Appendix A. Compliance with BDAR requirements

This BDAR has been prepared in accordance with the BAM (DPIE 2020), documenting the first two stages:

- Stage 1 – Biodiversity assessment
- Stage 2 – Impact assessment (biodiversity values and prescribed impacts).

Table A-1 details the minimum information requirements as provided in Appendix K of the BAM (DPIE 2020) and the corresponding section of this report where they are addressed.

Table A-1 Minimum requirements for a BDAR and corresponding section

BAM minimum information requirements	Section addressed
Introduction ▪ Introduction to the biodiversity assessment including: - brief description of the Project - identification of subject land boundary, including: · operational footprint (if BDAR) · disturbance footprint indicating clearing associated with temporary/ancillary construction facilities infrastructure (if BDAR) ▪ General description of the subject land ▪ Sources of information used in the assessment, including reports and spatial data Maps and tables ▪ Map of the subject land boundary showing the final Project footprint, including the disturbance footprint for any clearing associated with temporary/ancillary construction facilities and infrastructure	Information on the introduction for the biodiversity assessment are detailed in: ▪ Introduction – **Chapter 1 –** Page 1: - Project background - Page 5 - Purpose of this technical report Page 5 - Legislation and policy – Page 5 - Checklist of the minimum information requirements of this BDAR - Page 7 - Personnel - Page 9 - Agency Consultation - Page 8 ▪ Description of Project – **Chapter 2 –** Page 15 - Project components - Page 15 - Project location - Page 15 - Construction - Page 15 - Operation - Page 15
Landscape context ▪ Identification of site context components and landscape features, including: - general description of subject land topographic and hydrological setting, geology and soils - percent native vegetation cover in the assessment area (as described in BAM Section 3.2) - IBRA bioregions and subregions (as described in BAM Subsection 3.1.3(2.)) - rivers and streams classified according to stream order (as described in BAM Subsection 3.1.3(3.) and Appendix E) - wetlands within, adjacent to and downstream of the site (as described in BAM Subsection 3.1.3(3.)) - connectivity of different areas of habitat (as described in BAM Subsection 3.1.3(5–6.)) - karst, caves, crevices, cliffs, rocks and other geological features of significance and for vegetation clearing - Projects, soil hazard features (as described in BAM Subsections 3.1.3(7.) and 3.1.3(12.) - areas of outstanding biodiversity value occurring on the subject land and assessment area (as described in BAM Subsection 3.1.3(8–9.)) any additional landscape features identified in any SEARs for the Project. Maps and tables ▪ Site Map - Boundary of subject land - Cadastre of subject land - Landscape features identified in BAM Subsection 3.1.3 ▪ Location Map	Information on the landscape context for the biodiversity assessment are detailed in: ▪ Landscape features – **Chapter 3 –** Page 28: - Sources of Information used in the assessment - Page 29 - IBRA bioregions and sub-regions - Page 29 - BioNet NSW Landscapes (Mitchell landscapes) Page 29 - Rivers, streams and estuaries - Page 30 - Wetlands - Page 30 - Connectivity of habitat - Page 31 - Areas of geological significance and soil hazard features - Page 31 - Areas of outstanding biodiversity value - Page 32 - Native vegetation extent - Page 32

BAM minimum information requirements	Section addressed
- Digital aerial photography at 1:1,000 scale or finer - Boundary of subject land - Assessment area, (i.e. the subject land and either 1500 m buffer area or 500 m buffer for linear development - Landscape features identified in BAM Subsection 3.1.3 - Additional detail (e.g. local government area boundaries) relevant at this scale ▪ Landscape features identified in BAM Subsection 3.1.3 and to be shown on the Site Map and/or Location map include: - IBRA bioregions and subregions - rivers, streams and estuaries - wetlands and important wetlands - connectivity of different areas of habitat - karst, caves, crevices, cliffs, rocks and other geological features of significance and if required, soil hazard features - areas of outstanding biodiversity value occurring on the subject land and assessment area - any additional landscape features identified in any SEARs for the Project - NSW (Mitchell) landscape on which the subject land occur Data ▪ All report maps as separate jpeg files Individual digital shape files of: - subject land boundary - assessment area (i.e. subject land and 1500 m buffer area) boundary - cadastral boundary of subject land - areas of native vegetation cover - landscape feature	
Native Vegetation ▪ Identify native vegetation extent within the subject land, including cleared areas and evidence to support differences ▪ between mapped vegetation extent and aerial imagery (as described in BAM Section 4.1(1–3.) and Subsection 4.1.1) ▪ Provide justification for all parts of the subject land that do not contain native vegetation (as described in BAM Subsection 4.1.2) ▪ Review of existing information on native vegetation including references to previous vegetation maps of the subject land and assessment area (described in BAM Section 4.1(3.) and Subsection 4.1.1) ▪ Describe the systematic field-based floristic vegetation survey undertaken in accordance with BAM Section 4.2 ▪ Where relevant, describe the use of more appropriate local data, provide reasons that support the use of more appropriate local data and include the written confirmation from the decision-maker that they support the use of more appropriate local data (as described in BAM Subsection 1.4.2 and Appendix A) ▪ For each PCT within the subject land, describe: - vegetation class - extent (ha) within subject land - evidence used to identify a PCT including any analyses undertaken, references/sources, existing vegetation maps (BAM Section 4.2(1–3.)) - plant species relied upon for identification of the PCT and relative abundance of each species - if relevant, TEC status including evidence used to determine vegetation is the TEC (BAM Subsection 4.2.2(1–2.)) - estimate of percent cleared value of PCT (BAM Subsection 4.2.1(5.)). ▪ Describe the vegetation integrity assessment of the subject land, including: - identification and mapping of vegetation zones (as described in BAM Subsection 4.3.1) - assessment of patch size (as described in BAM Subsection 4.3.2)	Information on the native vegetation for the biodiversity assessment are detailed in: ▪ Native vegetation and vegetation integrity – **Chapter 4** – Page 41: - Background research and data sources – Page 42 - Mapping extent of native vegetation – Page 42 - Plant community type identification – Page 43 - Vegetation zones and vegetation integrity score – Page 105 - Patch size – Page 111 - Threatened ecological communities – Page 112 - Groundwater dependent ecosystems – Page 122 - Vegetation survey limitations – Page 123

BAM minimum information requirements	Section addressed
- survey effort (i.e. number of vegetation integrity survey plots) as described in BAM Subsection 4.3.4(1–2.) - use of relevant benchmark data from BioNet Vegetation Classification (as described in BAM Subsection 4.3.3(5.)). ▪ Where use of more appropriate local benchmark data is proposed (as described in BAM Subsection 1.4.2, BAM Subsection 4.3.3(5.) and BAM Appendix A): - identify the PCT or vegetation class for which local benchmark data will be applied - identify published sources of local benchmark data (if benchmarks obtained from published sources) - describe methods of local benchmark data collection (if reference plots used to determine local benchmark data) - provide justification for use of local data rather than BioNet Vegetation Classification benchmark values - provide written confirmation from the decision-maker that they support the use of local benchmark data. Maps and tables ▪ Map of native vegetation extent within the subject land at scale not greater than 1:10,000 including identification of cleared areas (as described in BAM Section 4.1(1–3.)) and all parts of the subject land that do not contain native vegetation (BAM Subsection 4.1.2) ▪ Map of PCTs within the subject land (as described in BAM Section 4.2(1.) ▪ Map of vegetation zones within the subject land (as described in BAM Subsection 4.3.1) ▪ Map the location of floristic vegetation survey plots and vegetation integrity survey plots relative to PCTs boundaries ▪ Map of TEC distribution on the subject land and table of TEC listing, status and area (ha) ▪ Map of patch size locations for each native vegetation zone and table of patch size areas (as described in BAM Subsection 4.3.2) ▪ Table of current vegetation integrity scores for each vegetation zone within the site and including: - composition condition score - structure condition score - function condition score - presence of hollow bearing trees Data ▪ All report maps as separate jpeg files ▪ Plot field data (MS Excel format) ▪ Plot field data sheets Digital shape files of: - PCT boundaries within subject land - TEC boundaries within subject land - vegetation zone boundaries within subject land - floristic vegetation survey and vegetation integrity plot location	
Threatened species ▪ Identify ecosystem credit species likely to occur on the subject land, including: - list of ecosystem credit species derived from the BAM-C (as described in BAM Subsection 5.1.1 and Section 5.2(1.)) - justification and supporting evidence for exclusion of any ecosystem credit species based on geographic - limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2) - justification for addition of any ecosystem credit species to the list. ▪ Identify species credit species likely to occur on the subject land, including:	Information on the threatened species for the biodiversity assessment are detailed in: ▪ Threatened species – **Chapter 5 –** Page 125: - Threatened species habitat assessment – Page 125 - Habitat types – Page 126 - Ecosystem credit species assessment – Page 128 - Identifying geographic and habitat constraints – Page 135

BAM minimum information requirements	Section addressed
- list of species credit species derived from the BAM-C (as described in BAM Subsection 5.1.1) - justification and supporting evidence for exclusions based on geographic limitations, habitat constraints or vagrancy (as described in BAM Subsections 5.2.1 and 5.2.2) - justification and supporting evidence for exclusions based on degraded habitat constraints and/or microhabitats on which the species depends (as described in BAM Subsection 5.2.2) - justification for addition of any species credit species to the list. ▪ From the list of candidate species credit species, identify: - species assumed present within the subject land (if relevant) (as described in BAM Subsection 5.2.4(2.a.)) - species present within the subject land on the basis of being identified on an important habitat map for a species (as described in BAM Subsection 5.2.4(2.d.)) - species for which targeted surveys are to be completed to determine species presence (Subsection 5.2.4(2.b.)) - species for which an expert report is to be used to determine species presence (Subsection 5.2.4(2.c.)). ▪ Present the outcomes of species credit species assessments from: - threatened species survey (as described in BAM Section 5.2.4) - expert reports (if relevant) including justification for presence of the species and information used to make this determination (as described in BAM Section 5.2.4 and 5.3, Box 3). ▪ Where survey has been undertaken include detailed information on: - survey method and effort, (as described in BAM Section 5.3) - justification of survey method and effort (e.g. citation of peer-reviewed literature) if approach differs from the Department's taxa-specific survey guides or where no relevant guideline has been published - timing of survey in relation to requirements in the TBDC or the Department's taxa-specific survey guides. Where survey was undertaken outside these guides include justification for the timing of surveys - survey personnel and relevant experience - describe any limitations to surveys and how these were addressed/overcome. ▪ Where an expert report has been used in place of survey (as described in BAM Section 5.3, Box 3), include: - justification of the use of an expert report - identify the expert, provide evidence of their expert credentials and Departmental approval of expert status - all requirements of Box 3 have been addressed in the expert report. ▪ Where use of local data is proposed (BAM Subsection 1.4.2): - identify relevant species - identify data to be amended - identify source of information for local data (published literature, additional survey data) - justify use of local data in preference to VIS Classification or TBDC data - provide written confirmation from the decision-maker that they support the use of local data. ▪ Species polygon completed for species credit species present within the subject land (assumed present or determined on the basis of survey, expert report or important habitat map) ensuring that: - the unit of measure for each species is documented ▪ for species assessed by area: - the polygon includes the extent of suitable habitat for the target species within the subject land (as described in BAM Subsection 5.2.5) - a description of, and evidence-based justification for, the habitat constraints, features or microhabitats used to	- Candidate species removed from the assessment – Page - Final list of candidate species – Page 139 - Targeted threatened species surveys – Page 141 - Survey limitations – Page 165 - Threatened species survey results – Page 173 ▪ Aquatic assessment – **Chapter 6** – Page 226 ▪ Matters of National Environmental Significance – **Chapter 8** – Page 262

BAM minimum information requirements	Section addressed
- map the species polygon including reference to information in the TBDC for that species and any buffers applied ▪ for species assessed by counts of individuals: - the number of individual plants present on the subject land (as described in BAM Subsection 5.2.5(3.)) - the method used to derive this number (i.e. threatened species survey or expert report) and evidence-based justification for the approach taken - the polygon includes all individuals located on the subject land with a buffer of 30 m around the individuals or groups of individuals on the subject land. ▪ Identify the biodiversity risk weighting for each species credit species identified as present within the subject land (as described in BAM Section 5.4). Maps and Tables ▪ Table showing ecosystem credit species in accordance with BAM Section 5.1.1, and identifying: - the ecosystem credit species removed from the list - the sensitivity to gain class of each species ▪ Table detailing species credit species in accordance with BAM section 5.2 and identifying: - the species credit species removed from the list of species because the species is considered vagrant, out of geographic range or the habitat or micro habitat features are not present - the candidate species credit species not recorded on the subject land as determined by targeted survey, expert report or important habitat map Biodiversity Assessment Method 122 Report section BAM ref. Information Maps & tables (in document) Data (to be supplied) ▪ Table detailing species credit species recorded or assumed as present within the subject land, habitat constraints or microhabitats associated with the species, counts of individuals (flora)/extent of suitable habitat (flora and fauna) (as described in BAM Subsection 5.2.6) and biodiversity risk weighting (BAM Section 5.4) ▪ Map indicating the GPS coordinates of all individuals of each species recorded within the subject land and the species polygon for each species (as described in BAM Subsection 5.2.5) Data ▪ Digital shape files of suitable habitat identified for survey for each candidate species credit species ▪ Survey locations including GPS coordinates of any plots, transects, grids ▪ Digital shape files of each species polygon including GPS coordinates of located individuals ▪ Species polygon map in jpeg format ▪ Expert reports and any supporting data used to support conclusions of the expert report ▪ Field data sheets detailing survey information including prevailing conditions, date, time, equipment used	
Prescribed impacts ▪ Identify potential prescribed biodiversity impacts on threatened entities, including: - karst, caves, crevices, cliffs, rocks and other geological features of significance (as described in BAM Subsection 6.1.1) - occurrences of human-made structures and non-native vegetation (as described in BAM Subsection 6.1.2) - corridors or other areas of connectivity linking habitat for threatened entities (as described in BAM Subsection 6.1.3) - water bodies or any hydrological processes that sustain threatened entities (as described in BAM Subsection 6.1.4)	Information on prescribed impacts for the biodiversity assessment are detailed in: ▪ Assessment of impacts – Chapter 10 – Page : - Prescribed biodiversity impacts - Karst, caves, crevices, cliffs, rocks and other geological features of significance - Human-made structures or non-native vegetation - Habitat connectivity

BAM minimum information requirements	Section addressed
- protected animals that may use the proposed wind farm development site as a flyway or migration route (as described in BAM Subsection 6.1.5) - where the proposed development may result in vehicle strike on threatened fauna or on animals that are part of a threatened ecological community (as described in BAM Subsection 6.1.6). ▪ Identify a list of threatened entities that may be dependent upon or may use habitat features associated with any of the prescribed impacts ▪ Describe the importance of habitat features to the species including, where relevant, impacts on life-cycle or movement patterns (e.g. Subsection 6.1.3). ▪ Where the proposed development is for a wind farm: - identify a candidate list of protected animals that may use the development site as a flyway or migration route, including: - resident threatened aerial species, resident raptor species and nomadic and migratory species that are - likely to fly over the Project area (as described in BAM Subsection 6.1.5) - provide details of targeted survey for candidate species of wind farm developments undertaken in accordance with BAM Subsection 6.1.5(2–3.) - predict the habitual flight paths for nomadic and migratory species likely to fly over the subject land and map the - likely habitat for resident threatened aerial and raptor species (BAM Subsection 6.1.5(4.)). Maps and Tables ▪ Map showing location of any prescribed impact features (i.e. karst, caves, crevices, cliffs, rocks, human-made structures, etc.) ▪ Maps of habitual flight paths for nomadic and migratory species likely to fly over the site and maps of likely habitat for threatened aerial species resident on the site (for wind farm developments only). Data ▪ Digital shape files of prescribed impact feature locations Prescribed impact features map in jpeg format	- Water bodies, water quality and hydrological processes - Wind turbine strikes - Vehicle strike.
Avoid and minimise impacts ▪ Demonstration of efforts to avoid and minimise impacts on biodiversity values (including prescribed impacts) associated with the Project location in accordance with Chapter 7, including an analysis of alternative: - modes or technologies that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed mode or technology - routes that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed route - alternative locations that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed location - alternative sites within a property on which the Project is located that would avoid or minimise impacts on biodiversity values and justification for selecting the proposed site. ▪ Describe efforts to avoid and minimise impacts (including prescribed impacts) to biodiversity values through Project design (as described in BAM Sections 7.1 and 7.2) ▪ Identification of any other site constraints that the proponent has considered in determining the location and design of the Project (as described in BAM Section 7.2.1(3.)). Maps and Tables ▪ Table of measures to be implemented to avoid and minimise the impacts of the Project, including action, outcome, timing and responsibility ▪ Map of alternative footprints considered to avoid or minimise impacts on biodiversity values; and of the final Project footprint, including construction and operation	Information on the avoid and minimise impacts for the biodiversity assessment are detailed in: ▪ Impact avoidance and minimisation – **Chapter 9**: - Locating the Project to avoid and minimising direct and indirect impacts on biodiversity values - Designing the Project to avoiding and minimise direct and indirect impacts on biodiversity values - Locating and designing the Project to avoid and minimise prescribed impacts.

BAM minimum information requirements	Section addressed
▪ Maps demonstrating indirect impact zones where applicable Data ▪ Digital shape files of: - alternative and final Project footprint - direct and indirect impact zones	
Assessment of impacts ▪ Determine the impacts on native vegetation and threatened species habitat, including a description of direct impacts of clearing of native vegetation, threatened ecological communities and threatened species habitat (as described in BAM Section 8.1). ▪ Assessment of indirect impacts on vegetation and threatened species and their habitat including (as described in BAM Section 8.2): - description of the nature, extent, frequency, duration and timing of indirect impacts of the Project - documenting the consequences to vegetation and threatened species and their habitat including evidence-based justifications - reporting any limitations or assumptions, etc. made during the assessment - identification of the threatened entities and their habitat likely to be affected. ▪ Assessment of prescribed biodiversity impacts (as described in BAM Section 8.3) including assessment of the nature, extent and duration of impacts on the habitat of threatened species or ecological communities associated with: - karst, caves, crevices, cliffs, rocks and other features of geological significance - human-made structures - non-native vegetation - connectivity of different areas of habitat of threatened species that facilitates the movement of those species across their range - movement of threatened species that maintains their life cycle - water quality, water bodies and hydrological processes that sustain threatened species and threatened ecological communities - assessment of the impacts of wind turbine strikes on protected animals - assessment of the impacts of vehicle strikes on threatened species of animals or on animals that are part of a TEC. Maps and Tables ▪ Table showing change in vegetation integrity score for each vegetation zone as a result of identified impacts.	Information on the assessment of impacts for the biodiversity assessment are detailed in: ▪ Assessment of impacts – **Chapter 10**: - Direct impact - Indirect impacts - Prescribed biodiversity impacts - Summary of uncertain impacts - Cumulative impacts.
Mitigation and management of impacts ▪ Identification of measures to mitigate or manage impacts in accordance with the recommendations in BAM Sections 8.4 and 8.5 including: ▪ techniques, timing, frequency and responsibility ▪ identify measures for which there is risk of failure ▪ evaluate the risk and consequence of any residual impacts ▪ document any adaptive management strategy proposed. ▪ Identification of measures for mitigating impacts related to: - displacement of resident fauna (as described in BAM Subsection 8.4.1(2.)) - indirect impacts on native vegetation and habitat (as described in BAM Subsection 8.4.1(3.)) - mitigating prescribed biodiversity impacts (as described in BAM Subsection 8.4.2). ▪ Details of the adaptive management strategy proposed to monitor and respond to impacts on biodiversity values that are uncertain (BAM Section 8.5). Maps and Tables	Information on the mitigation and management of impacts for the biodiversity assessment are detailed in: ▪ Mitigating and managing impacts on biodiversity values – **Chapter 12**: - Mitigation measures - Monitoring and adaptive management.

BAM minimum information requirements	Section addressed
▪ Table of measures to be implemented to mitigate and manage impacts of the Project, including action, outcome, timing and responsibility.	
Impact Summary ▪ Identification and assessment of impacts on TECs and threatened species that are at risk of a serious and irreversible impacts (SAII, in accordance with BAM Section 9.1) including: - addressing all criteria in Subsection 9.1.1 for each TEC listed as at risk of an SAII present on the subject land - addressing all criteria in Subsection 9.1.2 for each threatened species at risk of an SAII present on the subject land - documenting assumptions made and/or limitations to information documenting all sources of data, information, references used or consulted clearly justifying why any criteria could not be addressed. ▪ Identification of impacts requiring offset in accordance with BAM Section 9.2. ▪ Identification of impacts not requiring offset in accordance with BAM Subsection 9.2.1(3.). ▪ Identification of areas not requiring assessment in accordance with BAM Section 9.3. ▪ Ecosystem credits and species credits that measure the impact of the development on biodiversity values, including: - future vegetation integrity score for each vegetation zone within the subject land (Equation 25 and Equation 26 in BAM Appendix H) - change in vegetation integrity score (BAM Subsection 8.1.1) - number of required ecosystem credits for the direct impacts of the Project on each vegetation zone within the subject land (BAM Subsection 9) - number of required species credits for each candidate threatened species that is directly impacted on by the Project (BAM Subsection 10.1.3). Maps and Tables ▪ Map showing the extent of TECs at risk of an SAII within the subject land ▪ Map showing location of threatened species at risk of an SAII within the subject land Map showing location of: - impacts requiring offset - impacts not requiring offset - areas not requiring assessment ▪ Table of PCTs requiring offset and the number of ecosystem credits required ▪ Table of threatened species requiring offset and the number of species credits required Data ▪ Digital shape files of: - extent of TECs at risk of an SAII within the subject land - location of threatened species at risk of an SAII within the subject land - boundary of impacts requiring offset - boundary of impacts not requiring offset - boundary of areas not requiring assessment - Maps in jpeg format ▪ Submitted Project in the BAM Calculator	Information on the impact summary for the biodiversity assessment are detailed in: ▪ Serious and irreversible impacts – Chapter 11 ▪ Thresholds for the assessment and offsetting of impacts of the Project – Chapter 13: - Impacts on a potential entity that are serious and irreversible impacts - Impacts for which the assessor is required to determine an offset requirement - Impacts for which the assessor is not required to determine an offset requirement - Impacts that do not require further assessment by the assessor.
Biodiversity credit report ▪ Description of credit classes for ecosystem credits and species credits at the development or clearing site or land to be biodiversity certified (BAM Section 10.2). ▪ Biodiversity Assessment Method Calculator (BAM-C) case numbers:	Information on the biodiversity credit report for the biodiversity assessment are detailed in: ▪ Biodiversity credit requirements – Chapter 14.

Appendix B. Personnel, roles, qualifications and experience

The work required to prepare this BDAR was undertaken by appropriately qualified and experienced ecologists. The personnel, their roles, qualifications and years of experience are provided in **Table B-1**.

Table B-1 Personnel, role, qualifications and experience

Personnel	Role	Qualifications	Experience
Jonathan Carr	Senior Ecologist – Technical Lead, vegetation integrity assessment, amphibian survey, reporting, mapping, and GIS analysis.	Bachelor of Environmental Science and Management BAM Accredited Assessor (No. BAAS18058)	11 years professional ecological consultant in NSW
Chris Thomson	Principal Ecologist – Technical review, vegetation surveys, bird and bat survey, reporting, mapping, and GIS analysis	Graduate Certificate in Natural Resources Bachelor of Applied Science (Environmental Management) BAM Accredited Assessor (No. BAAS18058)	26 years professional ecological consultant in NSW
Kirsty Raines	Ecologist – vegetation integrity assessment and bird and bat survey. reporting, mapping, and GIS analysis	Bachelor of Zoology (Animal Ecology) Master of Environmental Science and Management BAM Accredited Assessor (BAAS22013)	4 years professional ecological consultant in NSW
Emma Weatherstone	Ecologist – vegetation integrity assessment, amphibian survey and targeted flora surveys. reporting,	Bachelor of Environmental Science (Wildlife and Conservation Biology)	2 years' experience in ecological consulting in NSW
Matt Consterdine	Senior Ecologist – Ecologist – bird and bat survey	Bachelor of Environmental Science and Management BAM Accredited Assessor (BAAS20027)	9 years professional ecological consultant in NSW
Jorja Vernon	Aquatic Ecologist September 2021 – flora surveys. Aquatic assessment and reporting	Bachelors (Other), Bachelor of Environmental Science	4 years' experience in ecological consulting in NSW
Zeta Bull	Senior Ecologist - bird and bat survey	Bachelor of Arts (Biology and Psychology) (Hons) PhD (Ecology)	18 years professional ecological consultant in SA. Previous Project experience in NSW.
John Kershaw	Senior Botanist - targeted flora survey – September 2022	Bachelor of Science (Conservation Ecology)	15 years professional ecological consultant in Victoria. Previous Project experience in NSW.
Mike Timms	Senior Ecologist – vegetation survey	Bachelor of Science (Ecology) Master of Environment (Conservation and Restoration)	6 years professional ecological consultant in Victoria. Previous Project experience in NSW.
Gemma Higgins	Ecologist - Bird and bat survey, vegetation survey and targeted flora survey - September 2022	Bachelor of Science (Ecology & Conservation and Zoology) Master of Environment (Tailored)	1 year professional ecological experience in Victoria. Previous experience specialising in ornithology during Masters' research.

Personnel	Role	Qualifications	Experience
Ryan Fisher	Ecologist – targeted flora survey - September 2022	Bachelor of Science (Botany) Master of Environment (Tailored)	2 years professional Ecological experience within Victoria. Previous experience doing biodiversity and flora surveys for universities.
Michael Honeyman	Bird and bat survey	Master of Environmental Management Graduate Diploma (Ornithology)	20+ years ornithology experience working with governments, universities and NGOs since 1992.
Josh Sheridan	Ecologist – targeted flora survey - September 2022	Bachelor of Science (Ecology & Biotechnology)	2 years professional ecological experience in Victoria
Julia Bayada	Ecologist – targeted flora survey - November 2021	Bachelor of Science, Bachelor of Environmental Science and Management	2 years professional ecological consultant in NSW
Tim Maher	Ecologist – targeted flora surveys	Master of Research (Plant Ecology) Bachelor of Advanced Science (Biology)	3 years professional ecological consultant in NSW
Subcontractors			
Rob Gration (Eco Aerial Environmental Services)	Director / Principal Ecologist – all bat data analysis	Master Wildlife Management - Ecology Post Graduate Certificate Applied Science - Ecology Associate Diploma Applied Science – Natural Resource Management	20 years in senior management roles with international engineering consultancies, local government and the tertiary education sector
Phil Cameron (AREA Environmental & Heritage Consultants)	Senior Ecologist – targeted plant searches (September & November 2021)	CEnvP, BSc, Ass Dip App Sci, Cert III (Zoo Keeping). BAM accredited assessor BAAS17082	18 years professional ecological consultant in NSW
Addy Watson (AREA Environmental & Heritage Consultants)	Senior Ecologist – targeted plant searches (September & November 2021)	Graduate Diploma Captive Vertebrate Management, Zoo Management Graduate Certificate, Social Impact Bachelor of Environmental Science, Biodiversity Conservation BAM accredited assessor BAAS19066	5 years professional ecological consultant in NSW
David Sturman (AREA Environmental & Heritage Consultants)	Ecologist – targeted plant searches (September & November 2021)	Bachelor of Environmental Science BAM accredited assessor BAAS 22015	6 years professional ecological consultant in NSW
Greg Bible (AREA Environmental & Heritage Consultants)	Ecologist – targeted plant searches (September & November 2021)	Bachelor of Environmental Science (Hons.)	3 years professional ecological consultant in NSW
Dr Heidi Kolkert	November - bat data processing and analysis	PhD, BEnvSc (hons).	Five years professional ecological consulting experience

Personnel	Role	Qualifications	Experience
Dr Mark Sturman	November 2021 flora survey	(Retired)	Life long avid field naturalist. Assisted AREA with developing a predictive modelling for Swainsona recta LLS threatened flora Projects 2019 to 2022.
Dan Byrne	November 2021 flora survey	BA (Landscape architecture), Cert III (Hort) avid field naturalist (flora)	Three years consulting experience
Lynda Marshall	November bird surveys	BSc (Hons.)	Five years professional ecological consulting experience
Blake Wilmen	November bird surveys	BEnvSc (pending)	Blake is an avid bird watcher and current university student
Dr Rhidian Harrington	November bird surveys	PhD (ornithology), MSc, BSc (hons).	20 years professional ecological consulting experience
Ian Campbell	November bird surveys	(Retired)	An avid life long bird watcher who is part of Deniliquin Field Naturalists

Appendix C. Vegetation integrity assessment plot data for vegetation zones in the study area

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P5.3a	7	1.10	101	Low-Moderate	55	374943	6106432.0	280	1	5	2	4	0	0	45.0	0.9	0.3	0.8	0.0	0.0	1	0	40.0	2.0	1	1	1	1	1	1	0.0
P4.14a	9	0.22	101	Low-Moderate	55	380628	6101415.0	130	1	3	2	0	0	0	30.0	9.5	1.2	0.0	0.0	0.0	9	9	24.0	57.0	0	0	0	0	1	0	4.0
P3.2a	13	0.58	101	Moderate-Good	55	370284	6120946.0	113	1	9	2	3	0	0	15.0	27.6	0.4	0.4	0.0	0.0	5	5	51.0	14.0	1	0	0	0	1	0	1.0
P3.6a	13	0.58	101	Moderate-Good	55	368290	612587.0	34	1	4	7	2	1	0	1.0	6.5	86.6	0.2	0.4	0.0	0	0	3.0	0.0	0	1	0	0	0	0	0.0
P3.3B	13	0.11	101	Low-Moderate	55	366816.7578	6125601.719	290	1	7	2	5	0	0	0.2	7.2	25.0	6.4	0.0	0.0	2	1	9.0	5.0	0	0	0	0	1	0	5.0
P3.11a	17	1.86	101	Moderate-Good	55	364747	6117900.0	120	0	9	4	6	0	0	0.0	10.0	21.5	0.8	0.0	0.0	0	0	5.4	0.0	0	0	0	0	0	0	0.0
P3.3a	17	1.86	101	Moderate-Good	55	369715	6120093.0	325	0	6	4	3	1	0	0.0	6.4	70.5	0.5	0.3	0.0	0	0	17.0	0.0	0	0	0	0	0	0	0.1
P4.6a	17	1.86	101	Moderate-Good	55	362418	6117136.0	129	1	5	5	5	1	0	1.0	19.5	38.1	1.1	0.3	0.0	0	0	9.0	0.0	0	0	1	0	0	0	0.0
P1.3b	17	1.86	101	Moderate-Good	55	362941.6526	6112806.759	270	0	5	7	4	0	0	0.0	19.6	37.8	1.2	0.0	0.0	0	0	6.0	0.0	0	0	0	0	0	0	0.0
P4.2b	17	1.86	101	Moderate-Good	55	369707.9606	6111521.262	330	0	5	4	9	1	0	0.0	48.0	15.2	5.9	0.2	0.0	0	0	5.0	0.0	0	0	0	0	0	0	0.0
P5.4b	17	1.86	101	Moderate-Good	55	364664.0508	6109577.422	105	0	7	4	10	1	0	0.0	45.5	37.0	8.1	0.1	0.0	0	0	3.0	0.0	0	0	0	0	0	0	0.0
P1.2a	26	27.00	101	Moderate-Good-G	55	373579.1426	6113533.297	305	1	8	4	4	0	0	2.0	2.8	41.7	0.7	0.0	0.0	0	0	5.0	0.0	0	1	0	0	0	0	0.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P4.1 a	26	27.00	101	Moderate-Good-G	55	365769.9634	6121209.561	358	1	8	3	9	0	0	12.0	10.5	0.5	1.1	0.0	0.0	0	0	25.6	1.0	1	1	0	0	0	1	0.0
P4.9 a	26	27.00	101	Moderate-Good-G	55	363214.9838	6119487.49	120	1	7	5	4	0	0	2.0	6.4	41.5	1.3	0.0	0.0	2	0	7.8	4.0	0	1	1	1	0	1	1.0
P2.3 a	26	27.00	101	Moderate-Good-G	55	371688.9412	6122315.42	192	1	5	4	7	0	0	8.0	0.6	40.4	0.7	0.0	0.0	0	0	0.0	0.0	1	0	0	0	0	1	0.1
P4.7 a	26	27.00	101	Moderate-Good-G	55	365310.7079	6120281.316	50	1	10	3	7	0	0	4.0	14.6	5.7	1.5	0.0	0.0	0	0	17.0	3.0	1	1	0	0	0	0	0.0
P4.8 a	26	27.00	101	Moderate-Good-G	55	362548.7762	6117357.279	5	1	8	4	7	0	0	7.0	15.1	7.2	0.9	0.0	0.0	0	0	22.0	0.0	1	1	0	0	0	1	0.0
P5.1 a	26	27.00	101	Moderate-Good-G	55	366104.9564	6110968.534	206	1	6	4	8	0	0	1.0	6.0	11.0	4.8	0.0	0.0	0	0	2.2	0.0	0	1	0	0	0	0	0.3
P4.1 b	26	27.00	101	Moderate-Good-G	55	369950.0314	6111278.591	255	1	5	8	8	0	0	15.0	3.6	59.0	1.2	0.0	0.0	1	0	13.0	0.0	0	0	0	1	0	0	0.0
P2.8 b	26	27.00	101	Moderate-Good-G	55	364998.455	6127611.307	26	1	6	7	7	0	0	20.0	4.9	70.1	5.8	0.0	0.0	0	0	4.0	5.0	0	1	0	0	0	0	0.1
P4.4 B	26	27.00	101	Moderate-Good-G	55	366805.4772	6112183.229	235	1	7	5	14	1	0	5.0	15.7	36.0	8.5	0.1	0.0	0	0	37.0	0.0	1	1	1	0	0	0	0.0
P4.3 a	26	27.00	101	Moderate-Good-G	55	364711	6120893.0	134	1	10	6	6	1	0	6.0	15.9	8.4	0.6	0.1	0.0	0	0	7.4	4.0	0	0	1	0	0	1	0.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P3.5a	26	1.40	101	Low-Moderate-G	55	369649	6121580.0	334	1	2	5	6	0	0	0.2	0.4	45.1	0.6	0.0	0.0	0	0	13.0	0.0	0	0	0	0	0	1	0.0
P5.1a	26	1.40	101	Low-Moderate-G	55	366104.9564	6110968.534	206	1	6	4	8	0	0	1.0	6.0	11.0	4.8	0.0	0.0	0	0	2.2	0.0	0	1	0	0	0	0	0.3
P4.12a	26	2.10	101	Moderate-Good-S	55	360538.7137	6119469.424	221	1	9	4	11	0	0	15.0	4.8	1.3	12.1	0.0	0.0	1	0	15.0	0.0	1	1	0	1	0	1	0.1
P4.7b	26	2.10	101	Moderate-Good-S	55	366846.2278	6115877.757	330	1	8	5	9	1	0	15.0	13.8	30.2	1.5	0.1	0.0	0	0	48.0	0.0	1	1	1	0	0	0	0.0
P5.4a	26	2.10	101	Moderate-Good-S	55	373714.5226	6106595.997	110	1	6	7	5	1	1	30.0	26.2	28.4	0.8	0.1	1.0	2	0	27.0	25.0	1	1	1	1	0	1	0.0
P3.10a	26	0.59	101	Low-Moderate-S	55	367823.1477	6119158.111	122	1	9	6	7	0	0	2.0	22.6	7.5	1.6	0.0	0.0	0	0	10.0	1.0	0	1	0	0	0	0	0.0
P4.4a	28	10.28	101	Low-Moderate	55	365371	6114621	148	0	2	4	4	0	0	0.0	0.5	6.0	1.1	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P4.5a	28	10.28	101	Low-Moderate	55	365012	6120569	140	1	3	5	1	0	0	3.0	0.3	11.5	0.1	0.0	0.0	2	0	1.6	0.0	0	0	0	0	1	0	0.1
P2.6a	28	10.28	101	Low-Moderate	55	368698	6118415	240	0	2	4	5	0	0	0.0	2.1	12.5	10.6	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.0
P2.7a	28	10.28	101	Low-Moderate	55	369009	6119390	230	0	5	7	4	0	0	0.0	1.5	9.1	3.6	0.0	0.0	1	0	19.0	0.0	0	0	0	1	0	1	3.0
P2.8a	28	10.28	101	Low-Moderate	55	370025	6119824	24	0	2	6	2	0	0	0.0	0.6	5.1	0.2	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	1.0
P3.6b	28	10.28	101	Low-Moderate	55	364977.7155	6121787.194	345	1	0	3	4	0	0	15.0	0.0	21.0	1.0	0.0	0.0	1	0	4.0	0.0	0	0	0	0	1	0	2.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P3.1 b	28	10.28	101	Low-Moderate	55	365768.6474	6124083.637	180	0	3	2	6	0	0	0.0	16.1	20.0	26.7	0.0	0.0	2	0	1.0	0.0	0	0	0	1	1	0	0.0
P2.5 a	44	32.99	101	Moderate-Good	55	369381.967	6117532.783	104	0	5	6	12	0	0	0.0	1.6	70.1	1.5	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.2
P3.1 a	44	32.99	101	Moderate-Good	55	368952.5685	6122291.782	260	0	6	6	6	0	0	0.0	2.8	21.7	1.9	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P3.12a	44	32.99	101	Moderate-Good	55	367192.0659	6117045.682	262	0	5	5	19	0	0	0.0	3.4	25.5	5.3	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P4.2 a	44	32.99	101	Moderate-Good	55	365161.4916	6115283.794	238	0	8	6	15	0	0	0.0	4.4	72.1	2.8	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P1.1 b	44	32.99	101	Moderate-Good	55	363639.8509	6112068.436	170	0	6	6	7	0	0	0.0	1.7	64.0	6.9	0.0	0.0	0	0	5.0	0.0	0	0	0	0	0	0	0.0
P2.2 b	44	32.99	101	Moderate-Good	55	364619.2571	6112689.011	75	0	5	5	8	0	0	0.0	9.2	56.0	12.8	0.0	0.0	0	0	8.0	0.0	1	0	0	0	0	0	0.0
P2.3 b	44	32.99	101	Moderate-Good	55	368943.3059	6125098.443	15	0	7	4	8	0	0	0.0	0.7	61.0	2.3	0.0	0.0	0	0	6.0	0.0	0	0	0	0	0	0	0.0
P2.5 b	44	32.99	101	Moderate-Good	55	363598.9299	6126270.39	280	1	3	6	7	0	0	0.1	2.5	45.0	7.5	0.0	0.0	0	0	10.0	0.0	0	0	0	0	0	1	0.0
P4.3 b	44	32.99	101	Moderate-Good	55	366297.2121	6112196.991	330	0	3	6	11	0	0	0.0	0.3	80.2	11.2	0.0	0.0	0	0	12.0	0.0	0	0	0	0	0	0	0.0
P4.5 b	44	32.99	101	Moderate-Good	55	366860.2377	6113168.101	190	0	4	6	9	1	0	0.0	0.5	50.5	1.9	0.1	0.0	0	0	12.0	0.0	0	0	0	0	0	0	0.0
P5.2 b	44	32.99	101	Moderate-Good	55	363650.6998	6110953.009	180	0	8	9	8	0	0	0.0	22.9	66.1	3.3	0.0	0.0	0	0	8.0	0.0	0	0	0	0	0	0	0.0
P5.6 b	44	32.99	101	Moderate-Good	55	367546.3537	6109641.81	205	0	5	4	9	0	0	0.0	9.0	64.0	13.7	0.0	0.0	0	0	8.0	0.0	0	0	0	0	0	0	0.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P3.13a	44	32.99	101	Moderate-Good	55	366185.6921	6117326.183	160	0	3	4	12	0	0	0.0	10.2	1.3	41.5	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P4.11a	44	32.99	101	Moderate-Good	55	363010.3101	6118422.653	233	0	7	5	5	0	0	0.0	7.3	32.5	2.6	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P1.3a	44	3.15	101	Low-Moderate	55	368952.5685	6122291.782	29	0	4	5	6	0	0	0.0	1.0	102.1	2.7	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P1.6b	44	3.15	101	Low-Moderate	55	362352.67	6114795.201	15	0	3	6	4	0	0	0.0	12.1	55.1	6.1	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.2
P3.2b	44	3.15	101	Low-Moderate	55	365377.1007	6124395.401	315	0	3	5	6	0	0	0.0	0.4	38.4	7.3	0.0	0.0	0	0	2.0	8.0	1	0	0	1	1	0	0.1
P3.7b	44	3.15	101	Low-Moderate	55	373007.4563	6112689.527	315	0	4	5	5	0	0	0.0	0.6	80.0	7.3	0.0	0.0	0	0	10.0	0.0	0	0	0	0	0	0	0.0
P5.1b	45	1.42	101	Moderate-Good	55	368931.8719	6110993.082	100	0	5	5	8	0	0	0.0	5.5	88.1	1.0	0.0	0.0	0	0	21.0	0.0	0	0	0	0	0	0	0.0
P5.5b	45	1.42	101	Moderate-Good	55	364362.9963	6110322.29	90	0	5	6	9	0	0	0.0	13.3	54.1	1.9	0.0	0.0	0	0	11.0	0.0	0	0	0	0	0	0	0.0
P5.3b	45	0.81	101	Low-Moderate	55	363473.7544	6109393.149	190	0	6	4	3	0	0	0.0	12.3	61.0	0.5	0.0	0.0	0	0	5.0	0.0	0	0	0	0	0	0	0.1
P2.2a	46	31.29	101	Moderate-Good	55	371203.9778	6118592.007	17	0	6	7	7	0	1	0.0	6.6	21.0	1.6	0.0	0.1	0	0	0.0	0.0	0	0	0	0	0	0	0.1
P2.4a	46	31.29	101	Moderate-Good	55	369666.8398	6115931.036	265	0	6	5	7	0	0	0.0	1.4	49.2	1.0	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.1
P4.10a	46	31.29	101	Moderate-Good	55	363882.4658	6118868.343	39	0	7	5	9	0	0	0.0	4.4	77.0	1.4	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P5.2a	46	31.29	101	Moderate-Good	55	368347.9619	6111589.882	262	0	6	5	4	0	0	0.0	1.0	26.2	0.7	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
P1.2b	46	31.29	101	Moderate-Good	55	363148.5188	6112507.956	100	0	5	8	7	0	0	0.0	3.0	89.0	5.6	0.0	0.0	0	0	5.0	0.0	0	0	0	0	0	0	0.0
P2.4b	46	31.29	101	Moderate-Good	55	362179.4472	6124805.218	56	0	5	6	8	0	0	0.0	5.7	71.0	2.2	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.0
P3.5b	46	31.29	101	Moderate-Good	55	363243.1929	6122234.233	315	0	5	6	12	0	0	0.0	0.6	80.5	0.1	0.0	0.0	0	0	14.0	0.0	0	0	0	0	0	0	0.5
P3.8b	46	31.29	101	Moderate-Good	55	372169.8765	6112081.527	200	0	4	4	6	1	0	0.0	5.2	73.0	5.6	0.5	0.0	0	0	8.0	0.0	0	0	0	0	0	0	0.0
P4.9b	46	31.29	101	Moderate-Good	55	367874.936	6113471.822	315	0	4	9	11	1	0	0.0	0.7	85.2	1.9	0.1	0.0	0	0	29.0	0.0	0	0	0	0	0	0	0.0
P4.10b	46	31.29	101	Moderate-Good	55	369086.3075	6113638.378	290	0	5	5	10	0	0	0.0	10.5	70.0	10.2	0.0	0.0	0	0	35.0	0.0	0	0	0	0	0	0	0.0
4.13a	46	13.32	101	Low-Moderate	55	378825.8755	6101825.382	216	0	3	5	2	0	0	0.0	1.2	65.3	0.3	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P3.4a	46	13.32	101	Low-Moderate	55	370421.3278	6120762.806	46	1	3	4	3	0	0	0.1	0.3	45.7	2.2	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	1	0.4
P2.7b	46	13.32	101	Low-Moderate	55	364062.9352	6127095.828	60	0	4	3	0	0	0	0.0	0.7	40.6	0.0	0.0	0.0	0	0	6.0	0.0	0	0	0	0	0	1	0.1
P2.6b	46	13.32	101	Low-Moderate	55	365440.1999	6125832.667	270	0	2	3	6	0	0	0.0	3.0	55.0	9.5	0.0	0.0	0	0	2.0	0.0	0	0	0	0	0	0	0.0
P3.9b	46	13.32	101	Low-Moderate	55	371742.3657	6110924.428	350	0	4	4	5	0	0	0.0	5.4	70.0	3.8	0.0	0.0	0	0	5.0	0.0	0	0	0	0	0	0	0.0
P3.8a	46	22.63	101	Moderate-Good-C	55	367514.48	6120885.025	149	1	4	6	11	0	0	0.1	5.5	55.3	5.2	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P3.7a	46	22.63	101	Moderate-	55	367136.052	6119890.546	146	0	3	6	13	0	0	0.0	2.7	24.0	5.4	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0

Plot	Pct	Area	Patch size	Condition class	Zone	Easting	Northing	Bearing	Comptree	Compshrub	Compgrass	Compforbs	Compferns	Compother	Structree	Strucshrub	Strucgrass	Strucforbs	Strucferns	Strucother	Funlargetrees	Funhollowtrees	Funlittercover	Funlenfallenlogs	Funtreestem5to1	Funtreestem10to	Funtreestem20to	Funtreestem30to	Funtreestem50to	Funtreeregen	Funhighthreatexo
				Good-C																											
P1.4b	46	22.63	101	Moderate-Good-C	55	362138.7971	6113573.329	45	0	5	6	3	0	0	0.0	35.0	58.0	5.6	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.0
P1.5b	46	22.63	101	Moderate-Good-C	55	361157.535	6115904.838	355	0	5	5	6	0	0	0.0	20.4	32.2	10.8	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.0
P3.4b	46	22.63	101	Moderate-Good-C	55	361826.7994	6120857.372	60	1	3	3	9	1	0	0.1	27.3	41.0	12.9	0.1	0.0	0	0	22.0	0.0	0	0	0	0	0	1	0.0
P4.8b	46	22.63	101	Moderate-Good-C	55	365805.0762	6115643.972	195	0	5	6	10	0	0	0.0	13.1	73.0	3.8	0.0	0.0	0	0	19.0	0.0	0	0	0	0	0	0	0.0
P3.9a	46	22.51	101	Low-Moderate-C	55	366829.8215	6118811.537	209	1	4	5	9	0	0	0.1	20.8	16.2	7.6	0.0	0.0	0	0	0.0	0.0	0	0	0	0	0	0	0.0
P4.6b	46	22.51	101	Low-Moderate-C	55	367196.0643	6114138.126	80	0	3	4	7	0	0	0.0	25.3	67.0	2.6	0.0	0.0	0	0	41.0	0.0	0	0	0	0	0	0	0.0
1.7b	46	22.51	101	Low-Moderate-C	55	363247.1036	6113692.929	320	0	2	7	5	0	0	0.0	5.1	42.1	1.8	0.0	0.0	0	0	4.0	0.0	0	0	0	0	0	0	0.0
1.8b	46	22.51	101	Low-Moderate-C	55	361548.3855	6114143.146	315	0	1	5	6	0	0	0.0	20.0	55.0	5.4	0.0	0.0	0	0	3.0	0.0	0	0	0	0	0	0	0.1
2.1b	46	22.51	101	Low-Moderate-C	55	365049.8332	6113430.998	285	0	2	6	4	0	0	0.0	20.1	45.2	6.1	0.0	0.0	0	0	3.0	0.0	0	0	0	0	0	0	0.0
P2.1a	160	0.03	101	Moderate-Good	55	373246.0038	6110963.681	234	0	7	3	8	0	1	0.0	13.3	20.2	1.0	0.0	0.1	0	0	0.0	0.0	0	0	0	0	0	0	0.0

Appendix D. Vegetation integrity assessment field data sheets

PCT 7: Low-Moderate (Vegetation Zone 1)

Plot 5.3a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**	
	Tree (TG)	1		5m	10%	40.00%	
	Shrub (SG)	5		15m	100%		
	Forb (FG)	4		25m	35%		
	Grass & Grasslike (GG)	2		35m	30%		
	Fern (EG)	0		45m	25%		
	Other (OG)	0					
	TOTAL	12					
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**					
	Tree (TG)	45					
	Shrub (SG)	0.9					
	Forb (FG)	0.8					
	Grass & Grasslike (GG)	0.3					
	Fern (EG)	0					
	Other (OG)	0					
	TOTAL Native	47					
	TOTAL 'HTE'	0					
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80			Yes				
50-79	1		Yes				
30-49	yes						
20-29	yes						
10-19	yes						
5-9	yes						
<5	yes						
Length of logs (m)	2						

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Eucalyptus camaldulensis	River Red Gum	Myrtaceae	45	5		Tree (TG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.3	30		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	60	2000	*		No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.2	20		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.2	20		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.2	10		Shrub (SG)	No
Marrubium vulgare	White Horehound	Lamiaceae	0.1	5	*		No
Hordeum spp.	A Barley Grass	Poaceae	2	300	*		No
Rytidosperma spp.		Poaceae	0.2	20		Grass & grasslike (GG)	No

Arctotheca calendula	Capeweed	Asteraceae	0.1	20	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.3	20		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.2	20		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	2		Shrub (SG)	No
Salvia spp.		Lamiaceae	0.1	5	*		No
Austrostipa spp.		Poaceae	0.1	10		Grass & grasslike (GG)	No
Rumex spp.	Dock	Polygonaceae	0.1	1	*	Forb (FG)	No

PCT 9: Low-Moderate (Vegetation Zone 2)

Plot 4.14a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		1		5m	40%	24.00%
	Shrub (SG)		3		15m	0%	
	Forb (FG)		0		25m	10%	
	Grass & Grasslike (GG)		2		35m	60%	
	Fern (EG)		0		45m	10%	
	Other (OG)		0				
	TOTAL		6				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		30				
	Shrub (SG)		9.5				
	Forb (FG)		0				
	Grass & Grasslike (GG)		1.2				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		40.7				
	TOTAL 'HTE'		4				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80	5		Yes				
50-79	4		Yes				
30-49							
20-29							
10-19							
5-9							
<5							
Length of logs (m)	57						

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Eucalyptus camaldulensis	Eucalyptus camaldulensis population in the Hunter catchment	Myrtaceae	30	3		Tree (TG)	No
Lolium spp.	A Ryegrass	Poaceae	20	2000	*		No
Hordeum spp.	A Barley Grass	Poaceae	85	2000	*		No
Arctotheca calendula	Capeweed	Asteraceae	0.5	500	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	6	1000		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	20		Shrub (SG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	1	300		Grass & grasslike (GG)	No
Marrubium vulgare	White Horehound	Lamiaceae	15	1000	*		No

Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	3	10		Shrub (SG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	4	5	*		HTE
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.2	20		Grass & grasslike (GG)	No

PCT 13: Moderate-Good (Vegetation Zone 3)

Plot 3.2a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	9
	Forb (FG)	3
	Grass & Grasslike (GG)	2
	Fern (EG)	0
	Other (OG)	0
	TOTAL	15

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	95%	51.00%
	15m	5%	
	25m	5%	
	35m	50%	
	45m	100%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	15
	Shrub (SG)	27.6
	Forb (FG)	0.4
	Grass & Grasslike (GG)	0.4
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	43.4
	TOTAL 'HTE'	1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	2		2
50-79	3		3
30-49			
20-29			
10-19			
5-9	yes		
<5			N/A
Length of logs (m)	14		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Eucalyptus largiflorens	Black Box	Myrtaceae	15	2		Tree (TG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	25	2000		Shrub (SG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	1	50	*		HTE
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	50		Shrub (SG)	No
Sisymbrium spp.		Brassicaceae	0.2	100	*		No
Enchylaena tomentosa	Ruby Saltbush	Chenopodiaceae	0.1	20		Shrub (SG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.2	20		Shrub (SG)	No

Duma florulenta	Lignum	Polygonaceae	1	200		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	30		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.5	50		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	20		Shrub (SG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	1		Shrub (SG)	No
Carex inversa	Knob Sedge	Cyperaceae	0.2	300		Grass & grasslike (GG)	No
Hordeum spp.	A Barley Grass	Poaceae	5	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	5	2000	*		No
Lepidium africanum	Common Peppercress	Brassicaceae	0.1	10	*		No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	0.1	1		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.2	20		Grass & grasslike (GG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	10	*		No
Scleranthus spp.		Caryophyllaceae	0.1	10		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.1	100	*		No
Crassula spp.	Stonecrop	Crassulaceae	0.1	2000		Forb (FG)	No

Plot 3.6a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		1		5m	95%	51.00%
	Shrub (SG)		4		15m	5%	
	Forb (FG)		2		25m	5%	
	Grass & Grasslike (GG)		7		35m	50%	
	Fern (EG)		1		45m	100%	
	Other (OG)		0				
	TOTAL		15				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		1				
	Shrub (SG)		6.5				
	Forb (FG)		0.2				
	Grass & Grasslike (GG)		86.6				
	Fern (EG)		0.4				
	Other (OG)		0				
	TOTAL Native		94.7				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19	yes						
5-9							
<5			N/A				
Length of logs (m)							

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Eucalyptus largiflorens	Black Box	Myrtaceae	1	1		Tree (TG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	5	10		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	5	2000	*		No
Sisymbrium spp.		Brassicaceae	0.2	2000	*		No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	300		Shrub (SG)	No
Eleocharis spp.	Spike-rush, Spike-sedge	Cyperaceae	50	2000		Grass & grasslike (GG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.4	2000		Fern (EG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.2	100		Grass & grasslike (GG)	No
Alternanthera denticulata	Lesser Joyweed	Amaranthaceae	0.1	20		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	200		Shrub (SG)	No
Eragrostis cilianensis	Stinkgrass	Poaceae	0.1	30	*		No
Hordeum spp.	A Barley Grass	Poaceae	0.5	1000	*		No
Malva spp.	Mallow	Malvaceae	0.1	1	*		No
Duma florulenta	Lignum	Polygonaceae	0.2	5		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Juncus spp.	A Rush	Juncaceae	1	1000		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	0.3	100		Grass & grasslike (GG)	No
Eragrostis spp.	A Lovegrass	Poaceae	5	2000		Grass & grasslike (GG)	No
Erodium spp.	Crowfoot	Geraniaceae	0.1	1	*		No
Oxalis perennans		Oxalidaceae	0.1	500		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	5	*		No
Lepidium africanum	Common Peppercress	Brassicaceae	0.1	10	*		No
Rytidosperma spp.		Poaceae	30	2000		Grass & grasslike (GG)	No

PCT 13: Low-Moderate (Vegetation Zone 4)

Plot 3.3b							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		1		5m	2%	9.00%
	Shrub (SG)		7		15m	5%	
	Forb (FG)		5		25m	10%	
	Grass & Grasslike (GG)		2		35m	20%	
	Fern (EG)		0		45m	8%	
	Other (OG)		0				
	TOTAL		15				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0.2				
	Shrub (SG)		7.2				
	Forb (FG)		6.4				
	Grass & Grasslike (GG)		25				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		38.8				
	TOTAL 'HTE'		5				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80	0	1	0				
50-79	0	1	1 (30cm)				
30-49	N	1	0				
20-29	N	N	0				
10-19	N	N	0				
5-9	N	1	0				
<5	N	N	N/A				
Length of logs (m)	5						

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	2000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.2	10		Shrub (SG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	5	3	*		HTE
Crassula colorata	Dense Stonecrop	Crassulaceae	5	500		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	10	1000	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	5	50		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	2		Forb (FG)	No
Scleranthus minusculus		Caryophyllaceae	1	50		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.2	5		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.2	30		Forb (FG)	No

Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	2		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.5	30	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	500		Grass & grasslike (GG)	No
Maireana microphylla		Chenopodiaceae	1	10		Shrub (SG)	No
Atriplex nummularia	Old Man Saltbush	Chenopodiaceae	0.5	2		Shrub (SG)	No
Hordeum leporinum	Barley Grass	Poaceae	5	500	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	3		Forb (FG)	No
Eucalyptus largiflorens	Black Box	Myrtaceae	0.2	0		Tree (TG)	No

PCT 17: Moderate-Good (Vegetation Zone 5)

Plot 3.11a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		0		5m	5%	5.40%
	Shrub (SG)		9		15m	1%	
	Forb (FG)		6		25m	1%	
	Grass & Grasslike (GG)		4		35m	10%	
	Fern (EG)		0		45m	10%	
	Other (OG)		0				
	TOTAL		19				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0				
	Shrub (SG)		10				
	Forb (FG)		0.8				
	Grass & Grasslike (GG)		21.5				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		32.3				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19							
5-9							
<5			N/A				
Length of logs (m)							

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Duma florulenta	Lignum	Polygonaceae	3	50		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	5	500		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	30	2000	*		No
Chloris truncata	Windmill Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	0.2	5		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.2	5		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.2	500	*		No
Rytidosperma spp.		Poaceae	0.5	100		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	200		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	1	100		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	50		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	1	500		Shrub (SG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	1000		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	50		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.3	50		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.2	1000	*		No
Crassula spp.	Stonecrop	Crassulaceae	0.1	500		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.1	20		Shrub (SG)	No
Euphorbia drummondii			0.1	10		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	10		Shrub (SG)	No

Plot 3.3a

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	0		5m	30%	17.00%
	Shrub (SG)	6		15m	10%	
	Forb (FG)	3		25m	5%	
	Grass & Grasslike (GG)	4		35m	30%	
	Fern (EG)	1		45m	10%	
	Other (OG)	0				
	TOTAL	14				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	6.4
	Forb (FG)	0.5
	Grass & Grasslike (GG)	70.5
	Fern (EG)	0.3
	Other (OG)	0
	TOTAL Native	77.7
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Duma florulenta	Lignum	Polygonaceae	2	50		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	3	50		Shrub (SG)	No
Eragrostis spp.	A Lovegrass	Poaceae	5	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.5	200		Shrub (SG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.3	2000		Fern (EG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.5	100		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.3	20		Forb (FG)	No
Hordeum spp.	A Barley Grass	Poaceae	2	2000	*		No
Walwhalleya proluta		Poaceae	0.2	30		Grass & grasslike (GG)	No
Rytidosperma spp. (tussock 15cm tall)		Poaceae	65	2000		Grass & grasslike (GG)	No
Eragrostis cilianensis	Stinkgrass	Poaceae	0.1	30	*		No

Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.3	50		Grass & grasslike (GG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	5	*		HTE
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.2	30		Shrub (SG)	No
Enchylaena tomentosa	Ruby Saltbush	Chenopodiaceae	0.2	10		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	10		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	2	2000	*		No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	5		Forb (FG)	No

Plot 4.6a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	5
	Forb (FG)	5
	Grass & Grasslike (GG)	5
	Fern (EG)	1
	Other (OG)	0
	TOTAL	17

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	30%	9.00%
	15m	5%	
	25m	0%	
	35m	0%	
	45m	10%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	19.5
	Forb (FG)	1.1
	Grass & Grasslike (GG)	38.1
	Fern (EG)	0.3
	Other (OG)	0
	TOTAL Native	60
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29		1	
10-19			
5-9			
<5			N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Duma florulenta	Lignum	Polygonaceae	5	300		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	3	20		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	2000		Grass & grasslike (GG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	1	1		Tree (TG)	No

Lolium spp.	A Ryegrass	Poaceae	25	2000	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.5	500		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.5	2000	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	10	1000		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Hordeum spp.	A Barley Grass	Poaceae	5	2000	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	100		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	1000		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	1	1000		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.3	20		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.5	10		Shrub (SG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	30		Forb (FG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	10	*		No
Chloris truncata	Windmill Grass	Poaceae	15	2000		Grass & grasslike (GG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.3	500		Fern (EG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.1	50		Forb (FG)	No
Crassula spp.		Crassulaceae	0.1	500	#N/A	Forb (FG)	No

Plot 1.3b						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	2%	6.00%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	4		25m	10%	
	Grass & Grasslike (GG)	7		35m	10%	
	Fern (EG)	0		45m	3%	
	Other (OG)	0				
	TOTAL	16				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	19.6				
	Forb (FG)	1.2				
	Grass & Grasslike (GG)	37.8				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	58.6				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	3	500	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	2	200		Shrub (SG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.5	50		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	500		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	2	200		Shrub (SG)	No
Duma florulenta	Lignum	Polygonaceae	15	100		Shrub (SG)	No
Bulbine semibarbata	Wild Onion	Asphodelaceae	0.1	20		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.5	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.5	500		Forb (FG)	No
Austrostipa scabra subsp. falcata	Rough Speargrass	Poaceae	0.2	100		Grass & grasslike (GG)	No
Juncus amabilis		Juncaceae	0.1	20		Grass & grasslike (GG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	5		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No
Austrostipa aristiglumis	Plains Grass	Poaceae	0.5	200		Grass & grasslike (GG)	No
Tribulus terrestris	Cat-head	Zygophyllaceae	0.1	20	*		No
Arctotheca calendula	Capeweed	Asteraceae	0.1	2	*		No
Salsola australis		Chenopodiaceae	0.1	1		Shrub (SG)	No

Plot 4.2b

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	5
	Forb (FG)	9
	Grass & Grasslike (GG)	4
	Fern (EG)	1
	Other (OG)	0
	TOTAL	19

Litter Cover	Tape length	% Cover	Average %
	5m	5%	5.00%
	15m	5%	
	25m	3%	
	35m	5%	
	45m	8%	

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	48
	Forb (FG)	5.9
	Grass & Grasslike (GG)	15.2
	Fern (EG)	0.2
	Other (OG)	0
	TOTAL Native	69.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Duma florulenta	Lignum	Polygonaceae	20	100		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	20	100		Shrub (SG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	2	800		Shrub (SG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	2	2000	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	1	1000	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	3	200		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	1	30	*		No
Erodium moschatum	Musky Crowfoot	Geraniaceae	0.5	500	*		No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.2	500		Fern (EG)	No
Vittadinia dissecta		Asteraceae	1	100		Forb (FG)	No
Trifolium sp.	A Clover	Fabaceae (Faboideae)	2	2000	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	1	300		Forb (FG)	No

Erodium botrys	Long Storksbill	Geraniaceae	0.5	300	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.2	100		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	3	80		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.5	30	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.5	50		Forb (FG)	No
Cirsium vulgare	Spear Thistle	Asteraceae	0.1	1	*		No
Enneapogon spp.	Nineawn Grass, Bottlewashers	Poaceae	0.1	10		Grass & grasslike (GG)	No
Juncus amabilis		Juncaceae	0.1	2000		Grass & grasslike (GG)	No
Hordeum leporinum	Barley Grass	Poaceae	3	1000	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	2	50		Forb (FG)	No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.5	200		Forb (FG)	No
Stellaria angustifolia	Swamp Starwort	Caryophyllaceae	0.5	30		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	50		Forb (FG)	No
Marrubium vulgare	White Horehound	Lamiaceae	0.1	1	*		No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	30		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	10	200		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	20		Forb (FG)	No

Plot 5.4b						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	2%	3.00%
	Shrub (SG)	7		15m	4%	
	Forb (FG)	10		25m	2%	
	Grass & Grasslike (GG)	4		35m	2%	
	Fern (EG)	1		45m	5%	
	Other (OG)	0				
	TOTAL	22				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	45.5				
	Forb (FG)	8.1				
	Grass & Grasslike (GG)	37				
	Fern (EG)	0.1				
	Other (OG)	0				
	TOTAL Native	90.7				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Duma florulenta	Lignum	Polygonaceae	20	50		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	20	25		Shrub (SG)	No
Walwhalleya proluta		Poaceae	20	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	1	20		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	2	200		Shrub (SG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.5	1000	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.2	1000	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.1	20		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	1	15		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	2	30		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.2	80		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.2	20		Shrub (SG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.3	100	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.3	100		Forb (FG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.5	150	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	2	50		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.3	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.2	1000		Forb (FG)	No
Vittadinia dissecta		Asteraceae	2	40		Forb (FG)	No
Erodium cicutarium	Common Crowfoot	Geraniaceae	0.3	100	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	2	40		Shrub (SG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	500		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	10		Shrub (SG)	No

Austrostipa scabra	Speargrass	Poaceae	8	200		Grass & grasslike (GG)	No
Cotula australis	Common Cotula	Asteraceae	0.1	20		Forb (FG)	No
Rytidosperma spp.		Poaceae	8	200		Grass & grasslike (GG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	200		Fern (EG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.2	3	*		No
Marrubium vulgare	White Horehound	Lamiaceae	0.5	5	*		No

PCT 26: Moderate-Good-Grassy (Vegetation Zone 6)

Plot 1.2a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		1		5m	5%	5.00%
	Shrub (SG)		8		15m	0%	
	Forb (FG)		4		25m	5%	
	Grass & Grasslike (GG)		4		35m	0%	
	Fern (EG)		0		45m	15%	
	Other (OG)		0				
	TOTAL		17				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		2				
	Shrub (SG)		2.8				
	Forb (FG)		0.7				
	Grass & Grasslike (GG)		41.7				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		47.2				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19		4					
5-9							
<5			N/A				
Length of logs (m)	0						

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	2	3		Tree (TG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	40	2000		Grass & grasslike (GG)	No

Lolium spp.	A Ryegrass	Poaceae	30	2000	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	400		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	300		Shrub (SG)	No
Lepidium africanum	Common Peppercress	Brassicaceae	1	1000	*		No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	30		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	1	200		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Austrostipa nodosa	A Speargrass	Poaceae	0.5	50		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.2	200		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	5		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.4	300		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.1	1		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	0.1	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	200		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.2	300		Grass & grasslike (GG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.3	300		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.5	10		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	1	*		No
Hordeum spp.	A Barley Grass	Poaceae	0.2	200	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No

Plot 4.1a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	25%	25.60%
	Shrub (SG)	8		15m	85%	
	Forb (FG)	9		25m	2%	
	Grass & Grasslike (GG)	3		35m	15%	
	Fern (EG)	0		45m	1%	
	Other (OG)	0				
	TOTAL	21				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	12
	Shrub (SG)	10.5
	Forb (FG)	1.1
	Grass & Grasslike (GG)	0.5
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	24.1
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		8	
5-9		1	
<5		1	N/A
Length of logs (m)	1		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	2	50		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.3	150		Grass & grasslike (GG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	12	7		Tree (TG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	7	150		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.5	1000		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.5	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	1	2000	*		No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	100		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	100	*		No
Vittadinia dissecta		Asteraceae	0.1	10		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.2	100		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	10		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	20		Forb (FG)	No

Swainsona spp.		Fabaceae (Faboideae)	0.1	10		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.1	50		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	10		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Crassula spp.	Stonecrop	Crassulaceae	0.1	1000		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	5		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	10		Forb (FG)	No

Plot 4.3a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	15%	7.40%
	Shrub (SG)	10		15m	1%	
	Forb (FG)	6		25m	1%	
	Grass & Grasslike (GG)	6		35m	5%	
	Fern (EG)	1		45m	15%	
	Other (OG)	0				
	TOTAL	24				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	6
	Shrub (SG)	15.9
	Forb (FG)	0.6
	Grass & Grasslike (GG)	8.4
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	31
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29		8	
10-19			
5-9			
<5		6	N/A
Length of logs (m)	4		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Acacia pendula population in the Hunter catchment	Fabaceae (Mimosoideae)	6	4		Tree (TG)	No
Lolium spp.	A Ryegrass	Poaceae	35	2000	*		No
Oxalis perennans		Oxalidaceae	0.1	1000		Forb (FG)	No

Enteropogon ramosus	Curly Windmill Grass	Poaceae	4	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	12	2000		Shrub (SG)	No
Rytidosperma spp.		Poaceae	2	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	1	2000	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.3	50		Shrub (SG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	2	50		Shrub (SG)	No
Malva spp.	Mallow	Malvaceae	0.1	5	*		No
Maireana brevifolia		Chenopodiaceae	0.1	5		Shrub (SG)	No
Hordeum spp.	A Barley Grass	Poaceae	2	1000	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.5	100		Shrub (SG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No
Walwhalleya proluta		Poaceae	0.2	20		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	0.2	20		Grass & grasslike (GG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.2	30		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	500		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	10	*		No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	20		Fern (EG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	5		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	5		Forb (FG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	0.5	3		Shrub (SG)	No
Crassula spp.	Stonecrop	Crassulaceae	0.1	500		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Austrostipa spp.	A Speargrass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	0.1	50		Grass & grasslike (GG)	No

Plot 4.9a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		1		5m	1%	7.80%
	Shrub (SG)		7		15m	20%	
	Forb (FG)		4		25m	1%	
	Grass & Grasslike (GG)		5		35m	2%	
	Fern (EG)		0		45m	15%	
	Other (OG)		0				
	TOTAL		17				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		2				
	Shrub (SG)		6.4				
	Forb (FG)		1.3				
	Grass & Grasslike (GG)		41.5				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		51.2				
	TOTAL 'HTE'		1				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49		2					
20-29		1					
10-19		1					
5-9							
<5		4	N/A				
Length of logs (m)	4						

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Salsola australis		Chenopodiaceae	1	100		Shrub (SG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	1	20		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	2000		Grass & grasslike (GG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	2	3		Tree (TG)	No
Crassula spp.	Stonecrop	Crassulaceae	1	2000		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	2	2000	*		No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	4	2000	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	10		Forb (FG)	No
Rytidosperma spp.		Poaceae	5	2000		Grass & grasslike (GG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	50		Shrub (SG)	No
Hordeum spp.	A Barley Grass	Poaceae	0.5	50	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	10	*		No

Maireana aphylla	Cotton Bush	Chenopodiaceae	3	30		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.5	20		Shrub (SG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	10	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	20		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.5	20		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Austrostipa spp.	A Speargrass	Poaceae	0.5	20		Grass & grasslike (GG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	1	5	*		HTE
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	20		Grass & grasslike (GG)	No
Lolium spp.	A Ryegrass	Poaceae	2	1000	*		No

Plot 2.3a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	5
	Forb (FG)	7
	Grass & Grasslike (GG)	4
	Fern (EG)	0
	Other (OG)	0
	TOTAL	17

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m		
	15m		
	25m		
	35m		
	45m		

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	8
	Shrub (SG)	0.6
	Forb (FG)	0.7
	Grass & Grasslike (GG)	40.4
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	49.7
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		15	
5-9		5	N/A
<5			
Length of logs (m)			

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	8	13		Tree (TG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	40	2000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	20	2000	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	300		Forb (FG)	No
Crassula spp.	Stonecrop	Crassulaceae	0.1	2000		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	30		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.2	100		Grass & grasslike (GG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.2	20		Shrub (SG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.1	2		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	20		Shrub (SG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	20		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	100		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	5		Forb (FG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	1	*		HTE

Plot 4.7a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	10%	17.00%
	Shrub (SG)	10		15m	70%	
	Forb (FG)	7		25m	0%	
	Grass & Grasslike (GG)	3		35m	5%	
	Fern (EG)	0		45m	0%	
	Other (OG)	0				
	TOTAL	21				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	4
	Shrub (SG)	14.6
	Forb (FG)	1.5
	Grass & Grasslike (GG)	5.7
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	25.8
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		2	
5-9		1	
<5			N/A
Length of logs (m)	3		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	4	3		Tree (TG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.5	10		Shrub (SG)	No
Maireana spp.	Cotton Bush, Bluebush, Fissure-weed	Chenopodiaceae	0.5	40		Shrub (SG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	5	2000		Shrub (SG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	5	1000		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	7	2000	*		No
Crassula spp.			0.3	2000		Forb (FG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	1	15		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	1	2000	*		No
Salsola australis		Chenopodiaceae	1	2000		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Oxalis perennans		Oxalidaceae	0.1	300		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	1000		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.4	20		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.3	100	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Paspalidium spp.		Poaceae	0.3	50		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.4	10		Shrub (SG)	No

Sida corrugata	Corrugated Sida	Malvaceae	0.2	100		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.2	100		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.3	200		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.4	500		Grass & grasslike (GG)	No
Ptilotus spathulatus f. spathulatus	Pussy-tails	Amaranthaceae	0.1	30		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	10		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	30		Shrub (SG)	No
Senna spp.		Fabaceae (Caesalpinioideae)	0.1	1		Shrub (SG)	No

Plot 4.8a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	75%	22.00%
	Shrub (SG)	8		15m	0%	
	Forb (FG)	7		25m	5%	
	Grass & Grasslike (GG)	4		35m	0%	
	Fern (EG)	0		45m	30%	
	Other (OG)	0				
	TOTAL	20				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	7
	Shrub (SG)	15.1
	Forb (FG)	0.9
	Grass & Grasslike (GG)	7.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	30.2
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		3	
5-9		8	
<5		1	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	7	8		Tree (TG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	4	30		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	10		Forb (FG)	No

Maireana aphylla	Cotton Bush	Chenopodiaceae	3	30		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	5	2000		Grass & grasslike (GG)	No
Duma florulenta	Lignum	Polygonaceae	3	50		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.3	2000	*		No
Salsola australis		Chenopodiaceae	1	2000		Shrub (SG)	No
Rytidosperma spp.		Poaceae	2	1000		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	100		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.5	500		Shrub (SG)	No
Crassula spp.			0.3	2000		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	300		Shrub (SG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	100		Forb (FG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	3	20		Shrub (SG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	100		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Lolium spp.	A Ryegrass	Poaceae	0.5	500	*		No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.1	30	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	5		Forb (FG)	No

Plot 5.1a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	1%	2.20%
	Shrub (SG)	6		15m	2%	
	Forb (FG)	8		25m	1%	
	Grass & Grasslike (GG)	4		35m	2%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	19				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	1
	Shrub (SG)	6
	Forb (FG)	4.8
	Grass & Grasslike (GG)	11
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	22.8
	TOTAL 'HTE'	0.3

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		3	
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	6	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	3	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	10		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	65	2000	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	1	20		Forb (FG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	1		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	50		Shrub (SG)	No
Vittadinia dissecta		Asteraceae	0.3	20		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	2	2000		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	2	30		Shrub (SG)	No
Rhytidosporum spp.		Pittosporaceae	3	2000		Shrub (SG)	No
Asperula conferta	Common Woodruff	Rubiaceae	1	2000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	2		Shrub (SG)	No
Crassula spp.			0.2	1000		Forb (FG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	1	2		Tree (TG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.3	1	*		HTE

Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.3	5		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No
Walwhalleya proluta		Poaceae	1	200		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	1	200		Grass & grasslike (GG)	No

Plot 5.4a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	6
	Forb (FG)	5
	Grass & Grasslike (GG)	7
	Fern (EG)	1
	Other (OG)	1
	TOTAL	21

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	100%	27.00%
	15m	20%	
	25m	5%	
	35m	10%	
	45m	0%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	30
	Shrub (SG)	26.2
	Forb (FG)	0.8
	Grass & Grasslike (GG)	28.4
	Fern (EG)	0.1
	Other (OG)	1
	TOTAL Native	86.5
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49	2		
20-29	5		
10-19	4		
5-9	4		
<5	16		N/A
Length of logs (m)	25		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Acacia pendula population in the Hunter catchment	Fabaceae (Mimosoideae)	30	10		Tree (TG)	No
Lolium spp.	A Ryegrass	Poaceae	45	2000	*		No
Walwhalleya proluta		Poaceae	20	2000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.5	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	200		Grass & grasslike (GG)	No

Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	20	*		No
Amyema spp.	Mistletoe	Loranthaceae	1	8		Other (OG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	50		Fern (EG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.3	300	*		No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	25	40		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	100		Shrub (SG)	No
Rytidosperma spp.		Poaceae	5	1000		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	5		Forb (FG)	No
Enchylaena tomentosa	Ruby Saltbush	Chenopodiaceae	0.2	10		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.1	10		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.3	10		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	5		Forb (FG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	2	30		Grass & grasslike (GG)	No
Juncus spp.	A Rush	Juncaceae	0.1	5		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	5		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.5	200	*		No
Lythrum spp.		Lythraceae	0.3	300		Forb (FG)	No
Eleocharis spp.	Spike-rush, Spike-sedge	Cyperaceae	0.3	500		Grass & grasslike (GG)	No
Sisymbrium spp.		Brassicaceae	0.1	100	*		No
Rumex spp.	Dock	Polygonaceae	0.1	5	*	Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Medicago spp.	A Medic	Fabaceae (Faboideae)	0.1	20	*		No

Plot 4.1b						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	20%	13.00%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	8		25m	15%	
	Grass & Grasslike (GG)	8		35m	15%	
	Fern (EG)	0		45m	8%	
	Other (OG)	0				
	TOTAL	22				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	15
	Shrub (SG)	3.6
	Forb (FG)	1.2
	Grass & Grasslike (GG)	59
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	78.8
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	1	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	10		Forb (FG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	15	2		Tree (TG)	No
Duma florulenta	Lignum	Polygonaceae	3	5		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	2000		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	20		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.3	100		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.2	100	*		No
Sporobolus caroli	Fairy Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	20	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	20		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.2	5		Shrub (SG)	No
Vittadinia dissecta	Dissected New Holland Daisy	Asteraceae	0.1	10		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	2	*		No
Erodium cicutarium	Common Crowfoot	Geraniaceae	0.1	1	*		No

Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	8		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	510		Forb (FG)	No
Walwhalleya proluta		Poaceae	15	2000		Grass & grasslike (GG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.1	9		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.2	80		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	3	300		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	20		Forb (FG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	10	1000	*		No

Plot 2.8b

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	6
	Forb (FG)	7
	Grass & Grasslike (GG)	7
	Fern (EG)	0
	Other (OG)	0
	TOTAL	21

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	3%	4.00%
	15m	5%	
	25m	5%	
	35m	3%	
	45m	3%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	20
	Shrub (SG)	4.9
	Forb (FG)	5.8
	Grass & Grasslike (GG)	70.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	100.8
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	7	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	5		

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	10		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	1000		Grass & grasslike (GG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	15	1000		Grass & grasslike (GG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	20	7		Tree (TG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	10	1000	*		No
Sporobolus caroli	Fairy Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	5	800		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	5	500		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	8	1000	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	3	100		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	5	1000		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.2	50		Forb (FG)	No
Xanthium spinosum	Bathurst Burr	Asteraceae	0.1	20	*		HTE
Solanum esuriale	Quena	Solanaceae	0.1	10		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	20		Forb (FG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.2	1000		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.2	30	*		No
Salsola australis		Chenopodiaceae	1	50		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.2	10		Shrub (SG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.3	10		Shrub (SG)	No
Hordeum leporinum	Barley Grass	Poaceae	0.2	200	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	50		Shrub (SG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	10		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Juncus amabilis		Juncaceae	0.1	3		Grass & grasslike (GG)	No

Plot 4.4b

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum
	Tree (TG)	1
	Shrub (SG)	7
	Forb (FG)	14
	Grass & Grasslike (GG)	5
	Fern (EG)	1
	Other (OG)	0
	TOTAL	28

Litter Cover	Tape length	% Cover	Average %
	5m	65%	37.00%
	15m	15%	
	25m	90%	
	35m	5%	
	45m	10%	

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	5
	Shrub (SG)	15.7
	Forb (FG)	8.5
	Grass & Grasslike (GG)	36
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	65.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	4	0
10-19	N	7	0
5-9	N	1	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	5	1		Tree (TG)	No
Swainsona procumbens	Broughton Pea	Fabaceae (Faboideae)	0.1	1		Forb (FG)	No
Swainsona swainsonioides	Downy Swainson-pea	Fabaceae (Faboideae)	0.1	2		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.5	200		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	1	100		Forb (FG)	No
Oxalis perennans		Oxalidaceae	1	1000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.5	200		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	5	100		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	3	800		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	2	300		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	50		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	5	10		Shrub (SG)	No
Scleranthus spp.		Caryophyllaceae	0.1	10		Forb (FG)	No

Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.2	30		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	800		Grass & grasslike (GG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.2	200	*		No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	500		Fern (EG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.1	1000		Forb (FG)	No
Goodenia pusilliflora		Goodeniaceae	0.2	200		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	8	400		Grass & grasslike (GG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	100		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	50		Grass & grasslike (GG)	No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.1	200		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.5	200		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	100	*		No
Arctotheca calendula	Capeweed	Asteraceae	0.2	20	*		No
Atriplex nummularia	Old Man Saltbush	Chenopodiaceae	8	20		Shrub (SG)	No
Rytidosperma spp.		Poaceae	3	200		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.5	10		Forb (FG)	No
Bulbine semibarbata	Wild Onion	Asphodelaceae	0.1	20		Forb (FG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	5		Forb (FG)	No
Atriplex nummularia	Old Man Saltbush	Chenopodiaceae	8	20		Shrub (SG)	No
Rytidosperma spp.		Poaceae	3	200		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.5	10		Forb (FG)	No
Bulbine semibarbata	Wild Onion	Asphodelaceae	0.1	20		Forb (FG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	5		Forb (FG)	No

PCT 26: Low-Moderate-Grassy (Vegetation Zone 7)

Plot 3.5a

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	1		5m	20%	13.00%
	Shrub (SG)	2		15m	5%	
	Forb (FG)	6		25m	5%	
	Grass & Grasslike (GG)	5		35m	20%	
	Fern (EG)	0		45m	15%	
	Other (OG)	0				
	TOTAL	14				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0.2
	Shrub (SG)	0.4
	Forb (FG)	0.6
	Grass & Grasslike (GG)	45.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	46.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5		11	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	15	2000	*		No
Rytidosperma spp.		Poaceae	2	500		Grass & grasslike (GG)	No
Arctotheca calendula	Capeweed	Asteraceae	5	2000	*		No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	20		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	1	200		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	10		Shrub (SG)	No
Crassula spp.	Stonecrop	Crassulaceae	0.1	2000		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.3	50		Shrub (SG)	No
Euphorbia drummondii			0.1	10		Forb (FG)	No

Sida corrugata	Corrugated Sida	Malvaceae	0.1	100		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	10		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	10		Forb (FG)	No
Austrostipa spp.	A Speargrass	Poaceae	7	2000		Grass & grasslike (GG)	No
Acacia pendula	Acacia pendula population in the Hunter catchment	Fabaceae (Mimosoideae)	0.2	1		Tree (TG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No

PCT 26: Moderate-Good-Shrubby (Vegetation Zone 8)

Plot 4.12a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	0%	15.00%
	Shrub (SG)	9		15m	5%	
	Forb (FG)	11		25m	15%	
	Grass & Grasslike (GG)	4		35m	50%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	25				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	15
	Shrub (SG)	4.8
	Forb (FG)	12.1
	Grass & Grasslike (GG)	1.3
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	33.2
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49		1	
20-29			
10-19		1	
5-9		7	
<5		9	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	15	6		Tree (TG)	No
Goodenia pusilliflora		Goodeniaceae	1	2000		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	5	2000	*		No

Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	200		Shrub (SG)	No
Walwhalleya proluta		Poaceae	0.2	20		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.5	50		Grass & grasslike (GG)	No
Duma florulenta	Lignum	Polygonaceae	1	50		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	1	30		Shrub (SG)	No
Rytidosperma spp.		Poaceae	0.5	300		Grass & grasslike (GG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	30		Forb (FG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	5		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	20		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	1	50		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.3	20		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	20		Shrub (SG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	5	*		HTE
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	50		Forb (FG)	No
Scleranthus spp.		Caryophyllaceae	0.1	20		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	10	2000		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.2	2000	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	20		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.1	50	*		No
Alternanthera denticulata	Lesser Joyweed	Amaranthaceae	0.1	5		Forb (FG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	10		Forb (FG)	No
Enchylaena tomentosa	Ruby Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No

Plot 4.7b

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum
	Tree (TG)	1
	Shrub (SG)	8
	Forb (FG)	9
	Grass & Grasslike (GG)	5
	Fern (EG)	1
	Other (OG)	0
	TOTAL	24

Litter Cover	Tape length	% Cover	Average %
	5m	90%	48.00%
	15m	50%	
	25m	80%	
	35m	10%	
	45m	10%	

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	15
	Shrub (SG)	13.8
	Forb (FG)	1.5
	Grass & Grasslike (GG)	30.2
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	60.6
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	4	0
10-19	N	7	0
5-9	N	1	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	15	1		Tree (TG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Spergularia rubra	Sandspurry	Caryophyllaceae	0.2	20	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	50		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	10	100		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	5		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.5	25		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.3	8		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	8	20		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	3	50		Shrub (SG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	8		Shrub (SG)	No
Lepidium spp.	A Peppercress	Brassicaceae	0.1	1	*		No

Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	6		Shrub (SG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Walwhalleya proluta		Poaceae	10	1000		Grass & grasslike (GG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	6		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	11		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	5	500		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.2	50		Forb (FG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	0.2	20		Grass & grasslike (GG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	20		Fern (EG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.1	15	*		No
Duma florulenta	Lignum	Polygonaceae	2	2		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.1	2		Shrub (SG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	1		Forb (FG)	No
Euphorbia drummondii			0.1	3		Forb (FG)	No
Swainsona swainsonioides	Downy Swainson-pea	Fabaceae (Faboideae)	0.1	1		Forb (FG)	No

PCT 26: Low-Moderate-Shrubby (Vegetation Zone 9)

Plot 3.10a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	0%	10.00%
	Shrub (SG)	9		15m	0%	
	Forb (FG)	7		25m	30%	
	Grass & Grasslike (GG)	6		35m	20%	
	Fern (EG)	0		45m	0%	
	Other (OG)	0				
	TOTAL	23				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	2				
	Shrub (SG)	22.6				
	Forb (FG)	1.6				
	Grass & Grasslike (GG)	7.5				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	33.7				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19		2	
5-9			
<5			N/A
Length of logs (m)	1		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	2	2		Tree (TG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	20	1000		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	1	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	1	500		Grass & grasslike (GG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	1000		Forb (FG)	No
Teucrium spp.		Lamiaceae	0.1	30		Forb (FG)	No
Rytidosperma spp.		Poaceae	2	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Sporobolus caroli	Fairy Grass	Poaceae	2	2000		Grass & grasslike (GG)	No
Hordeum spp.	A Barley Grass	Poaceae	40	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	40	2000	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.3	200		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	1	200		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	50		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	10		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	1	20		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	50		Shrub (SG)	No
Austrostipa scabra	Speargrass	Poaceae	0.5	500		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	10		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	30		Forb (FG)	No
Walwhalleya proluta		Poaceae	1	500		Grass & grasslike (GG)	No

Duma florulenta	Lignum	Polygonaceae	0.3	10		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	30	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	20		Forb (FG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	0.2	1		Shrub (SG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.4	10		Shrub (SG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.2	10		Shrub (SG)	No

PCT 28: Low-Moderate (Vegetation Zone 10)

Plot 4.4a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	0%	00.00%
	Shrub (SG)	2		15m	0%	
	Forb (FG)	4		25m	0%	
	Grass & Grasslike (GG)	4		35m	0%	
	Fern (EG)	0		45m	0%	
	Other (OG)	0				
	TOTAL	10				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	0.5
	Forb (FG)	1.1
	Grass & Grasslike (GG)	6
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	7.6
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.3	10		Shrub (SG)	No
Crassula spp.	#N/A	#N/A	0.4	2000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	10		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.5	500		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.5	500		Forb (FG)	No

Trifolium arvense	Haresfoot Clover	Fabaceae (Faboideae)	30	2000	*		No
Solanum esuriale	Quena	Solanaceae	0.1	100		Forb (FG)	No
Hordeum spp.	A Barley Grass	Poaceae	30	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	10	2000	*		No
Paspalidium spp.		Poaceae	5	2000		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	0.3	100		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	30		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.2	30	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.2	100		Grass & grasslike (GG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	50	*		No
Vulpia spp.	Rat's-tail Fescue	Poaceae	20	2000	*		No

Plot 2.6a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		0		5m	0%	4.00%
	Shrub (SG)		2		15m	5%	
	Forb (FG)		5		25m	5%	
	Grass & Grasslike (GG)		4		35m	5%	
	Fern (EG)		0		45m	5%	
	Other (OG)		0				
	TOTAL		11				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0				
	Shrub (SG)		2.1				
	Forb (FG)		10.6				
	Grass & Grasslike (GG)		12.5				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		25.2				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19							
5-9							
<5			N/A				
Length of logs (m)							

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	2	200		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	45	2000	*		No
Hordeum spp.	A Barley Grass	Poaceae	30	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	10	2000	*		No
Cucumis myriocarpus	#N/A	#N/A	0.1	10	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.2	2000		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.2	500	*		No
Crassula spp.	#N/A	#N/A	10	2000		Forb (FG)	No
Trifolium spp.	A Clover	Fabaceae (Faboideae)	1	2000	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.2	50		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	1		Forb (FG)	No
Austrostipa scabra	Speargrass	Poaceae	2	1000		Grass & grasslike (GG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	20	*		No
Scleranthus diander	#N/A	#N/A	0.1	300		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.3	300		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	0.3	300		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	0.2	100		Grass & grasslike (GG)	No

Plot 2.7a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	90%	19.00%
	Shrub (SG)	5		15m	0%	
	Forb (FG)	4		25m	0%	
	Grass & Grasslike (GG)	7		35m	0%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	16				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	1.5
	Forb (FG)	3.6
	Grass & Grasslike (GG)	9.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	14.2
	TOTAL 'HTE'	3

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49		Yes	
20-29			
10-19			
5-9			
<5		yes (Hakea sp.)	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Austrostipa scabra	Speargrass	Poaceae	5	500		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	1	2000		Forb (FG)	No
Hordeum spp.	A Barley Grass	Poaceae	70	2000	*		No
Lycium ferocissimum	African Boxthorn	Solanaceae	3	10	*		HTE
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	20	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	1	40		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	20		Shrub (SG)	No
Crassula spp.			2	2000		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Rytidosperma spp.		Poaceae	0.2	30		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Hakea tephrosperma	Hooked Needlewood	Proteaceae	0.2	5		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.3	20		Forb (FG)	No
Eragrostis spp.	A Lovegrass	Poaceae	0.5	15		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	3	200		Grass & grasslike (GG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.3	50		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.2	20		Grass & grasslike (GG)	No

Lepidium africanum	Common Peppercress	Brassicaceae	0.5	100	*		No
Trifolium spp.	A Clover	Fabaceae (Faboideae)	0.1	50	*		No
Cucumis myriocarpus			0.1	10	*		No
Rytidosperma spp. 2		Poaceae	0.1	10		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	5		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.1	1		Shrub (SG)	No

Plot 2.8a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	0%	00.00%
	Shrub (SG)	2		15m	0%	
	Forb (FG)	2		25m	0%	
	Grass & Grasslike (GG)	6		35m	0%	
	Fern (EG)	0		45m	0%	
	Other (OG)	0				
	TOTAL	10				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	0.6
	Forb (FG)	0.2
	Grass & Grasslike (GG)	5.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	5.9
	TOTAL 'HTE'	1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)			

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	3	500		Grass & grasslike (GG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.5	100		Shrub (SG)	No
Eragrostis spp.	A Lovegrass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Hordeum spp.	A Barley Grass	Poaceae	90	2000	*		No

Rytidosperma spp.		Poaceae	1	300		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	0.2	200		Grass & grasslike (GG)	No
Eragrostis cilianensis	Stinkgrass	Poaceae	0.5	300	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	30		Shrub (SG)	No
Crassula spp.			0.1	2000		Forb (FG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	1	1	*		HTE
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	20	*		No
Trifolium spp.	A Clover	Fabaceae (Faboideae)	2	2000	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.2	300		Grass & grasslike (GG)	No
Cucumis myriocarpus	#N/A	#N/A	0.1	10	*		No
Sporobolus caroli	Fairy Grass	Poaceae	0.2	10		Grass & grasslike (GG)	No

Plot 3.6b

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	1
	Shrub (SG)	0
	Forb (FG)	4
	Grass & Grasslike (GG)	3
	Fern (EG)	0
	Other (OG)	0
	TOTAL	8

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	1%	4.00%
	15m	3%	
	25m	2%	
	35m	10%	
	45m	5%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	15
	Shrub (SG)	0
	Forb (FG)	1
	Grass & Grasslike (GG)	21
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	37
	TOTAL 'HTE'	2

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	1	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Hordeum leporinum	Barley Grass	Poaceae	70	3000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	300		Grass & grasslike (GG)	No
Arctotheca calendula	Capeweed	Asteraceae	1	500	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.5	2000		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	1	10		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	5	50		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.5	200	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No
Eragrostis cilianensis	Stinkgrass	Poaceae	0.2	10	*		No
Actinobole uliginosum	Flannel Cudweed	Asteraceae	0.2	30		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	10	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.2	100		Forb (FG)	No
Callitris glaucophylla	White Cypress Pine	Cupressaceae	15	1		Tree (TG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	2	4	*		HTE
Citrullus amarus	Wild Melon	Cucurbitaceae	1	5	*		No
Hypochaeris glabra	Smooth Catsear	Asteraceae	1	30	*		No

Plot 3.1b						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	2%	1.00%
	Shrub (SG)	3		15m	1%	
	Forb (FG)	6		25m	1%	
	Grass & Grasslike (GG)	2		35m	1%	
	Fern (EG)	0		45m	1%	
	Other (OG)	0				
	TOTAL	11				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	16.1				
	Forb (FG)	26.7				
	Grass & Grasslike (GG)	20				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	62.8				
	TOTAL 'THE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	1	0
30-49	N	1	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Proboscidea louisianica	Purple-flowered Devil's Claw	Martyniaceae	0.2	10	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	15	500	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	500		Grass & grasslike (GG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	10	1000		Forb (FG)	No
Hordeum leporinum	Barley Grass	Poaceae	20	2000	*		No
Oxalis perennans		Oxalidaceae	10	1000		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.5	100		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	20	*		No
Actinobole uliginosum	Flannel Cudweed	Asteraceae	5	20		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	1	20		Forb (FG)	No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.2	30		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.1	20		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.5	20	*		No
Erodium botrys	Long Storksbill	Geraniaceae	2	20	*		No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	15	500		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	4		Shrub (SG)	No

PCT 44: Moderate-Good (Vegetation Zone 11)

Plot 2.5a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	5		15m		
	Forb (FG)	12		25m		
	Grass & Grasslike (GG)	6		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	23				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	1.6
	Forb (FG)	1.5
	Grass & Grasslike (GG)	70.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	73.2
	TOTAL 'HTE'	0.2

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	2000		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	5	2000		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	5	1000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	50		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	50	2000	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	100		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	10		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	500		Forb (FG)	No
Pelargonium spp.		Geraniaceae	0.1	5	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.3	30		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.2	20		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	1	15		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	20	2000		Grass & grasslike (GG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	10	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	50		Forb (FG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.2	2	*		HTE
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	20		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	50		Shrub (SG)	No

Sporobolus caroli	Fairy Grass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	5	2000		Grass & grasslike (GG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	50		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	20		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.1	30		Shrub (SG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	50		Forb (FG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	20		Forb (FG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	100		Forb (FG)	No
Swainsona spp.		Fabaceae (Faboideae)	0.1	10		Forb (FG)	No
Avena spp.	Oats	Poaceae	0.1	1	*		No

Plot 3.1a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		0		5m		
	Shrub (SG)		6		15m		
	Forb (FG)		6		25m		
	Grass & Grasslike (GG)		6		35m		
	Fern (EG)		0		45m		
	Other (OG)		0				
	TOTAL		18				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0				
	Shrub (SG)		2.8				
	Forb (FG)		1.9				
	Grass & Grasslike (GG)		21.7				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		26.4				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19							
5-9							
<5			N/A				
Length of logs (m)	0						

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Rytidosperma spp.		Poaceae	8	2000		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	1	2000		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.3	200		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	12	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.5	50		Grass & grasslike (GG)	No
Lolium spp.	A Ryegrass	Poaceae	20	2000	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	2	2000		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	10	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.5	200		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	10		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	10		Forb (FG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	1	100		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Acacia semilunata		Fabaceae (Mimosoideae)	0.2	3	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	20		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.2	50		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	1		Grass & grasslike (GG)	No

Plot 3.12a						
FUNCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	5		15m		
	Forb (FG)	19		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	29				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	3.4
	Forb (FG)	5.3
	Grass & Grasslike (GG)	25.5
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	34.2
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Sporobolus caroli	Fairy Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	2000		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	10	2000		Grass & grasslike (GG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	3	2000		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	500	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	5	2000		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.1	30		Forb (FG)	No
Hyalosperma glutinosum			0.1	100		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.3	2000		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.4	1000		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	2	30		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Craspedia spp.	Billy Buttons	Asteraceae	0.2	2000		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	5		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	300		Shrub (SG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.2	30		Forb (FG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	100		Forb (FG)	No

Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	200		Forb (FG)	No
Goodenia pusilliflora		Goodeniaceae	0.1	1		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	30		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.4	60		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	10	*		No
Goodenia pinnatifida	Scrambles Eggs	Goodeniaceae	0.1	50		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	15	2000	*		No
Asperula conferta	Common Woodruff	Rubiaceae	0.2	2000		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	100		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	5		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No
Solanum esuriale	Quena	Solanaceae	0.1	1		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	1		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	10	*		No
Goodenia pinnatifida	Scrambles Eggs	Goodeniaceae	0.1	50		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	15	2000	*		No
Asperula conferta	Common Woodruff	Rubiaceae	0.2	2000		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	100		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	5		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No
Solanum esuriale	Quena	Solanaceae	0.1	1		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	1		Forb (FG)	No

Plot 4.2a

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	8		15m		
	Forb (FG)	15		25m		
	Grass & Grasslike (GG)	6		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	29				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	4.4
	Forb (FG)	2.8
	Grass & Grasslike (GG)	72.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	79.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Austrostipa nodosa	A Speargrass	Poaceae	25	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Crassula sp.		#N/A	1	2000		Forb (FG)	No
Rytidosperma spp.		Poaceae	5	2000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	3	2000		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	1	1000		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.3	500		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.2	500		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	20		Shrub (SG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.2	200		Shrub (SG)	No
Facelis retusa		Asteraceae	0.1	500	*		No
Vittadinia spp.	Fuzzweed	Asteraceae	0.2	500		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	1	1000		Grass & grasslike (GG)	No

Hyalosperma glutinosum		#N/A	0.1	500		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.2	30		Shrub (SG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.2	200		Forb (FG)	No
Rytidosperma spp. 2		Poaceae	40	2000		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.5	30		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	100		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	5	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	1		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	0.1	2000	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	20		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.1	2000		Grass & grasslike (GG)	No
Goodenia spp.		Goodeniaceae	0.1	30		Forb (FG)	No
Scleranthus spp.		Caryophyllaceae	0.1	30		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	300		Forb (FG)	No
Myriocephalus spp.		Haloragaceae	0.1	200		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	20		Forb (FG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	1	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No
Hordeum spp.	A Barley Grass	Poaceae	0.1	100	*		No
Cotula spp.		Asteraceae	0.1	50	*		No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	5		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	1		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No

Plot 4.11a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	7		15m		
	Forb (FG)	5		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	17				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	7.3
	Forb (FG)	2.6
	Grass & Grasslike (GG)	32.5
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	42.4
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	2000		Grass & grasslike (GG)	No
Hordeum spp.	A Barley Grass	Poaceae	5	2000	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	50		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	10	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	15	2000	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	1		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	5	50		Shrub (SG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	2	1000		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	1	2000	*		No
Crassula spp.	#N/A	#N/A	0.3	2000	#N/A	Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.3	200		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	1	500		Shrub (SG)	No
Rytidosperma spp.		Poaceae	10	2000		Grass & grasslike (GG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	30		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.1	100		Forb (FG)	No

Chloris truncata	Windmill Grass	Poaceae	2	1000		Grass & grasslike (GG)	No
Eragrostis cilianensis	Stinkgrass	Poaceae	0.1	5	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	50		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.3	30		Shrub (SG)	No

Plot 1.1b

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	5%	5%
	Shrub (SG)	6		15m	5%	
	Forb (FG)	7		25m	3%	
	Grass & Grasslike (GG)	6		35m	8%	
	Fern (EG)	0		45m	4%	
	Other (OG)	0				
	TOTAL	19				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	1.7
	Forb (FG)	6.9
	Grass & Grasslike (GG)	64
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	72.6
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	30	1000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	10	500		Grass & grasslike (GG)	No
Austrostipa spp.		Poaceae	5	500		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.5	50		Shrub (SG)	No

Atriplex nummularia	Old Man Saltbush	Chenopodiaceae	0.2	1		Shrub (SG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	10	2000	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	3	1000		Forb (FG)	No
Trifolium arvense	Haresfoot Clover	Fabaceae (Faboideae)	0.1	20	*		No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	1	50		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.5	20		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.5	30		Shrub (SG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	2	200		Grass & grasslike (GG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.3	10		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	5		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	2		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.5	50	*		No
Hordeum leporinum	Barley Grass	Poaceae	0.2	50	*		No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Avena fatua	Wild Oats	Poaceae	0.1	20	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.2	50		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	10	*		No
Oxalis perennans		Oxalidaceae	2	1000		Forb (FG)	No
Marrubium vulgare	White Horehound	Lamiaceae	0.1	1	*		No
Austrostipa scabra	Speargrass	Poaceae	2	50		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	2		Forb (FG)	No

Plot 2.3b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	8%	6%
	Shrub (SG)	7		15m	5%	
	Forb (FG)	8		25m	5%	
	Grass & Grasslike (GG)	4		35m	10%	
	Fern (EG)	0		45m	2%	
	Other (OG)	0				
	TOTAL	19				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	0.7
	Forb (FG)	2.3
	Grass & Grasslike (GG)	61
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	64
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	40	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	5	500	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	1	100		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	10	500		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	10	500		Grass & grasslike (GG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	200			No
Austrostipa nodosa	A Speargrass	Poaceae	1	100		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.1	2		Shrub (SG)	No
Sclerolaena tricuspis		Cyperaceae	0.1	2		Shrub (SG)	No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	2		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	0.1	2		Shrub (SG)	No
Vittadinia spp.	Fuzzweed	Asteraceae	0.2	10		Forb (FG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	10		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.1	1	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.2	10		Forb (FG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.5	50		Forb (FG)	No

Sida corrugata	Corrugated Sida	Malvaceae	0.1	3		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.1	1	*		No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	1	*		No
Goodenia pusilliflora		Goodeniaceae	0.1	1		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	1		Shrub (SG)	No

Plot 2.5b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	10%	10%
	Shrub (SG)	3		15m	12%	
	Forb (FG)	7		25m	10%	
	Grass & Grasslike (GG)	6		35m	15%	
	Fern (EG)	0		45m	2%	
	Other (OG)	0				
	TOTAL	17				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0.1
	Shrub (SG)	2.5
	Forb (FG)	7.5
	Grass & Grasslike (GG)	45
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	55.1
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	1	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Erodium crinitum	Blue Crowfoot	Geraniaceae	5	50		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	5	50	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	2	200		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	2	200	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.5	50		Shrub (SG)	No
Austrostipa scabra	Speargrass	Poaceae	20	2000		Grass & grasslike (GG)	No

Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	2	100		Grass & grasslike (GG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	1	50		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	5		Forb (FG)	No
Actinobole uliginosum	Flannel Cudweed	Asteraceae	0.1	10		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	20	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	200		Grass & grasslike (GG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	1	20		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	50		Forb (FG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	20		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	2		Forb (FG)	No
Acacia pendula	Acacia pendula population in the Hunter catchment	Fabaceae (Mimosoideae)	0.1	1		Tree (TG)	No
Hordeum leporinum	Barley Grass	Poaceae	10	2000	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No

Plot 4.3b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	15%	12%
	Shrub (SG)	3		15m	5%	
	Forb (FG)	11		25m	10%	
	Grass & Grasslike (GG)	6		35m	5%	
	Fern (EG)	0		45m	25%	
	Other (OG)	0				
	TOTAL	20				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	0.3				
	Forb (FG)	11.2				
	Grass & Grasslike (GG)	80.2				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	91.7				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Leucochrysum molle	Hoary Sunray	Asteraceae	10	500		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	50		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	5		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.2	100	*		No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	2		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	30	3000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	30		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	500		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	40		Forb (FG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	8		Forb (FG)	No
Austrostipa scabra	Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	9		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	2		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	0.1	7		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.2	100		Grass & grasslike (GG)	No
Facelis retusa		Asteraceae	0.1	15	*		No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	50		Forb (FG)	No
Leptorhynchos squamatus	Scaly Buttons	Asteraceae	0.2	100		Forb (FG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.1	100		Forb (FG)	No
Goodenia fascicularis	Mallee Goodenia	Goodeniaceae	0.1	10		Forb (FG)	No

Plot 4.5b

FUCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	0		5m	3%	12%
	Shrub (SG)	4		15m	2%	
	Forb (FG)	9		25m	15%	
	Grass & Grasslike (GG)	6		35m	30%	
	Fern (EG)	1		45m	10%	
	Other (OG)	0				
	TOTAL	20				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	0.5
	Forb (FG)	1.9
	Grass & Grasslike (GG)	50.5
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	53
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Spergularia rubra	Sandspurry	Caryophyllaceae	0.1	50	*		No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.5	100		Forb (FG)	No
Myriocephalus rhizocephalus	Woolly-heads	Asteraceae	0.5	200		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	15	1500		Grass & grasslike (GG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	100		Forb (FG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	20		Fern (EG)	No
Maireana excavata		Chenopodiaceae	0.1	10		Shrub (SG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	8		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.5	50		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Hyalosperma glutinosum subsp. glutinosum		Asteraceae	0.2	100		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	500		Grass & grasslike (GG)	No

Austrostipa nodosa	A Speargrass	Poaceae	20	2000		Grass & grasslike (GG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.2	100		Forb (FG)	No
Unknown forb 1			0.1	1		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	3		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	50	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	2		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	3	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	5		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.2	2		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	5		Forb (FG)	No
Rytidosperma spp.		Poaceae	5	1000		Grass & grasslike (GG)	No

Plot 5.2b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	8
	Forb (FG)	8
	Grass & Grasslike (GG)	9
	Fern (EG)	0
	Other (OG)	0
	TOTAL	25

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	8%	8%
	15m	5%	
	25m	5%	
	35m	15%	
	45m	5%	

	Stratum	**Sum**
Count of cover abundance (native vascular plants)	Tree (TG)	0
	Shrub (SG)	22.9
	Forb (FG)	3.3
	Grass & Grasslike (GG)	66.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	92.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	500		Grass & grasslike (GG)	No

Chloris truncata	Windmill Grass	Poaceae	2	100		Grass & grasslike (GG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	5	200		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.5	1000		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	6	300		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	20	15		Shrub (SG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	1	1000	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.2	200		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.3	300		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	1	100		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	150		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.2	50		Shrub (SG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.2	40		Shrub (SG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	200		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	1	100		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	80		Shrub (SG)	No
Juncus amabilis		Juncaceae	0.1	10		Grass & grasslike (GG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	1000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	50		Shrub (SG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	100		Forb (FG)	No
Walwhalleya proluta		Poaceae	20	500		Grass & grasslike (GG)	No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.1	200		Forb (FG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	6	300		Grass & grasslike (GG)	No
Maireana excavata		Chenopodiaceae	0.2	15		Shrub (SG)	No
Geranium spp.		Geraniaceae	0.1	5	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No

Plot 5.6b

FUCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	0		5m	10%	8%
	Shrub (SG)	5		15m	15%	
	Forb (FG)	9		25m	2%	
	Grass & Grasslike (GG)	4		35m	15%	
	Fern (EG)	0		45m	0%	
	Other (OG)	0				
	TOTAL	18				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	9
	Forb (FG)	13.7
	Grass & Grasslike (GG)	64
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	86.7
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Oxalis perennans		Oxalidaceae	1	1000		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	25	1000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	2	100		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	2	80		Shrub (SG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	8	3000		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	25	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	1	1000	*		No
Cotula spp.		Asteraceae	0.1	10	*		No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	30		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	3	30		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	7	50		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	7	50		Grass & grasslike (GG)	No

Arctotheca calendula	Capeweed	Asteraceae	2	200	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.5	300		Forb (FG)	No
Goodenia pusilliflora		Goodeniaceae	0.5	300		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.3	150		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	2	300		Shrub (SG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.2	40	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.5	50	*		No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	20		Forb (FG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.2	30		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	2	10		Shrub (SG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	1	20		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	2	80		Shrub (SG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	8	3000		Forb (FG)	No

Plot 3.13a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	12
	Grass & Grasslike (GG)	4
	Fern (EG)	0
	Other (OG)	0
	TOTAL	19

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m		
	15m		
	25m		
	35m		
	45m		

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	10.2
	Forb (FG)	41.5
	Grass & Grasslike (GG)	1.3
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	53
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Leucochrysum molle	Hoary Sunray	Asteraceae	30	2000		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	10	100		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	10	2000	*		No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	10	2000		Forb (FG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	30		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.5	2000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	100		Forb (FG)	No
Goodenia pusilliflora		Goodeniaceae	0.1	1000		Forb (FG)	No
Erodium spp.	Crowfoot	Geraniaceae	0.1	10	*		No
Rytidosperma spp.		Poaceae	1	300		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	50		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	20		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	5		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Hordeum spp.	A Barley Grass	Poaceae	0.5	1000	*		No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	50		Forb (FG)	No
Crassula spp.	Stonecrop	Crassulaceae	0.1	500		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.1	5		Grass & grasslike (GG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	500	*		No

PCT 44: Low-Moderate (Vegetation Zone 12)

Plot 1.3a							
FUNCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		0		5m		
	Shrub (SG)		4		15m		
	Forb (FG)		6		25m		
	Grass & Grasslike (GG)		5		35m		
	Fern (EG)		0		45m		
	Other (OG)		0				
	TOTAL		15				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0				
	Shrub (SG)		1				
	Forb (FG)		2.7				
	Grass & Grasslike (GG)		102.1				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		105.8				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80							
50-79							
30-49							
20-29							
10-19							
5-9							
<5			N/A				
Length of logs (m)							

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Austrostipa nodosa	A Speargrass	Poaceae	30	2000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	40	2000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	30	2000		Grass & grasslike (GG)	No
Eragrostis spp.	A Lovegrass	Poaceae	0.1	10	*		No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	10	2000	*		No
Crassula spp.			0.3	2000		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	500		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	50	2000	*		No
Oxalis perennans		Oxalidaceae	0.1	1000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	100		Shrub (SG)	No
Lepidium africanum	Common Peppercress	Brassicaceae	0.1	50	*		No

Rytidosperma spp.		Poaceae	2	1000		Grass & grasslike (GG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	10	*		No
Rumex tenax	Shiny Dock	Polygonaceae	0.1	5		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	50		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	2	500		Forb (FG)	No
Trifolium spp.	A Clover	Fabaceae (Faboideae)	0.1	100	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	100	*		No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	30	*		No
Hordeum spp.	A Barley Grass	Poaceae	0.1	50	*		No
Salsola australis		Chenopodiaceae	0.2	500		Shrub (SG)	No
Rytidosperma spp. 2		Poaceae	0.1	50		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.1	2000		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	100	*		No

Plot 1.6b

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	4
	Grass & Grasslike (GG)	6
	Fern (EG)	0
	Other (OG)	0
	TOTAL	13

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	5%	4.00%
	15m	5%	
	25m	5%	
	35m	3%	
	45m	2%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	12.1
	Forb (FG)	6.1
	Grass & Grasslike (GG)	55.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	73.3
	TOTAL 'HTE'	0.2

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)			

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Crassula colorata	Dense Stonecrop	Crassulaceae	2	1000		Forb (FG)	No
Hordeum leporinum	Barley Grass	Poaceae	8	1000	*		No
Austrostipa nodosa	A Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	100		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	10	500		Shrub (SG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	2	100		Shrub (SG)	No
Austrostipa scabra	Speargrass	Poaceae	15	1000		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	3	1000		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.1	10		Shrub (SG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	1	*		HTE
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No
Eragrostis cilianensis	Stinkgrass	Poaceae	2	100	*		No
Xanthium spinosum	Bathurst Burr	Asteraceae	0.1	2	*		HTE
Cyperus sp.	#N/A	#N/A	0.1	3		Grass & grasslike (GG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	1	10		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	100		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	10	500		Shrub (SG)	No

Plot 3.2b

FUNCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	6
	Grass & Grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	14

Litter Cover	Tape length	% Cover	Average %
	5m	3%	2.00%
	15m	2%	
	25m	1%	
	35m	3%	
	45m	3%	

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	Sum
	Shrub (SG)	0
	Forb (FG)	0.4
	Grass & Grasslike (GG)	7.3
	Fern (EG)	38.4
	Other (OG)	0
	TOTAL Native	0
	TOTAL 'HTE'	46.1

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	1	0
30-49	N	1	0
20-29	N	N	0
10-19	N	N	0
5-9	N	1	0
<5	N	N	N/A
Length of logs (m)	8		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Proboscidea louisianica	Purple-flowered Devil's Claw	Martyniaceae	0.1	20	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	5	1000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	500		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	10	500		Grass & grasslike (GG)	No
Hordeum leporinum	Barley Grass	Poaceae	40	2000	*		No
Eragrostis cilianensis	Stinkgrass	Poaceae	2	20	*		No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	8	200		Grass & grasslike (GG)	No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.1	100		Forb (FG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	1	2000		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	2	200		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	2	100	*		No

Erodium crinitum	Blue Crowfoot	Geraniaceae	3	1000		Forb (FG)	No
Actinobole uliginosum	Flannel Cudweed	Asteraceae	1	500		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Erodium cicutarium	Common Crowfoot	Geraniaceae	0.2	100	*		No
Salsola australis		Chenopodiaceae	0.2	20		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	100	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	1		Shrub (SG)	No
Citrullus amarus	Wild Melon	Cucurbitaceae	0.1	2	*		No
Walwhalleya proluta		Poaceae	0.2	10		Grass & grasslike (GG)	No
Xanthium spinosum	Bathurst Burr	Asteraceae	0.1	1	*		HTE
Vittadinia dissecta		Asteraceae	0.2	2		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.2	10		Grass & grasslike (GG)	No

Plot 3.7b

FUNCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	4
	Forb (FG)	5
	Grass & Grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	14

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	15%	10.00%
	15m	15%	
	25m	10%	
	35m	5%	
	45m	5%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	Sum
	Shrub (SG)	0
	Forb (FG)	0.6
	Grass & Grasslike (GG)	7.3
	Fern (EG)	80
	Other (OG)	0
	TOTAL Native	0
	TOTAL 'HTE'	87.9

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	M	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	3000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	2	200	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	5	500		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	2	150		Forb (FG)	No
Maireana microcarpa		Chenopodiaceae	0.2	20		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	15	1500		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	15	1500		Grass & grasslike (GG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	20	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	5		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	20		Shrub (SG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	3	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	5		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	2	*		No
Bulbine semibarbata	Wild Onion	Asphodelaceae	0.1	6		Forb (FG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	2		Shrub (SG)	No

PCT 45: Moderate-Good (Vegetation Zone 13)

Plot 5.1b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	60%	21%
	Shrub (SG)	5		15m	20%	
	Forb (FG)	8		25m	10%	
	Grass & Grasslike (GG)	5		35m	10%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	18				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	5.5				
	Forb (FG)	1				
	Grass & Grasslike (GG)	88.1				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	94.6				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Walwhalleya proluta		Poaceae	50	5000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	3	300		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	5	500		Shrub (SG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	15		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	12		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.2	50		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	2		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	15		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	50		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.1	8		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	30	3000		Grass & grasslike (GG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	2		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.1	50	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.3	6000	*		No
Juncus amabilis		Juncaceae	0.1	3		Grass & grasslike (GG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	60		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	2		Forb (FG)	No

Plot 5.5b

FUCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	0		5m	20%	11%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	9		25m	20%	
	Grass & Grasslike (GG)	6		35m	5%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	20				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	13.3
	Forb (FG)	1.9
	Grass & Grasslike (GG)	54.1
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	69.3
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Austrostipa aristiglumis	Plains Grass	Poaceae	30	3000		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	15	1500		Grass & grasslike (GG)	No
Hordeum leporinum	Barley Grass	Poaceae	30	3000	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	8	80		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	1	100		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	5	500	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Maireana excavata		Chenopodiaceae	0.1	6		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	2	200		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	3	300	*		No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	7		Shrub (SG)	No

Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	2	100		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	15		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	4	*		No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	6		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	3	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	12		Forb (FG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	5	3		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.2	20	*		No
Juncus spp.	A Rush	Juncaceae	0.1	2		Grass & grasslike (GG)	No
Unknown asteraceae			0.2	100		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	15		Forb (FG)	No
Swainsona swainsonioides	Downy Swainson-pea	Fabaceae (Faboideae)	0.1	2		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	10		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	4		Forb (FG)	No

PCT 45: Low-Moderate (Vegetation Zone 14)

Plot 5.3b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	6
	Forb (FG)	3
	Grass & Grasslike (GG)	4
	Fern (EG)	0
	Other (OG)	0
	TOTAL	13

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	5%	5%
	15m	7%	
	25m	2%	
	35m	5%	
	45m	8%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	12.3
	Forb (FG)	0.5
	Grass & Grasslike (GG)	61
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	73.8
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A

Length of logs (m)	0

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Walwhalleya proluta		Poaceae	50	5000		Grass & grasslike (GG)	No
Xanthium spinosum	Bathurst Burr	Asteraceae	0.1	10	*		HTE
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	5	25		Shrub (SG)	No
Duma florulenta	Lignum	Polygonaceae	3	20		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	1	10		Shrub (SG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.2	15		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Hordeum leporinum	Barley Grass	Poaceae	25	3000	*		No
Sporobolus caroli	Fairy Grass	Poaceae	3	300		Grass & grasslike (GG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	15		Forb (FG)	No
Hypochaeris spp.	A Catsear	Asteraceae	0.1	5	*		No
Oxalis perennans		Oxalidaceae	0.2	100		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	3	30		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	8	*		No
Austrostipa aristiglumis	Plains Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	3	300		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	6		Forb (FG)	No

PCT 46: Moderate-Good (Vegetation Zone 15)

Plot 2.2a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	6		15m		
	Forb (FG)	7		25m		
	Grass & Grasslike (GG)	7		35m		
	Fern (EG)	0		45m		
	Other (OG)	1				
	TOTAL	21				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	6.6				
	Forb (FG)	1.6				
	Grass & Grasslike (GG)	21				
	Fern (EG)	0				
	Other (OG)	0.1				
	TOTAL Native	29.3				
	TOTAL 'HTE'	0.1				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	5	1000		Grass & grasslike (GG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	0.1	10		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	0.2	100		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	1	2000		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	5	2000		Shrub (SG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	1	50		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	200		Shrub (SG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.1	30		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	50	2000	*		No
Oxalis perennans		Oxalidaceae	0.1	2000		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.5	2000	*		No
Sonchus spp.	Sowthistle	Asteraceae	0.1	50	*		No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Xanthium occidentale	Noogoora Burr	Asteraceae	0.1	2	*		HTE
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	1		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	5	*		No
Geranium spp.		Geraniaceae	0.1	1	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	10		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Cirsium vulgare	Spear Thistle	Asteraceae	0.1	1	*		No
Pelargonium spp.		Geraniaceae	0.1	1	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	10		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	10		Grass & grasslike (GG)	No

Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	20		Shrub (SG)	No
Convolvulus erubescens	Pink Bindweed	Convolvulaceae	0.1	10		Other (OG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	1		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	100		Grass & grasslike (GG)	No
Juncus spp.	A Rush	Juncaceae	0.1	5		Grass & grasslike (GG)	No

Plot 2.4a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	6
	Forb (FG)	7
	Grass & Grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	18

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m		
	15m		
	25m		
	35m		
	45m		

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	1.4
	Forb (FG)	1
	Grass & Grasslike (GG)	49.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	51.6
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	45	2000		Grass & grasslike (GG)	No
Xanthium occidentale	Noogoora Burr	Asteraceae	0.1	30	*		HTE
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.4	30		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	20		Shrub (SG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	65	2000	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.2	20		Forb (FG)	No

Rytidosperma spp.		Poaceae	2	1000		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.2	50		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	30		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	30		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	1000		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.4	5		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	20		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	10		Forb (FG)	No
Juncus spp.	A Rush	Juncaceae	0.1	2		Grass & grasslike (GG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	5	*		No
Walwhalleya proluta		Poaceae	2	100		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	0.1	5		Grass & grasslike (GG)	No
Geranium spp.		Geraniaceae	0.1	5	*		No
Duma florulenta	Lignum	Polygonaceae	0.1	10		Shrub (SG)	No

Plot 4.10a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	7		15m		
	Forb (FG)	9		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	21				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	4.4				
	Forb (FG)	1.4				
	Grass & Grasslike (GG)	77				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	82.8				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	25	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	500		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	3	30		Shrub (SG)	No
Goodenia pusilliflora		Goodeniaceae	0.4	2000		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.3	100		Shrub (SG)	No
Crassula spp.	#N/A	#N/A	0.2	2000	#N/A		No
Salsola australis		Chenopodiaceae	0.3	500		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	10	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.4	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	30		Forb (FG)	No
Rytidosperma spp.		Poaceae	20	2000		Grass & grasslike (GG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.3	2000	*		No
Eriochlamys squamata		Asteraceae	0.2	500		Forb (FG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	50		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	20	2000		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	50		Forb (FG)	No
Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.2	1		Shrub (SG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No

Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.2	30		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	5	2000	*		No
Vittadinia dissecta		Asteraceae	0.1	5		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	1		Shrub (SG)	No

Plot 5.2a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	6		15m		
	Forb (FG)	4		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	15				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	0.7
	Grass & Grasslike (GG)	26.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	27.9
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	15	2000		Grass & grasslike (GG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.2	20		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	65	2000	*		No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	25	2000	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	20		Forb (FG)	No

Rytidosperma spp.		Poaceae	0.5	200		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.2	500		Shrub (SG)	No
Vittadinia dissecta		Asteraceae	0.2	100		Forb (FG)	No
Crassula spp.	#N/A	#N/A	0.2	2000	#N/A	Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.1	500		Forb (FG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.1	5	*		No
Sporobolus caroli	Fairy Grass	Poaceae	0.5	500		Grass & grasslike (GG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Avena spp.	Oats	Poaceae	0.1	1	*		No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.3	2		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.2	20		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	5		Shrub (SG)	No

Plot 1.2b

FUCTION ATTRIBUTES

Count of Native Richness

Stratum	Sum
Tree (TG)	0
Shrub (SG)	5
Forb (FG)	7
Grass & Grasslike (GG)	8
Fern (EG)	0
Other (OG)	0
TOTAL	20

Litter Cover

Tape length	% Cover	Average %
5m	8%	5%
15m	2%	
25m	15%	
35m	0%	
45m	0%	

Count of cover abundance (native vascular plants)

Stratum	Sum
Tree (TG)	0
Shrub (SG)	3
Forb (FG)	5.6
Grass & Grasslike (GG)	89
Fern (EG)	0
Other (OG)	0
TOTAL Native	97.6
TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A

Length of logs (m)	0

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	25	1000		Grass & grasslike (GG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	5	1000		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	8	1000		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	20	1000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	2	50		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.5	20		Shrub (SG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	10	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	50		Shrub (SG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.3	200	*		No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	10	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	5	*		No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	20		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	20		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	30		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	10		Forb (FG)	No
Lepidium spp.	A Peppercress	Brassicaceae	0.1	5	*		No
Hordeum leporinum	Barley Grass	Poaceae	0.1	100	*		No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	8	1000		Grass & grasslike (GG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	2		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	2		Shrub (SG)	No
Rytidosperma fulvum	Wallaby Grass	Poaceae	8	1000		Grass & grasslike (GG)	No

Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	10		Forb (FG)	No
Lepidium spp.	A Peppercress	Brassicaceae	0.1	5	*		No
Hordeum leporinum	Barley Grass	Poaceae	0.1	100	*		No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	8	1000		Grass & grasslike (GG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	2		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	2		Shrub (SG)	No
Rytidosperma fulvum	Wallaby Grass	Poaceae	8	1000		Grass & grasslike (GG)	No

Plot 2.4b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	10%	4%
	Shrub (SG)	5		15m	3%	
	Forb (FG)	8		25m	2%	
	Grass & Grasslike (GG)	6		35m	2%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	19				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	5.7
	Forb (FG)	2.2
	Grass & Grasslike (GG)	71
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	78.9
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Austrostipa nodosa	A Speargrass	Poaceae	10	500		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	1000		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.5	10		Shrub (SG)	No

Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	200	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	1	1000	*		No
Goodenia pusilliflora		Goodeniaceae	1	1000		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	3	100		Shrub (SG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.5	1000		Forb (FG)	No
Facelis retusa		Asteraceae	0.1	1000	*		No
Salsola australis		Chenopodiaceae	0.2	100		Shrub (SG)	No
Cotula spp.		Asteraceae	0.1	1000	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.1	1000		Forb (FG)	No
Austrostipa spp.		Poaceae	15	1000		Grass & grasslike (GG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	50		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Vittadinia spp.	Fuzzweed	Asteraceae	0.1	500		Forb (FG)	No
Actinobole uliginosum	Flannel Cudweed	Asteraceae	0.1	50		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	1	100		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	1	200		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	8	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	8	1000		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.2	20		Forb (FG)	No
Hyalosperma glutinosum subsp. glutinosum		Asteraceae	0.1	50		Forb (FG)	No

Plot 3.5b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	10%	14%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	12		25m	5%	
	Grass & Grasslike (GG)	6		35m	20%	
	Fern (EG)	0		45m	30%	
	Other (OG)	0				
	TOTAL	23				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	0.6				
	Forb (FG)	1.8				
	Grass & Grasslike (GG)	80.5				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	82.9				
	TOTAL 'HTE'	0.5				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.2	50		Shrub (SG)	No
Maireana excavata		Chenopodiaceae	0.1	3		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	30	3000		Grass & grasslike (GG)	No
Stellaria angustifolia	Swamp Starwort	Caryophyllaceae	0.3	200		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	50	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.5	50		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	5		Shrub (SG)	No
Bulbine semibarbata	Wild Onion	Asphodelaceae	0.1	20		Forb (FG)	No
Austrostipa scabra	Plains Grass	Poaceae	15	1500		Grass & grasslike (GG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	2		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	2	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.5	1	*		HTE
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	25	2500		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Scleranthus pungens		Caryophyllaceae	0.1	2		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	1		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	0.5	50		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No

Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	5		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	5		Forb (FG)	No
Solanum esuriale	Quena	Solanaceae	0.1	1		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	1		Forb (FG)	No
Swainsona procumbens	Broughton Pea	Fabaceae (Faboideae)	0.1	1		Forb (FG)	No

Plot 3.8b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	5%	8%
	Shrub (SG)	4		15m	2%	
	Forb (FG)	6		25m	10%	
	Grass & Grasslike (GG)	4		35m	20%	
	Fern (EG)	1		45m	5%	
	Other (OG)	0				
	TOTAL	15				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	5.2
	Forb (FG)	5.6
	Grass & Grasslike (GG)	73
	Fern (EG)	0.5
	Other (OG)	0
	TOTAL Native	84.3
	TOTAL 'THE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Cheilanthes sieberi	Rock Fern	Pteridaceae	0.5	1000		Fern (EG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	500		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Erodium botrys	Long Storksbill	Geraniaceae	0.2	300	*		No
Austrostipa nodosa	A Speargrass	Poaceae	40	2000		Grass & grasslike (GG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	1	2000		Forb (FG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	1	300		Forb (FG)	No

Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	3	70		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	10	300		Grass & grasslike (GG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	1	100	*		No
Hypochaeris glabra	Smooth Catsear	Asteraceae	1	200	*		No
Vittadinia dissecta		Asteraceae	2	40		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	2	10		Shrub (SG)	No
Goodenia pusilliflora		Goodeniaceae	0.5	300		Forb (FG)	No
Sclerolaena spp.		Caryophyllaceae	0.1	10		Shrub (SG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	10		Forb (FG)	No
Vittadinia dissecta		Asteraceae	1	200		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	1	100	*		No
Sporobolus caroli	Fairy Grass	Poaceae	3	500		Grass & grasslike (GG)	No
Facelis retusa		Asteraceae	0.1	20	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	5	500	*		No
Taraxacum officinale	Dandelion	Asteraceae	1	200	*		No

Plot 4.9b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	4
	Forb (FG)	11
	Grass & Grasslike (GG)	9
	Fern (EG)	1
	Other (OG)	0
	TOTAL	25

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	40%	29%
	15m	80%	
	25m	10%	
	35m	5%	
	45m	8%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	0.7
	Forb (FG)	1.9
	Grass & Grasslike (GG)	85.2
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	87.9
	TOTAL 'THE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	200		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	30	3000		Grass & grasslike (GG)	No
Maireana excavata		Chenopodiaceae	0.2	12		Shrub (SG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.5	26		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.1	31	*		No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	20	2000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	40		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	20		Forb (FG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.2	200		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	100		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	50		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	50		Forb (FG)	No
Juncus amabilis		Juncaceae	0.1	2		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	15		Forb (FG)	No
Cotula australis	Common Cotula	Asteraceae	0.1	12		Forb (FG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	50		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	8	800		Grass & grasslike (GG)	No
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	2		Fern (EG)	No
Erodium cicutarium	Common Crowfoot	Geraniaceae	0.1	8	*		No
Walwhalleya proluta		Poaceae	10	1000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.2	200		Forb (FG)	No
Juncus flavidus		Juncaceae	0.1	4		Grass & grasslike (GG)	No

Euphorbia drummondii			0.1	6		Forb (FG)	No
Duma florulenta	Lignum	Polygonaceae	0.2	1		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Hypochaeris glabra	Smooth Catsear	Asteraceae	0.5	50	*		No

Plot 4.10b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	5
	Forb (FG)	10
	Grass & Grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	20

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	60%	35%
	15m	20%	
	25m	20%	
	35m	35%	
	45m	40%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	10.5
	Forb (FG)	10.2
	Grass & Grasslike (GG)	70
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	90.7
	TOTAL 'THE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sporobolus caroli	Fairy Grass	Poaceae	30	1000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	25	1000		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	3	10		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	8	10		Shrub (SG)	No
Austrostipa nodosa	A Speargrass	Poaceae	5	100		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	1	500		Shrub (SG)	No

Erodium botrys	Long Storksbill	Geraniaceae	0.5	200	*		No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.5	200		Shrub (SG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	1	300		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	8	500		Grass & grasslike (GG)	No
Rhodanthe citrina		Asteraceae	1	300		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.8	50		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.5	300		Shrub (SG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.2	100		Forb (FG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	0.1	300	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	2	1000	*		No
Hordeum leporinum	Barley Grass	Poaceae	2	1000	*		No
Goodenia pusilliflora		Goodeniaceae	0.5	200		Forb (FG)	No
Crassula colorata	Dense Stonecrop	Crassulaceae	0.5	1000		Forb (FG)	No
Oxalis perennans		Oxalidaceae	0.2	1000		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	1	200		Forb (FG)	No
Vittadinia dissecta		Asteraceae	2	50		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	3	*		No
Chloris truncata	Windmill Grass	Poaceae	2	100		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.5	5		Shrub (SG)	No

PCT 46: Low-Moderate (Vegetation Zone 16)

Plot 4.13a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	3		15m		
	Forb (FG)	2		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	10				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	1.2				
	Forb (FG)	0.3				
	Grass & Grasslike (GG)	65.3				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	66.8				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	55	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	10	2000	*		No
Chloris truncata	Windmill Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	30		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	50	2000	*		No
Austrostipa nodosa	A Speargrass	Poaceae	0.1	5		Grass & grasslike (GG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	5		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	2		Shrub (SG)	No
Lepidium africanum	Common Peppercress	Brassicaceae	0.1	5	*		No
Hordeum spp.	A Barley Grass	Poaceae	0.5	50	*		No
Maireana decalvans	Black Cotton Bush	Chenopodiaceae	0.1	1		Shrub (SG)	No
Walwhalleya proluta		Poaceae	0.2	20		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.2	2000		Forb (FG)	No

Plot 1.1a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	7		15m		
	Forb (FG)	6		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	18				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	2.1
	Forb (FG)	1.9
	Grass & Grasslike (GG)	62.8
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	66.8
	TOTAL 'HTE'	0

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5			N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	60	2000		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	10		Shrub (SG)	No
Walwhalleya proluta		Poaceae	1	500		Grass & grasslike (GG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.3	200		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	0.2	2		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.4	200		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	1000		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	3	2000	*		No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	1000		Shrub (SG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.5	2000		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	30	2000	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.5	2000		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.5	300		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.6	300		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	300		Forb (FG)	No
Rytidosperma spp.		Poaceae	1	2000		Grass & grasslike (GG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.3	20		Grass & grasslike (GG)	No

Arctotheca calendula	Capeweed	Asteraceae	0.1	10	*		No
Euphorbia drummondii			0.1	20		Forb (FG)	No
Maireana excavata		Chenopodiaceae	0.4	200		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.2	5		Shrub (SG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.1	10	*		No

Plot 3.4a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m		
	Shrub (SG)	3		15m		
	Forb (FG)	3		25m		
	Grass & Grasslike (GG)	4		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	11				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0.1
	Shrub (SG)	0.3
	Forb (FG)	2.2
	Grass & Grasslike (GG)	45.7
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	48.3
	TOTAL 'HTE'	0.4

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80			
50-79			
30-49			
20-29			
10-19			
5-9			
<5		2 A. pendula	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	45	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	25	2000	*		No
Crassula spp.	#N/A	#N/A	2	2000	#N/A	Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	40	2000	*		No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	0.1	5		Tree (TG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	10		Shrub (SG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	5		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	30	*		No
Austrostipa nodosa	A Speargrass	Poaceae	0.5	300		Grass & grasslike (GG)	No

Hordeum spp.	A Barley Grass	Poaceae	5	2000	*		No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.1	10		Shrub (SG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	5		Forb (FG)	No
Vulpia spp.	Rat's-tail Fescue	Poaceae	0.1	30	*		No
Eragrostis spp.	A Lovegrass	Poaceae	0.1	5		Grass & grasslike (GG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.4	1	*		HTE
Chloris truncata	Windmill Grass	Poaceae	0.1	50		Grass & grasslike (GG)	No

Plot 2.7b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	2%	6%
	Shrub (SG)	4		15m	15%	
	Forb (FG)	0		25m	8%	
	Grass & Grasslike (GG)	3		35m	3%	
	Fern (EG)	0		45m	4%	
	Other (OG)	0				
	TOTAL	7				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	0.7
	Forb (FG)	0
	Grass & Grasslike (GG)	40.6
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	41.3
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	1*	N/A
Length of logs (m)	0 *x1 African Boxthorn 0.8m high		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	20		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	40	4000		Grass & grasslike (GG)	No

Chloris truncata	Windmill Grass	Poaceae	0.5	200		Grass & grasslike (GG)	No
Tribulus terrestris	Cat-head	Zygophyllaceae	0.1	10	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.3	100		Shrub (SG)	No
Hordeum leporinum	Barley Grass	Poaceae	30	4000	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.1	20	*		No
Arctotheca calendula	Capeweed	Asteraceae	0.2	50	*		No
Xanthium spinosum	Bathurst Burr	Asteraceae	0.1	10	*		HTE
Maireana excavata		Chenopodiaceae	0.1	5		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	0.2	10		Shrub (SG)	No
Juncus spp.	A Rush	Juncaceae	0.1	3		Grass & grasslike (GG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	10	1000	*		No

Plot 2.6b							
FUCTION ATTRIBUTES							
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**	
	Tree (TG)	0		5m	0%	2%	
	Shrub (SG)	2		15m	5%		
	Forb (FG)	6		25m	0%		
	Grass & Grasslike (GG)	3		35m	5%		
	Fern (EG)	0		45m	0%		
	Other (OG)	0					
	TOTAL	11					
	Stratum	**Sum**					
Count of cover abundance (native vascular plants)	Tree (TG)	0					
	Shrub (SG)	3					
	Forb (FG)	9.5					
	Grass & Grasslike (GG)	55					
	Fern (EG)	0					
	Other (OG)	0					
	TOTAL Native	67.5					
	TOTAL 'HTE'	0					
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80	0	0	0				
50-79	0	0	0				
30-49	N	N	0				
20-29	N	N	0				
10-19	N	N	0				
5-9	N	N	0				
<5	N	1*	N/A				
Length of logs (m)	0 *x1 African Boxthorn 0.8m high						
COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Leucochrysum molle	Hoary Sunray	Asteraceae	2	1000		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	25	2000		Grass & grasslike (GG)	No

Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	1000		Grass & grasslike (GG)	No
Cotula bipinnata	Ferny Cotula	Asteraceae	1	800	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	10	1000	*		No
Goodenia pusilliflora		Goodeniaceae	2	1000		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	10	500		Grass & grasslike (GG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	2	500		Shrub (SG)	No
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	2	1000		Forb (FG)	No
Salsola australis		Chenopodiaceae	1	100		Shrub (SG)	No
Erodium botrys	Long Storksbill	Geraniaceae	2	50	*		No
Crassula colorata	Dense Stonecrop	Crassulaceae	1	1000		Forb (FG)	No
Facelis retusa		Asteraceae	0.5	200	*		No
Erodium crinitum	Blue Crowfoot	Geraniaceae	2	100		Forb (FG)	No
Maireana ciliata	Fissure Weed	Chenopodiaceae	0.5	200		Forb (FG)	No

Plot 3.9b							
FUCTION ATTRIBUTES							
Count of Native Richness	**Stratum**		**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)		0		5m	3%	5%
	Shrub (SG)		4		15m	5%	
	Forb (FG)		5		25m	8%	
	Grass & Grasslike (GG)		4		35m	1%	
	Fern (EG)		0		45m	6%	
	Other (OG)		0				
	TOTAL		13				
Count of cover abundance (native vascular plants)	**Stratum**		**Sum**				
	Tree (TG)		0				
	Shrub (SG)		5.4				
	Forb (FG)		3.8				
	Grass & Grasslike (GG)		70				
	Fern (EG)		0				
	Other (OG)		0				
	TOTAL Native		79.2				
	TOTAL 'HTE'		0				
Tree Stem Counts							
DBH	**Euc**	**Non Euc**	**Hollows**				
>80	0	0	0				
50-79	0	0	0				
30-49	N	N	0				
20-29	N	N	0				
10-19	N	N	0				
5-9	N	N	0				
<5	N	N	N/A				
Length of logs (m)	0						

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Enteropogon ramosus	Curly Windmill Grass	Poaceae	30	3000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	25	2500		Grass & grasslike (GG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	5	3		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.2	10		Shrub (SG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	5	50	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.5	10		Forb (FG)	No
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	100		Grass & grasslike (GG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	5		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.1	10		Forb (FG)	No
Asperula conferta	Common Woodruff	Rubiaceae	3	60		Forb (FG)	No
Maireana pentagonia	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	3		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Avena spp.	Oats	Poaceae	0.1	2	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	5		Forb (FG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	3	300	*		No

PCT 46: Moderate-Good-Cottonbush (Vegetation Zone 17)

Plot 3.8a						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m		
	Shrub (SG)	4		15m		
	Forb (FG)	11		25m		
	Grass & Grasslike (GG)	6		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	22				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0.1				
	Shrub (SG)	5.5				
	Forb (FG)	5.2				
	Grass & Grasslike (GG)	55.3				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	66.1				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	2000		Grass & grasslike (GG)	No
Rytidosperma spp.		Poaceae	2	500		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	5	50		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	4	50		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	2000		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	20	2000	*		No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	20		Forb (FG)	No
Walwhalleya proluta		Poaceae	15	2000		Grass & grasslike (GG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	30		Forb (FG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.2	20		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.3	50		Shrub (SG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	300		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	50		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	1	1000		Grass & grasslike (GG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	5		Shrub (SG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.1	5		Forb (FG)	No
Crassula spp.	#N/A	#N/A	0.1	1000		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	0.3	100		Grass & grasslike (GG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	0.1	3		Tree (TG)	No

Rhagodia spinescens	Thorny Saltbush	Chenopodiaceae	0.1	2		Shrub (SG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	1	*		No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.1	200		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	2	500		Grass & grasslike (GG)	No

Plot 3.7a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	3		15m		
	Forb (FG)	13		25m		
	Grass & Grasslike (GG)	6		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	22				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	2.7
	Forb (FG)	5.4
	Grass & Grasslike (GG)	24
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	32.1
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sporobolus caroli	Fairy Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	3	2000		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	1	2000		Forb (FG)	No
Lolium spp.	A Ryegrass	Poaceae	15	2000	*		No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	100		Forb (FG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	2	2000	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.1	50		Forb (FG)	No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	200		Shrub (SG)	No

Sida corrugata	Corrugated Sida	Malvaceae	0.1	20		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	3	500		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	3	500		Grass & grasslike (GG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	100		Forb (FG)	No
Austrostipa spp.	A Speargrass	Poaceae	3	500		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.2	20		Shrub (SG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	2	100		Shrub (SG)	No
Rytidosperma spp.		Poaceae	3	400		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	2	200		Grass & grasslike (GG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.2	200		Forb (FG)	No
Sonchus spp.	Sowthistle	Asteraceae	0.1	10	*		No
Oxalis perennans		Oxalidaceae	0.1	100		Forb (FG)	No
Goodenia spp.		Goodeniaceae	0.2	500		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.2	20		Forb (FG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	20		Forb (FG)	No
Daucus glochidiatus	Native Carrot	Apiaceae	0.1	10		Forb (FG)	No

Plot 1.4b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	3%	4%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	3		25m	2%	
	Grass & Grasslike (GG)	6		35m	5%	
	Fern (EG)	0		45m	3%	
	Other (OG)	0				
	TOTAL	14				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	35				
	Forb (FG)	5.6				
	Grass & Grasslike (GG)	58				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	98.6				
	TOTAL 'THE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	3	1000	*		No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	2	100		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	8	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	50		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	5	200		Forb (FG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	30	100		Shrub (SG)	No
Walwhalleya proluta		Poaceae	20	500		Grass & grasslike (GG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.5	50		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	1	30		Shrub (SG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	1	*		No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	1	30		Shrub (SG)	No
Avena fatua	Wild Oats	Poaceae	0.1	10	*		No
Hordeum leporinum	Barley Grass	Poaceae	1	500	*		No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	10		Forb (FG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	1	100	*		No

Plot 1.5b

FUCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum	Litter Cover	Tape length	% Cover	Average %
	Tree (TG)	0		5m	5%	4%
	Shrub (SG)	5		15m	5%	
	Forb (FG)	6		25m	3%	
	Grass & Grasslike (GG)	5		35m	5%	
	Fern (EG)	0		45m	4%	
	Other (OG)	0				
	TOTAL	16				

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	20.4
	Forb (FG)	10.8
	Grass & Grasslike (GG)	32.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	63.4
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Maireana aphylla	Cotton Bush	Chenopodiaceae	20	100		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	15	2000		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	1	500	*		No
Oxalis perennans		Oxalidaceae	0.2	200		Forb (FG)	No
Avena fatua	Wild Oats	Poaceae	0.5	200	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	10	500		Forb (FG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.1	20		Shrub (SG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	20		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	50		Forb (FG)	No
Arctotheca calendula	Capeweed	Asteraceae	0.1	20	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.5	500	*		No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.2	200		Forb (FG)	No

Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	20		Forb (FG)	No
Austrostipa nodosa	A Speargrass	Poaceae	0.2	100		Grass & grasslike (GG)	No
Wurmbea dioica subsp. dioica	Early Nancy	Colchicaceae	0.1	2		Forb (FG)	No
Sclerolaena birchii	Galvinized Burr	Chenopodiaceae	0.1	5		Shrub (SG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	2	500			No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.1	1		Shrub (SG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	2	500		Grass & grasslike (GG)	No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No

Plot 3.4b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m	10%	22%
	Shrub (SG)	3		15m	20%	
	Forb (FG)	9		25m	30%	
	Grass & Grasslike (GG)	3		35m	40%	
	Fern (EG)	1		45m	10%	
	Other (OG)	0				
	TOTAL	17				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0.1
	Shrub (SG)	27.3
	Forb (FG)	12.9
	Grass & Grasslike (GG)	41
	Fern (EG)	0.1
	Other (OG)	0
	TOTAL Native	81.4
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	1*	N/A
Length of logs (m)	0 * only 1m tall – not at breast height		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Marsilea drummondii	Common Nardoo	Marsileaceae	0.1	50		Fern (EG)	No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	200		Forb (FG)	No

Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.3	200		Forb (FG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	0.1	1		Tree (TG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	25	100		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	35	1000		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	2	100		Shrub (SG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	10	2000	*		No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	5	1000	*		No
Sida corrugata	Corrugated Sida	Malvaceae	2	50		Forb (FG)	No
Solanum esuriale	Quena	Solanaceae	0.1	10		Forb (FG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.1	10		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	10	50		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	1	10		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.3	5		Shrub (SG)	No
Wurmbea dioica subsp. Dioica	Early Nancy	Colchicaceae	0.1	1		Forb (FG)	No
Taraxacum officinale	Dandelion	Asteraceae	0.2	10	*		No
Lepidium fasciculatum	Bundled Peppercress	Brassicaceae	0.1	10		Forb (FG)	No
Scleranthus pungens	Prickly Knawel	Caryophyllaceae	0.1	2		Forb (FG)	No

Plot 4.8b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	1%	19%
	Shrub (SG)	5		15m	15%	
	Forb (FG)	10		25m	25%	
	Grass & Grasslike (GG)	6		35m	25%	
	Fern (EG)	0		45m	30%	
	Other (OG)	0				
	TOTAL	21				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	13.1				
	Forb (FG)	3.8				
	Grass & Grasslike (GG)	73				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	89.9				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Maireana aphylla	Cotton Bush	Chenopodiaceae	10	50		Shrub (SG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	150		Grass & grasslike (GG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.5	2000	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.5	30		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.5	30		Shrub (SG)	No
Walwhalleya proluta		Poaceae	30	800		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.5	50		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	500		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.2	500		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	2	50		Shrub (SG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.2	10		Forb (FG)	No
Marrubium vulgare	White Horehound	Lamiaceae	0.2	1	*		No
Austrostipa nodosa	A Speargrass	Poaceae	10	200		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.5	20		Forb (FG)	No
Salsola australis		Chenopodiaceae	0.1	1		Shrub (SG)	No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.5	30		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.2	30	*		No
Avena fatua	Wild Oats	Poaceae	0.1	10	*		No
Chloris truncata	Windmill Grass	Poaceae	8	50		Grass & grasslike (GG)	No
Dissocarpus paradoxus	Cannonball Burr	Chenopodiaceae	0.5	40		Shrub (SG)	No

Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	20		Forb (FG)	No
Bulbine bulbosa	Bulbine Lily	Asphodelaceae	0.1	10		Forb (FG)	No
Asperula conferta	Common Woodruff	Rubiaceae	1	1000		Forb (FG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	5	100		Grass & grasslike (GG)	No

PCT 46: Low-Moderate-Cottonbush (Vegetation Zone 18)

Plot 3.9a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	1		5m		5%
	Shrub (SG)	4		15m		
	Forb (FG)	9		25m		
	Grass & Grasslike (GG)	5		35m		
	Fern (EG)	0		45m		
	Other (OG)	0				
	TOTAL	19				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0.1
	Shrub (SG)	20.8
	Forb (FG)	7.6
	Grass & Grasslike (GG)	16.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	44.7
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Maireana aphylla	Cotton Bush	Chenopodiaceae	20	2000		Shrub (SG)	No
Lolium spp.	A Ryegrass	Poaceae	25	2000	*		No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	2	2000		Forb (FG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	2	2000		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.5	2000		Forb (FG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.1	20		Shrub (SG)	No
Oxalis perennans		Oxalidaceae	0.1	20		Forb (FG)	No

Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	0.5	2000	*		No
Sclerolaena diacantha	Grey Copperburr	Chenopodiaceae	0.5	500		Shrub (SG)	No
Goodenia spp.		Goodeniaceae	2	2000		Forb (FG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.5	500		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.2	50		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	7	1000		Grass & grasslike (GG)	No
Salsola australis		Chenopodiaceae	0.2	10		Shrub (SG)	No
Leucochrysum molle	Hoary Sunray	Asteraceae	0.2	100		Forb (FG)	No
Tricoryne elatior	Yellow Autumn-lily	Anthericaceae	0.1	100		Forb (FG)	No
Acacia pendula	Weeping Myall	Fabaceae (Mimosoideae)	0.1	1		Tree (TG)	No
Maireana pentagona	Hairy Bluebush, Slender Fissure-weed	Chenopodiaceae	0.2	50		Forb (FG)	No
Chloris truncata	Windmill Grass	Poaceae	2	100		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	2	100		Grass & grasslike (GG)	No

Plot 4.6b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	3
	Forb (FG)	7
	Grass & Grasslike (GG)	4
	Fern (EG)	0
	Other (OG)	0
	TOTAL	14

Litter Cover	**Tape length**	**% Cover**	**Average %**
	5m	50%	41%
	15m	10%	
	25m	25%	
	35m	60%	
	45m	60%	

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	25.3
	Forb (FG)	2.6
	Grass & Grasslike (GG)	67
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	94.9
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE							
Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Maireana aphylla	Cotton Bush	Chenopodiaceae	25	100		Shrub (SG)	No
Atriplex leptocarpa	Slender-fruit Saltbush	Chenopodiaceae	0.2	20		Shrub (SG)	No
Avena fatua	Wild Oats	Poaceae	0.1	60	*		No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.1	1000	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.8	50		Forb (FG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	0.5	1000	*		No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	20	200		Grass & grasslike (GG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	15	150		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	10	100		Grass & grasslike (GG)	No
Vittadinia dissecta		Asteraceae	0.5	40		Forb (FG)	No
Walwhalleya proluta		Poaceae	22	300		Grass & grasslike (GG)	No
Oxalis perennans		Oxalidaceae	0.2	500		Forb (FG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.2	500		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.3	800		Forb (FG)	No
Erodium botrys	Long Storksbill	Geraniaceae	0.2	40	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.5	15		Forb (FG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	3		Shrub (SG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.1	10		Forb (FG)	No

Plot 1.7b						
FUCTION ATTRIBUTES						
Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	3%	4%
	Shrub (SG)	2		15m	3%	
	Forb (FG)	5		25m	5%	
	Grass & Grasslike (GG)	7		35m	2%	
	Fern (EG)	0		45m	5%	
	Other (OG)	0				
	TOTAL	14				
Count of cover abundance (native vascular plants)	**Stratum**	**Sum**				
	Tree (TG)	0				
	Shrub (SG)	5.1				
	Forb (FG)	1.8				
	Grass & Grasslike (GG)	42.1				
	Fern (EG)	0				
	Other (OG)	0				
	TOTAL Native	49				
	TOTAL 'HTE'	0				

Tree Stem Counts			
DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Enteropogon ramosus	Curly Windmill Grass	Poaceae	15	2000		Grass & grasslike (GG)	No
Austrostipa scabra	Speargrass	Poaceae	10	1000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	15	2000	*		No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	5	100		Shrub (SG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	1	100		Grass & grasslike (GG)	No
Rytidosperma setaceum	Small-flowered Wallaby-grass	Poaceae	1	100		Grass & grasslike (GG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	20		Forb (FG)	No
Solanum esuriale	Quena	Solanaceae	0.1	5		Forb (FG)	No
Avena fatua	Wild Oats	Poaceae	5	100	*		No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	1	50		Forb (FG)	No
Vittadinia cuneata	A Fuzzweed	Asteraceae	0.5	5		Forb (FG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	0.2	50	*		No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	10		Shrub (SG)	No
Austrostipa aristiglumis	Plains Grass	Poaceae	0.1	20		Grass & grasslike (GG)	No
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	2		Forb (FG)	No

Plot 1.8b

FUCTION ATTRIBUTES

Count of Native Richness	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	1
	Forb (FG)	6
	Grass & Grasslike (GG)	5
	Fern (EG)	0
	Other (OG)	0
	TOTAL	12

Litter Cover	Tape length	% Cover	Average %
	5m	5%	3%
	15m	3%	
	25m	2%	
	35m	0%	
	45m	4%	

Count of cover abundance (native vascular plants)	Stratum	Sum
	Tree (TG)	0
	Shrub (SG)	20
	Forb (FG)	5.4
	Grass & Grasslike (GG)	55
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	80.4
	TOTAL 'HTE'	0.1

Tree Stem Counts

DBH	Euc	Non Euc	Hollows
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	Common Name	Family	% Cover	% Abundance	Exotic	Growth Form	High Threat?
Walwhalleya proluta		Poaceae	20	2000		Grass & grasslike (GG)	No
Sporobolus caroli	Fairy Grass	Poaceae	15	1000		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	2	500		Forb (FG)	No
Rytidosperma caespitosum	Ringed Wallaby Grass	Poaceae	5	500		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	1000		Grass & grasslike (GG)	No
Medicago polymorpha	Burr Medic	Fabaceae (Faboideae)	2	1000	*		No
Maireana aphylla	Cotton Bush	Chenopodiaceae	20	200		Shrub (SG)	No
Chloris truncata	Windmill Grass	Poaceae	5	1000		Grass & grasslike (GG)	No
Lolium rigidum	Wimmera Ryegrass	Poaceae	10	500	*		No
Erodium botrys	Long Storksbill	Geraniaceae	1	100	*		No
Vittadinia cuneata	A Fuzzweed	Asteraceae	1	20		Forb (FG)	No

Oxalis perennans		Oxalidaceae	2	1000		Forb (FG)	No
Lycium ferocissimum	African Boxthorn	Solanaceae	0.1	1	*		HTE
Calotis scabiosifolia	Rough Burr-daisy	Asteraceae	0.1	100		Forb (FG)	No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.2	100		Forb (FG)	No
Leptorhynchos squamatus	Scaly Buttons	Asteraceae	0.1	100		Forb (FG)	No

Plot 2.1b

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m	3%	3%
	Shrub (SG)	2		15m	4%	
	Forb (FG)	4		25m	3%	
	Grass & Grasslike (GG)	6		35m	5%	
	Fern (EG)	0		45m	2%	
	Other (OG)	0				
	TOTAL	12				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	20.1
	Forb (FG)	6.1
	Grass & Grasslike (GG)	45.2
	Fern (EG)	0
	Other (OG)	0
	TOTAL Native	71.4
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Chrysocephalum apiculatum	Common Everlasting	Asteraceae	0.1	10		Forb (FG)	No
Maireana aphylla	Cotton Bush	Chenopodiaceae	20	200		Shrub (SG)	No
Sporobolus caroli	Fairy Grass	Poaceae	5	50		Grass & grasslike (GG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	25	1000		Grass & grasslike (GG)	No
Walwhalleya proluta		Poaceae	5	500		Grass & grasslike (GG)	No
Trifolium sp.	A Clover	Fabaceae (Faboideae)	5	500	*		No
Chloris truncata	Windmill Grass	Poaceae	5	500		Grass & grasslike (GG)	No

Avena fatua	Wild Oats	Poaceae	2	100	*		No
Oxalis perennans		Oxalidaceae	0.5	100		Forb (FG)	No
Austrostipa scabra	Speargrass	Poaceae	5	200		Grass & grasslike (GG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	5	200		Forb (FG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	2	*		No
Rhodanthe corymbiflora	Small White Sunray	Asteraceae	0.5	5		Forb (FG)	No
Rytidosperma spp.		Poaceae	0.2	50		Grass & grasslike (GG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	0.1	2		Shrub (SG)	No

PCT 160: Moderate-Good (Vegetation Zone 19)

Plot 2.1a

FUCTION ATTRIBUTES

Count of Native Richness	**Stratum**	**Sum**	**Litter Cover**	**Tape length**	**% Cover**	**Average %**
	Tree (TG)	0		5m		
	Shrub (SG)	7		15m		
	Forb (FG)	8		25m		
	Grass & Grasslike (GG)	3		35m		
	Fern (EG)	0		45m		
	Other (OG)	1				
	TOTAL	19				

Count of cover abundance (native vascular plants)	**Stratum**	**Sum**
	Tree (TG)	0
	Shrub (SG)	13.3
	Forb (FG)	1
	Grass & Grasslike (GG)	20.2
	Fern (EG)	0
	Other (OG)	0.1
	TOTAL Native	34.6
	TOTAL 'HTE'	0

Tree Stem Counts

DBH	**Euc**	**Non Euc**	**Hollows**
>80	0	0	0
50-79	0	0	0
30-49	N	N	0
20-29	N	N	0
10-19	N	N	0
5-9	N	N	0
<5	N	N	N/A
Length of logs (m)	0		

COMPOSITION & STRUCTURE

Scientific Name	**Common Name**	**Family**	**% Cover**	**% Abundance**	**Exotic**	**Growth Form**	**High Threat?**
Sclerolaena divaricata	Tangled Copperburr	Chenopodiaceae	3	1000		Shrub (SG)	No
Sclerolaena muricata	Black Rolypoly	Chenopodiaceae	1	1000		Shrub (SG)	No
Chenopodium nitrariaceum	Nitre Goosefoot	Chenopodiaceae	8	200		Shrub (SG)	No
Leiocarpa panaetioides	Wooly Buttons	Asteraceae	0.2	50		Forb (FG)	No

Walwhalleya proluta		Poaceae	10	2000		Grass & grasslike (GG)	No
Atriplex semibaccata	Creeping Saltbush	Chenopodiaceae	0.5	500		Shrub (SG)	No
Salsola australis		Chenopodiaceae	0.1	10		Shrub (SG)	No
Erodium crinitum	Blue Crowfoot	Geraniaceae	0.2	100		Forb (FG)	No
Enteropogon ramosus	Curly Windmill Grass	Poaceae	10	2000		Grass & grasslike (GG)	No
Medicago truncatula	Barrel Medic	Fabaceae (Faboideae)	5	2000	*		No
Lolium spp.	A Ryegrass	Poaceae	50	2000	*		No
Hordeum spp.	A Barley Grass	Poaceae	1	2000	*		No
Rytidosperma spp.		Poaceae	0.2	500		Grass & grasslike (GG)	No
Duma florulenta	Lignum	Polygonaceae	0.5	200		Shrub (SG)	No
Echium plantagineum	Patterson's Curse	Boraginaceae	0.1	10	*		No
Asperula conferta	Common Woodruff	Rubiaceae	0.1	500		Forb (FG)	No
Sclerolaena stelligera	Star Copperburr	Chenopodiaceae	0.2	500		Shrub (SG)	No
Convolvulus erubescens	Pink Bindweed	Convolvulaceae	0.1	10		Other (OG)	No
Oxalis perennans		Oxalidaceae	0.1	500		Forb (FG)	No
Lepidium africanum	Common Peppercress	Brassicaceae	0.1	50	*		No
Einadia nutans	Climbing Saltbush	Chenopodiaceae	0.1	10		Forb (FG)	No
Sida corrugata	Corrugated Sida	Malvaceae	0.1	10		Forb (FG)	No
Vittadinia dissecta		Asteraceae	0.1	10		Forb (FG)	No
Vittadinia gracilis	Woolly New Holland Daisy	Asteraceae	0.1	10		Forb (FG)	No

Appendix E. Candidate threatened species (species credits)

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Flora						
Austrostipa wakoolica	E	E	Moderate	-	Alluvial plains and plains. South of the Murrumbidgee River	High Suitable habitat for the species is present, however no records within the locality. There are some records located south of Jerilderie.
Brachyscome muelleroides Mueller Daisy)	V	V	High	Yes	Floodplains on grey-brown or red-brown clays and claypans. Wetland-grassland communities on grey-brown or red-brown clays and claypans. East of the Cobb Highway and south of Griffith	High Suitable habitat for the species is present, however the species has not been recorded within the locality. There are records located east near Wagga Wagga and south within the Murray Valley National Park.
Brachyscome papillosa (Mossgiel Daisy)	V	V	High	-	-	High Suitable habitat for the species is present in the Cypress Pine forests, with records within the locality of the Project area. Suitable chenopod shrubland and grassland habitat occurs in the Project area.
Caladenia arenaria (Sand-hill Spider Orchid)	E	E	Moderate	Yes	Geographic – East of Jerilderie	Moderate Suitable habitat for the species is present in the Cypress Pine forests, however no records are within the Project area. However, the site is marginally west of Jerilderie.
Convolvulus tedmoorei Bindweed)	-	E	High	Yes	-	Moderate Possible suitable habitat within the Project area, however no records within the locality.
Cullen parvum (Small Scurf-pea)	-	E	High	-	Geographic – Hay Plains and to east	High Suitable habitat is present and the site is within about 30km of the only known population.
Diuris sp. (Oaklands, D.L. Jones 5380)	-	E	Moderate	Yes	-	Moderate Some suitable habitat is present in the White Cypress Pine forests. No records are within the Project area and the closest records are about 50k to the east.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Eucalyptus leucoxylon subsp. Pruinose (Yellow Gum)	-	V	High	-		Moderate There is possible habitat present in the Project area, however no records are present. The closest records are about 80km to the south near the Murry River.
Lepidium monoplocoides (Winged Pepper-cress)	E	E	High	-	-	Moderate Suitable habitat possible in waterlogged area, no records within the Project area. There are some records located near Lake Urana, about 40km east of the Project area
Leptorhynchos orientalis (Lanky Buttons)	-	E	Moderate	-	-	High Suitable vegetation is present on site within the forested and grassland communities. No records within the Project area, however Lake Urana and Buckingbong State Forest, from about 40km east of the Project area.
Maireana cheelii (Chariot Wheels)	V	V	High	-	Heavy grey clay soils and claypans or shallow depressions West of Darlington Point, west of Jerilderie	Moderate Some suitable habitats present, however no records within the Project area. The species is known population starting about 30km east of the Project area.
Pilularia novae-hollandiae (Austral Pillwort)	-	E	High	Yes	East of Deniliquin	Moderate Some suitable habitat is present in wetland areas. There are no records within the Project area, however there are several scattered around the region. The closest record is near Jerilderie.
Prasophyllum sp. Moama	-	CE	High	Yes	-	Moderate There is suitable habitat present in alluvial grasslands of the Project area, however the only records of the species are about 100km to the south-west near Moama.
Pterostylis despectans	-	CE	High	Yes	-	Moderate There is suitable habitat present in alluvial grasslands of the Project area, however the only records of the species are about 100km to the south-west near Moama.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Sclerolaena napiformis (Turnip Copperburr)	E	E	High	-	Hay plain	High Several records located within the locality of the Project area along Billabong Creek near Jerilderie. Suitable chenopod shrubland and grassland habitat may occur in the Project area.
Swainsona murrayana (Slender Darling Pea)	V	V	High	-	-	High (known) Species has historical records within the Project area and was recorded during the 2021/22 surveys. Occurs in variety of habitats including Black Box woodlands.
Swainsona plagiotropis (Red Darling Pea)	V	V	High	-	-	High Species was previously recorded within the Project area, however not during the 2021/22 surveys. Suitable habitat present.
Swainsona sericea (Silky Swainson-pea)	-	V	High	-	-	High (known) Recorded during the 2021/22 surveys. Records located within the locality of the Project area. Suitable habitat present.
Anthochaera phrygia (Regent Honeyeater)	CE	CE	High	Yes	Breeding – as per mapped areas.	Low Suitable habitat for the species was not recorded and species has not been recorded within the locality. There are some records located south west in Deniliquin.
Anseranas semipalmata (Magpie Goose)	-	V	Moderate	-	-	Moderate No records in the Project area, but several in the broader locality. Some suitable habitat in the wetland areas.
Ardeotis australis (Australian Bustard)		E	High	-	-	Moderate Some suitable habitat present on site, however no records within the locality. Few records near Deniliquin prior to 2005.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	-	V	Moderate	-	-	High (known) One sighting has been recorded within the locality, and suitable habitat is present
Botaurus poiciloptilus (Australasian Bittern)	E	E	Moderate	-	Brackish or freshwater wetlands.	Moderate Suitable habitat is present in areas of freshwater wetlands. However, the species has not been recorded within the locality. There are, however, multiple records located surrounding the Project area to the north, east, south and west.
Burhinus grallarius (Bush Stone-curlew)	-	E	High	-	Fallen/standing dead timber including logs	Moderate Suitable habitat for the species is present, however the species has not been recorded within the locality. There is one local record from 1977 to the east of the Project area.
Calidris ferruginea (Curlew Sandpiper)	M, CE	E	High	Yes	Foraging – As per mapped areas	Moderate Suitable habitat present in wetlands areas for temporary migration. No records in the Project area, and not within 100km. closest records are near Leeton in the Fivebough wetlands.
Certhionyx variegatus (Pied Honeyeater)	-	V	Moderate	-	-	High Suitable habitat for the species is present in Eucalypt and Acacia woodlands, however there are no records within the locality. There are some records located to the west of the Project area.
Circus assimilis (Spotted Harrier)	-	V	High	-	-	High (known) Some previous records within the Project area and recorded during 2021/22 surveys. Suitable shrubland, grassland and woodland habitats.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Climacteris picumnus victoriae (Brown Treecreeper (eastern subspecies))	-	V	High	-	-	High (known) Species recorded during 2021/22 surveys. Some historical records within the Project area. May provide suitable Semi-arid woodlands and Wetland habitats.
Daphoenositta chrysoptera (Varied Sittella)	-	V	Moderate	-	-	High Suitable habitat is present in eucalypt and Acaia woodlands. No records in the Project area, however numerous within the surrounding National Parks.
Epthianura albifrons (White-fronted Chat)	-	V	High	-	-	High (known) Some historical records within the Project area and recorded during 2021/22 surveys. Suitable Semi-arid woodlands, Grasslands, Arid Shrublands and Wetland habitats.
Falco hypoleucos (Grey Falcon)	V	E	Moderate	-	-	Moderate Some records within the Project area. May provide suitable Semi-arid woodlands, Grasslands and Arid Shrubland habitats.
Falco subniger (Black Falcon)	-	V	High	-	-	Moderate Some records within the Project area. May provide suitable Semi-arid woodlands, Grasslands and Arid Shrublands and Wetland habitats.
Grantiella picta (Painted Honeyeater)	V	V	Moderate	-	Mistletoes present at a density of greater than five mistletoes per hectare.	Moderate Some records within the Project area. May provide suitable Semi-arid woodland habitat.
Grus rubicunda (Brolga)	-	V	Moderate	-	-	Moderate Suitable habitat is present in wetlands areas, however the species has not been recorded within the locality. Records outside of the locality to the north, east, south and west.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Hieraaetus morphnoides (Little Eagle)	-	V	Moderate	-	Breeding -Nest trees – live (occasionally dead) large old trees within vegetation)	High (known) The species was recorded in the 2021/22 surveys. No historical records in the Project area, however there are several in the broader region.
Hirundapus caudacutus (White-throated Needletail)	V, M	-	High	-	-	Moderate Potential aerial habitat present. No records within the Project area, however some in the surrounding region and near Jerilderie.
Lathamus discolor (Swift Parrot)	CE	E	Moderate	Yes	Breeding – as per mapped areas.	High Foraging habitat present, however no records within the Project area. Several recent records within the surrounding 100km including Berrigan.
Leipoa ocellata (Malleefowl)	V	E	High	-	-	Low Suitable habitat for the species was not recorded and species has not been recorded within the locality. Only one record within 100km locality from 1994.
Limosa limosa (Black-tailed Godwit)	M	V	High	-	Foraging- As per mapped areas	Moderate There is minimal suitable habitat for the species in wetland areas. There are no records within the study area. There are numerous records at Fivebough Wetlands near Leeton. All mapped areas are coastal and over 400km to the east.
Lophochroa leadbeateri (Major Mitchell's Cockatoo)	-	V	Moderate	-	Breeding – Hollow bearing trees, Living or dead tree with hollows greater than 10cm diameter	Moderate Some suitable habitats present. However, no records present in the Project area and few historic records nearby Deniliquin and Leeton.
Lophoictinia isura (Square-tailed Kite)	-	V	Moderate	-	Breeding – nest trees	High (known) The species was recorded in the 2021/22 surveys. No historical records in the Project area, however there are several in the broader region.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Melanodryas cucullata cucullata (Hooded Robin (south-eastern form))	-	V	Moderate	-	-	Moderate Some suitable habitat is present, however no records are present within the Project area. Several records are near Oaklands and Buckingbong State Forest over 100km to the east, few of which are recent.
Melithreptus gularis gularis (Black-chinned Honeyeater) (eastern subspecies)	-	V	Moderate	-	-	Moderate Some suitable habitat for the species is present, however no records within the Project area. The closest records are over 100km away, mostly near the Murray River.
Ninox connivens (Barking Owl)	-	V	High	-	Breeding – Hollow bearing trees, Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground	Moderate Some suitable habitat present, however no records within the Project area. Few historical records in the region.
Oxyura australis (Blue-billed Duck)	-	V	Moderate	-	-	Moderate Marginal suitable habitat present on site. The wetland communities are likely not open and deep to be preferred habitat. No records within the Project area. Closest records mostly at Fivebough Wetlands near Leeton.
Pachycephala inornata (Gilbert's Whistler)	-	V	Moderate	-	-	Moderate Suitable habitat present in several woodland PCTs, particularly White Cypress Pine forests. No records within the Project area. Closest records are within the Murray River National Park about 80km to the south-west.
Pedionomus torquatus (Plains-wanderer)	CE	E	High	Yes	Breeding – as per mapped areas.	High (known) Multiple records within the Project area and was recorded in the 2021/22 surveys. May provide suitable Grassland and Arid Shrubland habitats.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Petroica boodang (Scarlet Robin)	-	V	Moderate	-	-	Moderate Some suitable habitats may be present in woodland area, however no records are within the Project area. Additionally, extensive fragmentation between wooded areas may limit the movement of the species. Nevertheless, there are numerous records about 80km south-west in the Murray River National Park.
Petroica phoenicea (Flame Robin)	-	V	Moderate	-	-	Moderate Suitable habitat for the species was not recorded and species has not been recorded within the locality. Multiple records outside of the locality to the north, east, south and west.
Polytelis anthopeplus monarchoides (Regent Parrot (eastern subspecies)	V	E	Moderate	-	Breeding – Hollow bearing trees, living or dead E. camaldulensis with hollows greater than 5 cm diameter, greater than 5 m above the ground OR trees with DBH of greater than 40cm, within 1 km of watercourses or billabongs. Trees can be isolated but within 20 km of mallee	Unlikely The Project area is over 50km from the Rivers the species is know to inhabit and the Project area is generally beyond the eastern extent of the known population. No records of the species are in 80knm of the site.
Polytelis swainsonii (Superb Parrot)	V	V	High	-	Breeding – 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.	High (known) Multiple records within the Project area and recorded near the Project area in 2021/22 surveys. Suitable Woodland habitats.
Pomatostomus temporalis temporalis (Grey-crowned Babbler) (eastern subspecies)	-	V	Moderate	-	-	High (known) Multiple records within the Project area and was recorded in the 2021/22 surveys Suitable Woodland habitats are present within the Project area.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Pyrrholaemus brunneus (Redthroat)	-	V	Moderate	-	-	High There is suitable habitat for the species in shrublnads, from Canegrass and Lignum swamps. However, there are no records of the species within 100km and it is on the eastern extent of its known range.
Rostratula australis (Australian Painted Snipe)	E	E	Moderate	-	-	Moderate There is possible suitable habitat for the species in its migratory route, however there are no records within the Project area. Most recent records are in the Fivebough wetlands near Leeton about 100km to the north-east.
Stagonopleura guttata (Diamond Firetail)	-	V	Moderate	-	-	High Suitable habitat is present for the species in wooded areas. There are no records in the study area, however numerous within the surrounding 100km, the closest of which is about 5km to the west.
Stictonetta naevosa (Freckled Duck)	-	V	Moderate	-	-	Moderate Some suitable habitat is present for the species in wetlands areas, however habitat is limited. There are no records in the study area, however numerous within the surrounding 100km, nevertheless, the closest is about 55km to the north-west.
Tyto novaehollandiae (Masked Owl)	-	V	High	-	-	Moderate Some suitable habitat present on edges of woodland areas, however is limited. No records in study area and only 2 two in 100km locality, most recent of which is from 1982.
Chalinolobus picatus (Little Pied Bat)	-	V	High	-	-	High Suitable foraging habitat present in forested areas, however no records in the locality.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Myotis macropus (Southern Myotis)	-	V	High	-	Hollow bearing trees Within 200 m of riparian zone, Bridges, caves or artificial structures within 200 m of riparian zone, Waterbodies including rivers, creeks, billabongs, lagoons, dams and other waterbodies on or within 200m of the site	High (known) This species was recorded on site during targeted surveys. There is some potential habitat along Yanco Creek within the Project area, however there are no records. The closest records are along the Murrumbidgee River and Murray River.
Nyctophilus corbeni (Corben's Long-eared Bat)	V	V	High	-	-	Low Suitable habitat for the species was not recorded. Only one record within 100km near Deniliquin in 1988.
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) (Koala)	E	V	High	-	Areas identified via survey as important habitat. 'Important' habitat (however this is not a mapped important habitat area) is defined by the density of koalas and quality of habitat determined by on-site survey.	Low Suitable habitat for the species was not recorded and species has not been recorded within the locality. Habitat is degraded / not suitable for this species.
Saccolaimus flaviventris (Yellow-bellied Sheathtail-bat)	-	V	High	-	-	High (known) This species was recorded during targeted surveys on site. Suitable foraging and roosting habitat is present. Historic records are numerous in the 100km locality, particularly in Murray National Park and along the Murray River.
Vespadelus baverstocki (Inland Forest Bat)	-	V	High	-	-	High Suitable foraging and roosting habitat on site in woodland areas with preferable species. No records in study area, however there are three recent records within the 100km locality.

Scientific Name (Common Name)	EPBC Act	BC Act	Sensitivity to gain class	SAII*	Habitat constraints and geographic limitations (BAM-C)	Suitable habitat in study area
Litoria raniformis (Growling Grass Frog/ Southern Bell Frog)	V	E	Moderate	-	-	Moderate Suitable habitat for the species is present in some of the forested wetlands, particularly where emergent vegetation is present. No records within the Project area, however there are numerous about 40km to the north-east, near Coleambally.
Haliaeetus leucogaster (White-bellied Sea-Eagle)	-	V	High	-	Breeding – Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines	Moderate Some terrestrial habitat exists, however no records are in the Project area. the Project area does not provide key habitat due to the lack of major waterways.

Appendix F. Threatened species likelihood of occurrence assessment

Table F-1 Habitat suitability assessment for threatened flora species

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Amphibromus fluitans (Floating Swamp Wallaby-grass)	V	V	-	Floating Swamp Wallaby-grass occurs in southern NSW, Victoria, South Australia and Tasmania. *Amphibromus fluitans* grows mostly in permanent swamps. The species needs wetlands which are at least moderately fertile, and which have some bare ground, conditions which are produced by seasonally-fluctuating water levels. Flowering time is from spring to autumn or November to March. Disturbance regimes are not known, although the species requires periodic flooding of its habitat to maintain wet conditions. Known to occur in the Ramsar Wetland area immediately adjacent the Project area (Hale and Butcher 2011).	PMST – May BAM – C	Low No species identified during surveys. Likely in permanent swamps in the locality, which are present within wetland habitats. If present, would benefit from improvements to inundation regime.
Austrostipa wakoolica (A spear-grass)	E	E	-	Confined to the floodplains of the River Murray tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South West Woodland Nature Reserve). Grows on floodplains of the River Murray tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine forest on low sandy range; and a low, rocky rise. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha* and *Einadia nutans*. Flowers from October to December, mainly in response to rain.	PMST – Likely	High Suitable habitat for the species is present, however no records within the locality. There are some records located south of Jerilderie. Recorded habitats include the edge of a lignum swamp / brown loam / box and mallee, creek banks in grey silty clay, mallee and lignum sandy loam flat, open cypress pine forest on low range in sand soil and a low rock.
Brachyscome muelleroides (Mueller Daisy)	V	V	-	The Claypan Daisy occurs in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas. Also occurs in north-central Victoria (only along the Murray from Tocumwal to the Ovens River). Grows in damp areas on the margins of claypans in moist grassland with *Pycnosorus globosus, Agrostis avenacea* and *Austrodanthonia duttoniana*. Also found growing in association with seasonal aquatic plants such as Marsilea species (Lucas, 2010). Also recorded from the margins of lagoons in mud or water, and in association with *Calotis anthemoides*. Victorian collections have generally come from open positions on the River Murray floodplain, swampy River Red Gum (Eucalyptus camaldulensis) Forest and damp depressions. Known to occur in the Ramsar Wetland area immediately adjacent the Project area (Hale and Butcher 2011).	PMST – May BAM – C 1 – BioNet	High Suitable habitat for the species is present, however the species has not been recorded within the locality. There are records located east near Wagga Wagga and south within the Murray Valley National Park.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Brachyscome papillosa (Mossgiel Daisy)	V	V	-	The Mossgiel Daisy is endemic to NSW and chiefly occurs within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley (Yanga) National Park in the south west to Urana in the south east. Sites are scattered across this Bioregion including the Jerilderie area, the Hay Plain (Maude and Oxley) and around Darlington Point. In addition, there are a number of records from the Willandra Lakes World Heritage Area (including Mungo National Park) with a north-western outlier at Byrnedale Station, north of Menindee. The only known site on South Western Slopes is Ganmain Reserve. Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and Leafless Bluebush (*Maireana aphylla*) plains, but also in grassland and in Inland Grey Box (*Eucalyptus microcarpa*) - Cypress Pine (*Callitris spp.*) woodland. Flowers from June to December. Recorded as locally occasional to common in populations.	PMST – May BAM – C	High Suitable habitat for the species is present in the Cypress Pine forests, with records within the locality of the Project area. Suitable chenopod shrubland and grassland habitat occurs in the Project area.
Caladenia arenaria (Sand-hill Spider Orchid)	E	E	-	Caladenia arenaria is found mostly on the south west plains and western south west slopes. The original description is of a plant from Nangus, west of Gundagai (1865) and there is a report of the species from Adelong near Tumut. A record near Cootamundra needs verifying. The Sand-hill Spider Orchid is currently only known to occur in the Riverina between Urana and Narranderra. Occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (Callitris glaucophylla).	BAM – C	Moderate Suitable habitat for the species is present in the Cypress Pine forests, however no records are within the Project area. However, the site is marginally west of Jerilderie.
Convolvulus tedmoorei (Bindweed)	-	E		This species has been recorded from northern inland areas of South Australia, south-wstern Queensland and western NSW. There are few known records from NSW: two areas on the Murrumbidgee and Darling River floodplains in central-western NSW (from Toganmain Station, Darlington Point, and from a locality 8km north-west of Louth); and two other records from east of Broken Hill on the road to Wilcannia, and from the Menindee Road, Scarsdale. Convolvulus tedmoorei is a perennial forb. Grows in self-mulching grey clay soils on the floodplains of the Darling and Murrumbidgee Rivers. Flowering specimens of Convolvulus tedmoorei were collected in late winter (August) and early spring (September). Disturbance regimes are not known, although the species may require periodic flooding of its habitat to maintain the wet conditions suitable for seed set and germination. Other species of Convolvulus from western NSW possess a thick taproot that aids their persistence during dry periods; also, Convolvulus species can produce hard-coated seed that can lie dormant in the soil for long periods.	BAM – C	Moderate Possible suitable habitat within the Project area, particularly comprising of grey clay soils, however no records within the locality.
Cullen parvum (Small Scurf-pea)	-	E	-	The Small Scurf-pea is known in NSW from only two herbarium collections; one from Wagga Wagga in 1884 and the other from Jindera (near Albury) in 1967. A small population was recently reported from near Jerilderie (although it has not been relocated). In recent years, two populations have been recorded in travelling stock reserves south-west of Wagga Wagga, and a population reputedly exists on a	BAM – C	High Suitable habitat is present and the site is within about 30km of the only known population.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				roadside near Galong. Another population has recently been discovered on private land near Young. Large populations have been recorded in grassy gaps in the Red Gum Woodlands of Barmah State Park, just across the border in Victoria. Extensive suitable habitat probably occurs across the border in NSW. In known populations in Victoria and NSW, plants are found in grassland, River Red Gum (Eucalyptus camaldulensis) Woodland or Box-Gum Woodland, sometimes on grazed land and usually on table drains or adjacent to drainage lines or watercourses, in areas with rainfall of between 450 and 700 mm. Plants tend to die back in dry seasons and resprout with rain in winter or spring; in dry years, plants apparently do not always produce shoots but survive below the ground. Flooding has been suggested as a mechanism for seed dispersal. Reproduction has been found to result largely from self-fertilisation, which has produced substantial differences between populations.		
Diuris sp. (Oaklands, D.L. Jones 5380)	-	E	-	Currently known only from the Oaklands-Urana region of southern NSW. Grows in White Cypress Pine (Callitris glaucophylla) Woodland, either among dense grasses in flat areas with associated eucalypts, or amongst sparse grasses and forbs on low sandhills. Grows mostly on sandy loam soils.	BAM – C	Moderate Some suitable habitat is present in the White Cypress Pine forests within the Project area. No records are within the Project area and the closest records are about 50k to the east.
Eucalyptus leucoxylon subsp. pruinose (Yellow Gum)	-	V	-	Restricted to several small areas between Barham and Euston. This species is not known from any protected area within NSW, though some remnants occur within State Forests along the Murray River, particularly within Campbells Island and Euston SFs. Eucalyptus leucoxylon subsp. pruinosa is a tree species which, in New South Wales, occurs at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion.	BAM – C	Moderate There is possible habitat present in the Project area, however no records are present. The closest records are about 80km to the south near the Murry River. No species were identified during surveys.
Lepidium aschersonii (Spiny Pepper-cress)	V	V	-	Not widespread, occurring in the marginal central-western slopes and north-western plains regions of NSW (and potentially the south western plains). In the north of the State recent surveys have recorded a number of new sites including Brigalow Nature Reserve, Brigalow State Conservation Area, Leard State Conservation Area and Bobbiwaa State Conservation Area. Also known from the West Wyalong in the south of the State. Records from Barmedman and Temora areas are likely to be no longer present. Approximately 50% of the total Lepidium aschersonii recorded for Australia occurs in NSW. Found on ridges of gilgai clays dominated by Brigalow (Acacia harpophylla), Belah (Casuarina cristata), Buloke	PMST – May	Low

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				(Allocasuarina luehmanii) and Grey Box (Eucalyptus microcarpa). In the south has been recorded growing in Bull Mallee (Eucalyptus behriana). Often the understorey is dominated by introduced plants. The species grows as a component of the ground flora, in grey loamy clays. Vegetation structure varies from open to dense, with sparse grassy understorey and occasional heavy litter.		
Lepidium monoplocoides (Winged Peppercress)	E	E	-	Widespread in the semi-arid western plains regions of NSW. Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300-500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses. Recorded in a wetland-grassland community comprising *Eragrostis australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma* and *Pycnosorus globosus*, on waterlogged grey-brown clay. Also recorded from a Maireana pyramidata shrubland.	PMST - Likely BAM – C	Moderate Was not detected during surveys. Suitable habitat possible in waterlogged area. Records located near Lake Urana, about 40km east of the Project area.
Leptorhynchos orientalis (Lanky Buttons)	-	E	-	Recorded from several Hay Plain and southern Riverina localities, including Willanthry east of Hillston, Zara-Wanganella via Hay, McKinley Road SW of Hillston, and "Morundah" navy land west of Buckingbong SF. A large population has most recently been recorded from Cowl Cowl Station SSW of Hillston along a TSR.	BAM – C	High Suitable vegetation is present on site within the forested and grassland communities. No records within the Project area, however Lake Urana and Buckingbong State Forest, from about 40km east of the Project area.
Maireana cheelii (Chariot Wheels)	V	V	-	Restricted to the southern Riverina region of NSW, mainly in the area between Deniliquin and Hay. Also has a limited distribution in Victoria where very rare. NSW collections have mainly been from the Moulamein, Deniliquin and Hay districts, including Tchelery and Zara Stations. Usually found on heavier, grey clay soils with Atriplex vesicaria (Bladder Saltbush). Recorded on the Hay Plain in Atriplex vesicaria, *Maireana aphylla* and *Acacia homalophylla* shrublands. Soils include heavy brown to red-brown clay-loams, hard cracking red clay, other heavy texture-contrast soils. Tends to grow in shallow depressions, often on eroded or scalded surfaces, and does not extend to the higher soils in the habitat. It has been found on the edges of bare, windswept claypans, in shallow depressions of eroded surfaces where rainwater collects and on a "shelf" in the crabhole complex of heavy grey soils. Associated species include *Atriplex vesicaria, Maireana pentagona, M. excavata, M. ciliata, Cressa cretica, Avena fatua* and *Acacia homalophylla*. Flowering time is mostly spring to summer. Bears fruits mostly from September to November.	PMST – May BAM – C	Moderate Suitable chenopod shrubland habitats occur within the Project area, however no records within the Project area. The species is known population starting about 30km east of the Project area .

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Pilularia novae-hollandiae (Austral Pillwort)	-	E	-	In NSW, Austral Pillwort has been recorded from suburban Sydney, Khancoban, the Riverina between Albury and Urana (including Henty, Walbundrie, Balldale and Howlong), Oolambeyan National Park near Carrathool and at Lake Cowal near West Wyalong. The populations at Lake Cowal and Oolambeyan NP are the only known extant populations in NSW, although the species is obscure and has possibly been overlooked elsewhere. The species has also been recorded in the Australian Capital Territory, Victoria, Tasmania, South Australia and Western Australia. Austral Pillwort grows in shallow swamps and waterways, often among grasses and sedges. It is most often recorded in drying mud as this is when it is most conspicuous. Most of the records in the Albury-Urana area were from table drains on the sides of roads. The ACT record was from a subalpine grassy plain. This species is probably ephemeral (especially in the drier parts of its range), appearing when soils are moistened by rain.	BAM – C	Moderate Some suitable habitat is present in wetland areas. There are no records within the Project area, however there are several scattered around the region. The closest record is near Jerilderie.
Prasophyllum sp. Moama	-	CE	-	*Prasophyllum sp. Moama* is known in NSW from only one locality, discovered in 2005, near Moama. The site is in the Murray Local Government Area. Several previous surveys of Riverina grassland and regional Travelling Stock Reserves in New South Wales did not detect the species. The species is not endemic to New South Wales, occurring also in Victoria in small to moderate-sized populations within 50 km of Echuca. The Moama site is currently managed, under short-term funding, as a high conservation value area on a Travelling Stock Reserve (TSR) but remains subject to discretionary grazing. Occurs in forb-rich natural grasslands on flat alluvial plains. Occurs on reddish calcareous clay-loam soils. Average annual rainfall between 405-465 mm.	BCS advice	Low There is suitable habitat present in alluvial grasslands of the Project area, however the only records of the species are about 100km to the south-west near Moama.
Pterostylis despectans	-	CE	-	In New South Wales the species is known only from a single population discovered in 2005 near Moama in the Riverina district. The site is within the Murray Local Government Area. Several surveys of Riverina grassland and regional Travelling Stock Reserves did not record *Pterostylis despectans* and it seems likely that the species is extremely rare in New South Wales. The species also occurs as very small fragmented populations in central Victoria and in South Australia. The total estimated number of individuals in the Victorian and South Australian populations is less than 1500. The Moama population has been assessed as comprising between 20 and 60 individual plants. All plants known to date occur within an area of about one hectare, within an apparently suitable habitat patch-size of about 20 ha. *Pterostylis despectans* is not known to occur in any NSW conservation reserves. The plant remains dormant underground as a tuber in late summer into early winter. The New South Wales population occurs in natural forb-rich grassland on flat alluvial plains and not derived from Acacia pendula woodland. The only tree species recorded as present at the site is Allocasuarina luehmannii.	BCS advice	Low There is suitable habitat present in alluvial grasslands of the Project area, however the only records of the species are about 100km to the south-west near Moama.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				The soil is a reddish, probably calcareous, clay loam. The community is described as occurring on plains of Quaternary alluvial sediments with an annual rainfall of 405-465 mm.		
Sclerolaena napiformis (Turnip Copperburr)	E	E	-	Known from only a few small populations in remnant grassland in the southern Riverina of NSW and north-central Victoria. NSW populations are confined to the area between Jerilderie and Moama on travelling stock routes and road reserves. Confined to remnant grassland habitats on clay-loam soils. Grows on level plains in tussock grassland of *Austrostipa nodosa* and *Chloris truncata*, in grey cracking clay to red-brown loamy clay. Sites are roadside travelling stock routes and reserves subject to sheep grazing. Other associated species include *Austrodanthonia duttoniana, Enteropogon acicularis, Austrostipa nodosa, Chloris truncata, Lolium rigidum, Swainsona murrayana, S. plagiotropis, S. procumbens, Rhodanthe corymbiflora, Calotis scabiosifolia, Microseris lanceolata, Acacia pendula* and various chenopods. Fruiting period is from November to May. Grows in areas with intermittent light grazing. Based on past land use, this regime may promote the growth of the species, or at least not be detrimental to it. Plants grow as low shrubs within an open to mid-dense tussock grassland with herbaceous ground layer. It is known only from a few populations in north-central Victoria in the Echuca-Nathalia area, and between Donald and Stawell in the west (Mavromihalis, 2010c). There is anecdotal evidence that the species can tolerate waterlogging in spring, and all known populations occur near a watercourse or swamp (Cook, 1997; Alexander 2002 both cited in Mavromihalis, 2010c).	PMST – Known BAM – C 2 – BioNet	High Several records located within the locality of the Project area along Billabong Creek near Jerilderie. Suitable chenopod shrubland and grassland habitat may occur in the Project area.
Solanum karsense (Menindee Nightshade)	V	V	-	Menindee Nightshade is the a species of Solanum endemic to NSW, restricted to the far south-western plains, extending up the Darling River to the Menindee and Wilcannia districts. Mainly restricted to the area between the Darling and Lachlan Rivers. Localities include Kars Station, Lake Tandou, Lake Cawndilla, Oxley area, between Broken Hill and Menindee, and the Darling River. It has been recorded from Kinchega National Park and Nearie Lake Nature Reserve. Grows in occasionally flooded depressions with heavy soil, including level river floodplains of grey clay with Black Box and Old Man Saltbush, and open treeless plains with solonized brown soils. Habitats are generally lake beds or floodplains of heavy grey clays with a highly self-mulching surface. Also found on sandy floodplains and ridges and in calcareous soils, red sands, red-brown earths and loamy soils. Flowers chiefly in spring. Has been observed in the field to have an extensive root system which will grow when cut and left on the soil surface. This species is ephemeral in nature, appearing following rainfall events. It also tolerates disturbance and will often appear after such activities as grading, ploughing and flooding for irrigation.	BAM – C	Low Species prefer habitats that are generally lake beds or floodplains of heavy grey clays with a highly self-mulching surface. Species records do not occur within the locality. Recorded from near Balranald and further northwest.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				Menindee Nightshade is a clonal species and is recorded as common to locally abundant in most populations. It can form small colonies of several hundred plants, to large spreading colonies found over an area of 8-12000 hectares (11 stands over about 6 km). Isolated and few plants have also been recorded at some sites.		
Swainsona murrayana (Slender Darling Pea)	V	V	-	Found throughout NSW, it has been recorded in the Jerilderie and Deniliquin areas of the southern riverine plain, the Hay plain as far north as Willandra National Park, near Broken Hill and in various localities between Dubbo and Moree. The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with low chenopod shrubs (*Maireana spp., Atriplex vesicaria*), wallaby-grasses (*Austrodanthonia spp.*), and spear grasses (*Austrostipa spp.*). Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated.	PMST – Likely BAM – C 16 – BioNet	High (known) Species has historical records within the Project area and was recorded during the 2021/22 surveys. Occurs in variety of habitats including Black Box woodlands.
Swainsona plagiotropis (Red Darling Pea)	V	V	-	Occurs in the upper River Murray valley in the south-western plains of NSW and into Victoria. Most NSW records are from the Jerilderie area, with possible collections from the Louth-Bourke area and a disjunct record in the north-western plains from Buttabone Stud Park 35 kilometres NW of Warren. Also rare in Victoria, restricted to a few sites in the central north, mostly between Bendigo and the River Murray south of Echuca. Grows on flat grassland and in heavy red soil, often on roadsides and especially in table drains. Soils are derived from quaternary sediments and are usually red-brown clay-loams. The species is absent from black low-lying soils. Associated species include *Austrostipa aristiglumis, A. nodosa, A. setacea, Homopholis proluta, Chloris truncata, Austrodanthonia caespitosa, A. duttoniana, Enteropogon acicularis, Hordeum spp., Lolium rigidum, Rhodanthe corymbiflora, Calotis scabiosifolia, Microseris lanceolata* and *Chrysocephalum apiculatum*.	PMST – Known BAM – C 51 – BioNet	High Species was previously recorded within the Project area, however not during the 2021/22 surveys. Suitable habitat present.
Swainsona sericea (Silky Swainson-pea)	-	V	-	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Found in Natural Temperate Grassland and Snow Gum Eucalyptus pauciflora Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes. Sometimes found in association with cypress-pines *Callitris spp*.	BAM – C 2 – BioNet	High (known) Recorded during the 2021/22 surveys. Records located within the locality of the Project area. Suitable habitat present.

Table F-2 Habitat suitability assessment for threatened fauna species

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Birds						
Anseranas semipalmata (Magpie Goose)	-	V	-	The Magpie Goose is still relatively common in the Australian northern tropics, but had disappeared from south-east Australia by 1920 due to drainage and overgrazing of reed swamps used for breeding. Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains; roosts in tall vegetation.	BAM – C	Moderate No records in the Project area, but several in the broader locality. Some suitable habitat in the wetland areas.
Anthochaera phrygia (Regent Honeyeater)	CE	CE	-	The Regent Honeyeater that has a patchy distribution between south-east Queensland and central Victoria. It mostly inhabits inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation such as sheoak (*Casuarina sp.*) where it feeds on needle-leaved mistletoe and sometimes breeds. It sometimes utilises lowland coastal forest, which may act as a refuge when its usual habitat is affected by drought. It also uses a range of disturbed habitats within these landscapes including remnant patches in farmland and urban areas and roadside vegetation. It feeds primarily on the nectar of eucalypts and mistletoes and, to a lesser extent, lerps and honeydew; it prefers taller and larger diameter trees for foraging. It is nomadic and partly migratory with its movement through the landscape being governed by the flowering of select eucalypt species. There are four known key breeding areas: three in NSW and one in Victoria. Breeding varies between regions and corresponds with flowering of key eucalypt and mistletoe species. It usually nests in horizontal branches or forks in tall mature eucalypts and Sheoaks.	PMST – May BAM - C	Low The closest mapped area of important habitat for the Regent Honeyeater is about 140km to the east near Albury. Suitable habitat for the species was not recorded and species has not been recorded within the locality. There are some records located southwest in Deniliquin
Ardeotis australis (Australian Bustard)	-	E	-	The Australian Bustard mainly occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. In NSW, they are mainly found in the north-west corner and less often recorded in the lower western and central west plains regions. Occasional vagrants are still seen as far east as the	BAM – C	Moderate Preferred tussock grassland habitat within Project area. However, no records within the

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				western slopes and Riverine plain. Breeding now only occurs in the north-west region of NSW. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams. Breeds on bare ground on low sandy ridges or stony rises in ecotones between grassland and protective shrubland cover; roosts on ground among shrubs and long grasses or under trees.		locality. Few records near Deniliquin prior to 2005.
Artamus cyanopterus cyanopterus (Dusky Woodswallow)	-	V	-	The Dusky Woodswallow has two separate populations. The eastern population is found from Atherton Tableland, Queensland south to Tasmania and west to Eyre Peninsula, South Australia. The other population is found in south-west Western Australia. The Dusky Woodswallow is found in open forests and woodlands and may be seen along roadsides and on golf courses.	BAM – C 1 – BioNet	High (known) One sighting has been recorded within the locality, and suitable habitat is present. Wide ranging species. Habitat at the site is not critical to the species.
Botaurus poiciloptilus (Australasian Bittern)	E	E	-	Occurs from south-east Queensland to south-east South Australia, Tasmania and the south-west of Western Australia. The Australasian Bittern's preferred habitat is comprised of wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 metres deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus) or cutting grass (*Gahnia*) growing over a muddy or peaty substrate. Known to occur in the Ramsar Wetland area adjacent the Project area (TLM surveys) and critical to the Ecological character of the Ramsar site area (Hale and Butcher 2011).	PMST - Known BAM – C	Moderate This species may occur in suitable wetland habitat with tall dense vegetation, permanent and seasonal freshwater within the Project area and locality. There are multiple records of this species within the locality. However, the species has not been recorded within the locality. There are, however, multiple records located surrounding the Project area to the north, east, south and west.
Burhinus grallarius (Bush Stone-curlew)	-	E	-	Open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes. Nest on the ground in a scrape or small bare patch.	BAM - C 1 – BioNet	Moderate Suitable non-critical habitat occurs in the study area (open forest and woodland over sparse grassland). However, the species has not been recorded within the locality. There is one local record from 1977 to the east of the Project area. Wide ranging species. Habitat at the site is not critical to the species.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Certhionyx variegatus (Pied Honeyeater)	-	V	-	Widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. Occasionally occurs further east, on the slopes and plains and the Hunter Valley, typically during periods of drought. Inhabits wattle shrub, primarily Mulga (Acacia aneura), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (Eremophila spp.); also from mistletoes and various other shrubs (e.g. Grevillea spp.); also eats saltbush fruit, berries, seed, flowers and insects. Highly nomadic, following the erratic flowering of shrubs; can be locally common at times. Constructs a relatively large cup-shaped nest, usually robust, although occasionally loose, constructed of grasses and fine twigs, bound with spider webs, in the fork of a shrub or tree up to 5 m above the ground.	BAM – C 1 – BioNet	High Suitable habitat for the species is present in Eucalypt and Acacia woodlands, however there are no records within the locality. There are some records located to the west of the Project area.
Circus assimilis (Spotted Harrier)	-	V	-	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	BAM – C 5 – BioNet	High (known) Some previous records within the Project area and recorded during 2021/22 surveys. Suitable shrubland, grassland and woodland habitats. Habitat at the site is not critical to the species.
Climacteris picumnus victoriae (Brown Treecreeper (eastern subspecies))	-	V	-	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Hollows in standing dead or live trees and tree stumps are essential for nesting.	3 – BioNet	High (known) Species recorded during 2021/22 surveys. Some historical records within the Project area. May provide suitable Semi-arid woodlands and Wetland habitats. Prefers woodlands with open shrub layer, hollows in standing dead or live trees and fallen timber. Wide ranging species. Habitat at the site is not critical to the species but is part of known extent.
Daphoenositta chrysoptera (Varied Sittella)	-	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decorticating bark, dead	BAM – C	High Study area occurs within known range (all of NSW). Suitable habitat is present in eucalypt and Acacia woodlands.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				branches, standing dead trees and small branches and twigs in the tree canopy. Nests in an upright tree fork high in the living tree canopy.		No records in the Project area, however numerous within the surrounding National Parks. Nests in forks of tree high up in canopy. Wide ranging species. Habitat at the site is not critical to the species but is part of known extent.
Epthianura albifrons (White-fronted Chat)	-	V	-	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 metres above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Have been observed breeding from late July through to early March, with 'open-cup' nests built in low vegetation. Nests in the Sydney region have also been seen in low isolated mangroves. Nests are usually built about 23 centimetres above the ground (but have been found up to 2.5 metres above the ground).	BAM – C 9 – BioNet	High (known) Some historical records within the Project area and recorded during 2021/22 surveys. Suitable Semi-arid woodlands, Grasslands, Arid Shrublands and Wetland habitats. Habitat at the site is not critical to the species. Species would benefit from improved watering regime.
Falco hypoleucos (Grey Falcon)	V	E	-	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	PMST – Likely BAM – C	Moderate Some records within the Project area. May provide suitable Semi-arid woodlands, Grasslands and Arid Shrubland habitats. Non-core habitat in the study area is considered suitable for this species. Rarely observed species within the locality. Wide ranging species. Habitat at the site is non-critical to the species.
Falco subniger (Black Falcon)	-	V	-	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referrable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly	4 – BioNet BAM – C	Moderate Some records within the Project area. May provide suitable Semi-arid woodlands, Grasslands and Arid Shrublands and Wetland

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.		habitats. Wide ranging species. Habitat at the site is not critical to the species.
Grantiella picta (Painted Honeyeater)	V	V	-	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of birds, and almost all breeding, occur on the inland slopes of the Great Dividing Range in NSW, Victoria, and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.	PMST – Known BAM – C 6 – BioNet	Moderate Few records within the Project area. May provide suitable Semi-arid woodland habitat. Prefers Boree Brigalow, specialist feeder on mistletoe of genus *Amyema*. Nomadic species sparsely distributed throughout range. Site occurs within species known range. Habitat at the site is not critical to this nomadic / specialist feeder.
Grus rubicunda (Brolga)	-	V	-	Though Brolgas often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. The nest comprises a platform of grasses and sticks, augmented with mud, on an island or in the water. Two eggs are laid from winter to autumn. They feed using their heavy straight bill as a 'crowbar' to probe the ground or turn it over, primarily on sedge roots and tubers. They will also take large insects, crustaceans, molluscs and frogs. Occur in a range of habitats including ephemeral wetlands, saltmarsh, open grassland and crops (Menkhorst et al. 2017).	BAM – C 2 – BioNet	Low Suitable habitat is present in wetland areas. There are numerous records to the north, east, south and west. However, some are duplicate and potentially the same individuals (Max of 3 observed at one location). Habitat at the site is not critical to the species.
Haliaeetus leucogaster (White-bellied Sea-Eagle)	-	V	-	Distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. Found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. Habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, and the sea). It feeds opportunistically on a variety of fish, birds, reptiles, mammals and crustaceans, and on carrion. It generally forages over large expanses of open water; this is particularly true of birds that occur in coastal environments close to the sea-shore. However, they will also forage over open terrestrial habitats (such as grasslands). Nests may be built in a variety of sites including tall trees (especially Eucalyptus species), bushes, mangroves, cliffs, rocky outcrops, caves, crevices, on the ground or even on artificial structures.	BAM – C	High Suitable non-critical habitat occurs in the study area, creeks, open water. Multiple records within the locality. Wide ranging species. May nest in large River Red Gums near water, but generally nest in coastal habitats. Large stick nests were recorded within the subject land.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Hieraaetus morphnoides (Little Eagle)	-	V	-	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	BAM – C	High (known) Species recorded during surveys. Suitable non-critical habitat occurs in the subject land (open eucalypt forest, woodland, riparian woodland). Wide ranging species.
Lathamus discolor (Swift Parrot)	CE	E	-	The swift parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter. Whilst on the mainland the swift parrot disperses widely to forage on flowers and psyllid lerps in eucalypt species, with the majority being found in Victoria and NSW. In NSW they forage in forests and woodlands throughout the coastal and western slopes regions each year. Coastal regions tend to support larger numbers of birds when inland habitats are subjected to drought. Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, and coastal swamp mahogany (*Eucalyptus robusta*) and spotted gum (*Corymbia maculata*) woodland when in flower, otherwise often in coastal forests. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as *E. robusta, Corymbia maculata, C. gummifera, E. sideroxylon, and E. albens*. Commonly used lerp infested trees include *E. microcarpa, E. moluccana and E. pilularis*.	PMST – Known BAM – C	High Foraging habitat present. Preferred habitat includes woodland and forest containing winter-flowering eucalypt species, such as Spotted Gum (*Corymbia maculata*), Swamp Mahogany (*Eucalyptus robusta*) and Forest Red Gum (*E. tereticornis*) but will also use *E. microcarpa*. Most these species are unlikely to occur at the Project area. Several recent records within 100km. There is no important areas mapping within the study area.
Leipoa ocellata (Maleefowl)	V	E	-	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary, and is part of a larger population north of the Murray River in South Australia. The population in central NSW has been significantly reduced through land clearance and fox predation and now occurs chiefly in Yathong, Nombinnie and Round Hill NRs and surrounding areas, though birds continue to survive in Loughnan NR. To the south of this area the species is probably locally extinct in such reserves as Pulletop NR (last recorded 1989), Ingalba NR (1982) and Buddigower NR (1990) and the intensely studied population at Yalgogrin was still known to have at lest one active mound in 2017. Further east, a population continues to persist in the Goonoo forest near Dubbo, though the size of this population is unknown. Outside these areas, occasional records have been made in the Pilliga forests (most recently 1999), around Cobar (1991) and Goulburn River NP (1989) though the extent and status of populations in these areas are unknown. Predominantly inhabit mallee communities, preferring the tall, dense and	PMST – Likely	Low Suitable habitat for the species was not recorded and species has not been recorded within the locality. Only one record within 100km locality from 1994.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers.		
Lophochroa leadbeateri (Major Mitchell's Cockatoo)	-	V	-	Found across the arid and semi-arid inland, from south-western Queensland south to north-west Victoria, through most of South Australia, north into the south-west Northern Territory and across to the west coast between Shark Bay and about Jurien. In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres.	BAM – C	Moderate Some suitable habitats present including saltbush and Cypress pines. However, no records present in the Project area and few historic records from Deniliquin and Leeton.
Lophoictinia isura (Square-tailed Kite)	-	V	-	Typically inhabits coastal forested and wooded lands of tropical and temperate Australia. In NSW it is often associated with ridge and gully forests dominated by *Eucalyptus longifolia, Corymbia maculata, E. elata, or E. smithii*. Individuals appear to occupy large hunting ranges of more than 100 kilometre squared. They require large living trees for breeding, particularly near water with surrounding woodland /forest close by for foraging habitat. Nest sites are generally located along or near watercourses, in a tree fork or on large horizontal limbs.	BAM – C	High (known) The species was recorded in the 2021/22 surveys. River Red Gum Forest near water may provide suitable habitat. Habitat at the site is not critical to the species.
Melanodryas cucullata cucullata (Hooded Robin (south-eastern form))	-	V	-	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. The nest is a small, neat cup of bark and grasses bound with webs, in a tree fork or crevice, from less than one metre to five metres above the ground.	BAM – C	Moderate Suitable habitat may be present in areas that are open and structurally diverse. Habitat at the study area is not critical to the species. Several records are near Oaklands and Buckingbong State Forest over 100km to the east, few of which are recent.
Melithreptus gularis gularis (Black-chinned	-	V	-	The Black-chinned Honeyeater has two subspecies, with only the nominate (gularis) occurring in NSW. The other subspecies (laetior) was formerly considered a separate species (Golden-backed Honeyeater) and is found in	BAM – C 1 – BioNet	Moderate

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Honeyeater (eastern subspecies))				northern Australia between central Queensland west to the Pilbara in Western Australia. The eastern subspecies extends south from central Queensland, through NSW, Victoria into south eastern South Australia, though it is very rare in the last state. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis).		Some suitable habitat for the species is present (open forests or woodlands).
Ninox connivens (Barking Owl)	-	V	-	Found throughout continental Australia except for the central arid regions. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas.	BAM – C	Moderate Some suitable habitat present, however no records within the Project area. Few historical records in the region.
Oxyura australis (Blue-billed Duck)	-	V	-	Endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 kilometres away. It is generally only during summer or in drier years that they are seen in coastal areas. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. It will fly if disturbed but prefers to dive if approached. Partly migratory, with short-distance movements between breeding swamps and overwintering lakes with some long-distance dispersal to breed during spring and early summer. Usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in Lignum, sedges or Spike-rushes, where a bowl-shaped nest is constructed. The most common clutch size is five or six. Males take no part in nest-building or incubation.	BAM - C	Moderate Records located within the south of the Project area. Some suitable habitat present including wetland communities. Habitat at the site is not critical to the species. Species would benefit from improved watering regime.
Pachycephala inornata (Gilbert's Whistler)	-	V	-	The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The Gilbert's Whistler occurs in a range of habitats within NSW, though the shared feature appears to be a dense shrub layer. It is widely recorded in mallee shrublands, but also occurs in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests,	BAM – C	Moderate Suitable habitat present in several woodland PCTs, particularly White Cypress Pine forests. Multiple records within the locality. Habitat

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				though at this stage it is only known to use this habitat along the Murray, Edwards and Wakool Rivers. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including wattles, hakeas, sennas and hop-bushes. In woodland habitats, the understorey comprises dense patches of shrubs, particularly thickets of regrowth Callitris pine. Parasitic 'cherries' (*Exocarpus* species) appear to be an important habitat component in Belah and Red Gum communities, though in the latter case other dense shrubs, such as Lignum and wattles, are also utilised.		at the site is not critical to the species.
Pedionomus torquatus (Plains-wanderer)	CE	E	-	The Plains-wanderer has declined greatly since European settlement. Areas where the species was formerly common and is now so reduced in numbers that it is effectively extinct include eastern NSW, south-western Victoria, and south-eastern South Australia. Its current stronghold is the western Riverina of southern NSW. Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. These grasslands support a high diversity of plant species, including a number of state and nationally threatened species. Habitat structure appears to play a more important role than plant species composition. Preferred habitat of the Plains-wanderer typically comprises 50 per cent bare ground, 10 per cent fallen litter, and 40 per cent herbs, forbs and grasses. Most of the grassland habitat of the Plains-wanderer is <5 centimetres high, but some vegetation up to a maximum of 30 centimetres is important for concealment, as long as grass tussocks are spaced 10-20 centimetres apart. During prolonged drought, the denudation of preferred habitats may force birds into marginal denser and taller grassland habitats that become temporarily suitable.	PMST - Known BAM – C 35 – BioNet	High (known) Multiple records within the Project area and was recorded in the 2021/22 surveys. May provide suitable Grassland and Arid Shrubland habitats. Important habitat mapping located within Project area. Nomadic, cryptic ground-bird. Preferred foraging and nesting habitat of ephemeral open grasslands and herbfields.
Petroica boodang (Scarlet Robin)	-	V	-	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and re-growth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. This species' nest is built in the fork of tree usually more than two metres above the ground; nests are often found in a dead branch in a live tree, or in a dead tree or shrub.	BAM – C	Moderate Suitable habitat may be present in woodland areas. Habitat at the site is not likely to be critical to the species. Additionally, extensive fragmentation between wooded areas may limit the movement of the species.
Petroica phoenicea (Flame Robin)	-	V	-	The Flame Robin ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or	3 – BioNet	Low Suitable habitat for the species was not recorded and species has not been recorded within the locality. Multiple records outside of the locality to the north, east, south

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes.		and west.. Habitat at the site is not likely to be critical to the species.
Pezoporus occidentalis (Night Parrot)	E	PE	-	The distribution of the Night Parrot has not been well documented, but it is known to be restricted to arid and semi-arid Australia. The Night Parrot is known to occur within Spinifex grasslands in stony or sandy areas and samphire and chenopod associations on floodplains, salt lakes and clay pans. Suitable habitat is characterized by the presence of large and dense clumps of Spinifex, and it may prefer mature spinifex that is long and unburnt.	PMST - May	Low Species is considered extinct in the area, no recent records, no suitable preferred habitat present.
Polytelis anthopeplus monarchoides (Regent Parrot (eastern subspecies))	V	E	-	The eastern subspecies is restricted to areas around the Murray River in South Australia, Victoria and NSW. In NSW it occurs along the Murray River downstream of Tooleybuc (though there are few records between Mildura and the South Australian border), the Wakool River downstream of Kyalite, and the Murrumbidgee River immediately upstream from the junction with the Murray River and adjoining areas of mallee. There are scattered records along the Darling River as far north as Menindee, but at this stage the species has not been confirmed to breed along this river. The nominate subspecies occurs in south western Western Australia. The species nests within River Red Gum forests along the Murray, Wakool and lower Murrumbidgee Rivers, and possibly the Darling River downstream of Pooncarie. Typical nest trees are large, mature healthy trees with many spouts (though dead trees are used) and are usually located close to a watercourse. Principal foraging habitat is mallee woodlands, though foraging also occurs in riverine forests and woodlands. Mallee woodland within 20 kilometres of nesting sites is critical foraging habitat for breeding birds. They may utilise cereal crops and will feed on spilt grain. Is claimed to be a pest in almond orchards.	BAM - C	Unlikely The Project area is over 50km from the Rivers the species is know to inhabit and the Project area is generally beyond the eastern extent of the known population. No records of the species are in 80km of the site.
Polytelis swainsonii (Superb Parrot)	V	V	-	Found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the bird's nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree. Key breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. It is estimated that there are less than	PMST – Known BAM – C 15 – BioNet	High Multiple records within the Project area and recorded near the Project area in 2021/22 surveys. Suitable habitats present in woodland habitat. Nest in hollows of dead or living trees. Habitat at the site is not likely to be critical to the species.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				5000 breeding pairs left in the wild. Known to occur in the Ramsar Wetland area of the Project area (TLM surveys) and critical to the Ecological character of the site (Hale and Butcher 2011).		
Pomatostomus temporalis temporalis (Grey-crowned Babbler (eastern subspecies))	-	V	-	In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year-round, and old nests are often dismantled to build new ones.	BAM – C 133 – BioNet	High (known) Multiple records within the Project area and was recorded during surveys. Suitable habitat may be present in woodlands. Habitat at the site is not likely to be critical to the species.
Pyrrholaemus Brunneus (Redthroat)	-	V	-	Endemic to southern mainland Australia in all States and the NT, the Redthroat is a sedentary species with no known large-scale seasonal movements. In NSW, the species is confined to the far west of the state, with populations known from four main areas, though the species is probably under-recorded due to its shy habits and low observer numbers within its distribution. A population exists in the Bulloo Overflow to the east of Tibooburra, with occasional records further to the west in Sturt NP. There are records from around Broken Hill extending at least as far north as Mutawintji NP. The two areas in the south west of NSW are in chenopod shrublands (particularly Old Man Saltbush) to the north of Penarie, 25 kilometres north of Balranald and around the Great Darling Anabranch (particularly around Nearie Lake NR) to the north of Wentworth. Scattered records are known from other locations, such as around Lake Victoria and near Oxley, so further survey may reveal greater numbers in NSW. In NSW the species has been recorded mainly in chenopod shrublands including Old Man Saltbush, Black Bluebush and Dillon Bush shrublands. Around Broken Hill it appears to be associated with the denser vegetation, particularly Acacias, found in drainage lines that run from the rocky hills. In other locations it is known from Canegrass and Lignum swamps and depressions, particularly on floodplains.	BAM – C	High There is suitable habitat for the species in shrublnads, from Canegrass and Lignum swamps. However, there are no records of the species within 100km and it is on the eastern extent of its known range.
Rostratula australis (Australian Painted Snipe)	E	E	-	Most records are from south-east Australia, particularly the Murray Darling Basin, with scattered records across northern Australia. They generally inhabit shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges,	PMST - Known BAM – C	Moderate Elusive species. Most records are from southeast Australia, particularly the Murray Darling Basin. there is possible suitable habitat for the species in its

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				rushes or reeds, or samphire; often with scattered clumps of lignum Muehlenbeckia or canegrass. Breeding habitat requirements may be quite specific; shallow wetlands with areas of bare wet mud and both low cover and canopy cover nearby; nest records nearly all from or near small islands in freshwater wetlands. Has also been recorded nesting in and near swamps, canegrass swamps, flooded areas including samphire, grazing land, among cumbungi, sedges and grasses; one nest has been found in the centre of a cow-pat in a clump of long grass.		migratory route. Nomadic wader prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.
Stagonopleura guttata (Diamond Firetail)	-	V	-	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (*Eucalyptus pauciflora*) Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.	BAM – C 1 – BioNet	Moderate Multiple records within the locality. Suitable habitat may be present in woodland habitat. Habitat at the site is not likely to be critical to the species.
Stictonetta naevosa (Freckled Duck)	-	V	-	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	BAM – C	Moderate Species may occur in suitable limited wetland habitat within the Project area (permanent water, dense aquatic vegetation). Habitat at the site is not critical to the species.
Tyto novaehollandiae (Masked Owl)	-	V	-	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90 per cent of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. Dry eucalypt forests and woodland, typically prefers open forest with low shrub density. Requires old trees for roosting and nesting.	BAM – C	Moderate Site is within range. Suitable, non-critical habitat would be present within the Project area (woodland areas, open woodland with low shrub density). No records in study area and only 2 two in 100km locality, most recent of which is from 1982.
Mammals						
Chalinolobus picatus (Little Pied Bat)	-	V	-	The Little-Pied Bat is found in inland Queensland and NSW (including Western Plains and slopes) extending slightly into South Australia and Victoria. Occurs in dry open forest, open woodland, mulga woodlands, chenopod shrublands,	BAM – C	High

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				cypress pine forest and mallee and Bimbil box woodlands. Roosts in caves, rock outcrops, mine shafts, tunnels, tree hollows and buildings.		Suitable foraging habitat within the forested areas, however, no records within the locality.
Myotis macropus (Southern Myotis)	-	V	-	Generally, roost in groups close to water in caves, mine shafts, hollow-bearing trees, and storm water channels, buildings, under bridges and in dense foliage. Forages over streams and pools catching insects and small fish.	BAM - C	High (known) Species recorded during surveys. There is some potential habitat along Yanco Creek within the Project area, however there are no records. The closest records are along the Murrumbidgee River and Murray River.
Nyctophilus corbeni (Corben's Long-eared Bat)	V	V	-	Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke Allocasuarina luehmannii and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark.	PMST - May	Low One record, located at Deniliquin, southwest of the Project area. Site is on the edge of predicted range. Core population is in the Piliga Scrub, considerably north of the study area. Suitable, non-critical habitat may be present within the Project area, (woodlands, tree hollows).
Phascolarctos cinereus (Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory))	V	V	-	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	PMST – Likely BAM – C 1 – BioNet	Low Multiple records located substantially south of the study area, mainly located within the Millewa National Park. Habitat is degraded / not suitable for this species.. Habitat at the site is not likely to be critical to the species.
Pteropus poliocephalus (Grey-headed Flying-fox)	V	V	-	Generally found within 200 kilometres of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 kilometres of a regular food source and are commonly found in gullies, close to water, in vegetation with a	PMST - May	Low No records, no known camps, site is west of edge of known range. Suitable non-core foraging habitat may occur within the Project area. Habitat at the site is not likely to be critical to the species.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young.		
Saccolaimus flaviventris (Yeallow-bellied Sheathtail-bat)	-	V	-	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	BAM – C	High (known) This species was recorded during targeted surveys on site. Suitable foraging and roosting habitat is present. Historic records are numerous in the 100km locality, particularly in Murray National Park and along the Murray River.
Vespadelus Baverstocki (Inland Forest Bat)	-	V	-	Because of the difficulty of identification, the distribution of this species, particularly in NSW, is very poorly known. Believed to occur widely in all the mainland states, generally in areas with annual rainfall less than 400 millimetres. In Victoria it is confined to the extreme north west. In NSW it has been most regularly captured in the far south west, north from the Murray River to Menindee, and at least as far east as the Balranald-Ivanhoe Road. There is some evidence to suggest that this species also occurs in the central NSW mallee, centred on Nombinnie Nature Reserve, although there has been very little recent survey in this part of the state. Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high. The habitat requirements of this species are poorly known but it has been recorded from a variety of woodland formations, including Mallee, Mulga and River Red Gum. Most records are from drier woodland habitats with riparian areas inhabited by the Little Forest Bat. However, other habitats may be used for foraging and/or drinking.	BAM – C	High Suitable foraging and roosting habitat on site in woodland areas with preferable species. No records in study area, however there are three recent records within the 100km locality.
Amphibians						
Litoria raniformis (Southern Bell Frog)	V	E	-	The species is currently widespread throughout the River Murray valley and has been recorded from six Catchment Management Areas in NSW: Lower Murray Darling, Murrumbidgee, Murray, Lachlan, Central West and South East. Found mostly amongst emergent vegetation, including Typha sp. (bullrush), Phragmites sp. (reeds) and Eleocharis sp.(sedges), in or at the edges of still or slow-flowing water bodies such as lagoons, swamps, lakes, ponds and farm dams. The Growling Grass Frog (*Litoria raniformis*) inhabits areas within or on the edges of permanent water, such as slow-flowing streams, swamps, lagoons and lakes (Clemann & Gillespie, 2012), but also farm dams, irrigation channels, irrigated rice crops and disused quarries. Favoured sites have a large proportion	PMST – Known BAM – C	Moderate Project area occurs within known range. Moderate Suitable habitat for the species is present in some of the forested wetlands, particularly where emergent vegetation is present. No records within the Project area, however there are numerous about

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				of emergent, submerged and floating vegetation. Breeding is triggered by flooding of ephemeral waterbodies during spring or summer, with the larval period as short as two months (Schultz, 2008). The range of the Growling Grass Frog has declined markedly, with loss of populations resulting a high level of fragmented and a disjunct distribution (Clemann & Gillespie, 2012).		40km to the north-east, near Coleambally.
Aquatic species						
Bidyanus bidyanus (Silver Perch)	CE	V	V	Once widespread and abundant throughout most of the Murray-Darling river system. They have now declined to low numbers or disappeared from most of their former range. Only one remaining secure and self-sustaining population occurs in NSW in the central River Murray downstream of Yarrawonga weir, as well as several anabranches and tributaries. Silver perch show a preference for faster-flowing water, including rapids and races, and more open sections of river. Hatchery-bred silver perch are also stocked out of their range in a number of impoundments on east coast river systems, where they generally fail to reproduce. However, a self-sustaining population of silver perch occurs in Cataract Dam in the Hawkesbury Nepean System. Silver perch are also bred and grown in aquaculture facilities but these cultured fish are not considered meaningful to survival of silver perch in the wild. Similarly, stocked silver perch appear to make little improvement to the conservation situation of wild silver perch. Known to occur in the Ramsar Wetland area of the Project area (TLM surveys) and critical to the Ecological character of the site (Hale and Butcher 2011).	Fisheries NSW (DPI, 2022a)	Moderate Main channel specialist. Typically inhabits deeper flowing waters of the River Murray and larger tributaries. Delta Creek, Yanco Creek and Turn Back Jimmy Creek are mapped as predicted habitat for this species (DPI, 2022), however available habitat is not considered suitable and there are no records of species within proximity of the Project (ALA, 2022; DPE, 2022).
Galaxias rostratus (Flathead Galaxias)	CE	CE	CE	Flathead Galaxias, also known as Murray jollytail are a small native fish that are known from the southern part of the Murray Darling Basin. They have been recorded in the Macquarie, Lachlan, Murrumbidgee and River Murrays in NSW. Despite extensive scientific sampling over the past 15 years there have been very few recorded sightings of Flathead Galaxias. They have not been recorded and are considered locally extinct in the lower Murray, Murrumbidgee, Macquarie and Lachlan Rivers. The species is now only known from the upper River Murray near Tintaldra and wetland areas near Howlong. Flathead Galaxias are found in still or slow moving water bodies such as wetlands and lowland streams. The species has been recorded forming shoals. They have been associated with a range of habitats including rock and sandy bottoms and aquatic vegetation.	PMST – May Fisheries NSW (DPI, 2022a)	Moderate Species prefer still or slow-moving water bodies such as wetlands and lowland streams. Delta Creek, Yanco Creek and Turn Back Jimmy Creek are mapped as predicted habitat for this species (DPI, 2022). Habitat may be suitable in Yanco Creek in proximity of the Project, and in Delta Creek and Turn Back Jimmy Creek when water is present. There are no records of species within proximity of the Project (ALA, 2022; DPE, 2022).

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Maccullochella macquariensis (Trout Cod)	E	E	E	The Trout Cod is a riverine species, inhabiting a variety of flowing waters in the mid to upper reaches of rivers and streams. Trout Cod use river positions where large cover, in the form of woody debris and boulders, is present in high quantity, close to deeper water and high surface velocity, further from the river bank. At present only two potentially sustainable populations are known; a naturally occurring population in the River Murray (NSW) downstream of the Yarrawonga Weir between Yarrawonga and Barmah and the translocated population in Seven Creeks below Polly McQuinns Weir (Vic). There have been no recent records in the River Murray downstream from Echuca (NSW, SA), Macquarie River (NSW), Murrumbidgee River (NSW, ACT), and the Goulburn, Broken, Campaspe, Ovens, King, Buffalo and Mitta Mitta Rivers (Vic). The wild populations formerly occurring in these rivers are now probably extinct. Trout Cod and Murray Cod translocated into Cataract Dam (Nepean River NSW) have hybridised, and the cod population existing there is composed largely of hybrids. Known to occur in the Ramsar Wetland area of the Project area (TLM surveys) and critical to the Ecological character of the site (Hale and Butcher 2011).	PMST – May	Low Large-bodied channel specialist. Prefers deeper waters of main channel of River Murray and larger tributaries.
Maccullochella peelii (Murray Cod)	V	-	-	The Murray Cod occurs naturally in the waterways of the Murray-Darling Basin (ACT, SA, NSW and Vic) and is known to live in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat. Some translocated populations exist outside the species' natural distribution in impoundments and waterways in NSW and Vic which are maintained by the release of hatchery bred fish. Known to occur in the Ramsar Wetland area of the Project area (TLM surveys) and critical to the Ecological character of the site (Hale and Butcher 2011).	PMST – Known Fisheries NSW (DPI, 2022a)	Moderate Large-bodied channel specialist. Prefers deeper waters of main channel of River Murray and larger tributaries. Yanco Creek is mapped as predicted habitat (DCCEEW, 2022) however available habitat is not considered suitable and there are no records of species within proximity of the Project (ALA, 2022; DPE, 2022).
Macquaria australasica (Macquarie Perch)	E	E	E	The Macquarie Perch is a riverine species that prefers clear water and deep, rocky holes with abundant cover such as aquatic vegetation, large boulders, debris and overhanging banks. In Victorian parts of the Murray-Darling, only small natural populations remain in the upper reaches of the Mitta Mitta, Ovens, Broken, Campaspe and Goulburn Rivers; translocated populations occur in the Yarra River and Lake Eildon. In NSW, natural inland populations are isolated to the upper reaches of the Lachlan and Murrumbidgee Rivers. Populations of the eastern form are confined to the Hawkesbury-Nepean and Shoalhaven river systems. Translocated populations in NSW are found in the Mongarlowe River, Queanbeyan River upstream of the Googong Reservoir and in Cataract Dam. In	PMST – May	Low Large-bodied channel specialist. Prefers deeper waters of main channel of River Murray and larger tributaries. No records within the study area based on survey evidence or database searches (ALA, 2022; DPE, 2022), however the species has been recorded in the Murrumbidgee River upstream.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				the ACT, it is restricted to the Murrumbidgee, Paddys and Cotter Rivers. Historical records, considered to be locally extinct in the Ramsar section of the study area (Hale and Butcher 2011).		
Migratory species						
Actitis hypoleucos (Common Sandpiper)	M	-	-	Found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper is wader / shorebird migrating to Australia in summer for its non-breeding period. the species breeds in a variety of habitats near water in Eurasia. When in Australia, the species is more common in the northern half of Australia (Geering et al. 2008), this species is widespread in small numbers and has been recorded in a variety of habitats including steep sided sewage ponds and dams, feeding in the shallow edges of inland wetlands, farm dams and lakes. With a preference for environments with standing water, it is noted that the proposed inundation regime will potentially improve and extend suitable foraging habitat for this species.	PMST – May	Low No BioNET records, but suitable non-core habitat may occur within the Project area.
Apus pacificus (Fork-tailed Swift)	M	-	-	Recorded in all regions of NSW. The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 metres to at least 1000 metres above ground and probably much higher, seldom recorded on the ground. The species occurs aerially over a wide range of habitats, which vary from rainforests to treeless plains (Menkhorst et al. 2017).	PMST – Likely	Low Highly mobile, almost entirely aerial species. Numerous ALA records from much of inland and coastal Australia. Given widespread nature and use of aerial habitat has potential to occur above the study area as an overfly visitor.
Calidris acuminata (Sharp-tailed Sandpiper)	M	-	-	The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation; this includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries, or seashores, and also swamps and creeks lined with mangroves. They	PMST – May	Moderate Migratory wader / shorebird. Breeds in Siberia and migrates to New Guinea and Australia. Occurs in coastal and inland areas but prefers non-tidal fresh or brackish wetlands. Recorded from wetlands throughout Australia. One of the most numerous migratory shorebirds to occur in fresh to saline inland wetlands, also

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
				tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. Sometimes they occur on rocky shores and rarely on exposed reefs.		forages in nearby damp grasslands, sometimes dams.
Calidris ferruginea (Curlew Sandpiper)	M, CE	E	-	In Australia, Curlew Sandpipers occur around the coasts of all states and are also quite widespread inland, though in smaller numbers. They occur in Australia mainly during the non-breeding period but also during the breeding season when many non-breeding one-year old birds remain. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh and in mangroves.	PMST – May BAM – C	Moderate Suitable habitat present in wetlands areas for temporary migration. No records in the Project area, and not within 100km. closest records are near Leeton in the Fivebough wetlands.
Calidris melanotos (Pectoral Sandpiper)	M	-	-	Breeds in northern North America and Siberia and migrates (from late June) to South America and to a lesser extent Australasia (Menkhorst et al 2017). In New South Wales (NSW), the Pectoral Sandpiper is widespread, but scattered. Records exist east of the Great Divide, from Casino and Ballina, south to Ulladulla. West of the Great Divide, the species is widespread in the Riverina and Lower Western regions. Prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains, and artificial wetlands.	PMST - May	Low No BioNet records, ALA records scattered around the region. Occurs solitary or in small flocks on freshwater wetlands, grassy or lightly vegetated coastal and inland swamps. Riparian and floodplain areas within the study area may provide occasional habitat for this species following floods.
Gallinago hardwickii (Latham's Snipe)	M	-	-	Recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia. Occurs in permanent and ephemeral wetlands up to 2000 metres above sea-level. Non-breeding visitor to south-eastern Australia. Prefers permanent and ephemeral wetlands, usually open, freshwater wetlands with low, dense vegetation. Sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers, although usually only during migration (Menkhorst et al. 2017).	PMST – Known	Low Riparian and floodplain areas within the study area may provide occasional habitat for this species following floods.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Hirundapus caudacutus (White-throated Needletail)	M, V	-	-	Widespread in eastern and south-eastern Australia. Almost exclusively aerial, from heights of less than 1 metres up to more than 1000 metres above the ground. They also commonly occur over heathland but less often over treeless areas, such as grassland or swamps.	PMST – May BAM – C 2 – BioNet	Moderate Likely to use airspace above the Project area, if present. No records to date, however some surrounding Jerilderie. Potential to utilise the habitats within Project area. Habitat at the site is not critical to the species.
Limosa limosa (Black-tailed Godwit)	M	V	-	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	BAM – C	Moderate There is minimal suitable habitat for the species in wetland areas. There are no records within the study area. There are numerous records at Fivebough Wetlands near Leeton. All mapped areas are coastal and over 400km to the east.
Motacilla flava (Yellow Wagtail)	M	-	-	Rare but regular visitor around Australian coast, especially in the NW coast Broome to Darwin. Found in open country near swamps, salt marshes, sewage ponds, grassed surrounds to airfields, bare ground; occasionally on drier inland plains. Uncommon migratory wagtail. Nearly all Australia records are coastal, with a few widely scattered inland records. Typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops.	PMST – May	Low No BioNet records. Riparian and floodplain areas within the study area may provide occasional habitat for this species following floods.
Myiagra cyanoleuca (Satin Flycatcher)	M	-	-	Widespread in eastern Australia and vagrant to New Zealand. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. The species shows a north-south migration throughout its range. Breeding occurs in Australia mostly in October through January, with the species nesting preferentially in wet gullies of heavy eucalypt forest, in the south-east NSW and Victoria and Tasmania. The Satin Flycatcher spends a lot of its time aerially in the mid to upper levels of the forest feeding on flying insects from perches in the canopy around the same level.	PMST – May	Low No BioNet records. Riparian and floodplain areas within the study area may provide occasional habitat for this species following floods.

Scientific name (common name)	EPBC Act	BC Act	FM Act	Distribution and habitat	No. records in locality	Likelihood of occurrence
Numenius madagascariensis (Eastern Curlew)	M, CE	-	-	Within Australia, the Eastern Curlew has a primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sand flats, often with beds of seagrass.	PMST - May	Low Large migratory wader patchily distributed in coastal areas, particularly tidal flats. Historic records from River Murray floodplain. No records in the locality.

Appendix G. Biodiversity credit reports

BAM Credit Summary Report

Proposal Details

Assessment Id
00029138/BAAS18009/21/00029139

Proposal Name
Jerilderie Windfarm - dummy

BAM data last updated *
14/10/2022

Assessor Name
Jonathan Carr

Report Created
08/11/2022

BAM Data version *
55

Assessor Number
BAAS18009

BAM Case Status
Finalised

Date Finalised
02/11/2022

Assessment Revision
3

Assessment Type
Major Projects

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
3	13_Moderate-Good	Not a TEC	61.1	61.1	0.58	PCT Cleared - 57%	High Sensitivity to Gain			1.75		15

4	13_Low-Moderate	Not a TEC	48.9	48.9	0.11	PCT Cleared - 57%	High Sensitivity to Gain			1.75		2
											Subtotal	**17**
Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion												
15	46_Moderate-Good	Not a TEC	92.1	92.1	31.3	PCT Cleared - 20%	High Sensitivity to Gain			1.50		1080
16	46_Low-Moderate	Not a TEC	67.3	67.3	13.3	PCT Cleared - 20%	High Sensitivity to Gain			1.50		336
17	46_Moderate-Good-C	Not a TEC	97.7	97.7	22.6	PCT Cleared - 20%	High Sensitivity to Gain			1.50		829
18	46_Low-Moderate-C	Not a TEC	83.3	83.3	22.5	PCT Cleared - 20%	High Sensitivity to Gain			1.50		704
											Subtotal	**2949**
Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion												
11	44_Moderate-Good	Not a TEC	99.4	99.4	33	PCT Cleared - 73%	High Sensitivity to Gain			2.00		1640

12	44_Low-Moderate	Not a TEC	84.5	84.5	3.2	PCT Cleared - 73%	High Sensitivity to Gain			2.00		133
											Subtotal	**1773**
Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)												
5	17_Moderate-Good	Not a TEC	94	94.0	1.9	PCT Cleared - 63%	High Sensitivity to Gain			1.75		76
											Subtotal	**76**
Nitre Goosefoot shrubland wetland on clays of the inland floodplains												
19	160_Moderate-Good	Not a TEC	80.3	80.3	0.03	PCT Cleared - 28%	High Sensitivity to Gain			1.50		1
											Subtotal	**1**
Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion												
13	45_Moderate-Good	Not a TEC	90.9	90.9	1.4	PCT Cleared - 60%	High Sensitivity to Gain			1.75		56
14	45_Low-Moderate	Not a TEC	68.7	68.7	0.81	PCT Cleared - 60%	High Sensitivity to Gain			1.75		24
											Subtotal	**80**

River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion												
2	9_Low-Moderate	Not a TEC	33.1	33.1	0.22	PCT Cleared - 66%	High Sensitivity to Gain			1.75		3
											Subtotal	**3**
River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion												
1	7_Low-Moderate	Not a TEC	37.7	37.7	1.1	PCT Cleared - 15%	High Sensitivity to Gain			1.50		16
											Subtotal	**16**
Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion												
6	26_Moderate-Good-G	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	50.1	50.1	27	PCT Cleared - 90%	High Sensitivity to Gain	Endangered Ecological Community	Endangered	2.00		676

7	26_Low-Moderate-G	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	30.9	30.9	1.4	PCT Cleared - 90%	High Sensitivity to Gain	Endangered Ecological Community	Endangered	2.00		22
8	26_Moderate-Good-S	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	82.2	82.2	2.1	PCT Cleared - 90%	High Sensitivity to Gain	Endangered Ecological Community	Endangered	2.00		86

9	26_Low-Moderate-S	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	34.9	34.9	0.59	PCT Cleared - 90%	High Sensitivity to Gain	Endangered Ecological Community	Endangered	2.00		10
											Subtotal	**794**
White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone												
10	28_Low-Moderate	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	28.2	28.2	10.3	Biodiversity Conservation Act listing status	High Sensitivity to Gain	Endangered Ecological Community	Not Listed	2.00		145
											Subtotal	**145**
											Total	**5854**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Austrostipa wakoolica / A spear-grass (Flora)									
17_Moderate-Good	94.0	94.0	0.95			Endangered	Endangered	False	45
26_Moderate-Good-G	50.1	50.1	12.2			Endangered	Endangered	False	305
26_Low-Moderate-G	30.9	30.9	0.01			Endangered	Endangered	False	1
26_Moderate-Good-S	82.2	82.2	0.6			Endangered	Endangered	False	25
26_Low-Moderate-S	34.9	34.9	0.03			Endangered	Endangered	False	1
28_Low-Moderate	28.2	28.2	5.8			Endangered	Endangered	False	82
								Subtotal	**459**
Brachyscome muelleroides / Claypan Daisy (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Vulnerable	Vulnerable	True	700
46_Moderate-Good	92.1	92.1	2.6			Vulnerable	Vulnerable	True	182
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Vulnerable	True	22
46_Low-Moderate	67.3	67.3	4			Vulnerable	Vulnerable	True	200

46_Moderate-Good-C	97.7	97.7	0.94			Vulnerable	Vulnerable	True	69
46_Low-Moderate-C	83.3	83.3	6.3			Vulnerable	Vulnerable	True	394
								Subtotal	**1567**
Brachyscome papillosa / Mossgiel Daisy (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Vulnerable	Vulnerable	False	467
46_Moderate-Good	92.1	92.1	2.6			Vulnerable	Vulnerable	False	121
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Vulnerable	False	14
46_Low-Moderate	67.3	67.3	4			Vulnerable	Vulnerable	False	133
46_Moderate-Good-C	97.7	97.7	0.94			Vulnerable	Vulnerable	False	46
46_Low-Moderate-C	83.3	83.3	6.3			Vulnerable	Vulnerable	False	263
160_Moderate-Good	80.3	80.3	0.03			Vulnerable	Vulnerable	False	1
								Subtotal	**1045**
Caladenia arenaria / Sand-hill Spider Orchid (Flora)									
28_Low-Moderate	28.2	28.2	1.5			Endangered	Endangered	True	31
								Subtotal	**31**

Convolvulus tedmoorei / Bindweed (Flora)									
44_Moderate-Good	99.4	99.4	9.5			Endangered	Not Listed	True	711
46_Moderate-Good	92.1	92.1	0.07			Endangered	Not Listed	True	5
26_Moderate-Good-G	50.1	50.1	2.1			Endangered	Not Listed	True	79
26_Moderate-Good-S	82.2	82.2	0.19			Endangered	Not Listed	True	12
44_Low-Moderate	84.5	84.5	0.34			Endangered	Not Listed	True	22
160_Moderate-Good	80.3	80.3	0.03			Endangered	Not Listed	True	2
								Subtotal	**831**
Cullen parvum / Small Scurf-pea (Flora)									
44_Moderate-Good	99.4	99.4	31.8			Endangered	Not Listed	False	1580
7_Low-Moderate	37.7	37.7	0.17			Endangered	Not Listed	False	3
9_Low-Moderate	33.1	33.1	0.2			Endangered	Not Listed	False	3
44_Low-Moderate	84.5	84.5	3.1			Endangered	Not Listed	False	132
								Subtotal	**1718**
Lepidium monoplocoides / Winged Peppercress (Flora)									
46_Moderate-Good	92.1	92.1	0.07			Endangered	Endangered	False	3

26_Moderate-Good-G	50.1	50.1	12.2			Endangered	Endangered	False	305
26_Low-Moderate-G	30.9	30.9	0.01			Endangered	Endangered	False	1
26_Moderate-Good-S	82.2	82.2	0.6			Endangered	Endangered	False	25
26_Low-Moderate-S	34.9	34.9	0.03			Endangered	Endangered	False	1
160_Moderate-Good	80.3	80.3	0.03			Endangered	Endangered	False	1
								Subtotal	**336**
Leptorhynchos orientalis / Lanky Buttons (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Endangered	Not Listed	False	467
46_Moderate-Good	92.1	92.1	2.7			Endangered	Not Listed	False	124
26_Moderate-Good-G	50.1	50.1	2			Endangered	Not Listed	False	50
26_Moderate-Good-S	82.2	82.2	0.13			Endangered	Not Listed	False	5
44_Low-Moderate	84.5	84.5	0.34			Endangered	Not Listed	False	14
46_Low-Moderate	67.3	67.3	4			Endangered	Not Listed	False	133
46_Moderate-Good-C	97.7	97.7	0.94			Endangered	Not Listed	False	46

46_Low-Moderate-C	83.3	83.3	6.3			Endangered	Not Listed	False	263
								Subtotal	**1102**
Maireana cheelii / Chariot Wheels (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Vulnerable	Vulnerable	False	467
46_Moderate-Good	92.1	92.1	2.7			Vulnerable	Vulnerable	False	124
26_Moderate-Good-G	50.1	50.1	2			Vulnerable	Vulnerable	False	50
26_Moderate-Good-S	82.2	82.2	0.13			Vulnerable	Vulnerable	False	5
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Vulnerable	False	14
46_Low-Moderate	67.3	67.3	4			Vulnerable	Vulnerable	False	133
46_Moderate-Good-C	97.7	97.7	0.94			Vulnerable	Vulnerable	False	46
46_Low-Moderate-C	83.3	83.3	6.3			Vulnerable	Vulnerable	False	263
								Subtotal	**1102**
Myotis macropus / Southern Myotis (Fauna)									
7_Low-Moderate	37.7	37.7	0.88			Vulnerable	Not Listed	False	17
9_Low-Moderate	33.1	33.1	0.02			Vulnerable	Not Listed	False	1

								Subtotal	**18**
Pedionomus torquatus / Plains-wanderer (Fauna)									
44_Moderate-Good	99.4	99.4	0.12			Endangered	Critically Endangered	True	9
46_Moderate-Good	92.1	92.1	0.44			Endangered	Critically Endangered	True	30
17_Moderate-Good	94.0	94.0	0.03			Endangered	Critically Endangered	True	2
26_Moderate-Good-G	50.1	50.1	0.48			Endangered	Critically Endangered	True	18
45_Low-Moderate	68.7	68.7	0.05			Endangered	Critically Endangered	True	3
46_Low-Moderate	67.3	67.3	0.38			Endangered	Critically Endangered	True	19
46_Low-Moderate-C	83.3	83.3	0.28			Endangered	Critically Endangered	True	18
								Subtotal	**99**
Pilularia novae-hollandiae / Austral Pillwort (Flora)									
9_Low-Moderate	33.1	33.1	0.16			Endangered	Not Listed	True	4
13_Moderate-Good	61.1	61.1	0.56			Endangered	Not Listed	True	26
13_Low-Moderate	48.9	48.9	0.11			Endangered	Not Listed	True	4
26_Moderate-Good-G	50.1	50.1	12.2			Endangered	Not Listed	True	458

26_Low-Moderate-G	30.9	30.9	0.01			Endangered	Not Listed	True	1
26_Moderate-Good-S	82.2	82.2	0.6			Endangered	Not Listed	True	37
26_Low-Moderate-S	34.9	34.9	0.03			Endangered	Not Listed	True	1
45_Moderate-Good	90.9	90.9	0.49			Endangered	Not Listed	True	33
45_Low-Moderate	68.7	68.7	0.29			Endangered	Not Listed	True	15
								Subtotal	**579**
Sclerolaena napiformis / Turnip Copperburr (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Endangered	Endangered	False	467
46_Moderate-Good	92.1	92.1	2.7			Endangered	Endangered	False	124
26_Moderate-Good-G	50.1	50.1	2			Endangered	Endangered	False	50
26_Moderate-Good-S	82.2	82.2	0.13			Endangered	Endangered	False	5
44_Low-Moderate	84.5	84.5	0.34			Endangered	Endangered	False	14
46_Low-Moderate	67.3	67.3	4			Endangered	Endangered	False	133
46_Moderate-Good-C	97.7	97.7	0.94			Endangered	Endangered	False	46

46_Low-Moderate-C	83.3	83.3	6.3			Endangered	Endangered	False	263
								Subtotal	**1102**
Swainsona murrayana / Slender Darling Pea (Flora)									
44_Moderate-Good	99.4	99.4	10			Vulnerable	Vulnerable	False	496
46_Moderate-Good	92.1	92.1	4			Vulnerable	Vulnerable	False	186
26_Moderate-Good-G	50.1	50.1	2.2			Vulnerable	Vulnerable	False	56
26_Moderate-Good-S	82.2	82.2	0.19			Vulnerable	Vulnerable	False	8
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Vulnerable	False	14
45_Moderate-Good	90.9	90.9	0.53			Vulnerable	Vulnerable	False	24
46_Low-Moderate	67.3	67.3	5.1			Vulnerable	Vulnerable	False	170
46_Moderate-Good-C	97.7	97.7	1.7			Vulnerable	Vulnerable	False	82
46_Low-Moderate-C	83.3	83.3	6.6			Vulnerable	Vulnerable	False	274
28_Low-Moderate	28.2	28.2	1.5			Vulnerable	Vulnerable	False	21
								Subtotal	**1331**

Swainsona plagiotropis / Red Darling Pea (Flora)									
44_Moderate-Good	99.4	99.4	9.5			Vulnerable	Vulnerable	False	474
46_Moderate-Good	92.1	92.1	3.7			Vulnerable	Vulnerable	False	171
26_Moderate-Good-G	50.1	50.1	2.1			Vulnerable	Vulnerable	False	53
26_Moderate-Good-S	82.2	82.2	0.19			Vulnerable	Vulnerable	False	8
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Vulnerable	False	14
45_Moderate-Good	90.9	90.9	0.53			Vulnerable	Vulnerable	False	24
46_Low-Moderate	67.3	67.3	5.1			Vulnerable	Vulnerable	False	170
46_Moderate-Good-C	97.7	97.7	0.99			Vulnerable	Vulnerable	False	48
46_Low-Moderate-C	83.3	83.3	6.5			Vulnerable	Vulnerable	False	270
								Subtotal	**1232**
Swainsona sericea / Silky Swainson-pea (Flora)									
44_Moderate-Good	99.4	99.4	9.4			Vulnerable	Not Listed	False	467
46_Moderate-Good	92.1	92.1	2.7			Vulnerable	Not Listed	False	124
26_Moderate-Good-G	50.1	50.1	2			Vulnerable	Not Listed	False	50

26_Moderate-Good-S	82.2	82.2	0.13			Vulnerable	Not Listed	False	5
44_Low-Moderate	84.5	84.5	0.34			Vulnerable	Not Listed	False	14
46_Low-Moderate	67.3	67.3	4			Vulnerable	Not Listed	False	133
46_Moderate-Good-C	97.7	97.7	0.94			Vulnerable	Not Listed	False	46
46_Low-Moderate-C	83.3	83.3	6.3			Vulnerable	Not Listed	False	263
28_Low-Moderate	28.2	28.2	1.5			Vulnerable	Not Listed	False	21
								Subtotal	**1123**

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00029138/BAAS18009/21/00029139

Proposal Name
Jerilderie Windfarm - dummy

BAM data last updated *
14/10/2022

Assessor Name
Jonathan Carr

Assessor Number
BAAS18009

BAM Data version *
55

Proponent Names
Steve Crowe

Report Created
08/11/2022

BAM Case Status
Finalised

Assessment Revision
3

Assessment Type
Major Projects

Date Finalised
02/11/2022

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Brachyscome muelleroides / Claypan Daisy
Caladenia arenaria / Sand-hill Spider Orchid
Convolvulus tedmoorei / Bindweed

Pedionomus torquatus / Plains-wanderer
Pilularia novae-hollandiae / Austral Pillwort

Additional Information for Approval

PCT Outside Ibra Added

None added

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
Polytelis anthopeplus monarchoides / Regent Parrot (eastern subspecies)

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion	Not a TEC	1.1	0	16	16

9-River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion	Not a TEC	0.2	3	0	3
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0.7	17	0	17
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	1.9	0	76	76
26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions	31.1	0	794	794
28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	10.3	0	145	145
44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion	Not a TEC	36.1	0	1773	1773
45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	Not a TEC	2.2	0	80	80
46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	Not a TEC	89.8	0	2949	2949

160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	Not a TEC	0.0	0	1	1

7-River Red Gum - Warrego Grass - herbaceous riparian tall open forest wetland mainly in the Riverina Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 79, 112, 233, 234, 249, 356, 362	Inland Riverine Forests <50%	7_Low-Moderate	No	16	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

9-River Red Gum - wallaby grass tall woodland wetland on the outer River Red Gum zone mainly in the Riverina Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region

	Inland Riverine Forests This includes PCT's: 9, 36, 78, 79, 112, 249, 356, 362	Inland Riverine Forests >=50% and <70%	9_Low-Moderate	Yes	3	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Moderate-Good	Yes	15	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	13_Low-Moderate	Yes	2	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 115, 161, 241, 247, 375	Inland Floodplain Shrublands >=50% and <70%	17_Moderate-Good	No	76	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

26-Weeping Myall open woodland of the Riverina Bioregion and NSW South Western Slopes Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Moderate-Good-G	No	676	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Low-Moderate-G	No	22	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Moderate-Good-S	No	86	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
	Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South Western Slopes bioregions This includes PCT's: 26, 27, 37, 43, 49, 55, 145, 159, 1766	-	26_Low-Moderate-S	No	10	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

28-White Cypress Pine open woodland of sand plains, prior streams and dunes mainly of the semi-arid (warm) climate zone

Like-for-like credit retirement options

Name of offset trading group	Trading group	Zone	HBT	Credits	IBRA region
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	28_Low-Moderate	No	145	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

44-Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Riverine Plain Grasslands This includes PCT's: 44	Riverine Plain Grasslands >=70% and <90%	44_Moderate-Good	No	1640	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Riverine Plain Grasslands This includes PCT's: 44	Riverine Plain Grasslands >=70% and <90%	44_Low-Moderate	No	133	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
45-Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Plain Grasslands This includes PCT's: 44, 45	Riverine Plain Grasslands >=50% and <70%	45_Moderate-Good	No	56	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	Riverine Plain Grasslands This includes PCT's: 44, 45	Riverine Plain Grasslands >=50% and <70%	45_Low-Moderate	No	24	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
46-Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Riverine Plain Grasslands This includes PCT's: 44, 45, 46, 165, 1203	Riverine Plain Grasslands <50%	46_Moderate-Good	No	1080	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Riverine Plain Grasslands This includes PCT's: 44, 45, 46, 165, 1203	Riverine Plain Grasslands <50%	46_Low-Moderate	No	336	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Riverine Plain Grasslands This includes PCT's: 44, 45, 46, 165, 1203	Riverine Plain Grasslands <50%	46_Moderate-Good-C	No	829	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
Riverine Plain Grasslands This includes PCT's: 44, 45, 46, 165, 1203	Riverine Plain Grasslands <50%	46_Low-Moderate-C	No	704	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

160-Nitre Goosefoot shrubland wetland on clays of the inland floodplains	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 24, 25, 115, 160, 161, 240, 241, 247, 261, 271, 375	Inland Floodplain Shrublands <50%	160_Moderate-Good	No	1	Murrumbidgee, Darling Depression, Lachlan, Lachlan Plains, Lower Slopes, Murray Fans, Robinvale Plains and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Vegetation Zone/s	Area / Count	Credits
Austrostipa wakoolica / A spear-grass	**17_Moderate-Good, 26_Moderate-Good-G, 26_Low-Moderate-G, 26_Moderate-Good-S, 26_Low-Moderate-S, 28_Low-Moderate**	19.6	459.00

Brachyscome muelleroides / Claypan Daisy	**44_Moderate-Good, 46_Moderate-Good, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C**	23.6	1567.00
Brachyscome papillosa / Mossgiel Daisy	**44_Moderate-Good, 46_Moderate-Good, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C, 160_Moderate-Good**	23.6	1045.00
Caladenia arenaria / Sand-hill Spider Orchid	**28_Low-Moderate**	1.5	31.00
Convolvulus tedmoorei / Bindweed	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 160_Moderate-Good**	12.3	831.00
Cullen parvum / Small Scurf-pea	**44_Moderate-Good, 7_Low-Moderate, 9_Low-Moderate, 44_Low-Moderate**	35.3	1718.00

Lepidium monoplocoides / Winged Peppercress	**46_Moderate-Good, 26_Moderate-Good-G, 26_Low-Moderate-G, 26_Moderate-Good-S, 26_Low-Moderate-S, 160_Moderate-Good**	12.9	336.00
Leptorhynchos orientalis / Lanky Buttons	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C**	25.8	1102.00
Maireana cheelii / Chariot Wheels	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C**	25.8	1102.00
Myotis macropus / Southern Myotis	**7_Low-Moderate, 9_Low-Moderate**	0.9	18.00

Pedionomus torquatus / Plains-wanderer	**44_Moderate-Good, 46_Moderate-Good, 17_Moderate-Good, 26_Moderate-Good-G, 45_Low-Moderate, 46_Low-Moderate, 46_Low-Moderate-C**	1.8	99.00
Pilularia novae-hollandiae / Austral Pillwort	**9_Low-Moderate, 13_Moderate-Good, 13_Low-Moderate, 26_Moderate-Good-G, 26_Low-Moderate-G, 26_Moderate-Good-S, 26_Low-Moderate-S, 45_Moderate-Good, 45_Low-Moderate**	14.4	579.00
Sclerolaena napiformis / Turnip Copperburr	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C**	25.8	1102.00

Swainsona murrayana / Slender Darling Pea	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 45_Moderate-Good, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C, 28_Low-Moderate**	32.1	1331.00
Swainsona plagiotropis / Red Darling Pea	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 45_Moderate-Good, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C**	28.9	1232.00
Swainsona sericea / Silky Swainson-pea	**44_Moderate-Good, 46_Moderate-Good, 26_Moderate-Good-G, 26_Moderate-Good-S, 44_Low-Moderate, 46_Low-Moderate, 46_Moderate-Good-C, 46_Low-Moderate-C, 28_Low-Moderate**	27.2	1123.00

Like-for-like credit retirement options

Credit Retirement Options

Austrostipa wakoolica / A spear-grass	Spp	IBRA subregion
	Austrostipa wakoolica / A spear-grass	Any in NSW
Brachyscome muelleroides / Claypan Daisy	Spp	IBRA subregion
	Brachyscome muelleroides / Claypan Daisy	Any in NSW
Brachyscome papillosa / Mossgiel Daisy	Spp	IBRA subregion
	Brachyscome papillosa / Mossgiel Daisy	Any in NSW
Caladenia arenaria / Sand-hill Spider Orchid	Spp	IBRA subregion
	Caladenia arenaria / Sand-hill Spider Orchid	Any in NSW
Convolvulus tedmoorei / Bindweed	Spp	IBRA subregion
	Convolvulus tedmoorei / Bindweed	Any in NSW
Cullen parvum / Small Scurf-pea	Spp	IBRA subregion
	Cullen parvum / Small Scurf-pea	Any in NSW

Lepidium monoplocoides / Winged Peppercress	Spp	IBRA subregion
	Lepidium monoplocoides / Winged Peppercress	Any in NSW
Leptorhynchos orientalis / Lanky Buttons	Spp	IBRA subregion
	Leptorhynchos orientalis / Lanky Buttons	Any in NSW
Maireana cheelii / Chariot Wheels	Spp	IBRA subregion
	Maireana cheelii / Chariot Wheels	Any in NSW
Myotis macropus / Southern Myotis	Spp	IBRA subregion
	Myotis macropus / Southern Myotis	Any in NSW
Pedionomus torquatus / Plains-wanderer	Spp	IBRA subregion
	Pedionomus torquatus / Plains-wanderer	Any in NSW
Pilularia novae-hollandiae / Austral Pillwort	Spp	IBRA subregion
	Pilularia novae-hollandiae / Austral Pillwort	Any in NSW
Sclerolaena napiformis / Turnip Copperburr	Spp	IBRA subregion

	Sclerolaena napiformis / Turnip Copperburr	Any in NSW
Swainsona murrayana / Slender Darling Pea	Spp	IBRA subregion
	Swainsona murrayana / Slender Darling Pea	Any in NSW
Swainsona plagiotropis / Red Darling Pea	Spp	IBRA subregion
	Swainsona plagiotropis / Red Darling Pea	Any in NSW
Swainsona sericea / Silky Swainson-pea	Spp	IBRA subregion
	Swainsona sericea / Silky Swainson-pea	Any in NSW

Appendix H. Fauna species list

Table H-1 Bird list results from all seasonal utilisation surveys

Species (common name)	Count	HAG - 0-20m	HAG - 20-50m	HAG - >50m	Guilds
Laughing Kookaburra	2	1	0	0	Carnivore
Sacred Kingfisher	3	1	0	0	Carnivore
Grey Butcherbird	7	1	0	0	Carnivore
Pied Butcherbird	131	1	1	0	Carnivore
Australian Raven	357	1	1	1	Carnivore
Little Raven	480	1	1	1	Carnivore
Australian Magpie	1022	1	1	1	Carnivore
Common Myna	3	1	0	0	Exotic
Blackbird	12	1	0	0	Exotic
House Sparrow	138	1	1	0	Exotic
Common Starling	1215	1	1	1	Exotic
Diamond Firetail	1	1	0	0	Granivore
Little Button-quail	2	1	0	0	Granivore
Peaceful Dove	3	1	0	0	Granivore
Double-barred Finch	13	1	0	0	Granivore
Brown Quail	16	1	0	0	Granivore
Common Bronzewing	26	1	0	0	Granivore
Stubble Quail	59	1	0	0	Granivore
Zebra Finch	216	1	1	0	Granivore
Apostlebird	229	1	0	0	Granivore
Crested Pigeon	699	1	1	0	Granivore
Crested bellbird	1	1	0	0	Insectivore
Dollarbird	1	1	1	0	Insectivore
Fan-tailed Cuckoo	1	1	0	0	Insectivore
Grey Shrike-thrush	1	1	0	0	Insectivore
Horsfield's Bronze-Cuckoo	1	1	0	0	Insectivore
Inland Thornbill	1	1	0	0	Insectivore
Restless flycatcher	1	1	0	0	Insectivore
Fuscous Honeyeater	2	1	0	0	Insectivore
Silvereye	2	1	0	0	Insectivore
Spotted Pardalote	2	1	0	0	Insectivore
White-breasted Woodswallow	2	1	0	0	Insectivore
Australian Owlet-nightjar	3	1	0	0	Insectivore
Grey Fantail	3	1	0	0	Insectivore
Varied Sittella	3	1	0	0	Insectivore
Red-capped Robin	4	1	0	0	Insectivore
Rufous Songlark	4	1	0	0	Insectivore

Species (common name)	Count	HAG - 0-20m	HAG - 20-50m	HAG - >50m	Guilds
Rufous Whistler	5	1	1	0	Insectivore
Chestnut-rumped heathwren	6	1	0	0	Insectivore
Masked Woodswallow	6	1	0	0	Insectivore
Splendid Fairy-wren	7	1	0	0	Insectivore
Striated Pardalote	8	1	0	0	Insectivore
Western Gerygone	8	1	0	0	Insectivore
Yellow Thornbill	8	1	0	0	Insectivore
White-winged Triller	11	1	0	0	Insectivore
Buff-rumped Thornbill	12	1	0	0	Insectivore
Striped Honeyeater	13	1	0	0	Insectivore
Masked Lapwing	14	1	0	0	Insectivore
Weebill	22	1	1	0	Insectivore
Chestnut-rumped Thornbill	23	1	0	0	Insectivore
Variegated Fairy-wren	25	1	0	0	Insectivore
White-plumed Honeyeater	26	1	0	0	Insectivore
Rainbow Bee-eater	34	1	0	0	Insectivore
Black-faced Cuckoo-shrike	37	1	1	0	Insectivore
Banded Lapwing	50	1	0	0	Insectivore
Black-faced Woodswallow	55	1	1	0	Insectivore
Straw-necked Ibis	58	1	1	0	Insectivore
White-winged Chough	75	1	0	0	Insectivore
White-fronted Chat	78	1	1	0	Insectivore
Horsfield's Bushlark	83	1	0	0	Insectivore
Yellow-rumped Thornbill	96	1	0	0	Insectivore
Welcome Swallow	105	1	1	0	Insectivore
Emu	107	1	0	0	Insectivore
Australasian Pipit	133	1	0	0	Insectivore
Singing Honeyeater	148	1	1	0	Insectivore
Willie Wagtail	156	1	0	0	Insectivore
Brown Songlark	198	1	0	0	Insectivore
Southern Whiteface	215	1	0	0	Insectivore
Tree Martin	220	1	1	1	Insectivore
Grey-crowned Babbler	253	1	1	0	Insectivore
Magpie-lark	296	1	1	0	Insectivore
Yellow-throated Miner	330	1	1	0	Insectivore
Superb Fairy-wren	417	1	1	0	Insectivore
White-winged Fairy-wren	454	1	0	0	Insectivore
Noisy Miner	635	1	0	0	Insectivore
White-browed Woodswallow	805	1	1	1	Insectivore

Species (common name)	Count	HAG - 0-20m	HAG - 20-50m	HAG - >50m	Guilds
Yellow-faced Honeyeater	4	1	0	0	Nectivore
Crimson Rosella	1	1	0	0	Parrot
Sulphur-crested Cockatoo	3	1	0	0	Parrot
Mallee Ringneck	16	1	0	0	Parrot
Cockatiel	20	1	0	0	Parrot
Eastern Rosella	32	1	0	0	Parrot
Budgerigar	58	1	1	0	Parrot
Australian Ringneck	117	1	1	0	Parrot
Red-rumped Parrot	1042	1	1	1	Parrot
Blue Bonnet	1142	1	1	0	Parrot
Galah	1659	1	1	1	Parrot
Black Falcon	1	1	0	0	Raptor
Southern Boobook	1	1	0	0	Raptor
Brown Goshawk	2	1	0	1	Raptor
Square-tailed Kite	2	1	0	0	Raptor
Eastern Barn Owl	5	1	0	0	Raptor
Spotted Harrier	6	1	1	0	Raptor
Whistling Kite	9	1	1	1	Raptor
Australian Hobby	11	1	1	0	Raptor
Kestrel	20	1	1	0	Raptor
Black-shouldered Kite	58	1	1	1	Raptor
Brown Falcon	77	1	1	1	Raptor
Wedge-tailed Eagle	89	1	1	1	Raptor
Black Kite	103	1	1	1	Raptor
Nankeen Kestrel	274	1	1	1	Raptor
Chesnut Teal	1	1	1	0	Waterbird
Dusky moorhen	1	1	0	0	Waterbird
Great egret	1	1	0	0	Waterbird
Black-fronted Dotterel	4	1	0	0	Waterbird
Pelican	4	0	1	0	Waterbird
Australian Shelduck	7	1	0	1	Waterbird
Hoary-headed Grebe	10	1	0	0	Waterbird
White-necked Heron	11	1	1	0	Waterbird
Plumed Whistling-Duck	25	1	0	0	Waterbird
Great Cormorant	36	0	0	1	Waterbird
White-faced Heron	56	1	1	1	Waterbird
Pacific Black Duck	76	1	1	1	Waterbird
Australasian Grebe	94	1	0	0	Waterbird

Species (common name)	Count	HAG - 0-20m	HAG - 20-50m	HAG - >50m	Guilds
Grey Teal	144	1	1	1	Waterbird
Australian Wood Duck	197	1	0	1	Waterbird

Table H-2 Fauna list results from other fauna surveys

Species (common name)	Status
Birds	
Eastern Barn Owl	Protected
Striped Honeyeater	Protected
Superb Parrot	Vulnerable (BC Act and EPBC Act)
Frogs and Reptiles	
Spotted Grass Frog	Protected
Crucifix Frog	Protected
Giant Banjo Frog	Protected
Peron's Tree Frog	Protected
Gould's Goanna	Protected
Bearded Dragon	Protected
Eastern Brown Snake	Protected
Curl Snake	Protected
Mammals	
White-striped freetail bat	Protected
Chocolate wattled bat	Protected
Gould's wattled bat	Protected
Long-eared bat complex	Protected
South-eastern free-tailed bat	Protected
Ride's free-tailed bat	Protected
Inland broad-nosed bat	Protected
Large forest bat	Protected
Little forest bat	Protected
White-striped freetail bat	Protected
Chocolate wattled bat	Protected
Brushtail Possum	Protected
House Mouse	Exotic

Appendix I. SAII impact assessment

I.1 Threatened species at risk of an SAII

I.1.1 Threatened flora entities

I.1.1.1 *Brachyscome muelleroides* (Claypan Daisy) (Principle 3)

Criteria	Discussion
1. Impact avoidance	
What action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII?	Several measures have been undertaken to avoid direct and indirect impact to the species: 1. A detailed biodiversity constraints assessment was completed in February 2022 to assist with decisions around selective avoidance of key biodiversity values. These outputs aided in the footprint selection process and played an important role in the feasibility and design of infrastructure to avoid and or minimise impacts on conservation significant biodiversity. 2. The outcome of the assessment and consultation with BCS and DPE resulted in several footprint revisions to reduce the direct removal of potential habitat for the species, including: a. a reduction in the number of proposed WTGs from 245 to 208 b. the establishment of 56 WTGs/hardstands and three substations including associated access tracks and cabling in large areas of exotic vegetation/cropping land c. the disturbance footprint has been designed to avoid waterways and drainage lines to reduce potential changes to the local hydrology 3. Mitigation measures would be implemented to ensure indirect impacts to the species potential habitat do not occur during the construction and the operation of the Project, some of the key measures are summarised below: a. Biodiversity management plan b. Exclusion zones c. Preclearance surveys d. Vegetation management plan. Further details of the impact avoidance are provided in **Chapter 9** and mitigation measures are detailed in **Chapter 12**.
2. Current population	
a. evidence of rapid decline (Principle 1) presented by an estimate of the:	i. Little is known about the current location and status of *B. muelleroides*. The species has been recorded from about 20 locations since 1900, only about 13 locations since 1930, and only

Criteria	Discussion
i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	eight locations since 1990 (Lucas 2010). Many records of the species are now several decades old, and there are few recent records, with most known plants occurring on Morundah Station (about 20,000) in NSW, approximately 65 kilometres east of the Project area. ii. It is likely that there has been a historical decline in abundance of the species over the past two decades with much of the area within its distribution being converted to agriculture, causing loss and degradation of habitat and weed invasion (Lucas 2010). Natural river flows and flooding regimes have been substantially altered with a consequent reduction in flooding and probably fewer opportunities for the species to germinate and grow.
b. evidence of small population size (Principle 2) presented by: i. an estimate of the species' current population size in NSW, and ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	i. The species is restricted to the mid Murray and Murrumbidgee Rivers region in NSW and Victoria. Current distribution and abundance are poorly known. Only five sites have precise locality details, and four of these are on Morundah Station in NSW, which has almost all of the currently recorded plants (about 20,000). ii and iii. It is difficult to estimate the decline in the species population size in NSW due to a lack of recent surveys, the inconspicuous nature of the plant and its probable reliance on environmental factors, such as periodic flooding, to grow each year. There are fluctuations in species numbers from year to year, and the inconspicuous nature of the species may have caused it to be overlooked during surveys. The extended drought covering much of its distribution over the last decade has also reduced opportunities to survey for flowering plants.
c. evidence of limited geographic range for the threatened species (Principle 3) presented by: i. extent of occurrence ii. area of occupancy iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and iv. whether the species' population is likely to undergo extreme fluctuations	i. The extent of occurrence for *B. muelleroides* is <100 kilometres square. ii. The area of occupancy for *B. muelleroides* is < ten kilometres square iii. The species has a restricted distribution, though additional populations are likely to exist in suitable habitat in surrounding areas. Only a single significant known population exists at Morundah Station in NSW, the species is vulnerable to extinction via stochastic events. The regulation of water flow in the Murray River, especially the decrease in flood frequency may have affected the range of the species (OEH 2022). iv. The species numbers fluctuates from year to year in response to flood frequency and drought conditions. The species is inconspicuous and may be overlooked during surveys.
d. evidence that the species is unlikely to respond to management (Principle 4) because: i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).	i. This species requires site-based management in order to secure it from extinction in NSW for 100 years, however little is known surrounding the mechanisms underlying recruitment and regeneration for the species. Successful population management will be founded on understanding the relationships between *B. muelleroides* and associated flora, and its response to the environment which are directly linked to biological function and vital to recovery (Lucas 2010). ii. Germination and growth seem to be highly dependent upon wetter years, although the exact relationship between flooding and the species is not known. It appears that sufficient autumn rainfall that results in localised soil waterlogging, or periodic flooding, are required to initiate seed germination and plant growth (Lucas 2010).

Criteria	Discussion
	Currently there is one priority management site for the species under the NSW Saving Our Species (SoS) program within the Federation LGA (OEH 2022). The program has identified 12 conservation management actions which prioritise the management of major threats to the species. Major threats include accidental destruction of habitat, competition from pest plants, grazing by pest animals and loss of variability to habitat from changes to flooding and waterlogging regimes as a result of commercial and agricultural activities. A range of strategies will be necessary to alleviate these threats, including weed control, fencing, control of pest animals and increases in flood flows. Broad scale protection measures applicable to all populations include protection of sites, habitat retention and liaison with land managers including private landholders. In addition, searches of known and potential habitat should continue to better define the distributions and size of populations. iii Key Threatening Processes applicable to the species include: Clearing of native vegetation 1. Invasion of native plant communities by exotic perennial grasses 2. Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands 3. Human-caused Climate Change
3. Unknown or data deficient	
Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR	The TBDC does not indicate data is 'unknown' or 'data deficient' for this species
4. Impacts of the project on the species at risk of SAII	
a. the impact on the species' population (Principles 1 and 2) presented by: i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and ii. an estimate of the number of individuals (mature and immature) to be impacted by the Project and as a percentage of the total NSW population, or iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the Project	I, ii and iii. The species has not been recorded within the Project area despite intensive targeted flora surveys undertaken during September and November 2021 and September 2022, therefore an estimate of the number of individuals within the Project area, as a percentage of the total NSW population cannot be calculated. A total of 472.36 hectares of suitable habitat for the species is present within PCTs 44, 45, 46 and 160, of which 23.57 hectares occurs within the disturbance footprint and would be impacted directly, which equates to about 5% of suitable habitat within the Project area. Historic and current grazing and agricultural activities, drought, and changes to the flooding regime within the Project area and locality may have impacted the species presence within the Project area. Nevertheless, due to the extensive suitable habitat within the Project area and ability to avoid and minimise direct and indirect impacts the Project is not likely to significantly impact the species.
b. impact on geographic range (Principles 1 and 3) presented by: i. the area of the species' geographic range to be impacted by the Project in hectares, and a percentage of the total AOO, or EOO within NSW	i. The species has not been recorded within the Project area despite intensive targeted flora surveys undertaken during September and November 2021 and September 2022. A total of 23.57 hectares of is assumed suitable habitat within the disturbance footprint and would be

Criteria	Discussion
ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.	impacted directly, which equates to about 2.5% of the area of occupancy for the species (1000 hectares) within NSW ii. The proposed impact would affect some habitat, but no individuals of the species would be directly impacted. iii. The genetic exchange and the pollination of the species is largely unknown (Lucas 2010). Due to the narrow nature of the access tracks (about five metres wide) the Project is unlikely to result in fragmentation of a population within the Project area. Additionally, the transmission line alignment would also not increase fragmentation as vegetation removal impacts would be limited to the power pole locations. iv. The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges. However, considering the current movement of livestock and grazing within the Project area, this is considered a minor increased risk. If elevated access roads are constructed, the hydrology within the Project area may be altered by increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, although it is unlikely to substantially modify the hydrological regime or cause serious erosion; however it may facilitate the spread of weeds. Disease is not considered a key threat for the species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk. Measures to minimise the risk of fire during operation will be detailed in the Vegetation Management Plan.
5. New information	
The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAII, is inaccurate.	Not applicable
6. Details of data deficiency, assumptions, reasons for low confidence in information	
The primary references used in this assessment include: 4. Lucas (2010). National Recovery Plan for the Mueller Daisy Brachyscome muelleroides. Department of Sustainability and Environment, Melbourne.doi:10.1371/journal.pone.0242485 5. OEH (2022) Claypan Daisy - profile | NSW Environment, Energy and Science. Accessed 23 September 2022. 6. OEH (2022) Saving our Species program Urana Area Claypan Daisy (Brachyscome muelleroides) Urana area | Claypan Daisy (Brachyscome muelleroides) | Conservation project | NSW Environment, Energy and Science. Accessed 23 September 2022. There is no NSW Scientific Committee final determination available for the species.	

I.1.1.2 *Caladenia arenaria* (Sand-hill Spider Orchid) (Principle 3)

Criteria	Discussion
1. Impact avoidance	
What action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII?	Several measures have been undertaken to avoid direct and indirect impact to the species: 1. A detailed biodiversity constraints assessment was completed in February 2022 to assist with decisions around selective avoidance of key biodiversity values. These outputs aided in the footprint selection process and played an important role in the feasibility and design of infrastructure to avoid and or minimise impacts on conservation significant biodiversity. 2. The outcome of the assessment and consultation with BCS and DPE resulted in several footprint revisions to reduce the direct removal of potential habitat for the species, including: a. a reduction in the number of proposed WTGs from 245 to 208 b. the establishment of 56 WTGs/hardstands and three substations including associated access tracks and cabling in large areas of exotic vegetation/cropping land c. the disturbance footprint has been designed to avoid waterways and drainage lines to reduce potential changes to the local hydrology 3. Mitigation measures would be implemented to ensure indirect impacts to the species potential habitat do not occur during the construction and the operation of the Project, some of the key measures are summarised below: a. Biodiversity management plan b. Exclusion zones c. Preclearance surveys d. Vegetation management plan. Further details of the impact avoidance are provided in **Chapter 9** and mitigation measures are detailed in **Chapter 12**.
2. Current population	
a. evidence of rapid decline (Principle 1) presented by an estimate of the: i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	i. The species has suffered a massive contraction in range and abundance in the last century, given the documented historic range and variety of habitat in which the species now occurs in NSW. ii. There has been a continuous decline in abundance of the species in the last century with much of the area within its distribution being converted to agriculture, causing loss and degradation of habitat, weed invasion and grazing pressure (domestic, feral and native species) (OEH 2022). Forestry operations such as thinning, harvesting, regeneration and construction have also impacted the species and hybridisation in some populations have reduced the genetic viability of the species.

Criteria	Discussion
b. evidence of small population size (Principle 2) presented by: i. an estimate of the species' current population size in NSW, and ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	i and ii. The species was known from five locations in NSW, with a total population of around 2,000 individuals in 1997 (DEC 2004). The species is currently only known from two locations, north of Narrandera, on the south-western slopes of NSW, and near Lake Urana, on the south western plains of NSW, with a total population of about 25 individuals in 2021 (DPE 2021). It has previously been found in the Narrandera - Griffith region and near Adelong, although recent searches have failed to find any extant populations in these areas. iii. The species has limited capacity to regenerate after a decline and is not known to undergo extreme fluctuations. However a functional ecosystem is essential for the species pollination (further discussed below) and disturbance to that system would disadvantage the orchids germination and seed growth (DEC 2004).
c. evidence of limited geographic range for the threatened species (Principle 3) presented by: i. extent of occurrence ii. area of occupancy iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and iv. whether the species' population is likely to undergo extreme fluctuations	i. The extent of occurrence for *C. arenaria* is <100 kilometres square. ii. The area of occupancy for *C. arenaria* is < ten kilometres square iii. The species has a restricted distribution; it is currently only known to occur in the Riverina between Urana and Narranderra in NSW. The restricted distribution and the low number of individuals places the species at risk from stochastic events (OEH 2022). iv. It is unlikely that the species population will undergo extreme fluctuations.
d. evidence that the species is unlikely to respond to management (Principle 4) because: i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).	i and ii. The species requires site-based management in order to secure it from extinction in NSW for 100 years, however for germination orchid seeds require infection by a suitable fungal symbiont/partner. The fungus supplies nutrients for germination and initial seedling growth (DEC 2004). *C. arenaria* possess a swollen stem (the collar) immediately below the leaf just under the soil surface. The mycorrhizal fungus invades collar. It is believed that before the orchid produces a leaf each year, reinfection of the mycorrhizal zone (collar) by the fungal partner must occur. The implication of the specialised pollination (which is believed to be species specific) and dependence on a fungal symbiont (partner) for *C. arenaria* is that a functional ecosystem supporting these organisms is essential (DEC 2004). Disturbance to the system that adversely affects the pollinator or fungal partner may clearly disadvantage the orchid. The identity of the fungal partner (which is normally free-living and reliant on leaf litter for its nutrition) or the pollinator of *C. arenaria* is not known, let alone their habitat requirements. Currently there are four priority management site for the species under the NSW Saving Our Species (SoS) program within the Federation, Coolamon and Narrandera LGA's (OEH 2022). The program has identified conservation management actions which prioritise the management of major threats to the species and augmenting the extant of wild populations. iii Key Threatening Processes applicable to the species which are unable to be controlled include: 1. Clearing of native vegetation

Criteria	Discussion
	2. Invasion of native plant communities by exotic perennial grasses 3. Human-caused Climate Change
3. Unknown or data deficient	
Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR	The TBDC does not indicate data is 'unknown' or 'data deficient' for this species
4. Impacts of the project on the species at risk of SAII	
a. the impact on the species' population (Principles 1 and 2) presented by: i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and ii. an estimate of the number of individuals (mature and immature) to be impacted by the Project and as a percentage of the total NSW population, or iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the Project	i, ii and iii. The species has not been recorded within the Project area despite intensive targeted flora surveys undertaken during September 2021 and September 2022, therefore an estimate of the number of individuals within the Project area, as a percentage of the total NSW population cannot be calculated. A total of 34.58 hectares of suitable habitat for the species is present within PCT 28 within the Project area, of which 10.28 hectares occurs within the disturbance footprint and would be impacted directly. This equates to about 29.7% of suitable habitat within the Project area. Historic and current grazing by feral, native and agricultural herbivores and land clearing and weed invasion within the Project area and locality may have impacted the species presence within the Project area.
b. impact on geographic range (Principles 1 and 3) presented by: i. the area of the species' geographic range to be impacted by the Project in hectares, and a percentage of the total AOO, or EOO within NSW ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.	i. The relatively broad habitat tolerances of *C. arenaria* make the definition of critical habitat difficult, although it would be possible to declare critical habitat just over the area of known populations (DEC 2004). A total of 10.28 hectares of possible habitat occurs within the disturbance footprint and would be impacted directly, which equates to about 1% of the area of occupancy for the species (1000 hectares). ii. The proposed impact would affect some habitat, but no individuals of the species would be directly impacted. iii and iv. A population of the species was not identified during targeted survey. The Project is unlikely to result in fragmentation of a population within the Project area or increase fragmentation as vegetation removal impacts would be limited to the narrow nature of the access tracks (about five metres wide) and to the power pole locations. Impacts to the structure and function of retained vegetation as a result of clearing and edge effects can change abiotic factors. Increased light intensity and duration, increased exposure to wind, and weed invasion in edge habitats, or displacement of soil into adjoining vegetation from areas of modified landforms may adversely affect the pollinator or the fungal partner of the species. The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges and /or increase the potential for hybridisation of species. However, considering the current movement of livestock and grazing within the Project area, this is considered a minor increased risk. If elevated access roads are constructed, the hydrology within the Project area may be altered by increasing flooding in

Criteria	Discussion
	lower areas bound by elevated roads. The extent of this impact is uncertain, although it is unlikely to substantially modify the hydrological regime or cause serious erosion; however it may further facilitate the spread of weeds. Disease is not considered a key threat for the species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk. Measures to minimise the risk of fire during operation will be detailed in the Vegetation Management Plan.
5. New information	
The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAII, is inaccurate.	Not applicable
6. Details of data deficiency, assumptions, reasons for low confidence in information	
The primary references used in this assessment include: 4. DEC (2004) Caladenia arenaria Fitzg. Recovery Plan Caladenia arenaria Fitzg. recovery plan (dcceew.gov.au) February 2004. 5. DPE (2021) Caladenia arenaria (a terrestrial orchid) - endangered species listing NSW Scientific Committee - final determination. 6. OEH (2022) Saving our Species program Sand-hill Spider Orchid (Caladenia arenaria) Sand-hill Spider Orchid (Caladenia arenaria). Conservation project , NSW Environment, Energy and Science.	

I.1.1.3 *Convolvulus tedmoorei* (Bindweed) (Principle 2)

Criteria	Discussion
1. Impact avoidance	
What action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII?	Several measures have been undertaken to avoid direct and indirect impact to the species: 1. A detailed biodiversity constraints assessment was completed in February 2022 to assist with decisions around selective avoidance of key biodiversity values. These outputs aided in the footprint selection process and played an important role in the feasibility and design of infrastructure to avoid and or minimise impacts on conservation significant biodiversity. 2. The outcome of the assessment and consultation with BCS and DPE resulted in several footprint revisions to reduce the direct removal of potential habitat for the species, including: a. a reduction in the number of proposed WTGs from 245 to 208 b. the establishment of 56 WTGs/hardstands and three substations including associated access tracks and cabling in large areas of exotic vegetation/cropping land c. the disturbance footprint has been designed to avoid waterways and drainage lines to reduce potential changes to the local hydrology 3. Mitigation measures would be implemented to ensure indirect impacts to the species potential habitat do not occur during the construction and the operation of the Project, some of the key measures are summarised below: a. Biodiversity management plan b. Exclusion zones c. Preclearance surveys d. Vegetation management plan. Further details of the impact avoidance are provided in **Chapter 9** and mitigation measures are detailed in **Chapter 12**.
2. Current population	
a. evidence of rapid decline (Principle 1) presented by an estimate of the: i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	i and ii. The species is endemic to NSW with only two known collections from 1969 and 1971. The species has not been collected from any other locations since. There is an insufficient understanding of the ecology, distribution and threats to the species. Disturbance regimes are not known, however, habitat modification resulting from changes to land use are thought to be a contributing cause to the species decline (OEH 2022).
b. evidence of small population size (Principle 2) presented by: i. an estimate of the species' current population size in NSW, and	i. There are few known records of the species from NSW: two areas on the Murrumbidgee and Darling River floodplains in central-western NSW (from Toganmain Station, Darlington Point, and from a locality eight kilometres north-west of Louth) and two other records from east of

Criteria	Discussion
ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	Broken Hill on the road to Wilcannia, and from the Menindee Road, Scarsdale. Populations sizes in NSW are estimated to be between <50 individuals to <250 individuals where threats are known. ii. It is difficult to estimate the decline in the species population size in NSW due to a lack of ecological and distributional information (OEH 2022). iii. The estimated number of mature individuals within the one subpopulation is not available.
c. evidence of limited geographic range for the threatened species (Principle 3) presented by: i. extent of occurrence ii. area of occupancy iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and iv. whether the species' population is likely to undergo extreme fluctuations	i. The extent of occurrence for *C. tedmoorei* is unknown in NSW. ii. The area of occupancy for *C. tedmoorei* is unknown in NSW. iii. The species has a restricted distribution, with only two known collections in NSW (from 1969 and 1971) from the Murrumbidgee and Darling River floodplains in central western NSW where the species was growing in self-mulching grey clay soils (DPE 2021). It is not known from any conservation reserve. The apparent small size and isolation of known populations renders it vulnerable to local extinction. The species is also threatened by environmental and demographic stochasticity. The species has also been recorded from northern inland areas of South Australia and south-western Queensland. iv. It is unlikely that the species population will undergo extreme fluctuations.
d. evidence that the species is unlikely to respond to management (Principle 4) because: i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).	i and ii. Little is known surrounding the mechanisms underlying recruitment and regeneration for the species. Successful population management will be founded on understanding the relationships between *C. tedmoorei* environmental factors which are directly linked to seed set and germination (OEH 2022). It is thought that the species may require periodic flooding of its habitat to maintain the wet conditions suitable for seed set and germination. However, some species of Convolvulus from western NSW possess a thick taproot that aids their persistence during dry periods, and some can produce hard-coated seed that can lie dormant in the soil for long periods (OEH 2022). Currently there is lack of data for the species. A strategy for the species under the NSW Saving Our Species (SoS) program was developed by experts and identifies the priority research and/or survey actions required to address critical knowledge gaps currently inhibiting effective management of the species. An improved understanding of the species biology and ecology are required to inform conservation and recovery of the species. iii. Key Threatening Processes applicable to the species which are unable to be controlled include: 1. Clearing of native vegetation 2. Invasion of native plant communities by exotic perennial grasses 3. Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands 4. Human-caused Climate Change

Criteria	Discussion
3. Unknown or data deficient	
Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR	The TBDC indicates that this is 'data deficient' for this species
4. Impacts of the project on the species at risk of SAII	
a. the impact on the species' population (Principles 1 and 2) presented by: i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and ii. an estimate of the number of individuals (mature and immature) to be impacted by the Project and as a percentage of the total NSW population, or iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the Project	i, ii and iii. The species has not been recorded within the Project area despite intensive targeted flora surveys undertaken during September 2021 and September 2022, therefore an estimate of the number of individuals within the Project area, as a percentage of the total NSW population cannot be calculated. A total of 256.23 hectares of assumed suitable habitat for the species is present in PCT 26 and PCT 44 within the Project area, of which 14.23 hectares of assumed suitable habitat within the disturbance footprint and would be impacted directly. This equates to about 6% of suitable habitat within the Project area. Historic and current grazing and agricultural activities, changes to the local hydrological regime and habitat modification within the Project area and locality may have impacted the species presence within the Project area.
b. impact on geographic range (Principles 1 and 3) presented by: i. the area of the species' geographic range to be impacted by the Project in hectares, and a percentage of the total AOO, or EOO within NSW ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.	i. A total of 70.89 hectares of possible habitat occurs within the disturbance footprint and would be impacted directly, however the area of occupancy in NSW is unknown. ii. The proposed impact would affect some potential habitat, but no individuals of the species would be directly impacted as none have been recorded. iii. The ecology and the biology required to support a population, genetic exchange and / or pollination are not well understood. A population of the species was not identified during targeted survey. The Project is unlikely to result in fragmentation of a population within the Project area or increase fragmentation, as vegetation removal impacts would be limited to the narrow nature of the access tracks (about five metres wide) and the transmission pole locations. iv. The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges. However, considering the current movement of livestock and grazing within the Project area, this is considered a minor increased risk. If elevated access roads are constructed, the hydrology within the Project area may be altered by increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, although it is unlikely to substantially modify the hydrological regime or cause serious erosion; however it may facilitate the spread of weeds. Disease is not considered a key threat for the species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk. Measures to minimise the risk of fire during operation will be detailed in the Vegetation Management Plan.

Criteria	Discussion
5. New information	
The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAII, is inaccurate.	Not applicable
6. Details of data deficiency, assumptions, reasons for low confidence in information	
The TBDC indicates that this is 'data deficient' for this species, more recent records occur in other states, but little is known from NSW; information based on other similar spp (no observational data). There is no current recovery plan for the species. The primary references used in this assessment include: 5. OEH (2022) Bindweed – profile. Bindweed - profile | NSW Environment, Energy and Science 6. OEH (2022 Saving our Species (SoS) program Bindweed (Convolvulus tedmoorei) ProjectReport (nsw.gov.au) 7. DPE (2021) Convolvulus tedmoorei (a perennial plant) - endangered species listing. Convolvulus tedmoorei (a perennial plant) - endangered species listing | NSW Environment and Heritage	

I.1.2 Threatened fauna entities

I.1.2.1 Plains-wanderer (*Pedionomus torquatus*) (Principle 1)

Criteria	Discussion
1. Impact avoidance	
What action and measures taken to avoid the direct and indirect impact on the potential entity for an SAII?	Several measures have been undertaken to avoid direct and indirect impact to the species: 1. A detailed biodiversity constraints assessment was completed in February 2022 to assist with decisions around selective avoidance of key biodiversity values. These outputs aided in the footprint selection process and played an important role in the feasibility and design of infrastructure to avoid and or minimise impacts on conservation significant biodiversity. 2. The outcome of the assessment and consultation with BCS and DPE resulted in several footprint revisions to reduce the direct removal of potential habitat for the species, including: a. The original footprint impacted about 128.12 hectares of mapped habitat for the species, the revised disturbance footprint impacts about 1.78 hectares of mapped habitat b. the disturbance footprint has been designed to avoid waterways and drainage lines to reduce potential changes to the local hydrology 3. Mitigation measures would be implemented to ensure indirect impacts to the species potential habitat do not occur during the construction and the operation of the Project, some of the key measures are summarised below: a. Biodiversity management plan b. Exclusion zones c. Rehabilitation plan d. Preclearance surveys and staged habitat removal e. Vegetation management plan. Further details of the impact avoidance are provided in **Chapter 9** and mitigation measures are detailed in **Chapter 12**.
2. Current population	
a. evidence of rapid decline (Principle 1) presented by an estimate of the: i. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer), or ii. decline in population of the species in NSW in the past 10 years or three generations (whichever is longer) as indicated by: an index of abundance appropriate to the species; decline in geographic distribution and/or habitat quality; exploitation; effect of introduced species, hybridisation, pathogens, pollutants, competitors or parasites	i and ii. The Plains-wanderer has declined greatly since European settlement. The decline in species distribution and population size are largely attributed to the loss and degradation of sparse, lowland native grasslands, caused by the conversion of native grasslands to dense introduced pasture or croplands (DoE, 2016). Areas where the species was formerly common are now so reduced in numbers that it is effectively extinct in eastern NSW, south-western Victoria, and south-eastern South Australia (OEH 2019).The vast majority (>99%) of records of Plains-wanderers in NSW now come from

Criteria	Discussion
	an area of the western Riverina bounded by Hay and Narrandera on the Murrumbidgee River in the north, the Cobb Highway in the west, the Billabong Creek in the south, and Urana in the east. Recent analysis of monitoring data collected between 2001 and 2014 from across sites in the Riverina region indicate that there was an overall decline in numbers of 93% over this time period (DoE 2016).
b. evidence of small population size (Principle 2) presented by: i. an estimate of the species' current population size in NSW, and ii. an estimate of the decline in the species' population size in NSW in three years or one generation (whichever is longer), and iii. where such data is available, an estimate of the number of mature individuals in each subpopulation, or the percentage of mature individuals in each subpopulation, or whether the species is likely to undergo extreme fluctuations	i. There is estimated to be only 300 birds remaining in NSW and less than 1000 in Australia (LLS 2020). ii. There is limited recent published data on the Plains-wanderer Riverina population. Historically, the Plains-wanderer population was estimated to have undergone a reduction in numbers of approximately 75% during the 2002 drought, after which time there was only minor, staged increases in numbers between 2004 to 2010. Further population declines occurred following the increased rainfalls experienced from late 2010 to 2012. A population of the species which has been monitored in NSW over a 14 year period has also shown a decline of >90% (OEH 2019). iii. The size of the Plains-wanderer population is likely to fluctuate in response to seasonal conditions. This is further discussed below.
c. evidence of limited geographic range for the threatened species (Principle 3) presented by: i. extent of occurrence ii. area of occupancy iii. number of threat-defined locations (geographically or ecologically distinct areas in which a single threatening event may rapidly affect all species occurrences), and iv. whether the species' population is likely to undergo extreme fluctuations	i. Recent data on the species is limited, therefore it is difficult to determine the current extent of occurrence for the species. In 2011 the estimated the extent of occurrence of the species was 930 000 kilometres square (DoE 2016). ii. Recent data on the species is limited, therefore it is difficult to determine the current area of occupancy. In 2011 the estimated area of occupancy was 330 kilometres square (DoE 2016). iii. Habitat critical to the survival of the species includes any regions or new locations where the species is likely to occur. Key areas include the Riverina in NSW and the Northern Pains in Victoria; however the Riverina is the population stronghold (DoE 2016). iv. The population size is susceptible to fluctuations (fluctuating up to 80% from year to year in times of drought) in response to environmental conditions. As breeding may not occur in years of drought and breeding success can also be very low in years of heavy rainfall (DoE, 2016). Previously, Plains-wanderer populations have been shown to recover from population declines associated with drought conditions and localised overgrazing, however in the past two decades, the populations have remained low (DoE, 2016).
d. evidence that the species is unlikely to respond to management (Principle 4) because: i. known reproductive characteristics severely limit the ability to increase the existing population on, or occupy new habitat (e.g. species is clonal) on, a biodiversity stewardship site ii. the species is reliant on abiotic habitats which cannot be restored or replaced (e.g. karst systems) on a biodiversity stewardship site, or	i. Plains-wanderers breed in solitary pairs in a territory defended by the larger female, though they can be serially polyandrous. They are capable of breeding in their first year. The male does most of the incubation during the 23 day incubation period and is also primarily responsible for attending the young (DoE 2016). At this time the female may pair with and lay a clutch for a second male to incubate. Young birds gain independence at about two months. However, breeding success is often linked to environmental conditions. There may be no breeding during drought years and success can also be very low in years of heavy rainfall, if there is sufficient moderate rainfall during summer, females will often produce a second clutch.

Criteria	Discussion
iii. life history traits and/or ecology is known but the ability to control key threatening processes at a biodiversity stewardship site is currently negligible (e.g. frogs severely impacted by chytrid fungus).	ii. The species is reliant on a high diversity of plant species and a preferred habitat structure, many remnant vegetation patches are degraded and likely missing important ecological features. Preferred habitat is typically comprised of 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses about <5 centimetres high, but some vegetation up to a maximum of 30 centimetres and grass tussocks spaced ten to 20 centimetres apart (OEH 2019). Structure is important for concealment, during drought or extended periods of heavy grazing, the primary habitat can become too sparse for the Plains-wanderer. Currently there are two priority management sites for the species under the NSW Saving Our Species (SoS) program within the NSW Riverine Plain in Carrathool, Edward River, Federation, Griffith, Hay, Leeton, Murrumbidgee, Narrandera LGA and a captive breeding population (OEH 2022). Priority actions are comprised of habitat management, pest and feral species control augmenting the population with captive bred individuals and promoting a stewardship program. iii. Key Threatening Processes applicable to the species which are unable to be controlled include: 1. Clearing of native vegetation 2. Invasion of native plant communities by exotic perennial grasses 3. Alteration to the natural flow regimes of rivers, streams, floodplains and wetlands 4. Human-caused Climate Change
3. Unknown or data deficient	
Where the TBDC indicates data is 'unknown' or 'data deficient' for a species for a criterion listed in Subsection 9.1.2(2.), the assessor must record this in the BDAR	The TBDC does not indicate data is 'unknown' or 'data deficient' for this species
4. Impacts of the project on the species at risk of SAII	
a. the impact on the species' population (Principles 1 and 2) presented by: i. an estimate of the number of individuals (mature and immature) present in the subpopulation on the subject land (the site may intersect or encompass the subpopulation) and as a percentage of the total NSW population, and ii. an estimate of the number of individuals (mature and immature) to be impacted by the Project and as a percentage of the total NSW population, or iii. if the species' unit of measure is area, provide data on the number of individuals on the site, and the estimated number that will be impacted, along with the area of habitat to be impacted by the Project	i, ii and iii. A total of about 134.45 hectares of mapped habitat for the species occurs within the Project area, of which 1.78 hectares is within the disturbance footprint and would be impacted directly. This equates to about 1.3% of suitable habitat within the Project area. The impact would be associated with a series of very small fragments along existing farm tracks over a large area. The species is considered to be able to persist in the Project area given the low impact activity associated with an operational wind farm and the extent of habitat that will remain. However, the Project would directly remove critical habitat for the species and would also increase risk of vehicle strikes, and to a minor extent, predation, and the risk of weed and pathogen encroachment.
b. impact on geographic range (Principles 1 and 3) presented by: i. the area of the species' geographic range to be impacted by the Project in hectares, and a percentage of the total AOO, or EOO within NSW	i. The Project would directly impact on around 1.78 hectares of mapped habitat for the species, which equates to 0.005 % of the area of occupancy (33, 000 hectares) in NSW for the species (based on DPE's important area mapping)

Criteria	Discussion
ii. the impact on the subpopulation as either: all individuals will be impacted (subpopulation eliminated); OR impact will affect some individuals and habitat; OR impact will affect some habitat, but no individuals of the species will be directly impacted iii. to determine if the persisting subpopulation that is fragmented will remain viable, estimate (based on published and unpublished sources such as scientific publications, technical reports, databases or documented field observations) the habitat area required to support the remaining population, and habitat available within dispersal distance, and distance over which genetic exchange can occur (e.g. seed dispersal) and pollination distance for the species iv. to determine changes in threats affecting remaining subpopulations and habitat if the proposed impact proceeds, estimate changes in environmental factors including changes to fire regimes (frequency, severity); hydrology, pollutants; species interactions (increased competition and effects on pollinators or dispersal); fragmentation, increased edge effects, likelihood of disturbance; and disease, pathogens and parasites. Where these factors have been considered elsewhere in relation to the target species, the assessor may refer to the relevant sections of the BDAR or BCAR.	ii. The number of birds from the broader population that occupy habitat within the Project area and surrounds are unknow, however on the basis of reported preferred habitat (Grassland) the Project would remove about 1.78 hectares. Extensive areas of potential habitat will remain within the Project area, including below and around turbines and other infrastructure. This vegetation removal would result in direct impacts from habitat loss and a low expected increase in risk of vehicle strikes throughout the expected 38-month construction period. There is unlikely to be a risk of turbine strike with this species iii and iv. The Project is unlikely to result in fragmentation of a population within the Project area or increase fragmentation as vegetation removal impacts would be limited to the narrow nature of the access tracks (about five metres wide) and the transmission pole locations. As the species inhabits grassland habitats, it is unlikely aerial components of the Project (transmission lines and turbine blades) would impacts the species. Movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds and pathogens into habitat edges, however considering the current movement of livestock on the property, this is considered a minor increased risk. The clearing of habitat has the potential to increase the risk of predation for the species. Foxes and cats are known to be present in the Project area and are considered to already be established. Within the grassland habitat of the Plains-wanderer foxes are considered to be the greatest risk.
5. New information	
The assessor may also provide new information that can be used to demonstrate that the principle identifying the species as at risk of an SAII, is inaccurate.	Not applicable
6. Details of data deficiency, assumptions, reasons for low confidence in information	
The primary references used in this assessment are provided below, however the national plan was more applicable to the Plains-wanderer Riverina population. Publications had a lack of recent data on population extent and occurrence in SW. References include: 3. NSW Scientific Committee. (2009). Plains-wanderer *Pedionomus torquatus* - Review of Current Information in NSW Retrieved from 4. Department of the Environment (DoE). (2016). National Recovery Plan for the Plains-wanderer (*Pedionomus torquatus*) Retrieved from https://www.awe.gov.au/sites/default/files/documents/national-recovery-plan-plains-wanderer.pdf 5. DCCEEW (2018) Plains-wanderer Year 3 scorecard 2018. https://www.dcceew.gov.au/environment/biodiversity/threatened/species/20-birds-by-2020/plains-wanderer 6. Local Land Servcies (LLS) (2020) Bringing Plains-wanderers back from the brink - Local Land Services (nsw.gov.au) 7. OEH (2022 Saving our Species (SoS) program Plains-wanderer. Plains-wanderer (Pedionomus torquatus) | Conservation project | NSW Environment, Energy and Science	

Appendix J. Assessment of significance

For threatened biodiversity listed under the EPBC Act, significance assessments have been completed in accordance with the EPBC Act *Policy Statement 1.1 Significant Impact Guidelines* . Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts .

Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50 per cent chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility . This advice has been considered while undertaking the assessments.

An assessment of significance test has been undertaken for the threatened ecological communities, including the Natural Grasslands of the Murray Valley Plains (listed as critically endangered under the EPBC Act) and the Weeping Myall Woodlands (listed as endangered under the EPBC Act). An assessment of significance test has also been undertaken for the following species:

- *Austrostipa wakoolica* endangered species
- *Caladenia arenaria* (Sand-hill Spider Orchid) endangered species
- *Lepidium monoplocoides* (Winged Peppercress) endangered species
- *Sclerolaena napiformis* (Turnip Copperburr) endangered species
- *Swainsona murrayana* (Slender Darling Pea) vulnerable species
- *Swainsona plagiotropis* (Red Darling Pea) vulnerable species
- *Brachyscome muelleroides* (Claypan Daisy) vulnerable species
- *Brachyscome papillosa* (Mossgiel Daisy) vulnerable species
- *Maireana cheelii* (Chariot Wheels) vulnerable species
- Plains-wanderer (*Pedionomus torquatus*) critically endangered species
- Regent Honeyeater (*Anthochaera phrygia*) critically endangered species
- Swift Parrot (*Lathamus discolor*) critically endangered species
- Superb parrot (*Polytelis swainsonii*) vulnerable species
- Painted Honeyeater (*Grantiella picta*) vulnerable species
- White-throated Needletail (*Hirundapus caudacutus*) vulnerable species
- Southern Bell Frog (*Litoria raniformis*) vulnerable species
- Migratory species.

Threatened Fish species are assessed in **Appendix K**.

- Silver Perch (*Bidyanus bidyanus*) critically endangered species
- Murray Cod (*Maccullochella peelii*) vulnerable species
- Trout Cod (Maccullochella macquariensis) endangered species
- Macquarie Perch (*Macquaria australasica*) endangered species
- Flathead Galaxias (*Galaxias rostratus*) critically endangered species.

When assessing vulnerable species, the assessment centres around whether the population that would be impacted is an 'important population' or not. An 'important population' is a population that is necessary for a species' long-term survival and recovery (Department of Environment, 2013). This may include populations identified as such in recovery plans, and/or that are:

- Key source populations either for breeding or dispersal
- Populations that are necessary for maintaining genetic diversity, and/or
- Populations that are near the limit of the species range.

This definition of what constitutes an 'important population' has guided the assessments for vulnerable species.

J.1 Critically Endangered Ecological Community

J.1.1 Natural Grasslands of the Murray Valley Plains (Critically Endangered, EPBC Act)

The Natural Grasslands of the Murray Valley Plains ecological community is a type of natural temperate grassland that has semi-arid characteristics, due to the lower rainfall where it occurs. The structure is an open grassland to forbland in which trees and tall shrubs are sparse to absent.

The vegetation is dominated by the ground layer with range of perennial grasses, forbs and small shrubs. Characteristic genera present typically include *Rytidosperma* (formerly *Austrodanthonia*), *Austrostipa, Chloris, Enteropogon, Arthropodium, Bulbine, Calotis, Chrysocephalum, Leptorhynchos, Minuria, Ptilotus, Rhodanthe, Sida, Swainsona, Atriplex* and *Maireana* (SEWPC, 2012). Past and present grazing pressure as well as drought and rainfall patterns influence the composition of the community, and as such, some species may not always be evident above-ground, but instead exist in the seedbank (Threatened Species Scientific Committee, 2012).

Most occurrences of the community are associated with Quaternary alluvial sediments on heavy-textured grey, brown and red clay soils (Threatened Species Scientific Committee, 2012).

The community is similar to some other derived grassland forms of the 'Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray Darling Depression, Riverina and NSW South Western Slopes bioregions' (listed as Endangered under the BC Act and EPBC Act), however, it generally differs in the proportional composition of species (Threatened Species Scientific Committee, 2012).

The community has reduced in extent significantly since pre-European settlement. In NSW, it has reduced in extent from about 500,000 hectares to about 120,000 hectares, or in the order of 76% (Threatened Species Scientific Committee, 2012). Australia wide (NSW and Vic), it is estimated to have reduced from about 1,227,000 hectares to only 153, 000 -168,000 hectares, a decline of about 86 to 87.5% across its range (Threatened Species Scientific Committee, 2012). However, it is likely the extent which is in good condition is considerably lower with the actual extent approaching a reduction of 90% or more.

The Project area contains large areas of Riverine Plain Grassland consistent with the listing criteria of the Natural Grasslands of the Murray Valley Plains CEEC and corresponds to the following Plant Community Types (PCTs):

- Forb-rich Speargrass - Windmill Grass - White Top grassland of the Riverina Bioregion (PCT 44)
- Plains Grass grassland on alluvial mainly clay soils in the Riverina Bioregion and NSW South Western Slopes Bioregion (PCT 45)
- Curly Windmill Grass - speargrass - wallaby grass grassland on alluvial clay and loam on the Hay Plain, Riverina Bioregion (PCT 46).

At a regional scale, between 20-73% of these PCTs are estimated to have been cleared.

The grassland CEEC occurs in very large patches comprising around 10,000 hectares in the Project area. All patches of grassland have been exposed to historical and ongoing grazing (predominantly sheep grazing) and other agricultural pressures. The degree of disturbance varies across the Project area and no patches persist unaffected by such disturbances. However, a combination of the current grazing regime and favourable climatic factors have resulted with a near intact grassland condition across the landscape with no to minimal perennial weed cover.

The CEEC is considered present if it meets the key diagnostic characteristics and condition thresholds in the listing advice (Threatened Species Scientific Committee, 2012). In October 2021, Jacobs ecologists undertook a large-scale preliminary vegetation assessment to determine the overall condition of grassland within the Project area. This was assessed using rapid data collection points recording the number of diagnostic native plant species found at a sample point across the landscape within the Project area. This assessment found that most of the Riverine Plain Grassland is in moderate to high condition in the landscape.

Grassland broad condition states were delineated into three categories, moderate to good, low to moderate and low using criteria from the listing advice to determine listing status of the CEEC.

At the time of writing this assessment no comprehensive plot-based surveys had been conducted. Based in the preliminary mapping, the justification of the community is provided in **Section 4.7.2.1** based on the requirements of Section 5 "Key Diagnostic Characteristics and Condition Thresholds" in the Approved Conservation Advice (Threatened Species Scientific Committee, 2012).

The Project footprint is predicted to impact a total of 88.33 hectares of this CEEC.

An action is likely to have a significant impact on a critically endangered if there is a real chance or possibility that it will:

1. **reduce the extent of an ecological community**

In NSW, it has reduced in extent from about 500,000 hectares to about 120,000 hectares, or in the order of 76% (Threatened Species Scientific Committee, 2012). Australia wide (NSW and Vic), it is estimated to have reduced from about 1,227,000 hectares to only 153, 000 -168,000 hectares, a decline of about 86 to 87.5% across its range (Threatened Species Scientific Committee, 2012). However, it is likely the extent which is in good condition is considerably lower with the actual extent approaching a reduction of 90% or more.

The Project would remove up to 88.33 hectares of the community. This comprises about 0.08% of the estimated extent in NSW (120,000 ha) and 0.06% Australia wide (153,000 ha) (Threatened Species Scientific Committee, 2012). These impacts represent a small fraction of the community on a regional and National scale, albeit a large amount.

2. **fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines**

The known areas of the community are located within the footprint of turbines, access tracks and substations. It is also likely to be present in areas of the transmission line power poles.

Within the Project area, patches of the community are generally well connected. Larger patches of landscape fragmentation are present in area of cropping and irrigated land. Within the Project area, these are primarily present in the south (Willandra-Yanco Property) and north-west (Cotton Farm property).

Due to the narrow nature of the access tracks (about 5m wide) and the nature of dispersal of grasses (predominantly via wind), the Project would not result in fragmentation of any substantial patches of the community, nor will it increase fragmentation in the landscape. Additionally, the transmission line alignment would not increase fragmentation as vegetation removal impacts would be limited to the power pole locations.

3. **adversely affect habitat critical to the survival of an ecological community**

Habitat critical to the survival of the community comprises flat alluvial lowland plains with heavy-textured grey, brown and red clays within the Riverina Bioregion and the Wimmera plains of the Murray Darling Depression Bioregion. (Threatened Species Scientific Committee, 2012). Critical habitat for the survival of the community also includes areas that contain the floristic structure and patch size requirements in the listing (Threatened Species Scientific Committee, 2012).

The Project would clear up to 88.33 hectares of habitat for the community within the Project area.

4. **modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns**

The construction of access roads across the Project area to facilitate construction activities and operational maintenance may alter the hydrology of the community. Although designs of the roads are not yet developed, it is assumed that they will be elevated in some areas to avoid flooding and support accessibility in high rainfall events (similar to other existing roads within the Project area facilitating access to existing powerlines). This may change the hydrology of the community by increasing water runoff from hard stand areas and increasing flooding in lower areas bound by elevated roads. However, the potential impacts are expected to be localised and, due to the topography, are not considered to cause substantial alteration of

surface water drainage patterns. Additionally, drainage structures will be included to prevent large scale changes. The impact and threat of changed hydrology is briefly mentioned in the conservation advice (SEWPC, 2012; Threatened Species Scientific Committee, 2012), however not discussed in detail. As such, the potential impacts of changed hydrology are unknown. It is possible it may impact species structure and composition, extent of the community and weed incursion. As there are several other nearby communities that are dominated by higher water levels (i.e. PCTs 12 and 13), it is possible that increased water availability may favour this community and support its incursion on the TEC.

Furthermore, within the Project area there is about 9776 hectares of the community of which the 539 kilometres of proposed roads would traverse. As such, even if the impacts adjacent to the roads are limited in extent, this would impact a considerable amount of the community across the Project area.

5. cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The Project is not expected to cause a substantial change in the species composition of the grassland vegetation in the Project area. As a grassland, vegetation clearing would be restricted to the footprints of infrastructure (roads, power poles, substations) and would be entirely removed in these areas. However, species composition would not be directly altered in areas outside the development footprint, such as below overhead infrastructure (i.e. transmission lines, turbines) as the community does not have a tree canopy, and the infrastructure will not cause substantial shading and negative impacts on ground cover plant species.

Nevertheless, as discussed above, the construction of access roads across the Project area to facilitate construction activities and operational maintenance may alter the hydrology of the community. This has the potential to cause localised impacts to hydrology, thus potentially impacting structure and composition.

6. cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

a. assisting invasive species, that are harmful to the listed ecological community, to become established, or
b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

During construction and operation, the movement of vehicles and equipment has the potential to introduce weeds and pathogens to the site. This is considered to be a minor risk during construction and a negligible risk during operation due to the level of vehicle movement.

As discussed above, the construction of access roads has the potential to alter the hydrology of the community due to increased runoff and flooding. This has the potential to alter structure and composition, extent of the community and weed incursion, however the extent of the impacts is unknown. Additionally, if future changes to the surrounding land use occur, particularly if cropping and grazing is increased, it may amplify the changed in hydrology cause by the Project by increasing movement of weeds and pollutants across the landscape.

7. interfere with the recovery of an ecological community.

There is no federal recovery plan for the community. The conservation advice (SEWPC, 2012) sets out recommended priority recovery and threat abatement actions to support the recovery of the community. Relevant to the Project, the following recovery actions would be impacted:

- "Protect and conserve remnants of the ecological community. Further clearance, disturbance and fragmentation of this ecological community should be avoided.
- Identify remnants of high conservation priority, with a focus on small scale linkages and habitat connectivity as many grassland fauna and flora are unable to move across larger landscape-scale barriers.
- Ensure infrastructure works, maintenance activities (e.g. road works) or development activities involving substrate or vegetation disturbance in areas where the Natural Grasslands of the Murray Valley Plains ecological community occurs do not adversely impact on known occurrences.
- Manage any changes to natural hydrology that may adversely impact on the ecological community." (SEWPC, 2012).

The Project would remove up to 88.33 hectares of the community within the Project area. The current turbine layout is generally in a standard linear arrangement and has not been specifically adapted to minimise impacts to the community. Within the Project area, the majority of the turbines are located in the centre of the Project area, within the area dominated by the community. In the current design, 105 of the 217 turbines (48%) are located within the community extent.

Additionally, the construction of access roads across the Project area to facilitate construction activities and operational maintenance may alter the hydrology of the community. This has the potential to alter structure and composition, extent of the community and weed incursion, however the extent of the impacts is unknown.

Conclusion

The Project would remove up to 88.33 hectares of the Natural Grassland of the Murray Valley Plains ecological community which comprises about 0.06% of the NSW extent. The construction of permanent access roads throughout the community has the potential to cause indirect impacts. The Project is considered to have **a significant impact on a critically endangered community** as there is a real chance or possibility that it will:

- reduce the extent of an ecological community
- adversely affect habitat critical to the survival of an ecological community
- cause a substantial reduction in the quality or integrity of an occurrence of an ecological community; and
- interfere with the recovery of an ecological community.

J.2 Endangered Ecological Community

J.2.1 Weeping Myall Woodlands

The Weeping Myall Woodlands ecological community occurs on the inland alluvial plains west of the Great Dividing Range in NSW and Queensland across eight bioregions (DEWHA, 2008).

The community is dominated by Weeping Myall (*Acacia pendula*) trees, often occur in monotypic stands. Other common species, albeit never dominate, include Western Rosewood (*Alectryon oleifolius subsp. elongatus*); Poplar Box (*Eucalyptus populnea*); or Black Box (*Eucalyptus largiflorens*). Grey Mistletoe (*Amyema quandang*) is also common in myall trees (Threatened Species Scientific Committee, 2009). There is often considerable variation in the composition of individual stands of the listed community within any given bioregion, with over 80 different species found in the community (DEWHA, 2009).

The community generally occurs on flat areas, shallow depressions or gilgais on raised (relict) alluvial plains on black, brown, red-brown or grey clay or clay loam soils. It is typically found in narrow bands on the edge of better-watered country in drier areas of its range (Threatened Species Scientific Committee, 2009).

Most areas remaining in the best condition are in lightly-grazed, uncropped sites such as road reserves and Travelling Stock Routes and Reserves.

The community is listed as endangered due to the considerable range decline since European settlement. In NSW, the extent has been estimated at a reduction of between 83% to 94% reducing it to a current extent of between 330,000 to 190,000 hectares. In the Riverina, the loss is expected to be particularly high, with an estimated reduction of about 94%, leaving approximately 780 kilometres^2 (NSW Scientific Committee, 2005).

At the time of writing this assessment, high level vegetation mapping had been undertaken, however plot-based surveys had not yet been conducted. Based in the vegetation integrity assessment, the justification for listing this community is provided in **Section 4.7.2.2**, based on the requirements of Section 3 "Condition Classes" (Threatened Species Scientific Committee, 2009).

An action is likely to have a significant impact on an endangered ecological community if there is a real chance or possibility that it will:

1. **reduce the extent of an ecological community**

In NSW, the extent has been estimated at a reduction of between 83% to 94% reducing it to a current extent of between 330,000 to 190,000 hectares. In the Riverina, the loss is expected to be particularly high, with an estimated reduction of about 94%, leaving approximately 78,000 hectares (NSW Scientific Committee, 2005).

The Project would remove up to 29.69 hectares of the community. This comprises about 0.01% of the estimated extent in NSW and 0.04% within the Riverina region. These impacts represent a small fraction of the of the community on a regional and National scale.

2. **fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines**

The known areas of the community are located within the footprint of turbines, access tracks and substations. It is also likely to be present in areas of the transmission line power poles.

Within the Project area, patches of the community are generally well connected and existing patches are considerably large. Due to the narrow nature of the access tracks (about 5m wide) and the open nature of the woodland, the clearing would not increase fragmentation between patches. Dispersal and pollination would be possible between patches due to the ability of birds and wind to cross between patches in the landscape.

Turbine locations are generally located in areas with no trees present, thus, clearing for these structures would mostly involve groundcover vegetation within these patches of the community. Nevertheless, if the chosen transmission line alignment traverses the community, removal of canopy trees and shrubs would be required.

3. **adversely affect habitat critical to the survival of an ecological community**

No specific critical habitat is outlined in the conservation listing and advice (DEWHA, 2008; Threatened Species Scientific Committee, 2009). As such, the extent of habitat here is considered to be that of the Projected extents of 190,000 hectares in NSW and 78,000 hectares in the Riverina (NSW Scientific Committee, 2005). Furthermore, as much of the remaining patches are bound by dryland/irrigated cropping land and wetter floodplain communities (i.e. dominated by lignum and Eucalyptus camaldulensis subsp. camaldulensis), it is unlikely that there is much additional availed habitat that is not currently utilised. This estimate also considers all areas mapped as the community (in all conditions), if any areas are below the condition thresholds, they would still be considered suitable habitat.

Considering this, the Project would remove up to 29.69 hectares of the critical habitat for the community. This comprises about 0.01% of the estimated extent in NSW and 0.04% within the Riverina region.

4. **modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns**

The construction of access roads across the Project area to facilitate construction activities and operational maintenance may alter surface water drainage patterns, however the impact would be very localised as much of the landscape is flat. Although designs of the roads are not yet developed, it is assumed that they will be elevated slightly in some low depressions to avoid flooding (similar to other existing roads within the Project area facilitating access to existing powerlines). This may change the surface hydrology in localised areas, although drainage structures will be included to prevent large scale changes. The impact and threat of changed hydrology is briefly mentioned in the conservation advice (Threatened Species Scientific Committee, 2009), however not discussed in detail. As such, the potential impacts of changed hydrology are unknown but are likely to be small scale and negligible. It is possible it may impact species structure and composition, extent of the community and weed incursion in road edges.

5. cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting

The Project is not expected to directly impact the species composition of this community in areas not impacted by the Project. As most of the community is open woodland with a sparse canopy of Myall, vegetation clearing is mostly avoiding the removal of Myall trees and would be restricted to the groundcover vegetation within these patches of the community. Nevertheless, if the chosen transmission line alignment traverses the community, removal of canopy trees and shrubs may be required which would remove the canopy vegetation (Myall, Black box and Red gums) for the overhead clearing.

6. cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

a. assisting invasive species, that are harmful to the listed ecological community, to become established, or
b. causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

During construction and operation, the movement of vehicles and equipment has the potential to introduce weeds and pathogens to the site. This is considered to be a minor risk during construction (able to be managed) and a negligible risk during operation due to the level of vehicle movement.

As discussed above, the construction of access roads has the potential to alter surface runoff in localised areas of the community due to changed runoff patterns and possible short-term flooding. This has the potential to alter structure and composition, and allow weed incursion, however the extent of the impacts is likely to be small relative to the extent of vegetation present, and this is largely due to the flat topography which predominates. The community is known to be vulnerable ground cover weed species, particularly in remnants in riparian/ floodplain areas (Threatened Species Scientific Committee, 2009). Additionally, if future changes to the surrounding land use occur, particularly if cropping and grazing is increased, it may amplify the changed in hydrology cause by the Project by increasing movement of weeds and pollutants across the landscape.

7. interfere with the recovery of an ecological community.

There is no federal recovery plan for the community. The conservation advice (DEWHA, 2008) sets out recommended priority recovery and threat abatement actions to support the recovery of the community. These comprise:

- "protecting remnants of the listed ecological community through the development of conservation agreements and covenants;
- the use of strategic grazing that allows regeneration;
- replanting of understorey species where they have been depleted;
- use of lopping methods that do not result in the death of the dominant tree species;
- avoiding the application of fertilisers and herbicides in or near remnants;
- protecting remnants from weeds including the speedy eradication of any new invasions; and
- raising awareness of the ecological community within the community."

None of the recovery actions specifically mention avoiding clearing of the community or its habitat. Nevertheless, the most relevant recovery action refers to "protecting remnants of the listed ecological community" albeit via "the development of conservation agreements and covenants". Considering the lack of a comprehensive recovery management plan it is reasonable to consider protecting all remnant vegetation as a suitable management action. As such, the removal of up to 29.69 hectares of the community is considered an interference to its recovery.

Conclusion

The Project would remove up to 29.69 hectares of the Weeping Myall Woodlands endangered ecological community which comprises about 0.01% of the estimated extent in NSW and 0.04% within the Riverina

region. Although there is a large extent of clearing of the community and unknown impacts to the narrow roadside patches, the Project is unlikely to have a significant impact on the endangered community.

J.3 Critically Endangered Species

J.3.1 Plains-wanderer (*Pedionomus torquatus*)

The Plains-wanderer is a small quail-like bird standing about 12 to 15 cm tall and weighing 40 to 95 grams. They have straw-yellow legs and bills, and their plumage is mainly fawn with fine black rosettes. The female is larger and distinguished by a prominent white-spotted black collar above a rich rufous breast patch (DPE, 2019).

It occurs in scattered sites of 50 to 600 hectares in central NSW, Victoria and south-west QLD, which encompass the core sites for the species (DoE, 2015b, 2016a). Most records are now in a single population within the Riverina (Stephen Garnett, Szabo, & Dutson, 2012). Its habitat comprises sparse, treeless, lowland native grasslands which usually occur on hard red-brown clay soils. It prefers a grassland structure with about 50% bare ground, 10% leaf litter and 40% herbs, forbs and grasses (DPE, 2019). Most vegetation less than 5 cm in height and some widely-spaced plants up to 30 cm. It is occasionally recorded in nearby vegetation of low cereal crops and in low, sparse chenopod shrubland (DoE, 2016a).

The extent of suitable habitat estimated in this assessment comprises the PCTs listed in the BioNet threatened species description for the species (DPE, 2022b). Within the study area, these comprise PCT 44 and PCT 46.

As a ground dwelling bird, impacts of turbine strike and barotrauma are not considered relevant.

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of a population

The Plains-wanderer within the broader Riverina region is considered to comprise a subpopulation of the species at about 800 birds, with possibly less than 250 in dry years (NSW Scientific Committee, 2009). The extent of this population occupies suitable habitats of the greater Riverina region extending to the foothills of the Snowy Mountains north-west through the Murrumbidgee River catchment area to the flat dry inland plains of Hay and Carrathool. This has apparently been a reduction of about 75% of the population since 2001.

It is known that this population occupies parts of the Project area, particularly in area with important area mapping. The number of birds from the broader population that occupy habitat with the impacted properties is unknown, however on the basis of reported preferred habitat (i.e. Grassland) the Project would remove about 128.12 hectares. Extensive areas of potential habitat will remain on these properties, including below and around turbines and other infrastructure. This vegetation removal would result in direct impacts from habitat loss and a low expected increase in risk of vehicle strikes throughout the expected 38-month construction period.

The population size is susceptible to fluctuations associated with environmental conditions as no breeding may occur in years of drought and breeding success can also be very low in years of heavy rainfall (DoE, 2016). Additionally, as the estimated generation length is three years (S Garnett & Crowley, 2000), the construction duration may disturb breeding activities for two seasons, for low number of birds.

Considering the spatial and temporal extent of construction activities within an area supporting a portion of the regional population. It is considered possible that the Project may lead to change in the site population numbers, especially if environmental conditions are unfavourable during construction or in the years following. The long-term implications are unknown, and post construction, the species is considered to persist in the study area given the low impact activity associated with an operational wind farm.

2. reduce the area of occupancy of the species

Area of occupancy represents the area of suitable habitat currently occupied by the species. The area of occupancy is estimated at 330 kilometres^2 (National Environmental Science Program Threatened Species

Research Hub, 2019). However, during very wet or dry years, the proportion of suitable habitat can drop considerably further (NSW NPWS, 2002).

The Project would remove about 128.12 hectares of preferred habitat (grasslands) comprising about 0.27% of the area of occupancy. This would remove habitat important for all stages of the species lifecycle (i.e. breeding, foraging). However, it is important to note that the habitat loss is associated with a series of small footprints over a large area, and the species is considered to persist in the study area given the low impact activity associated with an operational wind farm and the extent of habitat that will remain.

3. fragment an existing population into two or more populations

As discussed above, the population is considered to comprise suitable habitats within the whole the Riverina region. The Project would require the construction of extensive access tracks and easements across the study area totalling about 539 kilometres. The access tracks would link the turbines and provide access from external roads. Access tracks would generally be about 5m wide and be maintained permanently. Powerline easements would have lesser impact to grassland habitats, with clearing of about 10m2 at each power pole located 200- 400m apart. As such, the works would not fragment the landscape to a degree in which would separate the population.

4. adversely affect habitat critical to the survival of a species

The National Recover Plan (DoE, 2016a) for the species specifies that "Habitat critical to the survival of the plains-wanderer includes:

- Any regions where the species is likely to occur (as defined by the distribution map in (DoE, 2016a)); and
- Any newly discovered locations that extend the likely range of the plains-wanderer."

In the Riverina, this critical area comprises "the area bounded by the Cobb Highway between Deniliquin and Willandra National Park to the west, Narrandera and Urana to the east, and Billabong Creek to the south" (DoE, 2016a). This comprises an area of about 25,000 kilometres^2. The entire area of occurrence for the species in Australia is about 526,000 kilometres^2 (National Environmental Science Program Threatened Species Research Hub, 2019). The whole Project area is in the south-east of the Riverina critical habitat. As such, direct vegetation removal would impact about 128.12 hectares (0.004%) of critical habitat within the Riverina region and about 0.0002% across Australia.

5. disrupt the breeding cycle of a population

It is unknown how long individuals live in the wild, however in captivity they have been recorded at up to eight years of which they are capable of breeding in the first year (DoE, 2016a). Breeding success is often linked to environmental conditions in which they may be no breeding in years of drought years and success can also be very low in years of heavy rainfall (DoE, 2016a). A clutch of usually four eggs is laid in spring, with a second clutch laid in summer or autumn if summer rains fall with incubation taking 23 days (NSW Scientific Committee, 2009). Additionally, the estimated generation length is three years (S Garnett & Crowley, 2000). As such, with construction expected to commence in late 2024 and take about 36 months to complete it is possible that construction activities would temporarily disturb breeding activities for two seasons due to direct (vegetation clearing, excavations) and indirect impacts (e.g. noise, vibration and dust).

6. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project would remove 128.12 hectares of preferred habitat for the species. This comprises about 0.27% of the area of occupancy (area of suitable habitat currently occupied by the species) in the Riverina region. As the species inhabits grassland habitats, it is unlikely aerial components of the Project (i.e., transmission lines and turbine blades) would impacts the species (except for the footings of the poles which is included in the vegetation removal estimation above). Movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds and pathogens into habitat edges, however considering the current movement of livestock on the property, this is considered a minor increased risk. However, it is important to note that the habitat loss is associated with a series of small footprints over a large area, and the species is considered to persist in the study area over the long-term given the low impact activity associated with an operational wind farm and the extent of habitat that will remain.

7. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Foxes and cats are known to be present in the Project area and are considered to already be established. During field surveys, numerous foxes and cats were observed including juveniles. Within the grassland habitat of the Plains-wanderer foxes are considered to be a greater risk (DoE, 2016a).

Additionally, movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges, however considering the current movement of livestock on the property, this is considered a minor increased risk.

8. introduce disease that may cause the species to decline, or

Disease is not considered a key threat for the species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk.

9. interfere with the recovery of the species.

Strategies for the national recovery of the Plains-wanderer are to (DoE, 2016a):

- Develop and implement a robust, targeted conservation breeding strategy for the Plains-wanderer
- Facilitate management of grazing regimes, and improve knowledge of appropriate burning regimes, to maintain suitable habitat for the plains-wanderer
- Enhance protection, improve the quality and increase the extent of habitat suitable for the plains-wanderer
- Identify the key factors that have contributed to the significant recent declines in the numbers of plains-wanderers and develop mitigation measures to address these threats
- Improve understanding of the distribution and population trends of the plains-wanderer
- Increase community participation in plains-wanderer conservation and management.

Of these strategies and their associated actions, the Project would impact the strategy "Enhance protection, improve the quality and increase the extent of habitat suitable for the plains-wanderer". Under this strategy, the following action would be interfered with: "Reduce, and where possible prevent, the clearing and loss of habitat in important areas".

The Project would remove 128.12 hectares of potential habitat for the species. This comprises about 0.27% of the area of occupancy in the Riverina region. Although this is only one of the many actions posed by the recovery plan (DoE, 2016a), it is a considerable impact to the recovery of the species. All other actions relate to research, policy and educational opportunities.

Conclusion

The Project would remove about 128.12 hectares of potential habitat (grasslands) comprising about 0.27% of the area of occupancy within the Riverina region. This vegetation removal would primarily remove critical habitat and would also increase risk of vehicle strikes, and to a minor extent, predation and the risk of weed and pathogen encroachment. However, it is important to note that the habitat loss is associated with a series of small footprints over a large area, and the species is considered to persist in the study area over the long-term given the low impact activity associated with an operational wind farm and the extent of habitat that will remain. As such, the Project may **have a significant impact** on the species as there is a real chance or possibility that it will:

- reduce the area of occupancy of the species
- adversely affect habitat critical to the survival of a species
- May disrupt the breeding cycle of a population during construction.

J.3.2 Regent Honeyeater and Swift Parrot

Regent Honeyeater *Anthochaera phrygia*

The Regent Honeyeater is a striking black and yellow, medium sized bird with a sturdy, curved bill and a wingspan of approximately 30cm, weighing between 35-50 grams. Their bodies are black with a pale-lemon patch on the lower breast and a black scalloped pattern, flight and tail feathers are edged with bright yellow, and they possess a characteristic patch of dark pink or cream-coloured facial skin. Males are slightly larger, darker and with a larger patch of bare facial skin (DPE, 2022c).

The species is found mainly in temperate woodlands and open forests of the inland slopes of south-east Australia. Its range is extremely patchy and has decreased dramatically in the last 30 years to between south-east Queensland and north-east Victoria, with only three known breeding regions remaining: north-east Victoria (Chiltern-Albury), and Capertee Valley and Bundarra – Barraba regions in NSW (DPE, 2022c).

Principally a canopy bird, the species is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, however can be found in a range of other habitats including remnant trees in farmland, roadside reserves and travelling stock routes as well as in planted vegetation in parks and gardens (DoE, 2016b). Key eucalypt species for the Regent Honeyeater's diet include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany, however other tree species may be regionally important. The species comprises a single population, and in 2010 was estimated at 350 to 400 mature individuals (Garnett et al., 2011; DoE, 2016b).

Swift Parrot *Lathamus discolor*

The Swift Parrot is a small bright green parrot around 25 cm long, with red around the bill, throat and forehead. The species' crown is blue purple, with red patches under the wing and a distinctive, thin, dark red, 12cm long tail (DPE, 2021). The species occurs as a single migratory population, breeding in Tasmania during spring and summer and migrating north to Victoria, eastern New South Wales and south-eastern Queensland during the winter months. In NSW, they forage in forests and woodlands throughout coastal and western slopes regions, with a higher concentration in coastal areas during periods of inland drought (Saunders & Tzaros, 2011).

Key habitats in mainland Australia for the species include eucalypt forests and woodlands with species such as Mugga Ironbark, Swamp Mahogany, Grey Box, Yellow Box and Blackbutt – with limiting habitat factors including the production of lerp and nectar food resources. Swift parrots have been found to preferentially forage in large, mature trees (Saunders & Tzaros, 2011).

The extent of suitable habitat estimated in this assessment comprises the PCTs listed in the Bionet threatened species description for the species (DPE, 2022b). Within the study area, these comprises PCT 9 for the and Regent Honeyeater and 9 and 11 for the Swift Parrot. There is currently no proposed removal of PCT 9 for the Project.

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of a population

The Regent Honeyeater and the Swift Parrot are both considered to have a single population across Australia (DoE, 2016b; Saunders & Tzaros, 2011). The Regent Honeyeater's population is dispersed across a large area with some exchange of individuals between regularly used areas. The Swift Parrot is migratory, with the entire population travelling between Tasmania for breeding to mainland Australia in non-breeding periods.

No recent estimations of population size are available for both species. Populations estimates from 2010, indicates that the Regent Honeyeater has a population size of 350-400 mature individuals (DoE, 2016b) and the Swift Parrot at about 2,000 individuals.

There are no records of the Regent Honeyeater in the locality and the Project is located on the western extent of the species known range. Preferred habitat in western areas is consider box-ironbark communities (DoE, 2015a), of which there is none in the study area. As such, it is possible the population may be present in the study area, but it is unconfirmed. Comparatively, there are several historical records of the Swift Parrot within the locality. The most recent record is in Murray River National Park in 2021, about 80 kilometres south-west

of the study area. There are several recent records to the south of the Murray River, all of which are the western extent of the known range. There are no mapped important areas (DPE, 2022a) for the two species within the study area. The closest mapped areas are for the Swift Parrot about 130 kilometres to the east near Mangoplah and Wagga Wagga.

During construction, the Project would remove about 0.5 hectares of PCT 11 which provides suitable foraging habitat for the Swift Parrot. The species demonstrate high site fidelity and are known to regularly return to the same sites, however can move in repose to feeding resources (Threatened Species Scientific Committee, 2016).

During operation, there is a risk of direct strikes to birds from the moving turbines. Flight heights of the Regent Honeyeater and Swift Parrot are unknown; however, they are assumed to fly most frequently below the Rotor Sweep Area (RSA) based on the follow reasoning. Firstly, other birds of a similar size and ecology were recorded on site only below the RSA, including Fuscous Honeyeater, Yellow-faced Honeyeater, Singing Honeyeater, Red-rumped Parrot and Blue Bonnet. Secondly, the maximum heights of canopy tree species in the study area (*Eucalyptus camaldulensis* and *Eucalyptus largiflorens*) are 45 metres. It is assumed that movement between patches would be above the canopy, as such between about 50 metres to 70 metres.

As a migratory species often fly at high heights when traveling distances, the Swift Parrot has a higher collision risk to the higher turbines. Higher flying migratory routes and altitudes are unknown (Saunders & Tzaros, 2011), however it is possible the study area is not a highly trafficked migratory route as it is on the western extent of the species range. Nevertheless, estimations for modelling Swift Parrot risk to strikes at exiting windfarms, has suggested that at a 95% avoidance rate (the 'worst case scenario' which was modelled), strike rates are between 0.00002 to 0.019 strike related deaths per year (Smales, Muir, Meredith, & Baird, 2013). For context, cumulatively across all the 35 Australian windfarms modelled in 2005, about one bird would be killed every 10 years. Additionally, to date, no recorded collisions with Swift Parrot or Regent Honeyeater have occurred. As such, considering the low frequency and densities of the populations potentially utilising the study area and the low chance of strike occurrences, the risk of strike related deaths is considered low.

As such, is it unlikely the Project would lead to a long-term decrease in the size of the Regent Honeyeater or Swift Parrot populations.

2. reduce the area of occupancy of the species

Area of occupancy represents the area of suitable habitat currently occupied by the species. The Area of Occupancy of the Regent Honeyeater is estimated at 300 kilometres2 (DoE, 2015a). In 2014, the Area of Occupancy for the Swift Parrot was estimates at between 18.5 kilometres2 to 355 kilometres2, which likely fluctuates between years based on the choice/ availability of non-breeding foraging habitat (Threatened Species Scientific Committee, 2016).

The Project would remove about 0.5 hectares of PCT 11 which provides suitable foraging habitat for the Swift Parrot. On a conservative estimation, this comprises about 0.03% of the Area of Occupancy. The clearing works are not expected to directly impact known Regent Honeyeater habitat.

3. fragment an existing population into two or more populations

As discussed above, the Regent Honeyeater and the Swift Parrot comprise single populations across Australia. They are both highly mobile species, particularly the Swift Parrot which migrates annually from Tasmania.

The Project would clear about 539 kilometres of predominantly grassland vegetation for access tracks, turbines and powerline easements. Access tracks would generally be about 5m wide and be maintained permanently. Powerline easements would have lesser impact to grassland habitats, with clearing of about 10m2 at each power pole located 200- 400 metres apart. As such, the works would not fragment the landscape to a degree in which would separate the populations.

4. adversely affect habitat critical to the survival of a species

Critical habitat for the Regent Honeyeater is defined as: 1) "Any breeding or foraging habitat in areas where the species is likely to occur" (as defined by the distribution map in the Recovery Plan); and 2) "Any newly discovered breeding or foraging" (DoE, 2016b). The study area is beyond the western extent of the breeding

or foraging habitat shown in the Recovery Plan. Additionally, as there are no historical records of the species in the locality, it is concluded that the study area does not provide critical habitat for the Regent Honeyeater.

Critical habitat for the Swift Parrot is defined as "areas with a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot, or are otherwise identified by the recovery team" (Saunders & Tzaros, 2011). The NSW Important Areas Map (DPE, 2022a) has been used in here to identify these areas as the mapped areas are associated with high fidelity sites. The closest mapped areas are for the Swift Parrot about 130 kilometres to the east near Mangoplah and Wagga Wagga. This information, supported by the lack of any historical records within the study area (albeit in the larger locality), suggests that the study area does not provide critical habitat for the Swift Parrot.

As such, the Project would not adversely affect habitat critical to the survival of the two species.

5. disrupt the breeding cycle of a population

The Regent Honeyeater is known to breed in a small number of locations including Bundarra-Barraba, Capertee Valley and Hunter Valley districts in New South Wales, and the Chiltern area in north-east Victoria (DoE, 2016b). The species, nor any breeding activities, have been recorded in the locality. Although birds are known to occasionally change breeding locations (DoE, 2016b), the closest known breeding site is at Chiltern, Victoria, about 140m kilometres south-east of the study area. As such, it is unlikely the Project would impact the breeding cycle of the Regent Honeyeater.

The breeding ecology of the Swift Parrot is well studied. The species breeds on the east and south-east coast of Tasmania in the Spring/ Summer (Saunders & Tzaros, 2011). As such, the Project would not directly impact breeding activities of the species. Potential indirect impacts to breeding involve the removal of about 0.5 hectares of PCT 11 which provides suitable foraging habitat for the Swift Parrot in non-breeding times. However, as it has been identified that the study area does not provide critical habitat for the species, it is unlikely that this extent of habitat loss would impact the non-breeding part of the species life cycle.

6. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project has been designed to largely avoid woodland areas. The direct impacts are mostly located in grassland areas which do not provide suitable habitat for the two species. However, the Project would remove about 0.5 hectares of PCT 11 which provides suitable foraging habitat for the Swift Parrot. In these areas, it is assumed that all vegetation strata would be removed, including canopy trees. The clearing works are not expected to directly impact known Regent Honeyeater habitat. Additionally, as detailed above, the study area is not considered to contain critical habitat for either species.

Movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds and pathogens into habitat edges, however as the majority of construction and operation (maintenance) works would be located in grassland areas, this is considered a negligible risk to habitat for the Regent Honeyeater and Swift Parrot.

As such, the Project is not likely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

7. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

Movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds and pathogens into habitat edges. However, as the majority of construction and operation (maintenance) works would be located in grassland areas, this is considered a negligible risk to habitat for the Regent Honeyeater and Swift Parrot. Moreover, the proliferation of ground-storey weeds, would have little impact to the canopy feeding resources important to the species.

Competition of resources from aggressive birds is a threat to both species. There is already a strong population of Noisy Miners in the study area which are a noted species contributing to this threat. Clearing of about 0.5 hectares of PCT 11 may increase edge effects on already disturbed and small patches of woodland, thus potentially increasing the competitive pressures. Additionally, foxes and cats are known to be present in the study area. The predation of cats is a known Key Threatened Process on the Swift Parrot (Saunders &

Tzaros, 2011). However, the population of Noisy Miners and cats in the study area are already considered established.

8. introduce disease that may cause the species to decline, or

Psittacine Beak and Feather Disease is considered a threat to the Swift Parrot (Saunders & Tzaros, 2011). The disease is present Australia wide with early reports dating back to the 1880s (Raidal & Peters, 2018). The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the study area, however, it is unlikely that Psittacine Beak and Feather Disease would be transported via equipment as direct bird contact is considered the main source of transmission (DoEE, 2016). No pathogens are noted as threats for the Regent Honeyeater. As such, it is unlikely that the Project would introduce disease that may cause the species to decline.

9. interfere with the recovery of the species.

Strategies for the recovery of the Regent Honeyeater comprise (DoE, 2016b):

1. Improve the extent and quality of regent honeyeater habitat.
2. Bolster the wild population with captive-bred birds until the wild population becomes self-sustaining.
3. Increase understanding of the size, structure, trajectory and viability of the wild population.
4. Maintain and increase community awareness, understanding and involvement in the recovery program.

Of the above strategies, the first is the only relevant to the Project. Associated actions include various research and on-ground actions relating to the identification, protection and improvement of habitat. As discussed above, the study area does not comprise critical or important habitat for the Regent Honeyeater or areas previously known to be utilised by the species. Moreover, the Project would not directly remove suitable habitat for the species within the study area.

Key actions for the recovery of the Swift Parrot comprise (Saunders & Tzaros, 2011):

1. Identify the extent and quality of habitat.
2. Manage and protect Swift Parrot habitat at the landscape scale.
3. Monitor and manage the impact of collisions, competition and disease.
4. Monitor population and habitat.
5. Increase community involvement in, and awareness of, the recovery program.
6. Coordinate, review and report on recovery process.

Of the above actions, 2 and 3 are relevant to the Project.

Action 2 includes a relevant measure (2.1a) to "Encourage and support the protection, conservation management and restoration of Swift Parrot nesting and foraging habitat through agreements with landowners, incentive programs and community Projects….". Although this measure is directed at the conservation and protection of land, it is considered here in the context of habitat removal. The Project would remove about 0.5 hectares of PCT 11 which provides suitable foraging habitat for the Swift Parrot, however, is not considered critical habitat.

In Action 3, "collisions" refer to all collisions with human-made objects. The plan notes that collisions with wire netting or mesh fences windows and cars are a cause of mortality in urban areas and that "wind energy turbines may have implications for the conservation of the Swift Parrot where they are poorly sited". As detailed above, the Swift Parrot has a higher collision risk as it is migratory species. However, the presumed importance of the migratory path and the outcomes of previous impact modelling (Smales et al., 2013), indicated that the risk of direct strikes are low. One management measure (3.1a) requires to "Establish and maintain a database for all reported injuries and deaths". To be compliant with the measure of the Plan, an adaptive bird and bat monitoring program will be observed during operation in which recorded strikes will be reported to the Department of Agriculture, Water and the Environment.

As such, with the implementation of an adaptive bird and bat monitoring program, the Project is consistent with the species Recovery Plans and would not interfere with the recovery of the species.

Conclusion

The Project would remove about 0.5 hectares of suitable foraging habitat for the Swift Parrot. No direct impacts to the Regent Honeyeater are expected. The risk of turbine strike on the two species is considered

low and actual operation impacts would be monitored in an adaptive bird and bat monitoring program. As such, the Project is not likely to have a significant impact on the two Regent Honeyeater and Swift Parrot.

J.4 Endangered Species

J.4.1 *Austrostipa wakoolica, Caladenia arenaria, Lepidium monoplocoides* and *Sclerolaena napiformis*

Descriptions for each flora species are presented below.

Much of the habitat in the Project area is unlikely to be important habitat for these plant species. Intensive targeted flora surveys have been undertaken in September and November 2021 and September 2022 and these species were not detected. These species are sensitive to grazing pressure and the Project area has had a long grazing history. As a result, these habitats are unlikely to support an ecologically significant proportion of the population of these species. Therefore, individual assessments of significance were not completed for these species.

Austrostipa wakoolica

Confined to the floodplains of the Murray River tributaries of central-western and south-western NSW, with localities including Manna State Forest, Matong, Lake Tooim, Merran Creek, Tulla, Cunninyeuk and Mairjimmy State Forest (now part of South-West Woodland Nature Reserve). Grows on floodplains of the Murray River tributaries, in open woodland on grey, silty clay or sandy loam soils; habitats include the edges of a lignum swamp with box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open Cypress Pine Forest on low sandy range; and a low, rocky rise.

Caladenia arenaria

Caladenia arenaria is listed endangered under the BC Act and EPBC Act. It is found mostly on the southwest plains and western southwest slopes. The original description is of a plant from Nangus, west of Gundagai (1865) and there is a report of the species from Adelong near Tumut. The Sand-hill Spider Orchid is currently only known to occur in the Riverina between Urana and Narranderra. The species produces flowers between September and November. This species occurs in woodland with sandy soil, especially that dominated by White Cypress Pine (*Callitris glaucophylla*), which is present within the Project area. Therefore, suitable habitat, associated with PCT 28, containing White Cypress Pine (*Callitris glaucophylla*), was surveyed.

Lepidium monoplocoides

Erect annual herb or perennial forb growing to 15-20 cm high, with angular and striped stems roughened with small warts. Species is widespread in the semi-arid western plains regions of NSW and Victoria across the Murray Darling Depression, Riverina, Darling Riverine Plains and Cobar Peneplain Bioregions (Mavromihalis, 2010), however it has not been recorded since 1950 (Leigh et al, 1984). The species occurs predominantly in mallee scrub and in semi-arid areas, in open woodland dominated by *Allocasuarina leuhmanni* and/or eucalypts, with field layers dominated by tussock grasses such as Danthonia spp, or moisture dependent herbs in seasonally waterlogged sites such as *Marsilea spp* (Leigh & Briggs, 1992). Flowers from late winter to spring, or August to October and is highly dependent on seasonal conditions occurring in periodically flooded and water habitats – it does not tolerate grazing. Sites tend to be small in area with local concentrations of the plant (DPE, 2019a).

Sclerolaena napiformis

Low subshrub to about 30 cm high, branches slender and sparsely covered with short, curled hairs and linear to narrow leaves (5-15 mm long). The species produces hard fruit 2-3 mm long with 5 or 6 widely spreading stout spines (1-4 mm long) radiating outwards with 2 considerably shorter than the others (DPE, 2022b). The species is confined to 1% of its original distribution, in remnant grassland habitats on clay-loam soils, dominated by tussock grasses such as Austrostipa nodosa and Chloris truncate, with sites including roadside travelling stock routes and reserves subject to intermittent / light sheep grazing.

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of a population

The plant populations are considered to occur around the Riverina region. Populations of species are considered to be nationally important due to their size, and thus breeding potential and genetic diversity (DAWE, 2022b; NSW Scientific Committee, 2008). During the targeted surveys for the four species in 2021-2022, no individuals were recorded. Nevertheless, due to the close proximity of known or potential populations and the suitable habitat present within the Project area, it is also considered highly likely to occur.

The Project would remove up to 19.57 hectares, 1.49 hectares, 12.92 hectares and 25.75 hectares of assumed suitable habitat for *Austrostipa wakoolica*, *Caladenia arenaria*, *Lepidium monoplocoides* and *Sclerolaena napiformis*, respectively. Moreover, as the targeted surveys were focused in areas of vegetation removal, it is possible that works in non-surveyed areas (and assumed presence for the purposes of offsetting) could lead to a long-term decrease in the size of an important population, especially if suitable habitat or breeding conditions are poor in years following construction. Nevertheless, as the area of vegetation impact only a proportionally small section of the larger Project area and it is likely that the population extends into other areas of suitable habitat that would not be impacted and long-term survival of the whole population would not be threatened.

2. reduce the area of occupancy of the species

Area of occupancy represents the area of suitable habitat currently occupied by these species. It is difficult to quantify the area of occupancy for these species, given the seasonal nature of their habitat (NSW Scientific Committee, 2008). As such, the reduction of the area of occupancy is predicted to be is about 19.57 hectares, 1.49 hectares, 12.92 hectares and 25.75 hectares of assumed suitable habitat for *Austrostipa wakoolica*, *Caladenia arenaria, Lepidium monoplocoides* and *Sclerolaena napiformis*, respectively. This comprises about 0.5% of the Project area.

3. fragment an existing population into two or more populations

The extents of the populations are discussed above and are expected to extend within the locality of the Jerilderie area.

The pollination of these species is largely unknown however the *Austrostipa wakoolica* would be wind pollinated and dispersed. Due to the narrow nature of the access tracks (about 5 metres wide) and the possible nature of dispersal (via insect pollination, specifically wasps for *Caladenia arenaria*), the Project would not result in fragmentation of individual plants within the Project area. Additionally, the transmission line alignment would not increase fragmentation as vegetation removal impacts would be limited to the power pole locations.

4. adversely affect habitat critical to the survival of a species

No critical habitat has been identified for these species in relevant Conservation Advice. As such, the area of occupancy estimates provided in Question 2 above have been used to support this assessment. Additionally, as local populations are known and there are associated vegetation communities present for species within the Project area, it is assumed that the Project area provides critical habitat for the local populations.

As such, the Project would clear up to 19.57 hectares, 1.49 hectares, 12.92 hectares and 25.75 hectares of assumed suitable habitat for *Austrostipa wakoolica*, *Caladenia arenaria, Lepidium monoplocoides* and *Sclerolaena napiformis*, respectively. This comprises about 0.5% of the area of occupancy. This is not considered a considerable impact to the habitat in the locality.

5. disrupt the breeding cycle of a population

Little is known about the reproductive ecology of these species. Construction is expected to commence in late 2024 and take about 36 months to complete, as such construction activities may disturb two or three reproductive seasons. This degree of impact would vary depending on construction staging (i.e., if most vegetation clearing is undertaken in the first year, or staggered over multiple years). However, as the suitable habitat is present across the majority of the Project area, pollination of other individuals would still be

possible. Yet, if poor, dry conditions follow years of construction, reproduction within the Project area may be considerably impacted. As such, the works would impact the breeding cycle of an important population, however the degree of which is unknown.

6. modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project would remove up to 19.57 hectares, 1.49 hectares, 12.92 hectares and 25.75 hectares of assumed suitable habitat for *Austrostipa wakoolica*, *Caladenia arenaria, Lepidium monoplocoides* and *Sclerolaena napiformis*, respectively. This would largely be isolated in periods of vegetation clearing and the construction of the infrastructure. If population numbers are decreased during the construction phase and poor environmental conditions follow in the years after construction, these species have the potential to decline in the short and long-term.

The extent of operational impacts due to elevated access roads is unknown. Although designs of the roads are not yet developed, it is assumed that they will be elevated to avoid flooding in high rainfall events (similar to other existing roads within the Project area facilitating access to existing powerlines). This may change the hydrology of the habitat by increasing water runoff from hard stand areas and increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however may be positive and/or negative as species appear to thrive in years of increase rain, yet increased flooding may increase weed spread.

7. result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges. However, considering the current movement of livestock on the property, this is considered a minor increased risk.

Nevertheless, if elevated access roads are constructed, the hydrology of the habitat may be altered by increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however it may increase weed spread.

8. introduce disease that may cause the species to decline, or

Disease is not considered a key threat for these species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk.

9. interfere with the recovery of the species.

The management actions for these species are focused on the increased development of knowledge of the species ecology and threats. However, habitat destruction is noted as a key threat to species. Nevertheless, as the conservation of these species are in preliminary stages and the Project area is not specifically noted as an area of high conservation importance. The Project is not considered to interfere substantially with the recovery of these species.

Conclusion

The Project has potential to remove up to 19.57 hectares, 1.49 hectares, 12.92 hectares and 25.75 hectares of assumed suitable habitat for *Austrostipa wakoolica*, *Caladenia arenaria, Lepidium monoplocoides* and *Sclerolaena napiformis*, respectively. Species have extensive suitable habitat within the Project area, of which much has been comprehensively surveyed. Nevertheless, due to the extensive suitable habitat within the Project area and ability to avoid and minimise impacts through alternative design routes, the above assessment the Project is not likely to have a significant impact on any of the four species.

J.5 Vulnerable Species

J.5.1 *Swainsona murrayana* and *Swainsona plagiotropis*

Swainsona murrayana

Swainsona murrayana is a prostrate, ascending to erect perennial herb growing up to 25 cm tall with densely pubescent stems. Its distribution is across western NSW and into Vic and SA (DAWE, 2022c). Within NSW there are at least 60 geographically distinct sub-populations (NSW Scientific Committee, 2008). Historically there appears to be a strong population in the South Western Plains in the particularly in the Conargo-Jerilderie-Urana area, albeit there are few surveys since 2003 (DPE, 2022b).

The species often grows in heavy soils, especially depressions, and is also found on grey and red to brown clay and clay-loam soils in Atriplex vesicaria (Bladder Saltbush) herbland, *Eucalyptus largiflorens* (Black Box) woodland and grassland communities and is frequently associated with Maireana species (DAWE, 2022c). The species flowers in August to November, with flowering usually begins in late August to early September and finishes by the end of October (DAWE, 2022c).

Swainsona plagiotropis

Swainsona plagiotropis is a small, prostrate to decumbent perennial herb to 30 cm tall. It is endemic to the riverine plains of inland south-eastern Australia, in Vic and NSW. Population sizes fluctuate markedly in response to seasonal conditions but total population size in good years probably exceeds 200,000 individuals across Australia (DAWE, 2022b). In NSW, the local population is centred around Jerilderie (DAWE, 2022b).

The species is found in relatively open native grassland vegetation on seasonally waterlogged red–brown clay and clay loam soils. The vegetation is dominated by perennial native grasses including Wallaby-grasses Austrodanthonia species, Spear-grasses Austrostipa species and Spider-grass *Enteropogon acicularis*, often with scattered small shrubby bluebushes *Maireana pentagona*, *Maireana excavata* and *Maireana humillima* (DAWE, 2022b). The grasslands also comprise various other daisies and herbs. It also flowers in August to November, with fruit maturing in November.

Both Swainsona murrayana and Swainsona plagiotropis are both listed as Vulnerable under EPBC Act. For both species, the suitable vegetation types on the site comprise PCTs 26, 44, 45, and 46 (DPE, 2022b). The two species are commonly associated on grey soils (DAWE, 2022c).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

Under the EPBC guidelines (DoE, 2013), "an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

The populations of *S. murrayana* and *S. plagiotropis* are both considered to be focused around the Jerilderie area, with *S. murrayana* roughly extent from Urana in the east, Conargo in the west and Coleamally to the north and with *S. plagiotropis* more centralised to the Urana- Jerilderie area. Populations of both species are considered to be nationally important due to their size, and thus breeding potential and genetic diversity (DAWE, 2022b; NSW Scientific Committee, 2008). During the targeted surveys for the two species in 2021, 48 individuals of *S. murrayana* were recorded within the Project area, thus supporting a strong existing population. No individuals of *S. plagiotropis* were recorded during the survey and the closest historical record is about 9 kilometres south of the Project area around Jerilderie. Nevertheless, due to the close proximity of the known *S. plagiotropis* population and the suitable habitat present within the Project area, it is also considered highly likely to occur.

The Project would remove up to 32.12 hectares and 28.94 hectares of known and assumed suitable habitat for *S. murrayana* and *S. plagiotropis*, respectively. However, the Project design is expected to avoid populations. Moreover, as the targeted surveys were focused in areas of vegetation removal, the works would directly remove known *S. murrayana* plants. As such, it is possible that works could lead to a long-term decrease in the size of an important population of *S. murrayana*, especially if suitable habitat or breeding conditions are poor in years following construction. However, the Project design is expected to avoid populations. Nevertheless, as the area of vegetation impact only a proportionally small section of the larger Project area and it is likely that the population extends into other areas of suitable habitat that would not be impacted and long-term survival of the whole population would not be threatened.

However, as *S. plagiotropis* has not been recorded in the Project area and considerable suitable habitat would still remain, it is not likely that the Project would lead to a long-term decrease in the size of an important population of this species.

2. reduce the area of occupancy of an important population

Area of occupancy represents the area of suitable habitat currently occupied by the species.

It is difficult to quantify the area of occupancy of the two species given the seasonal nature of their habitat (NSW Scientific Committee, 2008). For *S. murrayana*, the estimated area of occupancy in NSW is 240 kilometres^2, which is considered a conservative estimate (NSW Scientific Committee, 2008). As such, the reduction of the area of occupancy would is about 32.12 and 28.94 of known and assumed suitable habitat for *S. murrayana* and *S. plagiotropis*, respectively.

There are no estimates for the area of occupancy of *S. plagiotropis*, of which determining the distribution, abundance and population structure of the species is a key recovery action (Tonkinson & Robertson, 2010). However, as the species is known to be associated with fewer vegetation communities (DPE, 2022b) and existing geographic distribution across Australia (DAWE, 2022b, 2022c) is about 10% of that utilised by *S. murrayana*, a coarse Projected estimate of a 5% reduction of the species of area of occupancy is provided for the purposes of this assessment.

3. fragment an existing important population into two or more populations

The extents of the populations are discussed above and are expected to extend within the locality of Jerilderie. The current populations of both species are thought to have been isolated by large scale fragmentation of agricultural activities (DEWHA, 2008; Tonkinson & Robertson, 2010).

The pollination both species is largely unknown. However, one study found that *S. murrayana* and *S. plagiotropis* may only be pollinated by *Trichocolletes maximus*, a solitary, ground nesting bee (Morgan & Williams, 2015). Due to the narrow nature of the access tracks (about 5m wide) and the possible nature of dispersal (via insect pollination), the Project would not result in fragmentation of individual plants within the Project area. Additionally, the transmission line alignment would not increase fragmentation as vegetation removal impacts would be limited to the power pole locations.

4. adversely affect habitat critical to the survival of a species

No critical habitat has been identified for either species (DAWE, 2022c; Tonkinson & Robertson, 2010). As such, the area of occupancy estimates provided in Question 2 above have been used to support this assessment. Additionally, as local populations are known and there are associated vegetation communities present for both species within the Project area, it is assumed that the Project area provides critical habitat for the local populations.

As such, the Project would clear up to 32.12 hectares and 28.94 hectares of known and assumed suitable habitat for *S. murrayana* and *S. plagiotropis*, respectively. This is considered a considerable impact to the habitat in the locality.

5. disrupt the breeding cycle of an important population

Little is known about the reproductive ecology of the two species. Both species flower in August to November, with seeds forming in October. *Swainsona* species are largely renascent perennials, resprouting in suitable wet-cool conditions from a persistent rootstock (DAWE, 2022c). Construction is expected to commence in late 2024 and take about 36 months to complete, as such construction activities may disturb two or three

reproductive seasons. This degree of impact would vary depending on construction staging (i.e., if most vegetation clearing is undertaken in the first year, or staggered over multiple years). However, as the suitable habitat is present across the majority of the Project area, pollination of other individuals would still be possible. Yet, if poor, dry conditions follow years of construction, reproduction within the Project area may be considerably impacted. As such, the works would impact the breeding cycle of an important population, however the degree of which is unknown.

6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project would remove up to 32.12 hectares and 28.94 hectares of known and assumed suitable habitat for *S. murrayana* and *S. plagiotropis*, respectively. This would largely be isolated in periods of vegetation clearing and the construction of the infrastructure. if population numbers are decreased during the construction phase and poor environmental conditions follow in the years after construction, the species has the potential to decline in both the short and long- term.

The extent of operational impacts due to elevated access roads is unknown. Although designs of the roads are not yet developed, it is assumed that they will be elevated to avoid flooding in high rainfall events (similar to other existing roads within the Project area facilitating access to existing powerlines). This may change the hydrology of the habitat by increasing water runoff from hard stand areas and increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however may be positive and/or negative as both species appear to thrive in years of increase rain, yet increased flooding may increase weed spread.

7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges. However, considering the current movement of livestock on the property, this is considered a minor increased risk.

Nevertheless, if elevated access roads are constructed, the hydrology of the habitat may be altered by increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however it may increase weed spread.

8. introduce disease that may cause the species to decline, or

Disease is not considered a key threat for both species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk.

9. interfere substantially with the recovery of the species.

There is currently no recovery plan for *S. murrayana*, however the SPRAT profile (DAWE, 2022c) outlines the following key threat abetment and recovery actions:

1. Maintain grassland vegetation in a relatively open state so that the species is not suppressed by more competitive plants (particularly perennial tussock grasses such as *Austrodanthonia* and *Austrostipa* species and annual exotics like *Avena, Bromus, Vulpia* and *Lolium* species).
2. Control rabbits and goats at sites where that are having a deleterious impact.
3. Ensure that surveys are undertaken during the flowering season.
4. Where grazing occurs in suitable habitat, ensure that it is light, intermittent grazing occurs rather than heavy grazing.
5. Research the ecology and impacts of disturbances on the species.

The current recovery plan (Tonkinson & Robertson, 2010) for S. plagiotropis outlines the following key objectives:

1. Determine distribution, abundance and population structure
2. Identify habitat requirements
3. Ensure that all populations and their habitat are protected and managed appropriately
4. Manage threats to populations

5. Identify key biological characteristics
6. Determine life history and viability of populations
7. Maintain ex situ collections
8. Build community support for its conservation.

The management actions for both species are focused on the increased development of knowledge of the species ecology and threats. However, habitat destruction is noted as a key threat to both species. Nevertheless, as the conservation of both species are in preliminary stages and the Project area is not specifically noted as an area of high conservation importance. The Project is not considered to interfere substantially with the recovery of the species.

Conclusion

The Project would remove up to 32.12 hectares and 28.94 hectares of known and assumed suitable habitat for *S. murrayana* and *S. plagiotropis*, respectively. Although both species have extensive suitable habitat within the Project area, only *S. murrayana* was recorded during the 2021 targeted surveys. Nevertheless, due to the extensive suitable habitat within the Project area, ability to avoid and minimise impacts through alternative design routes, the above assessment the Project is not likely to have a significant impact.

J.5.2 *Brachyscome muelleroides*, *Brachyscome papillosa* and *Maireana cheelii*

Descriptions for each flora species are presented below.

Intensive targeted flora surveys have been undertaken in September and November 2021 and these species were not detected. These species are sensitive to grazing pressure and the Project area has had a long grazing history. However, the Project area contains potential habitat and assessment of significance were competed.

Claypan Daisy (*Brachyscome muelleroides*)

The Claypan Daisy is an annual herb that grows to 14cm tall with single white flowers (4mm across) produced at the end of thread-like stems to 3cm long which are produced from September to November. The species also has thread-like 5.5 cm long leaves growing from the stem (DPE, 2018). Occurring in the Wagga Wagga, Narranderra, Tocumwal and Walbundrie areas (and in north-central Victoria along the Murray from Tocumwal to the Ovens River), it grows in damp areas on the margins of claypans in moist grassland (with *Pycnosorus globosus, Agrostis avenacea* and *Austrodanthonia duttoniana*) and along the margins of lagoons in mud or water in association with *Calotis anthemoides* (DPE, 2018). Appears to rely on seasonal inundation to survive. Current distribution and abundance of the species is not well known, but it is predicted there may be 5-6 locations the species inhabits, with a high concentration at one location in NSW (Lucas, 2010).

Mossgiel Daisy (*Brachyscome papillosa*)

The Mossgiel Daisy is a perennial herb with multiple stems growing to 40cm tall with woolly young shoots and stemless leaves up to 7 cm long. Leaf edges vary from being smooth-edged to deeply indented, with solitary mauve flower heads that have a yellow centre and are 6-11 mm in diameter. The species flowers between June and December and has a distinctive one seeded fruit that is important in confirming identification (DPE, 2018a). Endemic to NSW it occurs mainly within the Riverina Bioregion, from Mossgiel in the north, Murrumbidgee Valley National Park in the southwest and Urana in the south east in primarily clay soils on Bladder Saltbush and Leafless Bluebush plains, as well as in Inland Grey Box – Cypress Pine woodland. It is recorded in variably sized populations (DPE, 2018a).

Chariot Wheels (*Maireana cheelii*)

A perennial forb growing to around 20 cm high with slender striped woolly stems and a fleshy swollen taproot. The leaves (to 6 mm long) are hairless, narrow-cylindrical and slender, flowers are solitary or in pairs in the leaf axils and the fruiting body is whitish, woolly or cottony above with 5 distinctly wheel-like wings radiating up to 2.5 mm long (DPE, 2018b). The species occurs in western Victoria, south-western NSW (in the Riverina Region) and south-western QLD on roadsides or private land. Usually found on floodplains and chenopod shrubland, the species appears to prefer heavy brown to red-brown clay-loams, hard cracking clay and other heavy texture-contrast soils that support Bladder Saltbush (*Atriplex vesicaria*), *Maireana aphylla* and *Acacia homalophylla* shrubland communities (DAWE, 2022d). Flowering in approximately Spring to Summer, it bares fruit mainly from September to November and appears in small, localised occurrences in scattered localities (DPE, 2018b).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

Under the EPBC guidelines (DoE, 2013), "an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

The plant populations are considered to occur around the Riverina region. Populations of species are considered to be nationally important due to their size, and thus breeding potential and genetic diversity (DAWE, 2022b; NSW Scientific Committee, 2008). During the targeted surveys for the two species in 2021, no individuals were recorded during the survey. Nevertheless, due to the close proximity of the potential population and the suitable habitat present within the Project area, it is also considered highly likely to occur.

The Project would remove up to 23.57 hectares, 23.60 hectares and 25.75 hectares of assumed suitable habitat *Brachyscome muelleroides, Brachyscome papillosa* and *Maireana cheelii*, respectively. Moreover, as the targeted surveys were focused in areas of vegetation removal, it is possible that works in non-surveyed areas could lead to a long-term decrease in the size of an important population, especially if suitable habitat or breeding conditions are poor in years following construction. Nevertheless, as the area of vegetation impact only a proportionally small section of the larger Project area and it is likely that the population extends into other areas of suitable habitat that would not be impacted and long-term survival of the whole population would not be threatened.

2. reduce the area of occupancy of an important population

Area of occupancy represents the area of suitable habitat currently occupied by the species.

It is difficult to quantify the area of occupancy for these species, given the seasonal nature of their habitat (NSW Scientific Committee, 2008). As such, the reduction of the area of occupancy is predicted to be is about 24.38 hectares, 23.60 hectares and 25.75 hectares of assumed suitable habitat *Brachyscome muelleroides, Brachyscome papillosa* and *Maireana cheelii*, respectively.

3. fragment an existing important population into two or more populations

The extents of the populations are discussed above and are expected to extend within the locality of the Jerilderie area.

The pollination of these species is largely unknown. Due to the narrow nature of the access tracks (about 5m wide) and the possible nature of dispersal (via insect pollination), the Project would not result in fragmentation of individual plants within the Project area. Additionally, the transmission line alignment would not increase fragmentation as vegetation removal impacts would be limited to the power pole locations.

4. adversely affect habitat critical to the survival of a species

No critical habitat has been identified for these species. As such, the area of occupancy estimates provided in Question 2 above have been used to support this assessment. Additionally, as local populations are known and there are associated vegetation communities present for species within the Project area, it is assumed that the Project area provides critical habitat for the local populations.

As such, the Project would clear up to 23.57 hectares, 23.60 hectares and 25.75 hectares of assumed suitable habitat *Brachyscome muelleroides, Brachyscome papillosa* and *Maireana cheelii*, respectively. This is not considered a considerable impact to the habitat in the locality.

5. disrupt the breeding cycle of an important population

Little is known about the reproductive ecology of the species. Construction is expected to commence in late 2024 and take about 36 months to complete, as such construction activities may disturb two or three

reproductive seasons. This degree of impact would vary depending on construction staging (i.e., if most vegetation clearing is undertaken in the first year, or staggered over multiple years). However, as the suitable habitat is present across the majority of the Project area, pollination of other individuals would still be possible. Yet, if poor, dry conditions follow years of construction, reproduction within the Project area may be considerably impacted. As such, the works would impact the breeding cycle of an important population, however the degree of which is unknown.

6. **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The Project would remove up to 23.57 hectares, 23.60 hectares and 25.75 hectares of assumed suitable habitat *Brachyscome muelleroides, Brachyscome papillosa* and *Maireana cheelii*, respectively. This would largely be isolated in periods of vegetation clearing and the construction of the infrastructure. if population numbers are decreased during the construction phase and poor environmental conditions follow in the years after construction, the species has the potential to decline in the short and long- term.

The extent of operational impacts due to elevated access roads is unknown. Although designs of the roads are not yet developed, it is assumed that they will be elevated to avoid flooding in high rainfall events (similar to other existing roads within the Project area facilitating access to existing powerlines). This may change the hydrology of the habitat by increasing water runoff from hard stand areas and increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however may be positive and/or negative as species appear to thrive in years of increase rain, yet increased flooding may increase weed spread.

7. **result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat**

The movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds into habitat edges. However, considering the current movement of livestock on the property, this is considered a minor increased risk.

Nevertheless, if elevated access roads are constructed, the hydrology of the habitat may be altered by increasing flooding in lower areas bound by elevated roads. The extent of this impact is uncertain, however it may increase weed spread.

8. **introduce disease that may cause the species to decline, or**

Disease is not considered a key threat for these species. The importation of materials and movement of construction and operational maintenance vehicles has the potential to introduce pathogens to the Project area, however, this is considered a minor risk.

9. **interfere substantially with the recovery of the species.**

The management actions for these species are focused on the increased development of knowledge of the species ecology and threats. However, habitat destruction is noted as a key threat to species. Nevertheless, as the conservation of these species are in preliminary stages and the Project area is not specifically noted as an area of high conservation importance. The Project is not considered to interfere substantially with the recovery of these species.

Conclusion

The Project has potential to remove up to 23.57 hectares, 23.60 hectares and 25.75 hectares of assumed suitable habitat *Brachyscome muelleroides, Brachyscome papillosa* and *Maireana cheelii*, respectively. Species have extensive suitable habitat within the Project area. Nevertheless, due to the extensive suitable habitat within the Project area and ability to avoid and minimise impacts through alternative design routes, the above assessment the Project is not likely to have a significant impact.

J.5.3 Superb Parrot (*Polytelis swainsonii*)

The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the

upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. It is estimated that there are less than 5000 breeding pairs left in the wild. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South-West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box.

The Project footprint has been designed to avoid all potential breeding locations in the Project area. Superb Parrot was observed in the north east part of the Project area near weeping myall woodland.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. **lead to a long-term decrease in the size of an important population of a species**

Under the EPBC guidelines (DoE, 2013), "an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. Superb parrots were recorded flying below the RSA height during surveys conducted in the Project area. However, they have not been recorded flying at proposed turbine locations.

No suitable breeding habitat such as hollows in eucalypt woodland would be impacted by the Project. Given the avoidance of potential breeding areas, the current low to no frequency of observed flights at proposed turbine locations in the Project area and the Project is unlikely to lead to a long-term decrease in the Superb Parrot national population and the risk of blade strike.

2. **reduce the area of occupancy of an important population**

The Project is unlikely to reduce the area of occupancy for this species. There is potential loss of foraging and roosting habitat of 29.69 hectares in weeping myall woodland. However, the Project would not impact on suitable breeding habitat such as hollows in eucalypt woodland. has potential to reduce available airspace in the Project area at locations of turbines.

3. **fragment an existing important population into two or more populations**

This species is highly mobile with broad dispersal extent. The Project would not fragment existing habitats or an important population of this species into to two or more populations.

4. **adversely affect habitat critical to the survival of a species**

The Project would not impact on suitable breeding habitat such as hollows in eucalypt woodland in the Project footprint and avoids all breeding areas in the Project area. It is unlikely that the habitat critical to the survival of the Superb Parrot would be adversely affected.

5. **disrupt the breeding cycle of an important population**

The Project would not impact on suitable breeding habitat such as hollows in eucalypt woodland in the Project footprint and avoids all breeding areas in the Project area. It is unlikely that the Project disrupt the breeding cycle of an important population.

6. **modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline**

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. It also has potential to remove foraging and roosting habitat of 29.69

hectares in weeping myall woodland. The Project would not impact on suitable breeding habitat such as hollows in eucalypt woodland in the Project footprint and avoids all breeding areas in the Project area. The Project is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Project is unlikely to result in invasion species harmful to this species becoming established in the in the Project area.

8. introduce disease that may cause the species to decline, or

The Project is unlikely to introduce disease that may cause decline to this species in the Project area.

9. interfere substantially with the recovery of the species.

Blade strike collisions from wind farms are known threats to this species. The number of individuals using the airspace in the Project area is currently unknown and further bird surveys need to be undertaken to assess this risk. Given that habitat loss constitutes as the key threat to the species, the potential removal of foraging habitat may have potential to interfere in the recovery of this species.

Conclusion

The Project has a low potential of significant impact on the Superb Parrot.

J.5.4 Painted Honeyeater (*Grantiella picta*)

The Painted Honeyeater is a small (16 cm) and distinctive bird with a black head, white underparts and dark streaks on the flanks. It has black wings and a black tail with bright yellow edgings, and a pink bill with a dark tip. The female is greyer on the upperparts and possesses less streaking on the flanks (DPE, 2022c). The species is nomadic, occurring at low densities throughout its range with the greatest concentrations at the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. Breeding occurs here from spring to autumn in small nests hanging from drooping eucalypts, she-oak, paperbark or mistletoe branches, after which in winter it is more likely to be found north of its distribution (DPE, 2022c). The species inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests and feeds on the fruits and occasionally nectar and insects of mistletoes or eucalypts (DPE, 2022c).

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

Under the EPBC guidelines (DoE, 2013), "an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area.

There is potential loss of breeding, foraging and roosting habitat of 29.69 hectares in weeping myall woodland that may provide fruits of mistletoes and nesting opportunities. The potential impact to habitat and blade strike are unlikely to lead to a long-term decrease in the Painted Honeyeater national population.

2. reduce the area of occupancy of an important population

The Project has potential to reduce the area of occupancy for this species. There is potential loss of breeding, foraging and roosting habitat of 29.69 hectares in weeping myall woodland that may provide fruits of mistletoes and nesting opportunities.

3. fragment an existing important population into two or more populations

This species is highly mobile with broad dispersal extent. The Project would not fragment existing habitats or an important population of this species into to two or more populations.

4. adversely affect habitat critical to the survival of a species

There is potential loss of breeding, foraging and roosting habitat of 29.69 hectares in weeping myall woodland that may provide fruits of mistletoes and nesting opportunities. It is unlikely that the habitat critical to the survival of the Painted Honeyeater would be adversely affected.

5. disrupt the breeding cycle of an important population

There is potential loss of breeding, foraging and roosting habitat of 29.69 hectares in weeping myall woodland that may provide fruits of mistletoes and nesting opportunities. The construction and operation is unlikely to disrupt the breeding cycle of an important population.

6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. There is potential loss of breeding, foraging and roosting habitat of 29.69 hectares in weeping myall woodland that may provide fruits of mistletoes and nesting opportunities. The Project is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Project is unlikely to result in invasion species harmful to this species becoming established in the in the Project area.

8. introduce disease that may cause the species to decline, or

The Project is unlikely to introduce disease that may cause decline to this species in the Project area.

9. interfere substantially with the recovery of the species.

Blade strike collisions from wind farms are known threats to this species. The number of individuals using the airspace in the Project area is currently unknown and further bird surveys need to be undertaken to assess this risk. Given that habitat loss constitutes as the key threat to the species, the potential removal of foraging habitat may have potential to interfere in the recovery of this species.

Conclusion

The Project has a low potential of significant impact on the Painted Honeyeater.

J.5.5 White-throated Needletail (*Hirundapus caudacutus*)

The White-throated Needletail is a large swift with a thickset, cigar shaped body; a black bill; a stubby tail and long pointed wings; a dark-olive head and neck with an iridescent gloss on the crown and a white band across the forehead and lores; a paler, greyish back; and blackish upperwings with a greenish gloss and a contrasting white patch at the base of the trailing edge (DAWE, 2022e). A migratory species, it is usually seen in eastern Australia from October to April (non-breeding season), more commonly in coastal areas. They are often sighted before storms, low-pressure troughs, approaching cold fronts and occasionally bushfire due to the swarming of insects the conditions result in (DPE, 2021b). There has been a reported decline in sightings

between 1977 and 2002, indicating a decline in the species population of extent of occurrence in Australia (Barret et al., 2003; Blakers et al., 1984).

The species is almost exclusively aerial, from heights of 1 – 1000 metres above the ground. They occur over most types of habitats but are recorded most often above wooded areas including open forests and rainforests, over heathland, and may also fly between and in clearings – less commonly they are recorded flying above woodland, grasslands or swamps (DAWE, 2022e). They forage aerially above a wide range of habitats ranging from heavily vegetated forests to open areas.

This bird species is known to roost in in tree hollows in tall trees on ridge-tops, on bark or rock faces which are absent in the Project area.

Based on the referral guidelines for listed migratory species, a total of 10 individuals corresponds to an ecologically significant proportion of their population at the national scale whilst a total of 100 individuals corresponds to an internationally significant proportion of their population (i.e. 1% of their total population) ((Department of Environment, 2015).

An action is likely to have a **significant impact on a vulnerable species** if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

Under the EPBC guidelines (DoE, 2013), "an 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- key source populations either for breeding or dispersal
- populations that are necessary for maintaining genetic diversity, and/or
- populations that are near the limit of the species range."

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. This species is less commonly known to fly across grassland, woodland and lignum swamps found in the Project area and the Project is unlikely lead to a long term decrease in the size of the species important population. However, given the lack of information around the level of blade strike risk for this species, the proportion of individuals that fly at RSA height is generally unknown and there's a high level of uncertainty estimating the actual impacts on an ecologically significant proportion of their population at a national and international scale.

2. reduce the area of occupancy of an important population

The Project is unlikely to reduce the area of occupancy for this species. The Project has potential to reduce available airspace in the Project area at locations of turbines.

3. fragment an existing important population into two or more populations

This species is highly mobile with broad dispersal extent. The Project would not fragment an existing important population of this species into to two or more populations.

4. adversely affect habitat critical to the survival of a species

No critical habitat has been identified for species and the Project area is outside their breeding and roosting range.

5. disrupt the breeding cycle of an important population

The Project area is outside the breeding range for this species and the Project is unlikely to disrupt the breeding cycle of an important population.

6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. This species is less commonly known to fly across grassland, woodland

and lignum swamps found in the Project area and the Project is unlikely to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. However, given the lack of information around the level of blade strike risk for this species, the proportion of individuals that fly at RSA height is generally unknown and there's a high level of uncertainty estimating the actual impacts on an ecologically significant proportion of their population at a national and international scale.

7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

The Project is unlikely to result in invasion species harmful to this species becoming established in the potential airspace available in the Project area.

8. introduce disease that may cause the species to decline, or

The Project is unlikely to introduce disease that may cause decline to this species in the potential airspace available in the Project area.

9. interfere substantially with the recovery of the species.

Blade strike collisions from wind farms are known threats to this species. The number of individuals using the airspace in the Project area is unknown and there's a high level of uncertainty estimating the actual impacts on an ecologically significant proportion of their population at a national and international scale. As a result, the operation of up to 208 turbines may have potential to interfere in the recovery of this species.

Conclusion

There are uncertainties around the number of individuals likely to use the airspace in the Project area and ability to estimate impacts on an ecologically significant proportion of their population at a national and international scale. As a result, the Project has potential **to have a significant impact** on this species as there is a chance or possibility that it will seriously disrupt the lifecycle of an ecologically significant proportion of their population.

J.5.6 Southern Bell Frog (*Litoria raniformis*)

The Southern Bell Frog is one of the largest frog species in Australia, reaching up to 104 mm in length, with females usually larger than males. The species is typically olive to bright emerald-green, with irregular gold, brown, black to bronze spotting and a pale green stripe down the centre of the back. The undersides are white and coarsely granular, becoming dark grey/black or yellow for males in the breeding season. The groin and posterior of the thighs are turquoise blue and they lack webbing on fingers, however the toes are almost fully webbed with the toe discs being small and approximately equal in width to the digits (DPE, 2017b). The species range has declined with the most pronounced decline in NSW (Mahony, 1999), once centred on the Murray and Murrumbidgee River Valleys and their tributaries, the species currently exists in NSW in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria.

The species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs, but are also found in irrigated rice crops, particularly where there is no available natural habitat. Breeding is triggered by flooding in the warmer months, where they are found floating amongst aquatic vegetation. Outside of the breeding season they are more commonly found beneath ground debris such as fallen timber and bark, rocks, grass clumps and in deep soil cracks (DPE, 2017b).

The Project area has potential habitat for the Southern Bell Frog (*Litoria raniformis*) associated with the tributaries of the Murray and Murrumbidgee Rivers. This species can be found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, River Red Gum swamps or billabongs along floodplains and river valleys. They also have potential to occur in irrigated crops, particularly where there is no available natural habitat. The extent of suitable habitat estimated in this assessment comprises the PCTs listed in the Bionet threatened species description for the species (DPE, 2022b), these comprise PCT 7, 9, 13 and 17.

Frog surveys were conducted in accordance with methods described in the Survey Guidelines for Australia's Threatened Frogs (Commonwealth of Australia, 2010) and the *NSW Survey Guide for Threatened Frogs, A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method* (DPIE

2020). Habitat assessments were completed to identify suitable habitat in the Project area. Three nights targeted frog survey was undertaken at locations with potential habitat for Southern Bell Frog, this included habitats with permanent water at wetlands, farm dams, creeks and irrigated areas with emergent wetland vegetation if available. Frog habitat in the Project area is marginally appropriate for Southern Bell Frog and generally lacked suitable habitat features such as emergent wetland vegetation. No Southern Bell Frog individuals were detected during targeted surveys.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

The recovery plan for the Southern Bell Frog states that "any viable population is considered to be an important population for the persistence and recovery of the species" and that it must not be isolated from interactions with other nearby populations (Clemann & Gillespie, 2012). There are 284 records of the species within locality, with the most recent record being from 2019 about 20 kilometres from the study area. Connectivity of wetlands appears to be an important characteristic of the species (Wassens, Hall, Osborne, & Watts, 2010), in which the study area would only have infrequently in times of high rainfall (i.e. inundation of floodplains). Moreover, during the targeted surveys, no individuals were recorded. As such, it is possible the study area provides habitat for a viable population of the species, however likely on the edge of the extent of the existing population. Nevertheless, as it is possible the species utilises the study area, or could migrate to it in good conditions, as such, this assessment assumes a viable population is possible in the study area, albeit, marginally.

There are no estimates of the population size of the population nationally, or in NSW.

The Project will not remove suitable habitat (associated PCTs) for the species, much of the associated habitat does not include the preferred emergent vegetation. Additionally, as the species was not recorded during the 2021/22 surveys, it is expected that the habitat loss would not be significant to the local population and not lead to a long-term decline.

2. reduce the area of occupancy of an important population

Area of occupancy represents the area of suitable habitat currently occupied by the species. The area of occupancy of the species has not been calculated, however it is known to occupy various aquatic environments from native emergent vegetated as slow flowing permanent streams, swamps, lagoons and lakes to roadside drainage lines (Clemann & Gillespie, 2012).

The Project will not remove suitable habitat (associated PCTs) for the species, much of the associated habitat does not include the preferred emergent vegetation.

3. fragment an existing important population into two or more populations

The Project would require the construction of extensive access tracks and easements across the study area totalling about 539 kilometres. The access tracks would link the turbines and provide access from external roads. Access tracks would generally be about 5m wide and be maintained permanently.

The Southern Bell Frog is a highly mobile frog that can move at least one kilometre in 24 hrs (Clemann & Gillespie, 2012). The presence of permanent waterbodies are important connectivity structures for the Southern Bell Frog in the larger landscape. Although there is a minor risk of direct strike from vehicles as a barrier, particularly during construction, overall the construction and operational activities are not considered likely to impact connectivity to the species. The works would not fragment a population into two or more populations.

4. adversely affect habitat critical to the survival of a species

Habitat critical to the survival of the Southern Bell Frog differs throughout its range (Clemann & Gillespie, 2012). As discussed above, habitat can vary greatly from preferred areas (permanent slowflowing streams, swamps, lagoons and lakes with emergent vegetation) to highly disturbed wetland areas. Key features of the habitat in its northern range, include large, continuous areas containing both permanent and ephemeral waterbodies that undergo regular flooding, and are surrounded by areas containing suitable refugia in the form of ground debris, vegetation cover and cracking soils (Clemann & Gillespie, 2012). However, there is

limited flooding across the study area outside of key wetland areas, and permanent ponds are separated by large distances (generally > 1 kilometres). As such, the study area is not considered critical habitat for the species.

5. disrupt the breeding cycle of an important population

In semi-arid NSW, seasonal flooding of wetland systems necessary for breeding to occur (DEWHA, 2009). Breeding occurs in spring and summer, particularly following flooding events (Clemann & Gillespie, 2012). Construction is expected to commence in late 2024 and take about 36 months to complete. As such, it may impact three years of breeding cycles, however, is more likely to impact one, during the clearing works. The construction of elevated access tracks may have a minor positive impact on hydrology for the species, by increasing flooding of low land areas.

Although the study area provides potential breeding habitat, as the surveys do not support a significant population size, it is unlikely the works would disrupt the breeding cycle of an important population.

6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The Project will not remove suitable habitat (associated PCTs) for the species, much of the associated habitat does not include the preferred emergent vegetation. There is risk of erosion and sedition during excavation works, however this would be isolated to area near the works. Conversely, the construction of elevated access tracks may have a minor positive impact on hydrology for the species, by increasing flooding of low land areas.

Nevertheless, considering the lack of a strong population in the study area and the impact to suitable habitat in the scale of the entire study area, the Project is not considered to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

7. result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Movement of construction and operational maintenance vehicles has the potential to increase the movement of weeds and pathogens into habitat edges. However, as the majority of construction and operation (maintenance) works would be located in grassland areas, this is considered a negligible risk to habitat of the Southern Bell Frog.

8. introduce disease that may cause the species to decline, or

Chytridiomycosis (Chytrid fungus) is known to infect Southern Bell Frogs. It travels via soil and water and, as such is difficult to manage in floodplain areas. Nevertheless, due to the majority of construction and operation vehicle traveling on elevated access tracks in low rainfall conditions, as well as the lack of a strong population in the study area, the risk of spreading the disease is considered low.

9. interfere substantially with the recovery of the species.

National recovery objectives for the species include:

- Secure extant populations of Southern Bell Frogs, particularly those occurring in known breeding habitats, and improve their viability through increases in size and / or area of occurrence.
- Determine distribution, biology and ecology of the Southern Bell Frog, and identify causes of the decline of the species across its geographic range.
- Address known or predicted threatening processes, and implement appropriate management practices where possible to ensure that land use activities do not threaten the survival of the Southern Bell Frog.
- Increase community awareness of and support for Southern Bell Frog conservation.

The Project would not be conflict with the above objectives or any associated recovery actions for the species recovery.

Conclusion

The Project will not remove suitable habitat (associated PCTs) for the species, much of the associated habitat does not include the preferred emergent vegetation. Considering the above assessment, the Project is unlikely to have a significant impact on the species.

J.6 Migratory species

The Significant impact guidelines (DoE, 2013) define an area of 'important habitat' for a migratory species as:

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- habitat that is of critical importance to the species at particular life-cycle stages, and/or
- habitat utilised by a migratory species which is at the limit of the species range, and/or
- habitat within an area where the species is declining.

Much of the habitat in the Project area is unlikely to be important habitat for listed migratory waterbird species. There are irregularly flooded Lignum and Nitre Goosefoot swamps and drainage depressions. Permanent water sources are limited to man-made farm dams and the Yanco Creek. A water body in the north of the Project area has marginal habitat to support migratory waterbirds on occasion, but is generally small and isolated. These habitats are unlikely to support an ecologically significant proportion of the population of the waterbird migratory species. Further information is provided below.

J.6.1 Migratory waterbirds

Common Sandpiper (*Actitis hypoleucos*)

Common Sandpiper are found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers. The species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. The Common Sandpiper is wader / shorebird migrating to Australia in summer for its non-breeding period. the species breeds in a variety of habitats near water in Eurasia. When in Australia, the species is more common in the northern half of Australia (Geering et al. 2008), this species is widespread in small numbers and has been recorded in a variety of habitats including steep sided sewage ponds and dams, feeding in the shallow edges of inland wetlands, farm dams and lakes. With a preference for environments with standing water.

Sharp-tailed Sandpiper (*Calidris acuminata*)

The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation; this includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries, or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. Sometimes they occur on rocky shores and rarely on exposed reefs.

Pectoral Sandpiper (*Calidris melanotos*)

Breeds in northern North America and Siberia and migrates (from late June) to South America and to a lesser extent Australasia (Menkhorst et al 2017). In New South Wales (NSW), the Pectoral Sandpiper is widespread, but scattered. Records exist east of the Great Divide, from Casino and Ballina, south to Ulladulla. West of the Great Divide, the species is widespread in the Riverina and Lower Western regions. Prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains, and artificial wetlands.

Cattle Egret (*Ardea ibis*)

The Cattle Egret is widespread and common according to migration movements and breeding localities surveys. Two major distributions occur in Australia, separated by the east and west of the country. In Australia the principal breeding sites are the central east coast from about Newcastle to Bundaberg. It also breeds in major inland wetlands in north NSW.

Latham's Snipe (*Gallinago hardwickii*)

Recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia. Occurs in permanent and ephemeral wetlands up to 2000 metres above sea-level. Non-breeding visitor to south-eastern Australia. Prefers permanent and ephemeral wetlands, usually open, freshwater wetlands with low, dense vegetation. Sometimes occur in habitats that have saline or brackish water, such as saltmarsh, mangrove creeks, around bays and beaches, and at tidal rivers, although usually only during migration (Menkhorst et al. 2017).

J.6.2 Other migratory and marine species

Rainbow bee-eater (*Merops ornatus*)

The Rainbow Bee-eater is distributed across much of mainland Australia and occurs on several near-shore islands. The species mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.

Rainbow bee-eaters have been observed on numerous occasions during spring and summer surveys in the Project area.

Fork-tailed Swift (*Apus pacificus*)

The Fork-tailed Swift recorded in all regions of NSW. It is almost exclusively aerial, flying from less than 1 metres to at least 1000 metres above ground and probably much higher, seldom recorded on the ground. The species occurs aerially over a wide range of habitats, which vary from rainforests to treeless plains (Menkhorst et al. 2017).

Yellow Wagtail (*Motacilla flava*)

Rare but regular visitor around Australian coast, especially in the NW coast Broome to Darwin. Found in open country near swamps, salt marshes, sewage ponds, grassed surrounds to airfields, bare ground; occasionally on drier inland plains. Uncommon migratory wagtail. Nearly all Australia records are coastal, with a few widely scattered inland records. Typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops.

Satin Flycatcher (*Myiagra cyanoleuca*)

Widespread in eastern Australia and vagrant to New Zealand, sparely scattered on western slopes, extending into the Riverina region as far west as Deniliquin. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.

White-bellied Sea-Eagle (*Haliaeetus leucogaster*)

The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. This species is thought to have a nesting site a few kilometres to the south west of the Project area.

White-throated Needletail (*Hirundapus caudacutus*)

The White-throated Needletail is a large swift with a thickset, cigar shaped body; a black bill; a stubby tail and long pointed wings; a dark-olive head and neck with an iridescent gloss on the crown and a white band across the forehead and lores; a paler, greyish back; and blackish upperwings with a greenish gloss and a contrasting white patch at the base of the trailing edge (DAWE, 2022e). A migratory species, it is usually seen in eastern Australia from October to April (non-breeding season), more commonly in coastal areas. They are often

sighted before storms, low-pressure troughs, approaching cold fronts and occasionally bushfire due to the swarming of insects the conditions result in (DPE, 2021b). There has been a reported decline in sightings between 1977 and 2002, indicating a decline in the species population of extent of occurrence in Australia (Barret et al., 2003; Blakers et al., 1984).

Black-eared Cuckoo (*Chalcites osculans*)

The Black-eared Cuckoo is widespread on mainland Australia, but avoids the wet, heavily forested areas on the east coast and the south-west corner of Western Australia. It is found in drier country where species such as mulga and mallee form open woodlands and shrublands.

Blue-winged Parrot (*Neophema chrysostoma*)

The Blue-winged Parrot is very similar to the Elegant Parrot, and to a lesser extent to the Rock and Orange-bellied Parrots. The Blue-winged Parrot inhabits a range of habitats from coastal, sub-coastal and inland areas, right through to semi-arid zones.

Swift Parrot (*Lathamus discolor*)

The Swift Parrot is a small bright green parrot around 25 cm long, with red around the bill, throat and forehead. The species' crown is blue purple, with red patches under the wing and a distinctive, thin, dark red, 12cm long tail (DPE, 2021). The species occurs as a single migratory population, breeding in Tasmania during spring and summer and migrating north to Victoria, eastern New South Wales and south-eastern Queensland during the winter months. In NSW, they forage in forests and woodlands throughout coastal and western slopes regions, with a higher concentration in coastal areas during periods of inland drought (Saunders & Tzaros, 2011).

An action is likely to have a significant impact on these migratory species if there is a real chance or possibility that it will:

1. **substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species**

The Project has potential to modify the available airspace on occasions when this species is foraging, dispersing through the Project area. Given the lack of information around the level of blade strike risk for this species, the proportion of individuals that fly at RSA height is generally unknown and there's a high level of uncertainty estimating the actual impacts on an ecologically significant proportion of their population at a national and international scale.

While the Project is likely to impact of some habitat that could potentially be used for breeding purposes, this habitat is not considered to be important habitat for these species'. The species' are not known to have a restricted breeding habitat.

2. **result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species, or**

The Project area is not important habitat for these species and it would not result in an invasive species that is harmful to these species.

3. **seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.**

The proposed works are not considered likely to seriously disrupt the lifecycle of an ecologically significant proportion of most of these populations. These species occur throughout Australia and having not been identified as being in a decline except the White-throated Needletail and White-bellied Sea Eagle.

There's potential for White-throated Needletail, Rainbow bee-eater and Fork-tailed Swift to fly within the turbine RSA heights and be susceptible to impacts from blade strike due to the high flight heights of these species and/or suitable habitat in the Project area. There are uncertainties around the number of individuals likely to use the airspace in the Project area and ability to estimate impacts on an ecologically significant proportion of their population at a national and international scale. Although, the Rainbow bee-eater population is in decline, this species was frequently recorded in the Project area and may lose myall woodland

habitat (possibly breeding), it also has a low risk (based on collision assessment) of blade strike collision and but there are also uncertainties around the level of impact this may pose on this species.

As a result, the Project has potential to have a significant impact White-throated Needletail, Rainbow bee-eater and Fork-tailed Swift as there is a chance or possibility that it will seriously disrupt the lifecycle of an ecologically significant proportion of their population due to the uncertainties around the number of individuals occupying the air space at risk of blade strike collision.

Conclusion

There are uncertainties around the number of individuals White-throated Needletail, Rainbow bee-eater and Fork-tailed Swift likely to use the airspace in the Project area and ability to estimate impacts on an ecologically significant proportion of their population at a national and international scale. As a result, the Project has potential **to have a significant impact on White-throated Needletail, Rainbow bee-eater and Fork-tailed Swift** as there is a chance or possibility that it will seriously disrupt the lifecycle of an ecologically significant proportion of their population due to the uncertainties around the number of individuals occupying the air space at risk of blade strike collision.

Appendix K. EPBC Act Assessment of Significance for Threatened Fish

Under the EPBC Act, the approval of the Commonwealth Minister for the Environment is required for any action that may have a significant impact on matters of national environmental significance (MNES). Five aquatic species listed under the EPBC Act – Silver Perch, Murray Cod, Trout Cod, Macquarie Perch and Flathead Galaxias were identified as likely to occur within the Project area and are assessed against the test of significance below.

Table K-1 Test of significance for the EPBC listed 'Critically Endangered' species – Silver Perch

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Lead to a long term decrease in the size of an important population of the species	Silver Perch is endemic to the waterways of the Murray-Darling Basin and was once widespread throughout most of the Basin. Currently, the remaining natural, wild and self-sustaining populations of the Silver Perch are known to occur in a region of the mid-Murray River from Yarrawonga Weir as well as several of its anabranches and tributaries including the Edward River – an anabranch of the Murray River that flows through Deniliquin and the Murrumbidgee River. Delta Creek, Yanco Creek and Turn Back Jimmy Creek within the Project area have been identified as indicative distribution of the Silver Perch. Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Works would be undertaken in accordance with standard sediment and erosion controls to manage and minimise further sedimentation. Aquatic vegetation, woody debris and riparian vegetation would subsequently be reinstated in the area after construction. Works would be carried out outside of the breeding season of Silver Perch to avoid disruption to spawning. To avoid additional coffer dam works and minimise risks of instream works, activities would aim to be carried out when sites are dry or mostly dry. Provided these standard practices are maintained throughout the construction of the project, it is unlikely that a long-term decrease in the size of the population would occur. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
Reduce the area of occupancy of an important population	Physical disruption of preferred habitat would be limited to the disturbance footprint. Appropriate erosion and sediment controls will be adopted to ensure no significant impacts to downstream environments are caused by disturbance of the banks, streambed or instream habitat features during instream works, mobilisation of construction run-off or dewatering activities. As such, Silver Perch populations are not expected to be negatively impacted by the project. There will be no instream structures and therefore operation of the project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the area of occupancy of the species
Fragment an existing population into two or more populations	The operation of the Project would not result in barriers to fish movement or impact on the connectivity of any aquatic species, including Silver Perch. As such, no fragmentation of any existing populations of Silver Perch are anticipated to result from this project.
Adversely affect habitat critical to the survival of a species	While the study area is suggested to support Silver Perch, no areas have been declared to be 'Critical habitat' for the species. Construction: The Project would require localised disturbance of the sites for access track, underground cabling and overhead wiring. This may require some clearance of adjoining riparian vegetation. Disturbance would be limited to the disturbance footprint.

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
	Operation: The operation would not adversely affect habitat critical to the survival of the Silver Perch and will not result in changes to flow or fish movement.
Disrupt the breeding cycle of a population	Silver Perch tend to spawn in spring and summer after migrating long distances upstream. The species spawn naturally in response to a change in conditions; usually a rise in water levels (rainfall) coinciding with warm water temperatures (above 23^{o} Celsius). Each female will lay up to approximately 300,000 eggs that are about 2.7 millimetres in diameter, which hatch within 36 hours. Eggs and larvae passively drift with the river current for a number of days. After about five days the yolk sac is absorbed and the larvae will start to feed on zooplankton. Juveniles disperse over large distances, and are often seen in fishways travelling upstream in large schools (DPI, 2017). Works would be carried out outside of the breeding season to avoid disruption to spawning. The Project is not expected to result in negative impacts to larval drift of Silver Perch as there will be no change to river connectivity compared to what is currently available.
Introduce disease that may cause species to decline	Little is known about the prevalence or effects of diseases on Silver Perch in the wild (DPI, 2006). Naturally occurring protozoan, fungal and bacterial diseases have been documented as occurring in farmed Silver Perch, and a protozoan parasite is thought to be responsible for at least one recorded mass mortality of Silver Perch in Bethungra Dam in the Murrumbidgee catchment in 1999. Another risk for Silver Perch is EHNV virus, which the species can contract from contact with Redfin Perch. While there is potential for contact with Redfin Perch as both species have been recorded in the Yanco Creek system the potential for increased interaction compared to current conditions is considered to be small because even under current conditions both species have potential to reach the study area if sufficient flow is available.
Interfere with the recovery of the species	The Project is not expected to interfere with recovery actions for the species as set out in the NSW Silver Perch recovery plan (DPI, 2006) (currently no national recovery plan for the species). In particular, management measures have been designed to minimise removal of vegetation and deterioration of water quality..

Table K-2 Test of significance for the EPBC listed 'Vulnerable' species – Murray Cod

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Lead to a long term decrease in the size of an important population of the species	Murray Cod can be found in a range of freshwater habitats including rivers and creeks in the Murray-Darling River System. The species occurred throughout almost the entire system with the exception of the upper reaches of tributaries. It has been recorded in the Yanco Creek system. **Construction:** The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Provided these standard practices are maintained throughout the construction of the project, it is unlikely that a long-term decrease in the size of the population would occur. **Operation:** Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Reduce the area of occupancy of an important population	Physical disruption of preferred habitat would be limited to the disturbance footprint. Appropriate erosion and sediment controls will be adopted to ensure no significant impacts to downstream environments are caused by disturbance of the banks, mobilisation of construction run-off or dewatering activities. As such, Murray Cod populations are not expected to be negatively impacted by the project. There will be no instream structures and therefore operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the area of occupancy of the species
Fragment an existing population into two or more populations	The operation of the Project would not result in barriers to fish movement or impact on the connectivity of any aquatic species, including Murray Cod. As such, no fragmentation of any existing populations of Murray Cod are anticipated to result from this project.
Adversely affect habitat critical to the survival of a species	While the study area is suggested to support Murray Cod, no areas have been declared to be 'Critical habitat' for the species. Construction: The Project would require localised disturbance of the sites for access track, underground cabling and overhead wiring. This may require some clearance of adjoining riparian vegetation. Disturbance would be limited to the footprint area. Instream works and construction activities carried out on the banks during construction may disturb submerged large woody debris and overhanging riparian vegetation in the relatively small areas affected by construction. Operation: Operation would not adversely affect habitat critical to the survival of the Murray Cod and will not result in changes to flow or fish movement.
Disrupt the breeding cycle of a population	Murray Cod have an annual reproductive cycle, with spawning occurring from spring to summer. Eggs are deposited on clay beds, rocks and logs in shallow and warm warmer. Larvae hatch after 5-13 days and drift downstream to find food and mature. High water levels enhance the survival of eggs, larvae and juveniles by providing better water quality and more food (Kalatzis and Baker, 2010). Recruitment success is expected to be linked to higher river flows. The Project is not expected to result in negative impacts to spawning migrations of Adult Murray Cod as there will be no change to river connectivity compared to what is currently available.
Introduce disease that may cause species to decline	Little is known of the impact of diseases on Murray Cod (National Murray Cod Recovery Team, 2010). Naturally occurring pathogens may be a problem for injured fish. Another risk for Murray Cod is EHNV virus, which the species can contract from contact with Redfin Perch.. While there is potential for contact with Redfin Perch as both species have been recorded in the Yanco Creek system the potential for increased interaction compared to current conditions is considered to be small because even under current conditions both species have potential to reach the study area if sufficient flow is available.
Interfere with the recovery of the species	The Project is not expected to interfere with recovery actions for the species as set out in the national recovery plan (National Murray Cod Recovery Team, 2010). In particular, management measures have been designed to minimise removal of vegetation and deterioration of water quality..

Table K-3 Test of significance for the EPBC listed 'Endangered' species – Trout Cod

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Lead to a long term decrease in the size of an important population of the species	The Trout Cod is endemic to the southern Murray-Darling system including the Murrumbidgee, Murray and Macquarie Rivers. There are only three known self-sustaining populations left in the wild. The largest is in the Murray River below Yarrawonga and small translocated populations in Cataract Dam and upper reaches of Sevens Creek (Lintermans, 2007). There have been no records of the species within the Project area, however the species has been recorded in the Murrumbidgee upstream. Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Provided these standard practices are maintained throughout the construction of the project, it is unlikely that a long-term decrease in the size of the population would occur. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
Reduce the area of occupancy of an important population	Physical disruption of preferred habitat would be limited to the disturbance footprint. Appropriate erosion and sediment controls will be adopted to ensure no significant. Cod populations (if present) are not expected to be negatively impacted by the project. There will be no instream structures and therefore operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the area of occupancy of the species
Fragment an existing population into two or more populations	The operation of the Project would not result in barriers to fish movement or impact on the connectivity of any aquatic species, including Trout Cod. As such, no fragmentation of any existing populations of Trout Cod (if present) are anticipated to result from this project.
Adversely affect habitat critical to the survival of a species	Based on recent records and literature, the study area is not considered likely to support Trout Cod and no areas have been declared to be 'Critical habitat' for the species. Construction: The Project would require localised disturbance of the sites for access track, underground cabling and overhead wiring. This may require some clearance of adjoining riparian vegetation. Disturbance would be limited to the footprint area. Operation: The operation would not adversely affect habitat critical to the survival of the Trout Cod and will not result in changes to flow or fish movement.
Disrupt the breeding cycle of a population	Trout Cod tend to spawn during spring and early summer when water temperatures are around 15 °C. The eggs are small, adhesive and attach to hard substrates which are guarded by the male. Hatching occurs between 5-10 days then disperse in the water column (DPI, 2014). The Project is not expected to result in negative impacts to Trout Cod larval drift as there will be no change to river connectivity compared to what is currently available.
Introduce disease that may cause species to decline	Little is known about the prevalence or effects of diseases on Trout Cod. While there is potential for contact with Redfin Perch as both species have been recorded in the Yanco Creek system the potential for increased interaction compared to current conditions is considered to be small because even under current conditions both species have potential to reach the study area if sufficient flow is available.
Interfere with the recovery of the species	The Project is not expected to interfere with recovery actions for the species as set out in the national Trout Cod recovery plan (Trout Cod Recovery Team, 2008). In particular, management measures have been designed to minimise removal of vegetation and deterioration of water quality.

Table K-4 Test of significance for the EPBC listed 'Endangered' species – Macquarie Perch

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Lead to a long term decrease in the size of an important population of the species	The Macquarie Perch is a riverine species, typically found in the cool upper reaches of the Murray-Darling river system. In NSW, natural inland populations are large isolated to the upper reaches of the Lachlan, Goulburn and Murrumbidgee Rivers. Translocated populations in NSW are found in the Mongarlowe River, Queanbeyan River upstream of the Googong Reservoir and in Cataract Dam (Lintermans, 2007). No records exist within the study area and the species is thought to be locally extinct. Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
Reduce the area of occupancy of an important population	Physical disruption of preferred habitat would be limited to the disturbance footprint Appropriate erosion and sediment controls will be adopted to ensure no significant impacts to downstream environments from mobilisation of construction run-off or dewatering activities. As such, Macquarie Perch populations (if present) are not expected to be negatively impacted by the project. There will be no instream structures and therefore operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the area of occupancy of the species
Fragment an existing population into two or more populations	The operation of the Project would not result in barriers to fish movement or impact on the connectivity of any aquatic species, including Macquarie Perch. As such, no fragmentation of any existing populations of Macquarie Perch (if present) are anticipated to result from this project.
Adversely affect habitat critical to the survival of a species	Based on recent records and literature, the study area is not considered likely to support Macquarie Perch and no areas have been declared to be 'Critical habitat' for the species. Construction: The Project would require localised disturbance of the sites for access track, underground cabling and overhead wiring. This may require some clearance of adjoining riparian vegetation. Disturbance would be limited to the footprint area. Instream works and construction activities carried out on the banks during construction may disturb submerged large woody debris and overhanging riparian vegetation in the relatively small areas affected by construction. Instream woody debris that is required to be removed from site would be moved upstream and downstream of the Project area. Aquatic vegetation and woody debris would subsequently be reinstated in the area after construction. Works would be carried out outside of the breeding season to avoid disruption to spawning. Operation: The operation would not adversely affect habitat critical to the survival of the Macquarie Perch and will not result in changes to flow or fish movement.
Disrupt the breeding cycle of a population	Macquarie Perch tend to spawn during spring and early summer in flowing, shallow upland stream and rivers when water temperatures reach at least 16.5 °C. Adult Macquarie Perch will undertake spawning migrations in search of suitable riffle habitat where they can deposit their eggs. The species deposit their eggs above riffles where they lodge among gravel and boulders (Tonkin, et al, 2009). Hatching occurs after approximately 10 days. The Project is not expected to result in negative impacts to Macquarie Perch larval drift as there will be no change to river connectivity compared to what is currently available.

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Introduce disease that may cause species to decline	Naturally occurring pathogens may be a problem for injured fish. Another risk for Macquarie Perch is EHNV virus, which the species can contract from contact with Redfin Perch. While there is potential for contact with Redfin Perch as both species have historically been recorded in proximity of the Project area, the potential for increased interaction compared to current conditions is considered to be small because even under current conditions both species have potential to reach the study area if sufficient flow is available.
Interfere with the recovery of the species	The Project is not expected to interfere with recovery actions for the species as set out in the National Recovery Plan for the Macquarie Perch (Commonwealth of Australia, 2018). In particular, management measures have been designed to minimise removal of vegetation and deterioration of water quality..

Table K-5 Test of significance for the EPBC listed 'Critically Endangered' species – Flathead Galaxias

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Lead to a long term decrease in the size of an important population of the species	Flathead galaxias is known from the southern part of the Murray Darling Basin and have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW, however over recent times there have been very few recorded and are now thought to be locally extinct in these rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong although Delta Creek, Yanco Creek and Turn Back Jimmy Creek within the project area have been identified as indicative distribution of the Flathead Galaxias. Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
Reduce the area of occupancy of an important population	Physical disruption of preferred habitat would be limited to the disturbance footprint. Appropriate erosion and sediment controls will be adopted to ensure no significant impacts to downstream environments are caused by mobilisation of construction run-off or dewatering activities. As such, Flathead Galaxias populations are not expected to be negatively impacted by the project. There will be no instream structures and therefore operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the area of occupancy of the species
Fragment an existing population into two or more populations	The operation of the Project would not result in barriers to fish movement or impact on the connectivity of any aquatic species, including Flathead Galaxias. As such, no fragmentation of any existing populations of Flathead Galaxias are anticipated to result from this project.
Adversely affect habitat critical to the survival of a species	While the study area is suggested to support Flathead Galaxias, no areas have been declared to be 'Critical habitat' for the species. Construction: The Project would require localised disturbance of the sites for access track, underground cabling and overhead wiring. This may require some clearance of adjoining riparian vegetation. Disturbance would be limited to the footprint area. Operation: The operation would not adversely affect habitat critical to the survival of the Flathead Galaxias and will not result in changes to flow or fish movement.

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Disrupt the breeding cycle of a population	Flathead Galaxias tend to spawn in spring when water temperatures are above 10.5°C, producing 2000-7000 transparent, slightly adhesive demersal eggs. The eggs hatch after 8 days at temperatures between 9-14°C (DPI 2014). Works would be carried out outside of the breeding season to avoid disruption to spawning. The Project is not expected to result in negative impacts to larval drift of Flathead Galaxias as there will be no change to river connectivity compared to what is currently available.
Introduce disease that may cause species to decline	Little is known about the prevalence or effects of diseases on Flathead Galaxias. While there is potential for contact with Redfin Perch as both species have been recorded in the Yanco Creek system the potential for increased interaction compared to current conditions is considered to be small because even under current conditions both species have potential to reach the study area if sufficient flow is available.
Interfere with the recovery of the species	The Project is not expected to interfere with recovery actions for the species although there is currently no recovery plan. In particular, management measures have been designed to minimise removal of vegetation and deterioration of water quality.

Appendix L. FM Act Seven-part test of significance

The results of this assessment identified one endangered ecological community (Murray River EEC), one vulnerable species (Silver Perch), two endangered species (Trout Cod, Macquarie Perch) and one critically endangered species (Flathead Galaxias) listed under the FM Act. A seven part test in accordance with the FM Act has been carried out below.

Table L-1 Seven-part test of significance for Lower Murray River Drainage System Aquatic ecological Communities (Lower Murray River EEC)

Seven-part test questions	Assessment
a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	The Project lies wholly within the Lower Murray River Drainage System (Lower Murray River EEC). Construction: The project would require localised disturbance within the disturbance footprint for the widening of access tracks, underground cabling and overhead wiring. Disturbance would be limited to the disturbance footprint. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species . There is a small risk to water quality from accidental spills as a result of vehicles using access tracks during maintenance activities however appropriate measures will be in place to manage any accidental spills. The Project is therefore unlikely to: i. have an adverse effect on the extent of the ecological community or place the community at risk of extinction ii. Substantially or adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
d. in relation to the habitat of a threatened species, population or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of	The Project would require localised disturbance of riparian vegetation or instream disturbance during construction. Disturbance would be limited to the footprint area. i. As the Project area is known to support several threatened fish and the Lower Murray River EEC, the Project has been designed to minimise waterway crossings, disturbance of waterways and riparian vegetation removal. The Project is unlikely to fragment or isolate the long-term survival of the ecological communities in the locality.

Seven-part test questions	Assessment
habitat as a result of the proposed action, and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	
e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	Not applicable
f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	Recovery actions would be made in accordance with relevant guidelines, Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013) and Why do Fish Cross the Road? Fish Passage Requirements for Waterways Crossings (Fairfull and Witheridge, 2003).
g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	Threatening processes which may occur during the construction of the Project may include: ▪ Temporary removal of large woody debris ▪ Disturbance of native riparian vegetation and associated erosion of stream banks. By incorporating erosion and sediment control measures, rehabilitating habitat structure and improving fish passage at control structures, the KTPs as mentioned above would be minimised.

Table L-2 Seven part test of significant for Silver Perch (Vulnerable)

Seven-part test questions	Assessment
a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Silver Perch is endemic to the waterways of the Murray-Darling Basin and was once widespread throughout most of the Basin. Currently, the remaining natural, wild and self-sustaining populations of the Silver Perch are known to occur in a region of the mid-Murray River from Yarrawonga Weir as well as several of its anabranches and tributaries including the Edward River – an anabranch of the Murray River that flows through Deniliquin and the Murrumbidgee River. Delta Creek, Yanco Creek and Turn Back Jimmy Creek within the project area have been identified as indicative distribution of Silver Perch. The species generally prefers faster-flowing water including rapids and more open sections of river (DPI, 2017). Adult Silver perch can travel large distances, often associated with spawning activity in spring and summer. Juveniles disperse over large distances and are often seen at fishways travelling upstream in large schools. Females can lay up to 300,000 eggs which passively drift with the river current for a number of days before hatching. The lifecycle is threatened by: ▪ Changes in water quality associated with agriculture and forestry, for example siltation (as a result of clearing) can destroy deep rock pools used by adults as well as smothering spawning areas ▪ Modification of natural river flows and temperatures as a result of construction of dams and weirs lead to disrupted cues for migration and spawning and reduce opportunities for dispersal and availability of food

Seven-part test questions	Assessment
	▪ Loss of riparian vegetation by deliberate removal result in sedimentation, increased salinity and declines in water quality subsequently degrading instream habitats important to Silver Perch ▪ Loss of submerged macrophytes which are important nursery areas for juvenile Silver Perch and important sites for feeding ▪ Competition from introduced species such as Carp, Redfin Perch and Gambusia (DPI, 2017). Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable
d. in relation to the habitat of a threatened species, population or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of	i. The Project would require localised disturbance of riparian vegetation or instream disturbance during construction. Disturbance would be limited to the footprint area. ii. Project has been designed to minimise waterway crossings, disturbance of waterways and riparian vegetation removal. The Project is not expected to result in fragmentation or isolation of Silver Perch populations.

Seven-part test questions	Assessment
habitat as a result of the proposed action, and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	
e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No critical habitat has been identified within or downstream of the Project area.
f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	Priority action statements for the Silver Perch include the following recovery actions: ▪ Provide advice to consent and determining authorities and management authorities regarding habitat protection and species distribution ▪ Community and stakeholder liaison, awareness and education ▪ Implement and enforce relevant fishing regulations in priority Silver Perch areas ▪ Implement and enforce relevant fishing regulations including national recovery plan to minimise adverse impact on the species ▪ Stocking/translocation ▪ Habitat protection and rehabilitation including management of environmental flows and water quality; improved fish passage at major regulating structures; protection and rehabilitation of aquatic habitat and riparian vegetation; and mitigate impacts of cold-water pollution. Potential Silver Perch habitat within the Project area will be protected throughout the construction phase through implementation of site-specific erosion and sediment controls.
g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	Threatening processes which may occur during the construction of the Project may include: ▪ Removal of riparian vegetation and associated erosion of stream banks. By incorporating erosion and sediment control measures, rehabilitating habitat structure and improving fish passage at control structures, the KTPs as mentioned above would be minimised.

Table L-3 Seven-part test of significance for Trout Cod (Endangered)

Seven-part test questions	Assessment
a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The Trout Cod is endemic to the southern Murray-Darling system including the Murrumbidgee, Murray and Macquarie Rivers. There are only three known self-sustaining populations left in the wild. The largest is in the Murray River below Yarrawonga and small translocated populations in Cataract Dam and upper reaches of Sevens Creek (Lintermans, 2007). There have been no records of the species within the Project area, however the species has been recorded in the Murrumbidgee upstream. The species generally prefers habitat that has lots of large in-stream woody debris or snags, which provide complex habitats for each stage of the species' life cycle. The species form pairs and spawn during spring and early summer when water temperature is around 15˚C. Females will attach their eggs to hard substrates and larvae would hatch after 5 – 10 day (DPI, 2017a). The species is threatened by:

Seven-part test questions	Assessment
	▪ Modification of natural river flows and temperatures as a result of river regulation which has led to spawning failures, reduced fish dispersal, and reduced habitat quality; ▪ Habitat degradation through the removal of snags, water quality impacts associated with agriculture and other land uses, and sedimentation caused by land clearing activities; and, ▪ Competition from, or interactions with, introduced fish species such as Brown Trout (*Salmo trutta*), Redfin Perch and Common Carp. **Construction:** The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. **Operation:** Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable
d. in relation to the habitat of a threatened species, population or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of	i. The Project would require localised disturbance of riparian vegetation or instream disturbance during construction. Disturbance would be limited to the footprint area. ii. Project has been designed to minimise waterway crossings, disturbance of waterways and riparian vegetation removal. The Project is not expected to result in fragmentation or isolation of Trout Cod populations.

Seven-part test questions	Assessment
habitat as a result of the proposed action, and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	
e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No critical habitat has been identified within or downstream of the Project area.
f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	Priority action statements for the Trout Cod include the following recovery actions: ▪ Provide advice to consent and determining authorities and management authorities regarding habitat protection and species distribution ▪ Community and stakeholder liaison, awareness and education ▪ Implement and enforce relevant fishing regulations including national recovery plan to minimise adverse impact on the species ▪ Habitat rehabilitation including: providing increased protection and rehabilitation for key area of Trout Cod aquatic habitat and riparian vegetation. Potential Trout Cod habitat within the Project area will be protected throughout the construction phase through implementation of site-specific erosion and sediment controls. During operation, environmental management measures will be in place to protect water quality which are in keeping with recovery actions.
g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	Threatening processes which may occur during the construction of the Project may include: ▪ Temporary removal of large woody debris ▪ Removal of riparian vegetation and associated erosion of stream banks. By incorporating erosion and sediment control measures, rehabilitating habitat structure and improving fish passage at control structures, the KTPs as mentioned above would be minimised.

Table L-4 Seven part test of significance for Macquarie Perch (Endangered)

Seven-part test questions	Assessment
a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	The Macquarie Perch is a riverine species, typically found in the cool upper reaches of the Murray-Darling river system. In NSW, natural inland populations are large isolated to the upper reaches of the Lachlan, Goulburn and Murrumbidgee Rivers. Translocated populations in NSW are found in the Mongarlowe River, Queanbeyan River upstream of the Googong Reservoir and in Cataract Dam (Lintermans, 2007). No records exist within the study area and the species is thought to be locally extinct. Macquarie Perch are a potadromous species, meaning that they undertake spawning migrations in search of suitable riffle habitat where they can deposit their eggs. The MDB subspecies is known to spawn from September to December, when water temperatures reach at least 16.5˚C (DPI, 2016a). The species deposits their eggs above riffle areas, where they lodge among gravel and boulders (Tonkin, et al, 2009). Silt creates unfavourable conditions for the eggs by filling deep holes and settling on the river bottom, blanketing rocky substrates and filling small spaces between the gravel and cobbles (Department of Sustainability, Environment, Water, Population and Communities, 2011). The species is threatened by: ▪ Changes in water quality associated with agriculture and forestry. For example, siltation (as a result of clearing) can destroy the deep rock pools used by adults as well as smothering spawning areas; ▪ Modification of natural river flows and temperatures as a result of river regulation which has led to spawning failures, reduced opportunities for dispersal, and reduced habitat quality; ▪ Habitat degradation through the removal of snags, water quality impacts associated with agriculture and other land uses, and sedimentation caused by land clearing activities; and, ▪ Competition from, or interactions with, introduced fish species such as Brown Trout (Salmo trutta), Redfin Perch and Common Carp. ▪ The viral disease EHNV (Epizootic Haematopoietic Necrosis), which is carried by the introduced species Redfin Perch. Construction: The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. Works would be undertaken in accordance with standard sediment and erosion controls to manage and minimise further sedimentation. Provided these standard practices are maintained throughout the construction of the project, it is unlikely that a long-term decrease in the size of the population would occur. Operation: Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.

Seven-part test questions	Assessment
b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable
d. in relation to the habitat of a threatened species, population or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	i. The Project would require localised disturbance of riparian vegetation or instream disturbance during construction. Disturbance would be limited to the footprint area. ii. Project has been designed to minimise waterway crossings, disturbance of waterways and riparian vegetation removal. The Project is not expected to result in fragmentation or isolation of Macquarie Perch populations (if present).
e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No critical habitat has been identified within or downstream of the Project area

Seven-part test questions	Assessment
f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	Priority action statements for the Macquarie Perch include the following recovery actions: ▪ Provide advice to consent and determining authorities and management authorities regarding habitat protection and species distribution ▪ Community and stakeholder liaison, awareness and education ▪ Implement and enforce relevant fishing regulations including national recovery plan to minimise adverse impact on the species ▪ Habitat rehabilitation including: providing increased protection and rehabilitation for key area of Macquarie Perch aquatic habitat and riparian vegetation. Potential Macquarie Perch habitat within the Project area will be protected throughout the construction phase through implementation of site-specific erosion and sediment controls. The disturbed aquatic environments will also be rehabilitated following construction through re-establishment of aquatic habitat features such as large woody debris, aquatic vegetation instream and riparian vegetation on the banks. During operation, environmental management measures will be in place to protect water quality which are in keeping with recovery actions.
g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	Threatening processes which may occur during the construction of the Project may include: ▪ Temporary removal of large woody debris ▪ Removal of riparian vegetation and associated erosion of stream banks. By incorporating erosion and sediment control measures, rehabilitating habitat structure and improving fish passage at control structures, the KTPs as mentioned above would be minimised.

Table L-5 Seven-part test of significance for Flathead Galaxias (Critically Endangered)

Seven-part test questions	Assessment
a. In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.	Flathead galaxias is known from the southern part of the Murray Darling Basin and have been recorded in the Macquarie, Lachlan, Murrumbidgee and Murray Rivers in NSW, however over recent times there have been very few recorded and are now thought to be locally extinct in these rivers. The species is now only known from the upper Murray River near Tintaldra and wetland areas near Howlong although Delta Creek, Yanco Creek and Turn Back Jimmy Creek within the project area have been identified as indicative distribution of the Flathead Galaxias. Flathead Galaxias tend to spawn in spring when water temperatures are above 10.5°C, producing 2000-7000 transparent, slightly adhesive demersal eggs. The eggs hatch after 8 days at temperatures between 9-14°C (DPI 2014). Works would be carried out outside of the breeding season to avoid disruption to spawning. The species is threatened by: ▪ Spawning or recruitment failure due to water regulation and cold water releases from impoundments ▪ Loss of, or altered connectivity between rivers and floodplains ▪ Loss of, or degradation of habitats In lakes, wetland and billabongs such as the loss of aquatic vegetation like Ribbon Weed (Vallisneria spp) ▪ Predatory and competitive interactions with introduced species such as Carp (Cyprinus carpio), Redfin Perch (Perca fluviatilis) and Gambusia (Gambusia holbrooki)

Seven-part test questions	Assessment
	▪ Construction of barriers to migration and recolonisation such as weirs and dams without fishways ▪ Habitat modifications as a result of agricultural practices including siltation and loss of riparian vegetation ▪ Pollution from domestic, agricultural and industrial sources. **Construction:** The works associated with the construction of the Project may impact on areas of potential habitat through direct disturbance of streambeds, clearance of vegetation, sedimentation and poor quality runoff caused by construction activities. **Operation:** Operation of the Project is not expected to negatively impact on the long-term movement and migration of the species and subsequently would not contribute to a reduction in the size of the population.
b. in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.	Not applicable
c. in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	Not applicable
d. in relation to the habitat of a threatened species, population or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the action proposed, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and the importance of the habitat to be	i. The Project would require localised disturbance of riparian vegetation or instream disturbance during construction. Disturbance would be limited to the footprint area. ii. Project has been designed to minimise waterway crossings, disturbance of waterways and riparian vegetation removal. The Project is not expected to result in fragmentation or isolation of Flathead Galaxias populations (if present).

Seven-part test questions	Assessment
removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality	
e. whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly)	No critical habitat has been identified within or downstream of the Project area
f. whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan	Conservation and recovery action for the Flathead Galaxias include the following: ▪ identification and prioritisation of KTP and their impact on the species ▪ community and stakeholder liaison, awareness and education ▪ monitoring of the species population over time to assess trends in abundance and distribution ▪ Implement the Aquatic Rehabilitation Program in priority areas to mitigate or remove operation of threatening process ▪ implement eradication/control program for introduced species where appropriate ▪ identification of future potential sites for translocation. Potential Flathead Galaxias habitat within the Project area will be protected throughout the construction phase through implementation of site. During operation, environmental management measures will be in place to protect water quality which are in keeping with recovery actions.
g. whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.	Threatening processes which may occur during the construction of the Project may include: ▪ Temporary removal of large woody debris ▪ Removal of riparian vegetation and associated erosion of stream banks. By incorporating erosion and sediment control measures, rehabilitating habitat structure and improving fish passage at control structures, the KTPs as mentioned above would be minimised.

Appendix M. Determination of excluded impacts

Introduction

A number of steps were undertaken during different stages of the project to determine areas of excluded land in the study area. This included identification of category 2 which requires full biodiversity assessment and category 1 – exempt land which is not regulated and therefore does not require assessment of ecosystem credits. However, these areas must still assess threatened species habitat and prescribed biodiversity impacts where suitable habitat is present. This section presents the method and results of land categorisation for the Project area and native vegetation regulatory mapping on proposed category 1 – exempt land.

Under section 6.8(3) of the BC Act, the BAM can exclude the assessment of impacts of any clearing of native vegetation and loss of habitat on Category 1 - Exempt Land. Category 1 - Exempt Land is not currently mapped for public view. Category 1 - exempt Land is land where, due to historical land use and detectable clearing or significant modification/disturbance since 1 January 1990, clearing on the land is not regulated (that is, it does not require approval) (OEH, 2017).

Method

The first approach was to identify whether land meets criteria for Category 2 - Regulated Land, prior to Category 1 - exempt Land. In some circumstances, land may meet multiple map criteria i.e. criteria for Category 2 - Regulated Land, and Category 1 - exempt Land. In most circumstances' Category 2 - Regulated Land criteria will determine the categorisation of the land, rather than Category 1 - exempt Land criteria. A desktop review of the category 2 Sensitive Regulated land and category 2 Vulnerable Regulated land was undertaken using the publicly available transitional NVR Map and spatial layer.

Inspection of non-woody vegetation in the Project area (e.g. grasslands and shrublands) outside known category 2 land was undertaken in the early stages of the project (i.e. October 2021) to identify detectable areas of past clearing, significant modification/disturbance since 1 January 1990.

The native vegetation regulatory map method statement (DPE, 2022) was later used in the assessment and subsequent surveys were completed to ground-truth and determine potential locations of excluded land. Many land categories in the Project area are currently unmapped in the Native Vegetation Regulated (NVR) map.

The determination of significant disturbance or modification of non-woody vegetation such as grasslands and shrublands was undertaken using the following criteria (as described in the LLS Regulation):

- There has been a detectable variation (from information obtained from aerial or satellite imagery) in the structure or composition, or both, of non-woody vegetation, and
- That variation is consistent with management of pasture or crops for agricultural purposes, and
- That variation has been sustained for at least 12 months on more than one occasion before the commencement of Part 5A of the Act, and
- That variation has not been caused only by grazing on the land, and
- That variation occurred (from information obtained from aerial or satellite imagery) between 1 January 1990 and the date of commencement of Part 5A of the Act.

A reasonable approximation was made to determine land categories in the Project area. Preliminary exclusion mapping was provided to BCS for review in early September 2022. Comments were provided in late September 2022 with an indicative map of land not meeting the criteria and requiring further evidence.

Results

The Project area has non-native vegetation including cultivated land has been ploughed regularly. Many of these areas in the study area were ground truthed to confirm the absence of native species. Other proposed locations that may meet category 1 - exempt land are farm dams and some existing tracks.

Due to the long history of agriculture in the Project area, much of the landscape has been disturbed or modified over the course of 150 years, mainly from grazing and fire wood collection during drought periods. However, the lack of 'perennial' weeds/exotic plants make the detection of category 1 - exempt land difficult.

There are obvious locations in the landscape where tracks and farm dam construction, ploughing and cultivation are evident. Indicative areas of category 1 - exempt land have been preliminarily mapped in the Project area based on the observations and analysis of:

- Historical and current aerial imagery
- Large scale ploughing of paddocks for cultivation
- Existing constructed vehicle tracks
- Location of farm dams with major earthworks
- Anecdotal dialogue from landholders.

There is an extensive network existing farm tracks across the Project area. Many of these tracks vary in condition, width and use by landholders. Many tracks are not constructed and have compacted over time with regular use or have regenerated with native grassland with irregular use. Due to the difficulty in mapping the variety of track types and conditions, the majority of tracks have been classed as native vegetation and assigned to vegetation zone based on observed vegetation mapping.

Further revision of the excluded land map were carried out following comments from BCS in late September 2022. Some locations had recent evidence of cultivation that didn't provide enough evidence to support the criteria for determining category 1 – exempt land and were categorised as category 2 land. However, rapid floristic surveys confirmed the absence of native species at these locations and justified the land to be assigned to non-native vegetation. This land is considered degraded for the purposes of threatened flora and fauna habitat and targeted surveys were not carried out. However, all locations categorisations were assessed for prescribed impacts to biodiversity, including potential frog habitat at farm dam locations and bird and bat blade strike from windfarms.

A map of excluded land in the disturbance footprint with category 2 and category 1 land is provided in **Figure 2-2.** The excluded land map requires final endorsement from BCS.

The assessment of land categorisations identified the following areas in the disturbance footprint:

- Category 1 – exempt land – non-native vegetation (comprising paddocks of cultivated land) – 54.71 hectares
- Category 1 – exempt land – constructed internal tracks – 3.08 hectares
- Category 1 – exempt land – constructed farm dams – 0.11 hectares
- Category 2 – native vegetation – 173.39 hectares
- Category 2 – non-native vegetation – 5.58 hectares.

Other areas of category 1 – exempt land not mapped in the study area include established main roads including Wilson Road, Mabins Well Road, Liddles Lane, Moonbria Lane, Liddles Lane, Jerrys Lane and Goolgumbla Road. All these roads are greater than 5 m wide with constructed swales and embankments and are maintained regularly. The road surfaces are hard comprising introduced gravel. The southern portion of Wilson Road comprises bitumen.

Road upgrades within the Project area were assessed as part of the study area. Field surveys were undertaken for each proposed upgrade. The field assessment found that very small areas of native vegetation may require disturbance in the Project area at the junctions of Moonbria Lane/Wilson Road, Liddles Lane/Wilson Road and Jerrys Lane/ Liddles Lane. These roads have wide man-made embankments and swales that are maintained by Council to drain water from the roads. As a result, these roads are considered to be category 1 – exempt land within the envelope of the roads and biodiversity values do not need to be assessed, except prescribed impacts where relevant.

Appendix N. EPBC Act Protected Matters Search

Australian Government
Department of Agriculture, Water and the Environment

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 30-Nov-2021

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	4
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	27
Listed Migratory Species:	10

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	17
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	None
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	3
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Banrock station wetland complex	400 - 500km upstream from Ramsar site	In feature area
Hattah-kulkyne lakes	200 - 300km upstream from Ramsar site	In feature area
Riverland	400 - 500km upstream from Ramsar site	In feature area
The coorong, and lakes alexandrina and albert wetland	500 - 600km upstream from Ramsar site	In feature area

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions	Endangered	Community may occur within area	In feature area
Grey Box (Eucalyptus microcarpa) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia	Endangered	Community likely to occur within area	In feature area
Natural Grasslands of the Murray Valley Plains	Critically Endangered	Community likely to occur within area	In feature area
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pedionomus torquatus Plains-wanderer [906]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area	In buffer area only
Polytelis swainsonii Superb Parrot [738]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
FISH			
Galaxias rostratus Flathead Galaxias, Beaked Minnow, Flat-headed Galaxias, Flat-headed Jollytail, Flat-headed Minnow [84745]	Critically Endangered	Species or species habitat may occur within area	In feature area
Maccullochella macquariensis Trout Cod [26171]	Endangered	Species or species habitat may occur within area	In buffer area only
Maccullochella peelii Murray Cod [66633]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In feature area
FROG			
Litoria raniformis Growling Grass Frog, Southern Bell Frog, Green and Golden Frog, Warty Swamp Frog, Golden Bell Frog [1828]	Vulnerable	Species or species habitat likely to occur within area	In feature area
MAMMAL			
Nyctophilus corbeni Corben's Long-eared Bat, South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area	In feature area
PLANT			
Amphibromus fluitans River Swamp Wallaby-grass, Floating Swamp Wallaby-grass [19215]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Austrostipa wakoolica [66623]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Brachyscome muelleroides Mueller Daisy [15572]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Brachyscome papillosa Mossgiel Daisy [6625]	Vulnerable	Species or species habitat may occur within area	In feature area
Lepidium monoplocoides Winged Pepper-cress [9190]	Endangered	Species or species habitat likely to occur within area	In feature area
Maireana cheelii Chariot Wheels [8008]	Vulnerable	Species or species habitat may occur within area	In feature area
Sclerolaena napiformis Turnip Copperburr [11742]	Endangered	Species or species habitat likely to occur within area	In feature area
Swainsona murrayana Slender Darling-pea, Slender Swainson, Murray Swainson-pea [6765]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat likely to occur within area overfly marine area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat may occur within area overfly marine area	In buffer area only
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat may occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]		Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

In feature area

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

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-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact Us page.

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