
28/02/2013	19.1	25.7	0	
17/02/2015	15.4	29.8	0	
18/02/2015	15.4	29.3	0	

**Most observations from Murrurundi, but some from Murrurundi Gap. (Bureau of Meterology (BOM) 2012b)*

Table B.3 Survey Effort – Offsite Offset Property

Survey Method	Effort
Flora	
Meander transect searches	Throughout survey period
Flora sampling	71 plots
General Fauna	
Diurnal Reptile search	2 person hours
Spotlighting and call playback	3 person hours
IR camera traps	6 trap nights
Arboreal trapping	
-Elliott B	108 trap nights
-Hairtubes	8077 trap nights
Terrestrial trapping	
-Elliott A	77 trap nights
-Hairtubes	-
Bats	
Anabat	10 trap nights
Harp traps	4 trap nights
Birds	
Diurnal Bird Area Census	15 hours
Spotlighting	3 person hours
Habitat	
Systematic Habitat Assessment	75 plots
Hollow counts	44 plots
Meander transect searches	Throughout survey period

The following sections describe the survey undertaken for baseline study of the offsite offset property.

B.3 Flora Survey of the Offsite Offset Property

B.3.1 Vegetation Mapping

Vegetation mapping of the offsite offset areas was undertaken in three broad stages:

- Development of a preliminary vegetation map based on desktop review of available datasets and studies, and using aerial photograph interpretation techniques and Geographic Information Systems (GIS) software (MapInfo Professional 12.5);
- Collection of detailed site data during field surveys to validate the preliminary mapping and to inform final mapping outputs; and
- Review and refinement of the preliminary vegetation map based on field datasets.

A preliminary base vegetation map was developed prior to field work. Vegetation boundaries, or polygons, were initially identified based on existing mapping and vegetation community descriptions by the former Namoi Catchment Management Authority (now the North West Local Land Services, or North West LLS). These data were then adjusted based on aerial photograph interpretation of high resolution imagery. This information, in combination with the interrogation of topographical and geological datasets, was used to assist in the delineation of vegetation boundaries and to broadly assign vegetation types.

Walking and driving meander-transect surveys were then conducted to ground-truth the occurrence and extent of different community types and to obtain a thorough understanding of key remnant areas of vegetation (general site floristics; topographical characters; and aspect). Records of vegetation units and boundary changes were made using a handheld Global Positioning Systems (GPS) unit. Broad units were sampled using standardised 400 m^2 plots to obtain site-specific information on floristics and community structure.

The field information was then used to refine the preliminary vegetation map.

i. Vegetation Classification and Community Descriptions

Remnant native vegetation communities on the offsite offset property are classified in accordance with the vegetation communities described for the Namoi catchment (Namoi Catchment Management Authority, 2012). Nomenclature assigned to each remnant native vegetation community is consistent with vegetation names identified in the Namoi catchment regional mapping (Namoi Catchment Management Authority, 2012). Map unit (MU) numbers have been assigned to each vegetation community for ease of reference.

All vegetation communities have been matched to an approved Plant Vegetation Type (PCT) and Biometric Vegetation Type (BVT) in the Vegetation Information System (VIS) Classification database administered and maintained by OEH. This is required to assess the Project using the FBA (OEH, 2014b).

B.3.2 Floristic Census

The flora assemblage was recorded by plot sampling, random meander surveys and through targeted searches for threatened species. All vascular plants recorded or collected were identified using keys and nomenclature provided in Harden (1990-1993). Other references used to assist identification of selected plant taxa include Richardson *et al* (2006) and Brooker and Kleinig (1990). Where known, taxonomic and nomenclatural changes have been incorporated into the results, as derived from PlantNET (Botanic Gardens Trust, 2015). Any specimens that were not readily identifiable were lodged for identification with the National Herbarium of NSW at the Royal Botanic Gardens, Sydney.

B.3.3 Targeted Searches for Threatened Plants

Targeted searches for threatened flora species likely to occur were undertaken as part of the flora surveys. Targeted surveys were conducted firstly through random meander surveys and then meander-transect surveys of suitable areas of habitat.

B.3.4 Plot Sampling

Within the offsite offset, a cumulative total of 71 detailed floristic plots were sampled within woodland and grassland vegetation. Locations were chosen to reflect the condition and composition of the vegetation patch.

In each plot, the following information was recorded as a minimum:

- All vascular flora species present within the plot or directly adjacent to the plot;
- The stratum in which each species occurred;
- The relative frequency of occurrence of each plant species;
- Vegetation structural data (i.e. height and percentage cover of each stratum);
- A waypoint to mark the location of the plot, using a handheld GPS; and
- Photographs of the plot.

The relative abundance and cover of each species within each plot sampled between 2012 and 2013 was approximated using a scoring system based on the Braun-Blanquet scoring system (Braun-Blanquet, 1927). The scores used are provided in **Table B.4**.

In 2015, the relative abundance and cover of each species was recorded in 1% increments for species covers comprising less than 1% of the ground cover within the plot, and then estimated to the nearest 5% for species covers comprising more than 5% of the ground cover within the plot, which is consistent with the FBA Operational Manual (OEH, 2014b).

Metric data along 50 m transect lines and within 50 x 20 m plots were sampled in accordance with the BBAM (OEH, 2014a). These were sampled at all floristic plot locations.

Plot locations are shown in **Figure B.1**.

Table B.4 Braun-Blanquet Scoring System

Class	Cover-abundance	Notes
+	Few Individuals (less than 1% cover)	Herbs, sedges and grasses: within 4 m^2 Shrubs and small trees: less than 5 individuals
1	Many Individuals (less than 5% cover)	Herbs, sedges and grasses: within 20 m^2 Shrubs and small trees: 5 or more individuals One medium – large overhanging tree
2	5 - less than 25% cover	-
3	25 - less than 50% cover	-
4	50 - less than 75% cover	-
5	75 - 100% cover	-

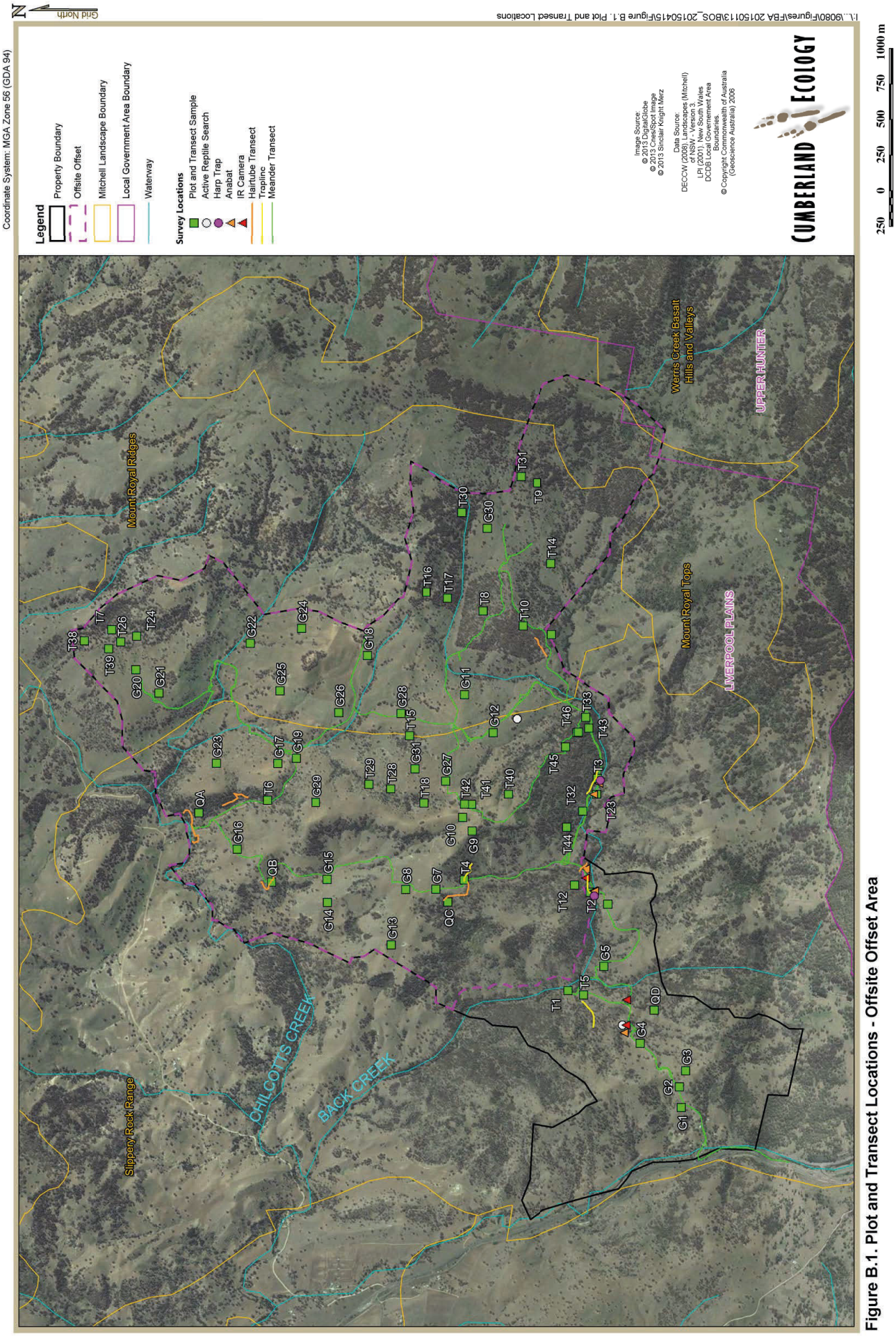


Figure B.1. Plot and Transect Locations - Offsite Offset Area

B.3.5 Identification of Threatened Ecological Communities

i. Criteria for Identifying Ecological Communities

Many of the Hunter Valley vegetation communities display ecotonal traits and are often difficult to distinguish from one another. Typically, only a variation in the proportion of canopy species indicates a change from one vegetation unit to a different vegetation unit.

The floristic composition of the understorey is often very similar, particularly where the land practices are similar over a large area. This also makes it difficult to discern the original communities from which native grassland areas are derived. Supplementary information such as slope, aspect, soil and underlying geology were considered to delineate between vegetation communities and areas of grassland derived from the different forest and woodland communities.

Ecological communities in the offset areas were determined by comparing plot data and field notes against published information, including descriptions within the TSC Act Final Determinations and the EPBC Act Listing Advice. Identification was based on community criteria such as geology, topography, known distribution, habitat descriptions and the number of recognised important or diagnostic species. Data was compared with the final determinations for listed communities under the TSC and EPBC Act to assess the presence of threatened ecological communities.

ii. Criteria for Identifying Box-Gum Woodland

a. EPBC Act Criteria

Box-Gum Woodland is a critically endangered ecological community (CEEC) listed under the EPBC Act. This community is also listed as an endangered ecological community (EEC) under the TSC Act. There are slight differences in the listing criteria. In order to determine whether vegetation communities in the offset areas comprised Box-Gum Woodland, vegetation communities were sampled according to the detailed methodology that is prescribed within the EPBC Act Policy Statement for assessing the presence of Box-Gum Woodland community (DEH, 2006).

The eastern limits of Box-Gum Woodland occur in the Upper Hunter Valley. In this region, it is common for the community to comprise intergrades of the dominant tree species, rather than pure stands. The latest advice to the Commonwealth Minister for the Environment regarding the listing of Box-Gum Woodland states that *Eucalyptus albens* x *Eucalyptus moluccana* (White Box – Grey Box intergrades) should be included in the definition of this community (Threatened Species Scientific Committee, 2010). Thus, this biodiversity offset strategy report includes areas containing *Eucalyptus albens* x *Eucalyptus moluccana* (White Box – Grey Box intergrades) or native grasslands that are derived from communities containing *Eucalyptus albens* x *Eucalyptus moluccana* (White Box – Grey Box intergrades), as Box-Gum Woodland.

b. TSC Act Criteria

There is no such prescriptive methodology to identify Box-Gum Woodland under the TSC Act. A detailed description that defines Box-Gum Woodland is included in the Final Determination made in 2004 by the NSW Scientific Committee to list the community as a CEEC under the TSC Act (NSW Scientific Committee, 2002). The presence of the community is determined on the basis of its consistency with the community described within the Final Determination.

The following community descriptors have been taken directly from the Final Determination for Box-Gum Woodland:

> *"White Box Yellow Box Blakely's Red Gum Woodland is the name given to the ecological community characterised by the assemblage of species listed in paragraph 3 [of this determination]."*
>
> *"White Box Yellow Box Blakely's Red Gum Woodland includes those woodlands where the characteristic tree species include one or more of the following species in varying proportions and combinations* – Eucalyptus albens (*White Box),* Eucalyptus melliodora *(Yellow Box) or* Eucalyptus blakelyi *(Blakely's Red Gum)."*
>
> *"In some locations, the tree overstorey may be absent as a result of past clearing or thinning and at these locations only an understorey may be present."*
>
> *"Woodlands including* Eucalyptus crebra, Eucalytpus dawsonii *and* Eucalyptus moluccana *(and intergrades with* Eucalyptus albens*)…are also included."*
>
> *"Intergrades between* Eucalyptus blakelyi *and* Eucalyptus teretecornis *may also occur here."*
>
> *"Disturbed remnants are still considered to form part of the community including remnants where the vegetation, either understorey, overstorey or both, would, under appropriate management, respond to assisted natural regeneration, such as where the natural soil and associated seed bank are still at least partially intact."*

B.4 Fauna Survey of the Offsite Offset Property

Fauna surveys were conducted, where possible, in accordance with OEH guidelines for ecological assessment (DEC (NSW), 2004). As the OEH survey guidelines are based upon stratification units, the offset areas were stratified using vegetation units as a surrogate for fauna habitat and survey effort was allocated accordingly.

The survey methods utilised during the Cumberland Ecology surveys for the onsite offsets are outlined in the EIS biodiversity assessment report. The survey methods utilised during the Cumberland Ecology surveys for the offsite offsets are described below. Fauna survey locations established on the offsite offset are shown in **Figure B.1**.

B.4.1 Traplines

Trapping was used to detect arboreal and terrestrial fauna that may occur on the property. The following traps were utilised for traplines across the site:

- Medium Elliott (B) traps for small to medium sized arboreal fauna;
- Small Elliott (A) traps for small terrestrial fauna; and
- Hairtubes for arboreal mammals.

i. Arboreal and Terrestrial Traplines

Four Elliott traplines were established in forest and woodland habitat using the previously described methodology. Traplines consisted of 10 paired arboreal/terrestrial Elliott B/A traps attached to large trees, located preferentially near hollows or midstorey vegetation. Elliott traps were closed and left on site for a period of time between the first and second sessions due to unfavourable weather conditions. The offsite offset survey involved a total of 108 Elliott trap nights.

Arboreal traps were positioned on platforms attached to habitat trees at a height of approximately 2 m and a distance of 10 to 30 m apart depending on availability. Large trees were chosen, specifically those that showed evidence of usage, such as scats at the base of the tree, scratch marks on the trunk and hollows. To prevent water entering the traps, they were set with the entrance tilted slightly downward. Traps were also positioned away from direct morning sunlight to reduce the potential for prolonged heat exposure.

Terrestrial traps were positioned in suitable ground habitat at the base of trees, in shrubbery or against logs, approximately 20 m apart along the trapline.

All traps were covered with tough plastic bags for protection from dew and rain, and lined with leaf litter and cotton wool during the winter trapping session to insulate any captured animals. Traps were baited with a mixture of peanut butter, honey and rolled oats with vanilla essence and re-baited when necessary. Each tree was sprayed with a honey and water mixture to attract fauna. Trapped fauna were carefully handled to avoid injury and distress, identified, then released into suitable habitat. Scat samples found at or in close vicinity to traps were sent for analysis to the specialist company Scats About.

ii. Hair Tubes

'Faunatech' plastic hairtubes designed to collect mammal hair were used to supplement arboreal and terrestrial traps. The plastic hairtubes were paired with Elliot traps along traplines near habitat features such as hollows, ground debris or shrubs. Each hairtube was lined with sticky wafers and baited with the rolled oats mixture. Arboreal hairtubes were attached to trees at heights of 2 to 3 m and positioned with the entrance facing downward. Trunks were sprayed with the honey-water mixture to attract mammals. Any hair samples collected were sent to Scats About for specialist analysis.

Six arboreal hairtube traplines were established in forest and woodland habitat across the site in the third session. A total of 84 hairtubes were used, in traplines of 10 to 15 hairtubes. The offsite offset survey involves a total of 8077 trap nights.

B.4.2 Bird Survey

A bird census was conducted by an ornithologist over 30 to 31 January, 2012 to survey for resident bird species. Survey methodology involved area searches, totalling 15 hours, at various sites in the southern central portion of the property (the north and east could not be accessed due to adverse weather conditions).

Spotlighting was conducted over three person hours for nocturnal birds. Incidental records were made and systematic habitat assessments were completed throughout the survey period to provide supporting information.

B.4.3 Bat Survey

Microbats were surveyed in summer using the following detection methods:

- Ultrasonic bat recordings using Anabat Z-CAIM units; and
- Harp traps.

Anabat Z-CAIM units (anabats) were used at multiple sites to record calls of microbats that could fly through or potentially roost or forage in different woodland habitats. Two units were used during each of the first 3 survey sessions and left in different locations considered to provide suitable bat forage or roosting habitat.

Anabats were aimed upwards at large stags, live hollow-bearing trees or in potential flyways. The recorders were housed in plastic containers and covered in plastic bags to shield against rain and left out for between one and four nights depending on weather conditions and habitat location.

Anabats were programmed to automatically turn on one hour before dusk each evening and switch off one hour after dawn. Call data was analysed by bat specialist Greg Ford from Balance Environmental to determine which species were present. Echolocation calls were identified to one of two confidence levels: positive identification and possible species detection. As a precautionary measure, species not positively identified were considered to occur and added to the cumulative fauna species list.

Two harp traps were established in the second session at creeklines and potential flyways. Traps were opened at dusk, checked for microbats within two hours and then left for the night. Traps were checked again in the early morning and closed (i.e. covered in sheets) to make the traps visible and prevent animals becoming entangled during the day.

The offsite offset survey involved a total of 4 harp trap nights and 10 Anabat trap nights.

B.4.4 Active Searches

Active searches for reptiles were conducted at two open woodland sites in which there was abundant ground debris, stags and trees with decorticating bark. Habitats were surveyed for a set period of 30 minutes per sample site. Searches involved lifting of bark, fallen logs, bush rock and scraping of top soil.

Adverse weather conditions limited the hours limited opportunities for extensive searches; incidental records were made and systematic habitat assessments were completed throughout the survey period to provide supporting information. The offsite offset survey involved a total of 2 person hours for active reptile searches.

B.4.5 Spotlighting and Call Playback

Spotlighting and call playback was conducted over three person hours. Spotlighting was conducted for nocturnal mammals, birds, amphibians and reptiles. Spotlighting transects were focussed on woodland patches. During this time, call playback was also used to elicit a vocal response from nocturnal animals.

Nocturnal surveys were conducted using a hand-held spotlight while walking or from a slow moving vehicle. Handheld spotlights used to pick up animal movement and eye shine. Spotlights (100 watt) with dimmer knobs were used. Reflective eye-shine was used to pick out any animals. Incidental spotlighting was also conducted while travelling between transects at night.

Adverse weather conditions limited the hours limited opportunities for extensive survey; systematic habitat assessments were completed throughout the survey period to provide supporting information.

B.4.6 IR Camera Traps

Three IR camera traps were deployed throughout the offsite offset property for a total of six trap nights during the third session.

B.4.7 Fauna Habitat Assessment

General habitat assessments were conducted at 75 sites across the property to record the type and condition of fauna habitat features present. This included vegetation connectivity, vegetation structure and microhabitats (litter, bush rock, ground debris, watercourses, forage resources etc).

The number and size class of hollows, as well as the count and type of hollow-bearing tree, were also recorded within a 20 x 50 sample area at 44 locations to quantify the hollow resource on the site.

B.5 Survey Limitations

The field surveys have produced reliable information regarding flora and fauna species occurrences within the offsite offset property and are considered to be adequate to support the assessment of the BOP. Notwithstanding this, the data produced by the surveys is intended only to be indicative of the types of species that could occur and not an absolute census of all flora and fauna species.

Although many species were detected during field surveys, additional species are likely to be present that have not been observed. Factors such as inclement weather, seasonality, migration schedules, population density and cryptic life histories can all affect the ability to detect species on ground. In particular, the fauna survey effort in the offsite offset property was limited by severe weather that impaired access to the site and likely reduced fauna activity, making species difficult to detect.

Appendix C

Description of the Offsite Offset Property

C.1 Vegetation Communities

The property contains over 1100 hectares of remnant forest and woodland that are dominated by a mixture of box, gum and stringybark eucalypt species. The remainder of the property (approximately 900 hectares) consists of grassland areas. Of this, around 1,600 ha will be dedicated to biodiversity conservation. The vegetation communities present within the conservation areas of the offsite offset property are listed in **Table C.1** and are shown in **Figure 8**. Descriptions of the communities mapped for the property are provided in the following sections.

Table C.1 Vegetation Communities of the Offsite Offset

Map Unit (MU)	Vegetation Community	EPBC Act	TSC Act	Area (ha)
MU13	Silvertop Stringybark - gum open forest on basalts of the Liverpool Range, Brigalow Belt South and Nandewar			71
MU 14	Silvertop Stringybark grassy open forests, eastern Nandewar and New England Tablelands	Box-Gum Woodland CEEC	Box-Gum Woodland EEC	244
MU 15	Box - stringybark shrubby woodlands, Brigalow Belt South and Nandewar			268
MU 16	Box - gum grassy woodlands, Brigalow Belt South and Nandewar	Box-Gum Woodland CEEC	Box-Gum Woodland EEC	54
MU 17	White Box grassy woodland, Brigalow Belt South and Nandewar	Box-Gum Woodland CEEC	Box-Gum Woodland EEC	173
MU 18	Rough-barked Apple - Blakely's Red Gum riparian grassy woodlands, Brigalow Belt South and Nandewar	Box-Gum Woodland CEEC	Box-Gum Woodland EEC	48
MU 19	River Oak riparian woodland, eastern NSW			14
	Total Forest and Woodland			**872**
MU 20	Derived grasslands, Brigalow Belt South and Nandewar	Box-Gum Woodland CEEC	Box-Gum Woodland EEC	676
MU 21	Low Diversity Derived Native Grassland		Box-Gum Woodland EEC	97
	Total Grassland			**773**
Total				**1,645**

C.1.1 Silvertop Stringybark - gum open forest on basalts of the Liverpool Range, Brigalow Belt South and Nandewar

This is a grassy open forest that is dominated by *Eucalyptus laevopinea* (Silvertop Stringybark) and *Eucalyptus dalrympleana* (Mountain Gum). In patches, *Eucalyptus melliodora* (Yellow Box) occurs as a co-dominant canopy species. The understorey is open and contains a few shrub species like *Melicytus dentatus* (Tree Violet), *Pittosporum undulatum* (Sweet Pittosporum) and *Olearia elliptica* (Sticky Daisy Bush). The ground layer is diverse and includes species such as *Poa labillardieri* (Tussock Grass), *Microlaena stipoides* (Weeping Meadow Grass), *Echinopogon ovatus* (Hedgehog Grass), *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium).

This community is typically restricted to mid-high elevation slopes on basalt substrate and was recorded at elevations above 800 metres in the eastern-most parts of the property (**Photographs C.1** and **C.2**). It does not conform to any TSC Act or EPBC Act listed threatened ecological community.



Photograph C.1 Silvertop Stringybark - Gum Open Forest (Plot T9)



Photograph C.2 Silvertop Stringybark - Gum Open Forest (Plot T14)

C.1.2 Silvertop Stringybark grassy open forests, eastern Nandewar and New England Tablelands

This is a grassy open forest that is dominated by *Eucalyptus laevopinea* (Silvertop Stringybark). On the property, this community is co-dominated by *Eucalyptus melliodora* (Yellow Box). Other tree species that were also recorded include *Angophora floribunda* (Rough-barked Apple) and *Eucalyptus blakelyi* x *teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade). The understorey is open and contains a few shrub species like *Melicytus dentatus* (Tree Violet), *Pittosporum undulatum* (Sweet Pittosporum) and *Olearia elliptica* (Sticky Daisy Bush). The ground layer is diverse and includes species such as *Poa labillardieri* (Tussock Grass), *Microlaena stipoides* (Weeping Meadow Grass), *Echinopogon ovatus* (Hedgehog Grass), *Acaena nova-zelandiae* (Bidgee-widgee), *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium).

This community was recorded on a variety of substrates at intermediate elevations of up to 800 metres, generally on southern facing slopes (**Photographs C.3** and **C.4**).

As this community is co-dominated by *Eucalyptus melliodora* (Yellow Box) and supports an open grassy understorey, it is considered to conform to the TSC Act and EPBC Act listings for Box-Gum Woodland.



Photograph C.3 Silvertop Stringybark Grassy Open Forests, Eastern Nandewar and New England Tablelands (Plot T4)



Photograph C.4 Silvertop Stringybark Grassy Open Forests, Eastern Nandewar and New England Tablelands (Plot T13)

C.1.3 Box - gum grassy woodlands, Brigalow Belt South and Nandewar

This grassy woodland is dominated by *Eucalyptus melliodora* (Yellow Box) and *Eucalyptus blakelyi* x *teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade). Other tree species recorded included *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrade) and *Angophora floribunda* (Rough-barked Apple). The understorey is open with few shrubs and the ground layer includes species such as *Bothriochloa decipiens* (Redleg Grass), *Microlaena stipoides* (Weeping Meadow Grass), *Poa sieberiana* (Snowgrass), *Acaena nova-zelandiae* (Bidgee-widgee), *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium).

The community was recorded in the north eastern corner of the property in more gently undulating country (**Photograph C.5**). As this community is dominated by *Eucalyptus melliodora* (Yellow Box) and *Eucalyptus blakelyi* x *teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade) and supports an open grassy understorey, it is considered to conform to the TSC Act and EPBC Act listings for Box-Gum Woodland.



Photograph C.5 Box - Gum Grassy Woodlands, Brigalow Belt South and Nandewar (Plot T7)

C.1.4 Box - stringybark shrubby woodlands, Brigalow Belt South and Nandewar

This is a shrubby open forest or woodland that is dominated by *Eucalyptus albens* x *moluccana* (White Box-Grey Box intergrade), *Eucalyptus laevopinea* (Silvertop Stringybark) and *Angophora floribunda* (Rough-barked Apple). In steeper parts of the property, *Eucalyptus melliodora* (Yellow Box) was recorded as a co-dominant. The understorey layer is well developed and supports a diversity of species including *Notelaea microcarpa* (Native Olive), *Melicytus dentatus* (Tree Violet) and *Pittosporum undulatum* (Sweer Pittosporum) and *Olearia elliptica* (Sticky Daisy Bush). The ground layer is usually sparse to moderately dense and includes a mixture of grasses like *Poa sieberiana* (Snowgrass), *Aristida ramosa* (Purple Wiregrass), *Cymbopogon refractus* (Barb-wire Grass), and *Desmodium brachypodum* (large Tick-trefoil), *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium).

This community is widespread across the property and was typically recorded on steep slopes on a range of substrates (**Photograph C.6**). Despite the dominance of *Eucalyptus albens* x *moluccana* (White Box-Grey Box intergrade), this community is too shrubby to conform to the TSC Act and EPBC Act listings for Box-Gum Woodland.



Photograph C.6 White Box - Stringybark Shrubby Woodlands, Brigalow Belt South and Nandewar (Plot T20)

C.1.5 White Box grassy woodland, Brigalow Belt South and Nandewar

This grassy woodland is dominated by *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrade) and *Eucalyptus laevopinea* (Silvertop Stringybark). Other tree species that were recorded in this unit include *Angophora floribunda* (Rough-barked Apple) and *Eucalyptus melliodora* (Yellow Box). The understorey is open and the shrub layer is generally sparse with *Notelaea microcarpa* (Native Olive), *Olearia elliptica* (Sticky Daisy Bush) and *Cassinia quinquefaria* (Cough Bush) the most common. The ground layer supports a mixed diversity of species like *Poa labillardieri* (Tussock Grass), *Austrodanthonia* spp. (the Wallaby Grasses), *Bothriochloa decipiens* (Redleg Grass), *Desmodium varians* (Tick Tre-foil), *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium).

The community was recorded mostly in the western portion of the property in low elevation areas. Pockets of the community are retained as remnant patches on hilltops but would once have been widespread across the property (**Photographs C.7** and **C.8**).

As this community is dominated by *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrade) and supports an open grassy understorey, it is considered to conform to the TSC Act and EPBC Act listings for Box-Gum Woodland.



Photograph C.7 White Box Grassy Woodland, Brigalow Belt South and Nandewar (Plot T5)



Photograph C.8 White Box Grassy Woodland, Brigalow Belt South and Nandewar (Plot T8)

C.1.6 River Oak riparian woodland, eastern NSW

This community is an open forest or woodland that occurs along the creeks on the property (**Photographs C.9** and **C.10**). The community is dominated by *Casuarina cunninghamiana* (River Oak) and *Angophora floribunda* (Rough-barked Apple) but is also co-dominated by other eucalypt species including *Eucalyptus melliodora* (Yellow Box) and *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade). The shrub layer is sparse and includes *Melicytus dentatus* (Tree Violet) and *Notelaea microcarpa* (Native Olive). The ground layer is dense and is dominated by *Microlaena stipoides* (Weeping Meadow Grass) and *Lomandra longifolia* (Siny-headed Mat-rush); *Urtica dioica* (Stinging Nettle) is locally abundant.

The community conforms to the TSC Act or EPBC Act listings for Box-Gum Woodland as it is generally co-dominated by either *Eucalyptus melliodora* (Yellow Box) or *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade) and has an open grassy understorey.



Photograph C.9 River Oak Riparian Woodland, Eastern NSW (Plot T1)



Photograph C.10 River Oak Riparian Woodland, Eastern NSW (Plot T1)

C.1.7 Rough-barked Apple - Blakely's Red Gum riparian grassy woodlands, Brigalow Belt South and Nandewar

This grassy woodland or open forest is dominated by *Angophora floribunda* (Rough-barked Apple) and *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade). Other tree species that were also recorded include *Callitris glaucophylla* (White Cypress Pine) and *Eucalyptus laevopinea* (Silvertop Stringybark). The understorey is open and a shrub layer of *Dodonaea viscosa* ssp. *angustifolia* (Sticky Hop-bush), *Melicytus dentatus* (Tree Violet) and/or *Bursaria spinosa* (Blackthorn) is present. The ground layer is variable but common species include *Lomandra confertifolia* ssp. *rubiginosa* (a Mat-rush), *Carex appressa* (Tall Sedge), *Microlaena stipoides* (Weeping Meadow Grass) and *Dichondra repens* (Kidney Weed).

This community was recorded in a gully and along a nearby flat in the centre of the property (**Photographs C.11** and **C.12**). It conforms to the TSC Act or EPBC Act listings for Box-Gum Woodland as it is generally co-dominated by *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade) and has an open grassy understorey.



Photograph C.11 Rough-barked Apple - Blakely's Red Gum Riparian Grassy Woodlands, Brigalow Belt South and Nandewar (Plot T15)



Photograph C.12 Rough-barked Apple - Blakely's Red Gum Rparian Grassy Woodlands, Brigalow Belt South and Nandewar (Plot T15)

C.1.8 Derived grasslands, Brigalow Belt South and Nandewar

Derived grasslands refer to native grasslands that have resulted from the clearing of woodland or forest types dominated by *Eucalyptus melliodora* (Yellow Box), *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade) or *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrades). These areas occur largely around the fringes of existing remnant woodland or forest, in the extremities of the property where grazing is comparatively less intense or where paddocks have not been improved (or have not been improved for a long time) (**Photographs C.13** and **C.14**).

These grasslands are of sufficient diversity to conform to the the TSC Act and EPBC Act listings for Box-Gum Woodland.



Photograph C.13 Derived Grasslands on the Offsite Offset Property



Photograph C.14 Derived Grasslands on the Offsite Offset Property

C.1.9 Low Diversity Derived Native Grassland

This term refers to native pastures that are currently or were recently improved for livestock grazing. Low Diversity Derived Native Grassland was recorded throughout the low to intermediate elevations in the central portion of the property where the larger cleared grazing paddocks are located (**Photograph C.15** and **C.16**).

Where derived from the clearing of woodland or forest types dominated by *Eucalyptus melliodora* (Yellow Box), *Eucalyptus blakelyi* x *Eucalyptus teretecornis* (Blakely's Red Gum-Forest Red Gum intergrade) or *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrades), this unit is not sufficiently diverse to meet the EPBC Act listing for Box-Gum Woodland.

However, the TSC Act listing for Box-Gum Woodland includes poorer condition grassland areas where natural regeneration is likely. Since natural regeneration of canopy and shrub species is evident throughout the property and the soil profile over much of the property has not been significantly altered (e.g. ploughing for crop farming), some areas are likely to conform to the TSC Act listing for Box-Gum Woodland (**Photograph C.17**).



Photograph C.15 Low Diversity Derived Grassland on the Offsite Offset Property



Photograph C.16 Low Diversity Derived Grassland on the Offsite Offset Property



Photograph C.17 Regeneration of Canopy Eucalypts in Low Diversity Derived Grassland

C.2 Fauna Habitat Values of the Offsite Offset Property

The offsite offset property provides sizable remnant forest and woodland patches with a natural or semi-natural understorey that provides valuable habitat for fauna. The habitat values associated with mature remnant forest and woodland on the property include the provision of tree hollows, flowering food resources and shelter. In addition to this, the property contains frontage to Chilcotts and Back Creeks, the riparian vegetation associated with these creeklines and other permanent watering points such as farm dams. Large areas of native derived grassland dominated by large tussock grasses such as *Poa labillardieri* (Tussock Grass) also provide foraging habitat for ground-foraging fauna species. Nearby cliff lines and rock outcrops are also habitat attributes that add to value of the property for native fauna.

Key habitat attributes of the offsite offset property are discussed in more detail in the following sections.

C.2.1 Hollow Resources

Tree hollows are an important resource for many species of wildlife including birds, bats and gliders. An estimate of hollow availability per hectare, which was extrapolated from field data, is provided below in **Table C.2**. Actual hollow abundance will vary between vegetation patches depending on the age class, species and number of trees; however, the estimates provide a useful indication of the hollow resource across the whole site.

Surveys for hollow-bearing trees were carried out at all 75 of the habitat assessment sites and in all forest and woodland communities. Hollows were found to range in size from less than 5 cm to over 30 cm in living trees and stags, and included broken branch spouts, trunk holes, fire scars, basal cavities and stags that were hollow throughout (**Photographs C.18**, **C.19** and **C.20**).

Stags were found to contain the highest number of hollows which is expected as a result of ongoing decay. Of the living trees, *Eucalyptus laevopinea* (Stringybark) and *Eucalyptus albens* x *Eucalyptus moluccana* (White Box-Grey Box intergrade) individuals were found to support the majority of tree hollows. Tree hollows were generally small in size and this reflects the history of timber clearing of the larger remnant individuals that has occurred in the past.

Hollow specificity will affect how the hollows are utilised by native fauna (Lindenmayer et al., 1990, Gibbons et al., 2002). Nonetheless, the abundance and variety of hollows present, including the retention of future hollow-bearing trees under conservation management is certainly an asset for many fauna species and will contribute considerably to the habitat values of property.

Table C.2 Hollow Count Data – Offsite Offset Property

Hollow Size Class	Tree species	No. hollows over 26 x 0.1 ha plot (i.e. 2.6 ha)	No. hollows per 0.1 ha	No. hollows/ha
<5cm	*E. blakelyi x E tereticornis*	2	0.1	0.8
	E. melliodora	1	0.0	0.4
	E. albens x moluccana	7	0.3	2.7
	Stag	8	0.3	3.1
	E. laevopinea	11	0.4	4.2
	A. floribunda	0	0.0	0.0
	Unidentified	2	0.1	0.8
5-10cm	*E. blakelyi x E tereticornis*	5	0.2	1.9
	E. melliodora	1	0.0	0.4
	E. albens x moluccana	21	0.8	8.1
	Stag	6	0.2	2.3
	E. laevopinea	15	0.6	5.8
	A. floribunda	2	0.1	0.8
	Unidentified	1	0.0	0.4
11-15cm	*E. blakelyi x E tereticornis*	1	0.0	0.4
	E. melliodora	2	0.1	0.8
	E. albens x moluccana	7	0.3	2.7
	Stag	7	0.3	2.7
	E. laevopinea	1	0.0	0.4
	A. floribunda	2	0.1	0.8
	Unidentified	0	0.0	0.0
16-20cm	*E. blakelyi x E tereticornis*	0	0.0	0.0
	E. melliodora	0	0.0	0.0
	E. albens x moluccana	8	0.3	3.1
	Stag	0	0.0	0.0
	E. laevopinea	3	0.1	1.2
	A. floribunda	0	0.0	0.0
	Unidentified	0	0.0	0.0
21-25cm	*E. blakelyi x E tereticornis*	1	0.0	0.4
	E. melliodora	2	0.1	0.8
	E. albens x moluccana	4	0.2	1.5
	Stag	0	0.0	0.0

Table C.2 Hollow Count Data – Offsite Offset Property

Hollow Size Class	Tree species	No. hollows over 26 x 0.1 ha plot (i.e. 2.6 ha)	No. hollows per 0.1 ha	No. hollows/ha
	E. laevopinea	1	0.0	0.4
	A. floribunda	0	0.0	0.0
	Unidentified	0	0.0	0.0
26-30cm	*E. blakelyi x E tereticornis*	2	0.1	0.8
	E. melliodora	0	0.0	0.0
	E. albens x moluccana	4	0.2	1.5
	Stag	0	0.0	0.0
	E. laevopinea	0	0.0	0.0
	A. floribunda	0	0.0	0.0
	Unidentified	0	0.0	0.0
>30cm	*E. blakelyi x E tereticornis*	0	0.0	0.0
	E. melliodora	0	0.0	0.0
	E. albens x moluccana	1	0.0	0.4
	Stag	10	0.4	3.8
	E. laevopinea	0	0.0	0.0
	A. floribunda	0	0.0	0.0
	Unidentified	0	0.0	0.0
	Total (nearest whole)	**138**	**5**	**53**



Photograph C.18 Multi-branched Stag with Numerous Hollows



Photograph C.19 An Example of a Basal Hollow on the Offsite Offset Property



Photograph C.20 Hollowed Stags on the Offsite Offset Property

C.2.2 Flowering Resource

The property offers a range of forage resources, particularly in the form of abundant mistletoes in box eucalypt trees, flowering eucalypt trees and casuarinas (e.g. **Photograph C.21**). Flowering times for the dominant canopy species generally overlap, and, due to their size and maturity, collectively provide reliable forage material over all seasons (**Table C.3**).

Eucalypt mistletoe species occur in canopy trees across the property; such species are also an important food resource for native fauna (Turner 1991, Southern New England Landcare Ltd 2008). These tree parasites provide nectar-rich, long-lived and abundant flowers, fruits and nutritious leaves for species such as gliders, possums, honeyeaters and parrots (Turner 1991, Southern New England Landcare Ltd 2008). They also provide additional nesting resources, both directly and indirectly by promoting hollow formation (Turner 1991, Southern New England Landcare Ltd 2008).

As such, the property can support resident nectarivorous fauna species throughout the year, and winter non-breeding species such as the Swift Parrot that may move through the region during migrations.

Native tussock grass species also provide abundant seed for granivores, and midstorey species such as *Olearia elliptica* (Sticky Daisy-bush) and *Pittosporum undulatum* (Sweet Pittosporum) also provide fruit and flowers in abundance (**Photograph C.22**).



Photograph C.21 Flowering and Budding Trees

Note: Eucalyptus nortonii (Large-flowered Bundy) are common on the offsite offset property



Photograph C.22 Flowering Understorey Shrubs

Table C.3 Flowering Schedule for Canopy Species that are Present on the Offsite Offset Property

Scientific Name	Common Name	Flowering Time											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Amyema miquelii	Box mistletoe		X	X	X	X							
Amyema pendula	Drooping mistletoe								X	X	X	X	X
Angophora floribunda	Rough-barked Apple	X	X	X								X	X
Brachychiton populneus	Kurrajong	X	X										X
Casuarina cunninghamiana	River Sheoak			X	X	X							
Eucalyptus albens x moluccana	White Box-Grey box intergrade			X	X	X	X						
Eucalyptus blakelyi x teretecornis	Blakely's Red Gum-Forest Red Gum intergrade						X	X	X	X	X	X	
Eucalyptus dalrympleana	Mountain Gum			X	X	X							
Eucalyptus laevopinea	Silver Top Stingybark						X	X	X				
Eucalyptus melliodora	Yellow Box	X	X							X	X	X	X
Eucalyptus nortonii	Large-flowered Bundy								X	X	X		
Eucalyptus viminalis	Ribbon Gum	X	X	X	X	X						X	X

**From Brooker and Kleinig (1990)*

C.2.3 Ground Debris and Understorey Complexity

Vegetation structure and complexity on the property is variable and includes open grasslands, open woodland, shrubby woodland and dense riparian communities. The vegetation features a diverse and complex understorey structure, containing native groundcover tussock grasses like *Poa labillardierii* (Tussock Grass) and localised areas of shrubby understorey largely represented by daisy-bushes (*Olearia* spp.) and Hop Bushes (*Dodonea* spp). The overstorey structure is also complex as the canopy is supported by small trees and mixed aged stands of regenerated trees.

These different characteristics have the potential to support a range of fauna and their various habitat requirements. For example, the grassland and open forest suits larger terrestrial macropods, while many native woodland bird species are strongly associated with shrub and tall tussock grass understorey. Understorey vegetation (and thus woodland structural complexity) provides nesting sites, refuge from predators and food for many small species (McIntyre et al., 2002). Taller canopy species with large hollows over a midstorey are preferred by species such as larger parrots and raptors.

Due to the history of felling and thinning activities by ringbarking, large fallen trees, stags, logs and smaller woody debris including branches and bark, are abundant on the property (**Photographs C.23** and **C.24**). Such debris is also typical of box eucalypts that readily drop their limbs.

Within the 75 habitat assessment plots, over 200 pieces of woody debris (at least a half metre long and with a diameter of over 10 cm) totalling over 800 m, were recorded. This ground debris provides important habitat for terrestrial mammals, reptiles and ground-foraging birds. Such woodland birds include the threatened Brown Treecreeper (*Climacteris picumnus*) and Specked Warbler (*Pyrrholaemus saggitatus*), which was recorded on site. The amount of woody debris is expected to increase significantly as the property becomes managed for conservation purposes rather than farming.



Photograph C.23 Woody Ground Debris



Photograph C.24 Woody Ground Debris

C.2.4 Rock Outcrops

Rock outcrops with minor cliffs and caves occur on several of the hilltop areas (**Photograph C.25**) and these are considered likely to afford habitat to cave roosting bats and to other fauna. Species that can potentially find roosting habitat in these areas include threatened microchiropteran bats of the family Vespertilionidae. Three such cave roosting species have been detected on the property including:

- Large-eared Pied Bat (*Chalinolobus dwyeri*);
- Little Bent-wing Bat (*Miniopterus australis*); and
- Eastern Bentwing-bat (*Miniopterus orianae oceanensis*).



Photograph C.25 Example of Rocky Outcrop at Ridgetop, in the Eastern Section of the Offsite Offset Property

C.2.5 Riparian Corridors and Dams

Due to the undulating and steep topograpy of the property, a number of ephemeral drainage lines and unnamed creeks flow through the property and drain into two more permanent Chilcotts and Back Creeks (**Photograph C.26**). The creeklines and gullies have fringing and riparian vegetation that provide shelter habitat and movement corridors for a range of fauna. These riparian corridors, although narrow, still exist and are comprised of remnant eucalypt species and casuarinas. These riparian corridors and connecting woodland patches provide a means for mobile fauna to traverse the landscape and utilise habitat on the property and elsewhere in the locality.

Multiple small farm dams are also present and provide more substantive and permanent water sources for wildlife (**Photograph C.27**).

These watercourses provide valuable sources of drinking water for all fauna support reptiles and amphibians.



Photograph C.26 Chilcotts Creek

Note: Fringing vegetation and rocky instream, which changes water flow and can create deeper pools.



Photograph C.27 Farm Dam on the Offsite Offset Property

C.3 Regenerative Potential of the Vegetation on the Offsite Offset Property

There is high potential for the regeneration of native vegetation across the property and there is considerable evidence that grazing lands are actively maintained by such procedures as ringbarking (**Photograph C.28**). Regeneration potential is high for all strata of vegetation including the canopy, subcanopy, understorey and ground stratum.

Regeneration of canopy species was evident at most assessment locations visited. Seedlings of *Eucalyptus albens* (White Box), *Eucalyptuss laevopinea* (Silver Top Stringybark) and *E. tereticornis x blakelyi* (Forest Red Gum - Blakely's Red Gum intergrade) were recorded, indicating much of the forest and woodland areas of the property have good natural regeneration potential and that the soil and canopy seed banks are viable.

Grasslands are generally dominated by native perennial grasses with various mixtures of native perennial and annual herbaceous plants. When livestock are removed to make way for conservation management it is expected that all native strata will regenerate naturally.

Weeds occur across the property and include species such as *Ailanthus ailtissima* (Tree of Heaven), *Rubus fruticosus* (Blackberry), *Hypericum perforatum* (St John's Wort), *Rosa rubiginosa* (Sweet Briar) and Thistles. These will need active management when livestock

grazing is phased out for conservation. Some species such as St John's Wort will need special active management as they tend to proliferate in ungrazed and unmanaged old farmland.

Some areas of grassland have been extensively cleared meaning that trees are either absent or extremely widely scattered. Such areas may require active replanting in the future to speed up the process of regeneration towards woodland or open forest.



Photograph C.28 Recent Ringbarking of Canopy Trees on the Offsite Offset Property

C.4 Threatened Species on the Offsite Offset Property

Surveys have verified the presence of a suite of threatened and migratory birds and bats on the property (**Table C.4**). The surveys provide a brief snapshot of fauna and it is expected that many more threatened species would occur on the property based upon the condition of habitat and the frequency of threatened species records from the LGA. An individual occurrence of *Cymbidium canaliculatum* (Tiger Orchid) was also recorded on the offsite offset property. Whilst the *Cymbidium canaliculatum* (Tiger Orchid) population is not listed outside of the Hunter catchment, the property is on the border between the Namoi and Hunter catchments and therefore, any potential habitat for the species is considered to be relevant to the Project.

Most of the threatened and migratory species found or considered likely to occur within the Study Area are also considered likely to occur on the property, as indicated in **Table C.5**.

As discussed above, the regenerative potential of the vegetation on the offsite offset property is high and it is considered likely that the current faunal habitats can be increased markedly in area and condition with active habitat management when farming makes way for conservation. **Table C.6** provides a broad indication of the areas of actual or potential habitat available for threatened species and also indicates how much habitat can be eventually provided in the longer term as grassland areas are regenerated to open forest and woodland.

Table C.4 Threatened and Migratory Species Recorded on the Offsite Offset Property

Family	Scientific Name	Common Name	TSC Act Status	EPBC Act Status
Acanthizidae	*Pyrrholaemus saggitatus*	Speckled Warbler	V	
Accipitridae	*Hieraaetus morphinoides*	Little Eagle	V	
Meropidae	*Merops ornatus*	Rainbow Bee-eater		Mi
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	V	
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll*	V	E1
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V	
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V
	Miniopterus australis	Little Bent-wing Bat	V	
	Miniopterus orianae oceanensis	Eastern Bentwing-bat	V	
Apocynaceae	*Tylophora linearis*	-	V	E
Orchidaceae	*Cymbidium canaliculatum*	Tiger Orchid	E2	

** Anecdotal record from land manager (pers. comm. P. Swain)*

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
Aves							
Acanthizidae	*Pyrrholaemus saggitatus*	Speckled Warbler	-	V	**Presence confirmed.** Records from multiple surveys of the Study Area and MAC mine lease.	20	**Presence confirmed.** Recorded during diurnal bird surveys.
Accipitridae	*Circus assimilis*	Spotted Harrier	-	V	**Presence confirmed.** Records from surveys of the Study Area.	No records	**Potential to occur**. Suitable habitat available within the offsite offset property.
Accipitridae	*Hieraaetus morphnoides*	Little Eagle	-	V	**Presence confirmed.** Recorded foraging in scattered paddock trees during 2011 surveys of the Study Area.	3	**Presence confirmed.** Recorded during diurnal bird surveys.
Ciconiidae	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	-	V	**Presence confirmed.** Records from multiple surveys of the Study Area and MAC mine lease.	38	**Potential to occur.** Suitable habitat available within the offsite offset property.
Estrildidae	*Stagonopleura guttata*	Diamond Firetail	-	V	**Presence confirmed.** Records from multiple surveys of the Study Area	12	**Potential to occur.** Suitable habitat, in the form of shrubby understorey and ground debris, is available within the offsite offset

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
					and from MAC mine lease and Drayton Mine.		property.
Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	-	V	**Presence confirmed.** Tentatively recorded from previous surveys of the Study Area.	2	**Potential to occur.** Suitable box eucalypt habitat available within the offsite offset property; may occur as part of larger feeding territory.
Meliphagidae	*Anthochaera phrygia*	Regent Honeyeater	E1, Mi	E1	**Potential to occur.** Not detected in fauna surveys of the Study Area; however the species may forage in dry open forest, woodland and riparian forests within the Study Area during migratory movements.	8	**Potential to occur.** Strongly nomadic in response to forage resource availability; abundant mistletoes, box eucalypt and River Oak habitat available within the offsite offset property.
Neosittidae	*Daphoenositta chrysoptera*	Varied Sittella	-	V	**Potential to occur.** Recorded from MAC mine lease. Suitable habitat available within the study area.	9	**Presence confirmed.** Recorded during diurnal bird surveys.

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
Petroicidae	*Melanodryas cucullata*	Hooded Robin (south-eastern form)	-	V	**Presence confirmed.** Recorded from surveys of the Study Area and from MAC mine lease.	2	**Potential to occur.** Suitable habitat, in the form of lightly wooded, shrubby and open areas, is available within the offsite offset property.
Petroicidae	*Petroica boodang*	Scarlet Robin	-	V	**Presence confirmed.** Recorded from previous surveys of the Study Area.	5	**Potential to occur.** Suitable habitat, in the form of eucalypt woodland, shrubby and open areas on ridges and slopes, is available within the offsite offset property.
Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	-	V	**Presence confirmed.** Recorded from multiple surveys of the Study Area and from MAC mine lease.	15	**Potential to occur.** Suitable habitat, in the form of open box-gum woodland and ground debris, is available within the offsite offset property.
Psittacidae	*Lathamus discolor*	Swift Parrot	E1; Ma	E1	**Presence confirmed.** Recorded from 2011 surveys of the Study Area, foraging in winter-flowering mistletoe.	1	**Potential to occur.** Species is migratory and forage on winter-flowering mistletoes and eucalypt species which are abundant within the offsite offset property.
Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	-	V	**Potential to occur.** Not detected in surveys of the Study Area. Recorded from	22	**Potential to occur.** Nomadic in response to food availability; suitable forage habitat, in the form of mistletoes and eucalypt species,

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
					MAC mine lease. Suitable foraging habitat available.		is available within the offsite offset property.
Psittacidae	*Neophema pulchella*	Turquoise Parrot	-	V	**Potential to occur.** Suitable habitat exists within the Study Area, within remnant and regenerating patches of Box-Gum Woodland. Recorded from MAC mine lease.	19	**Potential to occur.** Suitable habitat, in the form of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland, is available within the offsite offset property.
Strigidae	*Ninox connivens*	Barking Owl	-	V	**Presence confirmed.** Recorded from previous surveys (Ecotone, 2000) of the Study Area.	No records	**Low potential to occur.** No records for the species within the LGA. However, timbered creeklines in eucalypt woodland and Casuarina stands are available within the offsite offset property.
Migratory Aves							
Monarchidae	*Myiagra cyanoleuca*	Satin Flycatcher	Mar. M	-	**Potential to occur.** Previously recorded within the MAC mine. On occasion may potentially utilise habitat within the Study Area.	No records	**Low potential to occur.** No records for the species within the LGA and sparsely scattered on the western slopes and plains. Some suitable habitat, in the form of eucalypt woodland and vegetated gullies, is available within the offsite offset property.

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
Apodidae	*Hirundapus caudacutus*	White-throated Needletail	Mar. M	-	**Presence confirmed.** Recorded from previous surveys of the Study Area and from MAC mine lease and Drayton mine lease.	No records	**Potential to occur.** No records for the species within the LGA; exclusively aerial migratory species that occurs over most habitat types.
Meropidae	*Merops ornatus*	Rainbow Bee-eater	Mar. M	-	**Presence confirmed.** Recorded from previous surveys of the Study Area. Also known from MAC mine lease and Drayton mine lease.	No records	**Presence confirmed.** Recorded during diurnal bird surveys; migratory species found over a range of habitats including open forests and woodlands, shrubland and in various cleared or semi-cleared habitats.
Mammalia							
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	E1	V	**Potential to occur.** Not detected in fauna surveys but may utilise open forests, woodlands and riparian forest within the Study Area. Previously recorded in the MAC mine lease.	5	**Presence confirmed anecdotally.** Some suitable habitat, in the form of open forest, woodland and riparian forest, adjacent rocky cliff-faces and potential den sites, is available within the offsite offset property.
Emballonuridae	*Saccolaimus*	Yellow-bellied	-	V	**Presence confirmed**.	14	**Presence confirmed.** Calls recorded using

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
	flaviventris	Sheathtail-bat			Recorded during 2011 surveys of the Study Area. Also known from the MAC mine lease and Drayton mine lease.		Anabat unit and positively identified.
Molossidae	*Mormopterus norfolkensis*	Eastern Freetail-bat	-	V	**Presence confirmed.** Recorded during 2011 and previous surveys of the Study Area. Also known from MAC mine lease and Drayton mine lease.	No records	**Low potential to occur.** No records from the LGA. Distributed east of the Great Divide to the coastline.
Petauridae	*Petaurus norfolcensis*	Squirrel Glider	-	V	**Potential to occur.** Known from MAC mine lease and Drayton mine lease	4	**Potential to occur.** Suitable habitat, in the form of remnant box eucalypt woodland, abundant hollows and forage resources, is available within the offsite offset property.
Phascolarctidae	*Phascolarctos cinereus*	Koala	V	V	**Low potential to occur.** Not detected in fauna surveys. Some suitable habitat is available within the surrounding area. An individual was recorded in	46	**Potential to occur.** Suitable habitat, in the form of eucalypt woodland and feed trees, is available within the offsite offset property. Species distribution generally limited to elevations of less than 800m; the offsite offset property ranges from some gully lines

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
					early 2011 on a haul road in the MAC mine lease.		of 600m to slopes and ridges of over 1000m.
Vespertilionidae	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V	**Presence confirmed.** Recorded during 2011 surveys of the Study Area. Also known from MAC mine lease.	2	**Presence likely.** Calls recorded on Anabat unit could not be positively identified but based on call frequency and pattern, are considered probable from this species.
Vespertilionidae	*Miniopterus australis*	Little Bentwing-bat	-	V	**Unlikely to occur.** Not detected in fauna surveys of the Study Area. Sub-optimal habitat exists within the study area.	No records	**Presence confirmed.** Calls recorded using Anabat unit and positively identified.
Vespertilionidae	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	-	V	**Presence confirmed.** Recorded from surveys of the Study Area. Recorded from the MAC mine lease and Drayton mine lease.	3	**Presence confirmed.** Calls recorded using Anabat unit and positively identified.
Vespertilionidae	*Myotis macropus*	Southern Myotis	-	V	**Presence confirmed.** Recorded during 2011 and	No records	**Low potential to occur.** No records from the LGA. Rarely found more than 100km

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
					previous surveys of the Study Area. Also recorded in MAC mine lease		inland, except along major rivers; the offsite offset property is located 180km from the coast.
Vespertilionidae	*Nyctophilus corbeni*	Greater Long-eared Bat	V	V	**Presence confirmed.** Recorded from previous surveys of the Study Area.	No records	**Potential to occur.** No records from the LGA; however suitable habitat, in the form of box eucalypt woodland and abundant hollows, is available within the offsite offset property.
Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	-	V	**Presence confirmed.** Recorded from surveys of the Study Area. Recorded from Drayton mine lease.	No records	**Potential to occur.** No records from the LGA; however suitable habitat, in the form of box eucalypt woodland and abundant hollows, is available within the offsite offset property.
Vespertilionidae	*Vespadelus troughtoni*	Eastern Cave Bat	-	V	**Potential to occur.** Calls recorded during 2011 surveys of the Study Area but not positively identified. Recorded from MAC mine lease and Drayton mine lease.	3	**Potential to occur.** Some suitable roosting and forage habitat exists in the locality.

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
Plants							
Fabaceae - Mimosoideae	*Acacia pendula*	Acacia pendula population in the Hunter catchment	V	E2	**Presence confirmed.** Individuals recorded from previous surveys. Also known from two locations in MAC mine lease. The individuals do not conform to the listing for EPBC Weeping Myall Woodland; however there is potential for the community to occur within the Project area.	No records	**Potential to occur.** Typically grows on the floodplains of major rivers in heavy clay soils. However, could possibly occur in some of the basalt-rich parts of the property. The population is not listed outside of the Hunter Catchment but since the property is on the border between the Namoi and Hunter Catchments, any potential habitat for the species is considered to be relevant to the Project.
Myrtaceae	*Eucalyptus camaldulensis*	Eucalyptus camaldulensis population in the Hunter catchment	-	E2	**Presence confirmed.** One mature individual was recorded along Saddlers Creek and others are considered likely to occur.	No records	**Low Potential to occur.** Typically on deep rich alluvial soils adjacent to large permanent water bodies. Could possibly occur along creek lines at the New England Hwy frontage, but limited potential in the conservation areas of the property. The population is not listed outside of the Hunter Catchment but since the property is

Table C.5 Comparison of the Likelihood of Occurrence of Threatened Species on the Offsite Offset Property with the Study Area

Family	Scientific Name	Common Name	Status		Study Area	Offsite Offset Property	
			EPBC	TSC	Likelihood of occurrence	Liverpool Plains LGA Records	Likelihood of Occurrence
							on the border between the Namoi and Hunter Catchments, any potential habitat for the species is considered to be relevant to the Project.
Orchidaceae	*Cymbidium canaliculatum*	Cymbidium canaliculatum population in the Hunter Catchment	-	E2	**Presence confirmed.** Recorded from surveys of the Project area. Also known from two locations in MAC mine lease.	No records	**Presence confirmed.** The population is not listed outside of the Hunter Catchment but since the property is on the border between the Namoi and Hunter Catchments, any potential habitat for the species is considered to be relevant to the Project.
Orchidaceae	*Diuris tricolor*	Diuris tricolor Fitzg., the Pine Donkey Orchid, in the Muswellbrook local government area	-	E2	**Presence confirmed.** Recorded from surveys of the Project area. Also known from the MAC mine lease.	No records	**Potential to occur.** Suitable habitat present, in the form of Box-Gum Woodland, cleared eucalypt forests, relict grassland and moderately disturbed or conservatively grazed areas. The population is not listed outside of the Hunter Catchment but since the property is on the border between the Namoi and Hunter Catchments, any potential habitat for the species is considered to be relevant to the Project.

Key: V = Vulnerable; E1 = Endangered; E2 = Endangered Population; CE = Critically Endangered; Mi = Migratory; Ma = Marine

Table C.6 Habitat Available to Threatened Species on the Offsite Offset Property

Scientific Name	Common Name	EPBC Act	TSC Act	Preferred Habitat	Available Habitat (ha)
Aves					
Pyrrholaemus saggitatus	Speckled Warbler	-	V	F, W	872
Circus assimilis	Spotted Harrier	-	V	F, W, G	1,645
Hieraaetus morphnoides	Little Eagle	-	V	F, W, G	1,645
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	-	V	F, W	872
Stagonopleura guttata	Diamond Firetail	-	V	F, W	872
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	-	V	F, W	872
Anthochaera phrygia	Regent Honeyeater	E1,Mi	E1	F, W	872
Daphoenositta chrysoptera	Varied Sittella	-	V	F, W	872
Melanodryas cucullata	Hooded Robin (south eastern form)	-	V	F, W	872
Petroica boodang	Scarlet Robin	-	V	F, W	872
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	-	V	F, W, G	1,645
Lathamus discolor	Swift Parrot	E1; Ma	E1	F, W	872
Glossopsitta pusilla	Little Lorikeet	-	V	F, W	872
Neophema pulchella	Turquoise Parrot	-	V	F, W	872
Ninox connivens	Barking Owl	-	V	F, W	872
Migratory Aves					
Myiagra cyanoleuca	Satin Flycatcher	Mar. M	-	F, W	872
Hirundapus caudacutus	White-throated Needletail	Mar. M	-	F, W, G	1,645

Table C.6 Habitat Available to Threatened Species on the Offsite Offset Property

Scientific Name	Common Name	EPBC Act	TSC Act	Preferred Habitat	Available Habitat (ha)
Merops ornatus	Rainbow Bee-eater	Mar. M	-	F, W	872
Mammalia					
Dasyurus maculatus	Spotted-tailed Quoll	E1	V	F, W	872
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	-	V	F, W	872
Mormopterus norfolkensis	Eastern Freetail-bat	-	V	F, W	872
Petaurus norfolcensis	Squirrel Glider	-	V	F, W	872
Phascolarctos cinereus	Koala	V	V	F, W	872
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	F, W	872
Miniopterus australis	Little Bentwing-bat	-	V	F, W	872
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	-	V	F, W	872
Myotis macropus	Southern Myotis	-	V	F, W	872
Nyctophilus corbeni	Greater Long-eared Bat	V	V	F, W	872
Scoteanax rueppellii	Greater Broad-nosed Bat	-	V	F, W	872
Vespadelus troughtoni	Eastern Cave Bat	-	V	F, W	872
Plants					
Acacia pendula	*Acacia pendula* population in the Hunter catchment	V	E2	F, W, G	1,645
Eucalyptus camaldulensis	*Eucalyptus camaldulensis* population in the Hunter catchment	-	E2	riparian habitat on the floodplains	0
Cymbidium canaliculatum	*Cymbidium canaliculatum* population in the Hunter Catchment	-	E2	F, W	872

Table C.6 Habitat Available to Threatened Species on the Offsite Offset Property

Scientific Name	Common Name	EPBC Act	TSC Act	Preferred Habitat	Available Habitat (ha)
Diuris tricolor	*Diuris tricolor* Fitzg., the Pine Donkey Orchid, in the Muswellbrook local government area	-	E2	F, W, G	1,645

Key: V = Vulnerable; E1 = Endangered; E2 = Endangered Population; CE = Critically Endangered; Mi = Migratory; Ma = Marine

Appendix D

Saddlers Creek Restoration: Hunter Local Land Services Agreement

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HCRCMA Muswellbrook

NSW GOVERNMENT Primary Industries

Hunter-Central Rivers CMA CATCHMENT MANAGEMENT AUTHORITY

Collaboration Agreement

Anglo American Property Planning and Land Rehabilitation Programme

This is an agreement between the **Department of Primary Industries, an office of the CMA of Trade and Investment, Regional Infrastructure and Services** representing the Crown in right of the State of New South Wales (ABN 72 189 919 072) located at 161 Kite Street Orange NSW 2800 ("the CMA") and the Collaborator for the Collaborator to collaborate in accordance with the following **Details** and **Terms** and **Schedules** ("**the Agreement**").

Details		
Collaborator *(Clause 15)*	Name: Anglo American Metallurgical Coal Pty Ltd Address: GPO Box 1410, Brisbane QLD, 4001 Australia ABN: 93 076 059 679 Contact Person: Ian Curtis Position: Rural Property Manager Address: GPO Box 1410 Brisbane QLD 4001 Australia Telephone: 07 3834 1216 Fax: 07 3834 1390 E-mail: ian.curtis@angloamerican.com	
CMA Contact Person *(Clause 15)*	Contact Person: Fiona Marshall Position: General Manager Address: Private Bag 2010 Paterson NSW 2421 Telephone: 02 4930 1030 Fax:: 02 4930 1013 E-mail: fiona.marshall@cma.nsw.gov.au	
Commencement Date *(Clause 10)*	05/03/2012	
Completion Date	05/03/2015	
Programme	Saddlers Creek Property Planning and Land Rehabilitation Project	
Programme Steering Committee	The Programme Steering Committee will consist of: 2 members from the CMA and 2 members from the Collaborator	
	Collaborator	**CMA**
	1. Ron Connelly 2. Jason Fittler	1. Adrian J. Brown 2. Steve Eccles

Steering Committee Chairpersons	**Collaborator:** **CMA:**
Special Conditions:	

Terms of Collaboration

1. **Definitions and Interpretation**

2. **Interpretation**

Unless the context requires otherwise, in this Agreement:

(a) the terms set out in the left hand column of the Details have the meaning ascribed to them in the right hand column of the Details;
(b) words in the singular include the plural and vice versa;
(c) where any time limit pursuant to this Agreement falls on a day which is not a Business Day then the time limit will be deemed to have expired on the next Business Day;
(d) a reference to a statute, regulation, ordinance or by-law will be deemed to include a reference to all statutes, regulations, ordinances or by-laws amending, consolidating or replacing same from time to time;
(e) headings are for convenience only and do not affect the interpretation of this Agreement;
(f) the meaning of general words is not limited by specific examples introduced by "including" or "for example" or similar expressions;
(g) references to persons include bodies corporate, government agencies and vice versa;
(h) references to the parties include references to respective directors, officers, employees, agents of the parties;
(i) nothing in this Agreement is to be interpreted against a party solely on the ground that the party put forward this Agreement or any part of it; and
(j) where an expression is defined, any other grammatical form of that expression has a corresponding meaning.

3. **Definitions**

Background IP means Intellectual Property that is made available by a party for the purpose of this Agreement, whether upon commencement of this Agreement or during the Term, and:

a. is in existence prior to the date of this Agreement; or
b. is brought into existence independently of this Project.

Business Day means any day other than a Saturday, Sunday or public holiday in New South Wales.

Claim means any cost, expense, loss, damage, claim, action, proceeding or other liability (whether in contract, tort or otherwise), however arising and includes legal costs on a full indemnity basis.

Confidential Information of a party means all trade secrets, financial information and other commercially or scientifically valuable information of whatever description and in whatever form (whether written or oral, visible or invisible) which:

(a) is by its nature confidential;
(b) has been designated as confidential by a party;
(c) is capable of protection at law or equity as confidential information; or

(d) is derived or produced partly from the Confidential Information.

Intellectual Property includes:

(a) all rights in relation to copyright, inventions, plant varieties, trademarks, designs, patents;
(b) all other rights resulting from intellectual activity in the industrial, scientific, literary or artistic fields including trade secrets and know-how but does not include Moral Rights.

Notice means any approvals, consents, instructions, orders, directions, statements, requests and certificates, or other communication to be given under this Agreement.

Personal Information has the same meaning as in the *Privacy and Personal Information Protection Act 1998 (NSW)*.

Term means the period commencing on the Commencement Date and ending on the Completion Date, unless terminated earlier or extended in accordance with this Agreement.

Project means the individual project under the Programme as set out in Schedule 2 or as determined by the Steering Committee from time to time;

Project Activities means the activities referred to in Schedule 2 for the development and implementation of an individual Project and as varied from time to time by agreement of the parties;

Programme Goals means the goals of the parties in relation to the Programme as set out in Schedule 1 which may be changed from time to time by agreement of the parties;

Project Objectives means the objectives of each Project; and

Non-operational land means that land owned by Collaborator which is outside the area of land covered by a mining lease granted under Part 5 of the *Mining Act 1992*

4. The Collaborator's Obligations

4.1 In consideration of the obligations to be performed by the CMA under clause 5 the Collaborator agrees to:

(a) Provide funding as required under this Agreement;
(b) Undertake the Project Activities with due professional care and skill and in good faith;
(c) Ensure that all approvals and licences necessary to undertake any and all of the Project Activities as described are in place prior to the activities to which those approvals and licences pertain are commenced;
(d) Develop Project plan(s) in collaboration with the CMA;
(e) Engage and direct suitably qualified employees and contractors to undertake the Project Activities;
(f) ensure the occupational health and safety of all people who may be affected by the Collaborator's activities under the Agreement in compliance with the *Work Health and Safety Act 2012* for any works to be undertaken as part of the Project;
(g) avoid damage to property and the environment when carrying out the Project Activities, and make good any such damage at the Collaborator's expense;
(h) prevent nuisance or inconvenience to anyone who may be affected in performing Project Activities.

5. The CMAs obligations:

5.1 The CMA will:

(a) Assist with the development of Project plan(s) in collaboration with the Collaborator;

(b) Provide technical support to the Collaborator to support the implementation of certain works undertaken as part of the Project.

6. Commitments

6.1 Each party makes the following commitments:

(a) to positively promote the Programme;

(b) to provide personnel with the appropriate level of expertise to participate in the Programme; and

(c) each party will at all times be just and faithful in the conduct of the Programme and not conduct its affairs in any way that could bring the other party into disrepute, or cause damage to or otherwise diminish the reputation or standing of the other party in any way. This clause will not be used to limit the ability of either party to exercise its rights, responsibilities and obligations under any and all relevant legislation or regulation.

7. Contributions

7.1 Financial contributions for any Project Activities will be determined by the Steering Committee in conjunction with and during the development of the commercial arrangements for the joint projects.

7.2 To avoid doubt, any financial contributions determined and recommended by the Steering Committee will be subject to the final approval of each the parties.

7.3 In the event that financial contributions are agreed between the parties, the party responsible for the contribution must make payments 30 days after the receipt of a valid tax invoice.

7.4 Any payment of fees by the CMA does not constitute an admission on the part of the CMA that any services provided for such funding are in conformity with this Agreement and no payment will be deemed to release the Collaborator from its obligations under this Agreement.

8. GST

8.1 Unless otherwise defined in this Agreement, words or expressions used in this clause have the same meaning as defined in the *A New Tax System (Goods and Services Tax) Act 1999* ("GST law").

8.2 Unless otherwise indicated all amounts referred to in this Agreement are exclusive of GST.

8.3 If a taxable supply is made to a recipient, the party which makes the taxable supply must provide the recipient with a tax invoice or other document with information required by the GST law to be included in a tax invoice to enable the recipient to claim an input tax credit.

8.4 If the party which makes the taxable supply is not registered for GST it must provide the recipient with a statement with the first invoice in accordance with the GST law, or the recipient will withhold a withholding payment.

8.5 If any GST is payable by the party which makes the taxable supply under this Agreement, any consideration payable for any such taxable supply will be increased by the amount of GST payable (except to the extent that the consideration is already expressed to be GST inclusive).

9. Steering Committee and Administration

9.1(a) The Steering Committee will, wherever applicable:

(i) act as a forum for keeping all parties informed on the progress of the Project;

(ii) develop and approve projects comprising the Project Activities, including details of how, when and by whom such Project Activities will be implemented;

(iii) establish teams to manage Project Activities (Project management teams);

(iv) agree upon contributions to be made in respect of Project Activities (subject to the final approval of the party making such contribution);

(v) develop and approve budgets for Project Activities;

(vi) develop a communications plan for all Project Activities carried out under the Project. At a minimum, such communications plans should include:
(A) objectives and target audience;
(B) targeted key messages;
(C) proposed communications activities including format, timing and responsibilities;
(vii) collaborate at all stages of the Project including, but not limited to, issues relating to Project Activities development and implementation;
(viii) discuss any issues that may arise during the course of the Project that are considered necessary to be discussed in order to effectively carry out the Project;
(ix) make its decisions and actions in accordance with the Programme Goals Objectives and Project Objectives contemplated in Schedule 1.

(b) Decisions of the Steering Committee must be made on:
(i) on a consensus basis; and
(ii) ensure that the Programme is conducted in the spirit of the Programme Goals and Project Objectives and.

(c) Specific Project Activities will be carried out on a day-to-day basis by the party nominated by the Steering Committee as having responsibility for such activities.

(d) Such party or committee will manage the Project Activities as directed by the Steering Committee on behalf of the parties and will be responsible for all activities and operations conducted in respect of the Project Activities.

9.2 The Collaborator and CMA agree to report on the following matters at each Steering Committee meeting:

(a) (Partnership Commitments) any specified commitments that arise from Steering Committee or Project Management Team meetings;

(b) (Reporting of expenditure) both cash and in-kind expenditure on Project Activities;

(c) (Communication) communication activities undertaken relating to the Project. Each partner shall report on communication activities as required by the approved communications plans for Project Activities; and

(d) (Project Milestones) an update that summarises outputs achieved for each Project Activity as follows:
(i) status of Project Activities: Not commenced, Commenced, On-ground works commenced, Complete;
(ii) landholder engagement: Number of landholders contacted; number of landholders engaged; number of landholders trained; and
(iii) on-ground works: Summary of State Standard Output and CAP Management Target progress (eg. Km of riparian fencing, hectares revegetated).

10. Aboriginal Material

10.1 Where the material to be used in the Project (pre-existing or new) comprises material reasonably considered by the CMA to be the cultural and/or Intellectual Property of a particular Indigenous/Aboriginal person(s) or community(s), the CMA and Collaborator agree that they will not use or disclose such material unless authorised or required by law, to other persons or bodies without prior written and informed consent of the relevant Indigenous/Aboriginal person(s) or community(s).

10.2 For the purposes of this clause, the cultural and/or intellectual property of a particular Indigenous/ Aboriginal person(s) or community(s) includes the following:

(a) traditional Indigenous/Aboriginal knowledge which in the opinion of these groups or individuals should not be in the public domain; and/or

(b) material which is culturally sensitive to Indigenous/Aboriginal communities.

11. **Intellectual Property**

11.1 Each party retains ownership of any material or Background IP it provides to enable the Project Activities to be carried out.

11.2 The Collaborator acknowledges and agrees that ownership of all Intellectual Property Rights created during the Project will vest on their creation in the CMA and the Collaborator as joint tenants in common except in cases advised by the CMA where the rights are permanent and not capable of being transferred.

11.3 Each party may use any of the joint Intellectual Property and Project Results for its own internal research purposes

11.4 Where either party proposes to publish, register or commercialise any jointly owned Project Intellectual Property the parties will cooperate to facilitate that outcome.

12. **Confidential Information**

12.1 Each party as the recipient of Confidential Information ("Recipient") must in relation to the Confidential Information of the other party ("Discloser"):

(a) keep it confidential;
(b) use it only as permitted under this Agreement;
(c) not disclose it to any person other than to its employees, sub-contractors and agents who have a need to know;
(d) before disclosing it to any of the people described in sub-clause 12.1(c), make sure that those persons are made aware of the confidential nature of the Confidential Information prior to obtaining access and procure an assurance that any such Confidential Information will be kept confidential;
(e) not copy it or any part of it that is in material form other than as strictly necessary and must mark any such copy 'Confidential – ([*Name of Discloser*]);
(f) implement security practices against unauthorised copying, use and disclosure (whether that disclosure is oral, in writing or in any other form);
(g) immediately notify the Discloser if the Recipient becomes aware of any unauthorised copying, use or disclosure in any form or any disclosure required by law;
(h) promptly comply with any request by the Discloser to return or destroy any or all copies of Confidential Information unless required by law to be retained; and
(i) upon expiry or termination of this Agreement, return to the Discloser all Confidential Information provided to it by the Discloser.

12.2 A Recipient's obligations of confidentiality under this Agreement do not apply to information that (whether before or after this Agreement is executed):

(a) was acquired from a source other than the Discloser where such source is entitled to disclose it;
(b) is independently developed or known by the Recipient including because it is in the public domain otherwise than through a breach of this Agreement or other obligation of confidentiality;
(c) the Recipient can prove by contemporaneous written documentation was already known to it at the time of disclosure (unless such knowledge arose from disclosure of information in breach of an obligation of confidentiality); or
(d) is required to be disclosed by law.

12.3 The Recipient bears the onus of showing that any of the above exceptions apply.

12.4 **Disclosure of Information**

(a) In order for the CMA to comply with its obligations under the *Government Information (Public Access) Act 2009*, if this Agreement involves the provision of any services by the Collaborator to the public on behalf of the CMA, the Collaborator must, within seven (7) days

of receiving a written request by the CMA, provide the CMA with immediate access to the following information contained in records held by the Collaborator:

i) information that relates directly to the performance of the Project Activities;
ii) information collected by the Collaborator from members of the public to whom it provides, or offers to undertake Project Activities; and
iii) information received by the Collaborator from the CMA to enable it to undertake the Project Activities.

(b) For the purposes of sub-clause (a), information does not include:

i) information that discloses or would tend to disclose the Collaborator's financing arrangements, financial modelling, cost structure or profit margin;
ii) information that the Collaborator is prohibited from disclosing to the CMA by provision made by or under any Act, whether of any State or Territory, or of the Commonwealth; or
iii) information that, if disclosed to the CMA, could reasonably be expected to place the Collaborator at a substantial commercial disadvantage in relation to the CMA, whether at present or in the future.

(c) The Collaborator will provide copies of any of the information in sub-clause (a), as requested by the CMA, at the Collaborator's own expense.

(d) Any failure by the Collaborator to comply with any request pursuant to sub clause (a) or (c) will be considered a breach of an essential term and will allow the CMA to terminate this Agreement by providing notice in writing of its intention to do so with the termination to take effect seven (7) days after receipt of the notice. Once the Collaborator receives the notice, if it fails to remedy the breach within the seven (7) day period to the satisfaction of the CMA, then the termination will take effect seven (7) days after receipt of the notice.

(e) The Collaborator acknowledges that, under the *Government Information (Public Access) Act* 2009, the CMA may be required to publicly disclose information about this Agreement at https://tenders.nsw.gov.au . None of the disclosure obligations require the disclosure of: the commercial-in-confidence provisions of a contract; any matter that could reasonably be expected to affect public safety or security; or information which would be exempt from disclosure if it were the subject of an application under that Act. The Collaborator may nominate any items it considers are confidential and why, to assist the CMA in determining what items to disclose

(f) The Collaborator authorises the CMA to make personal information concerning the Collaborator, such as its name, address and details of its work performance, available to other State, Commonwealth and local government agencies and funding agencies. The Collaborator does not have to supply this information; however, the CMA may not be able to fulfil its obligations without revealing that information to such agencies. The Collaborator may obtain details of any personal information about it held by the CMA by contacting the CMA's Contact Person.

13. Privacy

13.1 The Collaborator will:

(a) use Personal Information provided by the CMA or collected by the Collaborator under this Agreement, only for the purposes of performing its obligations under this Agreement;
(b) not disclose any Personal Information without the written consent of the CMA;
(c) comply with the Information Protection Principles applying to NSW public sector agencies under the *Privacy and Personal Information Protection Act 1998 (NSW)*; and
(d) include equivalent requirements (including this clause 13.1) in any subcontract entered into for the provision of any of the Project Activities under this Agreement.

14. Promotional Material

14.1 Neither party will publish any article relating to the Programme without the prior written consent of the other party, such consent not to be unreasonably withheld. Where appropriate, publications arising out of the performance of this agreement will be jointly authored.

14.2 In the interest of maintaining the good name and reputation of both parties, Collaborator and CMA agree that full details (including artwork) of all proposed advertising or promotional material, press releases and any other publicity material or products making reference to the partnership and the Project Activities will be presented to both parties for approval prior to its production, publication or distribution. Neither party may proceed without the prior written consent of the other party (such consent not to be unreasonably withheld or delayed).

15. Term and Termination

15.1 This Agreement will commence on the Commencement Date and shall continue for the Term.

15.2 This Agreement will conclude on the earlier of:

(a) Expiry in accordance with clause15.1;

(b) on the expiration of 90 days following receipt of a notice from one party that it wishes to terminate the agreement; or

(c) except as provided for under clause 12.4(d), termination by either party by giving notice to the other party where the other party has breached any material provision of this Agreement and that other party has not rectified the breach within 30 days of receiving notice requiring it to do so;

(d) termination by the CMA by notice to the Collaborator if the Collaborator becomes insolvent, makes an assignment for the benefit of creditors, is the subject of winding up proceedings whether voluntary or compulsory otherwise than for the purpose of reconstruction and amalgamation or a receiver is appointed to the Collaborator by a court.

15.3 On termination of this Agreement:

(a) Termination of this Agreement will be without prejudice to any accrued rights of the parties;

(b) A party exercising its right to terminate under clause 15.2(b) will not be liable for any loss of profit, consequential loss or indirect loss suffered by the other party in relation to or as a result of the termination.

16. Insurance

16.1 The Collaborator must maintain the following insurance policies during the Term of the Agreement:

(a) public liability insurance, in the amount of not less that $10 million in respect of each and every occurrence and unlimited in the aggregate for any period of cover;

(b) worker's compensation insurance which covers all employees;

(c) any insurance which is compulsory under the laws in force for the time being.

16.2 The Collaborator must not do, permit or suffer any act, matter or thing or omission whereby any of the policies referred to in this clause may be vitiated, rendered void or voidable.

16.3 On request by the CMA, the Collaborator must provide a copy of valid and current certificates of currency for each or any of the policies described above.

17. **Dispute Resolution**

17.1 A party must not start an arbitration or court proceedings (except proceedings seeking interlocutory relief) about a dispute arising out of this Agreement unless it has complied with this clause.

17.2 A party claiming that a dispute has arisen must notify the other party to the dispute giving details of the Dispute.

17.3 Each party must negotiate in good faith to resolve a dispute and, if necessary to resolve the dispute, involve the Chief Executive Officers or other senior officers of the parties directly in the negotiations.

17.4 If the dispute involves technical matters and has not been resolved by negotiations under the previous clause within a reasonable time, the parties will refer the dispute for determination by an independent expert agreed by the parties in the technical field of the dispute.

17.5 If the dispute is not resolved under clause 17.3 or 17.4 within 30 days (or longer period agreed between the parties), the parties must refer the dispute for mediation by the Australian Commercial Dispute Centre Limited ("ACDC") for resolution in accordance with the Mediation Rules of the ACDC.

17.6 If the dispute is not resolved under clause 17.5 within 60 days after referral (or longer period agreed between the parties) either party may initiate proceedings in a court.

18. **Notices**

18.1 Unless otherwise stated in this Agreement, all Notices to be given under this Agreement must be in writing, and hand-delivered, posted, faxed or emailed:

(a) for the Collaborator, to the contact details specified in the Details or as otherwise notified in writing; and

(b) for the CMA, to the contact details for the Contact Person specified in the Details or as otherwise notified in writing.

18.2 Any Notice is deemed to be received by the receiving party as follows:

(a) if hand delivered, the day on which it is left at the relevant address;

(b) if sent by regular post within Australia, four [4] Business Days after the day on which it is posted;

(c) if sent by facsimile, the day of transmission, or the date and time the sender received a delivery confirmation report, and

(d) if sent by email, on entering the information system of the recipient party, notices given under the following clauses of the Agreement must not be sent by email: clause 15 (termination), clause 16 (insurance) and clause 18 (dispute resolution).

19. **General**

19.1 **Survival:** The following clauses survive termination or expiration of this Agreement clause 11 (Intellectual Property), clause 12 (Confidential Information), clause 13 (Privacy), clause 15 (Term and Termination), clause 15.3 (Termination consequences) this clause 19.1 and any other clause which by its nature is intended to survive this Agreement.

19.2 **Keeping of records and rights of access to such records:** The Collaborator:

(a) Where funding is received from the CMA the Collaborator authorises the CMA and any State or Commonwealth Government department or agency (the "Auditors") that has provided moneys to the CMA for the purposes of this Agreement, to examine and inspect, at reasonable times and on reasonable notice held by the Collaborator and Records, and allow any such Records to be copied; and

(b) Provide all reasonable assistance in order for auditors to properly carry out such inspections and audits.

19.3 **Independent Research:** Provided such research does not adversely affect that party's ability to carry out its obligations under this Agreement, each party has the right to conduct research independent of the Project free of any obligation to the other Party.

19.4 **Variation:** This Agreement may only be varied by agreement in writing signed by the parties.

19.5 **Inconsistency:** If there is any inconsistency between provisions then the order of precedence will be:

(a) the **Details**; then
(b) the **Special Conditions**; then
(c) these **Terms**; then
(d) any **Schedules**.

19.6 **Negation of employment, partnership or agency:** Notwithstanding that this Agreement is described as a "partnering":

(a) This Agreement does not create a relationship of agency, partnership, joint venture and/or employment between the parties.
(b) the rights, duties, obligations and liabilities of each party to this Agreement are several and not joint or collective;
(c) no party may hold itself out as the agent of, or in any way bind or commit, any other party to any obligation; and
(d) neither party has the authority to pledge or purport to pledge the credit of the other party, or to make or give any representations, warranties or undertakings for or on behalf of the other party.

19.7 **Waiver**

(a) If a party fails to exercise any of its rights under this Agreement, or delays exercising those rights, that failure or delay will not operate as a waiver of those rights or any future rights or in any respect estop a party from relying on the terms of this Agreement to their full force and effect.
(b) Any waiver by a party of a breach of this Agreement must be in writing and will not be construed as a waiver of any further breach of the same or any other provision.

19.8 **Assignment:** The Collaborator must not assign or novate its obligations or interests under this Agreement, without the prior written consent of the CMA.

19.9 **Counterparts:** This Agreement may be signed in any number of counterparts which taken together will constitute one instrument

19.10 **Governing Law:** The laws of New South Wales govern this Agreement and the parties submit to the non-exclusive jurisdiction of the courts in that State.



Executed as an Agreement (company)

Signed for and on behalf of Anglo American Metallurgical Coal Pty Ltd by:	
.....	.....
Signature of Director (1)	Signature of ~~Director (2) or~~ Company Secretary
Dieter Haage	Helen Patricia Kelly
Name of Director (1)	Name of ~~Director (2) or~~ Company Secretary
13/4/12	20/3/12.
Date	Date

Signed for and on behalf of the CMA **a part of Department of Primary Industries, an office of the Department of Trade & Investment, Regional Infrastructure & Services for and on behalf of the State of New South Wales** by its authorised signatory:

SUSAN E HOOKE	
Name	Signature
Chair Hunter-Central Rivers CMA	7 March 2012
Title	Date

SCHEDULE 1

Programme Goals

The goals of the Programme have been developed on the basis of the following:

- The Guiding Principles contained within the Hunter-Central Rivers Catchment Action Plan (CAP);
- Sound management of native vegetation including revegetating with locally endemic species;
- Sound management practices relating to riparian rehabilitation, woody weed control, stabilising actively eroding soils and revegetation of saline discharge areas; and
- Appropriate and best practice land management in relation to sustainable farming practices.

SCHEDULE 2

Saddlers Creek Property Planning and Land Rehabilitation Project

Background

Anglo American has approached the Hunter-Central Rivers Catchment Management Authority (CMA) in regards to the opportunities for rehabilitation of their properties in the Saddlers Creek catchment. Based on several site visits to the Saddlers Creek property and subsequent discussions with Anglo American staff, a project to undertake land rehabilitation and associated property planning activities was developed.

Project Scope

The proposed Saddlers Creek Property Planning and Land Rehabilitation Project area encompasses those lands illustrated in Figure 1. These lands are wholly owned by Anglo American. This is an area of non-operational land adjacent to the "Drayton South" open cut coal mine proposal. There is an existing lessee who manages this land and is a willing participant in the proposed property planning and land rehabilitation activities associated with the project.

Activities proposed for rehabilitation of Saddlers Creek have been developed from the land capability classification given to the land. This classification describes the practices that are within the natural limits of the land; dependent on soil type, slope, aspect and rainfall. A project outline with initial cost estimates is outlined below.

Project Activities

Broadly, project activities identified for Saddlers Creek and that form the cornerstones for proposed land rehabilitation include:

- Soil conservation earthworks, such as contour banks, gully control structures, and reshaping of eroded areas;
- Riparian fencing;
- Appropriately located vehicle and stock creek crossings;
- Revegetation, such as buffers, stock shelter belts, native vegetation restoration; and
- Sustainable farm practices, including minimal tillage, selection of appropriate machinery types, off stream watering, strategic fencing and rotational grazing.

Project Roles and Responsibilities

Anglo American will:

- Fund the project from its own funds
- Ensure that all approvals and licences necessary to undertake any and all of the project activities as described are in place prior to the activities to which those approvals and licences pertain are commenced.
- Develop project plan(s) in collaboration with the CMA at a suitable scale for each of the activities to be undertaken
- Engage and direct suitably qualified employees and contractors to undertake the works described in the project plan(s)
- Monitor, evaluate and report on the activities and outcomes according to a Monitoring, Evaluation and Reporting (MER) plan developed in collaboration with the CMA
- Provide the CMA with data pertaining to the outputs from the project, for inclusion in reporting against the targets described in the CAP

The CMA will:

- Assist with the development of project plan(s) in collaboration with Anglo American at a suitable scale for each of the activities to be undertaken
- Provide technical support to Anglo American to support the implementation of certain works undertaken as part of the project (these to be limited to soil conservation works, in-stream structures and riparian works).
- Provide advice to Anglo American on the implementation of strategic grazing activities.

- Collaborate with Anglo American to develop and implement a MER plan for the project.

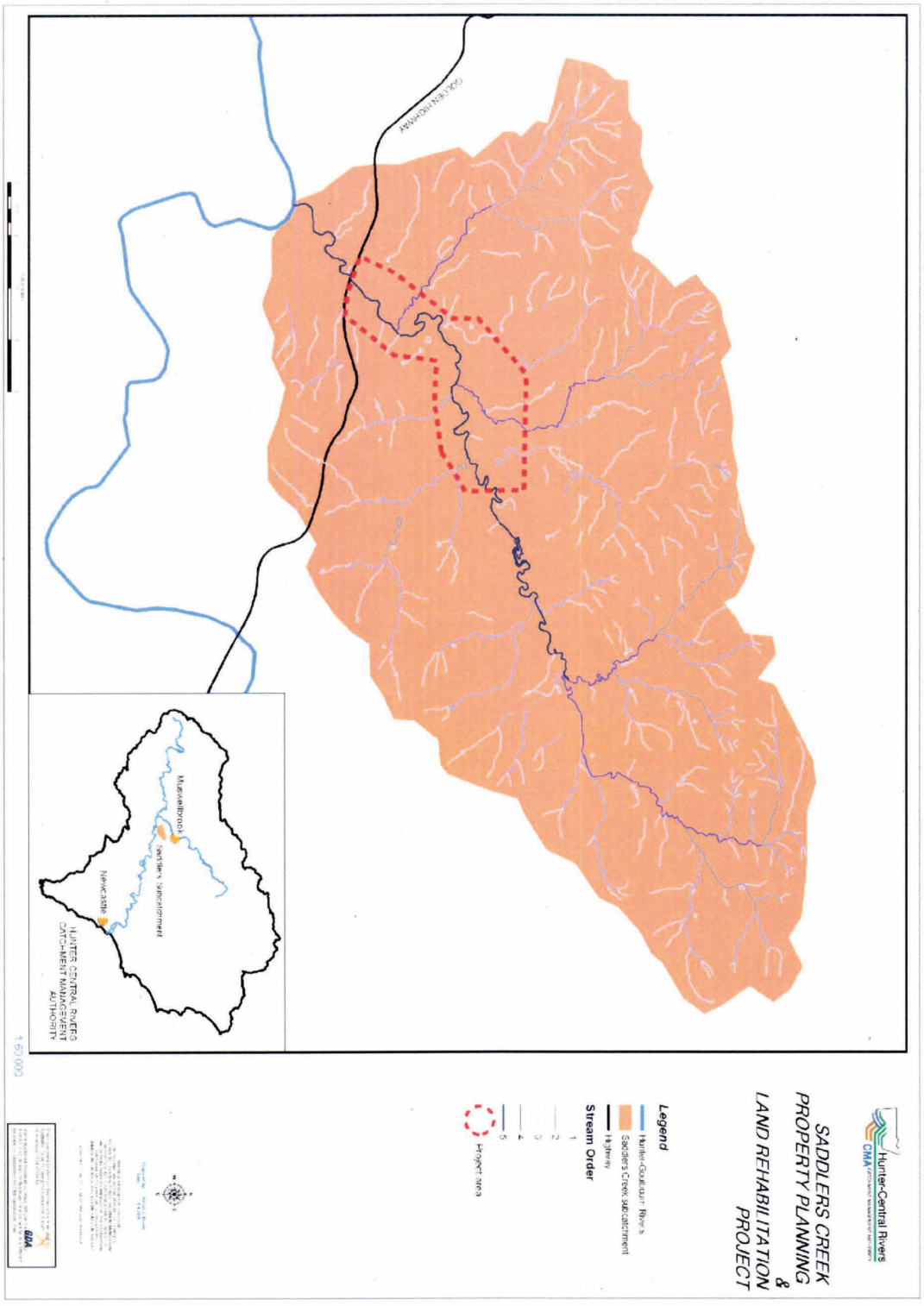


FIGURE 1: Saddlers Creek Property Planning and Land Rehabilitation Project area

Project concept and planning

A concept design layout, preliminary costs and a draft concept project map has been prepared, displaying the recommended activities along Saddlers Creek. The project area has been broken into three work areas. Detailed works are described below along with initial cost estimates. A concept project area is attached (Figure 2).

The concept map is subject to the proposed Edderton Road realignment, which is understood to traverse the project area.

Activities proposed for rehabilitation of Saddlers Creek are developed from the land capability classification given to the land. This classification describes the practices that are within the natural limits of the land; depend on soil type, land management constraints, slope, aspect and climate[1]

Land capability class for the western side of the creek ranges between Class III to Class V. The maps suggest the areas are mainly Class III. However soil limitations and slope provide limits to the land management practices and the area based on these issues is dominated by Class V. This classification relates to arable land with a moderate to high soil erosion hazard. The restricted areas of Class III land, soil erosion can be controlled by using soil conservation earthworks and/or conservation farming practices. Class V land which dominates the terrain is suitable for grazing. There are isolated areas of Class IV which restricts the land to occasional cropping providing soil conservation measures are implemented as per Class III.

The soil conservation earthworks proposed below require stable outlets with either permanently grassed areas or masonry works for water disposal points to ensure long term stability of the systems. Fencing of water disposal areas allows for greater ground cover and restricts domestic grazing in these critical areas. The earthworks generally require maintenance to ensure their continued effectiveness.

Proposed management activities for the Saddlers Creek land rehabilitation project area involve the following:

Soil conservation earthworks

- Construction of contour banks to divert surface flows away from degraded areas to dams to assist in reducing peak run-off and to increase water retention in the catchment.
- Construction of a gully control structure (flume) to stabilise the head-cut in the flow line originating from the property "Loloma" to the west of Saddler's Creek. The 1.5m head-cut is on a main tributary to Saddlers Creek (from the right bank) approximately 100m downstream of the existing vehicle crossing. The gully control structure would consist of angular rock, secured individually into place, with a cut-off wall at the top and bottom of the structure to secure the rock and prevent undercutting of the structure. The shape of the rock flume allows concentrated flows to be directed down the face of the flume and discharged into a stilling pond, before re-entering the gully at existing bed level. Estimated rock volume required to secure the bed of the gully is 220 cubic metres. A concept plan of the proposed structure is attached.
- Reshaping of upper terrace scour areas and smaller lateral head-cuts and application of seed and fertiliser to promote rapid establishment of ground cover
- Reshaping/ extension of existing contour banks to restore their functional use
- Stabilisation of a spillway from an existing dam with shaping and strips of revegetation across the gully to aid sediment retention

[1] Cunningham, GM, Higginson, F.R., Riddler, A.M.H., and Emery, K.A. 1986. *Systems Used to Classify Rural Lands in New South Wales.* Soil Conservation Service and NSW Agriculture.

Riparian fencing

Construction of fencing along Saddlers Creek and main tributaries is recommended to create a riparian corridor and allow regeneration of native plants and establishment of planted vegetation. The minimum buffer widths from the top of bank to the proposed fencing relative to the stream order (3rd order and above) is 40m on each side of the stream.

Tributaries of 3rd order and above or areas that become excessively wet or boggy would also benefit from fencing out. Recommended buffer widths vary for these tributaries, generally a minimum of 10m from the top of the bank to allow for lateral movement of streams, natural regeneration and ease of fencing.

Portions of existing fencing that is within the limits of the buffer area would be removed and new fencing located along the preferred buffer width alignment. (Area 2, Right bank; Figure 2).

Creek crossings

Vehicle and stock crossings are ideally located across a stable, straight stretch of stream to prevent erosion and extensive alteration to the channel. Crossings encountered during the site visits have been well located, with crossing levels matching streambed levels and minimal erosion on entries and exits. Little or no remedial works are required at these locations, but they will require careful management into the future.

Revegetation

Wide, dense, healthy vegetation buffers along the riparian areas provide multiple benefits for the catchment including habitat for aquatic and terrestrial wildlife, stream-bank erosion protection and biodiversity enhancement. Revegetation is recommended along the creek banks and the top of the banks to complement the suite of remnant riparian vegetation that occurs along the streams.

Casuarina glauca. (Swamp oak), is dominant along the riparian area with *Phragmites australis.* (native rush) and *Juncus acutus* (spiny rush an introduced species) intermixed along the creek-line. Areas where *juncus* dominates is generally an indicator of saline flows. A saline discharge area is highlighted on Figure 2. Revegetation with saline tolerant species is recommended across this area to alleviate saline discharge into the creek.

Locally endemic species grown from locally collected seed would be most suitable for revegetation. A plant list specific to the vegetation landscape is also available.[2]

Revegetation of Tributaries

The majority of tributaries to this section of the Saddlers Creek catchment have little or no native tree population. Connectivity to native vegetation outside the property is also low, and so the seed source for natural recruitment of native plants is very limited.

Suitable density of plantings for side gullies with no existing tree vegetation would be;
Minimum 3 rows of plantings along the banks, 3 along the top of the banks, each side of the gully, 4m spacings → 3000 plants / km.

Paddock Revegetation

Consideration may be given to connection of isolated paddock trees to other trees via vegetated corridors. Existing contour banks may provide a suitable medium for planting shelter belts and allow this connection. Integrated with internal paddock fencing (see Grazing section below) these linkages would provide additional stock shade and shelter and improved biodiversity benefits.

[2] Peake, T. 2003. Hunter Bushland Resource Kit: A guide to managing vegetation on private land in the Hunter catchment. Southwood Press, Hunter Catchment Management Trust, Tocal

Shelter belts for the project area have been aligned to suit the land aspect. Eastern facing slopes have greater distance between the corridors, compared to the southern and western facing slope that require greater protection from prevailing winds and therefore closer corridor spaces.

Land management - general

Cropping practices

Farming practices using conservation techniques such as minimal tillage, no kill cropping, direct drilling and pasture cropping are encouraged to maximise the amount of ground cover retained all year round, improving the organic matter in the soil, and improving general soil health.

The type of machinery used is critical in achieving conservation improvements, and existing machinery is often modified to allow this. Suitable machinery may include a "Para Plough", "Agrowplow" or a direct seed drill or machinery with "Baker Boot" fittings that minimise soil disturbance. Machinery such as offset disc ploughs would not form part of a sustainable system as they destroy soil structure.

Particularly in soils that are highly erodible, which is typical across the Bowfield property, conservation tillage techniques are recommended to allow the current enterprise to continue in the long term.

Grazing practices

Adjacent paddocks may benefit from the promotion of rotational grazing techniques, subject to establishment of a suitable stock density and paddock layout. Extensive grass growth in some areas along the western fall of the creek (Areas 1 and 2) may benefit from more intensive grazing over shorter periods, with longer periods of rest to utilise the growth potential of the existing pasture mix.

Subdivisional fencing would allow these strategic rotations to take place and would be easily facilitated through integration with the proposed riparian fencing.

Weed control

There are minimal weeds within the project area. Isolated plants including blackberry and boxthorn occur in Areas 1 and 3, and continued control of these woody weeds is recommended.

Off stream watering

Augmentation of the existing dams via provision of a reticulated system, coupled with a suitable rotational grazing system would allow maximisation of the available pasture and provide further stock benefits through a reticulated system.

A concept rotational plan has been developed for the grazing areas along the right bank of Saddlers Creek.

Initial ~~Cost~~ Work Estimates

The ~~costs associated with~~ the following list of recommended activities are to be considered as an estimate only and are based on the field experience of CMA staff and advice from other external sources. The user of this information is therefore advised to seek further clarification of costs prior to commencing the activities.

1. Rock Flume Design Saddler's Creek

Located on 4th order stream to the west of Saddler's Creek originating from W.R.Wolfgang property "Loloma".

Design Criteria

- 1,007 hectare catchment
- ARI (return period) I in 50 year
- Peak discharge 28 cubic metres.
- Drop of 1.5 meters
- Flume grade 1 in 10.

- 15 metres wide
- Rock Density minimum of 2200
- Minimum Rock diameter 0.6
- Total rock 220 cubic metres
- Cubic metres of the total of 220 to have a diameter of 0.8 metre.
- 2 concrete trenches minimum depth of 1.1 metres

2. Log Structures
- Located on the first flow line west of Saddler's Creek above Golden Highway.
- 3 log structures to control 3 different gully heads each 0.5 metre deep.
- Logs structures to be approximately 6 metres long.

3. Fencing
- Internal fencing including subdivision fencing tree planting area including initial exclusion fencing of Saddler's Creek and Tributaries.
- Based on traditional fence of 3 barbed wire and 2 plains with wooden post strainers and stays
- Total length of fencing is estimated at14 kilometres

4. Tree Planting
- 5.2 kilometres however Saddler's Creek initial area from Golden Highway 1 kilometre needs to have both sides planted
- Hence the total of 6.2 kilometres.
- At 3,000 trees per kilometre
- Total of 18,600 trees allow plants, (associated materials weed, mats, stakes and plastic or cardboard covers, fertiliser tablets).

5. Soil Conservation Works

Diversion Banks
- 2,500 metres to divert water into existing dams and away from eroded areas, including allowing for re-topsoiling due to the erosion hazard and general low fertility soils
- Gully Fill 700 metres
- Gully Shaping 2,000m

Compost
- Highly disturbed areas to be treated with compost from recycled green waste. The total area recommended to be treated for erosion is 9 hectares.

Seeding of eroded areas
- Seeding eroded areas

6. Weed Control
- Control of the existing boxthorns and blackberries using a combination of mechanical and chemical control methods.

7. Rabbit and Hare Control Program

Control by baiting
- Estimated minimum of 10 kilometre lineal length of bait runs.
- May need follow up work such as shooting and or release of virus

Warren ripping (bulldozer)
- Estimated 170 warrens varying in size are to found on the property.
- A minimum of 50 hours machine time is likely.

Seeding the disturbed Areas
- The area disturbed as a result of ripping of rabbit warrens is estimated at 20 hectares.


Hunter-Central Rivers CMA
Saddlers Creek Land Rehabilitation Project:
Concept Plan
Area 1
Golden Highway to Main Tributary
Area 2
Main Tributary to next paddock
Area 3
Paddock to Edderton Rd
Prepared by: Linda Russell & Adrian J. Brown
Date: 8/9/11
Legend
Existing Fence
Cattle Yards
Proposed Works
Riparian fencing
Internal fencing
Reshaping
Flume
Diversion bank
Establish vegetation
N
0 100200 400 Meters
GDA
AREA 1
AREA 2
AREA 3
Edderton Road
Golden Highway
Saline revegetation area

Figure 2.

Appendix E

Biodiversity Credit Reports

BioBanking credit report

This report identifies the number and type of credits required at a BIOBANK SITE

Date of report: 13/04/2015 Time: 12:44:57PM Calculator version: v4.0

Biobank details

Proposal ID:	0057/2015/1557B
Proposal name:	9080 - Offset Onsite - New EIS
Proposal address:	1 Mountain Street Epping NSW 2121
Proponent name:	Cumberland Ecology
Proponent address:	1 Mountain Street Epping NSW 2121
Proponent phone:	(02) 9868 1933
Assessor name:	David Robertson
Assessor address:	PO BOX 2474 Carlingford Court NSW 2118
Assessor phone:	9868 1933
Assessor accreditation:	0057

Additional information required for approval:

- ☐ Use of local benchmark
- ☐ Expert report...
- ☐ Request for additional gain in site value

Ecosystem credits summary

Plant Community type	Area (ha)	Credits created
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	435.29	3,336.00
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	82.19	710.00
Total	517.48	4,046

Credit profiles

1. River Red Gum / River Oak riparian woodland wetland in the Hunter Valley, (HU599)

Number of ecosystem credits created	254
IBRA sub-region	Hunter

2. Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter, (HU905)

Number of ecosystem credits created	2,534
IBRA sub-region	Hunter

3. Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter, (HU905)

Number of ecosystem credits created	802
IBRA sub-region	Hunter

4. River Red Gum / River Oak riparian woodland wetland in the Hunter Valley, (HU599)

Number of ecosystem credits created	456
IBRA sub-region	Hunter

Species credits summary

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Weeping Myall population in the Hunter catchment	Weeping Myall population in the Hunter catchment	2.00	14
River Red Gum population in the Hunter Catchment	Eucalyptus camaldulensis	1.00	7

Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Exclude commercial apiaries
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Exclude miscellaneous feral species
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Feral and/or over-abundant native herbivore control
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Fox control
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Slashing
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Control of feral pigs
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Exclude commercial apiaries
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Exclude miscellaneous feral species
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Feral and/or over-abundant native herbivore control
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Fox control
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Maintain or re-introduce natural flow regimes
River Red Gum / River Oak riparian woodland wetland in the Hunter Valley	Slashing
River Red Gum population in the Hunter Catchment	Slashing
Weeping Myall population in the Hunter catchment	Feral and/or over-abundant native herbivore control
Weeping Myall population in the Hunter catchment	Slashing

BioBanking credit report

This report identifies the number and type of credits required at a BIOBANK SITE

Date of report: 13/04/2015 Time: 12:48:24PM Calculator version: v4.0

Biobank details

Proposal ID:	0057/2015/1558B
Proposal name:	9080 - Offset Offsite - New EIS
Proposal address:	1 Mountain Street Epping NSW 2121
Proponent name:	Cumberland Ecology
Proponent address:	1 Mountain Street Epping NSW 2121
Proponent phone:	(02) 9868 1933
Assessor name:	David Robertson
Assessor address:	PO BOX 2474 Carlingford Court NSW 2118
Assessor phone:	9868 1933
Assessor accreditation:	0057

Additional information required for approval:

- ☐ Use of local benchmark
- ☐ Expert report...
- ☐ Request for additional gain in site value

Ecosystem credits summary

Plant Community type	Area (ha)	Credits created
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	54.25	488.00
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	13.79	128.00
Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	48.35	471.00
Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion	70.61	628.00
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	243.75	2,420.00
White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	268.04	2,748.00
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	946.20	10,295.00
Total	1,644.99	17,178

Credit profiles

1. Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion, (NA359)

Number of ecosystem credits created	2,420
IBRA sub-region	Peel - Namoi

2. Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion, (NA414)

Number of ecosystem credits created	9,387
IBRA sub-region	Peel - Namoi

3. Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion, (NA414)

Number of ecosystem credits created	908
IBRA sub-region	Peel - Namoi

4. Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion, (NA342)

Number of ecosystem credits created	471
IBRA sub-region	Peel - Namoi

5. Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion, (NA257)

Number of ecosystem credits created	488
IBRA sub-region	Peel - Namoi

6. White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion, (NA393)

Number of ecosystem credits created	2,748
IBRA sub-region	Peel - Namoi

7. Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion, (NA353)

Number of ecosystem credits created	628
IBRA sub-region	Peel - Namoi

8. River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion, (NA191)

Number of ecosystem credits created	128
IBRA sub-region	Peel - Namoi

Species credits summary

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Cymbidium canaliculatum population in the Hunter Catchment	Cymbidium canaliculatum population in the Hunter Catchment	1.00	7
Large-eared Pied Bat	Chalinolobus dwyeri	36.90	262
Large-eared Pied Bat	Chalinolobus dwyeri	0.00	262
Tylophora linearis	Tylophora linearis	5.00	36

Additional management actions

Additional management actions are required for:

Vegetation type or threatened species	Management action details
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Exclude commercial apiaries
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Exclude miscellaneous feral species
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Feral and/or over-abundant native herbivore control
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Fox control
Blakely's Red Gum - Yellow Box grassy tall woodland on flats and hills in the Brigalow Belt South Bioregion and Nandewar Bioregion	Slashing
Large-eared Pied Bat	Feral and/or over-abundant native herbivore control
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Exclude commercial apiaries
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Exclude miscellaneous feral species
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Feral and/or over-abundant native herbivore control
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Fox control
River Oak - Rough-barked Apple - red gum - box riparian tall woodland (wetland) of the Brigalow Belt South Bioregion and Nandewar Bioregion	Slashing

Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	Exclude commercial apiaries
Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	Exclude miscellaneous feral species
Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	Feral and/or over-abundant native herbivore control
Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	Fox control
Rough-barked Apple - White Cypress Pine - Blakely's Red Gum riparian open forest / woodland of the Nandewar Bioregion and New England Tableland Bioregion	Slashing
Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion	Exclude commercial apiaries
Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion	Exclude miscellaneous feral species
Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion	Feral and/or over-abundant native herbivore control
Silvertop Stringybark - Mountain Gum grassy open forest of the New England Tableland Bioregion	Fox control
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	Exclude commercial apiaries
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	Exclude miscellaneous feral species
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	Feral and/or over-abundant native herbivore control
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	Fox control
Silvertop Stringybark - Yellow Box +/- Nortons Box grassy woodland on basalt hills mainly on northern aspects of the Liverpool Range, Brigalow Belt South Bioregion	Slashing
White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	Exclude commercial apiaries
White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	Exclude miscellaneous feral species
White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	Feral and/or over-abundant native herbivore control
White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	Fox control

White Box - Silvertop Stringybark +/- White Cypress Pine grass shrub open forest of the southern Nandewar Bioregion and New England Tableland Bioregion	Slashing
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	Exclude commercial apiaries
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	Exclude miscellaneous feral species
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	Feral and/or over-abundant native herbivore control
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	Fox control
Yellow Box - White Box - Silvertop Stringybark - Blakely's Red Gum grass shrub woodland mainly on the Liverpool Range, Brigalow Belt South Bioregion	Slashing

BioBanking credit report

This report identifies the number and type of credits required at a BIOBANK SITE

Date of report: 26/04/2015 Time: 10:05:47AM Calculator version: v4.0

Biobank details

Proposal ID:	0057/2015/1556B
Proposal name:	9080 - Offset Rehab - New EIS
Proposal address:	1 Mountain Street Epping NSW 2121
Proponent name:	Cumberland Ecology
Proponent address:	1 Mountain Street Epping NSW 2121
Proponent phone:	(02) 9868 1933
Assessor name:	David Robertson
Assessor address:	PO BOX 2474 Carlingford Court NSW 2118
Assessor phone:	9868 1933
Assessor accreditation:	0057

Additional information required for approval:

- ☐ Use of local benchmark
- ☐ Expert report...
- ☐ Request for additional gain in site value

Ecosystem credits summary

Plant Community type	Area (ha)	Credits created
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	471.12	2,791.00
Slaty Box - Grey Gum shrubby woodland on footslopes of the upper Hunter Valley, Sydney Basin Bioregion	655.75	4,398.00
Total	1,126.87	7,189

Credit profiles

1. Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter, (HU905)

Number of ecosystem credits created	2,791
IBRA sub-region	Hunter

2. Slaty Box - Grey Gum shrubby woodland on footslopes of the upper Hunter Valley, Sydney Basin Bioregion, (HU618)

Number of ecosystem credits created	4,398
IBRA sub-region	Hunter

Species credits summary

Additional management actions