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DEPARTMENT OF PLANNING, INDUSTRY AND ENVIRONMENT

BIODIVERSITY ASSESSMENT REPORT - STAGE 1

SPECIAL ACTIVATION PRECINCT, PARKES

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JULY 2019

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Biodiversity Assessment Report - Stage 1
Special Activation Precinct, Parkes

Department of Planning, Industry and Environment

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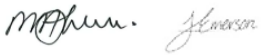
Prepared by:	Mark Stables; Julia Emerson (nee Wyllie)	03/06/2019	
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TABLE OF CONTENTS

CONTENTS (Continued)

CONTENTS (Continued)

LIST OF TABLES

LIST OF TABLES (CONTINUED)

LIST OF TABLES (CONTINUED)

LIST OF FIGURES

LIST OF PHOTOGRAPHS

LIST OF PHOTOGRAPHS (CONTINUED)

LIST OF APPENDICES

1 PROJECT BACKGROUND

1.1 INTRODUCTION

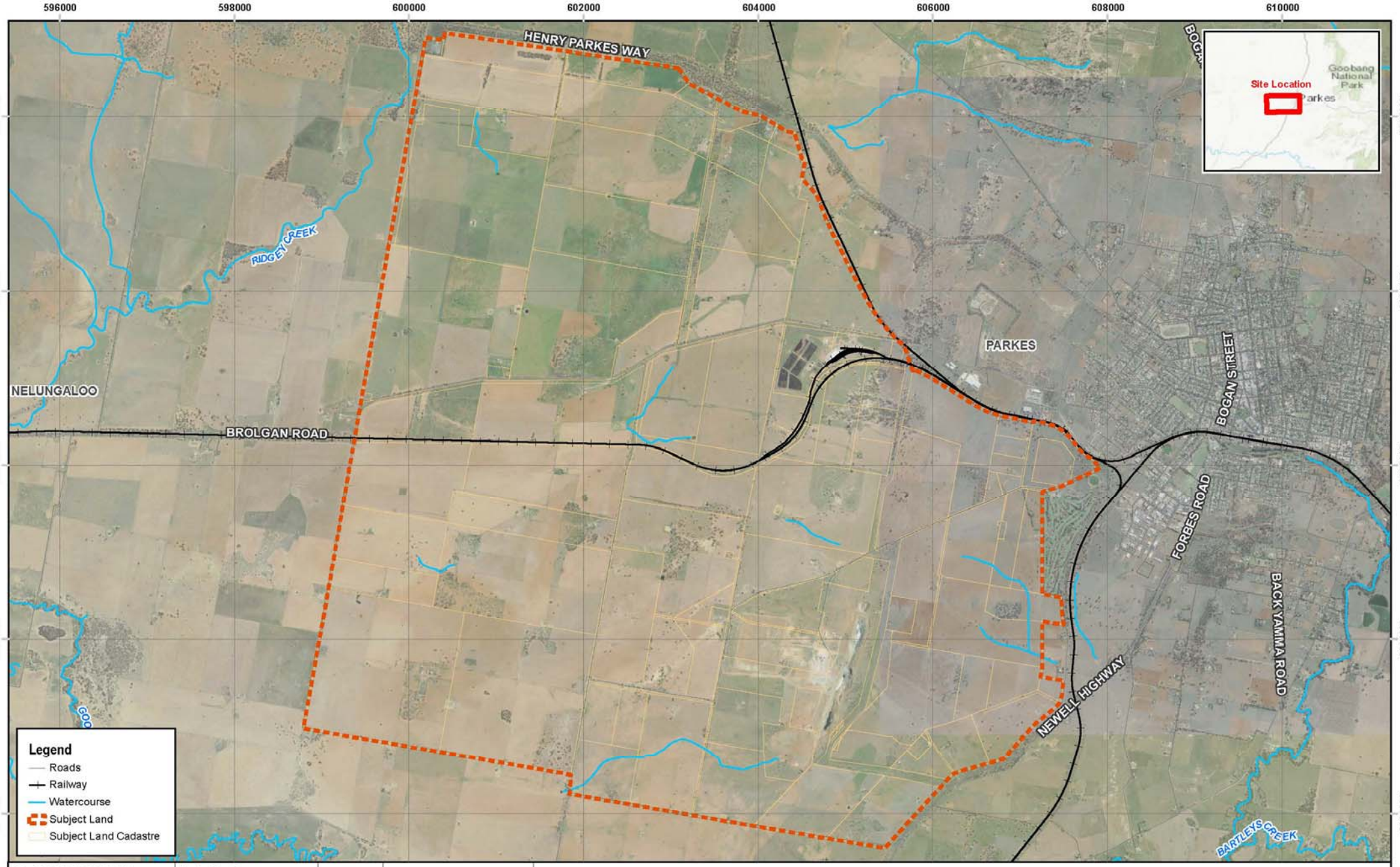
In July 2018, the NSW Government announced the first Special Activation Precinct (SAP) at Parkes. The objective of the SAP is to deliver a 20 year vision for job creation and economic development in the area. The Parkes SAP has been selected because of the economic opportunities from the construction of Inland Rail, the junction of the Perth/Adelaide rail corridor and its proximity to Henry Parkes Way and Newell Highway.

The investigation area for the Parkes SAP is approximately 5,600 hectares which is predominately agricultural land however also includes freight and logistics, solar farms and a quarry (hence forth referred to as the 'investigation area') (Figure 1.1). The development of the SAP allows government to fast track planning for the precinct and provide streamline environmental approvals.

1.2 PURPOSE OF THIS REPORT

This draft Biodiversity Assessment Report (BAR) has been prepared to address Stage 1 of the Biodiversity Assessment Method 2017 (BAM) and provides an assessment of the biodiversity values of the investigation area. Whilst the primary purpose of this report is to provide an assessment of the biodiversity values of the investigation area in the context of the *Biodiversity Conservation Act 2016* (BC Act) it also assesses 'Matters of National Environmental Significance' (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The purpose of this Stage 1 report is to provide an understanding of the baseline biodiversity values of the investigation area to inform ongoing Master Plan evaluation and identify any existing data gaps.



Parkes SAP

Figure 1.1
Site Map

2 METHODS

The following methods have been undertaken in the preparation of this BAR in accordance with the BAM. All work was carried out under the appropriate licences, including a scientific licence as required under Part 2 of the BC Act (License Number: SL100630) and an Animal Research Authority issued by the DPI (Agriculture).

2.1 PERSONNEL

The contributors to the preparation of this report, their qualification and roles are provided in Table 2.1.

Table 2.1 Contributors and their roles

NAME	QUALIFICATIONS	ROLE
Alex Cockerill	Bachelor of Science (Hons), accredited BAM assessor BAAS17020	Principal Ecologist – technical review
Selga Harrington	Bachelor of Science (Hons), accredited BAM assessor BAAS17079	Principal Ecologist – ecology lead, technical input
Mark Stables	Bachelor of Science (Hons), accredited BAM assessor BAAS18097	Principal Ecologist – field surveys, report preparation
Julia Emerson (nee Wyllie)	Bachelor of Environment, Cert 3 Conservation and Land Management, accredited BAM assessor BAAS18034	Ecologist – field surveys and report preparation
Troy Jennings	Bachelor of Biodiversity and Conservation, Master of Wildlife Management, accredited BAM assessor BAAS18172	Ecologist –Report preparation
Sam Wilson	Bachelor of Environmental Science, Master of Environmental Management	Graduate Ecologist – field surveys
Allan Richardson	Bachelor of Environmental Science (Hons)	Senior ecologist – field surveys and report preparation
David Naiken	Bachelor of Environmental Science (GIS Major); Master in Climate Change	GIS consultant – data management and map preparation
Trent Bowman	Bachelor of Science (Hons), Master of Science in Geoscience	GIS consultant – data management and map preparation

2.2 NOMENCLATURE

Names of vegetation communities used in this report are based on the Plant Community Type (PCT) used in the NSW BioNet Vegetation Classification Database (Office of Environment & Heritage 2019c).

These names are cross-referenced with those used for threatened ecological communities listed under the BC Act and/or the EPBC Act. They are also cross-referenced with previous vegetation mapping (Office of Environment & Heritage 2019e) using dominant species and structure of the community.

Names of plants used in this document follow PlantNet (Royal Botanic Gardens 2019). Scientific names are used in this report for species of plant. Scientific and common names (where available) are provided in the plant list provided in Appendix A. The names of introduced species are denoted with an asterisk (*).

For threatened species of plants, the names used in the OEH Threatened Species Website (Office of Environment & Heritage 2019f) are also provided in Appendix B where these differ from the names used in the PlantNet database.

Names of vertebrate fauna follow the Australian Faunal Directory maintained by the (Department of Environment and Energy (2019a). Common names are used in the report for species of animal. Both common and scientific names are provided in the appendices.

For threatened species of animals, the names used in the OEH Threatened Species Website are provided (Office of Environment & Heritage 2019f) in Appendix D.

2.3 BACKGROUND RESEARCH

2.3.1 DESKTOP REVIEW

The aim of the background research was to identify threatened flora and fauna species, populations and ecological communities, Commonwealth listed Migratory species or critical habitat recorded previously or predicted to occur in the locality of the investigation area.

This allowed for known habitat characteristics of to be compared with those present within the investigation area to determine the likelihood of occurrence of each species or populations. These results informed the identification of appropriate field survey effort and the groups likely to occur.

Records of threatened species, populations and ecological communities known or predicted to occur in the locality of the investigation area were obtained from a range of databases as detailed in Table 2.2.

Table 2.2 Database searches undertaken

DATABASE	SEARCH DATE	AREA SEARCHED	REFERENCE
Bionet Atlas of NSW Wildlife	21/03/19	25 km search around the investigation area	(Office of Environment & Heritage 2019b)
Atlas of Living Australia	21/03/19	Locality search around the investigation area	(Atlas of living Australia 2019)
Protected Matters Search Tool	21/03/19	25 km search around the investigation area	(Department of the Environment and Energy 2019b)
PlantNet Spatial Search	21/03/19	25 km search around the Parkes, NSW	(Royal Botanic Gardens, 2019)
NSW Department of Primary Industries Critical Habitat register	21/03/19	Search of the register	(Department of Primary Industries 2019b)
NSW Office of Environment and Heritage Critical Habitat register	21/03/19	Search of the register	(Office of Environment and Heritage 2019d)

Other relevant documents, existing broad-scale vegetation mapping, aerial photographs including historic aerial photos and maps reviewed as part of this study are referenced throughout the report where appropriate.

2.3.2 SPATIAL DATA USED FOR THE ASSESSMENT OF LANDSCAPE FEATURES

The following spatial data and reports was assessed to determine the landscape features and site values in accordance with Chapter 4 and Appendix 6 of the BAM:

- Aerial photographic imagery (Land and Property Information, 2019a)
- State Vegetation Mapping Central West Lachlan Region VIS_ID 4682 (Office of Environment & Heritage 2019a)
- NSW Mitchell Landscapes (Land and Property Information, 2019b)
- Interim Biogeographic Regionalisation of Australia (IBRA version 7.0) (Thackway & Cresswell, 1995).

2.3.3 LIKELIHOOD OF OCCURRENCE ASSESSMENT

An assessment was completed to assess the likelihood of occurrence of each threatened species, population and community (threatened biodiversity) identified with the potential to occur in the investigation area. All threatened biodiversity identified during background research were considered (see Section 2.3). The habitat assessment was utilised to inform the identification of appropriate targeted surveys. The assessment was based on the habitat profile for the species and other habitat information in the *Threatened Species Profile Database* (Office of Environment and Heritage, 2019f) and the *Species Profile and Threats Database* (Department of the Environment and Energy, 2019b). The assessment also included consideration of the dates and locations of nearby records and information about species populations in the locality. The assessment results are summarised in Section 5 and are provided in full in Appendix B and Appendix D.

For this study, the likelihood of occurrence of threatened and migratory species and populations was determined based on the criteria shown in Table 2.3 below.

Table 2.3 Likelihood of occurrence criteria for threatened species and populations

CLASSIFICATION	DEFINITION
High	It is highly likely that a species inhabits the investigation area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods such as winter flowing resources), has been recorded recently within the locality (10 km) and is known or likely to maintain resident populations in the investigation area. Also includes known or likely to visit the investigation area during regular seasonal movements or migration.
Moderate	Potential habitat is present within the investigation area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the investigation area opportunistically or during migration. The species is unlikely to be dependant (i.e. for breeding or important life cycle periods such as winter flowing resources) on habitat within the investigation area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabitants the investigation area and has not been recorded recently in the locality (10 km). It may be an occasional visitor, but habitat similar to the investigation area is widely distributed in the local areas, meaning that the species is not dependant (i.e. for breeding or important life cycle periods such as winter flowing resources) on available habitat. Specific habitat is not present in the investigation area or the species are a non-cryptic perennial flora species that were specially targeted by surveys and not recorded.
None	Suitable habitat is absent from investigation area.

2.3.4 IDENTIFICATION OF CANDIDATE SPECIES

Candidate species are those that have been assessed as having a moderate to high likelihood of occurring in the investigation area based on desktop assessment. Candidate species can form ecosystem credit species or species credit species as defined under the BAM:

- Ecosystem species credits: are a measurement of the value of threatened communities and habitat for those species that can be reliably predicted to occur with a Plant Community Type (PCT).
- Species credits: are generated by those species that were either recorded during field surveys (or recorded during previous surveys) or have been identified as requiring species credit offsets (as per Biodiversity Assessment Methodology).
- Targeted surveys were undertaken for candidate species as outlined in Section 2.6 below.

2.4 VEGETATION SURVEYS

The investigation area was inspected between 25 February – 1 March and 11–15 March by a team of ecologists. Across both survey periods, a team of two ecologists were mobilised with an additional two ecologists in the second survey period. This survey sought primarily to collect vegetation data and carry out threatened species in accordance with BAM and relevant guidelines to support the BAM Calculator.

2.4.1 NATIVE VEGETATION REGULATORY ASSESSMENT

In accordance with section 6.8 (3) of the BC Act, the BAM is to exclude the assessment of impacts of any clearing of native vegetation and loss of habitat on category 1-exempt land (within the meaning of Part 5A of the Local Land Services Act 2013), other than any impacts prescribed by the regulations under section 6.3.

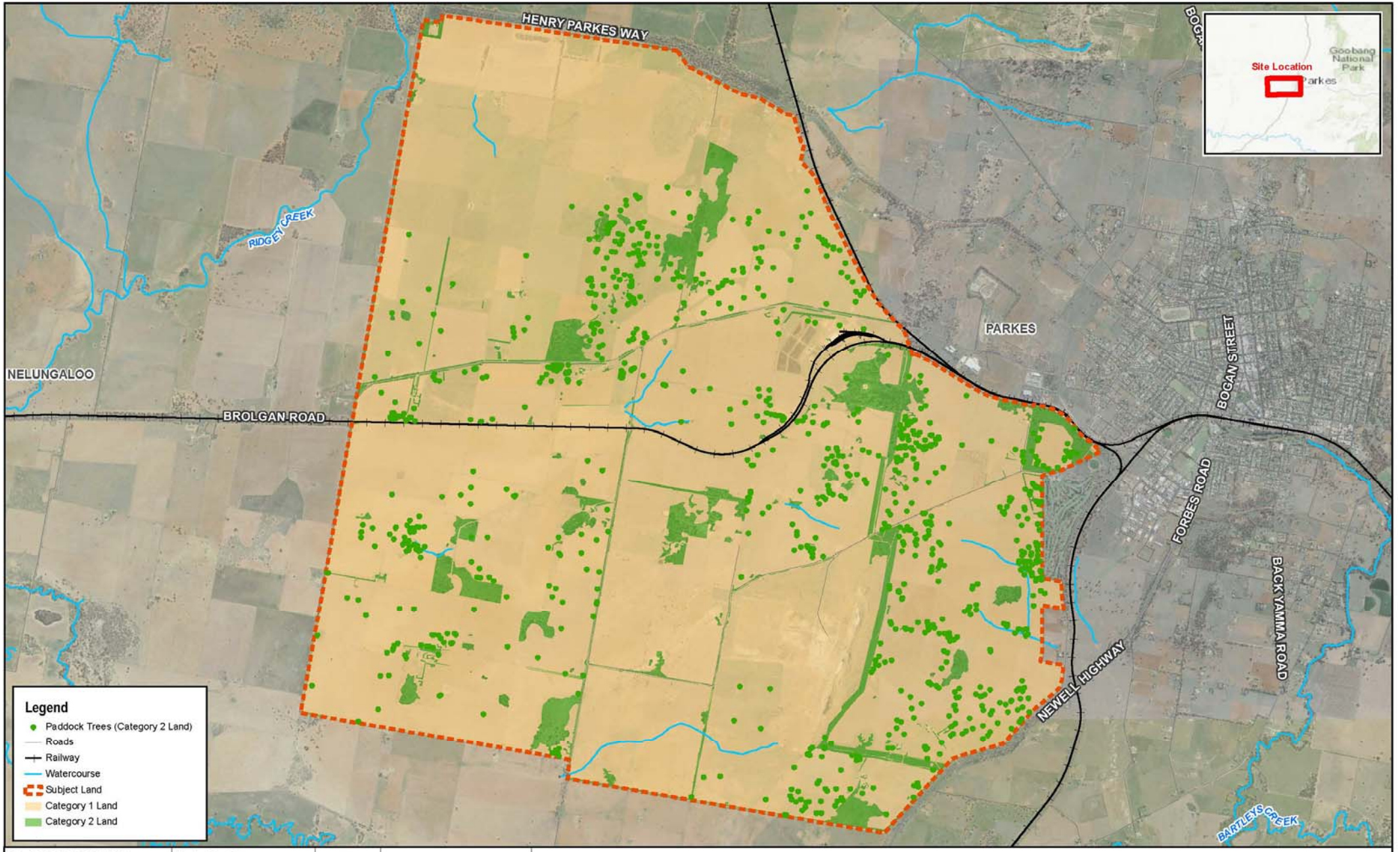
Category 1-exempt land has not currently been mapped for use in NSW and as such native vegetation regulatory mapping has been determined based on an analysis of the following datasets:

- Historical and current land use component – NSW Landuse 2013 ((https://data.nsw.gov.au/data/dataset/nsw-landuse-Office of Environment and Heritage 20183). This dataset is used to classify areas as either cleared/highly disturbed, impacted affected areas of native vegetation and undisturbed or protected areas of native vegetation; and
- Detectable woody vegetation clearing component – NSW Woody Vegetation Extent 2011 (https://datasets.seed.nsw.gov.au/dataset/nsw-woody-vegetation-extent-2011c0569). This dataset is used to identify areas of extant remnant vegetation and cleared lands/non-woody vegetation.

The outcome of native vegetation regulatory category 1-exempt land mapping is presented in Figure 2.1. It should be noted that these areas have been identified through desktop modelling.

2.4.2 STRATIFICATION – DESKTOP ANALYSIS OF VEGETATION

Preliminary mapping of vegetation community boundaries was undertaken through analysis of existing vegetation mapping and aerial photograph interpretation. Analysis of the aerial photographs was used to identify areas of disturbance (e.g. buildings, vehicle tracks, dams and power lines), vegetation structure and likely native versus exotic species composition throughout the investigation area. This provided an initial definition of vegetation communities into simple structural and disturbance classifications for verification during field surveys.



Map: PS112886_GIS_067_A2	Author: Trent.Bowman
Date: 4/06/2019	Approved by: Julia.Wyllie

0 530 1,060 m
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Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community © Department Finance, Services and Innovation 2019

Parkes SAP

Figure 2.1
Native vegetation regulatory assessment

2.4.3 RANDOM MEANDER SURVEY

Random meander surveys are a variation of the transect type survey and were completed in accordance with the technique described by (Cropper, 1993), whereby the recorder walks in a random meander throughout the investigation area recording dominant and key plant species (e.g. threatened species, priority weeds), boundaries between various vegetation communities and condition of vegetation. The time spent in each vegetation community was generally proportional to the size of the community and its species richness. This survey technique was used to verify vegetation boundaries and stratification from the desktop analysis.

2.4.4 FIELD VERIFICATION OF VEGETATION MAPPING

Field validation (ground-truthing) of the existing vegetation classifications was completed based on random meander surveys and BAM vegetation integrity plots. Field verification was undertaken to confirm the vegetation structure, dominant canopy species, native diversity, condition and presence of threatened ecological communities. Field data was compared and analysed against the regional vegetation mapping key diagnostic species to confirm each vegetation type. Field verification of the vegetation type, class and formation was used to identify vegetation zones and conditions in accordance with the BAM and NSW BioNet Vegetation Classification Database (Office of Environment & Heritage 2019c).

2.4.5 BAM VEGETATION INTEGRITY PLOTS

Vegetation integrity plots were undertaken following the Biodiversity Assessment Method (BAM) (Office of Environment and Heritage, 2017) as required under the new *Biodiversity Conservation Act 2016* (BC Act).

A total of 44 vegetation integrity plots were undertaken as outlined in the methodology contained within the BAM as described below and illustrated in Figure 2.2. Table 2.4 outlines the co-ordinates, orientations and vegetation type sampled for each plot whilst Table 2.5 compares the areas of each vegetation zone and number of plots completed to the requirements of the BAM.

Table 2.4 Location and orientation of biobank quadrats and transects

PLOT ID	VEGETATION TYPE AND CONDITION	EASTING	NORTHING	ORIENTATION
Q1	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	601139	6329067	315
Q2	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	601759	6328969	10
Q3	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	601382	6329971	230
Q4	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	601544	6330085	140
Q5	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	600476	6330634	100
Q6	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	600685	6331016	260

PLOT ID	VEGETATION TYPE AND CONDITION	EASTING	NORTHING	ORIENTATION
Q7	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	601953	6331186	80
Q8	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)	602143	6331177	200
Q9	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	601857	6331422	170
Q10	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	605431	6330844	210
Q11	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	605501	6331032	70
Q12	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	605332	6331237	350
Q13	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	605296	6332877	220
Q14	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	605723	6332604	100
Q15	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)	606886	6330367	65
Q16	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)	602338	6328170	290
Q17	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)	605237	6328612	315
Q18	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)	602581	6332387	350
Q19	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	603544	6331495	90
Q20	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	603170	6331433	245
Q21	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	603178	6331147	120

PLOT ID	VEGETATION TYPE AND CONDITION	EASTING	NORTHING	ORIENTATION
Q22	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)	604466	6331340	290
Q23	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	604885	6331713	295
Q24	PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)	605082	6333111	345
Q25	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	602911	6329599	165
Q26	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)	599856	6333500	225
Q27	PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)	600022	6333542	250
Q28	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)	601302	6333760	345
Q29	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (poor)	602180	6334542	320
Q30	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	602670	6334854	170
Q31	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	603160	6334403	120
Q32	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	602256	6334491	310
Q33	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	601218	6333254	30
Q34	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	601876	6333357	210
Q35	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)	601418	6332289	10
Q36	Miscellaneous: weeds and exotics	604757	6328696	195

PLOT ID	VEGETATION TYPE AND CONDITION	EASTING	NORTHING	ORIENTATION
Q37	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	605122	6327836	210
Q38	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	601965	6333136	190
Q39	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	600134	6332868	240
Q40	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	600249	6336727	100
Q41	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)	603253	6334538	300
Q42	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	602534	6334575	3
Q43	PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)	599577	6331228	270
Q44	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	599521	6333094	-

Note: Co-ordinate GDA94 Zone 55

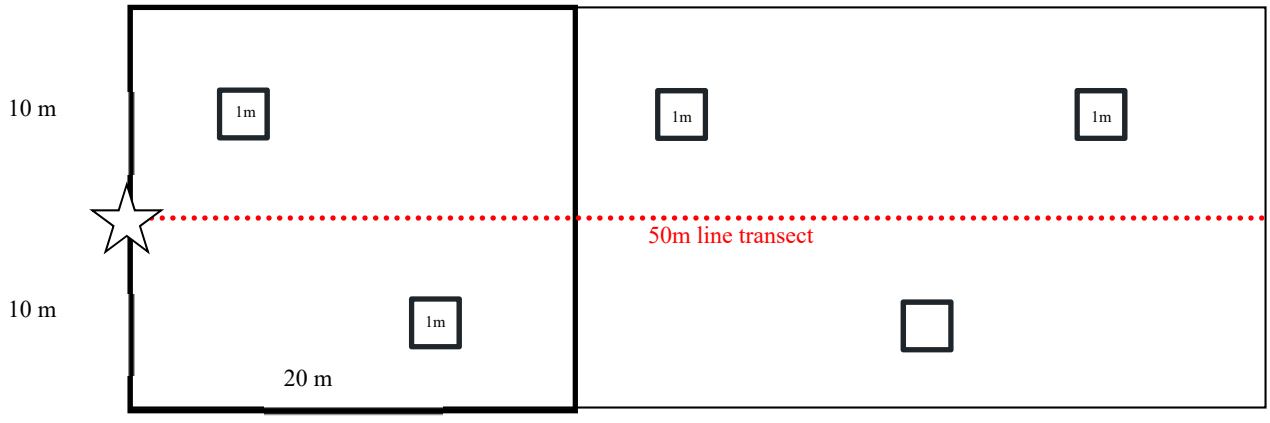


Figure 2.2 Schematic diagram illustrating the layout of the nested 20 x 50 m, 20 x 20 m and 1 x 1 m sub-quadrats used for the assessment of condition attributes at each site

The following site attributes were recorded at each site:

- **Location** (easting – northing grid type MGA 94, Zone 56).
- **Native and exotic species richness** (within a 400 m^2 quadrat): This consisted of recording all species by systematically walking through each 20 x 20 m quadrat. The cover and abundance (percentage of area of quadrat covered) of each species was estimated. The growth form, stratum/layer and whether each species was native/exotic/high threat weed was also recorded.
- **Number of trees with hollows** (1,000 m^2 quadrat): This was the frequency of hollows within living and dead trees within each 50 x 20 m quadrat. A hollow was only recorded if (a) the entrance could be seen: (b) the estimated entrance width was at least 5 cm across: (c) the hollow appeared to have depth: (d) the hollow was at least 1 m above the ground and the (e) the centre of the tree was located within the sampled quadrat.
- **Number of large trees and stem size diversity** (1,000 m^2 quadrat): tree stem size diversity was recorded by measuring the diameter at breast height (DBH) (i.e.1.3 m from the ground) of living trees (>5 cm DBH) within each 50 x 20 m quadrat. For multi-stemmed living trees, only the largest stem was included in the count. Number of large trees was determined by counting all trees with DBH greater than the DBH large trees for each vegetation formation.
- **Evaluation of regeneration**: This was estimated as the presence/absence of overstorey species present at the site that was regenerating (i.e. saplings with a diameter at breast height ≤5 cm.
- **Total length of fallen logs** (1,000 m^2 quadrat): This was the cumulative total of logs within each 50 x 20 m quadrat with a diameter of at least 10 cm and a length of at least 0.5 m.
- **Litter cover**: This comprised estimating the average percentage groundcover of litter (i.e. leaves, seeds, twigs, branchlets and branches with a diameter <10 cm which is detached from a living plant) from within five 1 x 1 m sub-plots spaced evenly either side of the 50 m central transect.

Table 2.5 Minimum number of transects/plots required per vegetation zone area

ZONE ID	VEGETATION TYPE AND ZONE	AREA WITHIN INVESTIGATION AREA	MINIMUM PLOTS REQUIRED	NUMBER PLOTS COMPLETED
VZ1	PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)	5.07	3	3 (Q24, Q27, Q43)
VZ2	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	90.77	5	5 (Q3, Q13, Q19, Q21, Q25)
VZ3	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)	6.37	3	3 (Q16, Q22, Q28)
VZ4	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	23.92	4	7 (Q32, Q33, Q34, Q38, Q39, Q40)
VZ5	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (poor)	1.16	1	1 (Q29)

ZONE ID	VEGETATION TYPE AND ZONE	AREA WITHIN INVESTIGATION AREA	MINIMUM PLOTS REQUIRED	NUMBER PLOTS COMPLETED
VZ6	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)	2.66	2	2 (Q8, Q18)
VZ7	PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	325.70	7	7 (Q2, Q4, Q6, Q9, Q12, Q20, Q30)
VZ8	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	84.98	5	7 (Q10, Q11, Q14, Q23, Q31, Q37, Q42)
VZ9	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)	14.05	3	3 (Q15, Q17, Q41)
VZ10	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	37.56	4	4 (Q1, Q5, Q7, Q44)
VZ11	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)	3.93	2	2 (Q26, Q35)
VZ12	Miscellaneous Ecosystem (urban exotic/native landscape plantings)	20.46	0	0

2.4.6 CONDITION OF VEGETATION COMMUNITIES

The vegetation within the investigation area was firstly assigned to a PCT and then aligned to a vegetation zone which is defined in the BAM as *'an area of native vegetation on the investigation area that is the same PCT and has a similar broad condition state'* (Office of Environment & Heritage 2017). A broad condition state infers that the vegetation has a similar tree cover, shrub cover, ground cover, weediness or combinations of these attributes which determine vegetation condition.

The vegetation broad condition states which were applied to vegetation within the investigation area are summarised in Table 2.6. These factors were defined by using factors such as levels of disturbance, weed invasion and resilience.

Table 2.6 Vegetation broad condition categories

CONDITION CATEGORY	DESCRIPTION
High	Vegetation still retains the species complement and structural characteristics. The vegetation displays resilience to weed invasion due to intact groundcover, shrub and canopy layers. Native species diversity is relatively high. Weeds may exist in this vegetation type but exhibit <5% foliage cover.
Moderate	Vegetation has retained a native canopy but the understorey and groundcover layers are generally co-dominated by exotic species that exhibit between 5–45% foliage cover. The mid and low stratums may have been structurally modified as a result of disturbances such as previous clearing or agricultural practices such as grazing of livestock.
Poor	Vegetation has retained a native canopy or the canopy cover is showing signs of regeneration. The understorey and groundcover layers are generally dominated or co-dominated by exotic species that exhibit between 46–70% foliage cover. Native species diversity is generally relatively low and the mid and low stratums have been structurally modified due to weed incursions, clearing, agricultural practises such as cropping or direct seeding.
Low	Native vegetation generally lacking a native over-storey and where either less than 50% of ground cover vegetation is indigenous species, or greater than 90% of ground cover vegetation is cleared. For native grassland, wetland or herbfield where either less than 50% of ground cover vegetation is indigenous species, or more than 90% of ground cover vegetation is cleared.'

(1) Note: These categories have been used to define vegetation zones in Section 4.

2.5 PADDOCK TREE ASSESSMENT

The definition for Paddock Trees relevant to the investigation area is outlined in Appendix 1 of the BAM as:

- trees which were located more than 50 m away from any living tree that is greater than 20 cm DBH
- trees in a group of three (3) or fewer living trees within 50 m of each other, that in turn, are greater than 50 m from the next living tree that is greater than 20 cm DBH
- during field surveys Paddock trees were visually inspected and measured to collect the following data:
  - the genus and species of each Paddock Tree
  - diameter at Breast Height (DBH)
  - presence of hollows
  - presence of Mistletoes
  - surrounding Plant Community Types.

PCTs were assigned to each paddock tree based on the species and proximity to identified PCT zones in the investigation area or the dominant canopy species per the PCT description. The large tree benchmark from the assigned PCT was used to inform the Paddock tree class for each tree. Paddock tree classes include:

- **Class 1:** paddock trees that are ≤20 cm DBH and are trees that meet the definition of trees with negligible biodiversity (i.e. do not contain hollows).
- **Class 2:** paddock trees that are ≥20 cm DBH and less than the large tree benchmark for the most likely plant community type.
- **Class 3:** paddock trees that are greater than or equal to the large tree benchmark for the most likely plant community type.

The Diameter at Breast Height (DBH) of the tree was assessed and assigned a paddock tree class relevant to the large tree benchmark. Where DBH was unable to be measured due to access restrictions a precautionary approach was adopted and paddock trees were assigned to Class 3. This approach was adopted for the presence of hollows whereby the presence of hollows was assumed for paddock trees unable to be accessed.

Threatened species that would use the paddock trees are assumed to be the same threatened species that are returned by the BAM Calculator for the vegetation zones. Where targeted fauna surveys were required by the BAM Calculations, paddock trees were also included in the surveys.

2.6 THREATENED SPECIES SURVEY

This section outlines the targeted threatened species surveys. Survey methods have been designed based on the species identified as potentially occurring (candidate species) within the investigation area. Survey methods are detailed below in section 2.6.2 and 2.6.3 with locations shown in Figure 2.3.

2.6.1 WEATHER CONDITIONS

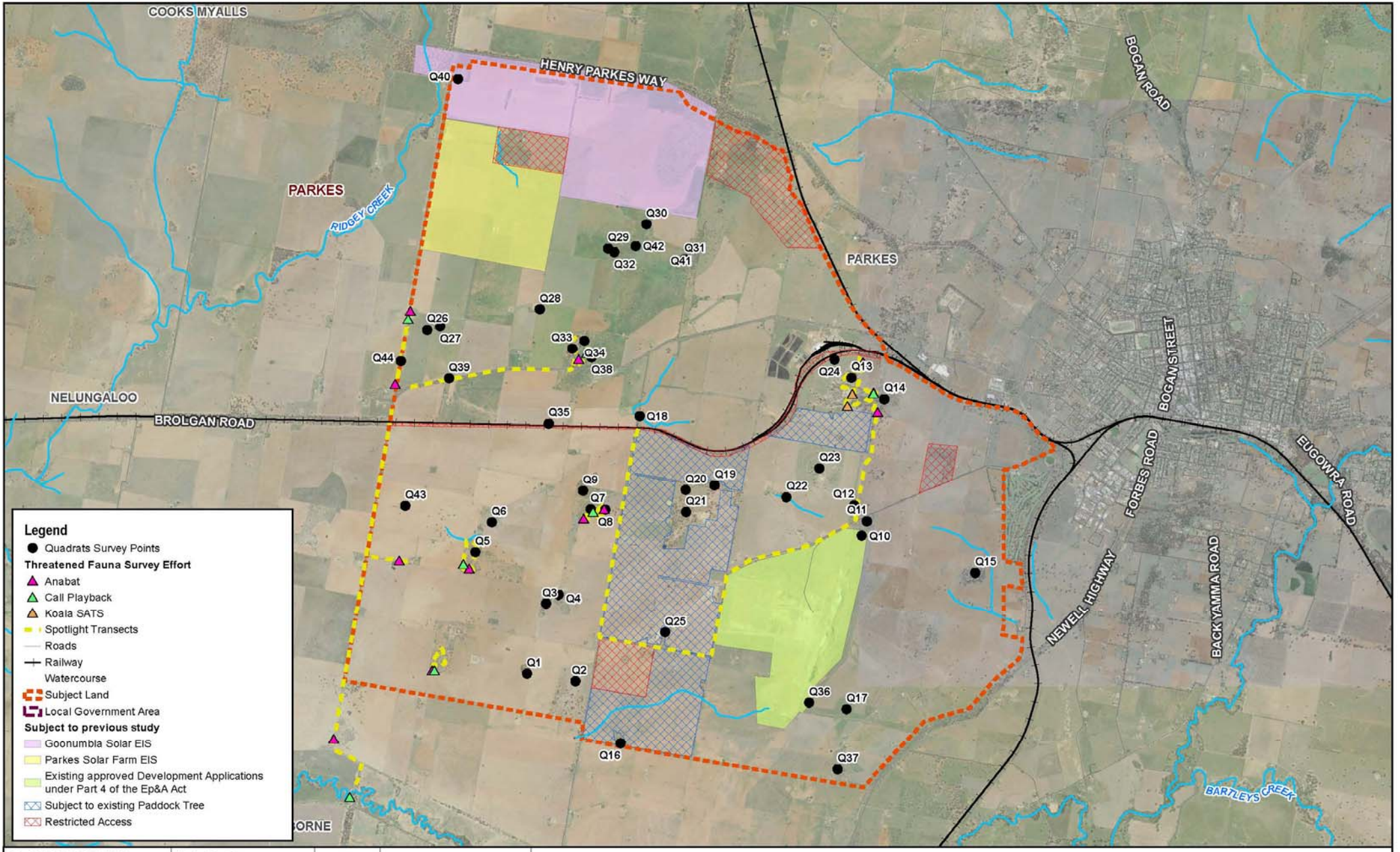
During the survey period conditions were mild to warm with a minimum temperature if 8.1°C and a maximum of 34.5°C. No rainfall was experienced during the survey period (Table 2.7).

Weather conditions leading up and during the WSP survey period were dry with the Parkes area experiencing an abnormally low amount of rainfall and drought conditions. This is discussed further in section 2.7.

Table 2.7 Weather condition during survey period

DATE	TEMPERATURE (°C)		RAIN (mm)
	Minimum	Maximum	
25.2.19	12.4	31.5	0.0
26.2.19	18.3	32.8	0.0
27.2.19	16.3	34.5	0.0
28.2.19	19.8	31.3	0.0
1.3.19	18.8	33.3	0.0
11.3.19	15.5	32.3	0.0
12.3.19	14.4	29.2	0.0
13.3.19	9.5	30.1	0.0
14.3.19	16.0	30.1	0.0
15.3.19	8.1	31.8	0.0

(1) Source: Climate data obtained from Bureau of Meteorology (2019), AWS 065068



Map: PS112886_GIS_035_A3	Author: Trent.Bowman
Date: 3/06/2019	Approved by: Julia.Wyllie

0 600 1,200 m
1:45,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community © Department Finance, Services and Innovation 2019

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Parkes SAP

Figure 2.3
Survey methods

2.6.2 TERRESTRIAL FLORA SURVEYS

Results of the threatened species database searches identified 15 threatened plant species listed under the BC Act and/or the EPBC Act as being known to occur or considered likely to occur within the investigation area. Based on desktop assessment of habitat requirements, 11 species were considered to have a moderate or higher likelihood of occurring within the investigation area and were considered further in the assessment (refer to section 2.6.2.3). The likelihood of occurrence assessment for each species is provided in Appendix B.

Targeted surveys were completed for the threatened flora species identified as having a moderate to high likelihood of occurring. Several flora species that potentially occur within the Investigation area have seasonal survey requirements due to difficulty of detection except at specific times of the year, during its flowering period.

A combination of random meander surveys and parallel transects were undertaken in areas of potential habitat. The BAM outlines survey requirements for threatened species including requirements for seasonal surveys to maximize the likelihood of recording a species if present. Surveys for threatened flora were undertaken as outlined in Table 2.8.

2.6.2.1 CANDIDATE FLORA SPECIES AND SURVEY EFFORT

Species credit species predicted by the Biodiversity Assessment Method (BAM) Calculator (Office of Environment and Heritage, 2019a) and/or identified during desktop assessments (section 2.3) were subject to a likelihood of occurrence assessment (Appendix B). Those species credit species considered to have a moderate or higher likelihood of occurrence became candidate species and were subject to targeted surveys. Table 2.8 outlines each candidate threatened flora species, conservation status, optimal survey months as prescribed by the BAM calculator and survey effort.

2.6.2.2 RANDOM MEANDERS

The floristic diversity and possible presence of threatened species was assessed using the random meander survey method. Random meander surveys are a variation of the transect type survey and were completed in accordance with the technique described by Cropper (1993), whereby the recorder walks in a random manner throughout each site undertaking habitat assessments and presence of threatened species. The time spent in each vegetation patch was generally proportional to the suitability of habitat for candidate threatened flora species.

2.6.2.3 PARALLEL TRANSECTS

Targeted threatened species surveys employed parallel line traverses where known or potential habitat for candidate threatened flora species occurred. This survey technique involved two ecologists walking parallel line traverses. This methodology is consistent with the current guidelines for NSW threatened plant surveys (Office of Environment & Heritage, 2016).

2.6.2.4 VEGETATION INTEGRITY PLOTS

Thirty-minute searches were conducted at each vegetation integrity plot location. Across the investigation area, a total of 44 vegetation integrity plots were undertaken equating to 22 hours of searches for threatened flora species at vegetation integrity plot locations.

Table 2.8 Survey requirements and effort for candidate threatened flora species

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SURVEY MONTHS[3]	POTENTIAL HABITAT[4]	WSP SURVEY EFFORT (2019)
Acacia ausfieldii	All year	V	–	All year	PCT 201; PCT 276; PCT 276	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Austrostipa metatoris	A spear-grass	V	V	All year	PCT 70; PCT 82; PCT 201	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches Parallel transects were undertaken in areas of potential habitat.
Austrostipa wakoolica	A spear-grass	E	E	Sept-Dec	PCT 70; PCT 76; PCT 82; PCT 201	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches Parallel transects were undertaken in areas of potential habitat.
Cullen parvum	Small Scurf-pea	E	–	Dec-Feb	PCT 276	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Diuris tricolor	Pine Donkey Orchid	V	–	Sept-Oct	PCT 70; PCT 76; PCT 82; PCT 201; PCT 267	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SURVEY MONTHS[3]	POTENTIAL HABITAT[4]	WSP SURVEY EFFORT (2019)
Eleocharis obicis	Spike-Rush	V	V	All year	Areas of PCT 76 and PCT 82 where ephemeral wet areas or waterlogged areas (including farm dams) are present	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Lepidium aschersonii	Spiny Peppercress	V	V	Sept-May	On ridges of gilgai clays in PCT 76 and PCT 201	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Lepidium monoplocoides	Winged Peppercress	E	E	Nov-Feb	No recorded vegetation is associated; species occurs in periodically flooded and waterlogged habitats	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Swainsona recta	Small Purple-pea	E	E	Sept-Nov	PCT 76; PCT 267; PCT 276	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches
Swainsona sericea	Silky Swainson-pea	V	–	Sept-Feb	PCT 70; PCT 76; PCT 82; PCT 201; PCT 250; PCT 267; PCT 276	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SURVEY MONTHS[3]	POTENTIAL HABITAT[4]	WSP SURVEY EFFORT (2019)
Tylophora linearis	Tylophora linearis	V	E	Sept-May	PCT 70	25 February – 1 March and 11–15 March 30 minute searches at each vegetation integrity plot location (44 plot locations = effort of 22 hours) Random meander searches

(1) V = Vulnerable, E = Endangered under the BC Act

(2) V = Vulnerable, E = Endangered under the EPBC Act

(3) Surveys months were prescribed by the BAM Calculator (Office of Environment and Heritage, 2019a)

(4) Potential habitat (PCT's) were obtained from BioNet database (Office of Environment and Heritage, 2019f)

2.6.3 TERRESTRIAL FAUNA SURVEYS

2.6.3.1 FAUNA HABITAT ASSESSMENT

Fauna habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the investigation area. Fauna habitat characteristics assessed included:

- structure and floristics of the canopy, understorey and ground vegetation, including the presence of flowering and fruiting trees providing potential foraging resources
- presence of mistletoes providing potential foraging recourses
- presence of hollow-bearing trees providing roosting and breeding habitat for arboreal mammals, birds and reptiles
- presence of the ground cover vegetation, leaf litter, rock outcrops and fallen timber and potential to provide protection for ground-dwelling mammals, reptiles and amphibians
- presence of waterways (ephemeral or permanent) and water bodies.

This habitat assessments informed seasonal surveys which targeted threatened fauna species. During these surveys, a hand-held GPS was used to record the locations of important habitat features including:

- hollow-bearing trees
- aquatic habitat
- rock outcrops
- habitat type boundaries.

The following criteria were used to evaluate the condition of habitat values:

- **Good:** A full range of fauna habitat components are usually present (for example, old-growth trees, fallen timber, feeding and roosting resources) and habitat linkages to other remnant ecosystems in the landscape are intact.
- **Moderate:** Some fauna habitat components are missing or greatly reduced (for example, old-growth trees and fallen timber), although linkages with other remnant habitats in the landscape are usually intact, but sometimes degraded.
- **Poor:** Many fauna habitat elements in low quality remnants have been lost, including old growth trees (for example, due to past timber harvesting or land clearing) and fallen timber, and tree canopies are often highly fragmented. Habitat linkages with other remnant ecosystems in the landscape have usually been severely compromised by extensive clearing in the past.

2.6.3.2 OPPORTUNISTIC SIGHTINGS

Opportunistic sightings of animals were recorded including diurnal birds and reptiles. Evidence of animal activity, such as scats, diggings, scratch marks, nests/dreys, burrows etc., was also noted. This provided indirect information on animal presence and activity.

2.6.3.3 TARGETED SEASONAL SURVEYS

Targeted seasonal surveys were completed for threatened fauna species identified as having a moderate to high likelihood of occurring within the investigation area. Threatened fauna surveys completed within the investigation area were carried out as described below and where applicable, considering the methodology detailed in the *NSW Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Working Draft)* (Department of Environment and Conservation, 2004), the Survey Guidelines for Australia's Threatened Birds (Department of Environment Water Heritage and the Arts, 2010a), the *Threatened Species survey and assessment guidelines: field survey and methods for fauna-Amphibians* (Department of Environment and Climate Change, 2009) and the *Survey guidelines for Australia's threatened frogs* (Department of Environment, Water, Heritage and the Arts, 2010b). The optimum survey period and dates surveyed for threatened fauna are summarised in Table 2.9.

DIURNAL BIRD SURVEYS

Formal 20-minute diurnal bird searches were completed within the investigation area. Bird surveys were completed by actively walking through the nominated site (transect) over a period of 20 minutes. All birds were identified to the species level, either through direct observation or identification of calls. Bird surveys were completed during different times of the day, but generally occurred during morning hours or evening. Birds were also recorded opportunistically during all other surveys.

Wherever threatened bird species were absent from the site, habitat assessments were conducted to determine the likelihood that investigation area might support those species that are known to occur in the region.

Targeted seasonal surveys for endangered blossom nomads (i.e. Regent Honeyeater and Swift Parrot) was undertaken during August to identify presence for blossoming eucalypts and nectar resources, along with potential habitat utilisation by threatened blossom nomads. Where seasonal conditions for some species including flowering eucalypts were not suitable during the timing of onsite investigations, as was the case for endangered blossom nomads such as the Regent Honeyeater and Swift Parrot, likelihood of occurrence assessments were conducted by the presence/absence of suitable habitat and its condition.

MICROCHIROPTERAN BAT SURVEYS

Ultrasonic Anabat bat detection (Titley Electronics) was used to record and identify the echolocation calls of microchiropterans foraging across a number of native vegetation communities in the investigation area. Passive monitoring of these survey sites was achieved by setting Anabat bat detectors to record continuously during nocturnal spotlighting transects, call playback and stag watches at potential artificial roosting sites within the investigation area. Bat call analysis was completed by Nathan Cooper of WSP, with the presentation of data considering the guidelines of the Australasian Bat Society. Bat call of New South Wales Sydney Basin region (Pennay et al., 2004) was used as a reference collection for bat call identification.

SPOTLIGHTING AND STAG WATCHES

Spotlighting would be used to target arboreal, flying and ground-dwelling mammals, as well as, nocturnal birds, reptiles and amphibians. Spotlighting was completed after dusk generally following the targeted nocturnal search transects. Surveys were completed on foot using high-powered headlamps and hand torches. Sighted animals were identified to the species level.

Stag watches would be undertaken at dusk in areas where hollow-bearing trees were identified within the investigation area. The aim of stag watches is to identify if threatened owls are utilising any hollow-bearing trees within the investigation area for breeding purposes. Following stag watches spotlighting transects would be undertaken near known hollow-bearing trees.

CALL PLAYBACK

Call playback would be used to survey for nocturnal birds (owls) and frogs using standard methods (Kavanagh *et al.,* 1993; Debus, S., 2001). Call playback was completed after dusk within a number of sites in the investigation area.

For each survey, an initial listening period of 10 to 15 minutes would be undertaken, followed by a spotlight search for 10 minutes to detect any animals in the immediate vicinity. The calls of the target species would be then played intermittently for five minutes followed by a 10-minute listening period. After the calls are played, another 10 minutes of spotlighting would be done in the vicinity to check for animals attracted by the calls, but not vocalising. Calls from Stewart and Pennay (Pennay et al., 2004) would be broadcast using a portable media player and megaphone.

HERPETOFAUNA ACTIVE SEARCHES

Herpetofauna active searches during the day and at night, would be undertaken and involve looking for active specimens and eye shine, turning over suitable ground shelter, such as fallen timber, sheets of iron and exposed rocks, raking debris, and peeling decorticating bark. Specimens would be either identified visually, by aural recognition of call (frogs only) or were collected and identified.

Herpetofauna surveys would be completed by one or two persons over a 30-minute period with all ground shelter returned to their original position. Herpetofauna active searches would be completed in conjunction with diurnal and nocturnal surveys. Frogs and reptiles would also be surveyed opportunistically during all other surveys in the investigation area. Reptiles would be surveyed in reference to *Threatened species survey and assessment guidelines: field survey methods for fauna (reptiles)* (Department of Environment and Climate Change, 2009).

2.6.3.4 KOALA SPOT ASSESSMENTS

Systematic Spot Assessment Technique (SAT) was undertaken within the investigation area to identify the presence of Koala usage within native vegetation. The SAT identifies whether local Koala tree species preferences by measuring the rate at which each species is utilised by Koalas.

The SAT involves measuring activity within the immediate area surrounding a tree of any species known to have been utilised by Koalas, or otherwise considered to be of some importance for Koala conservation and/or assessment purposes. A minimum of 29 surrounding trees are sampled systematically for Koala faecal pellets for 1 metre around the base of each tree. The activity of Koala usage for each SAT is then expressed as the percentage equivalent of the proportion of the surveyed trees within each SAT. The percentage is then compared to prescribed ranges for activity levels for Koalas within NSW (Phillips and Callaghan, 2011).

2.6.3.5 CANDIDATE FAUNA SPECIES AND SURVEY EFFORT

Threatened fauna which were identified as having a moderate likelihood of occurrence and were identified by the BAM calculator as a species credit species were subject to targeted threatened fauna surveys. The likelihood of occurrence assessment is provided in Appendix D. Table 2.9 outlines candidate threatened fauna species, their conservation status, survey months as prescribed by the BAM calculator and survey effort.

Table 2.9 Survey requirements and effort for candidate threatened fauna species credit species

COMMON NAME	SCIENTIFIC NAME	BC ACT STATUS[1]	EPBC ACT STATUS[2]	SURVEY MONTHS[3]	SURVEY EFFORT (WSP, 2019)
Barking Owl	*Ninox connivens*	V	–	May-Dec	Call Playback in areas of potential habitat over 4 nights (11–14 March, 2019) Spotlighting in areas of potential habitat over 4 nights (11–14 March, 2019)
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	–	All year	Habitat Assessment (25 Feb–1 Mar, 11–15 March) Diurnal Bird Surveys (11–15 March)
Little Eagle	*Hieraaetus morphnoides*	V	–	Aug–Oct	Habitat Assessment (25 Feb–1 Mar, 11–15 March) Diurnal Bird Surveys (11–15 March)
Masked Owl	*Tyto novaehollandiae*	V	–	May–Aug	Habitat Assessment (25 Feb–1 Mar, 11–15 March) Diurnal Bird Surveys (11–15 March)
Sloane's Froglet	*Crinia sloanei*	V	–	July–Aug	Herptofauna active searches (11–15 March)
Square-tailed Kite	*Lophoictinia isura*	V	–	Sept–Jan	Habitat Assessment (25 Feb–1 Mar, 11–15 March) Diurnal Bird Surveys (11–15 March)
Superb Parrot	*Polytelis swainsonii*	V	V	Sept–Nov	Habitat Assessment (25 Feb–1 Mar, 11–15 March) Diurnal Bird Surveys (11–15 March)

(1) V = Vulnerable as listed under the BC Act

(2) V = Vulnerable as listed under the EPBC Act

(3) Survey months have been prescribed by the BAM Calculator

2.7 FIELD SURVEY LIMITATIONS

2.7.1 SURVEY AND ASSESSMENT

Detailed desktop assessment was undertaken prior to field surveys to identify the threatened biodiversity likely to occur in the locality and determine the field survey effort required for the scale of the project and its ecological context for a constraints assessment. However, the precise range of habitats utilised by some species is not well understood. Furthermore, the discovery of hither to unknown populations of threatened species, even well outside their known range, is always present. This applies particularly to cryptic species of plants and animals and plant species which can persist as soil seedbanks and easily go undetected despite intensive survey.

No sampling technique can totally eliminate the possibility that a species is present within the investigation area. For example, some species of plant may be present in the soil seed bank and some fauna species use habitats on a sporadic or seasonal basis and may not be present within the investigation areas during surveys.

Time and access restrictions during the survey period prevented targeted threatened species surveys from being conducted throughout the survey area (i.e. limited targeted flora and fauna surveys). As such, targeted surveys were limited to areas were access was available within given timeframes. Additional targeted surveys will be required during later phases of the project for threatened flora and fauna species that are considered likely to occur within the investigation area based on habitat characteristics and previous records. As the actual distribution and the range of habitat utilised by some species is not fully understood, there is always a small possibility that other species could occur within the study despite being considered to have a low likelihood of occurrence based on their known range and known habitats.

Access was restricted within some locations of the investigation area (e.g. private properties etc.) and subsequently some areas could not be accessed and therefore not verified. Where access on foot was restricted or limited but adjacent areas were accessible, vegetation community boundaries, condition and threatened flora and fauna habitat attributes were extrapolated from a distance with the aid of binoculars. Where the vegetation could not be viewed existing vegetation mapping of the area and aerial photo interpretation was used.

The conclusions in this report are based upon data acquired for the investigation area and the known distribution and habitat preferences of species. The conclusions are, therefore, merely indicative of the likely biodiversity values of the investigation area, based on information available at the time of preparing the report, including the presence or otherwise of species. It should be recognised that, as more information becomes available, assessment of the likely presence of threatened species can change with time.

2.7.1.1 SEASONALITY

Weather conditions leading up and during the survey period were dry with the Parkes area experiencing an abnormally low amount of rainfall and drought conditions. These conditions were heightened through intensive grazing which lead to a lower the average native foliage cover in the ground layer, lower the average herb / graminoid abundance and possible absence of natural regeneration of canopy species. These conditions were considered during EPBC assessments and are discussed further in Appendix E.

A general lack of exotic annual cover was observed in the ground layer, possibly due to the lack of soil moisture leading to unfavourable conditions for germination. As such, native grasslands were recorded in favourable conditions in terms of low exotic foliage cover.

3 LANDSCAPE FEATURES

3.1 SITE LANDSCAPE FEATURES

An assessment of the landscape value of the investigation area was undertaken in accordance with Chapter 4 and Appendix 3 of the BAM (Office of Environment & Heritage, 2017). A summary of the landscape features for the investigation area are provided in Table 3.1 and shown in Figure 3.1.

Table 3.1 Landscape features

LANDSCAPE FEATURE	THE INVESTIGATION AREA
IBRA bioregions and subregions	NSW South Western Slopes, Lower Slopes IBRA subregion
NSW landscape regions (Mitchell landscapes)	Bimbi Plains in west (2987 ha) Goonumbla Hills in east (2659 ha)
Local Government Area (LGA)	Parkes Shire Council
Rivers and streams	No river or streams occur within the site or the investigation area and all watercourses are relatively undefined and considered unmapped or 1st order streams. Goobang Creek runs east/west to the south of the investigation area whilst Ridgey Creek drains north/south to the west.
Important and local wetlands	No important or local wetlands have been identified within the investigation area.
Connectivity features	The site is isolated from any surrounding areas of biodiversity value.
Areas of geological significance and soil hazard features	The site does not contain any areas of geological significance or soil hazard feature in relation to biodiversity.
Areas of outstanding biodiversity value	No declared areas of outstanding biodiversity value occur in or near the site.

3.2 SITE CONTEXT

As outlined in Subsection 4.2 of the BAM the following landscape attributes of the development footprint require assessment to determine the site context:

- native vegetation cover
- patch size.

The assessments of these two landscape attributes are provided below.

3.2.1 ASSESSING NATIVE VEGETATION COVER

Native vegetation cover of the development footprint and a 1500 m buffer of the investigation area was determined in accordance with Subsection 4.3.2 of the BAM and is summarised in Table 3.2. Figure 3.3 illustrated the vegetation recorded within the Subject Land and assessment buffer area.

Table 3.2 Native vegetation cover

ASSESSMENT AREA	AREA (HA)	NATIVE VEGETATION AREA (HA)	NATIVE VEGETATION COVER PERCENT
1500 m buffer area	10970.24	375.91	0–10%

3.2.2 PATCH SIZE

Patch size is defined under the BAM as an area of native vegetation that:

- occurs on the development site or stewardship site, and
- includes native vegetation that has a gap of less than 100 m from the next area of moderate to good native vegetation (or ≤30 m for non-woody ecosystems).

Patch size may extend onto adjoining land that is not part of a development site or a stewardship site. The patch size must include the area of native vegetation that is also within the 500 m buffer as required in Subsection 4.2.2.1 of the BAM.

All vegetation zones within the investigation area were recorded across several discontinuous patches which could be assigned to more than one patch size class (5–24 Ha, 25–100 Ha or ≥ 100 Ha). The largest patch size assessed was adopted and is outlined in Table 3.3 below.

Table 3.3 Patch sizes assigned to PCTs recorded within the Subject Land

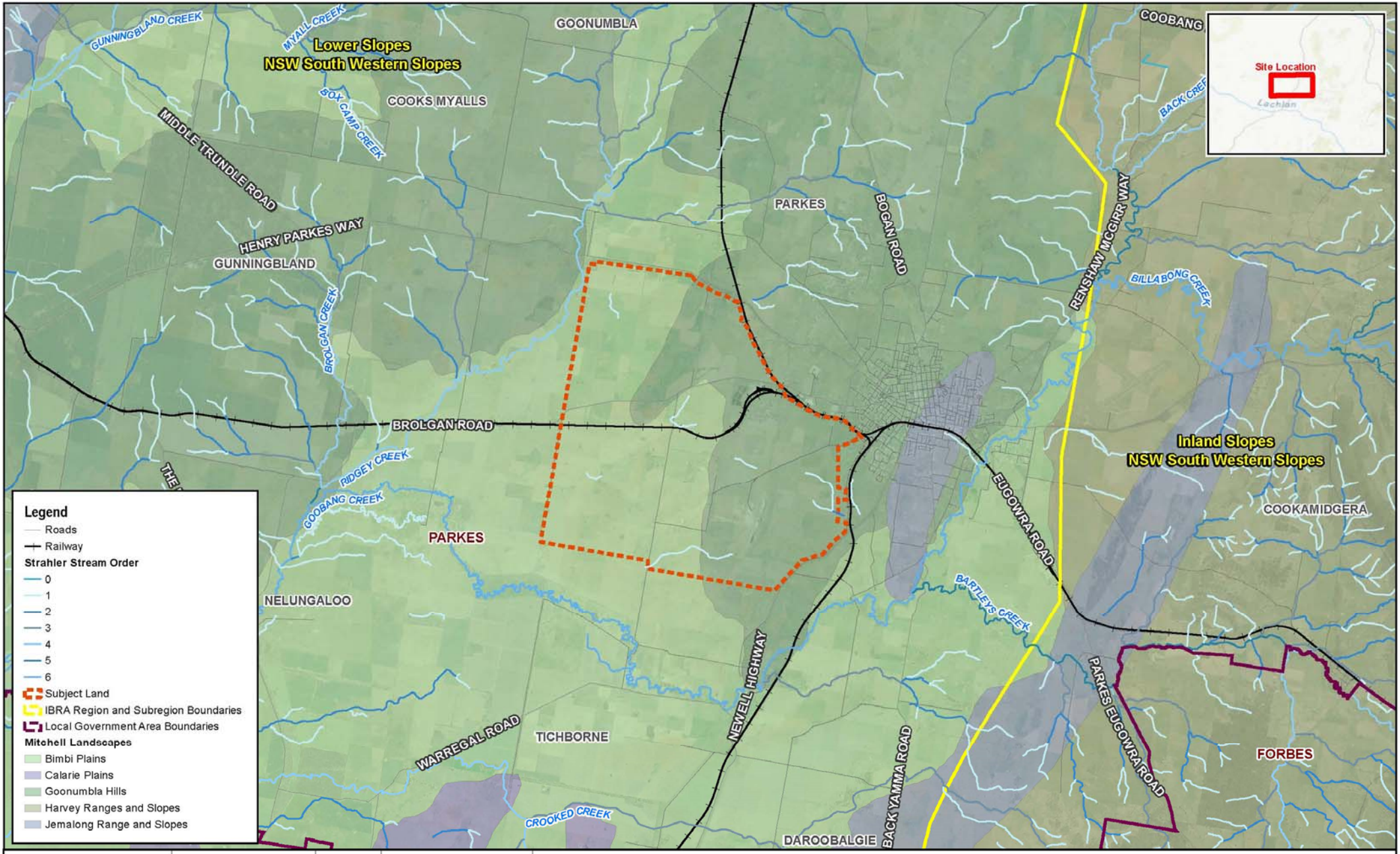
VEGETATION TYPE	PATCH SIZE CLASS
PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)	5–24 Ha
PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)	25–100 Ha
PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)	5–24 Ha
PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)	25–100 Ha
PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (poor)	5–24 Ha
PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)	5–24 Ha
PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	25–100 Ha
PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)	25–100 Ha
PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)	5–24 Ha
PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)	5–24 Ha
PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)	5–24 Ha

3.2.3 CONNECTIVITY

Overall, vegetation which provides significant connectivity through the investigation area to areas of higher quality habitat were identified through two main routes:

- The largest track of vegetation runs from Henry Parkes Way, within proximity to Brolgan Road and down Keiths Lane to riparian vegetation associated with Goobang Creek. This vegetation connects remnant vegetation to the north-east and south-west through the Subject Land.
- The investigation area is connected to remnant vegetation through patches of vegetation south of the railway line and through the Travelling Stock Route (TSR). This connects vegetation to the north of Brolgan Road to riparian vegetation associated with Goobang Creek.

Two additional tracks of vegetation which create connectivity are roadside vegetation which are in areas adjacent to Henry Parkes way to the north of the investigation area and along Keiths Lane which runs along the western boundary of the investigation area. All potential areas of connectivity which run through or adjacent to the investigation area have illustrated in Figure 3.2.



Map: PS112886_GIS_033_A1	Author: Trent.Bowman
Date: 26/03/2019	Approved by: Julia.Wyllie

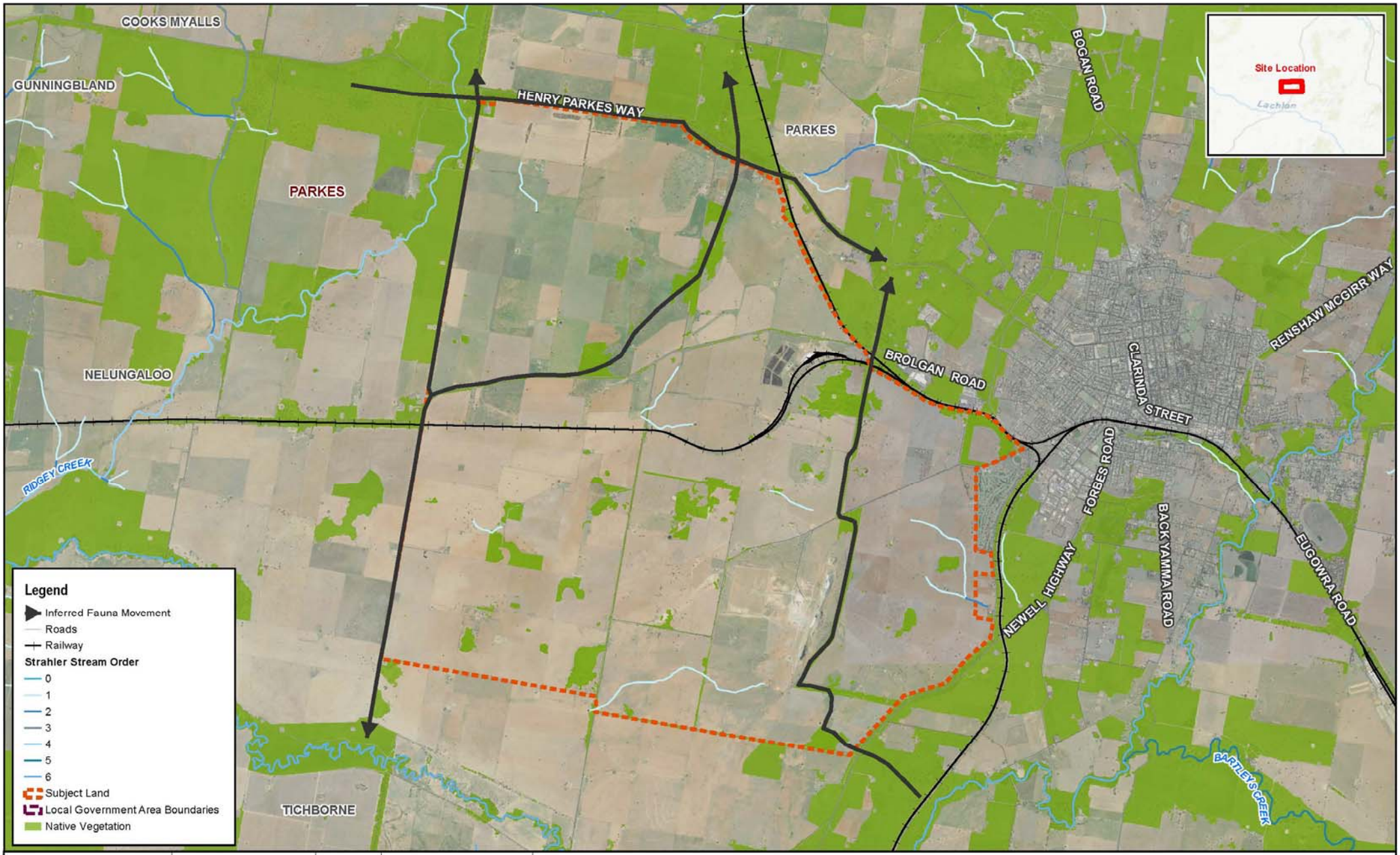
0 1,300 2,600 m

1:100,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Parkes SAP

Figure 3.1
Landscape Features



Map: PS112886_GIS_036_A2	Author: Trent.Bowman
Date: 3/06/2019	Approved by: Julia.Wyllie

0 670 1,340 m
1:50,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community © Department Finance, Services and Innovation 2019

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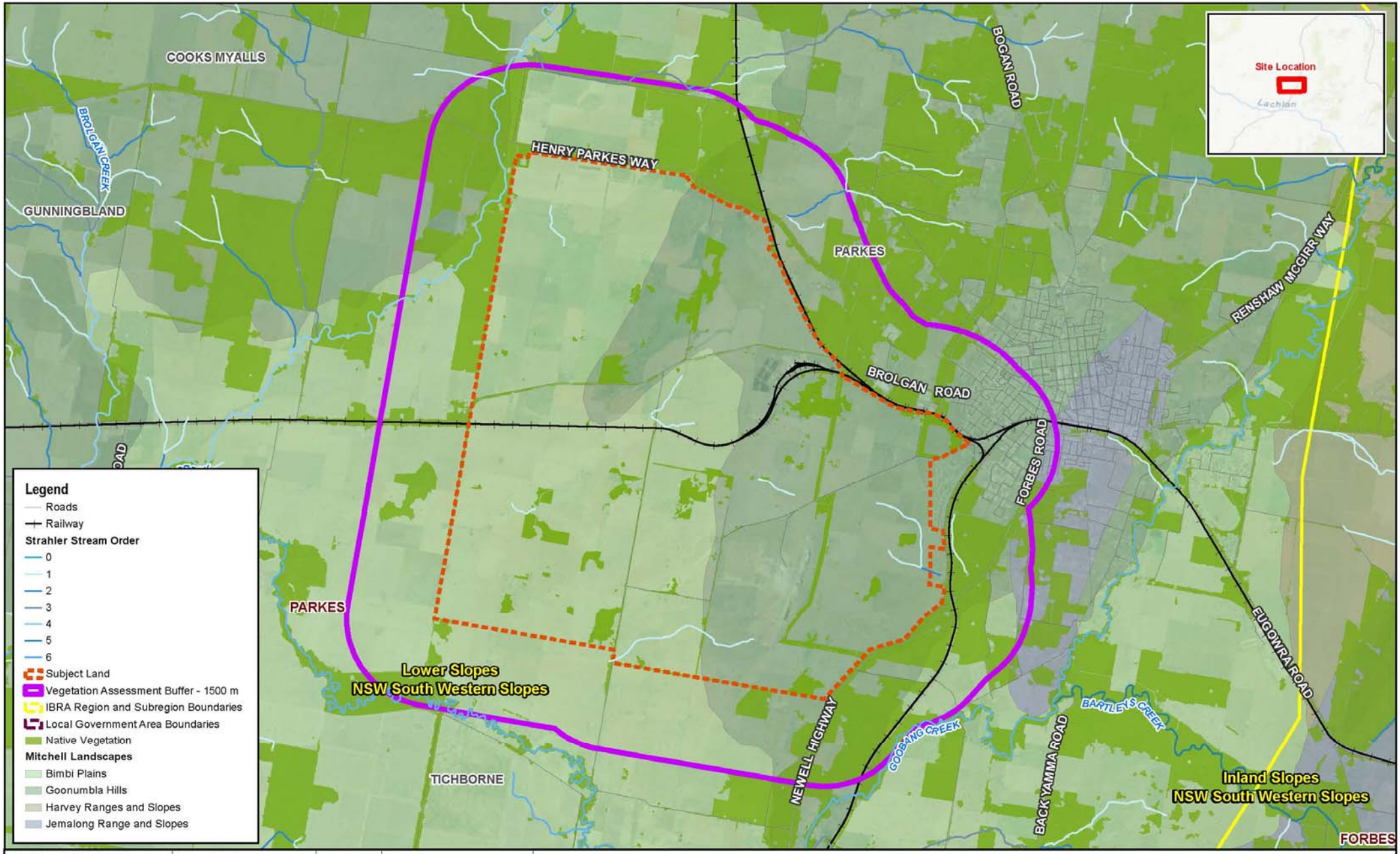
Figure 3.2
Habitat Connectivity



Map: PS112886_GIS_034_A2	Author: Trent.Bowman
Date: 3/06/2019	Approved by: Julia.Wyllie

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1:60,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

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Figure 3.3
Assessing Native Vegetation Cover

4 NATIVE VEGETATION

The section has been prepared to address section 5 of the BAM. Specifically, this section maps and identifies all native and non-native vegetation types within the site and provides and assessment of vegetation integrity and whether any recorded vegetation types correspond to threatened ecological communities listed under the BC Act.

4.1 OVERVIEW

Native vegetation was recorded to cover a total of 375.91 hectare within the surveyed areas of the investigation area. Of this, a total of seven native vegetation PCTs were recorded. These are:

- PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt.
- PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.
- PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion.
- PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.
- PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW.
- PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion.
- PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion.

The seven native vegetation PCTs were assigned to 11 vegetation zones based on broad condition state.

In addition, one non-native vegetation type was recorded, being:

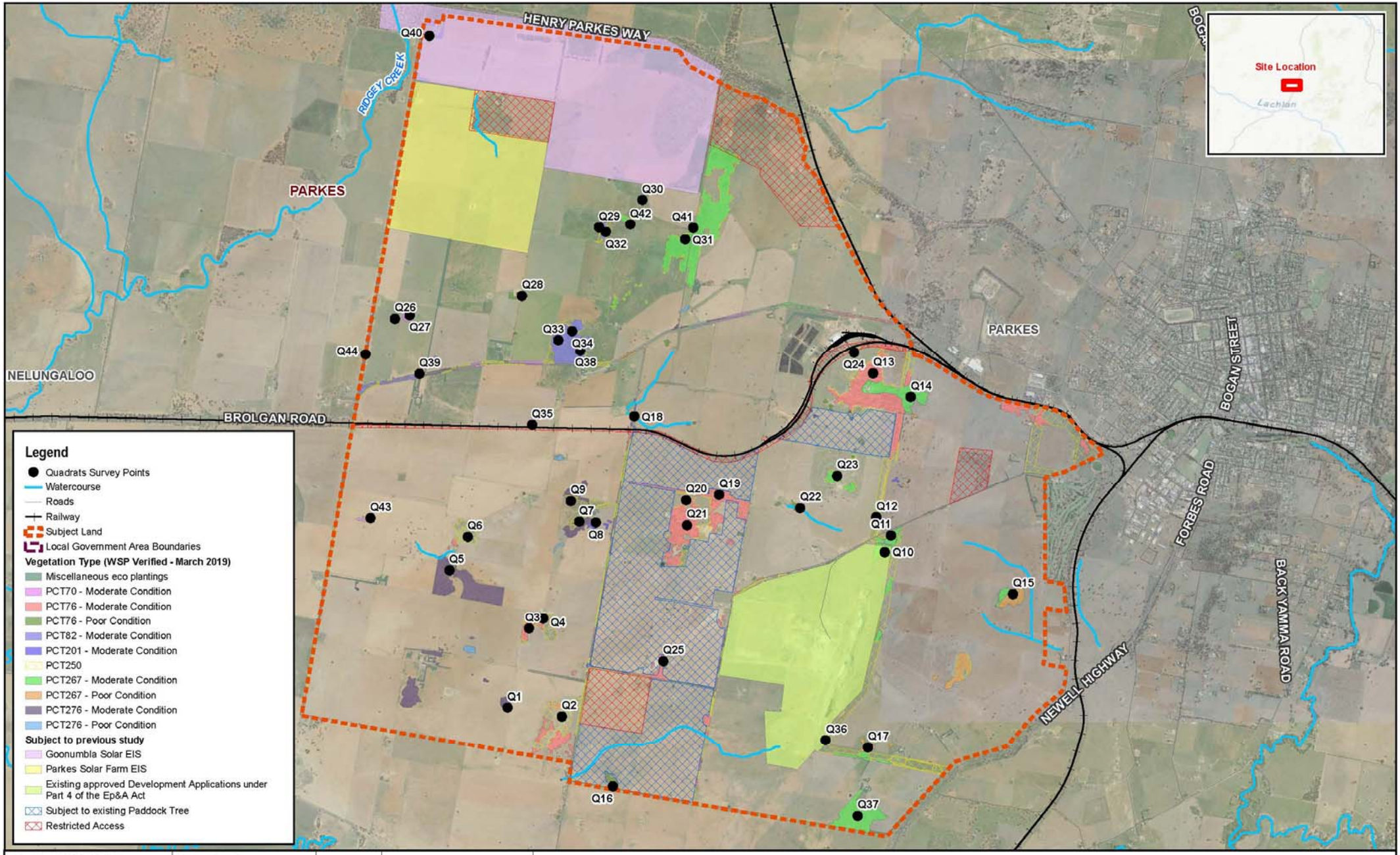
- Miscellaneous Ecosystem (urban exotic/native landscape plantings).

An overview of native and non-native vegetation types and zones identified within the investigation area is presented in Table 4.1 with the extent shown in Figure 4.1. A list of all flora species recorded is presented in Appendix A and all vegetation integrity plot data is presented in Appendix F.

Table 4.1 Overview of native and non-native vegetation types and zones identified within the investigation area

VEGETATION TYPE	ZONE	THREATENED ECOLOGICAL COMMUNITY (BC ACT)	FORMATION	CLASS	IBRA REGION / SUBREGION	PCT % CLEARED	PATCH SIZE (HA)	VEGETATION INTEGRITY SCORE	EXTENT IN THE INVESTIGATION AREA (HA)
Native vegetation									
PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt	Moderate	Not a TEC	KF_CH3 Grassy Woodlands	Floodplain Transition Woodlands	NSW South Western Slopes IBRA region / Lower Slopes IBRA subregion	65%	5–24	34	5.07
PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Moderate	Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	KF_CH3 Grassy Woodlands	Floodplain Transition Woodlands		92%	25–100	77.4	90.64
	Poor						5–24	40.2	6.37
PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	Moderate					75%	25–100	77.7	23.92
	Poor						5–24	25.1	1.16
PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Moderate	Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands		94%	5–24	64.8	2.66
PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	Moderate	Not listed	KF_CH4 Grasslands	Western Slopes Grasslands	NSW South Western Slopes IBRA region /	Not assessed	25–100	47.6	105.93

VEGETATION TYPE	ZONE	THREATENED ECOLOGICAL COMMUNITY (BC ACT)	FORMATION	CLASS	IBRA REGION / SUBREGION	PCT % CLEARED	PATCH SIZE (HA)	VEGETATION INTEGRITY SCORE	EXTENT IN THE INVESTIGATION AREA (HA)
PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Moderate	White Box Yellow Box Blakely's Red Gum Woodland	KF_CH3 Grassy Woodlands	Western Slopes Grassy Woodlands	Lower Slopes IBRA subregion	89%	25–100	67.2	84.82
	Poor						5–24	19	14.05
PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	Moderate					90%	5–24	80	37.35
	Poor						5–24	31.1	3.93
Total native vegetation									375.91
Non-native vegetation									
Miscellaneous ecosystem – urban exotic/native landscape plantings		–	–	–	–	–	–	–	20.46
Total non-native vegetation									20.46
Total all vegetation types									**396.37**



Map: PS112886_GIS_037_A4	Author: Trent.Bowman
Date: 3/06/2019	Approved by: Julia.Wyllie

0 530 1,060 m
1:40,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community,© Department Finance, Services and Innovation 2019

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Figure 4.1
Vegetation Types and Conditions

4.2 PCT DESCRIPTIONS

4.2.1 PCT 70 – WHITE CYPRESS PINE WOODLAND ON SANDY LOAMS IN CENTRAL NSW WHEATBELT

The occurrence of this vegetation type within the Subject Land is illustrated in Figure 4.1 with photographic representation provided in Photo 4.1 to Photo 4.4. A profile of PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt is provided in Table 4.2 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.3.

Table 4.2 Summary of PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt

PCT 70 – WHITE CYPRESS PINE WOODLAND ON SANDY LOAMS IN CENTRAL NSW WHEATBELT	
PCT Justification	PCT 70 was assigned to patches of native vegetation with an upper stratum dominated by mono-specific stands of *Callitris glaucophylla* (White Cypress Pine). Due to historic and ongoing disturbances from agricultural activities this community occurs in part as dense regrowth of semi-mature pines with relatively low species native species richness and cover. This vegetation type was differentiated from adjoining vegetation types like PCT 76, 82 and 267 based on the lack of diagnostic upper stratum eucalypt species.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Vegetation zone	VZ1 - moderate
Conservation status	Not listed a threatened ecological community
SAII entity	No
Percent cleared	65%
Patch size class	5–24 hectares
Area within the site	5.07 hectares
Vegetation integrity plots	Moderate condition – Q24, Q27, Q43
Current vegetation integrity score	34
Landscape position	Occurs on sandy loams of flat alluvial plains and low rises in the central and western portions of the investigation area.
Species upper stratum	Dominated by mono-specific stands of *Callitris glaucophylla* (White Cypress Pine).
Species middle stratum	Sparse to absent *Sclerolaena birchii* (Galvanized Burr).
Species ground stratum	*Austrostipa scabra* subsp. *scabra* (Speargrass), *Digitaria divaricatissima* (Umbrella Grass), *Dysphania pumilio* (Small Crumbweed), *Einadia nutans* subsp. *nutans* (Climbing Saltbush), *Enteropogon acicularis* (Windmill Grass), *Sida corrugata* (Corrugated sida), *Solanum esuriale* (Quena).
Vegetation condition	This vegetation type was recorded in moderate condition class although due to drought conditions, dense regrowth stands and ongoing agricultural disturbances native middle and ground stratum species richness and cover was low. Exotic perennial weed cover was relatively low <10% although following favourable climatic conditions it is considered that exotic annual weed cover would be relatively high.

Photo 4.1 PCT70 dominated by *Callitris glaucophylla* (White Cypress Pine)

Photo 4.2 PCT70 with dense stand of *Callitris glaucophylla* (White Cypress Pine)

Photo 4.3 PCT70 on alluvial floodplain

Photo 4.4 PCT70 on sandy loam low footslope

Table 4.3 Comparison of PCT 70 - White Cypress Pine woodland on sandy loams in central NSW wheatbelt vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	3	5	8	11	1	1	32	3	27	5	0	0	45	65	3(50)	–
Q24	1	0	3	3	0	0	65	0	1.2	0.5	0	0	54	4	0	2
Q27	1	0	0	3	0	1	25	0	0	1.2	0	0.2	11	5.4	0	0
Q43	1	1	2	12	0	0	25	0.2	1.5	14.4	0	0	13	42	0	0.8

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Floodplain Transition Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.2 PCT 76 – WESTERN GREY BOX TALL GRASSY WOODLAND ON ALLUVIAL LOAM AND CLAY SOILS IN THE NSW SOUTH WESTERN SLOPES AND RIVERINA BIOREGIONS

The occurrence of this vegetation type within the Subject Land is illustrated in Figure 4.1 with photographic representation provided in Photo 4.5 to Photo 4.9. A profile of PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions is provided in Table 4.4 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.5.

Table 4.4 Summary of PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

PCT 76 – WESTERN GREY BOX TALL GRASSY WOODLAND ON ALLUVIAL LOAM AND CLAY SOILS IN THE NSW SOUTH WESTERN SLOPES AND RIVERINA BIOREGIONS	
PCT Justification	PCT 76 was assigned to patches of native vegetation dominated by *Eucalyptus microcarpa* (Western Grey Box) that exhibited a sparse shrub middle stratum and predominately grassy ground stratum. This vegetation type was predominately associated with floodplain areas, alluvial foot slopes and undulating lower to mid slopes of local hills associated with clay loam soils. PCT 76 grades into PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion on upper slopes and hill crests and PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion on alluvial floodplain flats to the west.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Vegetation zone	VZ2 – moderate condition VZ3 – poor condition
Conservation status	Forms part of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Endangered – BC Act / EPBC Act)
SAII entity	No
Percent cleared	92%
Patch size class	Moderate condition – 25–100 hectares Poor condition – 5–24 hectares
Area within the site	Moderate condition – 90.64 hectares Poor condition – 6.37 hectares
Vegetation integrity plots	Moderate condition – Q3, Q13, Q19, Q21, Q25 Poor condition – Q16, Q22, Q28
Current vegetation integrity score	Moderate condition – 77.4 Poor condition – 40.2
Landscape position	Occurs on alluvial foot slopes and undulating lower to mid slopes of local hills associated with clay loam soils.

PCT 76 – WESTERN GREY BOX TALL GRASSY WOODLAND ON ALLUVIAL LOAM AND CLAY SOILS IN THE NSW SOUTH WESTERN SLOPES AND RIVERINA BIOREGIONS	
Species upper stratum	*Eucalyptus microcarpa* (Western Grey Box), *Eucalyptus conica* (Fuzzy Box), *Allocasuarina luehmannii* (Buloke) with scattered occurrences of *Alectryon oleifolius* (Western Rosewood).
Species middle stratum	*Maireana microphylla* (Small-leaved Bluebush), *Salsola australis* and *Sclerolaena muricata* (Black Rolypoly)
Species ground stratum	*Austrostipa scabra* subsp. *scabra* (Speargrass), *Bothriochloa macra* (Red Grass), *Carex inversa*, *Einadia nutans* subsp. *nutans* (Climbing Saltbush), *Enteropogon acicularis* (Windmill Grass), *Lomandra filiformis* subsp. *filiformis* (Wattle Mat-rush), *Maireana enchylaenoides* (Wingless Bluebush), *Panicum decompositum* (Native Millet), *Paspalidium constrictum* (Knottybutt Grass), *Sida corrugata* (Corrugated sida), *Solanum esuriale* (Quena), *Rytidosperma caespitosum* (Ringed Wallaby Grass)
Vegetation condition	Moderate: the vegetation integrity score for the condition state was relatively high at 77.4 with high treat weed cover recorded at <5%. Most patches had low middle stratum richness and cover although exhibited a relatively diverse native grass and forb ground stratum. Historic and ongoing grazing was evident in most patches and exotic annual weed cover was low due to drought and seasonality. Poor: these patches generally occur as canopy only with little to no middle or ground stratum present. Most patches of this condition class occur as sheep camps within paddocks and have little to no regeneration potential. Exotic annual weed cover was relative low due to drought and seasonality although it is expected that following rain or during later winter / spring these patches would be dominated annual weeds.

Photo 4.5 A patch of moderate condition PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions

Photo 4.6 PCT 76 moderate condition on undulating mid slope with a canopy of *Eucalyptus microcarpa* (Western Grey Box)

Photo 4.7 PCT 76 moderate condition on lower slope dominated by a canopy of *Eucalyptus microcarpa* (Western Grey Box)

Photo 4.8 PCT 76 moderate condition with grassy native ground stratum

Photo 4.9 PCT 76 poor condition with evidence of intensive sheep grazing

Table 4.5 Comparison of PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	3	5	8	11	1	1	32	3	27	5	0	0	45	65	3(50)	–
Q3	1	2	10	4	1	1	20	1.3	7.9	3.1	1	0.1	9	27.6	2	4
Q13	1	3	7	8	0	1	30	2.3	6.9	3.6	0	2	14	74	1	2
Q16	2	1	5	6	0	2	25	2	15.3	2.5	0	0.5	52	14	1	0.4
Q19	1	5	10	14	1	0	10	15.2	40.5	7	0.3	0	32	47	2	0
Q21	1	4	7	8	0	1	25	9	31.7	7.7	0	0.1	28	61	0	0
Q22	1	0	1	4	0	0	35	0	0.3	0.7	0	0	12	54	2	0
Q25	1	3	8	8	0	0	35	13.6	41.5	13.7	0	0	15	63	3	0
Q28	1	0	0	0	0	0	25	0	0	0	0	0	22	0.8	5	0

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type - PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Floodplain Transition Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.3 PCT 82 – WESTERN GREY BOX – POPLAR BOX – WHITE CYPRESS PINE TALL WOODLAND ON RED LOAMS MAINLY OF THE EASTERN COBAR PENEPLAIN BIOREGION

The occurrence of this vegetation type within the Subject Land is illustrated in Figure 4.1 with photographic representation provided in Photo 4.10 to Photo 4.12. A profile of PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion is provided in Table 4.6 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.7.

Table 4.6 Summary of PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion

PCT 82 – WESTERN GREY BOX – POPLAR BOX – WHITE CYPRESS PINE TALL WOODLAND ON RED LOAMS MAINLY OF THE EASTERN COBAR PENEPLAIN BIOREGION	
PCT Justification	PCT 82 was assigned to patches of native vegetation with an upper stratum dominated by *Eucalyptus microcarpa* (Western Grey Box), *Eucalyptus populnea* subsp. bimbil (Poplar Box), *Callitris glaucophylla* (White Cypress Pine) with scattered occurrences of *Eucalyptus melliodora* (Yellow Box). This vegetation community grades in PCT 76 where *Eucalyptus microcarpa* (Western Grey Box) become almost exclusively dominant in the upper stratum. On rocky slopes to the north of Brolgan Road, Poplar Box and White Cypress Pine become dominant and scattered occurrences of Yellow Box were recorded. In these rocky patches, Yellow Box trees were examined to ensure they were not *Eucalyptus intertexta* (Red Box) which is a species that commonly grows with Poplar Box and White Cypress Pine in the Bogan Gate/Trundle area. In this regard, the patch was considered as potentially candidate for PCT 72 White Cypress Pine – Poplar Box woodland on footslopes and peneplains mainly in the Cobar Peneplain Bioregion. Samples possible Red Box were collected and forwarded to the NSW National Herbarium for verification. Based on a precautionary approach, patches of this vegetation type on rocky slopes were included in PCT82 as it has a higher percentage cleared to PCT 72 and forms part of the Inland Grey Box Woodland threatened ecological community.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Floodplain Transition Woodlands
Vegetation zone	VZ4 – moderate condition VZ5 – poor condition
Conservation status	Forms part of Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Endangered – BC Act / EPBC Act).
SAII entity	No
Percent cleared	75%
Patch size class	Moderate condition – 25–100 hectares Poor condition – 5–24 hectares
Area within the site	Moderate condition – 23.92 hectares Poor condition – 1.16 hectares
Vegetation integrity plots	Moderate condition – Q32, Q33, Q34, Q38, Q39, Q40 Poor condition – Q29

PCT 82 – WESTERN GREY BOX – POPLAR BOX – WHITE CYPRESS PINE TALL WOODLAND ON RED LOAMS MAINLY OF THE EASTERN COBAR PENEPLAIN BIOREGION	
Current vegetation integrity score	Moderate condition – 77.7 Poor condition – 25.1
Landscape position	Occurs on flat alluvial plains and rocky footslopes in the central and north-western portions of the investigation area. This vegetation type was recorded along Brolgan Road and near the electrical substation on the eastern side of Davies Lane.
Species upper stratum	*Eucalyptus microcarpa* (Western Grey Box), *Eucalyptus populnea* subsp. bimbil (Poplar Box), *Callitris glaucophylla* (White Cypress Pine) with scattered occurrences of *Eucalyptus melliodora* (Yellow Box)
Species middle stratum	*Acacia dealbata subsp. dealbata* (Silver Wattle), *Geijera parviflora* (Wilga)
Species ground stratum	*Anthosachne scabra* (Wheatgrass), *Austrostipa verticillata* (Bamboo Grass)
Vegetation condition	This vegetation type was recorded in moderate condition class

Photo 4.10 PCT 82 in moderate condition fringing Brolgan Road

Photo 4.11 PCT 82 in moderate condition fringing Keiths Lane

Photo 4.12 PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion fringing Brolgan Road

Table 4.7 Comparison of PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	3	5	8	11	1	1	32	3	27	5	0	0	45	65	3(50)	–
Q29	2	0	0	0	0	0	30	0	0	0	0	0	12	4.4	4	0
Q32	2	0	6	3	0	1	30	0	27.8	4.5	0	3	19	38	2	0.4
Q33	2	1	6	5	0	0	35	0.5	12	2.6	0	0	13	46	1	0
Q34	2	0	4	3	0	0	30	0	10	1.7	0	0	11	16	0	0
Q38	2	1	6	4	0	0	25	2	13.4	2.3	0	0	14	51.6	1	0
Q39	3	2	13	13	0	3	39	16	49.7	14.7	0	4.5	7	52	5	0.6
Q40	5	3	7	19	0	2	47	9	86	34.2	0	0.3	16	73	2	1.1

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Floodplain Transition Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.4 PCT 201 – FUZZY BOX WOODLAND ON ALLUVIAL BROWN LOAM SOILS MAINLY IN THE NSW SOUTH WESTERN SLOPES BIOREGION

The occurrence of this vegetation type within the site is illustrated in Figure 4.1 with photographic representation provided in Photo 4.13 to Photo 4.15. A profile of PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion is provided in Table 4.8 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.9.

Table 4.8 Summary of PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion

PCT 201 – FUZZY BOX WOODLAND ON ALLUVIAL BROWN LOAM SOILS MAINLY IN THE NSW SOUTH WESTERN SLOPES BIOREGION	
PCT Justification	PCT 201 was assigned to patches of native vegetation with an upper stratum dominated by *Eucalyptus conica* (Fuzzy Box). Vegetation occurred as a tall open woodland with a sparse shrub layer on the fringes of alluvial flats on floodplain areas. Typically this community would display a grassy understorey however patch of PCT 201 recorded were subject to weed invasion and/or heavy grazing. PCT 201 grades into PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion as the soils become heavy stagnant clays and PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion on upper slopes and hill crests. Based on the dominance of *Eucalyptus conica* (Fuzzy Box), landscape position near the floodplain and grassy woodland structure, this vegetation type was considered most closely aligned to PCT201.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Vegetation zone	VZ6 – moderate
Conservation status	Forms part of Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions (Endangered – BC Act)
SAII entity	Yes
Percent cleared	94%
Patch size class	5–24 hectares
Area within the site	2.66 hectares
Vegetation integrity plots	Q8, Q18
Current vegetation integrity score	64.8
Landscape position	Occurs on flat alluvial plains associated with the Bimbi Plains Mitchell Landscape unit in the central portion of the investigation area.
Species upper stratum	*Eucalyptus conica* (Fuzzy Box), with scattered occurrences of *Eucalyptus microcarpa* (Western Grey Box), *Eucalyptus melliodora* (Yellow Box) and *Callitris glaucophylla* (White Cypress Pine).

PCT 201 – FUZZY BOX WOODLAND ON ALLUVIAL BROWN LOAM SOILS MAINLY IN THE NSW SOUTH WESTERN SLOPES BIOREGION	
Species middle stratum	*Acacia deanei* (Green Wattle), *Maireana enchylaenoides* (Wingless Bluebush), *Maireana microphylla* (Small-leaved Bluebush), *Sclerolaena muricata* (Black Rolypoly).
Species ground stratum	*Enteropogon acicularis* (Windmill Grass), *Rytidosperma richardsonii* (Straw Wallaby Grass), *Solanum esuriale* (Quena).
Vegetation condition	This vegetation type was recorded in moderate condition class.

Photo 4.13 PCT 201 in moderate condition although subject to current grazing

Photo 4.14 A patch of PCT 201 Fuzzy Box Woodland

Photo 4.15 A patch of PCT201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion to the west of Cooper Road

Table 4.9 Comparison of PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	4	3	8	9	1	1	18	1	30	6	0	0	49	56	2(50)	–
Q8	1	3	6	7	0	1	23	3.5	3.1	2.2	0	0.3	42	68	0	1
Q18	3	2	8	3	0	0	40.3	1.5	9.7	4	0	0	5	82	3	50

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Western Slopes Grassy Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.5 PCT 250 – DERIVED TUSSOCK GRASSLAND OF THE CENTRAL WESTERN PLAINS AND LOWER SLOPES OF NSW

The occurrence of this vegetation type within the investigation area is illustrated in Figure 4.1 with photographic representation provided in Photo 4.16 to Photo 4.19. A profile of PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW is provided in Table 4.10 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.11.

Table 4.10 Summary of PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW

PCT 250 – DERIVED TUSSOCK GRASSLAND OF THE CENTRAL WESTERN PLAINS AND LOWER SLOPES OF NSW	
PCT Justification	PCT 250 was assigned to patches of native vegetation with which is derived from clearing of wooded vegetation (i.e. PCT 267, PCT 276 ect.) which was often recorded in adjacent areas. This generic native grassland vegetation type was assigned to vegetation which displayed the floristics and landscape position of a neighbouring wooded communities (i.e. PCT 76, PCT 82, PCT 267, PCT 276 ect.) which were outlined as never occurring as a derived community (Office of Environment and Heritage, 2019). This vegetation was characterised by a large array of disturbance tolerant native grasses which can form different associations. Species such as *Austrostipa scabra* (Speargrass), *Bothriochloa macra* (Redgrass), *Enteropogon ancicularis* (Windmill Grass) and various Rytidosperma sp. (Wallaby Grass) These species are able to tolerate agricultural practises such as trampling and grazing, and colonise recovering areas from more intensive practises such as ripping of soils and light cropping.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Vegetation zone	VZ7
Conservation status	PCT 250 was assessed against both Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions (Endangered – BC Act / EPBC Act) and White Box Yellow Box Blakely's Red Gum Woodland (Endangered – BC Act) and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered – EPBC Act). In areas where this vegetation was recorded adjacent to wooded vegetation which was commensurate a BC Act or EPBC Act listing, patches of PCT 250 were considered further. This is detailed further in section 5.1 and Appendix E.
SAII entity	No
Percent cleared	Not assessed
Patch size class	25–100 hectares
Area within the site	105.93 hectares
Vegetation integrity plots	Q2, Q4, Q6, Q9, Q12, Q20, Q30
Current vegetation integrity score	47.6
Landscape position	This vegetation was recorded on a variety of landscape positions.

PCT 250 – DERIVED TUSSOCK GRASSLAND OF THE CENTRAL WESTERN PLAINS AND LOWER SLOPES OF NSW	
Species upper stratum	Absent
Species middle stratum	Generally absent with scattered occurrence *of Alectryon oleifolius subsp. canescens* (Western Rosewood), *Brachychiton populneus* (Kurrajong) and *Callitris glaucophylla* (White Cypress Pine).
Species ground stratum	A variety of tolerant native grasses including; *Aristida behriana* (Bunch Wiregrass), *Austrostipa scabra* (Speargrass), *Bothriochloa macra* (Redgrass), *Enteropogon acicularis* (Windmill Grass), *Paspalidium constrictum* (Knottybutt Grass) and *Rytidosperma* species. Fobs were generally sparse but did include; *Convolvulus erubescens* (Blushing Bindweed), *Rumex brownii* (Swamp Dock), *Sida corrugata* (Corrugated sida), *Solanum esuriale* (Quena), *Wahlenbergia communis* (Tufted Bluebell).
Vegetation condition	This vegetation type was recorded in moderate condition class.

Photo 4.16 PCT 250 Derived tussock grassland

Photo 4.17 PCT 250 Derived tussock grassland

Photo 4.18 PCT 250 Derived tussock grassland

Photo 4.19 PCT 250 Derived tussock grassland

Table 4.11 Comparison of PCT 250 Derived tussock grassland of the central western plains and lower slopes of NSW vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	1	2	8	9	1	1	0	0	96	8	0	0	–	–	–	0
Q2	0	1	9	7	0	0	0	0.2	26.8	2.2	0	0	0	19.8	0	1.5
Q4	0	2	10	9	1	1	0	4.6	12.4	9	1	0.3	0	13	0	0
Q6	0	0	10	9	0	2	0	0	21.2	5.4	0	0.6	0	42	0	1
Q9	0	0	9	12	0	0	0	0	23.8	4.9	0	0	0	30	0	1.4
Q12	0	1	5	5	0	0	0	3	14.2	2.9	0	0	0	3.8	0	3
Q20	0	2	4	10	0	0	0	2.5	39.2	5.5	0	0	0	23	0	0
Q30	0	1	10	9	0	1	0	0.5	65.7	4.8	0	1	0	36	0	2

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 250 Derived tussock grassland of the central western plains and lower slopes of NSW; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Western Slopes Grassy Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.6 PCT 267 – WHITE BOX – WHITE CYPRESS PINE – WESTERN GREY BOX SHRUB/GRASS/FORB WOODLAND IN THE NSW SOUTH WESTERN SLOPES BIOREGION

The occurrence of this vegetation type within the site is illustrated in Figure 4.1 with photographic representation provided in Photo 4.20 to Photo 4.23. A profile of PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion is provided in Table 4.12 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.13.

Table 4.12 Summary of PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion

PCT 267 – WHITE BOX – WHITE CYPRESS PINE – WESTERN GREY BOX SHRUB/GRASS/FORB WOODLAND IN THE NSW SOUTH WESTERN SLOPES BIOREGION	
PCT Justification	PCT 267 was assigned to patches of native vegetation that exhibited an upper stratum dominated by *Eucalyptus albens* (White Box) and *Callitris glaucophylla* (White Cypress Pine) with scattered occurrences of *Eucalyptus microcarpa* (Western Grey Box). This vegetation type was recorded on upper slopes and hill crests associated with the Goonumbla Hills Mitchell Landscape unit and generally occurred in the central and eastern portions of the investigation area. PCT 267 grades into PCT 76 on mid to lower slopes where *Eucalyptus microcarpa* (Western Grey Box) replaces *Eucalyptus albens* (White Box) and almost exclusively dominates the upper stratum. Whilst the BioNet Vegetation Classification Database for PCT 267 states that this vegetation type never occurs as a derived community (Office of Environment & Heritage 2019a), native grassland vegetation patches that occur adjacent to this community have been included under this PCT as a low condition class. The assigning of these grassland patches has been undertaken to ensure accurate assessment of threatened ecological community analysis for both BC Act and EPBC Act purpose.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Vegetation zone	VZ6 (moderate)
Conservation status	Patches of this vegetation type form part of White Box Yellow Box Blakely's Red Gum Woodland (Endangered – BC Act) and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered – EPBC Act).
SAII entity	Yes
Percent cleared	94%
Patch size class	Moderate condition – 25–100 hectares Poor condition – 5–24 hectares
Area within the site	Moderate condition – 84.82 hectares Poor condition – 14.05 hectares
Vegetation integrity plots	Moderate condition – Q10, Q11, Q14, Q23, Q31, Q37, Q42 Poor condition – Q15, Q17, Q41
Current vegetation integrity score	Moderate condition – 67.2 Poor condition – 19

PCT 267 – WHITE BOX – WHITE CYPRESS PINE – WESTERN GREY BOX SHRUB/GRASS/FORB WOODLAND IN THE NSW SOUTH WESTERN SLOPES BIOREGION	
Landscape position	Occurs on upper slopes and hill crests associated with the Goonumbla Hills Mitchell Landscape unit and generally occur in the central and eastern portions of the investigation area.
Species upper stratum	*Eucalyptus albens* (White Box) and *Callitris glaucophylla* (White Cypress Pine) with scattered occurrences of *Eucalyptus microcarpa* (Western Grey Box).
Species middle stratum	Sparse with scattered specimens of *Eremophila mitchellii* (False Sandlewood), *Maireana microphylla* (Small-leaved Bluebush), *Sclerolaena birchii* (Galvanised Burr).
Species ground stratum	The ground stratum is dominated by grasses such as *Anthosachne scabra* (Wheatgrass), *Bothriochloa macra* (Red Legs), *Austrostipa bigeniculata*, *Austrostipa scabra* subsp. *scabra* (Speargrass), *Chloris truncata* (Windmill Grass), *Enteropogon acicularis* (Windmill Grass) and *Panicum decompositum* (Native Millet). Forbs include *Boerhavia dominii* (Tarvine), *Calotis cuneifolia* (Purple Burr-Daisy), *Maireana enchylaenoides* (Wingless Bluebush), *Sida corrugata* (Corugated Sida), *Solanum esuriale* (Quena), *Vittadinia cuneata* var. *cuneata* (Fuzzweed), *Wahlenbergia communis* (Tuffed Bluebell), *Wahlenbergia luteola* (Bluebell) and *Xerochrysum viscosum* (Sticky Everlasting).
Vegetation condition	Moderate condition – this vegetation zone exhibited a woodland canopy with predominated grassy native ground stratum. The middle stratum was sparse due to historic and ongoing agricultural grazing. Weed cover was mostly <15% and vegetation integrity was 67.2. Poor condition – vegetation patches assigned to this vegetation zone comprise of a relatively intact upper stratum of woodland structure although the middle and ground stratums have been completely modified through historic and ongoing agricultural practises. The ground stratum was mostly devoid of native vegetation in both species richness and cover. It is considered that the ground stratum of this vegetation zone would be generally dominated by exotic annual grasses and weed species following rain events and suitable seasonal conditions (Spring – early summer).

Photo 4.20 PCT 267 recorded on rocky ground

Photo 4.21 *Eucalyptus albens* (White Box) bud

Photo 4.22 *Eucalyptus albens* (White Box) recorded in areas which have experienced direct seeding

Photo 4.23 PCT 267 poor condition with ground stratum dominated by *Asphodelus fistulosus** (Onion Weed)

Table 4.13 Comparison of PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	4	3	8	9	1	1	18	1	30	6	0	0	49	56	2 (50)	0
Q10	1	2	9	5	0	1	15	5	26.2	4	0	0.3	19	10	2	2
Q11	1	2	8	12	0	2	10	3	55.9	7.5	0	0.2	0	14	0	4
Q14	2	0	9	9	0	1	25	0	21.7	3.9	0	0.3	27	2	1	3.9
Q15	2	0	1	5	0	0	25	0	0.3	0.9	0	0	10	1.4	1	0
Q17	2	0	0	1	0	0	30	0	0	0.4	0	0	9	6	1	1
Q23	1	2	5	2	0	0	15	6	10.5	0.8	0	0	6	15	2	2.2
Q31	2	0	7	8	0	1	20	0	25.6	1.2	0	0.1	8	48	1	0
Q37	2	1	4	8	0	0	30	2	32	19.3	0	0	8	43	1	1
Q41	1	0	1	2	0	0	20	0	0.1	0.6	0	0	0	8	0	0
Q42	4	0	5	4	0	0	28	0	6.5	2.5	0	0	5	19	1	2

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Western Slopes Grassy Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.2.7 PCT 276 – YELLOW BOX GRASSY TALL WOODLAND ON ALLUVIUM OR PARNA LOAMS AND CLAYS ON FLATS IN NSW SOUTH WESTERN SLOPES BIOREGION

The occurrence of this vegetation type within the investigation area is illustrated in Figure 4.1 with photographic representation provided in Photo 4.24 to Photo 4.27. A profile of PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion is provided in Table 4.14 and a comparison of recorded vegetation integrity data against community condition benchmark data is presented in Table 4.15.

Table 4.14 Summary of PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion

PCT 276 – YELLOW BOX GRASSY TALL WOODLAND ON ALLUVIUM OR PARNA LOAMS AND CLAYS ON FLATS IN NSW SOUTH WESTERN SLOPES BIOREGION	
PCT Justification	This vegetation type was almost exclusively dominated by *Eucalyptus melliodora* (Yellow Box) although sporadic occurrences of *Callitris glaucophylla* (White Cypress Pine) were observed. Based on the dominance of *Eucalyptus melliodora* (Yellow Box) in the upper stratum, landscape position on the floodplain and grassy woodland structure, this vegetation type was considered most closely aligned to PCT276.
Vegetation formation	KF_CH3 Grassy Woodlands
Vegetation class	Western Slopes Grassy Woodlands
Vegetation zone	VZ10 – moderate condition VZ11 – poor condition
Conservation status	Patches of this vegetation type form part of White Box Yellow Box Blakely's Red Gum Woodland (Endangered – BC Act) and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Endangered – EPBC Act).
SAII entity	Yes
Percent cleared	90%
Patch size class	Moderate condition – 5–24 hectares Poor condition – 5–24 hectares
Area within the site	Moderate condition – 37.35 hectares Poor condition – 3.93 hectares
Vegetation integrity plots	Moderate condition – Q1, Q5, Q7, Q44 Poor condition – Q26, Q35
Current vegetation integrity score	Moderate condition – 80 Poor condition – 31.1
Landscape position	Occurs on flat alluvial floodplain areas associated with the Bimbi Plains Mitchell Landscape unit in the western portions of the investigation area.
Species upper stratum	*Eucalyptus melliodora* (Yellow Box), *Callitris glaucophylla* (White Cypress Pine).

PCT 276 – YELLOW BOX GRASSY TALL WOODLAND ON ALLUVIUM OR PARNA LOAMS AND CLAYS ON FLATS IN NSW SOUTH WESTERN SLOPES BIOREGION	
Species middle stratum	*Atriplex semibaccata* (Creeping Saltbush), *Eremophila debilis* (Winter Cherry), *Lycium ferocissimum** (African Boxthorn), *Maireana microphylla* (Small-leaved Bluebush), *Salsola australis* and *Sclerolaena muricata* (Black Rolypoly).
Species ground stratum	*Austrostipa scabra* subsp. *scabra* (Speargrass), *Austrostipa verticillata* (Bamboo Grass), *Digitaria divaricatissima* (Umbrella Grass), *Dysphania pumilio* (Small Crumbweed), *Enteropogon acicularis* (Windmill Grass), *Sida corrugata* (Corrugated sida).
Vegetation condition	Moderate condition – this vegetation zone exhibited a woodland canopy with predominated grassy native ground stratum. The middle stratum was sparse due to historic and ongoing agricultural grazing. Weed cover was mostly <15% and vegetation integrity was 80. Poor condition – vegetation patches assigned to this vegetation zone comprise of a relatively intact upper stratum of woodland structure although the middle and ground stratums have been completely modified through historic and ongoing agricultural practises. The ground stratum was mostly devoid of native vegetation in both species richness and cover. It is considered that the ground stratum of this vegetation zone would be generally dominated by exotic annual grasses and weed species following rain events and suitable seasonal conditions (Spring – early summer).

Photo 4.24 PCT 276_moderate condition

Photo 4.25 PCT 276_moderate condition

Photo 4.26 PCT 276_poor condition

Photo 4.27 PCT 276_moderate condition – tree cover

Table 4.15 Comparison of PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion vegetation integrity plot data against PCT condition benchmark data

PLOT	TREE RICHNESS	SHRUB RICHNESS	GRASS RICHNESS	FORB RICHNESS	FERN RICHNESS	OTHER RICHNESS	TREE COVER	SHRUB COVER	GRASS COVER	FORB COVER	FERN COVER	OTHER COVER	LENGTH TIMBER	LEAF LITTER	LARGE TREE	HTW COVER
BM[1]	**4**	**3**	**8**	**9**	**1**	**1**	**18**	**1**	**30**	**6**	**0**	**0**	**49**	**56**	**2**	**0**
Q1	1	0	6	7	0	2	20	0	4.3	6.5	0	0.3	5	25.6	4	1
Q5	1	1	9	14	0	2	20	0.6	8.2	11.1	0	0.7	11	33	0	0.2
Q7	1	5	9	13	0	1	15	3.2	39.9	8.6	0	0.4	39	28	0	0.1
Q26	2	0	0	0	0	0	45	0	0	0	0	0	17	19	3	15
Q35	1	0	3	4	0	0	35	0	4.5	4.9	0	0	51	33	4	0
Q44	2	1	7	5	0	1	38	1	36.1	1.6	0	0.5	24	67	3	12

(1) Benchmark data for equivalent community in NSW South Western Slopes IBRA Bioregion; Vegetation Type – PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion; Keith Formation: KF_CH3 Grassy Woodlands; Keith Class: Western Slopes Grassy Woodlands; source (NSW BioNet Vegetation Classification database accessed March 2019 and cross referenced with BAM Calculator)

4.3 NON-NATIVE VEGETATION

4.3.1 MISCELLANEOUS ECOSYSTEM (URBAN EXOTIC / NATIVE LANDSCAPE PLANTINGS)

Planted native vegetation which was not able to be assigned to a recognised NSW Plant Community Type was recorded as Miscellaneous Ecosystem (urban exotic/native landscape plantings). This vegetation was recorded as rows of planted native canopy species endemic to Parkes area (i.e. *Eucalypts mellidora* (Yellow Box), *Eucalypts populena* subsp. *bimbil* (Polar Box), *Casuarina cristata* (Belah). Urban exotic/native landscape plantings were also recorded around residential dwellings and included a range of both native and exotic species, some of which were not-indigenous to the Parkes area.

Photo 4.28 Native landscape plantings

Photo 4.29 Native landscape plantings

4.4 PADDOCK TREES

A total of 884 Class 2 and Class 3 paddock trees were recorded within the investigation area. A breakdown of each paddock tree class and associated PCT is provided in Table 4.16. The paddock trees recorded within areas subject to survey are shown in Figure 4.2. Paddock trees with negligible biodiversity value are those trees identified as Class 1 paddock trees and do not contain hollows.

Paddock Trees within the investigation area were assigned to the following PCTs:

- PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt.
- PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.
- PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion.
- PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.
- PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion.
- PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion.

The Large tree benchmark for all PCT's assigned is 50 cm DBH. This benchmark was used to determine the Class category for each Paddock tree in accordance with Appendix 1 of the BAM. A description of each condition class is provided in section 2.5.

Table 4.16 Class 2 and Class 3 Paddock trees recorded within the investigation area

CLASS OF PADDOCK TREE	ASSOCIATED PCT	NUMBER OF PADDOCK TREES
Class 3 – with hollows	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	62
	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	11
	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	6
	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	66
	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	93
	Total Class 3 paddock trees with hollows	238
Class 3 – with no hollows	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	21
	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	7
	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	6
	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	20
	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	24
	Total Class 2 paddock trees with no hollows	78
Class 2 – with hollows	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	3
	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	2
	Total Class 2 paddock trees with hollows	5
Class 2 – with no hollows	PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt	486
	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	14
	PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	1
	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	2
	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	44

CLASS OF PADDOCK TREE	ASSOCIATED PCT	NUMBER OF PADDOCK TREES
	PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	16
	Total Class 2 paddock trees with no hollows	563
	Total Class 3 and Class 2 paddock trees	884

4.5 PRIORITY WEEDS

A total of 177 flora species recorded during field surveys, of which 135 were native and 42 were introduced. Of the introduced species, nine were listed as High Threat weeds under the *Biodiversity Conservation Act 2016*. Four species were listed as Priority Weeds for the Central West region under the *Biosecurity Act 2015* (Department of Primary Industries, 2019a) and two are listed as Weeds of National Significance (WoNS) (Australian Weeds Committee, 2019).

Table 4.17 Priority weeds identified within the Subject Land

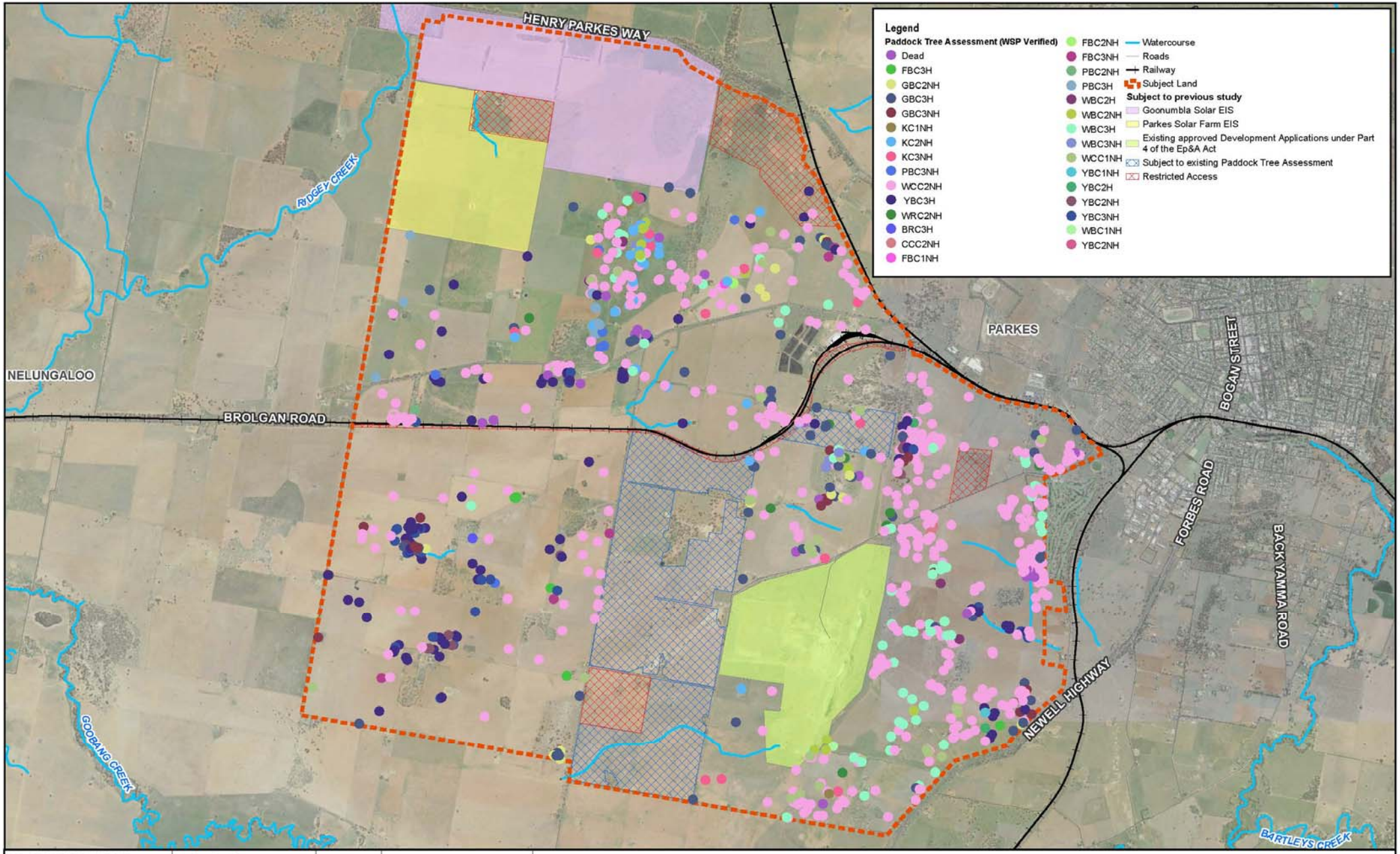
SCIENTIFIC NAME	COMMON NAME	BAM	PRIORITY WEED LISTING[1]	WONS
*Alternanthera pungens**	Khaki Weed	HT	–	–
*Carthamus lanatus**	Saffron Thistle	HT	–	–
*Eragrostis curvula**	African Lovegrass	HT	–	–
*Heliotropium amplexicaule**	Blue Heliotrope	HT	Regional Recommended Measure; Exclusion zone; Core infestation area	–
*Lycium ferocissimum**	African Boxthorn	HT	Prohibition on dealings	YES
*Paspalum dilatatum**	Paspalum	HT	–	–
*Solanum elaeagnifolium**	Silver-leaved Nighthade	HT	Prohibition on dealings; Regional Recommended Measure	YES
*Xanthium occidentale**	Noogoora Burr	HT	–	–
*Xanthium spinosum**	Bathurst Burr	HT	–	–

(1) Core infestation area: Land managers should reduce impacts from the plant on priority assets. Land managers should mitigate the risk of the plant being introduced to their land.

Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Land managers should mitigate the risk of the plant being introduced to their land.

Prohibition on dealings: Must not be imported into the State or sold.

Regional Recommended Measure: Land managers should mitigate the risk of the plant being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment. Land managers to reduce impacts from the plant on priority assets.



Map: PS112886_GIS_038_A3	Author: Trent.Bowman		0 500 1,000 m 1:40,000
Date: 29/03/2019	Approved by: Julia.Wyllie		Coordinate system: GDA 1994 MGA Zone 55 Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community © Department Finance, Services and Innovation 2019

Parkes SAP

Figure 4.2
Paddock Tree Assessment

5 THREATENED BIODIVERSITY

5.1 THREATENED ECOLOGICAL COMMUNITIES

Native vegetation recorded within the investigation area is considered to meet the final determination of three threatened ecological communities listed under the BC Act. These are:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions.
- Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions.
- White Box Yellow Box Blakely's Red Gum Woodland.

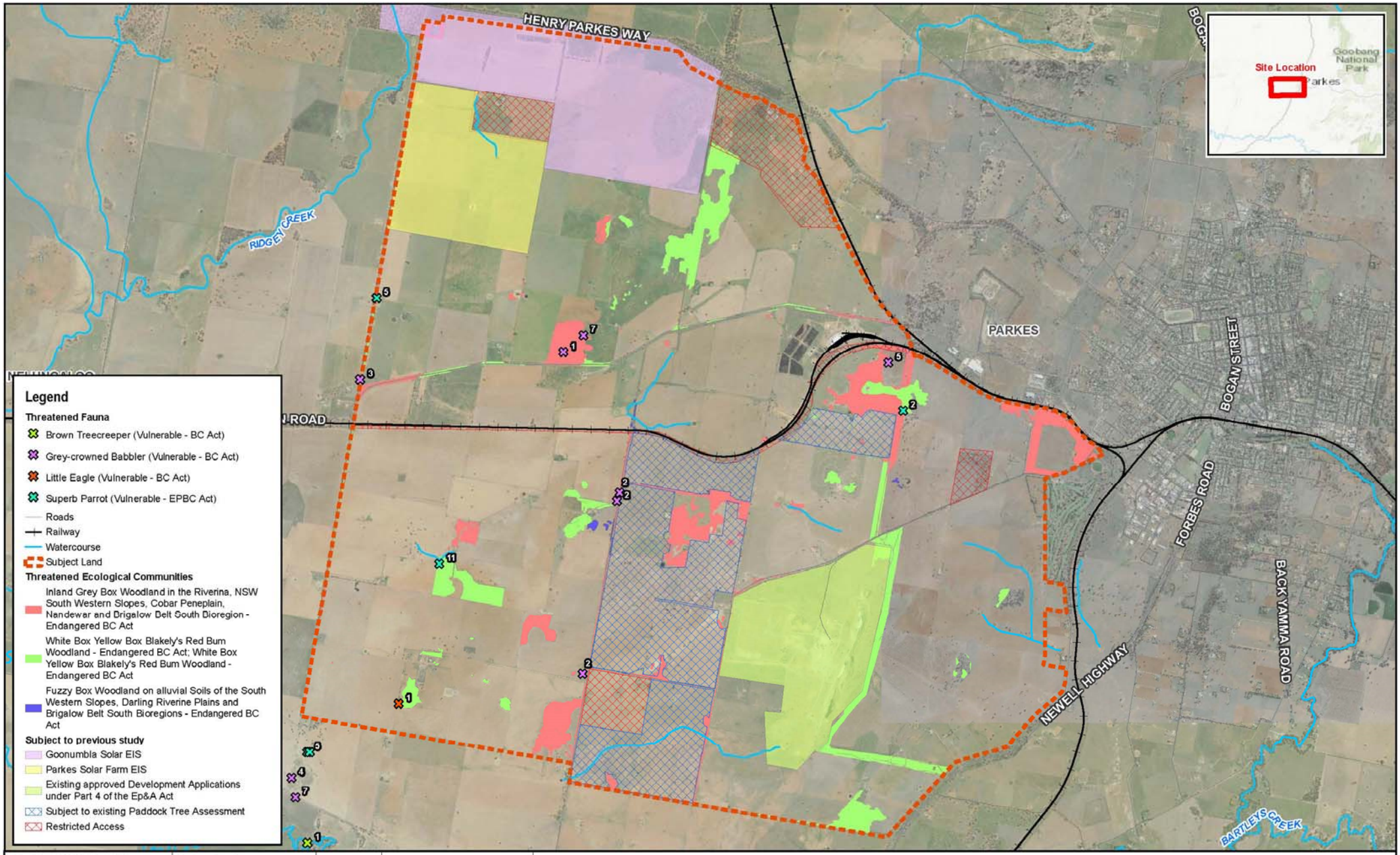
A summary of each threatened ecological community, associated PCT and extent within the investigation area is summarised in Table 5.1.

A comparison of the final determination for each threatened ecological community and candidate PCT is provided in Table 5.2 to Table 5.4. Each element of the final determination including locality, species composition, characteristic species and resilience is compared to each condition class for candidate PCTs to determine if vegetation recorded within the Subject Land is consistent with the criterion.

The location of each threatened ecological community in relation to the investigation area is provided in Figure 5.1.

Table 5.1 Threatened Ecological Communities listed under the BC Act recorded within the investigation area

THREATENED ECOLOGICAL COMMUNITY	STATUS[1]	ASSOCIATED PCT WITHIN THE INVESTIGATION AREA	CONDITION	EXTENT (HA)
Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions	E	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Moderate	90.64
			Poor	6.37
		PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	Moderate	23.92
			Poor	1.16
		PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	N/a	64.83
			Total area of Inland Grey Box Woodland:	186.92
Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions	E	PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion	Moderate	2.66
			Total area of Fuzzy Box Woodland:	2.66
White Box Yellow Box Blakely's Red Gum Woodland	E	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Moderate	84.82
			Poor	Does not meet criterion
		PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	Moderate	37.35
			Poor	Does not meet criterion
		PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	N/a	40.67
			Total area of White Box Yellow Box Blakely's Red Gum Woodland:	162.84
			Total area of all TECs listed under the BC Act:	352.41



Map: PS112886_GIS_030_A5	Author: Trent.Bowman
Date: 3/06/2019	Approved by: Julia.Wyllie

1:40,000

Coordinate system: GDA 1994 MGA Zone 55
Scale ratio correct when printed at A3

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community © Department Finance, Services and Innovation 2019

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Parkes SAP

Figure 5.1
BC Act Threatened Biodiversity

5.1.1 INLAND GREY BOX WOODLAND IN THE RIVERINA, NSW SOUTH WESTERN SLOPES, COBAR PENEPLAIN, NANDEWAR AND BRIGALOW BELT SOUTH BIOREGIONS

A comparison of PCT 76 and PCT 82 within the investigation area against the final determination for the threatened Inland Grey Box ecological community is provided in Table 5.2.

Table 5.2 Comparison of Inland Grey Box EEC final determination against associated PCT 76 and PCT 82 recorded within the investigation area

INLAND GREY BOX WOODLAND EEC FINAL DETERMINATION[1]	**PCT 76**		**PCT 82**		**PCT 250**
	Moderate	**Poor**	**Moderate**	**Poor**	
1. Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions is the name given to the ecological community found on relatively fertile soils of the western slopes and plains of NSW in which *Eucalyptus microcarpa* (Inland Grey Box) is the most characteristic species.	*Eucalyptus microcarpa* (Inland Grey Box) was the most dominant species.		*Eucalyptus microcarpa* (Inland Grey Box) was the generally the co-dominant *Eucalyptus populnea* (Poplar Box).		This PCT was recorded in areas adjacent to PCT 76 / PCT 82 and displayed similar understorey species. An assumption has been made for this assessment that *Eucalyptus microcarpa* (Inland Grey Box) would have been the most dominant overstorey species prior to clearing.
1a. In NSW the community principally occurs within the Riverina and South West Slopes Bioregions.	Recorded in the NSW South Western Slopes IBRA bioregion				
Inland Grey Box Woodland includes those woodlands in which the most characteristic tree species - *Eucalyptus microcarpa* - is often found in association with *Eucalyptus populnea subsp. bimbil* (Bimbil Box), *Callitris glaucophylla* (White Cypress-pine), *Brachychiton populneus* (Kurrajong), *Allocasuarina luehmannii* (Buloke) or *Eucalyptus melliodora* (Yellow Box), and sometimes with *Eucalyptus albens* (White Box).	*Eucalyptus microcarpa* (Inland Grey Box) was the most dominant species with *Callitris glaucophylla* (White Cypress-pine) often recorded as sub-dominant. *Eucalyptus melliodora* (Yellow Box) and with *Eucalyptus albens* (White Box) were recorded in eco-tonal areas.		*Eucalyptus microcarpa* (Inland Grey Box) was the co- dominant species with *Eucalyptus populnea* (Poplar Box). *Callitris glaucophylla* (White Cypress-pine) varied in abundance within the community. *Brachychiton populneus* (Kurrajong) was recorded intermittently. *Eucalyptus melliodora* (Yellow Box) was recorded in this community in ecotonal areas and in areas.		Canopy was not recorded in this PCT.

INLAND GREY BOX WOODLAND EEC FINAL DETERMINATION[1]	PCT 76		PCT 82		PCT 250
	Moderate	Poor	Moderate	Poor	
Paragraph 3 outlines the most characteristic species for this EEC.	Characteristic species were recorded in Q3, Q13, Q19, Q21, Q25	Characteristic species were recorded in Q16, Q22, Q28	Characteristic species were recorded in Q32, Q33, Q34, Q38, Q39, Q40	Characteristic species were recorded in Q29	Characteristic species were recorded in Q2, Q4, Q6 Q12, Q20, Q30
5. Inland Grey Box Woodland may be found in the local government areas of … Narromine, Parkes…	Recorded in Parkes Shire Council Local Government Area				
7. Inland Grey Box Woodland can, in some regions, be differentiated from Eucalyptus albens-E. melliodora communities by grass species. *Themeda triandra* and *Poa sieberiana* characterise the latter community whereas *Austrostipa scabra, Austrodanthonia spp.* and *Enteropogon spp.* are more typically associated with Eucalyptus microcarpa, although disturbance weakens this correlation (Prober and Thiele 2004).	*Austrostipa scabra, Rytidosperma caespitosum, Rytidosperma richardsonii*, and *Enteropogon ancilularis* were frequently recorded in these plant communities. It should be noted that during the time of survey, the Parkes region was experiencing drought conditions and majority of the survey area with native grasslands had experienced heavy grazing. These disturbing factors favour tolerant species such as *Enteropogon ancilularis* and *Bothriochloa macra* creating a floristic composition which is not truly representative.			
8. On a statewide scale, Benson et al. (2006) described six communities as fitting within the definition of Inland Grey Box Woodland (ID76, ID80, ID81, ID82, ID110 and ID237). The nominated community belongs to 'Floodplain Transition Woodlands' vegetation class of Keith (2004) which also includes the Eucalyptus conica (Fuzzy Box) and E. pilligaensis (Pilliga Box) woodland communities where E. microcarpa rarely occurs.	PCT 76 belongs to the Floodplain Transition Woodlands vegetation class and is known to align to this EEC.		PCT 82 belongs to the Floodplain Transition Woodlands vegetation class and is known to align to this EEC.		PCT 250 belongs to the Western Slopes Grasslands vegetation class. PCT 250 is a generic native grasslands Plant Community Type. Areas of PCT 250 considered in this assessment occurred as derived native grasslands of PCT 76 and PCT 82 are recorded prior to clearing.

INLAND GREY BOX WOODLAND EEC FINAL DETERMINATION[1]	PCT 76		PCT 82		PCT 250
	Moderate	Poor	Moderate	Poor	
12. Some remnants of the community survive with trees partly or wholly removed. Conversely, often the remnants of the community survive with trees largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification.	Not applicable	Poor condition PCT 76 was recorded in areas where the native understorey species were in very low abundance due to disturbances such as cropping. Exotic species were dominant in these areas.	Not applicable	Poor condition PCT 82 was recorded in areas where the native understorey species were in very low abundance due to disturbances such as cropping. Exotic species were dominant in these areas.	Canopy species in this Plant Community Type were trees were wholly removed.
13. Some remnants are highly degraded, with weedy understoreys and only a few hardy natives remaining.					Not applicable
Outcome	**Meets criterion**	**Meets criterion**	**Meets criterion**	**Meets criterion**	**Meets criterion**

(1) NSW Scientific Committee (2007)

5.1.2 FUZZY BOX WOODLAND ON ALLUVIAL SOILS OF THE SOUTH WESTERN SLOPES, DARLING RIVERINE PLAINS AND BRIGALOW BELT SOUTH BIOREGIONS

A comparison of PCT 201 within the investigation area against the final determination for the threatened Fuzzy Box Woodland ecological community is provided in Table 5.3.

Table 5.3 Comparison of Fuzzy Box EEC final determination against associated PCT 201 recorded within the investigation area

FUZZY BOX WOODLAND EEC FINAL DETERMINATION[1]	PCT 201 (MODERATE CONDITION)
1. Fuzzy Box Woodland … occurred mainly in the Dubbo – Narromine – Parkes – Forbes area. Within this region it is now found principally in the South Western Slopes Bioregion and also occurs in parts of the Darling Riverine Plains Bioregion and Brigalow Belt South Bioregion.	PCT 201 was recorded in Parkes Local Government Area within the South Western Slopes Bioregion.
Paragraph 1 outlined characteristic species of the community.	Characteristics species were recorded in Q8 and Q18.
2. Fuzzy Box Woodland … is a woodland or open forest usually dominated by Fuzzy Box *Eucalyptus conica*, which often grows with Inland Grey Box Eucalyptus microcarpa, Yellow Box *Eucalyptus melliodora* or Kurrajong *Brachychiton populneus*. Buloke *Allocasuarina luehmannii* is common in places. Shrubs are generally sparse and include *Acacia deanei, Dodonaea viscosa, Geijera parviflora, Acacia implexa, Senna artemisioides, Myoporum montanum* and *Cassinia aculeata*. Small shrubs include *Maireana microphylla* and *Sclerolaena muricata*. The ground cover may be dense after rain but is usually moderately dense. It comprises native forbs, including *Calotis cuneifolia, Sida corrugata, Einadia hastata, Dianella revoluta* and *Bracteantha viscosa*, prostrate shrubs such as *Eremophila debilis, Maireana enchylaenoides*, and native grasses including *Austrostipa scabra, Chloris truncata, Elymus scaber, Themeda australis* and *Austrodanthonia setacea*.	*Eucalyptus conica* (Fuzzy Box) was recorded as the dominant canopy species in vegetation mapped as PCT 201. *Allocasuarina luehmannii* (Buloke) was recorded intermittently where *Eucalyptus melliodora* (Yellow Box) and *Brachychiton populneus* (Kurrajong) was recorded in ecotonal areas where PCT 201 intergrades with PCT 276. The shrub, forb and grass species listed in Paragraph 2 are characteristic of those recorded within PCT 201 within the investigation area. Plot data for this community is provided in Appendix A.
4. Fuzzy Box Woodland … occurs on brown loam or clay, alluvial or colluvial soils on prior streams and abandoned channels or slight depressions on the undulating plains or flats of the western slopes of the Great Dividing Range. It also occurs on colluvial soils on lower slopes and on valley flats (King 1998, Murphy and Lawry 1998).	PCT 201 was on floodplain areas on clay-based soils. This community was recorded in areas slightly higher on the landscape then PCT 276 where soils were stagnant and alluvial.
Outcome	**Meets criterion**

(1) NSW Scientific Committee (2004)

5.1.3 WHITE BOX YELLOW BOX BLAKELY'S RED GUM WOODLAND

A comparison of PCT 267 and PCT 276 within the investigation area against the final determination for the threatened White Box Yellow Box Blakely's Red Gum Woodland ecological community is provided in Table 5.4.

Table 5.4 Comparison of White Box Yellow Box Blakey's Red Gum Woodland EEC final determination and associated PCT 267 and PCT 276 recorded within the investigation area

BOX GUM WOODLAND EEC FINAL DETERMINATION[1]	**PCT 267**		**PCT 276**		**PCT 250**
	Moderate	**Poor**	**Moderate**	**Poor**	
1. White Box Yellow Box Blakely's Red Gum Woodland (Box Gum Woodland) is found on relatively fertile soils on the tablelands and western slopes of NSW…The community occurs within the …South Eastern Highlands and NSW South Western Slopes Bioregions.	This vegetation was recorded on fertile soils of the NSW South Western Slopes Bioregion.				
2. Box 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). Grass and herbaceous species generally characterise the ground layer. 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. Shrubs are generally sparse or absent, though they may be locally common.	*Eucalyptus albens* (White Box) was the dominant. Shrubs are generally sparse or absent. Grass and herbaceous species generally characterise the ground layer.	*Eucalyptus albens* (White Box) was the dominant. Understorey was generally dominated by exotic species due to disturbances such as cropping and weed invasions.	*Eucalyptus melliodora* (Yellow Box) was the dominant overstorey species. *Eucalyptus blakelyi* (Blakely's Red Gum) was recorded infrequently within this community. Shrubs are generally sparse or absent. Grass and herbaceous species generally characterise the ground layer.	*Eucalyptus melliodora* (Yellow Box) was the dominant overstorey species. Understorey was generally dominated by exotic species due to disturbances such as cropping and weed invasions.	The tree overstorey in this vegetation is absent as a result of past clearing or thinning and at these locations only an understorey is present.

BOX GUM WOODLAND EEC FINAL DETERMINATION[1]	PCT 267		PCT 276		PCT 250
	Moderate	Poor	Moderate	Poor	
Paragraph 3 outlines characteristic species of Box Gum Woodland EEC	Characteristic species were recorded in Q10, Q11, Q14, Q23, Q31, Q37, Q42	Characteristic species were recorded in Q15, Q17, Q41	Characteristic species were recorded in Q1, Q5, Q7, Q44	Characteristic species were recorded in Q26, Q35	Characteristic species were recorded in Q9, Q12 and Q30
4. Woodlands with *Eucalyptus albens* are most common on the undulating country of the slopes region while *Eucalyptus blakelyi* and *Eucalyptus melliodora* predominate in grassy woodlands on the tablelands. Drier woodland areas dominated by *Eucalyptus albens* often form mosaics with areas dominated by *Eucalyptus blakelyi* and *Eucalyptus melliodora* occurring in more moist situations, while areas subject to waterlogging may be treeless. *E microcarpa* is often found in association with *E. melliodora* and *E. albens* on the south western slopes.	PCT 267 was recorded in areas of higher elevation where surface rock was present and occurred as a grassy woodland. *Eucalyptus microcarpa* (Inland Grey Box) was recorded in ecotonal areas where vegetation graded into PCT 76 / PCT 82 (or historically would have).		PCT 276 was recorded in low-lying areas in the landscape subject to period flooding and occurred as a grassy woodland. *Eucalyptus microcarpa* (Inland Grey Box) was recorded in ecotonal areas where vegetation graded into PCT 76 / PCT 82 (or historically would have).		No overstorey species were recorded in this vegetation. Areas of PCT 250 considered in this assessment were mapped in areas where PCT 267 or PCT 276 would have historically occurred prior to clearing.
8. Further remnants of the community are degraded as a consequence of their disturbance history. Some remnants of these communities survive with the trees partly of wholly removed by post European activities, and conversely, often remnants of these communities survive with these tree species largely intact but with the shrub or ground layers degraded to varying degrees through grazing or pasture modification.	Not applicable	PCT 267 in Poor condition was recorded in areas where *Eucalyptus albens* (White Box) was the dominant overstorey species with a degraded mid storey and ground strata.	Not applicable	PCT 267 in Poor condition was recorded in areas where *Eucalyptus melliodora* (Yellow Box) was the dominant overstorey species with a degraded mid storey and ground strata.	Areas of PCT 250 considered in this assessment occurred in areas where trees are wholly removed.

BOX GUM WOODLAND EEC FINAL DETERMINATION[1]	PCT 267		PCT 276		PCT 250
	Moderate	**Poor**	**Moderate**	**Poor**	
10. The condition of remnants ranges from relatively good to highly degraded, such as paddock remnants with weedy understories and only a few hardy natives left. Some remnants of the community may consist of only an intact overstorey or an intact understorey, but may still have high conservation value due to the flora and fauna they support.	Not applicable	This condition class occurred as paddock remnants with weedy understories and only a few hardy natives left.	Not applicable	This condition class occurred as paddock remnants with weedy understories and only a few hardy natives left.	Some remnants of the community may consist of only an intact understorey
11. 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.	The seed bank of this condition form is considered intact.	PCT 267 (Poor condition) is considered likely to respond to assisted natural regeneration. Assisted natural regeneration is considered unlikely to be successful.	The seed bank of this condition form is considered intact.	PCT 276 (Poor condition) is considered likely to respond to assisted natural regeneration.	Areas of PCT 250 considered in this assessment are considered likely to respond to assisted natural regeneration in the form of overstorey species.
Outcome	**Meets criterion**	Does not meet criterion	**Meets criterion**	Does not meet criterion	**Meets criterion**

(1) NSW Scientific Committee (2002)

5.2 THREATENED FLORA

5.2.1 THREATENED FLORA CANDIDATE SPECIES

A total of 14 threatened flora species were identified by the BAM calculator as species credit species, of these 11 were considered candidate species based on having a having a moderate or higher likelihood of occurrence. One additional species, *Lepidium monoplocoides* (Winged Peppercress) was considered to have moderate or higher likelihood of occurrence based on previous records and potential habitat.

Candidate species were the focus of detailed targeted surveys (refer to Table 2.8). Each species considered likely to occur have been assessed further in detail to determine if this species is likely to be affected (Table 5.5).

Table 5.5 BC Act candidate threatened flora survey results

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	CANDIDATE SPECIES LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Acacia ausfieldii	All year	V	**Moderate**. Associated habitat in the form of PCT 201; PCT 276; PCT 276 recorded within the Subject Land.	No. Targeted surveys were undertaken in areas of potential habitat within the appropriate survey months. The general lack of shrub layer throughout the investigation area possibly due to heaving grazing, is unlikely to support this species.
Austrostipa metatoris	A spear-grass	V	**Moderate**. Associated habitat in the form of PCT 70; PCT 82; PCT 201 recorded within the Subject Land.	No. Targeted surveys were carried out in areas of potential habitat for this species within prescribed survey months. Though parallel transects were not carried out over the entire investigation area for this species, *Austrostipa metatoris* has grows to over a meter tall and is not a cryptic species. *Austrostipa* specimens were sampled and cross-referenced from areas of higher habitat during field surveys. As this species was not recorded it is considered unlikely to be affected.
Austrostipa wakoolica	A spear-grass	E	**Moderate**. Though the Subject Land is considered outside of this species geographic restrictions, this species was considered as a candidate as records exist within close proximity of the Subject Land (Henry Parkes Way) and associated habitat (PCT 70; PCT 76; PCT 82; PCT 201) was recorded.	No. One threatened flora species, Austrostipa sp. possible wakoolica was tentatively recorded at three locations adjacent to the Subject Land to the west of Keith Lane. Samples of this species have been forwarded to the NSW National Herbarium for positive verification where the samples were identified as *Austrostipa bigeniculata.* As this species was not recorded it is considered unlikely to be affected.

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	CANDIDATE SPECIES LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Cullen parvum	Small Scurf-pea	E	**Moderate**. Associated habitat (PCT 276) was recorded within the Subject Land. This species may have died back due to heavy grazing and dry conditions.	No. Field surveys were conducted outside of prescribed survey months. Its acknowledged that *Cullen parvum* tends to die back in dry seasons and re-sprout with rain in winter or spring. In dry years, plants apparently do not always produce shoots but survive below the ground. The survey period was carried out in drought conditions. The management details published by (Office of Environment and Heritage, 2019f) for this species outlines that heavy, prolonged grazing on sites where this species may occur should be limited. The Subject Land have been historically disturbed through intensive agricultural practises and more recently overgrazed by sheep. Whilst targeted surveys were conducted in sub-optimal conditions for this species, the habitat recorded within the investigation area is limited.
Diuris tricolor	Pine Donkey Orchid	V	**Moderate**. Associated habitat was widely recorded within the Subject Land (all PCTs recorded form associated habitat). Previously recorded within locality of the Subject Land.	Yes. Targeted surveys were conducted outside of prescribed survey months. Several records for this species exist to the north of the investigation area with the most recent record being 2015 (Atlas of Living Australia, 2019). All vegetation types within the investigation area form associated habitat, this species is known to occur in disturbed habitats. *Diuris tricolor* is assumed to be affected pending targeted surveys in prescribed survey months and outside of drought conditions or an expert report.

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	CANDIDATE SPECIES LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Eleocharis obicis	Spike-Rush	V	**Moderate**. Associated habitat in the form of PCT 76 and PCT 82 with ephemeral wet areas or waterlogged areas (including farm dams) were recorded within the Subject Land.	No. Targeted surveys were carried out within the prescribed survey months. Areas of potential habitat included ephemerally wet habitat and in vegetation surrounding farm dams. This species is a perennial which stands 30cm high. As such, this species is non-cryptic and should be present despite drought conditions (Office of Environment and Heritage, 2019f). The associated geology, red sandy soils over clay, were not recorded within the investigation area. This species is considered unlikely to be affected.
Lepidium aschersonii	Spiny Peppercress	V	**Moderate**. Associated habitat in the form of PCT 76 and PCT 82 with gilgais were recorded within the Subject Land.	No. Targeted surveys were carried out within the prescribed survey months. Areas of potential habitat included gilgais with a canopy dominated by *Eucalyptus microcarpa* (Grey Box). This species is known to increase in numbers during drought conditions and has been described as a weed as it forms dense stands. Lepidium species were recorded through the investigation area in disturbed habitats. As this species is known to be tolerant of the conditions recorded and was not recorded during targeted surveys, it is considered unlikely to be affected.

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	CANDIDATE SPECIES LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Lepidium monoplocoides	Winged Peppercress	E	**Moderate**. This species was considered as a candidate as associated habitat requirements (periodically flooded and waterlogged habitats) were recorded.	No. Targeted surveys were conducted during late February and early March. It is acknowledged that plants generally only emerge about 1 month after rain and only persist for a few months. Seed heads are required for identification. Surveys were conducted during drought conditions and no heavy rain fall was recorded within the proceeding months prior to survey. The closest records of this species to the investigation area are off Fifield Road, Fifield (2016) and west of Condobolin off Kiacatoo Road (2000) (Atlas of Living Australia, 2019). *Lepidium monoplocoides* occurs in periodically flooded and waterlogged habitats and does not tolerate grazing disturbance. The investigation areas have been historically disturbed through intensive agricultural practises and include a long history of sheep grazing. Whilst targeted surveys were conducted in sub-optimal conditions for this species, limited preferred habitat was recorded. As such it is considered unlikely that this species would be affected.
Swainsona recta	Small Purple-pea	E	**Moderate**. Associated habitat was widely recorded within the Subject Land (PCT 76; PCT 267; PCT 276).	No. Targeted surveys were conducted outside of prescribed months. This species is known to be intolerant of grazing with previous recovery actions showing appropriate fire regimes and fencing of populations being the most crucial management actions to protect the species. The investigation areas have been historically disturbed through intensive agricultural practises and include a long history of sheep grazing and more recently overgrazing under the pressure of drought conditions (Office of Environment and Heritage, 2012). Whilst targeted surveys were conducted in sub-optimal conditions for this species, limited preferred habitat was recorded. As such it is considered unlikely that this species would be affected.

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS	CANDIDATE SPECIES LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Swainsona sericea	Silky Swainson-pea	V	**Moderate**. Associated habitat was widely recorded within the Subject Land (all PCT's recorded form associated habitat).	Yes. Targeted surveys were conducted within the prescribed survey months. This species is perennial which grows to 10 cm tall. Though this species is sensitive to grazing and the investigation areas have been historically disturbed through intensive agricultural practises and include a long history of sheep grazing and more recently overgrazing under the pressure of drought conditions. Whilst targeted surveys were conducted within the prescribed months, parallel transects which are required to identify a species of this size were not possible given the amount of associated habitat recorded. It is considered likely that *Swainsona sericea* may occur given the proximity of recent (2015) to the Subject Land (Atlas of Living Australia, 2019). This species is assumed to be affected pending parallel transect surveys in prescribed survey months and outside of drought conditions.
Tylophora linearis	Tylophora linearis	V	**Moderate**. Associated habitat (PCT 70) was limited the Subject Land. This species cannot be entirely discounted.	No. Targeted surveys were carried out in PCT 70 within the prescribed survey months. The potential habitat recorded was considered low quality as it consisted of a dense regrowth of semi-mature pines with relatively low species native species richness and cover. This species is considered unlikely to be affected.

(1) V = Vulnerable, E = Endangered under the BC Act

5.3 THREATENED FAUNA

5.3.1 FAUNA HABITAT AND FEATURES

The investigation area exhibits a number of characteristics that underpin its likelihood for support fauna species.

By and large the investigation area lacks important features for supporting a diverse range of fauna species. Its key habitat characteristics and limitations are:

- a lack of continuous vegetation such that connectivity is poor and small isolated fragments are characteristic across the investigation area
- a lack of large woodland patch size
- a lack of old growth woodland habitat and therefore a general low incidence of hollow-bearing trees in woodland patches (most old growth trees are isolated paddock trees, likely due to their long retention for livestock shade)
- a lack of complex understorey strata (ground cover, shrubs and midstorey plants – affecting bird diversity particularly small species). Most understorey strata across the investigation area was represented by small isolated patches of introduced Boxthorn species
- a general lack of mistletoe across eucalypt dominated canopies (Weeping Myall in the investigation area's southwest is the exception).

The combination of the above characteristics reduces the usability of the investigation area for fauna species that are dependent on higher quality habitat, that is with sufficient understorey to provide cover and foraging opportunities.

In terms of fauna observed, the dominant functional groups occurring were common open country medium sized birds (e.g. Butcherbirds, Miners, Magpies, Magpie-larks, Rosellas, Red-rumped Parrots and Galahs). Small bird species diversity was poor and limited to those species that are capable of persisting with a low amount of cover in association with small patches of canopy – e.g. Superb Fairy-wren, Yellow-rumped Thornbill and Red-capped Robin.

Comparative surveys were conducted outside the investigation area in continuous habitat south of the investigation area associated with Goobang Creek. The survey results revealed that common woodland bird species (e.g. Weebill, Western Gerygone, White-browed Woodswallow) that were not present in the investigation area were present adjacent to the investigation area in better quality habitat.

The only threatened bird species present within the investigation area (Little Eagle, Superb Parrot and Grey-crowned Babbler) are species that are either highly mobile (Little Eagle and Superb Parrot), or able to persist with minimal cover and large enough to safely span vegetation gaps, as is the case with Grey-crowned Babbler. Brown Treecreeper, a threatened woodland bird which is dependent upon hollows (which are available in the investigation area), but requires good patches of woodland habitat with complex understorey diversity, does not occur within the investigation area, but was recorded adjacent to the investigation area within Goobang Creek habitat, where habitat is of much greater quality in terms of strata complexity, patch size and continuity with similar habitats. White-browed Woodswallows were present at Goobang Creek and even though they are a very mobile species using aerial habitats for foraging purposes they were not observed over the investigation area during field surveys.

During four nights of extensive spotlighting coverage only a single arboreal mammal was observed across the investigation area being a Common Brushtail Possum. Such results evidencing that habitats are of low habitat value for common species, suggest they are unlikely to support threatened species that are reliant on higher quality habitats.

5.3.2 THREATENED FAUNA CANDIDATE SPECIES

Database searches identified 74 threatened fauna species as potentially utilising the habitat found within the investigation area. Of these, 12 species were either recorded or assessed as having a moderate or higher likelihood of occurring (Table 5.6). Likelihood for all species identified from database searches is provided in Appendix D.

Table 5.6 Threatened fauna recorded or predicted to occur within the investigation area

SCIENTIFIC NAME	COMMON NAME	BC ACT	ECOSYSTEM / SPECIES CREDIT	LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Amphibians (1)					
Sloane's Froglet	*Crinia sloanei*	V	Species	**Moderate.** Cannot be entirely discounted as there are some areas of water-holding depressions that may provide suitable habitat for this species, although such areas are small in extent, and isolated by large tracts of unsuitable habitat for this species.	Assumed present – subject to further assessment
Birds (8)					
Black Falcon	*Falco subniger*	V	Ecosystem	**Moderate**. The investigation area may occur within the home-range of one or more individuals. The investigation area habitats are considered unlikely to support this species in isolation from habitats that are more productive in terms of prey species. However, the species cannot be discounted from utilising that habitat in the investigation area for foraging purposes on an irregularly basis.	Ecosystem credit species
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	Ecosystem	**Recorded**. This species is dependent upon hollows (which are available in the investigation area), but requires good patches of woodland habitat with complex understorey diversity, which limited. This species was recorded adjacent to the investigation area within Goobang Creek habitat, where habitat is of much greater quality in terms of strata complexity, patch size and continuity with similar habitats. However, the species may irregularly utilise the investigation area.	Ecosystem credit species
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	Ecosystem	**Moderate**. Associated habitat in the form of open eucalypt forests and woodlands recorded within the investigation area.	Ecosystem credit species
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	Ecosystem	**Recorded**. Species was recorded in groups at three locations generally occurring in Eucalyptus grassy woodland.	Ecosystem credit species

SCIENTIFIC NAME	COMMON NAME	BC ACT	ECOSYSTEM / SPECIES CREDIT	LIKELIHOOD OF OCCURRENCE	AFFECTED SPECIES?
Little Eagle	*Hieraaetus morphnoides*	V	Ecosystem	**Recorded**. Recorded on site, and the investigation area may occur within the home-range of one or more individuals. The investigation area's habitats are considered unlikely to support this species in isolation from habitats that are more productive in terms of prey species. No remnant nest trees recorded within investigation area.	Ecosystem credit species
Little Lorikeet	*Glossopsitta pusilla*	V	Ecosystem	**Moderate**. Potential foraging and habitat within intact vegetation where presence of mature Eucalypts occur. May be an irregular visitor during abundance of blossoming eucalypts.	Ecosystem credit species
Superb Parrot	*Polytelis swainsonii*	V	Ecosystem	**Recorded**. This species was recorded within the investigation area as small groups flying through and pairs accessing water in dams. No individuals were observed foraging and due to the low numbers of adult males in groups and seasonal timings, occurrences are likely to be by post-breeding aggregations.	Ecosystem credit species
Swift Parrot	*Lathamus discolor*	E	Ecosystem	**Moderate**. Dependent on winter flowering resources of which *E. microcarpa* occurs widely within investigation area. No records locally and local resources are sparse, so occurrences are likely to be rare but cannot be discounted.	Ecosystem credit species
Mammals (3)					
Corben's Long Eared Bat	*Nyctophilus corbeni*	V	Ecosystem	**Moderate**. Associated habitat in the form of box dominated woodlands, tree hollows and loose bark were recorded within the investigation area.	Ecosystem credit species
Little Pied Bat	*Chalinolobus picatus*	V	Ecosystem	**Moderate**. Potential foraging and roosting habitat within remnant vegetation.	Ecosystem credit species
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	Ecosystem	**Moderate**. Potential foraging and roosting habitat within remnant vegetation.	Ecosystem credit species

6 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

6.1 THREATENED ECOLOGICAL COMMUNITIES

Native vegetation recorded within the Subject Land aligns to two threatened ecological communities listed under the EPBC Act. These are:

- Grey Box (*E. microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

For vegetation to meet to be commensurate with the EPBC-listing for Grey Box (*E. microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia both key diagnostic characteristics and condition criteria outlined in the Commonwealth listing advice (Threatened Species Scientific Committee, 2010) must be met.

Similarly, for vegetation to meet to be commensurate with the EPBC-listing for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, the condition criteria outlined in the Commonwealth Listing Advice must be met (Threatened Species Scientific Committee, 2006).

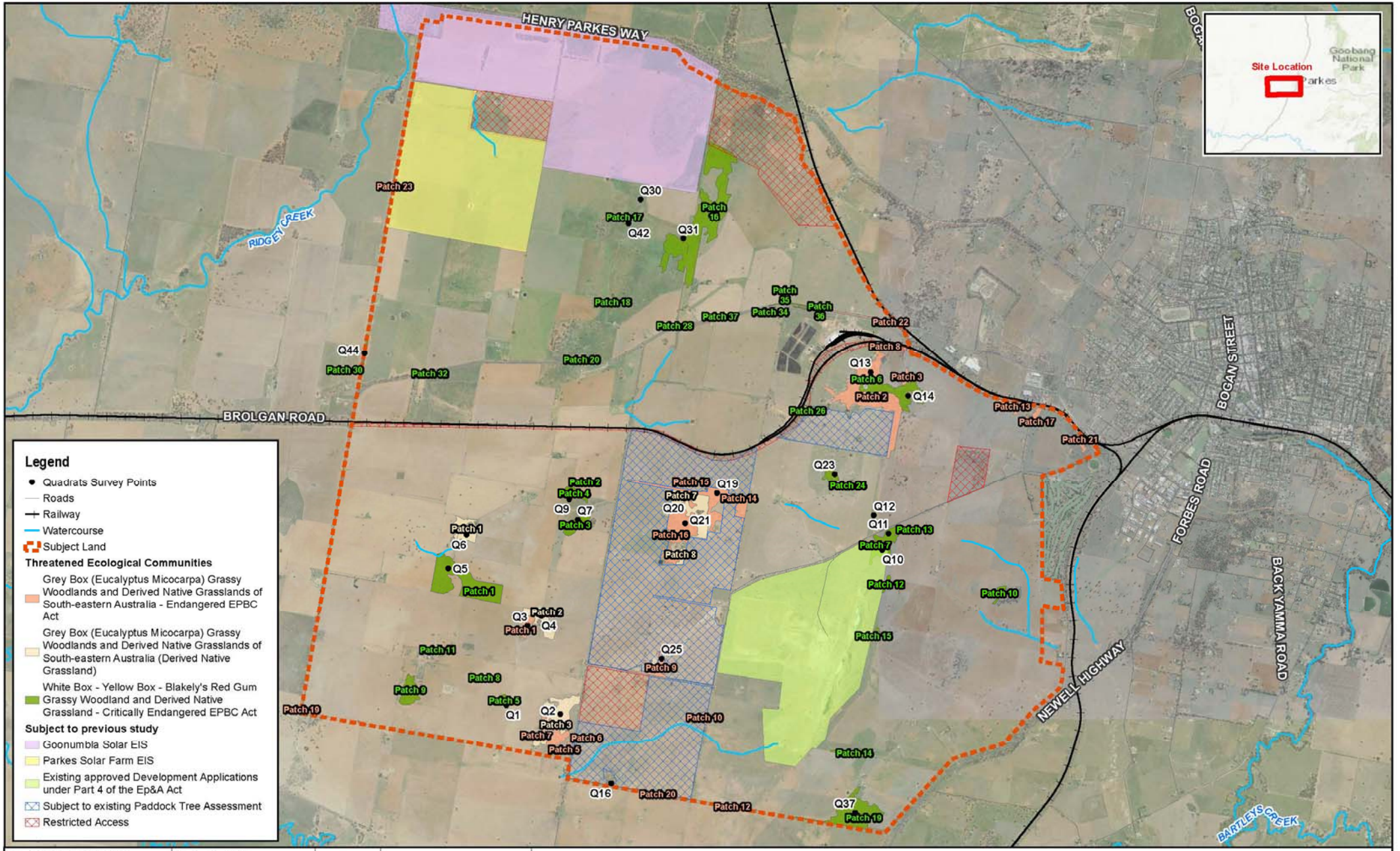
An assessment of each candidate PCT and condition class against the relevant criteria has been undertaken for each patch of vegetation within the investigation area and is provided in Appendix E. The candidate patches are shown on Figure 6.1.

A summary of each threatened ecological community, associated PCT and extent within the investigation area which is commensurate with EPBC listing is summarised in Table 6.1 and shown in Figure 6.2.

Table 6.1 Threatened Ecological Communities listed under the EPBC Act recorded within the Subject Land

THREATENED ECOLOGICAL COMMUNITY	STATUS[1]	ASSOCIATED PCT WITHIN THE INVESTIGATION AREA	CONDITION	EXTENT (HA)
Grey Box (*E. microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia	E	PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions	Moderate	79.88
			Poor	Does not meet criterion
		PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion	Moderate	Does not meet criterion
			Poor	Does not meet criterion
		PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	N/a	36.10
Total area of Grey Box (*E. microcarpa*) Grassy Woodlands				115.98
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion	Moderate	86.65
			Poor	Does not meet criterion
		PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion	Moderate	35.99
			Poor	Does not meet criterion
		PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW	N/a	Does not meet criterion
Total area of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland				119.65
Total area of all TECs listed under the EPBC Act				235.62

(1) E = Endangered, CE = Critically Endangered as listed under the EPBC Act



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Date: 3/06/2019	Approved by: Julia.Emerson

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Figure 6.1
Matters of National Environmental Significance – EPBC Patch Assessment

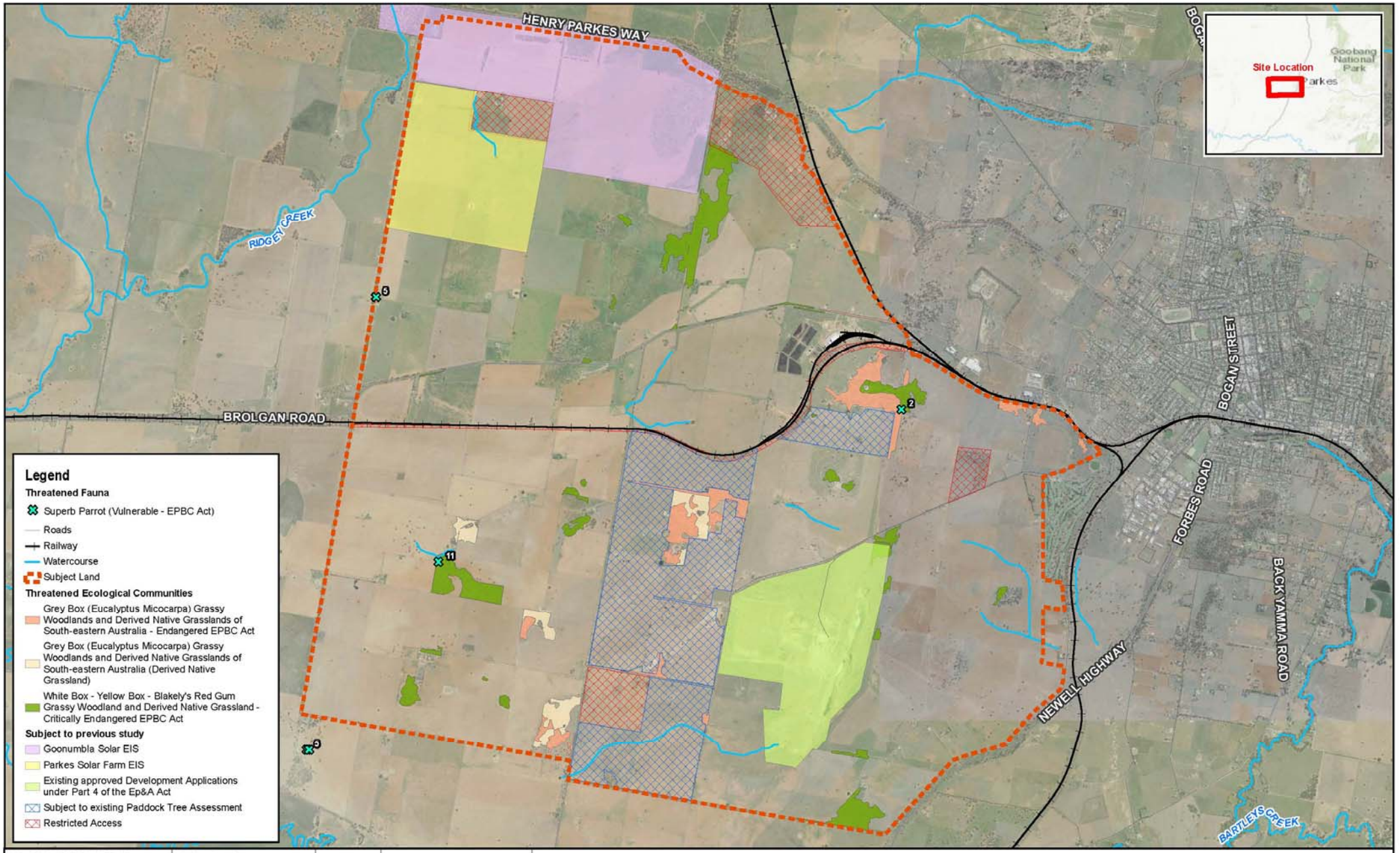

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Figure 6.2
Matters of National Environmental Significance

6.2 THREATENED SPECIES

6.2.1 EPBC LISTED FLORA

Results of the threatened species database searches identified 14 threatened fauna species listed under the EPBC Act as being known to occur or considered likely to occur within the investigation area. Of these, *Austrostipa wakoolica* (A Speargrass) was possibly recorded at three locations adjacent to the investigation area to the west of Keith Lane. Samples of this species have been forwarded to the NSW National Herbarium for positive verification where the samples were identified as *Austrostipa bigeniculata*. As this EPBC-listed species was not recorded it is considered unlikely to occur.

6.2.2 EPBC LISTED FAUNA

Results of the threatened species database searches identified 19 threatened fauna species listed under the EPBC Act as being known to occur or considered likely to occur within the investigation area. Of these, 3 have been either recorded or are considered to have a moderate or higher likelihood of occurring within the investigation area based on the availability of habitat (Table 6.2).

Table 6.2 Nationally threatened fauna with moderate or higher likelihood of occurrence

SCIENTIFIC NAME	COMMON NAME	EPBC ACT[1]	LIKELIHOOD OF OCCURRENCE
Swift Parrot	*Lathamus discolor*	CE	**Moderate**. Dependent on winter flowering resources of which *E. microcarpa* occurs widely within investigation area. No records locally and local resources are sparse, so occurrences are likely to be rare but cannot be discounted.
Superb Parrot	*Polytelis swainsonii*	V	**Recorded**. This species was recorded within the study area as small groups flying through and pairs accessing water in dams. No individuals were observed foraging and due to the low numbers of adult males in groups and seasonal timings, occurrences are likely to be by post-breeding aggregations.
Corben's Long Eared Bat	*Nyctophilus corbeni*	V	**Moderate**. Associated habitat in the form of box dominated woodlands, tree hollows and loose bark were recorded within the investigation area.

(1) Listed under the EPBC Act - CE = Critically Endangered, E= Endangered, V= Vulnerable

6.3 MIGRATORY SPECIES

Migratory species are protected under international agreements to which Australia are a signatory, including Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA), Republic of Korea-Australia Migratory Bird Agreement (RoKAMBA) and the Bonn Convention on the Conservation of Migratory Species of Wild Animals. Migratory species are considered Matters of National Environmental Significance and are protected under the EPBC Act.

Based on field investigations, EPBC Protected Matters area search and other desktop database searches, 21 migratory fauna species were identified that could occur within the locality. Based on field investigations and habitat assessments a total of 3 migratory species have a moderate to high likelihood to occur within the investigation area (Table 6.3).

Table 6.3 Migratory species with a moderate or higher likelihood of occurrence

SCIENTIFIC NAME	COMMON NAME	EPBC ACT[1]	LIKELIHOOD OF OCCURRENCE
Apus pacificus	Fork-tailed Swift	M; Ma	**Moderate.** Almost exclusively aerial. Commonly recorded over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. May irregularly occur foraging over investigation area.
Merops ornatus	Rainbow Bee-eater	Ma	**Moderate**. Occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. Study provides potential habitat during seasonal movements.
Hirundapus caudacutus	White-throated Needletail	M; Ma	**Moderate**. Almost exclusively aerial. Occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings. May irregularly occur foraging over investigation area.

(1) Listed under the EPBC Act - M= Migratory, Ma = Marine

These species (Table 6.3) have the potential to utilise a wide variety of habitats, including native vegetation communities found within the investigation area. The habitats within the investigation area are unlikely to constitute important habitat for any of the mentioned species. The habitat present is unlikely to support significant proportions of the population of any migratory species nor are the habitats critical to any life stage of these species. Due to their mobile nature, the mentioned species are likely to utilise higher quality habitat within the greater locality and where more extensive tracts of native vegetation occur.

6.4 WETLANDS OF INTERNATIONAL IMPORTANCE

Background research identified the following Wetlands of International Importance:

- Banrock Station Wetland Complex 700–800 km upstream
- Hattah-Kulkyne Lakes 500–600 km upstream
- Riverland 600–700 km upstream
- The Coorong, and Lakes Alexandrina and Albert Wetland 800–900 km upstream.

All wetlands identified are more than 500 km upstream of the investigation area and are not considered further in this assessment (Department of Environment and Energy, 2019b).

6.5 COMMONWEALTH LAND

Background research identified the following items of Commonwealth Land within locality of the investigation area:

- Airservices Australia
- Australian Postal Commission
- Australian Telecommunications Commission
- Commonwealth Scientific & Industrial Research Organisation
- Commonwealth Trading Bank of Australia
- Forbes Post Office (Commonwealth Heritage)
- Telstra Corporation Limited
- Parkes Training Depot.

All items of Commonwealth Land or Commonwealth Heritage are located outside of the investigation area and are not considered further in this assessment (Department of Environment and Energy, 2019b).

7 AVOIDANCE HIERARCHY

7.1 BIODIVERSITY CONSTRAINTS

The biodiversity values recorded within the investigation area have been ranked in terms of biodiversity constraint to assist with avoid and minimise impacts during the Master Plan development phase. Biodiversity constraints ranking have been based on the following criteria:

Tier 1 – High biodiversity constraint

- Native vegetation patches of PCT that correspond to Threatened Ecological Communities listed under the EPBC Act.
- Native vegetation patches of PCT listed under the BC Act as serious and irreversible impact entities.
- All areas identified in PVPs, certifications or notification (including paddock trees).
- All hollow bearing trees.

Tier 2 – Medium biodiversity constraint

- Native vegetation patches of PCT that correspond to other Threatened Ecological Communities listed under the BC Act.
- Paddock trees recorded as Class 2 or Class 3 that require biodiversity offsets at an ecosystem credit level.

Tier 3 – Other

- Native vegetation patches of PCT that do not that correspond to Threatened Ecological Community listed under either BC Act and/or EPBC Act but qualify to require biodiversity offsets at an ecosystem credit level.
- All other paddock trees and paddock trees recorded as Class 1.

Residual impacts to biodiversity values will require biodiversity offsets in accordance with the NSW Biodiversity Offset Scheme.

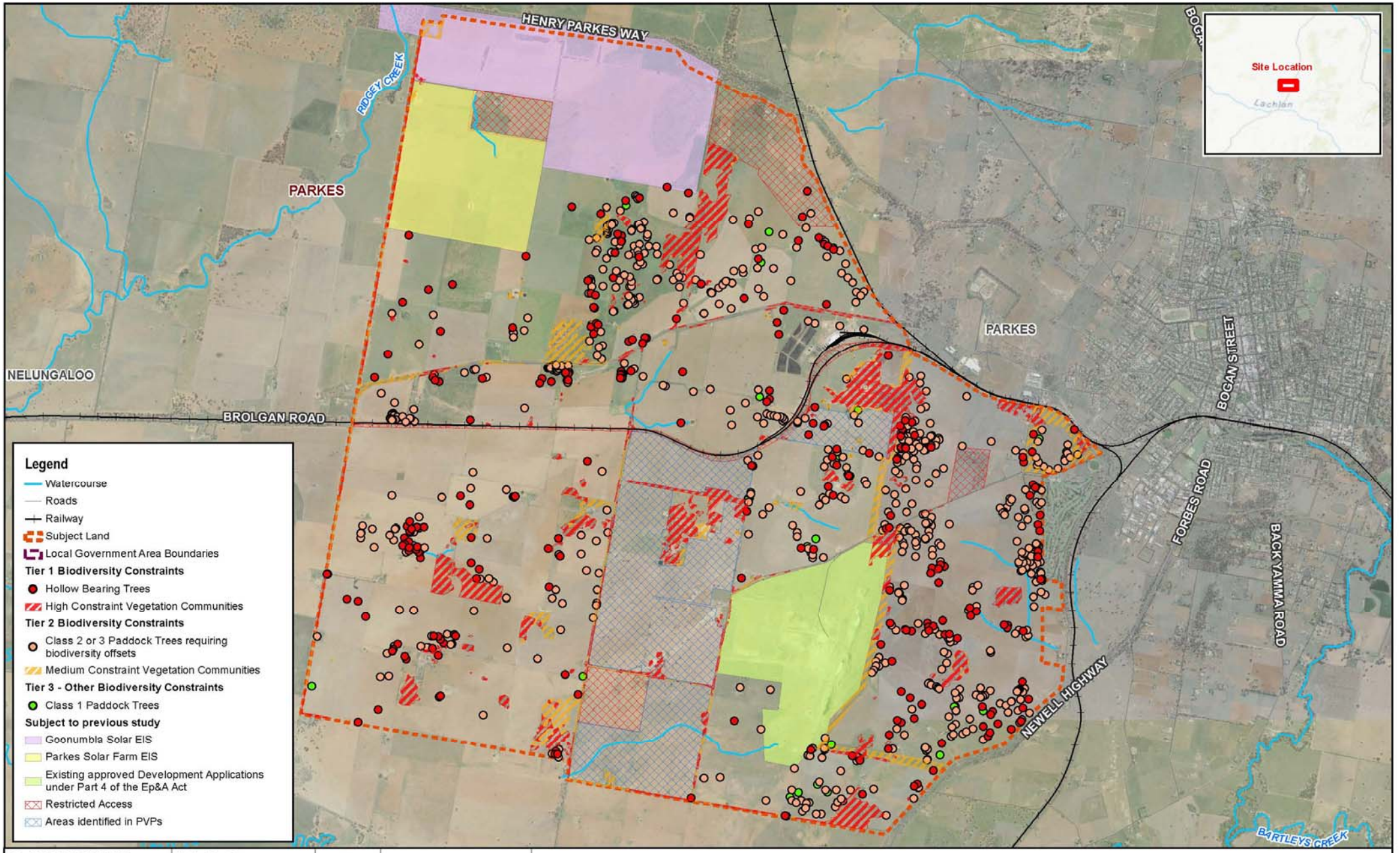

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Figure 7.1
Biodiversity Constraints Map

8 CONCLUSION

In summary, the flowing biodiversity values have been recorded within the surveyed areas of the investigation area.

Native vegetation was recorded to cover a total of 375.91 hectares within the surveyed areas of the investigation area. Of this, a total of seven native vegetation PCTs were recorded. These are:

- PCT 70 – White Cypress Pine woodland on sandy loams in central NSW wheatbelt.
- PCT 76 – Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions.
- PCT 82 – Western Grey Box – Poplar Box – White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion.
- PCT 201 – Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.
- PCT 250 – Derived tussock grassland of the central western plains and lower slopes of NSW.
- PCT 267 – White Box – White Cypress Pine – Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion.
- PCT 276 – Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion.

Three threatened ecological communities listed under the BC Act were recorded. These are:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions
- Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions
- White Box Yellow Box Blakely's Red Gum Woodland.

Two threatened ecological communities listed under the EPBC Act were recorded. These are:

- Grey Box (*E. microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

A total of 884 Class 2 and Class 3 paddock trees were recorded within the investigation area.

A total of four threatened fauna species were recorded within or adjacent to the investigation area. These are:

- Brown Treecreeper (*Climacteris picumnus*)
- Grey-crowned Babbler (*Pomatostomus temporalis*)
- Little Eagle (*Hieraaetus morphnoides*)
- Superb Parrot (*Polytelis swainsonii*).

These species are considered as ecosystem credit species within the investigation area and do not meet species credit requirements.

8.1 ADDITIONAL FIELD SURVEYS

A winter and spring targeted field survey will be undertaken targeting the following species:

- Sloane's Froglet (*Crinia sloanei)* – July/August
- *Diuris tricolor* (Pine Donkey Orchid) – September to October
- *Swainsona sericea* (Silky Swainson-pea) – September to November
- *Swainsona recta* – September to November.

The results of these surveys will be included as an addendum to this report.

9 LIMITATIONS

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APPENDIX A

FLORA SPECIES RECORDED

A1 FLORA SPECIES RECORDED

FAMILY	SCIENTIFIC NAME	COMMON NAME
Acanthaceae	*Brunoniella australis*	Trumpet
Acanthaceae	*Rostellularia adscendens var. adscendens*	–
Amaranthaceae	*Alternanthera angustifolia*	–
Amaranthaceae	*Alternanthera denticulata*	Lesser Joyweed
Amaranthaceae	*Alternanthera pungens**	Khaki Weed
Anthericaceae	*Tricoryne elatior*	Yellow Rush-lily
Apocynaceae	*Parsonsia eucalyptophylla*	Gargaloo
Asphodelacea	*Asphodelus fistulosus**	Onion Weed
Asteraceae	*Brachyscome sp.*	Daisy
Asteraceae	*Calotis cuneifolia*	Purple Burr-Daisy
Asteraceae	*Calotis lappulacea*	Yellow Burr-daisy
Asteraceae	*Carthamus lanatus**	Saffron Thistle
Asteraceae	*Chondrilla juncea**	Skeleton Weed
Asteraceae	*Cirsium vulgare**	Spear Thistle
Asteraceae	*Conyza bonariensis**	Flaxleaf Fleabane
Asteraceae	*Lactuca serriola**	Prickly Lettuce
Asteraceae	*Vittadinia cuneata var. cuneata*	Fuzzweed
Asteraceae	*Vittadinia cuneata var. hirsuta*	Fuzzweed
Asteraceae	*Vittadinia gracilis*	Woolly New Holland Daisy
Asteraceae	*Vittadinia pterochaeta*	Winged New Holland Daisy
Asteraceae	*Vittadinia muelleri*	–
Asteraceae	*Xanthium occidentale**	Noogoora Burr
Asteraceae	*Xanthium spinosum**	Bathurst Burr
Asteraceae	*Xerochrysum viscosum*	Sticky Everlasting
Boraginaceae	*Heliotropium amplexicaule**	Blue Heliotrope
Boraginaceae	*Heliotropium europaeum**	Potato Weed
Brassicaceae	*Brassica sp. (Dead)*	Brassica
Brassicaceae	*Lepidium africanum**	–
Brassicaceae	*Lepidium bonariense**	–
Brassicaceae	*Lepidium pseudohyssopifolium*	Peppercress

FAMILY	SCIENTIFIC NAME	COMMON NAME
Brassicaceae	*Lepidium sp. (no fertile material)*	–
Campanulaceae	*Lobelia concolor*	Poision Pratia
Campanulaceae	*Wahlenbergia communis*	Tufted Bluebell
Campanulaceae	*Wahlenbergia gracilis*	Australian Bluebell
Campanulaceae	*Wahlenbergia luteola*	–
Chenopodiaceae	*Atriplex semibaccata*	Creeping Saltbush
Chenopodiaceae	*Atriplex spinibractea*	Spiny-fruit Saltbush
Chenopodiaceae	*Dysphania pumilio*	Small Crumbweed
Chenopodiaceae	*Einadia hastata*	Berry Saltbush
Chenopodiaceae	*Einadia nutans subsp. linifolia*	–
Chenopodiaceae	*Einadia nutans subsp. nutans*	Climbing saltbush
Chenopodiaceae	*Einadia polygonoides*	–
Chenopodiaceae	*Maireana aphylla*	Leafless Bluebush
Chenopodiaceae	*Maireana decalvans*	Black Cotton Bush
Chenopodiaceae	*Maireana enchylaenoides*	Wingless Bluebush
Chenopodiaceae	*Maireana microphylla*	Small-leaved Bluebush
Chenopodiaceae	*Salsola australis*	–
Chenopodiaceae	*Sclerolaena birchii*	Galvanized Burr
Chenopodiaceae	*Sclerolaena muricata*	Black Rolypoly
Convolvulaceae	*Convolvulus angustissimus*	–
Convolvulaceae	*Convolvulus erubescens*	Blushing Bindweed
Convolvulaceae	*Dichondra repens*	Kidney Weed
Convolvulaceae	*Dichondra sp. A*	–
Cucurbitaceae	*Cucumis myriocarpus subsp. leptodermis**	Paddy Melon
Cupressaceae	*Callitris glaucophylla*	White Cypress Pine
Cyperaceae	*Carex inversa*	–
Cyperaceae	*Cyperus fulvus*	Sticky Sedge
Cyperaceae	*Fimbristylis dichotoma*	Common Fringe-sedge
Euphorbiaceae	*Euphorbia drummondii*	Caustic Weed
Fabaceae (Caesalpinioideae)	*Senna artemisioides subsp. zygophylla*	–
Fabaceae (Faboideae)	*Acacia oswaldii*	Miljee
Fabaceae (Faboideae)	*Astragalus hamosus**	Yellow Milk-vetch
Fabaceae (Faboideae)	*Desmodium varians*	Slender Tick-trefoil

FAMILY	SCIENTIFIC NAME	COMMON NAME
Fabaceae (Faboideae)	*Glycine canescens*	Silky Glycine
Fabaceae (Faboideae)	*Glycine clandestina*	–
Fabaceae (Faboideae)	*Glycine tabacina*	–
Fabaceae (Faboideae)	*Lotus australis*	Australian Trefoil
Fabaceae (Faboideae)	*Medicago polymorpha**	Burr Medic
Fabaceae (Faboideae)	*Medicago sativa**	Lucerne
Fabaceae (Mimosoideae)	*Acacia dealbata subsp. dealbata*	Silver Wattle
Fabaceae (Mimosoideae)	*Acacia deanei*	Green Wattle
Fabaceae (Mimosoideae)	*Acacia decora*	Western Silver Wattle
Fabaceae (Mimosoideae)	*Acacia pendula*	Weeping Myall
Gentianaceae	*Schenkia australis*	Spike Centaury
Goodeniaceae	*Goodenia hederacea subsp. hederacea*	Forest Goodenia
Juncaceae	*Juncus flavidus*	–
Juncaceae	*Juncus subsecundus*	–
Lamiaceae	*Marrubium vulgare**	white horehound
Lamiaceae	*Teucrium corymbosum*	Forest Germander
Lomandraceae	*Lomandra bracteata*	–
Lomandraceae	*Lomandra filiformis subp. filiformis*	Wattle Mat-rush
Lomandraceae	*Lomandra filiformis subsp. coriacea*	–
Lomandraceae	*Lomandra multiflora subsp. multiflora*	Many-flowered Mat-rush
Malvaceae	*Brachychiton populneus*	Kurrajong
Malvaceae	*Malva parviflora**	Small-flowered Mallow
Malvaceae	*Modiola caroliniana**	Red-flowered Mallow
Malvaceae	*Sida corrugata*	Corrugated sida
Malvaceae	*Sida cunninghamii*	Ridged Sida
Marsileaceae	*Marsilea costulifera*	–
Myrtaceae	*Eucalyptus albens*	White Box
Myrtaceae	*Eucalyptus blakelyi*	Blakely's Red Gum
Myrtaceae	*Eucalyptus conica*	Fuzzy Box
Myrtaceae	*Eucalyptus crebra*	Narrow-leaved Ironbark
Myrtaceae	*Eucalyptus melliodora*	Yellow Box
Myrtaceae	*Eucalyptus microcarpa*	Grey Box
Myrtaceae	*Eucalyptus populnea subsp. bimbil*	Poplar Box

FAMILY	SCIENTIFIC NAME	COMMON NAME
Nyctaginaceae	*Boerhavia dominii*	Tarvine
Oxalidaceae	*Oxalis exilis*	Slender xalis
Phormiaceae	*Dianella porracea*	Riverine Flax-lily
Phormiaceae	*Dianella revoluta var. revoluta*	–
Phyllanthaceae	*Phyllanthus virgatus*	–
Pittosporaceae	*Pittosporum angustifolium*	Weeping Pittosporum
Plantaginaceae	*Plantago debilis*	–
Plantaginaceae	*Plantago lanceolata**	Lambs Tongue
Poaceae	*Anthosachne scabra*	Wheatgrass
Poaceae	*Aristida behriana*	Bunch Wiregrass
Poaceae	*Aristida ramosa*	Purple Wiregrass
Poaceae	*Austrostipa scabra subsp. scabra*	A Speargrass
Poaceae	*Austrostipa verticillata*	Bamboo Grass
Poaceae	*Austrostipa bigeniculata*	–
Poaceae	*Austrostipa blackii*	Spear Grass
Poaceae	*Avena fatua**	Wild Oats
Poaceae	*Bothriochloa macra*	Red Grass
Poaceae	*Bothriochloa decipiens var. decipiens*	Red Grass
Poaceae	*Briza minor**	Quaking Grass
Poaceae	*Bromus catharticus**	Prairie Grass
Poaceae	*Chloris truncata*	Windmill Grass
Poaceae	*Chloris ventricosa*	Tall Windmill Grass
Poaceae	*Chloris ventricosa*	Tall chloris
Poaceae	*Chloris virgata**	Feathertop Rhodes Grass
Poaceae	*Cynodon dactylon*	Couch
Poaceae	*Dichanthium sericeum subsp. sericeum*	Queensland Bluegrass
Poaceae	*Digitaria divaricatissima*	Umbrella Grass
Poaceae	*Digitaria ammophila*	Silky Umbrella Grass
Poaceae	*Echinochloa colona*	Awnless Barnyard Grass
Poaceae	*Enneapogon nigricans*	Nine-awn grass
Poaceae	*Enteropogon acicularis*	Windmill Grass
Poaceae	*Entolasia stricta*	Wiry Panic
Poaceae	*Eragrostis curvula**	African Lovegrass

FAMILY	SCIENTIFIC NAME	COMMON NAME
Poaceae	*Eragrostis elongata*	Clustered Lovegrass
Poaceae	*Eragrostis leptostachya*	Paddock Lovegrass
Poaceae	*Eragrostis cilianensis**	Stinkgrass
Poaceae	*Hordeum sp.**	Barley (Crop)
Poaceae	*Leptochloa digitata*	Umbrella Canegrass
Poaceae	*Lolium perenne**	Ryegrass
Poaceae	*Panicum decompositum*	Native Millet
Poaceae	*Panicum effusum*	Hairy Panic
Poaceae	*Panicum capillare**	Witchgrass
Poaceae	*Paspalidium constrictum*	Knottybutt Grass
Poaceae	*Paspalidium gracile*	Slender Panic
Poaceae	*Paspalum dilatatum**	Paspalum
Poaceae	*Phalaris aquatica**	Phalaris
Poaceae	*Phalaris minor**	Lesser Canary Grass
Poaceae	*Rytidosperma caespitosum*	Ringed Wallaby Grass
Poaceae	*Rytidosperma erianthum*	Wallaby Grass
Poaceae	*Rytidosperma richardsonii*	Straw Wallaby-grass
Poaceae	*Rytidosperma sp. (no fertile material)*	A Wallaby Grass
Poaceae	*Rytidosperma bipartitum*	Wallaby Grass
Poaceae	*Rytidosperma setaceum*	Smallflower Wallaby Grass
Poaceae	*Sporobolus caroli*	Fairy Grass
Poaceae	*Sporobolus creber*	Western Rat-tail Grass
Poaceae	*Themeda triandra*	Kangaroo Grass
Poaceae	*Tragus australianus*	Small Burrgrass
Poaceae	*Urochloa panicoides**	Liverseed Grass
Polygonaceae	*Emex australis**	Spiny Emex
Polygonaceae	*Rumex brownii*	Swamp Dock
Polygonaceae	*Rumex crispus**	Curled Dock
Portulacaceae	*Portulaca oleracea*	Pigweed
Pteridaceae	*Cheilanthes sieberi subsp. sieberi*	Mulga Fern
Rubiaceae	*Asperula conferta*	Common Woodruff
Rutaceae	*Geijera parviflora*	Wilga
Sapindaceae	*Alectryon oleifolius*	Western Rosewood

FAMILY	SCIENTIFIC NAME	COMMON NAME
Sapindaceae	*Dodonaea viscosa subsp. cuneata*	Sticky Hopbush
Sapindaceae	*Dodonaea viscosa subsp. spatulata*	–
Scrophulariaceae	*Eremophila debilis*	Winter Cherry
Scrophulariaceae	*Eremophila mitchellii*	False Sandlewood
Scrophulariaceae	*Verbascum virgatum**	Twiggy Mullein
Solanaceae	*Lycium ferocissimum**	African Boxthorn
Solanaceae	*Solanum elaeagnifolium**	Silver-leaved Nightshade
Solanaceae	*Solanum ferocissimum*	Spiny Potato Bush
Solanaceae	*Solanum coactiliferum*	Western Nightshade
Solanaceae	*Solanum esuriale*	Quena
Stackhousiaceae	*Stackhousia muricata*	Western Stackhousia
Thymelaeaceae	*Pimelea linifolia*	Slender Rice Flower
Zygophyllaceae	*Tribulus micrococcus*	Spineless Caltrop
Zygophyllaceae	*Tribulus terrestris**	Caltrop

* denotes exotic species

APPENDIX B

THREATENED FLORA LIKELIHOOD OF OCCURRENCE

B1 THREATENED FLORA LIKELIHOOD OF OCCURRENCE ASSESSMENT

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS[1]	EPBC ACT STATUS[2]	HABITAT / GEOGRAPHIC REQUIREMENTS[3]	BIONET RECORDS	SOURCE[4]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Acacia ausfeldii	Ausfeld's Wattle	V	–	–	0	BCC	**Moderate.** Associated habitat in the form of PCT 201; PCT 276; PCT 276 recorded within the Subject Land.	Candidate species credit species subject to targeted surveys
Austrostipa metatoris	A spear-grass	V	V	–	0	BCC, PMST	**Moderate.** Associated habitat in the form of PCT 70; PCT 82; PCT 201 recorded within the Subject Land.	Candidate species credit species subject to targeted surveys
Austrostipa wakoolica	A spear-grass	E	E	South of Narranderra	4	BCC, BioNet, PMST	**Moderate.** Though the Subject Land is considered outside of this species geographic restrictions, this species was considered as a candidate as records exist within close proximity of the Subject Land (Henry Parkes Way) and associated habitat (PCT 70; PCT 76; PCT 82; PCT 201) was recorded.	Candidate species credit species subject to targeted surveys
Brachyscome papillosa	Mossgiel Daisy	V	V	South and West of Coolamon-Ardlethan Road, West of Lockhart and north of Rand	0	BCC	Low. The Subject Land is considered outside of this species known distribution.	Not considered further
Caladenia arenaria	Sand-hill Spider Orchid	E	E	West of Lockhart and north of Rand	0	BCC	Low. The Subject Land is considered outside of this species known distribution. One record from 1980 exists near Wellington.	Not considered further
Commersonia procumbens	–	V	V	–	0	PMST	Low. Associated vegetation not recorded within the Subject Land.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS[1]	EPBC ACT STATUS[2]	HABITAT / GEOGRAPHIC REQUIREMENTS[3]	BIONET RECORDS	SOURCE[4]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Cullen parvum	Small Scurf-pea	E	–	–	0	BCC	**Moderate.** Associated habitat (PCT 276) was recorded within the Subject Land. This species may have died back due to heavy grazing and dry conditions.	Candidate species credit species subject to targeted surveys
Diuris tricolor	Pine Donkey Orchid	V	–	–	5	BCC, PlantNet	**Moderate.** Associated habitat was widely recorded within the Subject Land (all PCTs recorded form associated habitat). Previously recorded within locality of the Subject Land.	Candidate species credit species subject to targeted surveys
Eleocharis obicis	Spike-Rush	V	V	Semi-permanent/ ephemeral wet areas/ Periodically waterlogged sites (including table drains and farm dams)	0	BCC	**Moderate.** Associated habitat in the form of PCT 76 and PCT 82 with ephemeral wet areas or waterlogged areas (including farm dams) were recorded within the Subject Land.	Candidate species credit species subject to targeted surveys
Lepidium aschersonii	Spiny Peppercress	V	V	On ridges of gilgai clays	0	BCC	**Moderate.** Associated habitat in the form of PCT 76 and PCT 82 with gilgais were recorded within the Subject Land.	Candidate species credit species subject to targeted surveys
Lepidium monoplocoides	Winged Peppercress	E	E	–	0	Not identified	**Moderate.** This species was considered as a candidate as associated habitat requirements (periodically flooded and waterlogged habitats) were recorded.	Candidate species credit species subject to targeted surveys
Leptorhynchos orientalis	Lanky Buttons	E	–	West of Narrandera/Lockhart Road and North of Urana/Lockhart Road	0	BCC	Low. The Subject Land is outside of the species geographic restrictions and on the edge of the species known distribution. Associated vegetation was not recorded within the Subject Land.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT STATUS[1]	EPBC ACT STATUS[2]	HABITAT / GEOGRAPHIC REQUIREMENTS[3]	BIONET RECORDS	SOURCE[4]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Philotheca ericifolia	Philotheca ericifolia	–	V	–	4	BioNet, PMST	Low. Associated habitat (damp sandy flats) and vegetation was not recorded within the Subject Land.	Not considered further
Prasophyllum sp. Wybong	Leek Orchid	–	CE	–	0	PMST	Low. Subject Land is on the edge of the species known distribution. Though elements of this species preferred habitat were recorded, the Subject Land is considered generally unsuitable.	Not considered further
Swainsona murrayana	Slender Darling Pea	V	V	western half of sub-CMA	0	BCC, PMST	Low. Associated habitat was limited within the study area. Species has not been previously recorded within locality.	Not considered further
Swainsona recta	Small Purple-pea	E	E	–	0	BCC, PMST	**Moderate.** Associated habitat was widely recorded within the Subject Land (PCT 76; PCT 267; PCT 276).	Candidate species credit species subject to targeted surveys
Swainsona sericea	Silky Swainson-pea	V	V	–	3	BCC, BioNet, PlantNet	**Moderate.** Associated habitat was widely recorded within the Subject Land (all PCT's recorded form associated habitat).	Candidate species credit species subject to targeted surveys
Tylophora linearis	Tylophora linearis	V	E	–	0	BCC, BioNet, PMST	**Moderate.** Associated habitat (PCT 70) was limited the Subject Land. This species cannot be entirely discounted.	Candidate species credit species subject to targeted surveys

(1) V = Vulnerable, E = Endangered as listed under the BC Act

(2) V = Vulnerable, E = Endangered, CE = Critically Endangered as listed under the EPBC Act

(3) Habitat and geographic requirements were obtained from the BAM Credit Calculator (BCC)

(4) BCC = BAM Credit Calculator, BioNet = Office of Environment and Heritage spatial search, PlantNet = Royal Botanic gardens spatial search, PMST = Protected Matters Search Tool (Department of Environment and Energy)

APPENDIX C

FAUNA SPECIES RECORDED

C1 FAUNA SPECIES RECORDED

COMMON NAME	SCIENTIFIC NAME	NUMBER OF INDIVIDUALS	LISTING
Amphibians (2)			
Eastern Sign-bearing Froglet	*Crinia parinsignifera*	1	
Green Tree Frog	*Litoria caerulea*	1	
Birds (61)			
Apostlebird	*Struthidea cinerea*	64	
Australian Magpie	*Cracticus tibicen*	49	
Australian Raven	*Corvus coronoides*	85	
Australian Wood Duck	*Chenonetta jubata*	2	
Black Kite	*Milvus migrans*	11	
Black-faced Cuckoo-shrike	*Coracina novaehollandiae*		
Black-fronted Dotterel	*Elseyornis melanops*	1	
Blue Bonnet	*Northiella haematogaster*	37	
Blue-faced Honeyeater	*Entomyzon cyanotis*	6	
Brown Falcon	*Falco berigora*	7	
Brown Treecreeper	*Climacteris picumnus*	1	Threatened
Cockatiel	*Nymphicus hollandicus*	92	
Common Myna	*Acridotheres tristis*	1	Exotic
Common Starling	*Sturnus vulgaris*	139	Exotic
Crested Pigeon	*Ocyphaps lophotes*	109	
Eastern Rosella	*Platycercus eximius*	98	
Galah	*Eolophus roseicapilla*	100	
Grey Butcherbird	*Cracticus torquatus*	13	
Grey Fantail	*Rhipidura albiscapa*	1	
Grey Shrike-thrush	*Colluricincla harmonica*	1	
Grey Teal	*Anas gracilis*	3	
Grey-crowned Babbler	*Pomatostomus temporalis*	35	Threatened
Hoary-headed Grebe	*Poliocephalus poliocephalus*	2	
Laughing Kookaburra	*Dacelo novaeguineae*	8	
Little Eagle	*Hieraaetus morphnoides*	1	Threatened
Little Friarbird	*Philemon citreogularis*	1	

COMMON NAME	SCIENTIFIC NAME	NUMBER OF INDIVIDUALS	LISTING
Little Pied Cormorant	*Phalacrocorax melanoleucos*	2	
Little Raven	*Corvus mellori*	96	
Magpie-lark	*Grallina cyanoleuca*	20	
Masked Lapwing	*Vanellus miles*	16	
Mistletoebird	*Dicaeum hirundinaceum*	1	
Musk Lorikeet	*Glossopsitta concinna*	10	
Nankeen Kestrel	*Falco cenchroides*	9	
Noisy Miner	*Manorina melanocephala*	69	
Pacific Black Duck	*Anas superciliosa*	12	
Pallid Cuckoo	*Cacomantis pallidus*	2	
Peaceful Dove	*Geopelia placida*	2	
Pied Butcherbird	*Cracticus nigrogularis*	23	
Pied Currawong	*Strepera graculina*	2	
Red-capped Robin	*Petroica goodenovii*	3	
Red-rumped Parrot	*Psephotus haematonotus*	33	
Rock Dove	*Columba livia*	80	Exotic
Rufous Whistler	*Pachycephala rufiventris*	2	
Striated Pardalote	*Pardalotus striatus*	12	
Superb Fairy-wren	*Malurus cyaneus*	13	
Superb Parrot	*Polytelis swainsonii*	24	
Tawny Frogmouth	*Podargus strigoides*	1	
Tree Martin	*Petrochelidon nigricans*	2	
Wedge-tailed Eagle	*Aquila audax*	4	
Weebill	*Smicrornis brevirostris*	2	
Welcome Swallow	*Hirundo neoxena*	2	
Western Gerygone	*Gerygone fusca*	2	
White-browed Woodswallow	*Artamus superciliosus*	22	
White-plumed Honeyeater	*Lichenostomus penicillatus*	4	
White-winged Chough	*Corcorax melanorhamphos*	75	
Willie Wagtail	*Rhipidura leucophrys*	9	
Yellow Thornbill	*Acanthiza nana*	8	
Yellow-billed Spoonbill	*Platalea flavipes*	3	
Yellow-rumped Thornbill	*Acanthiza chrysorrhoa*	23	

COMMON NAME	SCIENTIFIC NAME	NUMBER OF INDIVIDUALS	LISTING
Yellow-throated Miner	*Manorina flavigula*	1	
Zebra Finch	*Taeniopygia guttata*	4	
Mammals (7)			
Brown Hare	*Lepus capensis*	7	Exotic
Common Brushtail Possum	*Trichosurus vulpecula*	1	
Common Wallaroo	*Macropus robustus*	2	
Eastern Grey Kangaroo	*Macropus giganteus*	16	
Fox	*Vulpes vulpes*	2	Exotic
House Mouse	*Mus musculus*	1	Exotic
Red-necked Wallaby	*Macropus rufogriseus*	8	
Reptiles (9)			
Bandy-Bandy	*Vermicella annulata*	1	
Eastern Bearded Dragon	*Pogona barbata*	3	
Eastern Brown Snake	*Pseudonaja textilis*	1	
Inland Snake-eyed Skink	*Cryptoblepharus australis*	6	
Keelback	*Xenochrophis piscator*	1	
Ragged Snake-eyed Skink	*Cryptoblepharus pannosus*	1	
Red-naped Snake	*Furina diameda*	3	
South-eastern Morethia Skink	*Morethia boulengeri*	2	
Thick-tailed Gecko	*Unerwoodisaurus milii*	1	

APPENDIX D

THREATENED FAUNA LIKELIHOOD OF OCCURRENCE

D1 THREATENED FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Amphibians									
Sloane's Froglet	*Crinia sloanei*	V	-	Semi-permanent/ephemeral wet areas / Containing relatively shallow sections with submergent and emergent vegetation, or within 500 m of wet area/ within 500 m of swamps/ within 500 m of waterbody	0	BCC	Species	**Moderate**. Cannot be entirely discounted as there are some areas of water-holding depressions that may provide suitable habitat for this species, although such areas are small in extent, and isolated by large tracts of unsuitable habitat for this species.	Candidate species credit species subject to targeted surveys
Birds									
Australasian Bittern	*Botaurus poiciloptilus*	-	E	-	0	PMST	-	Low. Associated habitat, brackish waterbodies or freshwater wetlands not recorded within the Subject Land.	Not considered further
Australasian Painted Snipe	*Rostratula australis*	E	E; Ma	-	0	PMST	-	Low. Associated habitat, fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber, not recorded within the Subject Land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Barking Owl	*Ninox connivens*	V	-	-	1	BCC, BioNet	Species / Ecosystem	Low. Subject Land may be within the home range of local individuals, but local records are sparse and the Subject Land does not provide suitable foraging habitat for this species to be supported in isolation from much higher quality habitats. Any breeding habitat within the Subject Land is not likely to be utilised by this species.	Not considered further
Black Falcon	*Falco subniger*	V	-	-	4	BioNet	-	**Moderate**. The Subject Land may occur within the home-range of one or more individuals. The Subject Land's habitats are considered unlikely to support this species in isolation from habitats that are more productive in terms of prey species.	Ecosystem credit species
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	V	-	-	5	BioNet	Ecosystem	Low. The potential for this species to occur within the Subject Land cannot be entirely discounted, however it does not conform to high quality woodland habitats types that this species is dependent upon for foraging and breeding purposes, so its likelihood of occurrence is considered low.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Black-tailed Godwit	*Limosa limosa*	V	M; Ma	-	2	BioNet	-	Low. Prefers coastal habitats of sheltered bays, estuaries, lagoons and mudflats. Also, forages in shallow wetlands, salt-flats, swamps and floodplains. Associated habitat was not recorded within the Subject Land.	Not considered further
Brolga	*Grus rubicunda*	V	-	-	0	BCC	Ecosystem	Low. Marginal associated foraging habitat, dry grassland or ploughed paddocks and wetlands were not recorded within the Subject Land	Not considered further
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	V	-	East of Newell Highway - west is hybrid zone where intergrades with the arid zone subspecies of Brown Treecreeper (*Climacteris picumnus picumnus*), East of Newell Highway - west is hybrid zone with western subspecies, East of Walbundrie - west within hybrid zone with inland subspecies	30	BioNet	Ecosystem	**Recorded**. This species is dependent upon hollows (which are available in the Subject Land), but requires good patches of woodland habitat with complex understorey diversity, which was not recorded. This species was recorded adjacent to the Subject Land within Goobang Creek habitat, where habitat is of much greater quality in terms of strata complexity, patch size and continuity with similar habitats.	Ecosystem credit species

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Bush Stone-curlew	*Burhinus grallarius*	E1	-	Fallen/standing dead timber including logs	6	BCC, BioNet	Species	Low. A lack of quality understorey habitat to support this species. Few scattered records from locality exist, none of which are recent (>10 years old).	Not considered further
Common Greenshank	*Tringa nebularia*	-	M; Ma	-	4	BioNet	-	Low. Found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Species associated habitat not recorded within the Subject Land.	Not considered further
Curlew Sandpiper	*Calidris ferruginea*	E1	CE; M; Ma	-	2	BioNet, PMST	-	Low. Species associated habitat, littoral and estuarine habitats, not recorded within the Subject Land.	Not considered further
Diamond Firetail	*Stagonopleura guttata*	V	-	-	13	BioNet	Ecosystem	Low. Prefers good patches of woodland habitat with complex understorey diversity, which is limited in subject land. Marginal habitat in the form of grassy eucalypt woodlands recorded within the subject land. Unlikely to be reliant on the habitat within subject land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Dusky Woodswallow	*Artamus cyanopterus cyanopterus*	V	-	-	6	BioNet	Ecosystem	**Moderate**. Associated habitat in the form of open eucalypt forests and woodlands recorded within the Subject Land.	Ecosystem credit species
Eastern Curlew	*Numenius madagascariensis*	-	CE; M; Ma	-	0	PMST	-	Low. Associated with sheltered coasts, estuaries, bays, harbours, inlets with intertidal mudflats. Species associated habitat was not recorded within the Subject Land.	Not considered further
Flame Robin	*Petroica phoenicea*	V	-	-	2	BioNet	Ecosystem	Low. Associated habitat, moist eucalypt forests and woodlands, were not recorded within the Subject Land.	Not considered further
Fork-tailed Swift	*Apus pacificus*	-	M; Ma	-	0	PMST	-	**Moderate.** Almost exclusively aerial. Commonly recorded over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. May irregularly occur foraging over Subject Land.	Not considered further (migratory species further discussed in report)
Freckled Duck	*Stictonetta naevosa*	V	-	-	5	BioNet	-	Low. Species associated habitat was not recorded within the Subject Land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Gang-gang Cockatoo	*Callocephalon fimbriatum*	V	-	-	0	BCC	Species / Ecosystem	Low. The Subject Land is outside of species distribution. Though this species has been recorded west of Parkes (2012), this species is considered unlikely to occur.	Not considered further
Gilbert's Whistler	*Pachycephala inornata*	V	-	-	0	BCC	Ecosystem	Low. Associated habitat, dense shrub layer in box-ironbark communities, was not recorded. Species known breeding habitat (dense foliage of plants such as wattles or cypress pines) was sparse within the Subject Land.	Not considered further
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	V	-	-	0	BCC	Species / Ecosystem	Low. No Allocasuarina species observed on site upon which this species is dependent. Likely too distant from such resources to represent breeding sites in larger hollows on site.	Not considered further
Glossy Black-Cockatoo, Riverina population	*Calyptorhynchus lathami - endangered population*	E2	-	Outside Narrandera, Leeton and Griffith LGAs	0	BCC	Species	Low. No Allocasuarina species observed on site upon which this species is dependent. Likely too distant from such resources to represent breeding sites in larger hollows on site.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Glossy Ibis	*Plegadis falcinellus*	-	M; Ma	-	13	BioNet	-	Low. Preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. Species associated habitat was not recorded within the Subject Land. May occur as irregular nomadic visitor.	Not considered further
Grey Falcon	*Falco hypoleucos*	E1	-	-	2	BioNet	Ecosystem	Low. Outside species regular distribution. May occur as rare nomadic/visitor within the Subject Land.	Not considered further
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	V	-	-	26	BioNet	Ecosystem	**Recorded**. Species was recorded in groups at three locations generally occurring in Eucalyptus grassy woodland.	Ecosystem credit species
Gull-billed Tern	*Gelochelidon nilotica*	-	M; Ma	-	2	BioNet	-	Low. Outside species regular distribution. May occur as rare nomadic/visitor within the locality.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	V	-	-	7	BioNet	Ecosystem	Low. Prefers good patches of woodland habitat with complex understorey diversity, which is limited in subject land. Species is known in wider locality with associated with structural intact open eucalypt woodland.	Not considered further
Latham's Snipe	*Gallinago hardwickii*	-	M; Ma	-	7	BioNet	-	Low. Inhabits open, freshwater wetlands with low, dense vegetation. Associated habitat not recorded within the Subject Land.	Not considered further
Little Eagle	*Hieraaetus morphnoides*	V	-	-	2	BCC, BioNet	Species / Ecosystem	**Recorded**. The Subject Land may occur within the home-range of one or more individuals. The Subject Lands habitats are considered unlikely to support this species in isolation from habitats that are more productive in terms of prey species.	Ecosystem credit species
Little Lorikeet	*Glossopsitta pusilla*	V	-	-	11	BioNet	Ecosystem	**Moderate**. Potential foraging and habitat within intact vegetation where presence of mature Eucalypts occur. May be an irregular visitor during abundance of blossoming eucalypts	Ecosystem credit species
Magpie Goose	*Anseranas semipalmata*	V	-	Wetlands, swamps, cowals, marshes, lakes, creeks and lagoons	0	BCC	Ecosystem	Low. Associated habitat, shallow wetlands, not recorded within the Subject Land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Major Mitchell's Cockatoo	*Callocephalon fimbriatum*	V	-	-	0	BCC	Species / Ecosystem	Low. Subject Land is on the eastern fringes of range. Although it may occur rarely in the Subject Land habitats are unlikely to represent important foraging resources locally.	Not considered further
Malleefowl	*Leipoa ocellata*	E1	V	-	0	PMST	-	Low. Associated mallee habitat not recorded within the Subject Land.	Not considered further
Marsh Sandpiper	*Tringa stagnatilis*	-	M; Ma	-	7	BioNet	-	Low. Occurs in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. Associated habitat not recorded within the Subject Land.	Not considered further
Masked Owl	*Tyto novaehollandiae*	V	-	-	0	BCC	Species / Ecosystem	Low. Unlikely to occur within the Subject Land due to the paucity of local records and habitats within the Subject Land are of insufficient quality to support individuals.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Oriental Pratincole	*Glareola maldivarum*	-	M; Ma	-	1	BioNet	-	Low. Inhabits open plains, floodplains or short grassland (including farmland or airstrips), often with extensive bare areas. They often occur near terrestrial wetlands. May occur as rare nomadic/visitor within the locality.	Not considered further
Painted Honeyeater	*Grantiella picta*	V	V	Mistletoes present at a density of greater than five mistletoes per hectare	0	BCC, PMST	Ecosystem	Low. Marginal foraging habitat within remnant vegetation. A specialist feeder on mistletoes (Amyema) which did not occur in high densities.	Not considered further
Pied Honeyeater	*Certhionyx variegatus*	V	-	-	0	BCC	Ecosystem	Low. Preferred habitat of wattle shrub, primarily Mulga (*Acacia aneura*), Mallee and spinifex not within the Subject Land.	Not considered further
Rainbow Bee-eater	*Merops ornatus*	-	Ma	-	22	BioNet	-	**Moderate**. Occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. Study provides potential habitat during seasonal movements.	Not considered further (migratory species further discussed in report)

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Red-necked Stint	*Calidris ruficollis*	-	M; Ma	-	2	BioNet	-	Low. Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats. Associated habitat not recorded within the Subject Land.	Not considered further
Regent Honeyeater	*Anthochaera phrygia*	CE	CE	As per mapped areas	1	BCC, BioNet, PMST	Species / Ecosystem	Low. The potential for this species to occur within the Subject Land cannot be entirely discounted, however it does not conform to high quality woodland habitats types that this species is dependent upon for foraging and breeding purposes, so its likelihood of occurrence is considered low. The Subject Land is not identified as a breeding area for the species (Department of Environment, 2016).	Not considered further
Rufous Fantail	*Rhipidura rufifrons*	-	M; Ma	-	0	PMST	-	Low. Mainly inhabits wet sclerophyll forests. During seasonal movements sometimes recorded in drier sclerophyll forests and woodlands. Associated habitat not found within Subject Land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Satin Flycatcher	*Myiagra cyanoleuca*	-	M; Ma	-	0	PMST	-	Low. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands. During seasonal movements, occurs in coastal forests, woodlands, mangroves and drier woodlands and open forests. Preferred habitat not within Subject Land, rare occurrences during seasonal movements may occur.	Not considered further
Scarlet Robin	*Petroica boodang*	V	-	-	0	BCC	Ecosystem	Low. Prefers good patches of woodland habitat with complex understorey diversity, which is limited in subject land. Species is known in wider locality with associated with structural intact open eucalypt woodland.	Not considered further
Sharp-tailed Sandpiper	*Calidris acuminata*	-	M; Ma	-	22	BioNet	-	Low. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. Associated habitat not within Subject Land.	Not considered further
Speckled Warbler	*Chthonicola sagittata*	V	-	-	8	BioNet	Ecosystem	Low. Prefers good patches of woodland habitat with complex understorey diversity, which is limited in subject land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Spotted Harrier	*Circus assimilis*	V	-	-	6	BioNet	Ecosystem	Low. May occur over the site during local movements, but habitats are not of sufficient quality to support this species, due to a lack of habitat supporting an abundance of prey species.	Not considered further
Square-tailed Kite	*Lophoictinia isura*	V	-	Nest trees: The species is allocated to dual credit because they tend to be sensitive to disturbance around nests. It will be difficult to identify a Kite nest (there are lots of comparable sized stick nests built by other species), especially given Kites have large territories and other stick nesters will undoubtedly also be nesting where Kites might be recorded. Kites will need be in attendance to confirm breeding sites.	0	BCC	Species / Ecosystem	Low. May occur over the Subject Land during locally movements, but habitats are not of sufficient quality to support this species, due to a lack of habitat supporting an abundance of small bird species.	Not considered further
Superb Parrot	*Polytelis swainsonii*	V	V	Hollow bearing trees: Living or dead *E. blakelyi*, *E. melliodora*, *E. albens*, *E. camaldulensis*, *E. microcarpa*, *E. polyanthemos*, *E. mannifera*, *E. intertexta* with hollows greater than 5cm diameter; greater than 4m above ground or trees with a DBH of greater than 30cm.	17	BCC, BioNet, PMST	Species / Ecosystem	**Recorded**. This species was recorded within the Subject Land as small groups flying through and pairs accessing water in dams. No individuals were observed foraging and due to the low numbers of adult males in groups and seasonal timings, occurrences are likely to be by post-breeding aggregations.	Ecosystem credit species

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Swift Parrot	*Lathamus discolor*	E1	CE	Hollow bearing trees	3	BCC, BioNet, PMST	Species / Ecosystem	**Moderate**. May occur within Subject Land during seasonal movements and to utilise blossoming eucalypts. Dependent on winter flowering resources of which *E.microcarpa* occurs widely within subject land. No records locally and local resources are sparse, so occurrences are likely to be rare but cannot be discounted. Subject Land is outside of species known breeding habitat.	Ecosystem credit species
Turquoise Parrot	*Neophema pulchella*	V	-	-	1	BioNet	Ecosystem	Low. Local records occur within areas of higher quality woodland to the east. The Subject Lands provide marginal foraging habitat and irregular occurrences whilst foraging in greater locality cannot be discounted.	Not considered further
Varied Sittella	*Daphoenositta chrysoptera*	V	-	-	2	BioNet	Ecosystem	Low. Prefers good patches of woodland habitat with complex understorey diversity, which is limited in subject land.	Not considered further
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	V	Ma	-	0	BCC	Species / Ecosystem	Low. Preferred breeding and foraging habitat was not recorded within the Subject Land. May occur as a vagrant.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
White-browed Treecreeper population in Carrathool local government area south of the Lachlan River and Griffith local government area	*Climacteris affinis* - endangered population	E2	M	Listed population occurring within Carrathool LGA and Griffith LGA.	0	BCC	Species	Low. Habitats within the Subject Land are not consistent with those frequented by this species and the Subject Land is well beyond (>100km) the eastern limit of its range and suitable habitat.	Not considered further
White-fronted Chat	*Epthianura albifrons*	V	-	-	1	BioNet	Ecosystem	Low. Associated habitat, bare or grassy ground in wetland areas, was not recorded within the Subject Land.	Not considered further
White-throated Needletail	*Hirundapus caudacutus*	-	M; Ma	-	1	BioNet, PMST	-	**Moderate**. Almost exclusively aerial. Occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings. May irregularly occur foraging over Subject Land.	Not considered further (migratory species further discussed in report)
Wood Sandpiper	*Tringa glareola*	-	M; Ma	-	2	BioNet	-	Low. Occurs in well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. Suitable habitat not recorded within the Subject Land.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Yellow Wagtail	*Motacilla flava*	-	M; Ma	-	0	PMST	-	Low. Occurs in open country near swamps, salt marshes and sewage ponds. Rare visitor to coastal areas. Associated habitat not within Subject Land.	Not considered further
Fish									
Macquarie Perch	*Macquaria australasica*	-	E	-	0	PMST	-	Low. Suitable habitat not recorded within the Subject Land.	Not considered further
Murray Cod	*Maccullochella peeli*	-	V	-	0	PMST	-	Low. Suitable habitat not recorded within the Subject Land.	Not considered further
Mammals									
Corben's Long Eared Bat	*Nyctophilus corbeni*	V	V	-	0	BCC, PMST	Ecosystem	**Moderate**. Associated habitat in the form of box dominated woodlands, tree hollows and loose bark were recorded within the Subject Land.	Ecosystem credit species
Eastern Pygmy-possum	*Cercartetus nanus*	V	-	-	0	BCC	Species	Low. A lack of suitable patch size and quality in terms of understorey nectar-producing plants and shelter opportunities.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Grey-headed Flying-fox	*Pteropus poliocephalus*		V	Breeding camps	0	BCC, PMST	Species / Ecosystem	Low. Not observed during nocturnal surveys, but may visit the Subject Land when blossom is available if camps occur within accessible reach of the Subject Land	Ecosystem credit species
Koala	*Phascolarctos cinereus*	V	V	-	3	BCC, BioNet, PMST	Species / Ecosystem	Low. A lack of continuity between woodland patches, patch size and sufficient foraging resources suggest that this species does not occur in the Subject Land, apart from random movements.	Not considered further
Large-eared Pied Bat	*Chalinolobus dwyeri*	-	V	Cliffs within two kilometres of rocky areas containing caves, overhangs, escarpments, outcrops, or crevices, or within two kilometres of old mines or tunnels	0	BCC, PMST	Species	Low. No suitable roosting habitats associated with the Subject Land or its vicinity – may rarely extend to the site during foraging movements but the Subject Land is likely to be of low importance to this species.	Not considered further
Little Pied Bat	*Chalinolobus picatus*	V	-	-	3	BioNet	Ecosystem	**Moderate**. Potential foraging and roosting habitat within remnant vegetation.	Ecosystem credit species
New Holland Mouse	*Pseudomys novaehollandiae*	-	V	-	0	PMST	-	Low. The Subject Land is on fringe of known distribution. Vegetation recorded is unlikely to provide quality habitat due to low foliage cover in understorey and shrub layer.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Southern Myotis	*Myotis macropus*	V	-	Hollow bearing trees / Within 200 m of riparian zone / Bridges, caves or artificial structures within 200 m of riparian zone	0	BCC	Species	Low. Preferred riparian foraging habitats and roosting locations are not present within the Subject Land, but it's presence cannot be discounted during local movements.	Not considered further
Spotted-tailed Quoll	*Dasyurus maculatus*	V	E	-	0	BCC, PMST	Ecosystem	Low. The Subject Land is generally outside of species known distribution.	Not considered further
Squirrel Glider	*Petaurus norfolcensis*	V	-	-	0	BCC	Species	Low. A lack of continuity between woodland patches, patch size and a diversity of foraging resources suggest that this species does not occur in the Subject Land.	Not considered further
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	V	-	-	0	BCC	Ecosystem	**Moderate**. Potential foraging and roosting habitat within remnant vegetation.	Ecosystem credit species
Reptiles									
Pink-tailed Legless Lizard	*Aprasia parapulchella*	V	V	Rocky areas or within 50m of rocky areas	1	BCC, BioNet, PMST	Species	Low. Marginal habitat (rocky outcrops, scattered rocks) were recorded within the Subject Land in areas of higher elevations, generally in associated with PCT 267. A lack of high quality groundcover habitats with sufficient natural features for cover and foraging.	Not considered further

COMMON NAME	SCIENTIFIC NAME	BC ACT[1]	EPBC ACT[2]	HABITAT REQUIREMENTS / GEOGRAPHIC RESTRICTIONS[3]	BIONET RECORDS	SOURCE[4]	CREDIT TYPE[5]	LIKELIHOOD OF OCCURRENCE	OUTCOME
Striped Legless Lizard	*Delma impar*	-	V	-	0	PMST	-	Low. Although elements of preferred habitat were recorded within the Subject Land, the Subject Land is on the boundary of this species known distribution and hasn't historically been recorded within locality.	Not considered further

(1) V = Vulnerable, E = Endangered as listed under the BC Act

(2) V = Vulnerable, E = Endangered, CE = Critically Endangered as listed under the EPBC Act

(3) Habitat requirements and geographic requirements were obtained from the BAM Credit Calculator (BCC)

(4) BCC = BAM Credit Calculator, BioNet = Office of Environment and Heritage spatial search, PlantNet = Royal Botanic gardens spatial search, PMST = Protected Matters Search Tool (Department of Environment and Energy)

(5) Credit types as prescribed by the BAM Credit Calculator

APPENDIX E

COMMONWEALTH ASSESSMENT FOR THREATENED ECOLOGICAL COMMUNITIES

E1 EPBC ASSESSMENT OF THREATENED ECOLOGICAL COMMUNITIES

GREY BOX (E. MICROCARPA) GRASSY WOODLANDS AND DERIVED NATIVE GRASSLANDS OF SOUTH-EASTERN AUSTRALIA

In order for vegetation to meet to be commensurate with the EPBC-listing for Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia both key diagnostic characteristics and condition criteria outlined in the Commonwealth listing advice (Threatened Species Scientific Committee, 2010) must be met. A comparison of each candidate PCT and condition class against the key diagnostic characteristics is provided in Table E.1.

Those PCTs and condition classes which met the key diagnostics were assessed as patches the relevant criteria is provided in Table E.2 and Table E.3. For each patch size assessment, representative plot data was used from within the Subject Land in areas of the same condition class. Areas of PCT 250 which adjoin areas of vegetation which is commensurate with Commonwealth listing were considered against the relevant criteria.

A flowchart showing the condition criteria for Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia is provided in Figure E.1. All patches considered in this assessment are shown on Figure 6.1 in the main report.

Table E.1 Key diagnostics for Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia

KEY DIAGNOSTIC CHARACTERISTICS[1]	PCT 76	PCT 82	PCT 250
The ecological community occurs on low slopes and plains from central NSW, through northern and central Victoria into South Australia.	Yes. This vegetation was recorded on low slopes and plains from central NSW.		
The vegetation structure of the ecological community is typically a woodland to open forest.	Yes. This vegetation was recorded as an open woodland.		No. This community was recorded as a grasslands community with no over storey and typically no shrub layer however is considered further as derived native grasslands form part of this EEC.
The tree canopy is dominated (≥ 50% canopy crown cover) by *Eucalyptus microcarpa* (Grey Box). Other tree species may be present in the canopy and, in certain circumstances, Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia listing advice.	Yes. *Eucalyptus microcarpa* (Grey Box) was the dominant canopy species and formed >50% of the overstorey.	No. *Eucalyptus microcarpa* (Grey Box) was recorded in this community as a co-dominant species with *Eucalyptus populena* (Poplar Box) and does not form ≥ 50% canopy crown cover.	No. No canopy species were recorded in this community however is considered further as derived native grasslands form part of this EEC.
The mid layer comprises shrubs of variable composition and cover, from absent to moderately dense. The mid layer usually has a crown cover of less than 30% with local patches up to 40% crown cover.	Yes. Typically, this community had a sparse shrub later.	Yes. Typically, this community had a sparse shrub later.	Yes. Typically, shrubs were sparse in this community. Some areas formed stands of *Maireana microphylla* (Small-leaf Bluebush).
The ground layer also is highly variable in development and composition, ranging from almost absent to mostly grassy to forb-rich. Ground layer flora commonly present include one or more of the graminoid genera: *Austrodanthonia, Austrostipa, Elymus, Enteropogon, Dianella* and *Lomandra*; and one or more of the chenopod genera: *Atriplex, Chenopodium, Einadia, Enchylaena, Maireana, Salsola* and *Sclerolaena.*	Of the eight plots recorded, Q22 did not record one of the graminoid species and Q28 did not recorded one of the graminoid or chenopod species outlined in the key diagnostic characteristics. Q28 represents PCT 76 in Poor condition.	Of the seven plots recorded, Q34 and Q38 did not record one of the chenopod species and Q29 did not recorded one of the graminoid or chenopod species outlined in the key diagnostic characteristics. Q28 represents PCT 82 in Poor condition.	Of the seven plots recorded, one (Q30) did not recorded both a not recorded one of the chenopod species outlined in the key diagnostic characteristics.
Outcome	PCT 76 in Moderate condition is considered further however PCT 76 in Poor condition is not.	Did not meet criteria.	PCT 250 is considered further

(1) Threatened Species Scientific Committee (2010)

Table E.2 Comparison of PCT 76 against Inland Grey Box Woodland EPBC condition criteria (Threatened Species Scientific Committee, 2010)

PATCHES	**1, 5, 6, 7, 19 & 23**	**2, 3, 8, 13, 17, 21 & 22**	**14 & 15**	**16**	**9, 10, 12, 20**
CORRESPONDING PLOT DATA	**Q3**	**Q13**	**Q19**	**Q21**	**Q25**
1a. The minimum patch size is 0.5 hectare	Yes. All Patches considered in this assessment are >0.5 ha				
1b. The canopy layer contains Grey Box (E. microcarpa) as the dominant or co-dominant tree species	All Patches correspond to PCT 76 where *Eucalyptus microcarpa* was the dominant canopy species.				
1c. The vegetative cover of non-grass weed species in the ground layer is less than 30% at any time of the year	Yes. Patches with weed cover >30% have not been included in this assessment.				
Additional criteria for Patches 0.5 - < 2ha area with tree cover >10%	**This applies to Patch 5, 6, 19 & 23**	**This applies to Patch 3, 8, 17, 21 & 22**	**N/a**	**N/a**	**This applies to Patch 10, 12 & 20**
2a. At least 50% of the vegetative cover in the ground layer comprises perennial native species at any time of the year	Yes. Plot data recorded 75.6% of ground cover being native.	Yes. Plot data recorded 73% of ground cover being native.	N/a	N/a	Yes. Plot data recorded 99% of ground cover being native.
2b. 8 or more perennial native species are present in the mid and ground layers at any time of the year	Yes. 20 species	Yes. 19 species	Yes. 10 species	N/a	Yes. 19 species
Additional criteria that apply to larger woodland patches with well-developed canopy (2 ha or more in area)	**This applies to Patch 1 and 7.**	**This applies to Patch 2 and 13**	**This applies to Patch 14 & 15**	**This applies to Patch 16**	**This applies to Patch 9**
3a. At least 8 trees/ha are hollow bearing or have a diameter at breast height of 60 cm or more AND;	Yes. 10 HBT/Ha based on 1 HBT recorded in plot	Yes. 20 HBT/Ha based on 2 HBT recorded in plot	No. No HBT recorded.	Yes. 20 HBT/Ha based on 2 HBT recorded in plot	Yes. 30 HBT/Ha based on 3 HBT recorded in plot

PATCHES	1, 5, 6, 7, 19 & 23	2, 3, 8, 13, 17, 21 & 22	14 & 15	16	9, 10, 12, 20
CORRESPONDING PLOT DATA	**Q3**	**Q13**	**Q19**	**Q21**	**Q25**
3b. At least 10% of vegetative ground cover comprises native perennial native grasses at any time of the year OR;	Yes. 10%	No. 6.9%	Yes. 40.5%	Yes. 31.7%	Yes. 41.5%
4a. At least 20 trees/ha have a diameter at breast height of 12cm or more	Yes. 20/Ha based on 2/50+ DBH recorded in plot	Yes. 20/Ha based on 2/20+ DBH recorded in plot	Yes. 30/Ha based on 3/30+ DBH recorded in plot	Yes. 20/Ha based on 2/20+ DBH recorded in plot	Yes. 30/Ha based on 3/50+ DBH recorded in plot
4b. At least 50% of the vegetation cover in the ground layer comprises perennial native species	Yes. 76% Native	Yes. 73% Native	Yes. 95% native	Yes. 99% native	Yes. 99% native
Outcome	**All Patches meet criterion**	**All Patches meet criterion**	**All Patches meet criterion**	**All Patches meet criterion**	**All Patches meet criterion**

Table E.3 Comparison of PCT 250 against Inland Grey Box Woodland EPBC condition criteria (Threatened Species Scientific Committee, 2010)

PATCHES	**3**	**2**	**1**	**4, 5, 6, 9, 10, 11, 12, 13 14 &15**	**7 & 8**
CORRESPONDING PLOT DATA	**Q2**	**Q4**	**Q6**	**Q12**	**Q20**
1a. The minimum patch size is 0.5 hectare	All Patches are more than 0.5 ha in area.				
1b. The canopy layer contains Grey Box (E. microcarpa) as the dominant or co-dominant tree species	Patches of PCT 250 which occur in areas adjacent to PCT 76 in moderate condition have been included in this assessment. As such, an assumption has been made that this vegetation would display a canopy layer dominated by *Eucalyptus microcarpa* in its natural state.				
1c. The vegetative cover of non-grass weed species in the ground layer is less than 30% at any time of the year	Yes.	Yes.	Yes.	Yes.	Yes.
5a. Woodland density does not meet criteria 3a or 4a, or is a derived grassland with clear evidence that the site formerly was a woodland with a tree canopy dominated or co-dominated by E. microcarpa;	All Patches in this assessment occurred as Derived Native Grassland. Areas of PCT 250 which adjoin PCT 76 (Moderate) were considered in this assessment. Given the landscape position and floristic composition of the understorey, an assumption has been made that this vegetation would display a canopy layer dominated by *Eucalyptus microcarpa* in its natural state.				
5b. At least 50% of the vegetative cover in the ground layer is made up of perennial native species at any time of the year;	Yes.	Yes.	Yes.	Yes.	Yes.
5c. 12 or more native species are present in the ground layer at any time of the year.	Yes. 16 native species were recorded.	Yes. 23 native species were recorded	Yes. 21 native species were recorded	No. 11 native species were recorded	Yes. 17 native species were recorded
Outcome	**All Patches meet criterion**	**All Patches meet criterion**	**All Patches meet criterion**	**No Patches meet criterion.**	**All Patches meet criterion**

Category and rationale	Thresholds
Criteria that are broadly applicable	**1a.** The minimum patch size is 0.5 hectare; **AND** **1b.** The canopy layer contains Grey Box (*E. microcarpa*) as the dominant or co-dominant tree species; **AND** **1c.** The vegetative cover[7] of non-grass weed[8] species in the ground layer is less than 30% at any time of the year.
Additional criteria that apply to smaller woodland patches (0.5 to <2 ha in area) with tree crown cover >10%	**2a.** At least 50% of the vegetative cover in the ground layer comprises perennial native species at any time of the year; **AND** **2b.** 8 or more perennial native species[9] (6 or more in the Flinders Lofty Block Bioregion of South Australia) are present in the mid and ground layers at any time of the year.
Additional criteria that apply to larger woodland patches with a well developed canopy (2 ha or more in area)	**3a**. At least 8 trees/ha are hollow bearing or have a diameter at breast height of 60 cm or more[10]; **AND** **3b.** at least 10% of the vegetative ground cover comprises perennial native grasses at any time of the year;
	OR
	4a. At least 20 trees/ha have a diameter at breast height of 12 cm or more; **AND** **4b.** at least 50% of the vegetative cover in the ground layer comprises perennial native species.
Additional criteria that apply to patches where the canopy is less developed or absent (derived grassland) (≥0.5 ha in area)	**5a.** Woodland density does not meet criteria 3a or 4a, or is a derived grassland with clear evidence that the site formerly was a woodland with a tree canopy dominated or co-dominated by *E. microcarpa*; **AND** **5b.** At least 50% of the vegetative cover in the ground layer is made up of perennial native species at any time of the year; **AND** **5c.** 12 or more native species are present in the ground layer at any time of the year.

[7] Vegetative cover excludes mosses and lichens. Patches of bare ground or leaf litter are also not included.

[8] A weed is defined here as a plant species that is not native to Australia and the species has established viable self-sustaining populations in a region.

[9] Relevant growth-forms to include are: grasses, other graminoids, forbs and shrubs less than 4 metres tall. Shrubs that are 4 metres or more in height and non-vascular plants (mosses and lichens) are not included.

[10] Dead trees are included, if present up to 50% of the total tree count.

Figure E.1 Condition thresholds for the Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia ecological community (Threatened Species Scientific Committee, 2010)

WHITE BOX-YELLOW BOX-BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND

For vegetation to meet to be commensurate with the EPBC-listing for White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, the condition criteria outlined in the Commonwealth Listing Advice must be met (Threatened Species Scientific Committee, 2006).

The Commonwealth Listing Advice states that White Box – Yellow Box – Blakely's Red Gum grassy woodlands that existed prior to European settlement now exists as remnants in three different states (Threatened Species Scientific Committee, 2006):

- an overstorey of eucalypt trees exists, but there is no substantial native understorey.
- a native understorey exists, but the trees have been cleared.
- both a native understorey and an overstorey of eucalypts exist in conjunction.

The Listing Advice continues to outline that the in order for vegetation to be considered, a patch must have a predominantly native understorey. As such, any vegetation recorded in Poor condition, where the understorey is comprised of <50% native species is not considered further.

An assessment of each candidate PCT and condition class against the relevant criteria is provided in Table E.6.

For each patch size assessment, representative plot data was used from within the Subject Land in areas of the same condition class. Areas of PCT 250 which adjoin areas of vegetation which is commensurate with Commonwealth listing were considered against condition criteria.

For vegetation with canopy which was more than 0.5 Ha in area however did not meet the required number of understorey species or presence of natural regeneration, a precautionary approach was adopted and these areas were considered further. This approach was considered appropriate given the dry conditions in which the Subject Land was surveyed and the heavy grazing that had occurred within most of the Patches under assessment. As such, any Patch of PCT 267 or PCT 276 which was recorded in Moderate condition and was more than 0.5 Ha in area has been considered commensurate with the Commonwealth listing.

A flowchart showing the condition criteria for Grey Box (E. microcarpa) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia is provided in Figure E.2. All patches considered in this assessment are shown on Figure 6.1 in the main report.

Table E.4 Comparison of PCT 267 against Box Gum Woodland EPBC condition criteria

PATCHES	**5, 7 & 8**	**2, 17 & 13**	**6**	**4, 12 & 24**	**15, 16, 27, 31, 35 & 36**	**19 & 33**	**11**
CORRESPONDING PLOT DATA	**Q10**	**Q11**	**Q14**	**Q23**	**Q31**	**Q37**	**Q42**
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakey's Red Gum ?	Yes. All Patches considered in the assessment displayed *Eucalyptus albens* (White Box) are the dominant canopy species.						
Does the patch have a predominately (>50%) native understorey	Yes. 75% native understorey	Yes. 75% native understorey	Yes. 62% native understorey	Yes. 67% native understorey	Yes. 96% native understorey	Yes. 77% native understorey	No. 40% native understorey
Is the patch ≥ 0.1 ha in size?	Yes. All Patches considered in this assessment are ≥ 0.1 ha in size						
There are 12 or more native understorey species present (excluding grasses)	No. 8 native understorey species (excl. grasses)	Yes. 16 native understorey species (excl. grasses)	No. 10 native understorey species (excl. grasses)	No. 9 native understorey species (excl. grasses)	No. 9 native understorey species (excl. grasses)	No. 9 native understorey species (excl. grasses)	No. 4 native understorey species (excl. grasses)
Is the patch >2 Ha in size?	**Yes. Patch 7 is >2 Ha in size**	**Yes. Patch 13 is >2 Ha in size**	**Yes. Patch 6 is >2 Ha in size**	**No.**	**Yes. Patch 16 is >2 Ha in size**	**Yes. Patch 19 is >2 Ha in size**	**No.**
Does the patch have an average of ≥20 mature trees / Ha? or Is there natural regeneration?	Yes. 20 mature trees / Ha based on 2 trees with 50+ DBH recorded in plot (0.1 Ha). No natural regeneration recorded.	Yes. No trees with a DBH >50+ were recorded. Trees with a DBH <5cm recorded. No natural regeneration recorded.	No. <20 mature trees / Ha based on 1 tree with 50+ DBH recorded in plot (0.1 Ha). No natural regeneration recorded.	N/a	No. <20 mature trees / Ha based on 1 tree with 50+ DBH recorded in plot (0.1 Ha). No natural regeneration recorded.	No. <20 mature trees / Ha based on 1 tree with 50+ DBH recorded in plot (0.1 Ha). No natural regeneration recorded.	N/a

PATCHES	5, 7 & 8	2, 17 & 13	6	4, 12 & 24	15, 16, 27, 31, 35 & 36	19 & 33	11
CORRESPONDING PLOT DATA	**Q10**	**Q11**	**Q14**	**Q23**	**Q31**	**Q37**	**Q42**
There is at least on important species?	Yes. One important species was recorded	Yes. One important species was recorded	Yes. One important species was recorded	N/a	Yes. One important species was recorded	Yes. One important species was recorded	N/a
Is the Patch >0.5 Ha and has been excluded based on lack of understorey species and natural regeneration?	Yes. Patch 5 & 8 have been excluded as the representative plot lacks 4 understorey species and natural regeneration was not recorded, despite being 75% native in the ground layer.	n/a	Yes. Patch 6 is >0.5 Ha and have been excluded as the representative plot lacks 1 understorey species and natural regeneration was not recorded, despite being 71% native in the ground layer.	No. Patch 4 and 12 are <0.5 Ha in size. No natural regeneration recorded.	Yes. Patch 15, 16 and 35 are >0.5 Ha and have been excluded as the representative plot lacks 2 understorey species and natural regeneration was not recorded, despite being 96% native in the ground layer.	Yes. Patch 19 is >0.5 Ha and have been excluded as the representative plot lacks 2 understorey species and natural regeneration was not recorded, despite being 77% native in the ground layer.	Yes. Patch 11 is >0.5 Ha and have been excluded as the representative plot lacks 2 understorey species and natural regeneration was not recorded. despite being 40% native in the ground layer.
Outcome	All Patches meet criterion	All Patches meet criterion	All Patches meet criterion	Patches do not meet criterion.	Patch 27 and 31 does not meet criterion. Patch 15, 16, 35 and 36 meets criterion.	Patch 33 does not meet criterion. Patch 19 meets criterion.	All Patches meet criterion

(1) Department of Environment, Climate Change and Water NSW, 2010

Table E.5 Comparison of PCT 276 against Box Gum Woodland EPBC condition criteria (Department of Environment, Climate Change and Water NSW, 2010)

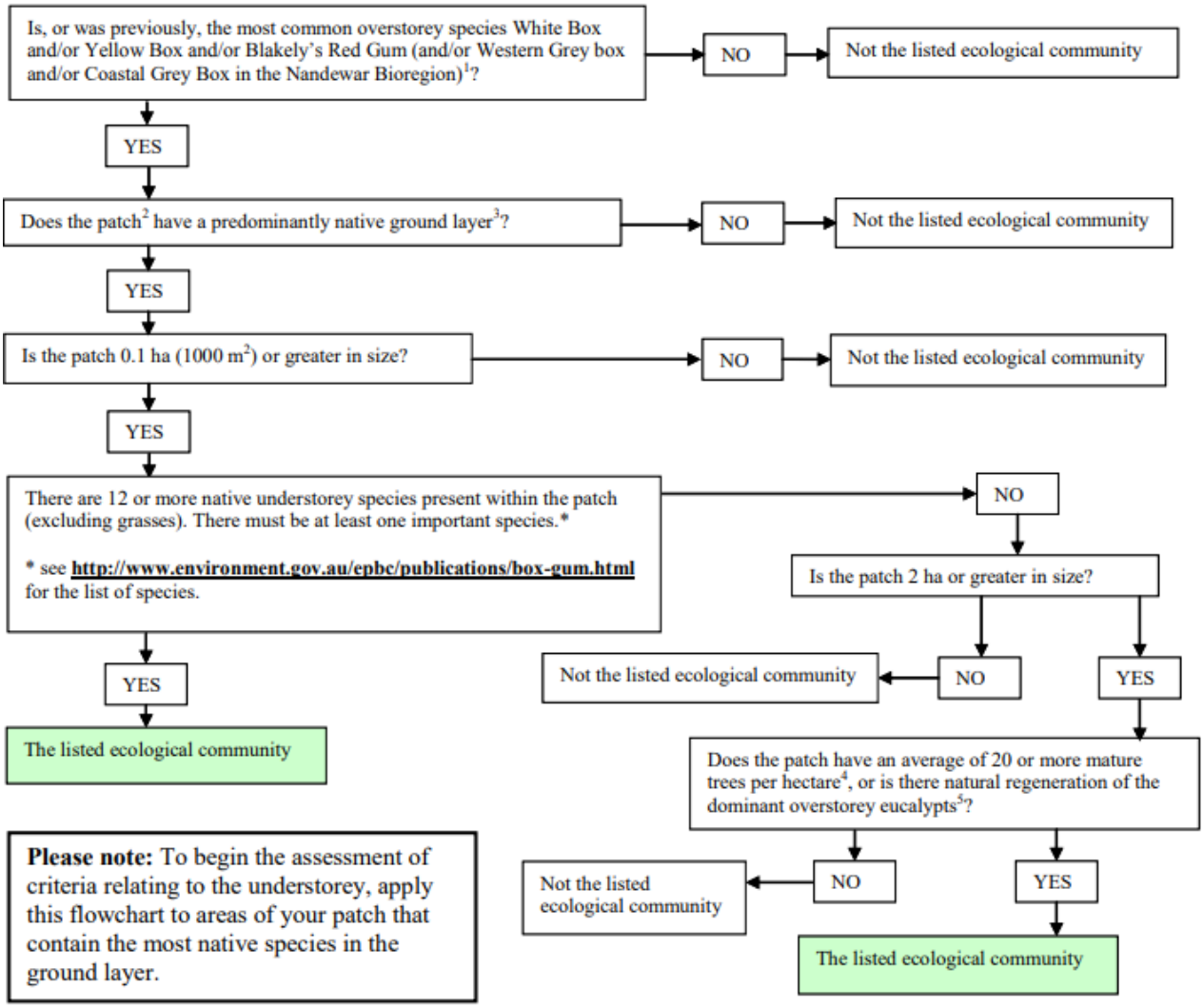
PATCHES	**9, 10, 23 & 26**	**1, 26, 37 & 28**	**14 & 3**	**30 & 32**
CORRESPONDING PLOT DATA	**Q1**	**Q5**	**Q7**	**Q44**
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakey's Red Gum?	Yes. The overstorey species for Patches in this assessment *Eucalyptus mellidora* (Yellow Box)			
Does the patch have a predominately (>50%) native understorey	Yes. 71% native	Yes. 62% native	Yes. 94% native	No. 28% native
Is the patch ≥ 0.1 ha in size?	Yes. All patches assessed were ≥ 0.1 ha in size			
There are 12 or more native understorey species present (excluding grasses)	No. 9 understorey species	Yes. 17 understorey species	Yes. 19 understorey species	No. 7 understorey species
Is the patch >2 Ha in size?	**Yes. Patch 9 is >2 Ha**	**Yes. Patch 1 is >2 Ha**	**Yes. Patch 3 is >2 Ha**	**No.**
Does the patch have an average of ≥20 mature trees / Ha? or Is there natural regeneration?	Yes. >20 mature trees / Ha based on 4 trees with a 50+ DBH recorded in plot (0.1 Ha). No natural regeneration recorded.	No. No mature trees or natural regeneration was recorded.	Yes. Although no mature trees were recorded, trees with a DBH <5 cm were recorded	n/a
There is at least on important species?	Yes. One important species was recorded	Yes. One important species was recorded	Yes. One important species was recorded	n/a
Is the Patch >0.5 Ha and has been excluded based on lack of understorey species and natural regeneration?	Yes. Patch 8, 10, 23 and 26 are >0.5 Ha and have been excluded as they lack 2 understorey species to meet criteria despite being 71% native in the ground layer.	No.	No.	No. Patch 30 and Patch 32 are <0.5 Ha and meet criteria for listing.
Outcome	All Patches meet criterion.	All Patches meet criterion.	All Patches meet criterion.	Does not meet criterion

(1) Department of Environment, Climate Change and Water NSW, 2010

Table E.6 Comparison of PCT 250 against Box Gum Woodland EPBC condition criteria (Department of Environment, Climate Change and Water NSW, 2010)

CONDITION CRITERIA	Q9	Q12	Q30
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakey's Red Gum?	Areas of PCT 250 which adjoin PCT 267 (Moderate) and/or PCT 276 (Moderate) were considered in this assessment.		
Does the patch have a predominately (>50%) native understorey	Yes.	Yes.	Yes
Is the patch ≥ 0.1 ha in size?	Yes. Patch is > 0.1 Ha	Yes. Patch is > 0.1 Ha	Yes. Patch is >0.1 Ha
There are 12 or more native understorey species present (excluding grasses)	Yes. 21 native species were recorded. Of these, 12 were grass species.	No. 11 native species were recorded, of which 10 were not grass species.	No. 21 native species were recorded, of which 11 were not grass species.
Is the patch >2 Ha in size?	N/a	N/a	N/a
Does the patch have an average of ≥20 mature trees / Ha? or Is there natural regeneration?	No over storey species or natural regeneration recorded.	No over storey species or natural regeneration recorded.	No over storey species or natural regeneration recorded.
There is at least on important species?	Yes. One important species was recorded.	Yes. One important species was recorded.	Yes. One important species was recorded.
Outcome	Meets criterion.	Not commensurate.	Not commensurate.

(1) Department of Environment, Climate Change and Water NSW, 2010



[1] These dominant species may include hybrids with any other *Eucalyptus* species.

[2] Patch – a patch is a continuous area containing the ecological community (areas of other ecological communities such as woodlands dominated by other species are not included in a patch). In determining patch size it is important to know what is, and is not, included within any individual patch. The patch is the larger of:
- an area that contains five or more trees in which no tree is greater than 75 m from another tree, or
- the area over which the understorey is predominantly native.

[3] A predominantly native ground layer is one where at least 50 per cent of the perennial vegetation cover in the ground layer is made up of native species. The best time of the year to determine this is late autumn when the annual species have died back and have not yet started to regrow.

[4] Mature trees are trees with a circumference of at least 125 cm at 130 cm above the ground.

[5] Natural regeneration of the dominant overstorey eucalypts occurs when there are mature trees plus regenerating trees of at least 15 cm circumference at 130 cm above the ground.

Figure E.2 Box Gum Woodland Identification Flowchart (Department of Environment, Climate Change and Water NSW, 2010)

E2 REFERENCES

Threatened Species Scientific Committee (2010). Commonwealth Listing Advice on Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia. Department of the Environment, Water, Heritage and the Arts. Canberra, ACT: Department of the Environment, Water, Heritage and the Arts. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/86-listing-advice.pdf. In effect under the EPBC Act from 01-Apr-2010.

Threatened Species Scientific Committee (2006). Commonwealth Listing Advice on White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/box-gum.html. In effect under the EPBC Act from 18-May-2006.

APPENDIX F

BAM VEGETATION INTEGRITY PLOT DATA

F1 BAM VEGETATION INTEGRITY PLOT DATA

Date 25/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q1: PCT 276 Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (Moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			20	16	1	0	6	7	0	2	4	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			33.3	31.1	20	0	4.3	6.5	0	0.3	2.2	1
Anthosachne scabra	0.2	3	GG				0.2					
Austrostipa scabra subsp. scabra	1	50	GG				1					
Boerhavia dominii	0.1	1	FG					0.1				
Dichondra repens	1	20	FG					1				
Einadia hastata	0.6	30	FG					0.6				
Einadia nutans subsp. linifolia	0.3	4	FG					0.3				
Enteropogon acicularis	0.8	3	GG				0.8					
Eucalyptus melliodora	20	4	TG		20							
Glycine canescens	0.2	3	OG							0.2		
Glycine tabacina	0.1	1	OG							0.1		
*Heliotropium europaeum**	0.5	15	EX								0.5	
*Lepidium bonariense**	0.3	15	EX								0.3	
Lomandra bracteata	0.2	3	GG				0.2					
*Lycium ferocissimum**	1	1	HT									1
Maireana enchylaenoides	0.3	4	FG					0.3				
*Marrubium vulgare**	0.4	1	EX								0.4	
Panicum effusum	0.1	1	GG				0.1					
Paspalidium constrictum	2	15	GG				2					
Sida corrugata	4	35	FG					4				
Wahlenbergia communis	0.2	5	FG					0.2				

Easting	601139
Northing	6329067
Orientation	315
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	4
30-49	Yes
20-29	No
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	25.6
Bare ground (%)	68
Vegetation (%)	6.4
Rock (%)	0

Date 25/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q2: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			19	17	0	1	9	7	0	0	2	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			30.7	29.2	0	0.2	26.8	2.2	0	0	1.5	1.5
Alternanthera denticulata	0.3	6	FG					0.3				
Austrostipa scabra subsp. scabra	4	30	GG				4					
*Carthamus lanatus**	1	28	HT									1
Chloris truncata	0.1	1	GG				0.1					
Cyperus fulvus	0.5	30	GG				0.5					
Dichanthium sericeum subsp. sericeum	6	45	GG				6					
Digitaria divaricatissima	0.5	6	GG				0.5					
Enteropogon acicularis	0.5	10	GG				0.5					
Juncus flavidus	5	50	GG				5					
Lobelia concolor	0.3	6	FG					0.3				
Maireana enchylaenoides	0.2	8	FG					0.2				
Maireana microphylla	0.2	3	SG			0.2						
Panicum effusum	0.2	3	GG				0.2					
Phyllanthus virgatus	0.1	2	FG					0.1				
Rumex brownii	0.2	3	FG					0.2				
Rytidosperma setaceum	10	100	GG				10					
Sida corrugata	0.1	7	FG					0.1				
Solanum esuriale	1	23	FG					1				
*Xanthium spinosum**	0.5	15	HT									0.5

Easting	601759
Northing	6328969
Orientation	10
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	19.8
Bare ground (%)	47
Vegetation (%)	13.2
Rock (%)	20

Date 25/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q3: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			21	19	1	2	10	4	1	1	2	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			41.6	36.6	20	2	10.4	3.1	1	0.1	5	4
Anthosachne scabra	1	6	GG				1					
Austrostipa scabra subsp. scabra	3	35	GG				3					
Brunoniella australis	0.2	5	FG					0.2				
Carex inversa	3	50	GG				3					
Convolvulus erubescens	0.1	1	OG							0.1		
Enteropogon acicularis	0.5	10	GG				0.5					
Eucalyptus microcarpa	20	2	TG		20							
Lomandra filiformis subp. filiformis	1	40	GG				1					
*Lycium ferocissimum**	4	5	HT									4
Maireana enchylaenoides	2	18	FG					2				
Maireana microphylla	1	2	SG			1						
Marsilea costulifera	1	100	EG						1			
Panicum decompositum	0.5		GG				0.5					
Paspalidium constrictum	0.6	10	GG				0.6					
*Phalaris aquatica**	1	2	EX								1	
Rytidosperma caespitosum	0.5	10	GG				0.5					
Sclerolaena muricata	1	7	SG			1						
Sida corrugata	0.5	6	FG					0.5				
Solanum esuriale	0.4	15	FG					0.4				
Sporobolus caroli	0.1	1	GG				0.1					
Tragus australianus	0.2	4	GG				0.2					

Easting	601382
Northing	6329971
Orientation	230
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	9
Attributes 1x1 plot (%)	
Litter (%)	27.6
Bare ground (%)	67.6
Vegetation (%)	4.8
Rock (%)	0

Date 25/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q4: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			29	23	0	2	10	9	1	1	6	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			28.9	27.3	0	4.6	12.4	9	1	0.3	1.6	0
Alternanthera denticulata	1	15	FG					1				
Anthosachne scabra	0.3	19	GG				0.3					
Atriplex spinibractea	1	6	FG					1				
Austrostipa scabra subsp. scabra	2	40	GG				2					
Austrostipa bigeniculata	0.6	8	GG				0.6					
*Avena fatua**	0.2	5	EX								0.2	
Carex inversa	2	100	GG				2					
Chloris truncata	1	15	GG				1					
*Cirsium vulgare**	0.5	1	EX								0.5	
Convolvulus erubescens	0.3	6	OG							0.3		
*Conyza bonariensis**	0.2	1	EX								0.2	
Dichondra repens	0.8	35	FG					0.8				
Enteropogon acicularis	0.4	20	GG				0.4					
Euphorbia drummondii	3	35	FG					3				
Fimbristylis dichotoma	0.2	2	GG				0.2					
*Lepidium bonariense**	0.3	10	EX								0.3	
Maireana decalvans	0.6	4	SG			0.6						
Maireana enchylaenoides	1	20	FG					1				
*Marrubium vulgare**	0.3	5	EX								0.3	
Marsilea costulifera	1	30	EG						1			
*Modiola caroliniana**	0.1	1	EX								0.1	
Oxalis exilis	0.6	10	FG					0.6				
Panicum decompositum	0.4	5	GG				0.4					
Rumex brownii	0.2	4	FG					0.2				
Rytidosperma sp. (no fertile material)	5	100	GG				5					
Sclerolaena muricata	4	10	SG			4						
Sida corrugata	1	20	FG					1				
Tragus australianus	0.5	15	GG				0.5					
Vittadinia cervicularis subsp. cervicularis	0.4	6	FG					0.4				

Easting	601544
Northing	6330085
Orientation	140
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	13
Bare ground (%)	68
Vegetation (%)	19
Rock (%)	0

Date 26/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q5: PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			35	27	1	1	9	14	0	2	8	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			48.1	40.6	20	0.6	8.2	11.1	0	0.7	7.5	0.2
Anthosachne scabra	1	20	GG				1					
Atriplex spinibractea	0.5	3	FG					0.5				
Austrostipa scabra subsp. scabra	3	30	GG				3					
Austrostipa bigeniculata	0.4	5	GG				0.4					
*Avena fatua**	4	100	EX								4	
Boerhavia dominii	2	20	FG					2				
Calotis lappulacea	0.5	5	FG					0.5				
Carex inversa	1	40	GG				1					
*Carthamus lanatus**	0.2	1	HT									0.2
*Chondrilla juncea**	0.2	3	EX								0.2	
Convolvulus erubescens	0.3	4	OG							0.3		
Dichondra repens	1	50	FG					1				
Dysphania pumilio	0.2	5	FG					0.2				
Einadia nutans subsp. linifolia	0.7	10	FG					0.7				
Enteropogon acicularis	0.4	15	GG				0.4					
Eucalyptus melliodora	20	11	TG		20							
Euphorbia drummondii	0.2	2	FG					0.2				
Glycine tabacina	0.4	15	OG							0.4		
*Heliotropium europaeum**	0.2	1	EX								0.2	
*Hordeum sp.**	2	55	EX								2	
Juncus flavidus	0.2	3	GG				0.2					
*Lepidium africanum**	0.1	2	EX								0.1	
*Lolium perenne**	0.3	4	EX								0.3	
Maireana enchylaenoides	0.8	25	FG					0.8				
*Marrubium vulgare**	0.5	20	EX								0.5	
Oxalis exilis	0.1	1	FG					0.1				
Panicum decompositum	1	25	GG				1					
Paspalidium constrictum	0.2	5	GG				0.2					
Rytidosperma caespitosum	1	20	GG				1					
Salsola australis	0.6	2	SG			0.6						
Sida corrugata	2	40	FG					2				
Solanum esuriale	2	40	FG					2				
Tribulus micrococcus	0.4	6	FG					0.4				
Vittadinia gracilis	0.4	10	FG					0.4				
Wahlenbergia communis	0.3	10	FG					0.3				

Easting	600476
Northing	6330634
Orientation	100
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	11
Attributes 1x1 plot (%)	
Litter (%)	33
Bare ground (%)	61
Vegetation (%)	6
Rock (%)	0

Date 26/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q6: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			28	21	0	0	10	9	0	2	7	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			35.4	27.2	0	0	21.2	5.4	0	0.6	8.2	1
*Avena fatua**	0.8	20	EX								0.8	
Bothriochloa macra	1	30	GG				1					
Carex inversa	2	40	GG				2					
Chloris ventricosa	0.5	10	GG				0.5					
Convolvulus erubescens	0.2	3	OG							0.2		
Cynodon dactylon	1	9	GG				1					
Dichanthium sericeum subsp. sericeum	2	50	GG				2					
Echinochloa colona	0.4	8	GG				0.4					
Enteropogon acicularis	0.3	5	GG				0.3					
Glycine clandestina	0.4	5	OG							0.4		
Juncus flavidus	3	20	GG				3					
*Lactuca serriola**	1	45	EX								1	
*Lepidium africanum**	0.8	15	EX								0.8	
*Lepidium bonariense**	0.2	25	EX								0.2	
Lobelia concolor	2	25	FG					2				
Maireana enchylaenoides	0.4	4	FG					0.4				
*Medicago sativa**	0.4	1	EX								0.4	
Oxalis exilis	0.1	3	FG					0.1				
Panicum decompositum	1	20	GG				1					
*Panicum capillare**	4	60	EX								4	
Rumex brownii	0.6	15	FG					0.6				
Rytidosperma caespitosum	10	150	GG				10					
Schenkia australis	0.1	1	FG					0.1				
Sida corrugata	0.6	15	FG					0.6				
Sida cunninghamii	1	20	FG					1				
*Solanum elaeagnifolium**	1	40	HT									1
Vittadinia pterochaeta	0.1	1	FG					0.1				
Wahlenbergia communis	0.5	15	FG					0.5				

Easting	600685
Northing	6331016
Orientation	260
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	42
Bare ground (%)	23
Vegetation (%)	31
Rock (%)	4

Date 26/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q7: PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			**34**	**29**	1	5	9	13	0	1	**5**	1
Species	**Cover**	**Abundance**	Sum cover	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			70.3	**67.1**	15	3.2	39.9	8.6	0	0.4	**3.2**	0.1
Atriplex semibaccata	0.3	15	SG			0.3						
Aristida behriana	0.3	6	GG				0.3					
Asperula conferta	0.4	27	FG					0.4				
Austrostipa scabra subsp. scabra	1	40	GG				1					
Boerhavia dominii	0.9	20	FG					0.9				
Carex inversa	1	50	GG				1					
*Carthamus lanatus**	0.1	1	HT									0.1
Convolvulus erubescens	0.4	3	OG							0.4		
*Cucumis myriocarpus subsp. leptodermis**	0.6	3	EX								0.6	
Dichondra repens	0.4	20	FG					0.4				
Digitaria divaricatissima	0.9	10	GG				0.9					
Dysphania pumilio	0.6	8	FG					0.6				
Einadia nutans subsp. nutans	1	18	FG					1				
Enteropogon acicularis	35	250	GG				35					
Eremophila debilis	1	1	SG			1						
Eucalyptus melliodora	15	6	TG		15							
*Hordeum sp.**	0.2	10	EX								0.2	
*Lepidium africanum**	0.3	6	EX								0.3	
Lepidium pseudohyssopifolium	0.3	4	FG					0.3				
Lomandra filiformis subsp. coriacea	0.1	3	GG				0.1					
Maireana enchylaenoides	0.4	7	FG					0.4				
Maireana microphylla	0.4	10	SG			0.4						
*Marrubium vulgare**	2	3	EX								2	
Panicum decompositum	1	40	GG				1					
Paspalidium constrictum	0.2	4	GG				0.2					
Rumex brownii	0.4	7	FG					0.4				
Rytidosperma sp. (no fertile material)	0.4	10	GG				0.4					
Salsola australis	1	2	SG			1						
Sclerolaena muricata	0.5	1	SG			0.5						
Sida corrugata	2	100	FG					2				
Solanum esuriale	0.6	35	FG					0.6				
Tribulus micrococcus	0.4	15	FG					0.4				
Wahlenbergia communis	1	40	FG					1				
Wahlenbergia luteola	0.2	3	FG					0.2				

Easting	601953
Northing	6331186
Orientation	80
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	Yes
Hollows	0
Length logs (m)	39
Attributes 1x1 plot (%)	
Litter (%)	28
Bare ground (%)	38
Vegetation (%)	34
Rock (%)	0

Date 26/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q8: PCT 201 - Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			19	18	1	3	6	7	0	1	1	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			33.1	32.1	23	3.5	3.1	2.2	0	0.3	1	1
Anthosachne scabra	0.2	4	GG				0.2					
Austrostipa scabra subsp. scabra	0.3	6	GG				0.3					
Boerhavia dominii	0.1	2	FG					0.1				
Bothriochloa macra	0.1	1	GG				0.1					
Einadia nutans subsp. linifolia	0.3	6	FG					0.3				
Enteropogon acicularis	2	100	GG				2					
Eragrostis elongata	0.1	1	GG				0.1					
Eremophila debilis	0.5	1	SG			0.5						
Eucalyptus conica	23	9	TG		23							
Glycine clandestina	0.3	10	OG							0.3		
Lepidium pseudohyssopifolium	0.2	4	FG					0.2				
*Lycium ferocissimum**	1	1	HT									1
Maireana enchylaenoides	1	3	FG					1				
Maireana microphylla	1	4	SG			1						
Oxalis exilis	0.1	1	FG					0.1				
Panicum decompositum	0.4	20	GG				0.4					
Sclerolaena muricata	2	4	SG			2						
Sida corrugata	0.3	10	FG					0.3				
Solanum esuriale	0.2	10	FG					0.2				

Easting	602143
Northing	6331177
Orientation	200
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	2
Length logs (m)	42
Attributes 1x1 plot (%)	
Litter (%)	68
Bare ground (%)	32
Vegetation (%)	0
Rock (%)	0

Date 26/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q9: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			29	21	0	0	9	12	0	0	8	3
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			33.5	28.7	0	0	23.8	4.9	0	0	4.8	1.4
Aristida behriana	2	20	GG				2					
Austrostipa scabra subsp. scabra	2	45	GG				2					
*Avena fatua**	0.4	10	EX								0.4	
Boerhavia dominii	0.4	4	FG					0.4				
Bothriochloa macra	1	25	GG				1					
*Carthamus lanatus**	0.2	4	HT									0.2
*Chondrilla juncea**	0.9	10	EX								0.9	
Digitaria divaricatissima	10	200	GG				10					
Dysphania pumilio	0.2	2	FG					0.2				
Einadia nutans subsp. nutans	0.6	20	FG					0.6				
Enteropogon acicularis	0.6	10	GG				0.6					
*Eragrostis curvula**	0.2	2	HT									0.2
*Eragrostis cilianensis**	0.4	10	EX								0.4	
Euphorbia drummondii	0.2	3	FG					0.2				
*Heliotropium amplexicaule**	1	2	HT									1
*Heliotropium europaeum**	1	6	EX								1	
Lepidium pseudohyssopifolium	0.3	4	FG					0.3				
Lomandra filiformis subp. filiformis	0.2	4	GG				0.2					
Maireana enchylaenoides	0.5	10	FG					0.5				
*Marrubium vulgare**	0.7	4	EX								0.7	
Oxalis exilis	0.1	1	FG					0.1				
Panicum decompositum	2	40	GG				2					
Rytidosperma caespitosum	2	10	GG				2					
Rytidosperma sp. (no fertile material)	4	55	GG				4					
Sida corrugata	0.5	25	FG					0.5				
Solanum esuriale	0.3	10	FG					0.3				
Tribulus micrococcus	0.3	9	FG					0.3				
Vittadinia gracilis	0.5	30	FG					0.5				
Wahlenbergia communis	1	40	FG					1				

Easting	601857
Northing	6331422
Orientation	170
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	30
Bare ground (%)	38
Vegetation (%)	26
Rock (%)	6

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q10: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			24	18	1	2	9	5	0	1	6	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			57.4	50.5	15	5	26.2	4	0	0.3	6.9	2
Anthosachne scabra	1	20	GG				1					
Aristida behriana	1	35	GG				1					
*Asphodelus fistulosus**	2	50	EX								2	
Austrostipa scabra subsp. scabra	7	50	GG				7					
Austrostipa bigeniculata	2	35	GG				2					
*Avena fatua**	0.2	4	EX								0.2	
Boerhavia dominii	0.6	15	FG					0.6				
Bothriochloa macra	2	35	GG				2					
Convolvulus erubescens	0.3	4	OG							0.3		
Enteropogon acicularis	10	100	GG				10					
Eremophila mitchellii	3	1	SG			3						
Eucalyptus albens	15	2	TG		15							
*Heliotropium europaeum**	0.2	2	EX								0.2	
*Hordeum sp.**	0.5	10	EX								0.5	
*Lycium ferocissimum**	2	4	HT									2
Maireana enchylaenoides	1	4	FG					1				
*Marrubium vulgare**	2	10	EX								2	
Panicum decompositum	0.7	5	GG				0.7					
Paspalidium constrictum	0.5	5	GG				0.5					
Rytidosperma sp. (no fertile material)	2	50	GG				2					
Sclerolaena birchii	2	1	SG			2						
Sida corrugata	1	40	FG					1				
Solanum esuriale	0.7	15	FG					0.7				
Tribulus micrococcus	0.7	15	FG					0.7				

Easting	605431
Northing	6330844
Orientation	210
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	1
30-49	Yes
20-29	No
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	19
Attributes 1x1 plot (%)	
Litter (%)	10
Bare ground (%)	77
Vegetation (%)	13
Rock (%)	0

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q11: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			32	25	1	2	8	12	0	2	7	3
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			82.9	76.6	10	3	55.9	7.5	0	0.2	6.3	4
Anthosachne scabra	1	40	GG				1					
Austrostipa scabra subsp. scabra	20	200	GG				20					
Austrostipa bigeniculata	0.9	10	GG				0.9					
*Avena fatua**	1	50	EX								1	
Boerhavia dominii	1	40	FG					1				
Brachyscome sp.	0.7	15	FG					0.7				
Callitris glaucophylla	10	5	TG		10							
Calotis lappulacea	1	30	FG					1				
*Carthamus lanatus**	1	20	HT									1
Convolvulus erubescens	0.1	1	OG							0.1		
Digitaria divaricatissima	10	150	GG				10					
Einadia nutans subsp. nutans	0.5	10	FG					0.5				
Enteropogon acicularis	10	150	GG				10					
*Eragrostis curvula**	2	100	HT									2
Euphorbia drummondii	0.4	10	FG					0.4				
Glycine clandestina	0.1	1	OG							0.1		
*Lepidium bonariense**	0.2	4	EX								0.2	
Lepidium sp. (no fertile material)	0.1	2	EX								0.1	
*Lycium ferocissimum**	1	4	HT									1
Maireana enchylaenoides	0.9	8	FG					0.9				
Maireana microphylla	1	1	SG			1						
*Marrubium vulgare**	1	6	EX								1	
Panicum decompositum	2	40	GG				2					
Paspalidium constrictum	2	100	GG				2					
Rostellularia adscendens var. adscende	0.4	3	FG					0.4				
Rytidosperma sp. (no fertile material)	10	150	GG				10					
Sclerolaena muricata	2	6	SG			2						
Sida corrugata	0.7	25	FG					0.7				
Tribulus micrococcus	0.2	3	FG					0.2				
Vittadinia cuneata var. cuneata	1	15	FG					1				
Vittadinia gracilis	0.2	3	FG					0.2				
Wahlenbergia communis	0.5	15	FG					0.5				

Easting	605501
Northing	6331032
Orientation	70
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	14
Bare ground (%)	45
Vegetation (%)	41
Rock (%)	0

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q12: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			18	11	0	1	5	5	0	0	7	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			24.7	20.1	0	3	14.2	2.9	0	0	4.6	3
Anthosachne scabra	1	25	GG				1					
Aristida ramosa	10	60	GG				10					
Austrostipa bigeniculata	0.2	1	GG				0.2					
*Avena fatua**	0.5	15	EX								0.5	
Boerhavia dominii	1	30	FG					1				
Bothriochloa macra	1	20	GG				1					
*Carthamus lanatus**	1	26	HT									1
*Chondrilla juncea**	0.4	5	EX								0.4	
*Cirsium vulgare**	0.1	1	EX								0.1	
Einadia nutans subsp. nutans	0.7	15	FG					0.7				
*Eragrostis curvula**	2	50	HT									2
Euphorbia drummondii	0.2	2	FG					0.2				
*Heliotropium europaeum**	0.1	1	EX								0.1	
Maireana microphylla	3	10	SG			3						
*Marrubium vulgare**	0.5	8	EX								0.5	
Rytidosperma sp. (no fertile material)	2	50	GG				2					
Sida corrugata	0.6	15	FG					0.6				
Solanum esuriale	0.4	10	FG					0.4				

Easting	605332
Northing	6331237
Orientation	350
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	3.8
Bare ground (%)	90.2
Vegetation (%)	6
Rock (%)	0

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q13: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			21	20	1	3	7	8	0	1	1	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			46.8	44.8	30	2.3	6.9	3.6	0	2	2	2
Aristida behriana	0.5	6	GG				0.5					
Austrostipa scabra subsp. scabra	3	60	GG				3					
Boerhavia dominii	0.2	1	FG					0.2				
Calotis cuneifolia	0.4	6	FG					0.4				
Dodonaea viscosa subsp. cuneata	0.2	2	SG			0.2						
Einadia nutans subsp. linifolia	0.4	4	FG					0.4				
Einadia nutans subsp. nutans	1	10	FG					1				
Enteropogon acicularis	1	40	GG				1					
Eucalyptus microcarpa	30	21	TG		30							
Lomandra filiformis subsp. coriacea	0.5	15	GG				0.5					
*Lycium ferocissimum**	2	4	HT									2
Maireana enchylaenoides	0.5	5	FG					0.5				
Maireana microphylla	2	15	SG			2						
Panicum decompositum	0.5	8	GG				0.5					
Parsonsia eucalyptophylla	2	6	OG							2		
Paspalidium constrictum	0.4	10	GG				0.4					
Pimelea linifolia	0.1	1	SG			0.1						
Rytidosperma caespitosum	1	40	GG				1					
Sida corrugata	0.5	7	FG					0.5				
Sida cunninghamii	0.4	10	FG					0.4				
Stackhousia muricata	0.2	2	FG					0.2				

Easting	605296
Northing	6332877
Orientation	220
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	2
Length logs (m)	14
Attributes 1x1 plot (%)	
Litter (%)	74
Bare ground (%)	11
Vegetation (%)	3
Rock (%)	12

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q14: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			27	21	2	0	9	9	0	1	6	3
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			56.6	50.9	25	0	21.7	3.9	0	0.3	5.7	3.9
Alternanthera angustifolia	0.1	1	FG					0.1				
Anthosachne scabra	0.5	35	GG				0.5					
Aristida ramosa	3	40	GG				3					
Austrostipa scabra subsp. scabra	10	150	GG				10					
*Avena fatua**	0.3	15	EX								0.3	
Bothriochloa macra	0.5	35	GG				0.5					
Callitris glaucophylla	10	1	TG		10							
*Carthamus lanatus**	0.5	25	HT									0.5
Enteropogon acicularis	3	40	GG				3					
Eucalyptus albens	15	1	TG		15							
Glycine tabacina	0.3	10	OG							0.3		
Goodenia hederacea subsp. hederacea	0.2	3	FG					0.2				
*Hordeum sp.**	0.5	10	EX								0.5	
Juncus subsecundus	0.2	1	GG				0.2					
Lomandra filiformis subsp. coriacea	0.5	15	GG				0.5					
*Lycium ferocissimum**	3	3	HT									3
Maireana enchylaenoides	1	6	FG					1				
*Marrubium vulgare**	1	25	EX								1	
Panicum decompositum	1	35	GG				1					
Rytidosperma caespitosum	3	50	GG				3					
Sida corrugata	1	40	FG					1				
Sida cunninghamii	0.5	10	FG					0.5				
Solanum esuriale	0.4	20	FG					0.4				
Wahlenbergia communis	0.2	5	FG					0.2				
Wahlenbergia luteola	0.4	10	FG					0.4				
*Xanthium spinosum**	0.4	10	HT									0.4
Xerochrysum viscosum	0.1	2	FG					0.1				

Easting	605723
Northing	6332604
Orientation	100
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	27
Attributes 1x1 plot (%)	
Litter (%)	2
Bare ground (%)	68
Vegetation (%)	16
Rock (%)	14

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q 15: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			13	8	2	0	1	5	0	0	5	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			28.1	26.2	25	0	0.3	0.9	0	0	1.9	0
Boerhavia dominii	0.1	1	FG					0.1				
Brassica sp. (Dead)	0	0	EX								0	
Callitris glaucophylla	15	3	TG		15							
*Chondrilla juncea**	0.2	1	EX								0.2	
Einadia hastata	0.1	1	FG					0.1				
Einadia nutans subsp. nutans	0.2	1	FG					0.2				
Enteropogon acicularis	0.3	5	GG				0.3					
*Eragrostis cilianensis**	0.1	1	EX								0.1	
Eucalyptus albens	10	1	TG		10							
*Hordeum sp.**	1	50	EX								1	
*Marrubium vulgare**	0.6	4	EX								0.6	
Rumex brownii	0.2	2	FG					0.2				
Tribulus micrococcus	0.3	6	FG					0.3				

Easting	606886
Northing	6330367
Orientation	65
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	10
Attributes 1x1 plot (%)	
Litter (%)	1.4
Bare ground (%)	98.6
Vegetation (%)	0
Rock (%)	0

Date 28/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q16: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			23	16	2	1	5	6	0	2	7	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			49.5	45.3	25	2	15.3	2.5	0	0.5	4.2	0.4
Alternanthera angustifolia	0.5	6	FG					0.5				
*Avena fatua**	1	20	EX								1	
Bothriochloa macra	1	40	GG				1					
Callitris glaucophylla	15	8	TG		15							
*Cirsium vulgare**	0.5	10	EX								0.5	
Convolvulus erubescens	0.2	1	OG							0.2		
Dichondra repens	0.3	20	FG					0.3				
Dysphania pumilio	0.5	10	FG					0.5				
Einadia nutans subsp. nutans	0.5	10	FG					0.5				
Enteropogon acicularis	10	100	GG				10					
*Eragrostis cilianensis**	0.1	1	EX								0.1	
Eucalyptus microcarpa	10	1	TG		10							
Glycine clandestina	0.3	4	OG							0.3		
*Hordeum sp.**	1	15	EX								1	
Juncus subsecundus	0.2	1	GG				0.2					
Lepidium pseudohyssopifolium	0.4	3	FG					0.4				
Lomandra filiformis subp. filiformis	0.1	1	GG				0.1					
Maireana microphylla	2	6	SG			2						
*Marrubium vulgare**	1	12	EX								1	
Panicum decompositum	4	40	GG				4					
Rumex brownii	0.3	4	FG					0.3				
*Verbascum virgatum**	0.2	6	EX								0.2	
*Xanthium occidentale**	0.4	4	HT									0.4

Easting	602338
Northing	6328170
Orientation	290
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	52
Attributes 1x1 plot (%)	
Litter (%)	14
Bare ground (%)	76
Vegetation (%)	10
Rock (%)	0

Date 27/2/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q17: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			6	3	2	0	0	1	0	0	3	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			58.4	30.4	30	0	0	0.4	0	0	28	1
*Asphodelus fistulosus**	26	400	EX								26	
Callitris glaucophylla	10	1	TG		10							
*Carthamus lanatus**	1	50	HT									1
Eucalyptus albens	20	1	TG		20							
*Marrubium vulgare**	1	60	EX								1	
Sida corrugata	0.4	5	FG					0.4				

Easting	605237
Northing	6328612
Orientation	315
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	9
Attributes 1x1 plot (%)	
Litter (%)	6
Bare ground (%)	61
Vegetation (%)	15
Rock (%)	18

Date 24/7/18			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q18: PCT 201 - Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			23	16	3	2	8	3	0	0	7	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			110.2	55.5	40.3	1.5	9.7	4	0	0	54.7	50
Acacia deanei	0.5	3	SG			0.5						
Anthosachne scabra	0.5	5	GG				0.5					
Brachychiton populneus subsp. populne	0.3	1	TG		0.3							
*Bromus catharticus**	0.5	50	EX								0.5	
Carex inversa	2	30	GG				2					
Einadia nutans subsp. nutans	1	5	FG					1				
Enteropogon acicularis	1	20	GG				1					
*Eragrostis curvula**	30	70	HT									30
Eragrostis elongata	0.2	10	GG				0.2					
Eucalyptus conica	10	1	TG		10							
Eucalyptus melliodora	30	3	TG		30							
Juncus flavidus	2	30	GG				2					
Lepidium sp. (no fertile material)	0.4	10	EX								0.4	
Leptochloa digitata	1	50	GG				1					
*Lolium perenne**	0.5	40	EX								0.5	
Maireana microphylla	1	6	SG			1						
*Marrubium vulgare**	3	25	EX								3	
Paspalidium constrictum	2	10	GG				2					
*Paspalum dilatatum**	20	50	HT									20
*Rumex crispus**	0.3	5	EX								0.3	
Rytidosperma richardsonii	1	50	GG				1					
Solanum coactiliferum	1	50	FG					1				
Solanum esuriale	2	90	FG					2				

Easting	602581
Northing	6332387
Orientation	350
Plot size	10x40 in 10x100
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	2
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	4
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	82
Bare ground (%)	0
Vegetation (%)	18
Rock (%)	0
	100

Date: 11/03/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q19: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			38	31	1	5	10	14	1	0	7	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			76.2	73	10	15.2	40.5	7	0.3	0	3.2	0
Alternanthera angustifolia	0.1	5	FG					0.1				
Atriplex spinibractea	0.5	10	FG					0.5				
Austrostipa scabra subsp. scabra	0.5	30	GG				0.5					
*Avena fatua**	1	70	EX								1	
Boerhavia dominii	0.6	25	FG					0.6				
Bothriochloa decipiens var. decipiens	0.2	6	GG				0.2					
Calotis cuneifolia	0.6	50	FG					0.6				
Calotis lappulacea	0.3	5	FG					0.3				
Carex inversa	0.6	5	GG				0.6					
Cheilanthes sieberi subsp. sieberi	0.3	5	EG						0.3			
*Chondrilla juncea**	0.3	5	EX								0.3	
Digitaria divaricatissima	2	40	GG				2					
Dysphania pumilio	0.5	15	FG					0.5				
Einadia nutans subsp. linifolia	0.2	4	FG					0.2				
Einadia nutans subsp. nutans	0.6	10	FG					0.6				
Enteropogon acicularis	15	150	GG				15					
*Eragrostis cilianensis**	1	35	EX								1	
Eucalyptus microcarpa	10	1	TG		10							
*Heliotropium europaeum**	0.2	4	EX								0.2	
Juncus flavidus	0.2	4	GG				0.2					
*Lepidium africanum**	0.3	9	EX								0.3	
*Lolium perenne**	0.2	5	EX								0.2	
Maireana aphylla	0.2	3	SG			0.2						
Maireana decalvans	10	30	SG			10						
Maireana enchylaenoides	2	20	FG					2				
Maireana microphylla	2	25	SG			2						
*Medicago sativa**	0.2	1	EX								0.2	
Panicum decompositum	5	50	GG				5					
Paspalidium constrictum	2	26	GG				2					
Rumex brownii	0.1	2	FG					0.1				
Rytidosperma caespitosum	10	150	GG				10					
Rytidosperma richardsonii	5	45	GG				5					
Salsola australis	2	3	SG			2						
Sclerolaena muricata	1	5	SG			1						
Sida corrugata	0.5	15	FG					0.5				
Solanum esuriale	0.3	6	FG					0.3				
Vittadinia cuneata var. cuneata	0.4	20	FG					0.4				
Wahlenbergia communis	0.3	6	FG					0.3				

Easting	603544
Northing	6331495
Orientation	90
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	Yes
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	32
Attributes 1x1 plot (%)	
Litter (%)	47
Bare ground (%)	31
Vegetation (%)	0
Rock (%)	22

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q20: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			18	16	0	2	4	10	0	0	2	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			49.6	47.2	0	2.5	39.2	5.5	0	0	2.4	0
Alternanthera angustifolia	0.6	15	FG					0.6				
Atriplex spinibractea	1	4	FG					1				
Boerhavia dominii	2	100	FG					2				
Bothriochloa macra	25	150	GG				25					
*Chondrilla juncea**	2	80	EX								2	
Convolvulus sp.	0.4	4	FG					0.4				
Cynodon dactylon	10	100	GG				10					
Einadia nutans subsp. nutans	0.1	1	FG					0.1				
Enteropogon acicularis	4	90	GG				4					
Lepidium sp. (no fertile material)	0.4	15	EX								0.4	
Maireana microphylla	2	10	SG			2						
Panicum decompositum	0.2	20	GG				0.2					
Portulaca oleracea	0.3	10	FG					0.3				
Sclerolaena muricata	0.5	1	SG			0.5						
Sida corrugata	0.3	20	FG					0.3				
Vittadinia cuneata var. cuneata	0.2	3	FG					0.2				
Wahlenbergia communis	0.3	18	FG					0.3				
Wahlenbergia luteola	0.3	20	FG					0.3				

Easting	603170
Northing	6331433
Orientation	245
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	23
Bare ground (%)	55
Vegetation (%)	21.6
Rock (%)	0.4

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q21: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			22	21	1	4	7	8	0	1	1	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			73.9	73.5	25	9	31.7	7.7	0	0.1	0.4	0
Anthosachne scabra	0.5	15	GG				0.5					
Atriplex spinibractea	2	14	FG					2				
Austrostipa scabra subsp. scabra	3	40	GG				3					
Boerhavia dominii	1	20	FG					1				
Bothriochloa macra	0.2	4	GG				0.2					
Dichondra repens	1	60	FG					1				
Einadia nutans subsp. nutans	1	20	FG					1				
Enteropogon acicularis	10	150	GG				10					
Eucalyptus microcarpa	25	6	TG		25							
Glycine clandestina	0.1	1	OG							0.1		
Lepidium sp. (no fertile material)	0.4	15	EX								0.4	
Lomandra filiformis subp. filiformis	2	50	GG				2					
Maireana decalvans	1	2	SG			1						
Maireana enchylaenoides	1	9	FG					1				
Maireana microphylla	5	15	SG			5						
Oxalis exilis	0.6	25	FG					0.6				
Panicum decompositum	3	50	GG				3					
Pittosporum angustifolium	2	1	SG			2						
Rytidosperma caespitosum	13	90	GG				13					
Sclerolaena muricata	1	3	SG			1						
Sida corrugata	1	20	FG					1				
Vittadinia cuneata var. cuneata	0.1	1	FG					0.1				

Easting	603178
Northing	6331147
Orientation	120
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	28
Attributes 1x1 plot (%)	
Litter (%)	61
Bare ground (%)	27
Vegetation (%)	10
Rock (%)	2

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q22: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			6	6	1	0	1	4	0	0	0	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			36	36	35	0	0.3	0.7	0	0	0	0
Dysphania pumilio	0.1	1	FG					0.1				
Einadia nutans subsp. nutans	0.1	2	FG					0.1				
Eucalyptus microcarpa	35	13	TG		35							
Maireana enchylaenoides	0.4	9	FG					0.4				
Sida corrugata	0.1	5	FG					0.1				
Tragus australianus	0.3	7	GG				0.3					

Easting	604466
Northing	6331340
Orientation	290
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	4
Length logs (m)	12
Attributes 1x1 plot (%)	
Litter (%)	54
Bare ground (%)	42
Vegetation (%)	1
Rock (%)	3

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q23: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			16	10	1	2	5	2	0	0	6	3
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			35.8	32.3	15	6	10.5	0.8	0	0	3.5	2.2
*Alternanthera pungens**	1	25	HT									1
Atriplex semibaccata	2	15	SG			2						
Austrostipa scabra subsp. scabra	4	150	GG				4					
Austrostipa verticillata	0.3	2	GG				0.3					
*Emex australis**	1	10	EX								1	
Enteropogon acicularis	5	200	GG				5					
Eucalyptus albens	15	1	TG		15							
*Hordeum sp.**	0.2	3	EX								0.2	
*Lycium ferocissimum**	1	1	HT									1
Maireana enchylaenoides	0.4	15	FG					0.4				
Maireana microphylla	4	50	SG			4						
*Marrubium vulgare**	0.1	2	EX								0.1	
Panicum decompositum	1	40	GG				1					
Rytidosperma caespitosum	0.2	4	GG				0.2					
Sida corrugata	0.4	20	FG					0.4				
*Xanthium spinosum**	0.2	4	HT									0.2

Easting	604885
Northing	6331713
Orientation	295
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	6
Attributes 1x1 plot (%)	
Litter (%)	15
Bare ground (%)	60
Vegetation (%)	12
Rock (%)	13

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q24: PCT 70 - White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			8	7	1	0	3	3	0	0	1	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			68.7	66.7	65	0	1.2	0.5	0	0	2	2
Austrostipa scabra subsp. scabra	0.5	50	GG				0.5					
Callitris glaucophylla	65	150	TG		65							
Digitaria divaricatissima	0.2	5	GG				0.2					
Einadia nutans subsp. nutans	0.1	1	FG					0.1				
Enteropogon acicularis	0.5	40	GG				0.5					
*Lycium ferocissimum**	2	1	HT									2
Maireana enchylaenoides	0.2	4	FG					0.2				
Sida corrugata	0.2	10	FG					0.2				

Easting	605082
Northing	6333111
Orientation	345
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	4
Attributes 1x1 plot (%)	
Litter (%)	54
Bare ground (%)	45
Vegetation (%)	1
Rock (%)	0

Date: 11/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q25: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			23	20	1	3	8	8	0	0	3	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			104.6	103.8	35	13.6	41.5	13.7	0	0	0.8	0
Anthosachne scabra	4	100	GG				4					
Atriplex spinibractea	4	30	FG					4				
Austrostipa scabra subsp. scabra	10	150	GG				10					
*Avena fatua**	0.5	16	EX								0.5	
Boerhavia dominii	3	40	FG					3				
Bothriochloa macra	10	150	GG				10					
Carex inversa	10	90	GG				10					
*Cirsium vulgare**	0.1	1	EX								0.1	
Dichondra repens	1	50	FG					1				
Einadia nutans subsp. linifolia	3	20	FG					3				
Enteropogon acicularis	3	50	GG				3					
Eremophila debilis	0.6	4	SG			0.6						
Eucalyptus microcarpa	35	3	TG		35							
Lomandra filiformis subp. filiformis	0.5	10	GG				0.5					
Maireana microphylla	10	60	SG			10						
*Marrubium vulgare**	0.2	3	EX								0.2	
Oxalis exilis	0.2	4	FG					0.2				
Panicum decompositum	1	50	GG				1					
Rytidosperma caespitosum	3	100	GG				3					
Sclerolaena muricata	3	20	SG			3						
Sida corrugata	1	25	FG					1				
Solanum esuriale	1	18	FG					1				
Vittadinia cuneata var. cuneata	0.5	4	FG					0.5				

Easting	602911
Northing	6329599
Orientation	165
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	1
30-49	No
20-29	No
10-19	No
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	15
Attributes 1x1 plot (%)	
Litter (%)	63
Bare ground (%)	17
Vegetation (%)	20
Rock (%)	0

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q26: PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			4	2	2	0	0	0	0	0	2	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			60.4	45	45	0	0	0	0	0	15.4	15
Eucalyptus melliodora	35	27	TG		35							
Eucalyptus populnea	10	1	TG		10							
*Heliotropium europaeum**	0.4	6	EX								0.4	
*Lycium ferocissimum**	15	10	HT									15

Easting	599856
Northing	6333500
Orientation	225
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	3
Length logs (m)	17
Attributes 1x1 plot (%)	
Litter (%)	19
Bare ground (%)	81
Vegetation (%)	0
Rock (%)	0

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q27: PCT 70 - White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			5	5	1	0	0	3	0	1	0	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			26.4	26.4	25	0	0	1.2	0	0.2	0	0
Callitris glaucophylla	25	12	TG		25							
Dysphania pumilio	0.3	6	FG					0.3				
Glycine tabacina	0.2	4	OG							0.2		
Sida corrugata	0.8	3	FG					0.8				
Solanum esuriale	0.1	1	FG					0.1				

Easting	600022
Northing	6333542
Orientation	250
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	11
Attributes 1x1 plot (%)	
Litter (%)	5.4
Bare ground (%)	94.6
Vegetation (%)	0
Rock (%)	0

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q28: PCT 76 - Western Grey Box tall grassy woodland on alluvial loam and clay soils in the NSW South Western Slopes and Riverina Bioregions (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			1	1	1	0	0	0	0	0	0	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			25	25	25	0	0	0	0	0	0	0
Eucalyptus microcarpa	25	3	TG		25							

Easting	601302
Northing	6333760
Orientation	345
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	3
30-49	Yes
20-29	No
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	22
Attributes 1x1 plot (%)	
Litter (%)	0.8
Bare ground (%)	99.2
Vegetation (%)	0
Rock (%)	0

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q29: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			3	2	2	0	0	0	0	0	1	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			30.5	30	30	0	0	0	0	0	0.5	0
Eucalyptus microcarpa	10	1	TG		10							
Eucalyptus populnea	20	2	TG		20							
*Medicago sativa**	0.5	6	EX								0.5	

Easting	602180
Northing	6334542
Orientation	320
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	3
50-79	1
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	3
Length logs (m)	12
Attributes 1x1 plot (%)	
Litter (%)	4.4
Bare ground (%)	95.6
Vegetation (%)	0
Rock (%)	0

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q30: PCT 250 - Derived tussock grassland of the central western plains and lower slopes of NSW			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			24	21	0	1	10	9	0	1	3	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			75.3	72	0	0.5	65.7	4.8	0	1	3.3	2
Aristida behriana	3	40	GG				3					
Austrostipa scabra subsp. scabra	5	70	GG				5					
Austrostipa verticillata	20	200	GG				20					
Boerhavia dominii	2	25	FG					2				
Bothriochloa macra	15	150	GG				15					
Calotis lappulacea	0.3	2	FG					0.3				
*Carthamus lanatus**	2	25	HT									2
*Chondrilla juncea**	0.3	6	EX								0.3	
Convolvulus erubescens	1	25	OG							1		
Digitaria divaricatissima	1	20	GG				1					
Enneapogon nigricans	5	100	GG				5					
Enteropogon acicularis	10	90	GG				10					
Eremophila mitchellii	0.5	1	SG			0.5						
*Marrubium vulgare**	1	20	EX								1	
Oxalis exilis	0.4	8	FG					0.4				
Panicum decompositum	5	25	GG				5					
Paspalidium constrictum	1	30	GG				1					
Rumex brownii	0.1	1	FG					0.1				
Rytidosperma caespitosum	0.7	40	GG				0.7					
Sida corrugata	1	40	FG					1				
Tribulus micrococcus	0.2	3	FG					0.2				
Tricoryne elatior	0.2	2	FG					0.2				
Wahlenbergia communis	0.2	10	FG					0.2				
Wahlenbergia luteola	0.4	15	FG					0.4				

Easting	602670
Northing	6334854
Orientation	170
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	36
Bare ground (%)	20
Vegetation (%)	30
Rock (%)	14

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q31: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			19	18	2	0	7	8	0	1	1	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			47.9	46.9	20	0	25.6	1.2	0	0.1	1	0
Alternanthera angustifolia	0.1	1	FG					0.1				
Anthosachne scabra	0.2	3	GG				0.2					
Aristida behriana	0.5	7	GG				0.5					
Austrostipa scabra subsp. scabra	15	150	GG				15					
Boerhavia dominii	0.1	1	FG					0.1				
Bothriochloa macra	1	90	GG				1					
Callitris glaucophylla	10	1	TG		10							
Dysphania pumilio	0.2	3	FG					0.2				
Enteropogon acicularis	5	50	GG				5					
Eucalyptus albens	10	1	TG		10							
Glycine tabacina	0.1	1	OG							0.1		
Maireana enchylaenoides	0.1	1	FG					0.1				
*Marrubium vulgare**	1	3	EX								1	
Oxalis exilis	0.1	1	FG					0.1				
Panicum decompositum	3	90	GG				3					
Rumex brownii	0.2	2	FG					0.2				
Rytidosperma caespitosum	0.9	15	GG				0.9					
Sida corrugata	0.2	5	FG					0.2				
Wahlenbergia gracilis	0.2	5	FG					0.2				

Easting	603160
Northing	6334403
Orientation	120
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	8
Attributes 1x1 plot (%)	
Litter (%)	48
Bare ground (%)	40
Vegetation (%)	0
Rock (%)	12

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q32: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			18	12	2	0	6	3	0	1	6	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			68.1	65.3	30	0	27.8	4.5	0	3	2.8	0.4
*Alternanthera pungens**	0.4	2	HT									0.4
Aristida behriana	0.5	15	GG				0.5					
Austrostipa scabra subsp. scabra	5	90	GG				5					
Austrostipa bigeniculata	0.3	2	GG				0.3					
Brassica sp. (Dead)	0	0	EX								0	
Callitris glaucophylla	10	1	TG		10							
Einadia nutans subsp. nutans	1	25	FG					1				
Enteropogon acicularis	20	250	GG				20					
*Eragrostis cilianensis**	0.2	4	EX								0.2	
Eucalyptus populnea	20	1	TG		20							
Glycine canescens	3	40	OG							3		
*Hordeum sp.**	0.2	4	EX								0.2	
Maireana enchylaenoides	0.5	2	FG					0.5				
*Marrubium vulgare**	1	3	EX								1	
*Medicago sativa**	1	4	EX								1	
Panicum decompositum	1	25	GG				1					
Paspalidium constrictum	1	20	GG				1					
Sida corrugata	3	40	FG					3				

Easting	602256
Northing	6334491
Orientation	310
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	1
50-79	1
30-49	Yes
20-29	No
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	19
Attributes 1x1 plot (%)	
Litter (%)	38
Bare ground (%)	45
Vegetation (%)	1
Rock (%)	16

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q33: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			15	14	2	1	6	5	0	0	1	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			50.1	50.1	35	0.5	12	2.6	0	0	0	0
Aristida behriana	1	50	GG				1					
Austrostipa scabra subsp. scabra	4	250	GG				4					
Callitris glaucophylla	10	2	TG		10							
Dichondra repens	0.9	25	FG					0.9				
Enteropogon acicularis	2	50	GG				2					
Eremophila debilis	0.5	2	SG			0.5						
Eucalyptus populnea	25	3	TG		25							
Calotis spp.	0.4	3	FG					0.4				
Lomandra filiformis subp. filiformis	1	20	GG				1					
Maireana enchylaenoides	0.1	2	FG					0.1				
*Medicago polymorpha**	0	0	EX								0	
Panicum decompositum	2	40	GG				2					
Rytidosperma caespitosum	2	50	GG				2					
Sida corrugata	1	20	FG					1				
Wahlenbergia communis	0.2	4	FG					0.2				

Easting	601218
Northing	6333254
Orientation	30
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	1
Length logs (m)	13
Attributes 1x1 plot (%)	
Litter (%)	46
Bare ground (%)	38
Vegetation (%)	7
Rock (%)	9

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q34: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			9	9	2	0	4	3	0	0	0	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			41.7	41.7	30	0	10	1.7	0	0	0	0
Aristida behriana	1	50	GG				1					
Austrostipa scabra subsp. scabra	4	100	GG				4					
Boerhavia dominii	0.2	3	FG					0.2				
Callitris glaucophylla	10	3	TG		10							
Dichondra repens	1	50	FG					1				
Enteropogon acicularis	3	40	GG				3					
Eucalyptus populnea	20	3	TG		20							
Panicum decompositum	2	25	GG				2					
Sida corrugata	0.5	10	FG					0.5				

Easting	601876
Northing	6333357
Orientation	210
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	1
Length logs (m)	11
Attributes 1x1 plot (%)	
Litter (%)	16
Bare ground (%)	41
Vegetation (%)	0
Rock (%)	43

Date: 12/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q35: PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			11	8	1	0	3	4	0	0	3	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			55.4	44.4	35	0	4.5	4.9	0	0	11	0
Austrostipa scabra subsp. scabra	1	20	GG				1					
Austrostipa verticillata	0.5	1	GG				0.5					
Brassica sp. (Dead)	0	0	EX								0	
Dysphania pumilio	0.4	6	FG					0.4				
Einadia nutans subsp. nutans	0.5	7	FG					0.5				
Enteropogon acicularis	3	40	GG				3					
Eucalyptus melliodora	35	15	TG		35							
*Hordeum sp.**	1	25	EX								1	
Maireana enchylaenoides	3	25	FG					3				
*Medicago sativa**	10	40	EX								10	
Sida corrugata	1	6	FG					1				

Easting	601418
Northing	6332289
Orientation	10
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	4
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	51
Attributes 1x1 plot (%)	
Litter (%)	33
Bare ground (%)	66
Vegetation (%)	1
Rock (%)	0

Date: 13/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q36: Unassigned			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			15	9	0	2	4	3	0	0	6	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			58.1	25.5	0	7.4	17.2	0.9	0	0	32.6	2
Aristida ramosa	15	60	GG				15					
*Asphodelus fistulosus**	4	30	EX								4	
Austrostipa scabra subsp. scabra	1	25	GG				1					
Austrostipa verticillata	0.2	3	GG				0.2					
*Avena fatua**	10	150	EX								10	
Bothriochloa macra	1	15	GG				1					
*Carthamus lanatus**	2	25	HT									2
*Chondrilla juncea**	0.6	4	EX								0.6	
Eremophila debilis	0.4	10	SG			0.4						
Maireana microphylla	7	10	SG			7						
*Marrubium vulgare**	15	25	EX								15	
Rumex brownii	0.2	4	FG					0.2				
Solanum coactiliferum	1	35	EX								1	
Tribulus micrococcus	0.6	20	FG					0.6				
Wahlenbergia communis	0.1	1	FG					0.1				

Easting	604757
Northing	6328696
Orientation	195
Plot size	20x20 in 20x50
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	32
Bare ground (%)	34
Vegetation (%)	34
Rock (%)	0

Date: 13/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q37: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			17	15	2	1	4	8	0	0	2	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			94.3	83.3	30	2	32	19.3	0	0	11	1
Alternanthera angustifolia	3	30	FG					3				
Austrostipa scabra subsp. scabra	10	100	GG				10					
Boerhavia dominii	1	15	FG					1				
Bothriochloa macra	4	50	GG				4					
Callitris glaucophylla	10	1	TG		10							
*Carthamus lanatus**	1	12	HT									1
Dichondra repens	3	50	FG					3				
Dysphania pumilio	0.5	3	FG					0.5				
Einadia nutans subsp. nutans	0.5	6	FG					0.5				
Enteropogon acicularis	15	200	GG				15					
Eucalyptus albens	20	2	TG		20							
Maireana enchylaenoides	0.3	5	FG					0.3				
Maireana microphylla	2	6	SG			2						
*Marrubium vulgare**	10	33	EX								10	
Rytidosperma caespitosum	3	15	GG				3					
Sida corrugata	10	150	FG					10				
Tribulus micrococcus	1	10	FG					1				

Easting	605122
Northing	6327836
Orientation	210
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	8
Attributes 1x1 plot (%)	
Litter (%)	43
Bare ground (%)	40
Vegetation (%)	17
Rock (%)	0

Date: 14/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q38: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			17	13	2	1	6	4	0	0	4	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			45.7	42.7	25	2	13.4	2.3	0	0	3	0
Aristida behriana	0.5	10	GG				0.5					
Austrostipa scabra subsp. scabra	0.4	10	GG				0.4					
Austrostipa verticillata	0.5	15	GG				0.5					
Brassica sp. (Dead)	0.6	15	EX								0.6	
*Briza minor**	1	40	EX								1	
Dysphania pumilio	0.2	4	FG					0.2				
Enteropogon acicularis	9	100	GG				9					
Eremophila debilis	2	14	SG			2						
Eucalyptus melliodora	15	6	TG		15							
Eucalyptus populnea	10	2	TG		10							
*Hordeum sp.**	0.9	40	EX								0.9	
*Marrubium vulgare**	0.5	20	EX								0.5	
Panicum decompositum	1	20	GG				1					
Rumex brownii	0.1	1	FG					0.1				
Rytidosperma sp. (no fertile material)	2	45	GG				2					
Sida corrugata	1	40	FG					1				
Tribulus micrococcus	1	35	FG					1				

Easting	601965
Northing	6333136
Orientation	190
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	2
Length logs (m)	14
Attributes 1x1 plot (%)	
Litter (%)	51.6
Bare ground (%)	36
Vegetation (%)	2.4
Rock (%)	10

Date: 13/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q39: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			40	34	3	2	13	13	0	3	5	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			127.7	123.9	39	16	49.7	14.7	0	4.5	2.8	0.6
Austrostipa scabra subsp. scabra	3	40	GG				3					
Austrostipa verticillata	0.2	1	GG				0.2					
Austrostipa blackii	0.5	10	GG				0.5					
*Avena fatua**	0.5	10	EX								0.5	
Bothriochloa macra	2	40	GG				2					
Brachychiton populneus	4	1	TG		4							
Calotis cuneifolia	0.5	8	FG					0.5				
Calotis lappulacea	0.4	5	FG					0.4				
Convolvulus angustissimus	0.3	1	FG					0.3				
Convolvulus erubescens	1	40	OG							1		
Digitaria divaricatissima	2	25	GG				2					
Einadia nutans subsp. linifolia	4	90	FG					4				
Einadia nutans subsp. nutans	1	25	FG					1				
Enteropogon acicularis	15	100	GG				15					
Eremophila debilis	15	30	SG			15						
Eucalyptus melliodora	20	1	TG		20							
Eucalyptus populnea	15	1	TG		15							
Geijera parviflora	1	1	SG			1						
Glycine canescens	3	60	OG							3		
Glycine tabacina	0.5	8	OG							0.5		
*Heliotropium amplexicaule**	1	10	GG				1					
Lomandra multiflora subsp. multiflora	5	150	GG				5					
Maireana enchylaenoides	0.4	6	FG					0.4				
Maireana microphylla	1	2	SG									
*Marrubium vulgare**	1	10	EX								1	
*Medicago sativa**	0.4	2	EX								0.4	
Oxalis exilis	0.2	6	FG					0.2				
Panicum decompositum	1	25	GG				1					
Paspalidium gracile	4	50	GG				4					
*Paspalum dilatatum**	0.6	1	HT									0.6
*Plantago lanceolata**	0.3	2	EX								0.3	
Rumex brownii	0.1	1	FG					0.1				
Rytidosperma erianthum	5	70	GG				5					
Rytidosperma richardsonii	10	100	GG				10					
Rytidosperma bipartitum	1	60	GG				1					
Sida corrugata	2	30	FG					2				
Sida cunninghamii	5	70	FG					5				
Vittadinia gracilis	0.2	4	FG					0.2				
Vittadinia muelleri	0.4	5	FG					0.4				
Wahlenbergia communis	0.2	3	FG					0.2				

Easting	600134
Northing	6332868
Orientation	240
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	2
50-79	3
30-49	Yes
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	2
Length logs (m)	7
Attributes 1x1 plot (%)	
Litter (%)	52
Bare ground (%)	17
Vegetation (%)	31
Rock (%)	0

Date: 14/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q40: PCT 82 Western Grey Box - Poplar Box - White Cypress Pine tall woodland on red loams mainly of the eastern Cobar Peneplain Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			38	36	5	3	7	19	0	2	2	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			177.6	176.5	47	9	86	34.2	0	0.3	1.1	1.1
Acacia dealbata subsp. dealbata	4	4	SG			4						
Anthosachne scabra	5	40	GG				5					
Atriplex spinibractea	3	25	FG					3				
Austrostipa scabra subsp. scabra	4	50	GG				4					
Austrostipa verticillata	40	200	GG				40					
Brachychiton populneus	2	1	TG		2							
Callitris glaucophylla	10	5	TG		10							
Calotis cuneifolia	1	40	FG					1				
Calotis lappulacea	2	40	FG					2				
Convolvulus angustissimus	0.2	4	OG							0.2		
Convolvulus erubescens	0.2	4	FG					0.2				
Desmodium varians	0.2	2	FG					0.2				
Dianella porracea	1	6	FG					1				
Dianella revoluta var. revoluta	3	60	FG					3				
Dichondra repens	3	100	FG					3				
Einadia nutans subsp. linifolia	3	20	FG					3				
Einadia nutans subsp. nutans	1	15	FG					1				
Enteropogon acicularis	10	90	GG				10					
*Eragrostis curvula**	0.1	2	HT									0.1
Eremophila debilis	3	15	SG			3						
Eucalyptus melliodora	10	2	TG		10							
Eucalyptus microcarpa	15	2	TG		15							
Eucalyptus populnea	10	1	TG		10							
Glycine tabacina	0.1	1	OG							0.1		
Lotus australis	0.3	6	FG					0.3				
*Lycium ferocissimum**	1	1	HT									1
Maireana enchylaenoides	0.6	10	FG					0.6				
Maireana microphylla	2	4	SG			2						
*Marrubium vulgare**	2	10	FG					2				
Panicum decompositum	1	50	GG				1					
Plantago debilis	0.1	1	FG					0.1				
Rytidosperma erianthum	1	35	GG				1					
Rytidosperma richardsonii	25	250	GG				25					
Sida corrugata	0.5	20	FG					0.5				
Sida cunninghamii	4	70	FG					4				
Vittadinia cuneata var. hirsuta	3	60	FG					3				
Vittadinia gracilis	6	100	FG					6				
Wahlenbergia gracilis	0.3	5	FG					0.3				

Easting	600249
Northing	6336727
Orientation	100
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	Yes
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	16
Attributes 1x1 plot (%)	
Litter (%)	73
Bare ground (%)	10
Vegetation (%)	17
Rock (%)	0

Date: 14/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q41: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (poor)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			8	4	1	0	1	2	0	0	4	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			21.4	20.7	20	0	0.1	0.6	0	0	0.7	0
Callitris glaucophylla	20	6	TG		20							
Dysphania pumilio	0.4	110	FG					0.4				
Enteropogon acicularis	0.1	1	GG				0.1					
*Hordeum sp.**	0.2	4	EX								0.2	
*Malva parviflora**	0.1	2	EX								0.1	
*Marrubium vulgare**	0.1	1	EX								0.1	
Sida corrugata	0.2	6	FG					0.2				
*Tribulus terrestris**	0.3	8	EX								0.3	

Easting	603253
Northing	6334538
Orientation	300
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
Attributes 1x1 plot (%)	
Litter (%)	8
Bare ground (%)	82
Vegetation (%)	0
Rock (%)	10

Date: 14/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q42: PCT 267 - White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			19	13	4	0	5	4	0	0	6	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			40.4	37	28	0	6.5	2.5	0	0	3.4	2
Alectryon oleifolius	4	1	TG		4							
*Alternanthera pungens**	1	3	HT									1
Aristida behriana	1	1	GG				1					
*Avena fatua**	0.4	6	EX								0.4	
Bothriochloa macra	1	9	GG				1					
Brachychiton populneus	7	2	TG		7							
Callitris glaucophylla	10	1	TG		10							
Einadia nutans subsp. nutans	0.5	3	FG					0.5				
*Emex australis**	0.1	2	EX								0.1	
Enteropogon acicularis	0.5	10	GG				0.5					
Eucalyptus albens	7	1	TG		7							
Glycine clandestina	0.5	1	FG					0.5				
*Hordeum sp.**	0.5	12	EX								0.5	
*Lycium ferocissimum**	1	1	HT									1
Panicum decompositum	1	10	GG				1					
Paspalidium constrictum	3	40	GG				3					
Sida corrugata	1		FG					1				
Solanum esuriale	0.5	14	FG					0.5				
*Tribulus terrestris**	0.4	8	EX								0.4	

Easting	602534
Northing	6334575
Orientation	3
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	4
Length logs (m)	5
Attributes 1x1 plot (%)	
Litter (%)	19
Bare ground (%)	15
Vegetation (%)	1
Rock (%)	65

Date: 15/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q43: PCT 70 - White Cypress Pine woodland on sandy loams in central NSW wheatbelt (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			23	16	1	1	2	12	0	0	7	2
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			47.7	41.1	25	0.2	1.5	14.4	0	0	6.6	0.8
Alternanthera angustifolia	0.1	1	FG					0.1				
Boerhavia dominii	0.2	2	FG					0.2				
Callitris glaucophylla	25	6	TG		25							
*Carthamus lanatus**	0.3	9	HT									0.3
*Emex australis**	0.2	2	EX								0.2	
*Chondrilla juncea**	0.2	5	EX								0.2	
Dichondra repens	2	150	FG					2				
Dysphania pumilio	1	40	FG					1				
Einadia nutans subsp. linifolia	0.5	4	FG					0.5				
Einadia nutans subsp. nutans	5	50	FG					5				
Enteropogon acicularis	1	15	GG				1					
*Heliotropium amplexicaule**	0.5	4	HT									0.5
*Heliotropium europaeum**	0.4	1	EX								0.4	
*Hordeum sp.**	4	90	EX								4	
Lepidium pseudohyssopifolium	0.1	1	FG					0.1				
Maireana enchylaenoides	1	15	FG					1				
*Marrubium vulgare**	1	2	EX								1	
Panicum decompositum	0.5	14	GG				0.5					
Rumex brownii	0.1	1	FG					0.1				
Sclerolaena birchii	0.2	1	SG			0.2						
Sida corrugata	1	40	FG					1				
Sida cunninghamii	0.4	3	FG					0.4				
Solanum esuriale	3	70	FG					3				

Easting	599577
Northing	6331228
Orientation	270
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	13
Attributes 1x1 plot (%)	
Litter (%)	42
Bare ground (%)	53
Vegetation (%)	5
Rock (%)	0

Date: 21/3/19			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Q44: PCT 276 - Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion (moderate)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Sheet version: 20170224.1531			19	16	2	1	7	5	0	1	3	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			93.4	77.2	38	1	36.1	1.6	0	0.5	16.2	12
Austrostipa scabra	0.4	3	GG				0.4					
Austrostipa verticillata	20	200	GG				20					
Boerhavia dominii	0.1	1	FG					0.1				
Bothriochloa macra	0.4	5	GG				0.4					
Callitris glaucophylla	3	2	TG		3							
Dichondra sp. A	0.2	5	FG					0.2				
Einadia nutans subsp. nutans	0.2	1	FG					0.2				
Enteropogon acicularis	12	200	GG				12					
Eucalyptus melliodora	35	15	TG		35							
Glycine tabacina	0.5	15	OG							0.5		
*Hordeum sp.**	0.2	5	EX								0.2	
Lomandra filiformis subsp. coriacea	0.1	2	GG				0.1					
*Lycium ferocissimum**	12	10	HT									12
Maireana enchylaenoides	0.3	5	FG					0.3				
Maireana microphylla	1	10	SG			1						
*Marrubium vulgare**	4	40	EX								4	
Panicum decompositum	3	60	GG				3					
Rytidosperma caespitosum	0.2	3	GG				0.2					
Sida corrugata	0.8	40	FG					0.8				

Easting	599521
Northing	6333094
Orientation	200
Plot size	20x20, 20x50m
Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	Yes
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	1
Length logs (m)	24
Attributes 1x1 plot (%)	
Litter (%)	67
Bare ground (%)	25
Vegetation (%)	8
Rock (%)	0
	100

ABOUT US

WSP is one of the world's leading engineering professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors, environmental specialists, as well as other design, program and construction management professionals. We design lasting Property & Buildings, Transportation & Infrastructure, Resources (including Mining and Industry), Water, Power and Environmental solutions, as well as provide project delivery and strategic consulting services. With approximately 48,000 talented people globally, we engineer projects that will help societies grow for lifetimes to come.