Victorian Murray Floodplain Restoration Project

Flora and Fauna Assessment - Belsar-Yungera Floodplain Restoration Project

IS297762-AP-AP-RP-0012 | Rev 0

22 June 2020

Lower Murray Urban and Rural Water Corporation

Appendices

Appendix A. Summary of previous reports

Report	Methods	Key findings	Recommendations
DELWP (2018) SDL Fish Management Plan - Belsar-Yungera. Plan prepared for Mallee CMA.	• Review of existing information. • Review of proposed SDL infrastructure and operation. • Review of existing ecological objectives and targets for the site. • Provision of recommended fish-related opportunities for the site.	• Site has potential to support up to 11 native fish species. • Potential for EPBC-listed Murray Cod and Silver Perch. • Floodplain currently not utilised often by fish. • Fish in the upper reaches of Narcooyia Creek currently have no clear floodplain exit strategy except during over-bank flooding. • Current waterway condition in the lower reaches of Narcooyia and Bonyaricall Creeks is likely to inhibit fish passage from the Murray River due to Cumbungi encroachment and silt deposition.	Increased flows (late winter/spring) into Narcooyia Creek may enhance habitat conditions for riverine (e.g. Murray Cod and Silver Perch). Provision of fishway will allow exit to the Murray River. Floodplain inundation may allow for restoration of wetland fish community, provided a fish exit strategy is implemented. Lakes Powell and Carpul may be filled by pumping
Australian Ecosystems (2013) *Hattah North and Belsar Yungera Islands Flora Census*. Report prepared for Mallee CMA.	Review of existing information Field surveys November 2013: • 27 sites (30 m x 30 m vegetation quadrats) surveyed • Projected foliage cover recorded for all overstorey and understorey species • Photographs of each quadrat	• Fifteen Ecological Vegetation Classes (EVCs) sampled • 252 flora species recorded (207 indigenous, 45 exotic) • 29 flora species listed as rare or threatened under the DELWP Advisory list of rare or threatened plants in Victoria recorded during surveys. • Including one FFG threatened flora species recorded, *Cullen pallidum* (Woolly Scurf-pea).	No recommendations

Report	Methods	Key findings	Recommendations
GHD (2013) *Preliminary Ecological Investigations – Belsar and Yungera Island Water Management Functional Design Stage*. Report prepared for Mallee CMA.	Review of existing information Field surveys over seven days, November 2012-January 2014: • 14 sites • Targeted Threatened species surveys • Two Hour Point Counts (THPC) for Regent Parrot nesting at sites containing suitable habitat • Ground dwelling vertebrates • Active searches for reptiles, amphibians and mammals • Nocturnal surveys for amphibians, mammals and reptiles Bird surveys: • Each site surveyed once in early morning and late afternoon • Standard 20 minute 2 hectare area search • Nocturnal spotlight surveys: • Owl call-playback, targeted survey for arboreal mammals and nocturnal birds • Recording of incidental observations. Flora Surveys • Identification and recording dominant indigenous and introduced plant species present at each site • Identification of the Ecological Vegetation Class (EVC) present at each site	• 78 native fauna species recorded • 72 native bird species • 1 native amphibian species • 2 native and 3 exotic terrestrial mammal species • 3 native reptile species • Significant and listed species included: • EPBC Act listed Regent Parrot recorded at 20 locations • 4 bird and reptile species listed as threatened under FFG Act • 5 species of bird listed under the DEPI Advisory List of Threatened Vertebrate Fauna in Victoria 2013	Further Studies to refine design and placement of structures. Net Gain Assessments required due to impacts to Native Vegetation. EPBC Act referral may be required. Possible referral of the project under the Victoria EE Act 1978. Application for a permit to remove Protected or Threatened Flora under the Victorian FFG Act 1988, should construction require removal of protected flora (highly likely). Application for a permit under the Victorian Planning and Environment Act 1987, should construction require removal of native vegetation (highly likely). Application for a permit under the Victorian Wildlife Act 1975, should the permit under the Planning and Environment not be sufficient. Application for a permit under the Swan Hill Rural City Council Planning Scheme, for the removal of native vegetation. Preparation of an Environmental Management Plan (EMP). Preparation of a Threatened Species Management Plan (TSMP).

Report	Methods	Key findings	Recommendations
	• Recording the location of Large Old Trees (LOTs), where practicable • Assessment of the broad condition of native vegetation at each site and the sites likely conservation significance • Identification of rare or threatened flora species at each site and the potential for additional species to occur • Determination of whether a Net Gain assessment is likely to be required.		
GHD (2014). *SDL Offsets - Fauna Survey. Hattah North and Belsar Yungera*. Report prepared for Mallee CMA.	• Review of existing information • Field surveys over five days/four nights, November 2013: • 12 intensive fauna survey sites • Pitfall trapping using T-array • Funnel and Elliot traps at each site. • Infrared motion-activated fauna camera traps. • Anabat ultrasonic bat recordings of each site, complemented by harp trapping of microbats at a selection of subsites. • Targeted Threatened species surveys • Two Hour Point Counts (THPC) for Regent Parrot nesting at sites containing suitable habitat. • Ground dwelling vertebrates • Active searches for reptiles, amphibians and mammals.	• 114 native fauna species recorded • 87 native bird species • 5 native amphibian species • 5 native and 4 exotic terrestrial mammal species • 6 bat species • 11 native reptile species • Significant and listed species included: • 105 records of the EPBC Act listed Regent Parrot. • 3 bird and reptile species listed as threatened under FFG Act • 7 species of bird and 1 reptile listed under the DEPI Advisory List of Threatened Vertebrate Fauna in Victoria 2013	No recommendations

Report	Methods	Key findings	Recommendations
	• Nocturnal surveys for amphibians, mammals and reptiles • Bird surveys: • Each site surveyed once in early morning and late afternoon • Standard 20 minute 2 hectare area search • Nocturnal spotlight surveys: • Owl call-playback, targeted survey for arboreal mammals and nocturnal birds • Recording of incidental observations.		
Ecology Australia (2016) *Mallee Sustainable Diversion Limit: Belsar & Yungera Islands – Flora & Fauna Assessment*. Report prepared for Mallee CMA.	Desktop review. Flora site assessment (December 2015): • Potential footprint traversed • Comprehensive observed flora list recorded • Habitat Hectare assessed • EVCs assigned Fauna site assessment (December 2015): • Incidental observations	Vegetation values recorded: • Nine EVC's recorded over the site (23 habitat zones) • 221 vascular plant species recorded (177 indigenous, 51 exotic) • 22 rare or threatened flora species under the DELWP Advisory list recorded during surveys • Three FFG listed threatened flora species recorded Fauna values recorded: • 92 vertebrate species recorded • 82 bird species (2 exotic) • Four mammal species (2 exotic) • One reptile species • Three amphibian species	To minimise potential native vegetation removal, the following recommendations are made regarding the proposed tracks and infrastructure alignments: • Relocate the works area to avoid the low-lying Lignum Swampy Woodland vegetation between Lake Powell and Lake Carpul (Figure 2) • Investigate the feasibility of realigning the underground pipeline that connects Bonyarical Creek water supply to the Lake Powell Regulator to follow the existing aboveground pipeline that runs almost parallel (Figure 4) • Ensure that Gearbox Loop Track is realigned to follow the existing track (appears to be out of line for the most part) (Figure 7)

Report	Methods	Key findings	Recommendations
		Threatened fauna recorded: • Regent Parrot (eastern subspecies) (EPBC and FFG listed). 18 recorded in five separate groups. • Hooded Robin (FFG listed) • Grey-crowned Babbler (FFG listed)	• Realign track to follow the boundary of the agricultural land between J1f Regulator and J1b Regulator (the existing alignment follows an overgrown track that has been recolonised by native vegetation (Figure 6) • Avoid damage to large, old, hollow-bearing River Red-gums (including root zones) during construction • Utilise mapped locations suitable for stockpiles, etc., as a priority over areas of better quality remnant vegetation (Figures 2-8)

Appendix B. Flora recorded during flora surveys

Key to table:

Status

en Endangered (Advisory List of Rare or Threatened Plants in Victoria – 2014 (DEPI 2014)

vu Vulnerable (Advisory List of Rare or Threatened Plants in Victoria – 2014 (DEPI 2014)

r Critically endangered (Advisory List of Rare or Threatened Plants in Victoria – 2014 (DEPI 2014)

L Listed as threatened (FFG Act)

P Listed as protected (FFG Act)

R Restricted (CaLP Act)

C Regionally Controlled (CaLP Act)

WONS Weed of National Significance

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Native Species						
Acacia brachybotrya s.l.	Grey Mulga	P		Y		
Acacia colletioides	Wait-A-While	P, r	Y			
Acacia ligulata	Small Cooba	P		Y		
Acacia melvillei	Yarran	L, P, vu				Y
Acacia oswaldii	Umbrella Wattle	L, P, vu	Y		Y	Y
Acacia rigens	Nealie	P			Y	
Acacia salicina	Willow Wattle	P			Y	
Acacia spp.	Wattle	P	Y			
Acacia stenophylla	Eumong	P	Y	Y	Y	
Actinobole uliginosum	Flannel Cudweed	P	Y	Y		
Ajuga australis	Austral Bugle		Y			
Ajuga grandiflora	Mallee Bugle			Y		
Alectryon oleifolius subsp. *canescens*	Cattle Bush		Y		Y	
Allocasuarina luehmannii	Buloke	L, P, en		Y	Y	
Alternanthera denticulata s.l.	Lesser Joyweed		Y			
Alternanthera denticulata s.s.	Lesser Joyweed			Y	Y	
Alternanthera nodiflora	Common Joyweed		Y			
Alternanthera sp. 1 (Plains)	Plains Joyweed			Y		
Amaranthus spp.	Amaranth			Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Amphibromus nervosus	Common Swamp Wallaby-grass		Y			
Amyema miquelii	Box Mistletoe		Y	Y	Y	
Amyema miraculosa subsp. *boormanii*	Fleshy Mistletoe				Y	
Amyema pendula subsp. *pendula* (s.s.)	Drooping Mistletoe				Y	
Amyema preissii	Wire-leaf Mistletoe				Y	
Anthosachne scabra s.s.	Common Wheat-grass				Y	
Aristida holathera var. *holathera*	Tall Kerosene Grass	vu		Y		
Aristida spp.	Wire-grass				Y	
Arthropodium minus	Small Vanilla-lily			Y		
Asperula gemella	Twin-leaf Bedstraw	r	Y		Y	Y
Asperula wimmerana	Wimmera Woodruff	r		Y		Y
Asteraceae spp.	Composite			Y		
Atriplex eardleyae	Small Saltbush				Y	
Atriplex leptocarpa	Slender-fruit Saltbush		Y	Y	Y	
Atriplex lindleyi subsp. *conduplicata*	Baldoo	r				Y
Atriplex lindleyi subsp. *inflata*	Corky Saltbush				Y	
Atriplex lindleyi subsp. *lindleyi*	Flat-top Saltbush		Y	Y	Y	Y
Atriplex nummularia subsp. *nummularia*	Old-man Saltbush				Y	
Atriplex pseudocampanulata	Mealy Saltbush	r			Y	Y
Atriplex semibaccata	Berry Saltbush			Y	Y	
Atriplex spp.	Saltbush		Y		Y	
Atriplex stipitata	Kidney Saltbush			Y	Y	
Atriplex suberecta	Sprawling Saltbush			Y	Y	
Atriplex vesicaria	Bladder Saltbush		Y			
Austrostipa elegantissima	Feather Spear-grass			Y	Y	
Austrostipa mollis	Supple Spear-grass				Y	
Austrostipa nitida	Balcarra Spear-Grass			Y	Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Austrostipa scabra subsp. *falcata*	Rough Spear-grass		Y	Y	Y	
Austrostipa spp.	Spear Grass		Y		Y	
Azolla rubra	Pacific Azolla		Y			
Boerhavia dominii	Tah-vine		Y		Y	
Brachyscome ciliaris	Variable Daisy	P		Y		
Brachyscome lineariloba	Hard-head Daisy	P		Y	Y	
Brachyscome paludicola	Woodland Swamp-daisy	P			Y	
Brachyscome spp.	Daisy	P	Y			
Brassicaceae spp.	Crucifer				Y	
Bulbine bulbosa	Bulbine Lily		Y			
Bulbine semibarbata	Leek Lily			Y	Y	
Calandrinia eremaea	Small Purslane		Y			
Calandrinia spp.	Purslane			Y	Y	
Callitriche spp.	Water Starwort				Y	
Callitris gracilis	Slender Cypress-pine			Y		
Callitris verrucosa	Scrub Cypress-pine		Y			
Calocephalus sonderi	Pale Beauty-heads	P	Y		Y	
Calotis cuneifolia	Blue Burr-daisy	P, r			Y	
Calotis erinacea	Tangled Burr-daisy	P			Y	
Calotis hispidula	Hairy Burr-daisy	P		Y	Y	
Calotis scabiosifolia var. *scabiosifolia*	Rough Burr-daisy	P		Y		
Calotis scapigera	Tufted Burr-daisy	P			Y	
Calotis spp.	Burr Daisy	P		Y		
Cardamine moirensis	Riverina Bitter-cress	r		Y		
Carex inversa	Knob Sedge				Y	
Carex spp.	Sedge		Y			
Carpobrotus modestus	Inland Pigface			Y	Y	
Casuarina pauper	Belah				Y	
Centipeda cunninghamii	Common Sneezeweed	P	Y	Y	Y	
Centipeda elatinoides	Elatine Sneezeweed	P			Y	
Centipeda minima s.l.	Spreading Sneezeweed		Y	Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Centipeda nidiformis	Cotton Sneezeweed	P, r	Y			
Centipeda thespidioides s.l.	Desert Sneezeweed	P	Y			
Chenopodium curvispicatum	Cottony Saltbush			Y	Y	
Chenopodium desertorum subsp. *microphyllum*	Small-leaf Goosefoot			Y		
Chenopodium desertorum subsp. *rectum*	Frosted Goosefoot	vu	Y	Y	Y	Y
Chenopodium glaucum	Glaucous Goosefoot			Y		
Chenopodium nitrariaceum	Nitre Goosefoot		Y	Y	Y	
Chenopodium spp.	Goosefoot		Y			
Chloris truncata	Windmill Grass		Y		Y	
Chrysocephalum apiculatum s.l.	Common Everlasting		Y			
Chthonocephalus pseudevax	Groundheads	P		Y		
Clematis microphylla s.l.	Small-leaved Clematis		Y			
Clematis microphylla s.s.	Small-leaved Clematis			Y	Y	
Convolvulus erubescens s.l.	Pink Bindweed			Y		
Convolvulus spp.	Bindweed		Y		Y	
Cotula vulgaris var. *australasica*	Slender Cotula			Y		
Crassula colorata	Dense Crassula			Y	Y	
Crassula sieberiana s.l.	Sieber Crassula		Y	Y		
Crassula tetramera	Australian Stonecrop				Y	
Cressa australis	Rosinweed		Y	Y		
Cullen pallidum	Woolly Scurf-pea	L, P, en		Y		Y
Cullen tenax	Tough Scurf-pea	L, P, en				Y
Cynodon dactylon var. *pulchellus*	Native Couch		Y	Y	Y	
Cyperus difformis	Variable Flat-sedge				Y	
Cyperus exaltatus	Tall Flat-sedge				Y	
Cyperus gymnocaulos	Spiny Flat-sedge		Y			
Cyperus spp.	Flat Sedge				Y	
Daucus glochidiatus	Australian Carrot		Y	Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Dianella porracea	Riverine Flax-lily	vu	Y			
Dianella revoluta s.l.	Black-anther Flax-lily		Y			
Disphyma crassifolium subsp. *clavellatum*	Rounded Noon-flower		Y			
Dodonaea viscosa	Sticky Hop-bush			Y		
Dodonaea viscosa subsp. *angustissima*	Slender Hop-bush		Y	Y	Y	
Duma florulenta	Tangled Lignum				Y	
Duma florulenta	Tangled Lignum		Y	Y		
Duma horrida subsp. *horrida*	Spiny Lignum	r				Y
Eclipta platyglossa subsp. *platyglossa*	Yellow Twin-heads	P			Y	
Einadia nutans subsp. *nutans* s.s.	Nodding Saltbush		Y	Y	Y	
Einadia spp.	Einadia		Y			
Elatine gratioloides	Waterwort		Y			
Eleocharis acuta	Common Spike-sedge				Y	
Eleocharis spp.	Spike Sedge		Y			
Enchylaena tomentosa var. *tomentosa*	Ruby Saltbush		Y	Y		
Enchylaena tomentosa var. *tomentosa* (prostrate form)	Ruby Saltbush (prostrate southern form)				Y	
Enchylaena tomentosa var. *tomentosa* (shrubby form)	Ruby Saltbush (shrubby inland form)				Y	
Enneapogon avenaceus	Common Bottle-washers			Y		
Enneapogon nigricans	Dark Bottle-washers		Y			
Enteropogon acicularis	Spider Grass		Y	Y	Y	
Epilobium hirtigerum	Hairywillow-herb				Y	
Eragrostis dielsii	Mallee Love-grass		Y		Y	
Eragrostis setifolia	Bristly Love-grass	vu		Y	Y	
Eragrostis spp.	Love Grass		Y		Y	
Eremophila divaricata subsp. *divaricata*	Spreading Emu-bush	P, r	Y		Y	Y
Eremophila glabra	Common Emu-bush	P		Y		
Eremophila longifolia	Berrigan	P	Y		Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Eremophila maculata subsp. *maculata*	Spotted Emu-bush	L, P, r	Y		Y	Y
Eriochiton sclerolaenoides	Woolly-fruit Bluebush			Y		
Eucalyptus camaldulensis	River Red-gum		Y	Y	Y	
Eucalyptus dumosa	Dumosa Mallee			Y		
Eucalyptus gracilis	Yorrell			Y	Y	
Eucalyptus largiflorens	Black Box		Y	Y	Y	
Eucalyptus odorata s.l.	Peppermint Box			Y		
Eucalyptus socialis	Grey Mallee			Y	Y	
Euchiton sphaericus	Annual Cudweed	P		Y		
Euphorbia dallachyana	Flat Spurge			Y		
Euphorbia drummondii	Flat Spurge				Y	
Eutaxia microphylla	Common Eutaxia		Y			
Exocarpos aphyllus	Leafless Ballart		Y	Y	Y	
Exocarpos strictus	Pale-fruit Ballart				Y	
Frankenia serpyllifolia	Bristly Sea-heath	r			Y	Y
Geococcus pusillus	Earth Cress			Y		
Glinus lotoides	Hairy Carpet-weed		Y			
Glossostigma elatinoides	Small Mud-mat		Y			
Glycyrrhiza acanthocarpa	Southern Liquorice		Y		Y	
Gnephosis tenuissima	Dwarf Cup-flower	r		Y		
Goodenia fascicularis	Silky Goodenia				Y	
Goodenia glauca	Pale Goodenia		Y	Y		
Goodenia pusilliflora	Small-flower Goodenia			Y		
Goodenia spp.	Goodenia		Y	Y		
Hakea leucoptera subsp. *leucoptera*	Silver Needlewood		Y			
Haloragis aspera	Rough Raspwort				Y	
Haloragis glauca f. *glauca*	Bluish Raspwort		Y			
Harmsiodoxa blennodioides	May Smocks			Y		
Helichrysum leucopsideum	Satin Everlasting	P		Y		
Heliotropium curassavicum	Smooth Heliotrope			Y		
Isoetopsis graminifolia	Grass Cushion	P		Y		
Juncus amabilis	Hollow Rush				Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Juncus aridicola	Tussock Rush		Y		Y	
Juncus flavidus	Gold Rush				Y	
Juncus semisolidus	Plains Rush				Y	
Juncus spp.	Rush				Y	
Juncus subsecundus	Finger Rush		Y		Y	
Juncus usitatus	Billabong Rush				Y	
Lachnagrostis filiformis s.l.	Common Blown-grass		Y			
Lachnagrostis filiformis s.s.	Common Blown-grass			Y	Y	
Laphangium luteoalbum	Jersey Cudweed		Y		Y	
Lemna disperma	Common Duckweed				Y	
Lepidium papillosum	Warty Peppercress			Y		Y
Lepidium pseudohyssopifolium	Native Peppercress		Y		Y	
Lepidium spp.	Peppercress				Y	
Lobelia concolor	Poison Pratia		Y		Y	
Lomandra effusa	Scented Mat-rush			Y		
Lotus australis var. *australis*	Austral Trefoil		Y			
Lotus cruentus/australis	Trefoil				Y	
Ludwigia peploides subsp. *montevidensis*	Clove-strip		Y		Y	
Lysiana exocarpi	Harlequin Mistletoe		Y		Y	
Lythrum hyssopifolia	Small Loosestrife				Y	
Maireana brevifolia	Short-leaf Bluebush			Y		
Maireana decalvans s.s.	Black Cotton-bush			Y	Y	
Maireana pentagona	Hairy Bluebush			Y	Y	
Maireana rohrlachii	Rohrlach's Bluebush				Y	
Maireana spp.	Bluebush		Y		Y	
Maireana turbinata	Satiny Bluebush			Y	Y	
Malacocera tricornis	Goat Head	r		Y	Y	Y
Marsilea costulifera	Narrow-leaf Nardoo				Y	
Marsilea drummondii	Common Nardoo			Y	Y	
Marsilea spp.	Nardoo		Y	Y		
Melaleuca lanceolata	Moonah		Y	Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Mentha australis	River Mint		Y			
Mentha diemenica	Slender Mint				Y	
Millotia muelleri	Common Bow-flower	P		Y		
Millotia perpusilla	Tiny Bow-flower	P		Y		
Minuria denticulata	Woolly Minuria	P, r				Y
Minuria integerrima	Smooth Minuria	P, r				Y
Myoporum montanum	Waterbush	r	Y			
Myoporum parvifolium	Creeping Myoporum			Y		
Myosotis australis	Austral Forget-me-not			Y		
Myosurus australis	Mousetail			Y		
Myriocephalus rhizocephalus	Woolly-heads	P		Y	Y	
Myriophyllum variifolium	Varied Water-milfoil				Y	
Nicotiana velutina	Velvet Tobacco			Y		
Nitraria billardierei	Nitre-bush		Y		Y	
Olearia pimeleoides	Pimelea Daisy-bush	P	Y	Y	Y	
Osteocarpum acropterum var. *deminutum*	Babbagia		Y		Y	
Osteocarpum salsuginosum	Bonefruit			Y		
Oxalis perennans	Grassland Wood-sorrel			Y	Y	
Oxalis spp.	Wood Sorrel		Y			
Panicum effusum	Hairy Panic				Y	
Panicum spp.	Panic				Y	
Paspalidium jubiflorum	Warrego Summer-grass		Y		Y	
Paspalidium spp.	Panic Grass				Y	
Persicaria decipiens	Slender Knotweed		Y			
Persicaria hydropiper	Water Pepper				Y	
Persicaria lapathifolia	Pale Knotweed		Y		Y	
Persicaria prostrata	Creeping Knotweed		Y		Y	
Picris angustifolia	Native Picris	P	Y			
Picris squarrosa	Squat Picris	P, r			Y	Y
Pimelea microcephala subsp. *microcephala*	Mallee Rice-flower				Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Pimelea trichostachya	Annual Rice-flower			Y		
Pittosporum angustifolium	Weeping Pittosporum			Y	Y	
Plantago cunninghamii	Clay Plantain			Y	Y	
Poaceae spp.	Grass				Y	
Podolepis capillaris	Wiry Podolepis	P		Y		
Pogonolepis muelleriana	Stiff Cup-flower	P		Y		
Polycalymma stuartii	Poached-eggs Daisy	P		Y		
Pseudoraphis spinescens	Spiny Mud-grass			Y		
Ptilotus spathulatus	Pussy Tails			Y		
Ranunculus pentandrus var. *platycarpus*	Inland Buttercup		Y			
Ranunculus pumilio	Ferny Small-flower Buttercup			Y		
Ranunculus sessiliflorus	Annual Buttercup			Y		
Ranunculus spp.	Buttercup			Y		
Rhagodia spinescens	Hedge Saltbush		Y	Y	Y	
Rhagodia spp.	Saltbush			Y	Y	
Rhodanthe corymbiflora	Paper Sunray	P		Y		
Rhodanthe pygmaea	Pygmy Sunray	P		Y		
Roepera apiculata	Pointed Twin-leaf		Y	Y		
Roepera aurantiaca subsp. *aurantiaca*	Shrubby Twin-leaf			Y		
Roepera eremaea	Climbing Twin-leaf				Y	
Rorippa eustylis	Dwarf Bitter-cress	r		Y		
Rorippa spp.	Bitter Cress			Y		
Rumex spp.	Dock		Y		Y	
Rumex tenax	Narrow-leaf Dock			Y		
Rytidosperma caespitosum	Common Wallaby-grass		Y		Y	
Rytidosperma duttonianum	Brown-back Wallaby-grass				Y	
Rytidosperma setaceum	Bristly Wallaby-grass			Y	Y	
Rytidosperma spp.	Wallaby Grass		Y			
Salsola tragus subsp. *tragus*	Prickly Saltwort		Y	Y	Y	
Santalum acuminatum	Sweet Quandong				Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Schenkia australis	Spiked Centaury				Y	
Scleranthus minusculus	Cushion Knawel			Y		
Scleroblitum atriplicinum	Starry Goosefoot			Y		
Sclerochlamys brachyptera	Short-wing Saltbush		Y	Y	Y	
Sclerolaena birchii	Galvanized Burr				Y	
Sclerolaena diacantha	Grey Copperburr			Y	Y	
Sclerolaena divaricata	Tangled Copperburr			Y		
Sclerolaena intricata	Poverty Bush	vu			Y	
Sclerolaena lanicuspis	Woolly Copperburr	en			Y	
Sclerolaena muricata var. *muricata*	Black Roly-poly	pk	Y	Y	Y	Y
Sclerolaena obliquicuspis	Limestone Copperburr		Y	Y		
Sclerolaena parviflora	Mallee Copperburr			Y		
Sclerolaena patenticuspis	Spear-fruit Copperburr	vu			Y	Y
Sclerolaena spp.	Copperburr		Y		Y	
Sclerolaena tricuspis	Streaked Copperburr		Y	Y		
Sclerolaena uniflora	Two-spined Copperburr	r			Y	
Senecio glossanthus s.l.	Slender Groundsel		Y	Y		
Senecio glossanthus s.s.	Slender Groundsel				Y	
Senecio quadridentatus	Cotton Fireweed	P	Y	Y	Y	
Senecio runcinifolius	Tall Fireweed	P	Y			
Senecio spanomerus	Mallee Groundsel	P		Y		
Senecio spp.	Groundsel	P		Y		
Senna artemisioides spp. agg.	Desert Cassia		Y			
Sida ammophila	Sand Sida	vu		Y		
Sida corrugata	Variable Sida		Y	Y		
Sida corrugata var. *angustifolia*	Variable Sida (narrow-lf form)			Y		
Sida corrugata var. *corrugata* (= broad leaf form)	Variable Sida (broad-leaf form)			Y		
Sida fibulifera	Pin Sida	vu	Y			
Sida spp.	Sida		Y		Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Solanum esuriale	Quena			Y		
Spergularia spp.	Sand Spurrey		Y	Y	Y	
Sphaeromorphaea littoralis	Spreading Nut-heads				Y	
Stelligera endecaspinis	Star Bluebush		Y	Y		
Stemodia florulenta	Blue Rod		Y	Y		
Stemodia glabella s.s.	Smooth Blue-rod				Y	
Stenopetalum sphaerocarpum	Pea Thread-petal			Y		
Tetragonia eremaea s.l.	Desert Spinach		Y	Y		
Tetragonia spp.	Native Spinach				Y	
Teucrium albicaule	Scurfy Germander			Y		
Teucrium racemosum s.l.	Grey Germander		Y	Y		
Teucrium racemosum s.s.	Grey Germander				Y	
Threlkeldia diffusa	Coast Bonefruit				Y	
Thysanotus baueri	Mallee Fringe-lily	P		Y		
Triglochin calcitrapa s.l.	Spurred Arrowgrass			Y		
Triodia scariosa	Porcupine Grass			Y	Y	
Typha domingensis	Narrow-leaf Cumbungi				Y	
Typha spp.	Bulrush		Y			
Verbena officinalis s.l.	Common Verbena		Y			
Verbena officinalis s.s.	Common Verbena			Y		
Verbena officinalis var. *africana*	Inland Verbena					Y
Verbena officinalis var. *gaudichaudii*	Native Verbena				Y	
Vittadinia cervicularis	Annual New Holland Daisy	P			Y	
Vittadinia dissecta s.s.	Dissected New Holland Daisy	P		Y	Y	
Vittadinia gracilis	Woolly New Holland Daisy	P		Y		
Vittadinia spp.	New Holland Daisy	P	Y	Y	Y	
Wahlenbergia fluminalis	River Bluebell		Y	Y	Y	
Wahlenbergia gracilis	Sprawling Bluebell			Y		
Wahlenbergia spp.	Bluebell		Y	Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Wahlenbergia tumidifructa	Mallee Annual-bluebell	r		Y		
Walwhalleya proluta	Rigid Panic		Y			
Wurmbea dioica	Common Early Nancy			Y		
Wurmbea dioica subsp. *brevifolia*	Inland Early Nancy			Y		
Xerochrysum bracteatum	Golden Everlasting	P	Y			
Introduced Species						
Anagallis arvensis	Pimpernel			Y		
Arctotheca calendula	Cape weed				Y	
Asparagus officinalis	Asparagus	R	Y			
Asphodelus fistulosus	Onion Weed	R		Y	Y	
Avena barbata	Bearded Oat		Y			
Avena spp.	Oat				Y	
Brassica tournefortii	Mediterranean Turnip			Y	Y	
Bromus catharticus	Prairie Grass		Y			
Bromus diandrus	Great Brome				Y	
Bromus rubens	Red Brome			Y	Y	
Carrichtera annua	Ward's Weed				Y	
Carthamus lanatus	Saffron Thistle	R	Y			
Centaurea melitensis	Malta Thistle			Y	Y	
Centaurium tenuiflorum	Slender Centaury				Y	
Chenopodium album	Fat Hen				Y	
Chenopodium murale	Sowbane				Y	
Chondrilla juncea	Skeleton Weed		Y	Y	Y	
Cirsium vulgare	Spear Thistle	R			Y	
Conyza bonariensis	Flaxleaf Fleabane			Y	Y	
Conyza spp.	Fleabane			Y		
Conyza sumatrensis var. *sumatrensis*	Tall Fleabane				Y	
Cotula bipinnata	Ferny Cotula			Y	Y	
Cucumis myriocarpus subsp. *leptodermis*	Paddy Melon			Y	Y	
Cynodon dactylon var. *dactylon*	Couch				Y	
Cyperus eragrostis	Drain Flat-sedge				Y	
Dittrichia graveolens	Stinkwort	R	Y			
Echium plantagineum	Paterson's Curse	R		Y		
Emex australis	Spiny Emex	C			Y	

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Eragrostis cilianensis	Stink Grass		Y			
Galium aparine	Cleavers			Y		
Gazania linearis	Gazania				Y	
Hedypnois rhagadioloides	Hedypnois		Y			
Heliotropium europaeum	Common Heliotrope				Y	
Hordeum glaucum	Northern Barley-grass				Y	
Hordeum leporinum	Barley-grass			Y	Y	
Hordeum murinum s.l.	Barley-grass		Y		Y	
Hordeum spp.	Barley Grass			Y		
Hypochaeris glabra	Smooth Cat's-ear			Y		
Hypochaeris radicata	Flatweed			Y		
Lactuca serriola	Prickly Lettuce			Y		
Lamarckia aurea	Golden-top			Y		
Lepidium africanum	Common Peppercress			Y	Y	
Lolium rigidum	Wimmera Rye-grass				Y	
Lycium ferocissimum	African Box-thorn	C, WONS	Y			
Lysimachia arvensis	Pimpernel				Y	
Marrubium vulgare	Horehound	R	Y			
Medicago minima	Little Medic		Y	Y	Y	
Medicago polymorpha	Burr Medic		Y	Y	Y	
Medicago spp.	Medic				Y	
Medicago truncatula	Barrel Medic				Y	
Melilotus indicus	Sweet Melilot				Y	
Mesembryanthemum nodiflorum	Small Ice-plant			Y	Y	
Mesembryanthemum spp.	Ice Plant		Y			
Opuntia ficus-indica	Indian Fig	WONS			Y	
Opuntia spp.	Prickly Pear	WONS	Y			
Parapholis incurva	Coast Barb-grass				Y	
Pentameris airoides subsp. *airoides*	False Hair-grass			Y		
Phyla canescens	Fog-fruit		Y		Y	
Psilocaulon granulicaule	Wiry Noon-flower		Y		Y	
Rapistrum rugosum	Giant Mustard				Y	
Reichardia tingitana	False Sow-thistle				Y	
Salvia verbenaca	Wild Sage		Y	Y		

Scientific Name	Common Name	Status	GHD 2013	AE 2013	EA 2016	GHD 2019
Schinus molle	Pepper Tree		Y			
Schismus barbatus	Arabian Grass		Y	Y	Y	
Silene apetala var. *apetala*	Mallee Catchfly				Y	
Silene nocturna	Mediterranean Catchfly			Y	Y	
Sisymbrium erysimoides	Smooth Mustard			Y		
Sisymbrium irio	London Rocket				Y	
Solanum nigrum s.l.	Black Nightshade		Y			
Sonchus asper s.l.	Rough Sow-thistle		Y	Y		
Sonchus oleraceus	Common Sow-thistle		Y	Y	Y	
Spergularia diandra	Lesser Sand-spurrey			Y		
Spergularia rubra s.l.	Red Sand-spurrey		Y			
Symphyotrichum subulatum	Aster-weed			Y	Y	
Trifolium spp.	Clover		Y			
Trifolium tomentosum var. *tomentosum*	Woolly Clover			Y		
Urtica urens	Small Nettle		Y			
Verbena supina	Trailing Verbena			Y	Y	
Veronica peregrina	Wandering Speedwell			Y		
Vulpia bromoides	Squirrel-tail Fescue			Y		
Vulpia muralis	Wall Fescue			Y		
Vulpia myuros	Rat's-tail Fescue			Y	Y	
Vulpia spp.	Fescue				Y	
Xanthium occidentale	Noogoora Burr	C			Y	
Xanthium strumarium spp. agg.	Noogoora Burr species aggregate	C	Y			

Appendix C. Habitat hectare assessment results (adapted from Ecology Australia 2016)

Key to table:

GRF – Grassy Riverine Forest

ISW – Intermittent Swampy Woodland

LS – Lignum Shrubland

LSW – Lignum Swampy Woodland

RCW – Riverine Chenopod Woodland

RGW – Riverine Grassy Woodland

RobP – Robinvale Plain bioregion

SRW – Shrubby Riverine Woodland

SSW – Spike-sedge Wetland

WSM – Woorinen Sands Mallee

Habitat Zone (HZ)			HZ 1	HZ 2	HZ 3	HZ 4	HZ 5	HZ 6	HZ 7	HZ 8	HZ 9	HZ 10	HZ 11	HZ 12	HZ 13	HZ 14	HZ 15	HZ 16	HZ 17	HZ 18	HZ 19	HZ 20	HZ 21	HZ 22	HZ 23
Site Assessment (SA)			SA 1	SA 2	SA 3	SA 4	SA 5	SA 6	SA 7	SA 8	SA 9	SA 10	SA 11	SA 12	SA 13	SA 14	SA 15	SA 16	SA 17	SA 18	SA 19	SA 20	SA 21	SA 22	SA 23
EVC Number and Name (initials)			103: RCW	823: LSW	103: RCW	86: WSM	103: RCW	103: RCW	103: RCW	106: GRF	813: ISW	823: LSW	86: WSM	808: LS	103: RCW	103: RCW	808: LS	106: GRF	819: SsW	823: LSW	823: LSW	103: RCW	295: RGW	818: SRW	823: LSW
Bioregion			RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP	RobP
		Max Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score	Score
Site Condition	Large Old Trees	10	10	5	6	2	8	10	0	9	9	4	10	-	9	0	-	10	-	0	2	10	10	10	0
	Canopy Cover	5	5	2	3	0	2	0	0	4	5	5	5	-	5	0	-	5	-	0	1	5	5	5	0
	Understorey	25	20	15	20	15	20	5	10	15	15	15	14	15	15	15	15	20	20	5	15	15	10	15	15
	Lack of Weeds	15	11	11	7	4	11	7	4	11	11	11	11	11	11	7	7	11	15	4	7	11	11	11	7
	Recruitment	10	10	10	6	0	10	10	10	10	10	10	6	6	6	6	10	10	6	10	6	10	10	10	10
	Organic Matter	5	3	5	5	3	3	4	4	3	5	5	5	6	5	5	5	5	5	2	3	5	5	3	5
	Logs	5	4	4	5	3	4	0	3	5	5	4	5	-	2	0	-	5	5	2	2	5	5	5	2
	Total Site Score	75	63	52	52	27	58	36	31	57	60	54	56	38	53	33	37	66	51	23	36	61	56	59	39
	Site score out of?	55 or 75	75	75	75	75	75	75	75	75	75	75	75	55	75	75	55	75	60	75	75	75	75	75	75
	Standardised score	75	63	52	52	27	58	36	31	57	60	54	56	52	53	33	50	66	64	23	36	61	56	59	39

Habitat Zone (HZ)		HZ 1	HZ 2	HZ 3	HZ 4	HZ 5	HZ 6	HZ 7	HZ 8	HZ 9	HZ 10	HZ 11	HZ 12	HZ 13	HZ 14	HZ 15	HZ 16	HZ 17	HZ 18	HZ 19	HZ 20	HZ 21	HZ 22	HZ 23
Landscape Context	25	18	18	16	8	18	12	16	18	18	18	14	16	16	16	16	18	14	16	16	18	18	18	16
Habitat points out of 100	1	81	70	68	35	76	48	47	75	78	72	70	68	69	49	66	84	78	39	52	79	74	77	55
Habitat Score (hab points/100)	0.##	0.81	0.7	0.68	0.35	0.76	0.48	0.47	0.75	0.78	0.72	0.7	0.68	1	0.49	0.66	0.84	0.78	0.39	0.52	0.79	0.74	0.77	0.55
Area of habitat zone (ha)	(#.#)	29.37	10.43	3.71	0.31	3.88	1.55	6.37	1.81	3.49	40.31	0.26	8.09	2	0.12	0.42	15.18	1.52	1.98	4.55	1.02	7.9	2.48	0.35

Appendix D. Likelihood of occurrence and impact for rare or threatened flora: Construction Footprint and Inundation Area

Likelihood of occurrence:

Not all of the threatened species identified during this assessment are equally likely to occur in the project site, due to the geographic location or context of the site, or the habitat type and condition. For each species, the likelihood of occurrence was evaluated using the following rationale:

PRESENT – Species known to occur within the site, or detected during the site visit.

POSSIBLE – Potentially suitable habitat occurs within Construction Footprint or Inundation Area and species' known range encompasses these areas. Species recorded historically in the 10-km search area, and generally within the last 30 years.

UNLIKELY – Species' known range encompasses the Construction Footprint and/or Inundation Area, but suitable habitat is not present or likely to be present. Species recorded historically in the Study Area but generally not within the last 30 years.

HIGHLY UNLIKELY – No historical records of the species and/or no suitable habitat in the Study Area.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Abutilon otocarpum	Desert Lantern			vu	5	2003	VBA	Rare, confined to red loam ridges and dunes near the floodplain of the Murray River in the far north-west (e.g. Hattah, Mildura and Robinvale areas). Flowering after summer rains (Walsh and Entwistle, 1996).	Aug-Nov	**Unlikely.** No suitable habitat recorded in the Construction Footprint.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Acacia colletioides	Wait-a-while			r	20	2017	VBA	In north-west of state only, growing mainly in mallee scrub or open woodland on sandy loam soils (Walsh and Entwisle 1996).	Sept	**Unlikely.** This species is not cryptic and it is expected it would have been recorded during recent or previous surveys if it was present.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Acacia loderi	Nealie		L	vu	1	2002	VBA	In Victoria, restricted to near Merbein and Nyah in the north-west, and near Pyramid Hill and Nathalia in the central north. It exists now as mostly remnant stands on or near private land. (Walsh & Entwisle 1996)	Sept-Oct	**Unlikely.** This species is not cryptic and it is expected it would have been recorded during recent or previous surveys if it was present.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Acacia melvillei	Yarran		L	vu	17	2009	VBA	Scattered through north-western Victoria, mostly along Murray River and its flood-plain, often in woodland (Walsh & Entwisle 1996).	Sept-Oct	**Present.** Recorded in low numbers during spring 2019 surveys. Was also recorded in local area during Australian Ecosystems 2013 census surveys. **Impact possible.** Several individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Acacia omalophylla	Yarran Wattle		L	en	1	2002	VBA	Widespread in New South Wales but just crossing the Murray River into Victoria where present mainly as remnant populations in paddocks and roadsides.	Sep	**Unlikely.** This species is not cryptic and it is expected in will have been recorded during recent or previous surveys if it was present.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Acacia oswaldii	Umbrella Wattle		L	vu	24	2009	VBA	Widespread but rather uncommon throughout north-western Victoria, mainly on calcareous soils or loam (Walsh & Entwisle 1996)	Sept-Nov	**Present**. Recorded in high numbers during spring 2019 surveys. Was also recorded in footprints during Ecology Australia (2015) surveys and in local area during Australian Ecosystems (2013) census surveys. **Impact possible**. High number of individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Allocasuarina luehmannii	Buloke		L	en	5	2017	VBA	Usually growing in woodland with *Eucalyptus microcarpa*, on calcareous soils. (Walsh and Entwistle, 1996)	Sept-Nov	**Possible.** Was not recorded in the broader 2013 flora census of the area, but was recorded in construction areas during the EA (2015) surveys. Was however not recorded in the most recent 2019 targeted surveys in the construction areas. **Impact Unlikely.** Not recorded in revised Construction Footprint during 2019 surveys.	**Possible.** Suitable habitat unlikely to be present, but as it was recorded in the Construction Footprint in 2015, considered possible that it could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Ammannia multiflora	Jerry-jerry			vu	2	1997	VBA	Confined in Victoria to the north-west where found in wet places, sometimes in water, on heavy soils. (Walsh & Entwisle 1996).	Throughout the year	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact possible.** Flood dependant species, could appear if conditions are right and be impacted by proposed works. But proposed works and subsequent floodplain inundation will also promote the potential presence of this species.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.
Aristida holathera var. *holathera*	Tall Kerosene Grass			vu	1	2004	VBA	Rare, confined to stabilised dunes and sandy rises in the far north-west, e.g. Hattah region. (Walsh & Entwisle 1996).	Nov	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Asperula gemella	Twin-leaf Bedstraw			r	36	2012	VBA	Rare in Victoria where known only from moist riparian sites along the Murray River downstream from Kerang, and with an isolated record from the Avoca River (Walsh & Entwisle 1996).	Sept-Mar	**Present.** Recorded in reasonable numbers in certain areas during the 2019 surveys. Was also recorded during 2013 and 2015 surveys. **Impact possible.** High number of individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Asperula wimmerana	Wimmera Woodruff			r	NIL	N/A	AE 2013 and GHD 2019	Confined to the north-west from the northern Grampians to the Murray River, usually in woodland on heavier water-retentive soils. The occurrence of this species in semi-arid areas of South Australia and New South Wales is to be anticipated, but to date specimens are lacking.	Aug-Oct	**Present.** Recorded in the broader area during 2013 flora census. Also recorded during 2019 surveys. **Impact possible.** Several individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Atriplex acutibractea	Pointed Saltbush			r	2	1999	VBA	2 subspecies (see below) with distinct population locations (Walsh and Entwisle 1996).	Unknown	**Unlikely.** No suitable habitat recorded in study sites.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Atriplex acutibractea subsp. *karoniensis*	Pointed Saltbush			r	1	1999	VBA	Recorded from the eastern portion of the region (Annuello, Manangatang, Nyah) on loamy soils. Fruits Apr., Jul., Oct. (Walsh & Entwisle 1996).	Apr, July, Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Atriplex lindleyi subsp. *conduplicata*	Saltbush			r	NIL	N/A	GHD 2019	Apparently confined to the Murray River flood plain downstream of Robinvale (e.g. Hattah Lakes, Red Cliffs, Merbein), occasionally occurring with the other two subspecies but apparently remaining distinct. An invader of degraded and/ or salted areas on heavier soils.	March - August	**Present.** Recorded several times during 2019 surveys. Also recorded previously during 2013 and 2015 surveys. **Impact possible.** Several individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Atriplex papillata	Coral Saltbush			r	14	1997	VBA	Occasional on verges of salt-pans in the far north west of Victoria (as far south and east as Lake Tyrell), usually indicative of gypseous soils. Fruits Sep.-Dec.(Walsh & Entwisle 1996)	Sept-Dec	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Atriplex pseudocampanulata	Mealy Saltbush			r	12	2009	VBA	Occurs mainly on heavier soils fringing lakes or rivers on the Murray River floodplain downstream of about Cohuna, also recorded from railyards at Bairnsdale and Toora in Gippsland where certainly inadvertently with stock or stock feed. Common in degraded, salted country. Fruits Sep.-May (Walsh & Entwisle 1996)	Sept-May	**Present.** Recorded several times during 2019 surveys. Also recorded previously during 2013 and 2015 surveys. **Impact possible.** Several individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Atriplex rhagodioides	Silver Saltbush		L	vu	1	2002	VBA	In Victoria apparently confined to the Murray River floodplain in the far north west and recorded only from Natya area (between Swan Hill and Robinvale), Red Cliffs and Cowra. Fruits Mar., Oct. (Walsh & Entwisle 1996)	Mar, Oct	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Atriplex spinibractea	Spiny-fruit Saltbush		L	en	1	1999	VBA	Known from Red Cliffs and Drumanure near Numurkah, where occuring on heavy alluvial soils in *Eucalyptus microcarpa* woodland. Fruits Jun. (Walsh & Entwisle 1996)	Jun	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Austrostipa metatoris	A Spear grass	VU					PMST	NSW species. Grows in sandy areas of the Murray Valley	In response to rain	**Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. And no records within 50 km of site.	**Highly Unlikely.** NSW species only. Suitable habitat could be present within the Inundation Area, but not in known distribution area.
Austrostipa trichophylla	Spear-grass			r	3	1999	VBA	Relatively rare in Victoria where known from scattered sites in the west and north-west (Little Desert, Black Range near Stawell, Wedderburn, Gunbower, Ouyen, Mildura areas), and occurring in mallee and woodland formations.	Nov-Jan	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Bergia ammannioides	Jerry Water-fire			vu	1	1986	VBA	Rare in Victoria, apparently now confined to the far north-west (Hattah Lakes and Mildura areas), collected from Lake Hindmarsh and near Dimboola late last century. Usually occurs on recently inundated sandy soil beside lakes, rivers and billabongs.	Dec-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Bergia trimera	Small Water-fire			vu	2	2011	VBA	Rare in Victoria, confined to floodplains of the Murray River in the far north-west (Red Cliffs, Lake Wallawalla), where occurring on moist, recently inundated sandy clay soils. Flowers after summer floods. (Walsh & Entwisle 1996)	Jan-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact possible.** Flood dependant species, could appear if conditions are right and be impacted by proposed works. But proposed works and subsequent floodplain inundation will also promote the potential presence of this species.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.

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Boerhavia coccinea	Scarlet Spiderling			r	1	1977	VBA	Confined to sandy rises in north-western Victoria at Lake Powell, Hattah Lakes, Mildura, and Neds Corner Station.	Nov-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Bossiaea walkeri	Cactus Bossiaea			en	3	2011	VBA	Rare in Victoria, confined to the north-west, occurring mainly in deep sand near the Murray River and in Wyperfeld National Park, usually in mallee communities	Jul-Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Brachyscome papillosa	Mossgiel Daisy	VU					PMST	NSW species. Grows on saltbush plains; chiefly from Mossgiel to Urana.	Jun–Dec	**Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. And no records within 50 km of site.	**Highly Unlikely.** NSW species only. Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Brachyscome trachycarpa	Inland Daisy			vu	2	1998	VBA	Known in Victoria only from the vicinity of the Raak Plain west of Nowingi (1988) and near Boundary Bend (1998), but purportedly collected from the Portland district in 1955 where it has not been collected since.	Sept	**Unlikely.** No suitable habitat recorded in study sites.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Caladenia tensa	Greencomb Spider-orchid	EN		vu			PMST	In Victoria found mainly in the Little Desert area (also with an isolated record near Wood Wood) in *Eucalyptus/Callitris* woodland on well-drained sandy soil (Walsh & Entwisle 1994).	Sept-Oct	**Highly Unlikely.** No suitable habitat recorded in study sites, and no records within 100 km of the site.	**Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated, and no records within 100 km of the site.

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Calandrinia volubilis	Twining Purslane			r	2	1986	VBA	Largely restricted in Victoria to the far north west in samphire and saltbush communities on saline flats and around salt lakes, but with a remarkably disjunct occurrence on a basalt escarpment of the Moorabool River near Lethbridge. Flowers Sep.-Oct.	Sept-Oct	**Unlikely.** No suitable habitat recorded in Construction Footprint.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Calostemma luteum	Yellow Garland-lily			vu	1	2010	VBA	Localised in the far north-west, known only from a single population on the Murray River floodplain west of Merbein, common in drainage systems of the Darling River in New South Wales and Queensland, and the Murray River floodplain in South Australia.	Unknown	**Unlikely.** No suitable habitat recorded in Construction Footprint.	**Unlikely.** No suitable habitat recorded in Construction Footprint.
Cardamine moirensis	Riverina Bitter-cress			r	12	2009	VBA	In Victoria, occurring in the north and west in seasonally wet areas.	Winter-Spring	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Centipeda crateriformis subsp. *compacta*	Compact Sneezeweed			r	2	1999	VBA	Principally grows on the shores of drying watercourses and in seasonally inundated swamps and depressions in the west, from the Grampians region north.	Most of the year	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Centipeda nidiformis	Cotton Sneezeweed			r	1	2002	VBA	Scattered, mostly in northern Victoria along the Murray River and its floodplains, but also in the Grampians, Ballarat district, Gellibrand Hill, and Lake Glenmaggie near Heyfield. Apparently a species of seasonally inundated sites and drying lake margins, often on rather sandy soils (Walsh & Entwisle 1996).	Sept-Feb	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Ceratogyne obionoides	Wingwort			r	1	1974	VBA	Uncommon herb of sand-ridges in far north-west Victoria, but sometimes locally abundant following good rains and/or fires (Walsh & Entwisle 1996).	Aug-Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Chenopodium desertorum subsp. *desertorum*	Frosted Goosefoot			r	15	2011	VBA	Confined to the far north-west (Hattah and Wyperfield National Parks, Annuello, etc.) where occurring mainly on sand-ridges and apparently not common (Walsh & Entwisle 1996).	Sept-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Chenopodium desertorum subsp. *rectum*	Frosted Goosefoot			vu	10	2004	VBA	Possibility. Recorded from only three sites in north west Victoria (Nandaly, Hattah, Tempy areas) where occuring in mallee scrub on sand or slightly heavier soils. Apparently locally common (Walsh & Entwisle 1996).	Sept-Jan	**Present.** Recorded during 2019 surveys. Recorded to species level (not subspecies level) in the broader area in the 2013 census surveys. **Impact possible.** Several individuals recorded in close proximity to proposed structures.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Choretrum glomeratum var. glomeratum	Common Sour-bush			r	1	1977	VBA	Scattered in woodlands and mallee scrubs of north-western and north-central Victoria where uncommon to rare (Walsh and Entwisle 1999).	Sept-Feb	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.
Craspedia haplorrhiza	Plains Billy-buttons		L		2	2009	VBA	Usually on heavy soils or loamy sands, particularly on floodplains and seasonally wet depressions. Flowers spring and early summer.	Spring and Early Summer	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely.** Not recorded in previous surveys of the construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Cullen cinereum	Hoary Scurf-pea		L	en	1	1999	VBA	Endangered in Victoria, known only from a few localities in the far north west of the state where it grows in moist depressions and on floodplains (Walsh & Entwisle 1996).	Oct-May	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Cullen discolor	Grey Scurf-pea		L	en	1	1977	VBA	Endangered in Victoria where found in the far north west of the state in sandy soils. Flowers mainly Sep.-Jan.	Sep-Jan	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.

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Cullen pallidum	Woolly Scurf-pea		L	en	32	2009	VBA	Endangered in Victoria where known from very few collections in the far north west of the state, growing in deep sand (Walsh & Entwisle 1996).	Sept-Feb	**Present.** Recorded in one location during the 2019 surveys. Also recorded in 2013 surveys. **Impact possible.** Small number of individuals recorded in close proximity to proposed structures.	**Unlikely.** Suitable habitat (deep sands) unlikely to be in the Inundation Area.
Cullen tenax	Tough Scurf-pea		L	en	NIL	N/A	2019 targeted survey	Widespread in Victoria but now much depleted from its former range and seldom collected. Generally grows in drier parts of the state in grassland and grassy woodland on heavy soils	Most of the year	**Present.** Recorded from one main location during the 2019 surveys. Not recorded in the area previously. **Impact possible.** Small number of individuals recorded in close proximity to one proposed structure.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Cymbonotus lawsonianus	Bear's-ear			r	3	2009	VBA	Scattered in woodland communities across northern Victoria from the Upper Murray and Hattah-Kulkyne and south to the Little Desert (Walsh & Entwisle 1996).	Throughout the year	**Unlikely.** No suitable habitat recorded in study sites.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Cyperus nervulosus	Annual Flat-sedge		L	en	1	1977	VBA	Apparently confined in Victoria to the far north-west (Mildura, Hattah Lakes, and Robinvale) where occasional on damp sandy soil fringing receding water in lakes and watercourses (Walsh & Entwisle 1996).	Sept-Feb	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.

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Cyperus rigidellus	Curly Flat-sedge		L	en	1	1977	VBA	Grows in ephemerally wet situations such as lake beds, floodways and roadside drains in the far north west (e.g. Hattah, Robinvale and Jeparit areas) (Walsh & Entwisle 1996).	Sept-Feb	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.
Dactyloctenium radulans	Finger Grass			r	1	2017	VBA	Confined in Victoria to the Murray River floodplain and closely adjacent areas in the far north west (Swan Hill to Mildura), but rarely collected and possibly only conspicuous in favourable seasons. Some collections (e.g. from railway yards and track margins) appear to be the result of casual introduction. Flowers Feb.-Apr.	Feb-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Dianella porracea	Riverine Flax-lily			vu	2	1999	VBA	Apparently confined to the far north-west, inhabiting sandy soils and usually in the vicinity of water (e.g. Lake Arawak near Hattah, Lake Powell near Robinvale, Wood Wood on the Murray River). A distinctive entity and possibly warranting specific status. (Walsh & Entwisle 1996).	Oct-May	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Dianella sp. aff. *longifolia* (Riverina)	Pale Flax-lily			vu	2	2009	VBA	Occurs in lowland plains grassland and grassy woodlands (e.g. Volcanic Plain and Riverina) as well as around rocky outcrops at higher altitudes than the var. longifolia (e.g. between Swifts Creek and Omeo, Benambra-Corryong district, Don River near Launching Place).	Nov-Dec	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely**. Not recorded in previous surveys of the construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Digitaria ammophila	Silky Umbrella-grass			vu	1	1977	VBA	Scattered through northern and north western Victoria, chiefly along the Murray River floodplain (e.g. Marmah, Lake Powell near Robinvale, Mildura area), a record from Warracknabeal is not substantiated by a specimen (Walsh & Entwisle 1996).	Feb-Mar	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Duma horrida subsp. *horrida*	Spiny Lignum			r	60	2009	VBA	Infrequent on silty soils and clays fringing shallow swamps and lakes in the northwest, and near the Murray River downstream from about Swan Hill.	Sep.–Nov	**Present.** Recorded in 2019 surveys on several occasions. Not recorded in 2013 or 2015 surveys. **Impact possible.** High number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Eragrostis australasica	Cane Grass			vu	1	2009	VBA	Apparently confined to a few clay pans and shallow lakes in the north west, mostly between Mildura and environs and the SA border, but also at Chirrup (between Donald and Wycheproof) (Walsh & Entwisle 1996).	Sept-May	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.

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Eragrostis lacunaria	Purple Love-grass			vu	23	2005	VBA	Uncommon to rare, confined to sandy or alluvial soils fringing lakes and seasonally flooded areas in the far north west (e.g. Mildura, Hattah lakes, Lake Powell near Robinvale), with isolated more southerly records from near Dimboola and Warracknabeal (Walsh & Entwisle 1996).	Dec-Mar	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Eragrostis setifolia	Bristly Love-grass			vu	54	2012	VBA	Occurs on clayey soils of seasonally flooded areas, confined to the far north-west. (Walsh & Entwisle 1996).	Sept-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded 2019 surveys (possibly due to lack of flowering material). Was recorded in sites during 2015 surveys. **Impact possible.** Not re-recorded in 2019 surveys, but could re-appear if conditions are favourable and be potentially impacted by proposed construction works.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Eremophila bignoniiflora	Bignonia Emu-bush		L	vu	1	2009	VBA	In Victoria confined to the far north-west. Found along river flats and in depressions in woodlands on heavy clay soils. (Walsh and Entwisle 1999)	June-Nov	**Unlikely.** This species is not cryptic and it is expected in would have been recorded during recent or previous surveys if it was present.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Eremophila divaricata subsp. *divaricata*	Spreading Emu-bush			r	29	2012	VBA	In Victoria confined to woodland communities along the floodplain of the Murray River system north-west from Kerang (Walsh & Entwisle 1996).	Nov-Apr	**Present.** Widespread. Recorded in high numbers during 2019 surveys. Also recorded during previous surveys in 2013 and 2015. **Impact possible.** High number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Eremophila maculata subsp. *maculata*	Spotted Emu-bush		L	r	5	2009	VBA	In Victoria confined to the north-west, mainly in *Eucalyptus largiflorens* forests or woodlands on heavy clay soils.	May–Dec	**Present.** Recorded during 2019 surveys. Also recorded during 2015 surveys on the construction areas. **Impact possible.** Low number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Eryngium paludosum	Long Eryngium			vu	1	2004	VBA	Confined to heavy soils of lake margins and river floodplains in the north and north-west (e.g. Robinvale, Warracknabeal, Kerang, Numurkah districts) (Walsh & Entwisle 1999).	Oct-Jan	**Possible.** Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys but not within / adjacent to the Construction Footprint. **Impact Unlikely.** Not recorded in previous surveys of the construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Ethuliopsis cunninghamii	Tall Nut-heads			vu	2	2014	VBA	Known in Victoria only from the far north-west where extremely rare, on heavy clay soils that are prone to inundation, usually in *Eucalyptus camaldulensis* and *Eucalyptus largiflorens* communities.	Spring-Autumn	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely**. Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Frankenia foliosa	Leafy Sea-heath			r	1	1986	VBA	On saline and gypseous soils in the Murray-Mallee region, from Lake Tyrrell to the far north-west corner of Victoria. Flowers most of the year (Walsh & Entwisle 1996).	Most of the year	**Unlikely.** No suitable habitat recorded in study sites.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Frankenia serpyllifolia	Bristly Sea-heath			r	20	2009	VBA	Restricted to salt lake verges in the north west, north of Dimboola area. Flowers most of year (Walsh & Entwisle 1996).	Most of the year	**Present.** Recorded in high numbers during 2019 surveys. Also recorded in 2013 and 2015 surveys. **Impact possible.** High number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Glossostigma cleistanthum	Small-flower Mud-mat			r	1	2009	VBA	Apparently uncommon, but possibly overlooked, in Victoria. Collected from temporary pools on granite outcrops, clayey soils of the Murray River floodplain, and margins of subalpine bogs.	Aug-Nov	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Glossostigma diandrum	Spoon-leaf Mud-mat			vu	1	2009	VBA	Usually along waterways or in shallow depressions on heavy clay soil.	Throughout the year	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Heliotropium asperrimum	Rough Heliotrope			vu	1	2008	VBA	A rare species of damp, sandy situations. Currently known only from the Horsham, Robinvale and Kerang areas.	Oct-Apr	**Possible.** Suitable habitat within the area, and as the species has been recorded locally in Robinvale it could be present under the right watering conditions. Impact Possible: Whilst the species wasn't recorded during the previous surveys, suitable habitat was identified, and its possible that this species might occur.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Isolepis congrua	Slender Club-sedge		L	vu	4	1996	VBA	Apparently rare in Victoria, but possibly overlooked, recorded from cracking clay along the Murray River near Colignan and other seasonally wet areas at Mt Arapiles, near Donald, St Arnaud, Dadswell Bridge and Puckapunyal (Walsh & Entwisle 1996)	Sept-Nov	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Jasminum didymum subsp. *lineare*	Desert Jasmine			vu	7	1999	VBA	In Victoria confined to dry woodlands in the far north west (Walsh & Entwisle 1996).	Mar-Apr	**Unlikely.** This species is not cryptic and it is expected in would have been recorded during recent or previous surveys if it was present.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated

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Lepidium monoplocoides	Winged Peppercress	EN	L	en			PMST	Uncommon in north western quarter of state, mostly on heavy soils near lakes and watercourses. Flowers mostly spring-summer (Walsh & Entwisle 1996).	Sept-Feb	**Unlikely.** Suitable habitat, but not in known distribution area (the nearest records are over 50 km west at Hattah Kulkyne National Park).	**Unlikely.** Suitable habitat could be present within the Inundation Area, but not in known distribution area (the nearest records are over 50 km west at Hattah Kulkyne National Park).
Lipocarpha microcephala	Button Rush			vu	1	1977	VBA	In open damp places such as sandy stream-banks and drying lake margins; widespread but scattered and uncommon. Flowers spring - summer (Walsh & Entwisle 1996).	Sept-Feb	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Maireana georgei	Slit-wing Bluebush			vu	1	2002	VBA	Rare, recorded in Victoria only from heavier, loamy soils of inter-dune swales in the Sunset Country. Fruits Sep.-Oct.	Sep-Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Maireana triptera	Three-wing Bluebush			r	7	2017	VBA	Rather rare in far north west Victoria (Mildura, Nowingi, Kulwin, Annuello), usually growing on red sandy loams of flats or dune swales (Walsh & Entwisle 1996).	Oct-Dec	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Malacocera tricornis	Goat Head			r	20	2012	VBA	Grows in clay pans and heavy alluvial flats along the Murray River floodplain from Boundary Bend downstream to the South Australian border (Walsh & Entwisle 1996).	Aug-Nov	**Present.** Recorded in high numbers during 2019 surveys. Also recorded in 2013 and 2015 surveys. **Impact possible.** High number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

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Marsdenia australis	Doubah			vu	4	2017	VBA	In Victoria confined to the far north west where occasional in dry woodland and scrubland often near watercourses. Flowers late spring-summer (Walsh & Entwisle 1996).	Nov-Feb	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Millotia macrocarpa	Large-fruited Millotia			r	2	2011	VBA	In Victoria confined to the far north west occuring in semi-arid shrublands and woodlands, usually on sandy soils (Walsh & Entwisle 1999)	Aug-Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Minuria cunninghamii	Bush Minuria			r	1	2009	VBA	Confined in Victoria to the north west, and rare (e.g. Raak plain near Benetook, Hattah Lakes, Lake Tyrell), usually occuring on slightly to strongly saline ground in sand, clay or gypseous soils (Walsh & Entwistle 1999).	Feb-April, Aug-Sept	**Possible.** Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Minuria denticulata	Woolly Minuria			r	4	2009	VBA	Rare in Victoria, confined to the far north-west where usually occuring in clay and clay loam soils of low lying seasonally wet areas (e.g. lake beds, roadside drains). Flowers Aug-Jan. (Walsh & Entwistle 1999).	Aug-Jan	**Present.** Recorded in low numbers at one location during 2019 surveys. Not recorded during 2013 or 2015 surveys. **Impact possible.** Low number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Minuria integerrima	Smooth Minuria			r	1	1999	VBA	In Victoria confined to heavy clay and alluvial silt on floodplains of Murray River, from Barmah districts to the South Australian border (Walsh & Entwistle 1999).	Sept-Mar	**Present.** Recorded during 2019 surveys. Also recorded in broader area during 2013 census surveys. **Impact possible.** Low number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Myoporum montanum	Waterbush			r	1	2009	VBA	Scattered across northern Victoria where uncommon to rather rare; mostly in mallee and riparian woodland communities but also in rocky gorges (Walsh & Entwisle 1999). Flowers mainly Jun-Nov.	June-Nov	**Unlikely.** Possible as suitable habitat (riparian woodland) identified in the Construction Footprint.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Nicotiana goodspeedii	Small-flower Tobacco			r	1	2011	VBA	In Victoria, confined to the north-west where rare and found mostly in alkaline soils, often in sand overlying limestone. Flowers mainly spring and summer.	Spring-Summer	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Olearia passerinoides subsp. *passerinoides*	Slender Daisy-bush			r	1	2003	VBA	In Victoria confined to mallee communities of the north-west (e.g. Red Cliffs, Hattah, Annuello, Robinvale areas), and uncommon to rare.	Feb-May	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Ophioglossum polyphyllum	Upright Adder's-tongue			vu	7	2009	VBA	Restricted to north-western Victoria where localised near Mildura, Hattah Lakes and the southern part of Wyperfeld National Park. However, this small apparent distribution may be a reflection of the cryptic nature of the species. (Walsh & Entwisle 1996).	Unknown	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely.** Not recorded in previous surveys of construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Picris squarrosa	Squat Picris			r	11	2009	VBA	Widespread in Victoria but of disjunct distribution. Usually found on coastal sand dunes or in alluvial soils on river banks or floodplains, mainly at low altitudes. Flowers mostly Oct.-Apr. Occurs in woodland to open forest of less flood-prone (riverine) watercourse fringes, principally on levees and higher sections of point-bar deposits (DSE 2004).	Oct-Apr	**Present.** Scattered occurrence during 2019 surveys. Also recorded during 2013 and 2015 surveys. **Impact possible**. Moderate number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Ptilotus polystachyus	Long Tails			en	22	2011	VBA	Confined to the far north-west (Mildura, Boundary Bend areas) where occurring on red sandy loams on low dunes and heavier soils on the Murray River floodplain.	May-Nov	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely.** Not recorded in previous surveys of construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Rhagodia ulicina	Spiny Goosefoot			r	2	1999	VBA	Localised in the northern part of the Sunset Country (north and north west of Hattah), but locally common. Occurring on red loamy soils, usually containing limestone, in dune swales and on flat ground (Walsh and Entwisle 1996).	Aug-Nov	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Rhyncharrhena linearis	Purple Pentatrope			vu	2	1999	VBA	A rare and localised species in Victoria restricted to the far north-west (Walsh & Entwistle 1996)	Apr-Jan	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Roepera similis	White Twin-leaf			r	1	2009	VBA	In Victoria, confined mainly to the far north-west where found in mallee scrub and riverine woodland on sand or heavier clay soils, but with an outlying occurrence near Kerang.	May-Dec	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Rorippa eustylis	Dwarf Bitter-cress			r	5	2009	VBA	Habitat restricted to scattered swamps and floodplains along Murray (Walsh & Entwistle 1996).	Throughout the year	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys (but not within or adjacent to the Construction Footprint). **Impact Unlikely.** Not recorded in previous surveys of construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Sarcozona praecox	Sarcozona			r	9	2008	VBA	Occasional in mallee and Callitris-Casuarina woodlands of the north west, usually on loamier soils (Walsh & Entwistle 1996)	Aug-Nov	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Sclerolaena patenticuspis	Spear-fruit Copperburr			vu	1	2002	VBA	In Victoria confined to the far north-west near the Murray River downstream from Robinvale, apparently rare and not collected since 1972 (near mouth of Chalka Creek, Hattak-Kulkyne National Park) (Walsh & Entwistle 1996)	Aug-Nov	**Present.** Recorded during 2019 surveys. Also recorded in construction areas during 2015 surveys. **Impact possible.** Moderate number of individuals recorded in close proximity to proposed construction areas.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Senecio cunninghamii var. *cunninghamii*	Branching Groundsel			r	2	2009	VBA	Occurs on heavy-sometimes winter wet soils as well as dry rocky soils. Common on embankments or escarpments and woodland to open forest to 15 m tall of less flood-prone (riverine) watercourse fringes, principally on levees and higher sections of point-bar deposits (Walsh & Entwisle 1996).	Aug-Apr	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact possible**. Flood loving species, could appear if conditions are right and be impacted by proposed works. But proposed works and subsequent floodplain inundation will also promote the potential presence of this species.	**Possible.** Could occur in Inundation Area. **Impact:** positive impact expected as the result of the operation of the project.
Sida ammophila	Sand Sida			vu	3	2005	VBA	Occurs on red sand and loam soils in the Hattah-Mildura area, mostly in non-eucalypt open shrublands on dunes and roadsides, depleted by grazing and clearing (Walsh and Entwisle 1996).	Nov-Jun	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Sida fibulifera	Pin Sida			vu	13	2011	VBA	Apparently confined to red loam or clay loam soils near the Murray River between Hattah-Kulkyne and Mildura, but depleted by clearing. Flowers usually spring or autumn (Walsh and Entwisle 1996).	Mar-May, Aug-Nov	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Sida intricata	Twiggy Sida			vu	17	2017	VBA	Moderately common in open areas of the far north and north-west, usually on heavier loam and clay loam soils no far from the Murray River. Flowers most of year (Walsh and Entwisle 1996)	Most of the year	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Solanum karsense	Menindee Nightshade	VU					PMST	Grows in flooded depressions	Spring	**Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. And no records within 50 km of site.	**Highly Unlikely.** NSW species only. Suitable habitat could be present within the Inundation Area, but not in known distribution area.
Sporobolus caroli	Yakka Grass			r	5	2012	VBA	Apparently confined in Victoria to seasonally inundated areas along the Murray River floodplain downstream of about Echuca.	Oct-Apr	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Swainsona murrayana	Slender Darling-pea	VU	L	en			PMST	Apparently restricted to a few sites in north-central Victoria (mostly between Bendigo and the Murray River) where it grows in grassland on heavy red soils and is now almost confined to roadside remnants (Walsh and Entwisle 1999).	Aug-Nov	**Highly Unlikely.** No suitable habitat recorded in study sites. Nearest record approximately 100 km away.	**Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated. Nearest record approximately 100 km away.
Swainsona phacoides	Dwarf Swainson-pea		L	en	12	2010	VBA	Scattered in seasonally inundated habitats along the Murray Valley downstream from about Echuca (Walsh and Entwisle 1999).	Aug-Oct	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Swainsona pyrophila	Yellow Swainson-pea	VU		vu	1	1990	VBA, PMST	Known only from the far north west where rare. Grows in mallee scrub on sandy or loamy soil and usually found only after fire (Walsh and Entwisle 1996).	Nov-Dec	**Highly Unlikely.** No suitable habitat (mallee scrub) recorded in study sites.	**Highly Unlikely.** Suitable habitat (mallee scrub) is unlikely to be present within the floodplain areas proposed to be inundated
Swainsona sericea	Silky Swainson-pea		L	vu	1	1999	VBA	Of disjunct occurrence in north of state where usually found in grassland and grassy woodland (Walsh and Entwisle 1996).	Aug-Oct	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Tragus australianus	Small Burr-grass			r	2	2005	VBA	Generally confined to sandy tracts of the far north-west, (Mildura area, Murrayville, Swan Hill) with a disjunct occurrence near Nathalia. Flowers all year (Walsh & Entwisle 1996).	Throughout the year	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Trigonella suavissima	Sweet Fenugreek			r	4	1995	VBA	Apparently confined to the drier north-west of the State where it grows along seasonal watercourses, floodplains and depressions (Walsh & Entwisle 1996).	Sept-Nov	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely**. Not recorded in any previous surveys, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.
Triraphis mollis	Needle Grass			r	15	2011	VBA	Confined to dry sandy ground of the north west and uncommon to rare. Apparently not favoured by stock and occasionally persisting in semi-improved pasture. Flowers all year (Walsh & Entwisle 1996).	Throughout the year	**Possible.** Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Impact Unlikely.** Not recorded in any previous surveys, unlikely to be impacted.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Velleia arguta	Grassland Velleia			r	3	2002	VBA	Apparently confined to the far north-west and the Dimboola district, usually in mallee or grassland (Walsh & Entwisle 1996).	Sept-Jan	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Vittadinia condyloides	Club-hair New Holland Daisy			r	1	2002	VBA	Confined to the north-west, usually occuring in grassland and grassy woodlands on better mallee soils and loams of the Riverina (Walsh & Entwisle 1996).	Oct-Dec	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated
Vittadinia pterochaeta	Winged New Holland Daisy			vu	1	2009	VBA	Very rare in Victoria, known by only a few collections in the Quambatook-Leaghur region, near Warracknabeal and Wallpolla Island west of Mildura. Apparently confined to relatively fertile clay-loam soils.	Oct-Jan	**Unlikely.** No suitable habitat recorded in study sites.	**Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated

Scientific Name	Common Name	EPBC	FFG	VICADV	Count	Last Record	Source	Habitat	Flowering time	Construction Footprint: Likelihood of Occurrence/Impact	Inundation Area: Likelihood of Occurrence/Impact Note: impact in this column pertains to the hypothetical scenario in which the species is actually present. However, many may not actually be present.
Wahlenbergia tumidifructa	Mallee Annual-bluebell			r	14	2011	VBA	Recorded from sandy flats and shallow depressions in the Big Desert and Hattah-Kulkyne area, and on black soils of the floodplain of the Murray River between Barmah and Strathmerton.	Sept-Oct	**Possible**. Suitable habitat was identified during survey, but not recorded in 2015 or 2019 surveys. Was recorded in local area during Australian Ecosystems (2013) census surveys. **Impact Unlikely.** Not recorded in previous surveys of the construction areas, unlikely to be impacted.	**Possible.** Could occur in Inundation Area. **Impact:** positive to neutral impact expected as the result of the operation of the project.

Appendix E. Likelihood of occurrence / impacts - threatened fauna – Construction Footprint

Likelihood of occurrence:

Not all of the threatened species identified during this assessment are equally likely to occur in the project site, due to the geographic location or context of the site, or the habitat type and condition. For each species, the likelihood of occurrence was evaluated using the following rationale:

PRESENT – Species known to occur within the site, or detected during the site visit.

POSSIBLE – Potentially suitable habitat occurs within Construction Footprints and species' known range encompasses the Construction Footprints. Species recorded historically in the 10-km search area, and generally within the last 30 years.

UNLIKELY – Species' known range encompasses the Construction Footprints, but suitable habitat does not occur within Construction Footprints, or occurs within Construction Footprints but with generally low quality and quantity. Species recorded historically in the Study Area but generally not within the last 30 years.

HIGHLY UNLIKELY – No historical records of the species and/or no suitable habitat in the Study Area.

Key: L – Listed EN / en – Endangered. VU / vu – Vulnerable. nt – Near Threatened. cr – Critically Endangered. Rx – Regionally Extinct Mi – Migratory

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
MAMMALS								
Nyctophilus corbeni	Corben's Long-eared Bat	VU	L	en			PMST	**Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
Phascolarctos cinereus	Koala	VU					PMST	**Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
BIRDS								
Struthidea cinerea	Apostlebird		L		11	2008	VBA	**Possible.** Suitable habitat at all sites **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Botaurus poiciloptilus	Australasian Bittern	EN	L	en	0		PMST	**Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
Ardeotis australis	Australian Bustard		L	cr	1	1985	VBA	**Unlikely.** Rare visitor to Victoria. Suitable habitat not present within Construction Footprints
Gelochelidon macrotarsa	Australian Gull-billed Tern		L	en	1	1978	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Rostratula australis	Australian Painted Snipe	EN	L	cr	0		PMST	**Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
Porzana pusilla	Baillon's Crake		L	vu	2	1946	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Falco subniger	Black Falcon		L	vu	11	1980	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Manorina melanotis	Black-eared Miner	EN	L	cr			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area
Oxyura australis	Blue-billed Duck		L	en	8	1995	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Grus rubicunda	Brolga		L	vu	2	1946	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Burhinus grallarius	Bush Stone-curlew		L	en	2	1946	VBA	**Unlikely.** Not recorded in last 70 years. Suitable habitat not present within Construction Footprints

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Hydroprogne caspia	Caspian Tern		L	nt	1	2003	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Tringa nebularia	Common Greenshank	Mi		vu			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.
Actitis hypoleucus	Common Sandpiper	Mi		vu			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.
Oreoica gutturalis	Crested Bellbird		L		53	2018	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Calidris ferruginea	Curlew Sandpiper	CR	L	en	1	1991	VBA, PMST	**Unlikely.** Suitable habitat not present within Construction Footprints
Geopelia cuneata	Diamond Dove		L		3	1986	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Stagonopleura guttata	Diamond Firetail		L		2	2000	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Numenius madagascariensis	Eastern Curlew	CR	L	vu			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
Ardea alba modesta	Eastern Great Egret		L	vu	11	2007	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Apus pacificus	Fork-tailed Swift	Mi			2	2001	VBA, PMST	**Possible.** Species may fly over Inundation Area while feeding. **Impact Unlikely.** Species extremely mobile and wide ranging, suitable surrounding habitat widespread. Species may benefit from insect proliferation following environmental water.
Stictonetta naevosa	Freckled Duck		L	en	7	1993	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Falco hypoleucos	Grey Falcon		L	en	3	1992	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Pomatostomus temporalis	Grey-crowned Babbler		L	en	16	2002	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Ptilotula plumula	Grey-fronted Honeyeater			vu	3	2001	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Coracina maxima	Ground Cuckoo-shrike		L	vu	1	1978	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Aythya australis	Hardhead			vu	13	1993	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Melanodryas cucullata	Hooded Robin		L		13	2008	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Gallinago hardwickii	Latham's Snipe/Japanese Snipe	Mi		nt	2	1946	CBA, PMST	**Unlikely.** No records in last 70 years. Species likely to benefit from environmental water when present.
Egretta garzetta	Little Egret		L	en	2	1946	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Anseranas semipalmata	Magpie Goose		L		1	1978	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Lophochroa leadbeateri	Major Mitchell's Cockatoo		L	vu	7	1983	VBA R8 2019	**Present.** Species recorded in area, likely to utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Stipiturus mallee	Mallee Emu-wren	EN	L	en	1	1998	VBA	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area
Leipoa ocellata	Malleefowl	VU	L	en	24	2008	VBA, PMST	**Unlikely.** Suitable habitat not present within Construction Footprints
Biziura lobata	Musk Duck			vu	8	1994	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Pezoporus occidentalis	Night Parrot	EN		rx			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Grantiella picta	Painted Honeyeater	VU	L	vu			PMST	**Possible.** Species not recorded previously but may occasionally utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Calidris melanotos	Pectoral Sandpiper	Mi		nt			PMST	**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
Pedionomus torquatus	Plains-wanderer	CR	L	cr			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within Construction Footprints
Ardea intermedia plumifera	Plumed Egret		L	en	5	1994	VBA	**Unlikely.** Suitable habitat not present within Construction Footprints
Pachycephala rufogularis	Red-lored Whistler	VU	L	en			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area
Polytelis anthopeplus monarchoides	Regent Parrot	V	L	vu	10	2019	VBA PMST GHD 2013 GHD 2014 R8 2019	**Present.** Recorded within the Study Area and at a number of Construction Footprints (ER3, ER1c, S7, S11/P3), with suitable foraging and potential nesting habitat within some Construction Footprints. **Impact Unlikely.** Targeted surveys for nesting birds during breeding season at sites containing potential nest trees did not record any breeding activity. Losses to relatively small area (50.35ha within 8,300+ ha within State Park) foraging habitat proposed to be lost, however the species is highly mobile and wide ranging, suitable surrounding habitat widespread.
Rhipidura rufifrons	Rufous Fantail	Mi					PMST	**Unlikely.** Not previously recorded. If present will likely benefit from improved ecological condition of Inundation Area.
Myiagra cyanoleuca	Satin Flycatcher	Mi						**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
Calidris acuminata	Sharp-tailed Sandpiper	Mi			3	1991	VBA, PMST	**Unlikely.** Suitable habitat present within iconstruction footrpint extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Ptilonorhynchus maculatus	Spotted Bowerbird		L	cr	1	1979	VBA	**Unlikely.** Not recorded in 40 years. Suitable habitat not present within Construction Footprints
Lophoictinia isura	Square-tailed Kite		L	vu	2	2013	VBA GHD 2013 GHD 2014 R8 2019	**Present.** Recorded within the Study Area and at a number of Construction Footprints, with suitable foraging and potential nesting habitat within some Construction Footprints. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Haliaeetus leucogaster	White-bellied Sea-Eagle		L	vu	12	2013	VBA	**Present.** Recorded within the Study Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread
Motacilla flava	Yellow Wagtail	Mi					PMST	**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
AMPHIBIANS								
Litoria raniformis	Growling Grass Frog	VU	L	en	4	1959	VBA, PMST	**Possible.** Potential aquatic habitat within the Murray River and associated waterways (ie Yungera Creek). **Impact Possible.** Localised impacts possible, consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways as part of a CEMP.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
REPTILES								
Morelia spilota metcalfei	Carpet Python		L	en	2	2002	VBA	**Possible.** Suitable habitat at all sites **Impact Possible.** Localised impacts possible, consideration of finalised footprint required, direct impacts (injury, stress, mortality) through habitat clearing should be mitigated. Suitable habitat surrounding and widespread
Chelodina expansa	Broad-shelled Turtle		L	En			VBA	**Possible**. Species is known from the area. May occur in waterways and waterholes especially those that are permanent and have aquatic vegetation, including the Murray River and Wallpolla Creek. **Impact Possible**. Localised impacts possible, consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways •
FISH								
Galaxias rostratus	Flat-headed Galaxias	CR		vu			PMST	**Unlikely.** No previous records. Suitable habitat of still or gently flowing water on the margins of lakes, billabongs and streams not present. **Impact Unlikely.** Consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways as part of a CEMP.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Macquaria australasica	Macquarie Perch	EN	L	en			PMST	**Highly Unlikely.** No previous records. Suitable habitat of clear water, deep, rocky holes and cover not present. **Impact Unlikely.** Localised impacts possible, consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways.
Maccullochella peelii peelii	Murray Cod	VU	L	vu			PMST GHD 2009	**Present.** Species is known from local area and suitable habitat present in waterways and potentially wetland areas. **Impact: Possible.** Localised impacts possible, consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways.
Craterocephalus fluviatilis	Murray Hardyhead	EN	L	cr			PMST	**Highly unlikely.** Suitable habitat not present - mostly recorded in isolated moderately saline lakes (Backhouse et al. 2008). Stoessel et al. (2020) state that they are predominantly found in permanent brackish wetlands, likely displaced to these locations due to the negative impacts of non-native species in wetlands with fresher water and the Murray Hardyhead's ability to tolerate high salinities. These conditions are not likely to be found in Murray River or existing aquatic habitat on Belsar island.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Bidyanus bidyanus	Silver Perch	CR	L	vu			PMST	**Possible.** No previous records. Silver Perch are a main-channel specialist but suitable flowing habitat likely to be present (i.e. Narcooyia, Bonyaricall and Yungera Creeks). Floodplain wetlands are likely to provide short-term foraging habitat. **Impact: Possible.** Localised impacts possible, consideration of coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways.

Appendix F. Likelihood of occurrence / impact - threatened fauna - inundation footprint

Likelihood of occurrence:

Not all of the threatened species identified during this assessment are equally likely to occur in the project site, due to the geographic location or context of the site, or the habitat type and condition. For each species, the likelihood of occurrence was evaluated using the following rationale:

PRESENT – Species known to occur within the site, or detected during the site visit.

POSSIBLE – Potentially suitable habitat occurs within Construction Footprints and species' known range encompasses the Construction Footprints. Species recorded historically in the 10-km search area, and generally within the last 30 years.

UNLIKELY – Species' known range encompasses the Construction Footprints, but suitable habitat does not occur within Construction Footprints, or occurs within Construction Footprints but with generally low quality and quantity. Species recorded historically in the Study Area but generally not within the last 30 years.

HIGHLY UNLIKELY – No historical records of the species and/or no suitable habitat in the Study Area.

Key: L – Listed EN / en – Endangered. VU / vu – Vulnerable. nt – Near Threatened. cr – Critically Endangered Mi – Migratory

Likelihood of occurrence of FFG Act and EPBC Act listed threatened fauna species, as developed from VBA and PMST searches within a 10 km radius of the inundation footprint

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
MAMMALS								
Nyctophilus corbeni	Corben's Long-eared Bat	VU	L	en			PMST	**Unlikely.** Not recorded previously. Suitable habitat present within inundation extent, if species present will likely benefit from environmental water when present and indirectly from improved habitat condition following environmental water.
Phascolarctos cinereus	Koala	VU					PMST	**Highly unlikely.** Not recorded previously. Suitable habitat present within inundation extent, if species present will likely benefit from environmental water when present and indirectly from improved habitat condition following environmental water.
BIRDS								
Struthidea cinerea	Apostlebird		L		11	2008	VBA	**Likely.** Species likely to utilise habitats across the Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Botaurus poiciloptilus	Australasian Bittern	EN	L	en			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.
Ardeotis australis	Australian Bustard		L	cr	1	1985	VBA	**Unlikely.** Not recorded previously. Suitable habitat present within inundation extent, if species present will likely benefit from environmental water indirectly from improved habitat condition following environmental water.
Gelochelidon macrotarsa	Australian Gull-billed Tern		L	en	1	1978	VBA	**Unlikely.** Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Rostratula australis	Australian Painted Snipe	EN	L	cr			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.
Porzana pusilla	Baillon's Crake		L	vu	2	1946	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Falco subniger	Black Falcon		L	vu	11	1980	VBA	**Possible.** Species may utilise habitats within Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Manorina melanotis	Black-eared Miner	EN	L	cr			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area
Oxyura australis	Blue-billed Duck		L	en	8	1995	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Grus rubicunda	Brolga		L	vu	2	1946	VBA	**Unlikely.** Not recorded in last 70 years. Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Burhinus grallarius	Bush Stone-curlew		L	en	2	1946	VBA	**Unlikely.** Not recorded in last 70 years. Species likely to benefit from improved habitat condition following environmental water.
Hydroprogne caspia	Caspian Tern		L	nt	1	2003	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Tringa nebularia	Common Greenshank	Mi		vu			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Actitis hypoleucus	Common Sandpiper	Mi		vu			PMST	**Unlikely.** No previous records. Suitable habitat not present within inundation extent currently, but species likely to benefit from environmental water when present.
Oreoica gutturalis	Crested Bellbird		L		53	2018	VBA	**Unlikely.** Suitable habitat not present within Inundation Area
Calidris ferruginea	Curlew Sandpiper	CR	L	en	1	1991	VBA, PMST	**Unlikely.** One previous record. Species likely to benefit from environmental water when present.
Geopelia cuneata	Diamond Dove		L		3	1986	VBA	**Possible.** Species may utilise habitats within Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Stagonopleura guttata	Diamond Firetail		L		2	2000	VBA	**Possible.** Species may utilise habitats within Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Numenius madagascariensis	Eastern Curlew	CR	L	vu			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within Inundation Area. If present species likely to benefit from improved habitat condition following environmental water
Ardea alba modesta	Eastern Great Egret		L	vu	11	2007	VBA	**Likely.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Stictonetta naevosa	Freckled Duck		L	en	7	1993	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Apus pacificus	Fork-tailed Swift	Mi			2	2001	VBA, PMST	**Possible.** Species may fly over Inundation Area while feeding. **Impact Unlikely.** Species extremely mobile and wide ranging, suitable surrounding habitat widespread. Species may benefit from insect proliferation following environmental water.
Falco hypoleucos	Grey Falcon		L	en	3	1992	VBA	**Unlikely.** Few records. Suitable habitat not present within Inundation Area
Pomatostomus temporalis	Grey-crowned Babbler		L	en	16	2002	VBA	**Possible.** Species may utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Ptilotula plumula	Grey-fronted Honeyeater			vu	3	2001	VBA	**Possible.** Suitable habitat across Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Coracina maxima	Ground Cuckoo-shrike		L	vu	1	1978	VBA	**Unlikely.** One historic record. Species likely to benefit from improved habitat condition following environmental water.
Aythya australis	Hardhead			vu	13	1993	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Melanodryas cucullata	Hooded Robin		L		13	2008	VBA	**Possible.** Suitable habitat across Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Gallinago hardwickii	Latham's Snipe/Japanese Snipe	Mi		nt	2	1946	CBA, PMST	**Unlikely.** No records in last 70 years. Species likely to benefit from environmental water when present.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Egretta garzetta	Little Egret		L	en	2	1946	VBA	**Unlikely.** No records in last 70 years. Species likely to benefit from environmental water when present.
Anseranas semipalmata	Magpie Goose		L		1	1978	VBA	**Unlikely.** One record. Species likely to benefit from environmental water when present.
Lophochroa leadbeateri	Major Mitchell's Cockatoo		L	vu	7	1983	VBA R8 2019	**Present.** Species recorded in area, likely to utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Stipiturus mallee	Mallee Emu-wren	EN	L	en	1	1998	VBA	**Highly unlikely.** No previous records. Suitable habitat not present within Inundation Area
Leipoa ocellata	Malleefowl	VU	L	en	24	2008	VBA, PMST	**Highly unlikely.** No previous records. Suitable habitat not present within Inundation Area
Biziura lobata	Musk Duck			vu	8	1994	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Pezoporus occidentalis	Night Parrot	EN		rx			PMST	**Highly unlikely.** No previous records. Suitable habitat not present within Inundation Area
Grantiella picta	Painted Honeyeater	VU	L	vu			PMST	**Possible.** Species not recorded previously but may occasionally utilise habitats for foraging **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread. Species likely to benefit from improved habitat condition following environmental water.
Calidris melanotos	Pectoral Sandpiper	Mi		nt			PMST	**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
Pedionomus torquatus	Plains-wanderer	CR	L	cr			PMST	**Highly Unlikely.** No previous records. Limited suitable habitat within Inundation Area.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Ardea intermedia plumifera	Plumed Egret		L	en	5	1994	VBA	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Pachycephala rufogularis	Red-lored Whistler	VU	L	en			PMST	**Highly Unlikely.** No previous records. Suitable habitat not present within broader area
Polytelis anthopeplus	Regent Parrot	V	L	vu	10	2019	VBA PMST GHD 2013 GHD 2014 R8 2019	**Likely.** Many recent previous records within the Study Area, with suitable foraging habitat across the Inundation Area. **Impact Unlikely.** Species is highly mobile and wide ranging, suitable surrounding habitat widespread. Important breeding habitat is present within the Inundation Area, this breeding habitat (large old River Red-gums) likely to have condition improved, and future breeding habitat sustained by environmental watering. Species likely to benefit from broadly improved habitat condition following environmental water. Environmental water is essential to sustain the River Red-gums this species requires for breeding habitat.
Rhipidura rufifrons	Rufous Fantail	Mi					PMST	**Unlikely.** Not previously recorded. If present will likely benefit from improved ecological condition of Inundation Area.
Myiagra cyanoleuca	Satin Flycatcher	Mi						**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
Calidris acuminata	Sharp-tailed Sandpiper	Mi			3	1991	VBA, PMST	**Possible.** Suitable habitat present within inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present.
Ptilonorhynchus maculatus	Spotted Bowerbird		L	cr	1	1979	VBA	**Unlikely.** Not recorded in 40 years. If present will likely benefit from improved ecological condition of Inundation Area.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Lophoictinia isura	Square-tailed Kite		L	vu	2	2013	VBA GHD 2013 GHD 2014 R8 2019	**Present.** Recorded within the Study Area. Suitable foraging and potential nesting habitat within Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread, will likely benefit from improved ecological condition of Inundation Area.
Haliaeetus leucogaster	White-bellied Sea-Eagle		L	vu	12	2013	VBA	**Likely.** Suitable habitat across Inundation Area. **Impact Unlikely.** Species mobile and wide ranging, suitable surrounding habitat widespread.Will likely benefit from environmental water when present and indirectly from improved habitat condition following environmental water.
Motacilla flava	Yellow Wagtail	Mi					PMST	**Highly Unlikely.** No previous records. Species likely to benefit from environmental water when present.
AMPHIBIANS								
Litoria raniformis	Growling Grass Frog	VU	L	en	4	1959	VBA, PMST	**Possible.** Potential aquatic habitat within the Murray River and associated waterways (ie Yungera Creek). **Impact Unlikely.** If present, species almost certain to benefit directly from greatly expanded habitat when environmental water is present, and indirectly from improved habitat condition following environmental water.
REPTILES								
Morelia spilota metcalfei	Carpet Python		L	en	2	2002	VBA	**Possible.** Suitable habitat across inundation extent. **Impact Unlikely.** Species likely to benefit from environmental water when present, and indirectly from improved habitat condition following environmental water.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Chelodina expansa	Broad-shelled Turtle		L	en			VBA	**Possible.** Species is known from the area. May occur in waterways and waterholes especially those that are permanent and have aquatic vegetation, including the Murray River and Wallpolla Creek. Suitable habitat expected to increase during environmental watering. **Impact Possible. S**pecies almost certain to benefit directly from greatly expanded habitat when environmental water is present and flowing habitat and connectivity is improved through the Narcooyia and Bonyaricall Creeks, and indirectly from improved habitat condition following environmental watering.
FISH								
Galaxias rostratus	Flat-headed Galaxias	CR		vu			PMST	**Unlikely.** No previous records. Unlikley that inundation will allow for the species to colonise via flooding mechanisms due to the low regional population size. Numerous surveys of riverine habitat completed as part of the Sustainable Rivers Audit between 2004 and 2010 failed to collect a single specimen (TSSC, 2015). Likewise, fish surveys of riverine and floodplain wetland habitat completed between the Murrumbidgee River confluence and the South Australian border also failed to collect the species (Gilligan, 2005).
Macquaria australasica	Macquarie Perch	EN	L	en			PMST	**Highly Unlikely.** No previous records. Suitable habitat of clear water, deep, rocky holes and cover not likely to be created by inundation.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Maccullochella peelii peelii	Murray Cod	VU	L	vu			PMST GHD 2009	**Present.** Species is known from local area and suitable habitat present in waterways and potentially wetland areas. **Impact: Unikely.** Species likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Narcooyia and Bonyaricall Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. There is a risk that floodplain inundation will increase the carp population. Mitigation measures recommended to minimise this risk include: • Implementing a winter fill regime • Develop a native fish exit strategy to strand carp • Drying of wetlands with high carp density Implementation of a Blackwater Management Plan and related water quality monitoring program on-site and within the Murray River should be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Murray cod within the Murray River.

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
Craterocephalus fluviatilis	Murray Hardyhead	EN	L	cr			PMST	**Highly unlikely.** No previous records. Suitable habitat not present - mostly recorded in isolated moderately saline lakes (Backhouse et al. 2008). Stoessel et al. (2020) state that they are predominantly found in permanent brackish wetlands, likely displaced to these locations due to the negative impacts of non-native species in wetlands with fresher water and the Murray Hardyhead's ability to tolerate high salinities. These conditions are not likely to be found in the areas that will be inundated by the project.
Bidyanus bidyanus	Silver Perch	CR	L	vu			PMST	**Possible.** Silver Perch are a main-channel specialist but suitable flowing habitat likely to be present (i.e. Narcooyia, Bonyaricall and Yungera Creeks). Floodplain wetlands are likely to provide short-term foraging habitat. **Impact Unlikely.** Species likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Narcooyia and Bonyaricall Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. There is a risk that floodplain inundation will increase the carp population. Mitigation measures recommended to minimise this risk include: • Implementing a winter fill regime • Develop a native fish exit strategy to strand carp • Drying of wetlands with high carp density

Species Name	Common Name	EPBC Act	FFG Act	DELWP Advisory	Number of Records	Most Recent Record	Source	Likelihood of Occurrence and Impact
								Implementation of a Blackwater Management Plan and related water quality monitoring program on-site and within the Murray River should be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Silver perch within the Murray River.

Appendix G. Ecological Values mapped in the Construction Footprints at Belsar Yungera

Ecological values mapped in the area of investigation at Belsar Yungera

LAKE POWELL

LAKE CARPUL

Legend

- Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Allocasuarina luehmannii
- Atriplex lindleyi subsp. conduplicata
- Atriplex pseudocampanulata
- Chenopodium desertorum subsp. rectum
- Cynodon dactylon var. pulchellus
- Duma horrida subsp. horrida
- Eremophila divaricata subsp. divaricata
- Eremophila maculata subsp. maculata
- Frankenia serpyllifolia
- Lepidium papillosum
- Malacocera tricornis
- Stemodia glabella s.s.

- Frankenia serpyllifolia
- Malacocera tricornis

Threatened Fauna Species

- Apostlebird

EVC (recorded 2016)

- 86,Woorinen Sands Mallee
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

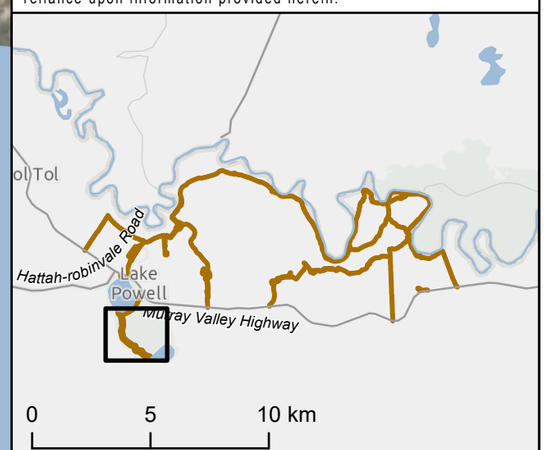
N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 115 230
Meters

DATA SOURCES
© Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3; VicMap Data © State of Victoria 2020; GHD 2020.



Legend

- Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Atriplex pseudocampanulata
- Eremophila divaricata subsp. divaricata
- Frankenia serpyllifolia
- Malacocera tricornis
- Frankenia serpyllifolia

EVC (recorded 2016)

- 823,Lignum Swampy Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

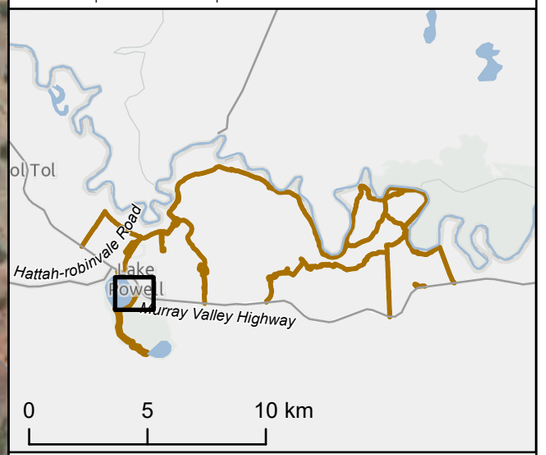
N

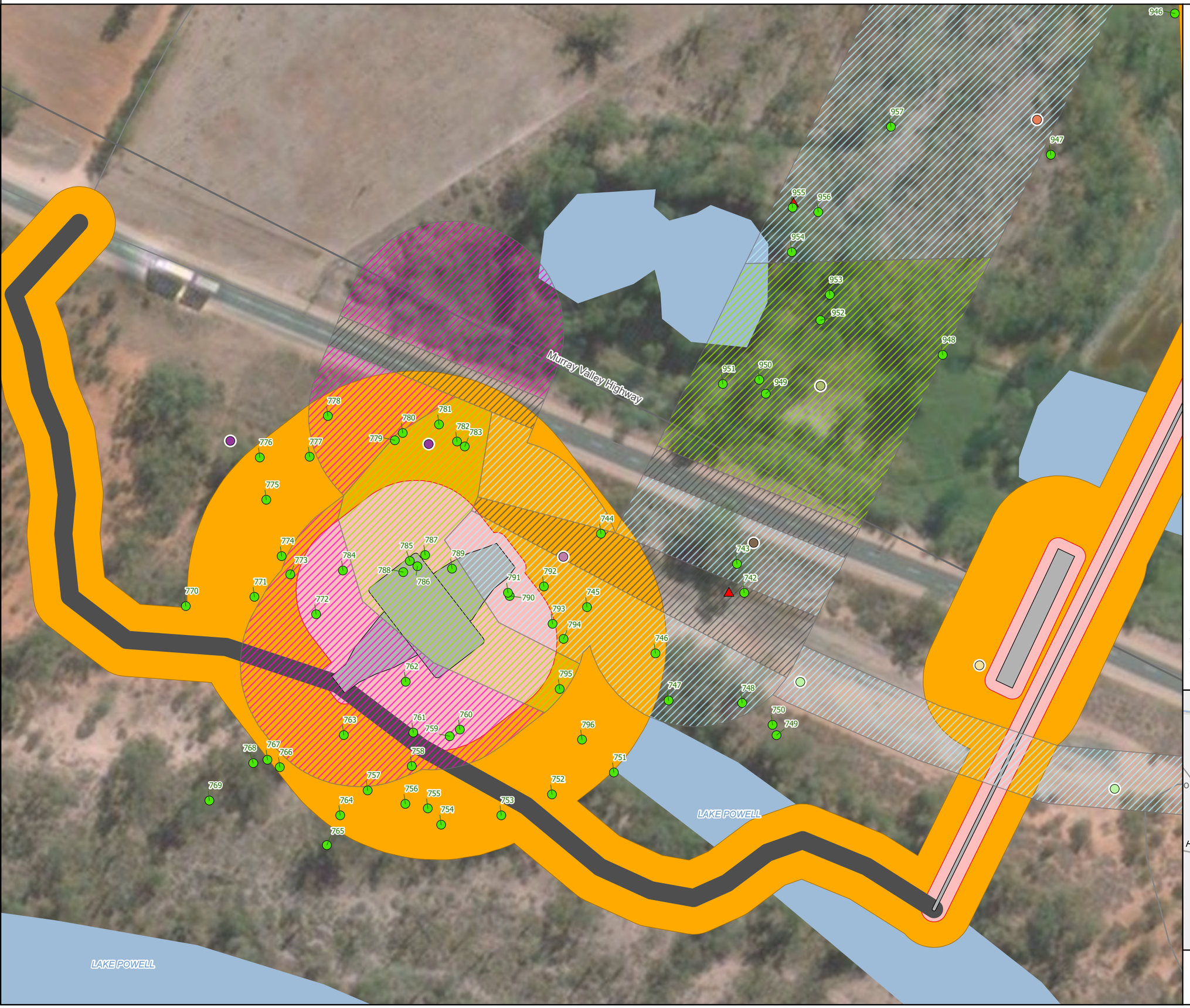
Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
© Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3; VicMap Data © State of Victoria 2020; GHD 2020.





Legend

Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Asperula gemella
- Chenopodium desertorum subsp. rectum
- Cullen pallidum
- Eragrostis setifolia
- Malacocera tricornis
- Minuria integerrima
- Sida intricata
- Stemodia glabella s.s.

Threatened Fauna Species

- Regent Parrot

EVC (recorded 2016)

- 0,Non-remnant
- 103,Riverine Chenopod Woodland
- 819,Spike-sedge Wetland
- 823,Lignum Swampy Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25 Meters

DATA SOURCES
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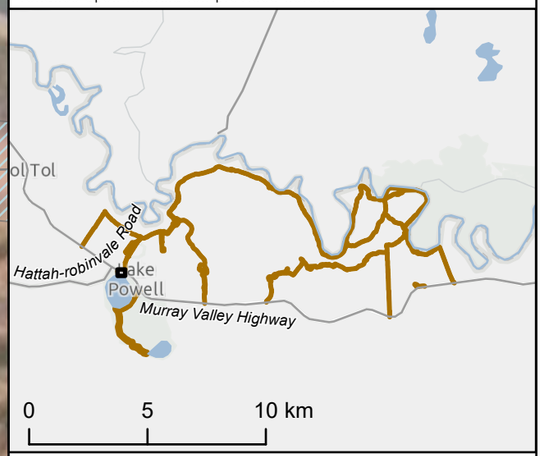

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Murray Valley Highway

Legend

Canopy Tree

Threatened Flora Species

Acacia oswaldii

Eremophila divaricata subsp. divaricata

Frankenia serpyllifolia

Malacocera tricornis

Minuria integerrima

Sclerolaena muricata var. muricata

Frankenia serpyllifolia

Threatened Fauna Species

Regent Parrot

EVC (recorded 2016)

103,Riverine Chenopod Woodland

808,Lignum Shrubland

819,Spike-sedge Wetland

823,Lignum Swampy Woodland

Major Road

Minor Road

Waterbody

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 40 80
Meters

DATA SOURCES
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R8

BONYARICALL CREEK

Legend

Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Asperula gemella
- Atriplex pseudocampanulata
- Calotis cuneifolia
- Cynodon dactylon var. pulchellus
- Eremophila divaricata subsp. divaricata
- Malacocera tricornis
- Stemodia glabella s.s.

Threatened Fauna Species

- Major Mitchell's Cockatoo
- Regent Parrot

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 808,Lignum Shrubland
- 823,Lignum Swampy Woodland

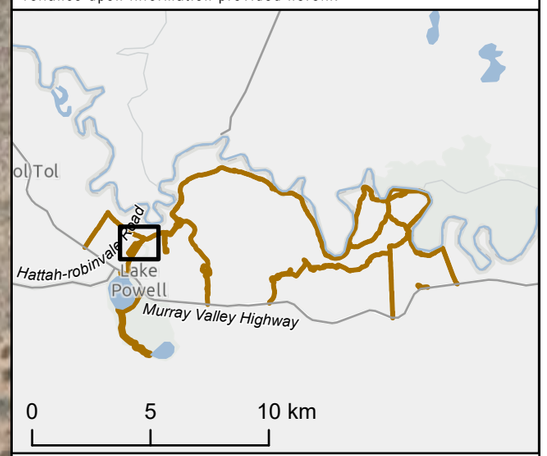
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140 Meters



Legend

- Canopy Tree

Threatened Flora Species

- Atriplex lindleyi subsp. lindleyi
- Atriplex pseudocampanulata
- Eremophila divaricata subsp. divaricata
- Malacocera tricornis
- Sclerolaena muricata var. muricata

Threatened Fauna Species

- Major Mitchell's Cockatoo
- Regent Parrot

EVC (recorded 2016)

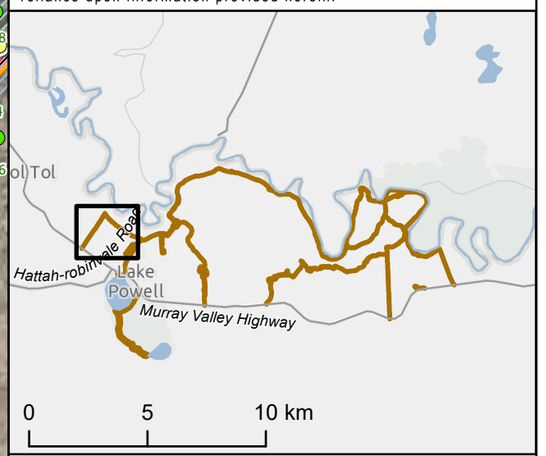
- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 808,Lignum Shrubland
- 823,Lignum Swampy Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 115 230
Meters



BONYARICALL CREEK

Legend

Canopy Tree

Threatened Flora Species

Calotis cuneifolia

Cynodon dactylon var. pulchellus

Stemodia glabella s.s.

Threatened Fauna Species

Regent Parrot

EVC (recorded 2016)

106,Grassy Riverine Forest

295,Riverine Grassy Woodland

823,Lignum Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 40 80 Meters

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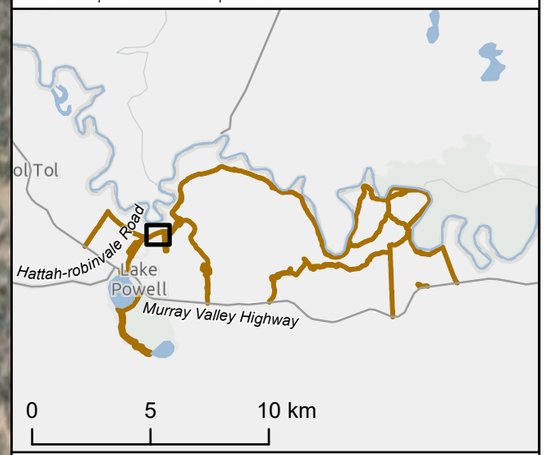


NARCOOYIA CREEK

BONYARICALL CREEK

Legend

Canopy Tree

Threatened Fauna Species

Regent Parrot

EVC (recorded 2016)

106,Grassy Riverine Forest

295,Riverine Grassy Woodland

823,Lignum Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

R8

Legend

Canopy Tree

Threatened Flora Species

Atriplex lindleyi subsp. lindleyi

Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

103,Riverine Chenopod Woodland

106,Grassy Riverine Forest

295,Riverine Grassy Woodland

823,Lignum Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

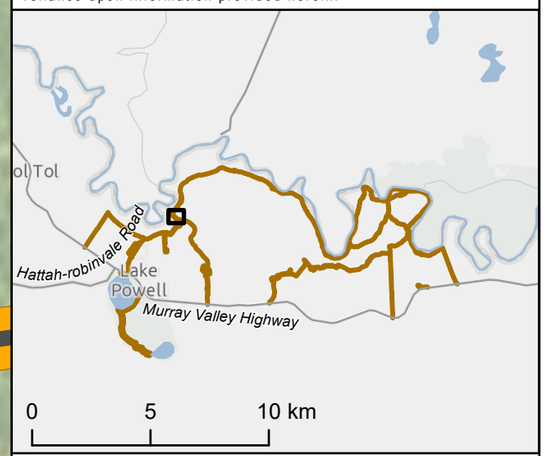
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



MURRAY RIVER

Legend

Canopy Tree

Threatened Flora Species

Acacia oswaldii

Eremophila divaricata subsp. divaricata

Threatened Fauna Species

Lace Monitor

EVC (recorded 2016)

103,Riverine Chenopod Woodland

106,Grassy Riverine Forest

823,Lignum Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

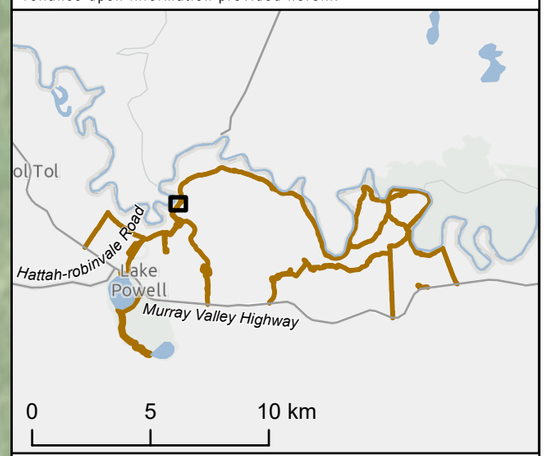
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



R8

Ecological values mapped in the area of investigation at Belsar Yungera

Legend

- Canopy Tree

EVC (recorded 2016)

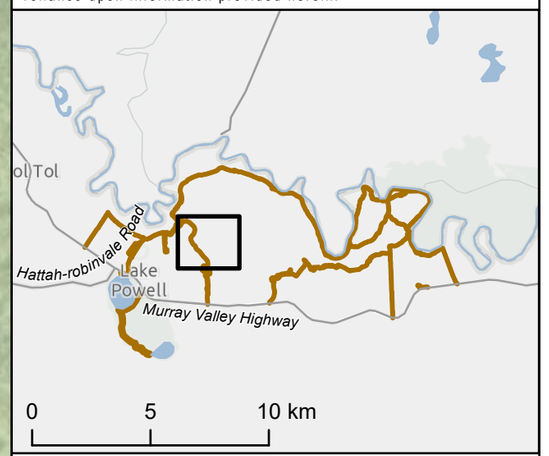
- 106,Grassy Riverine Forest
- 295,Riverine Grassy Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 115 230
Meters



Legend

Canopy Tree

Threatened Flora Species

- Asperula gemella
- Eremophila divaricata subsp. divaricata
- Lepidium papillosum
- Regent Parrot
- Sclerolaena lanicuspis
- Sclerolaena muricata var. muricata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 808,Lignum Shrubland
- Minor Road

- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

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Legend

Canopy Tree

Threatened Flora Species

- Asperula gemella
- Atriplex pseudocampanulata
- Cynodon dactylon var. pulchellus
- Eremophila divaricata subsp. divaricata
- Lepidium pseudohyssopifolium
- Malacocera tricornis
- Minuria integerrima
- Sclerolaena birchii
- Sclerolaena muricata var. muricata
- Sclerolaena uniflora

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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626
627
628
629
630
Murray Valley Highway

Legend

Canopy Tree

Threatened Flora Species
- Acacia oswaldii
- Atriplex pseudocampanulata
- Malacocera tricornis
- Sclerolaena muricata var. muricata
- Sclerolaena uniflora

EVC (recorded 2016)
- 0,Non-remnant
- 86,Woorinen Sands Mallee
- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland

Major Road
Minor Road
Waterbody
Development Footprint
Construction Footprint Tracks
Construction Footprint Structures
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 40 80 Meters

DATA SOURCES
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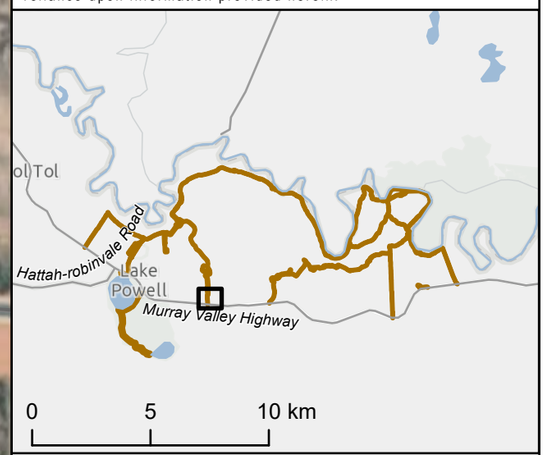

Legend

- Canopy Tree

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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R8

Legend

- Canopy Tree

EVC (recorded 2016)

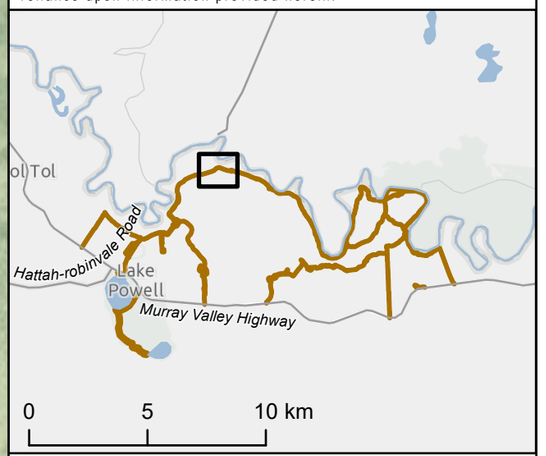
- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140 Meters



Legend

Canopy Tree

Threatened Flora Species

Asperula wimmerana

EVC (recorded 2016)

103,Riverine Chenopod Woodland

106,Grassy Riverine Forest

818,Shrubby Riverine Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

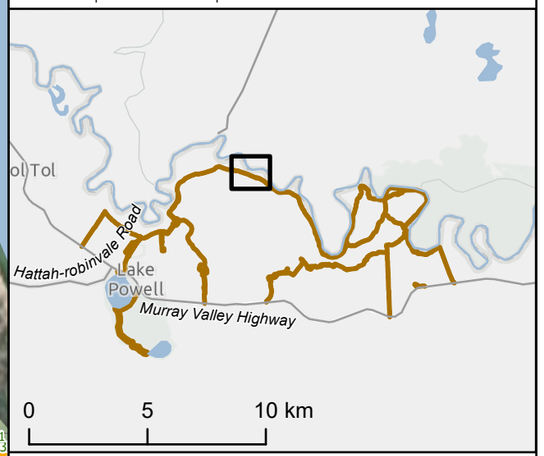
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters



Legend

- Canopy Tree

Threatened Flora Species

- Asperula wimmerana
- Eremophila divaricata subsp. divaricata
- Verbena officinalis var. gaudichaudii
- Asperula wimmerana

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 818,Shrubby Riverine Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

R8

Legend

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters

DATA SOURCES
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Ecological values mapped in the area of investigation at Belsar Yungera

MURRAY RIVER

Legend

Threatened Flora Species

- Acacia oswaldii

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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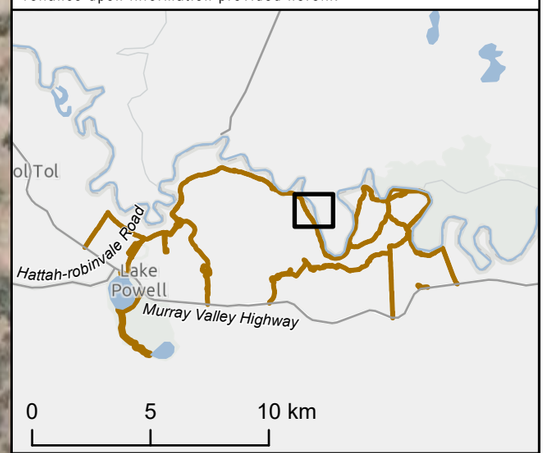
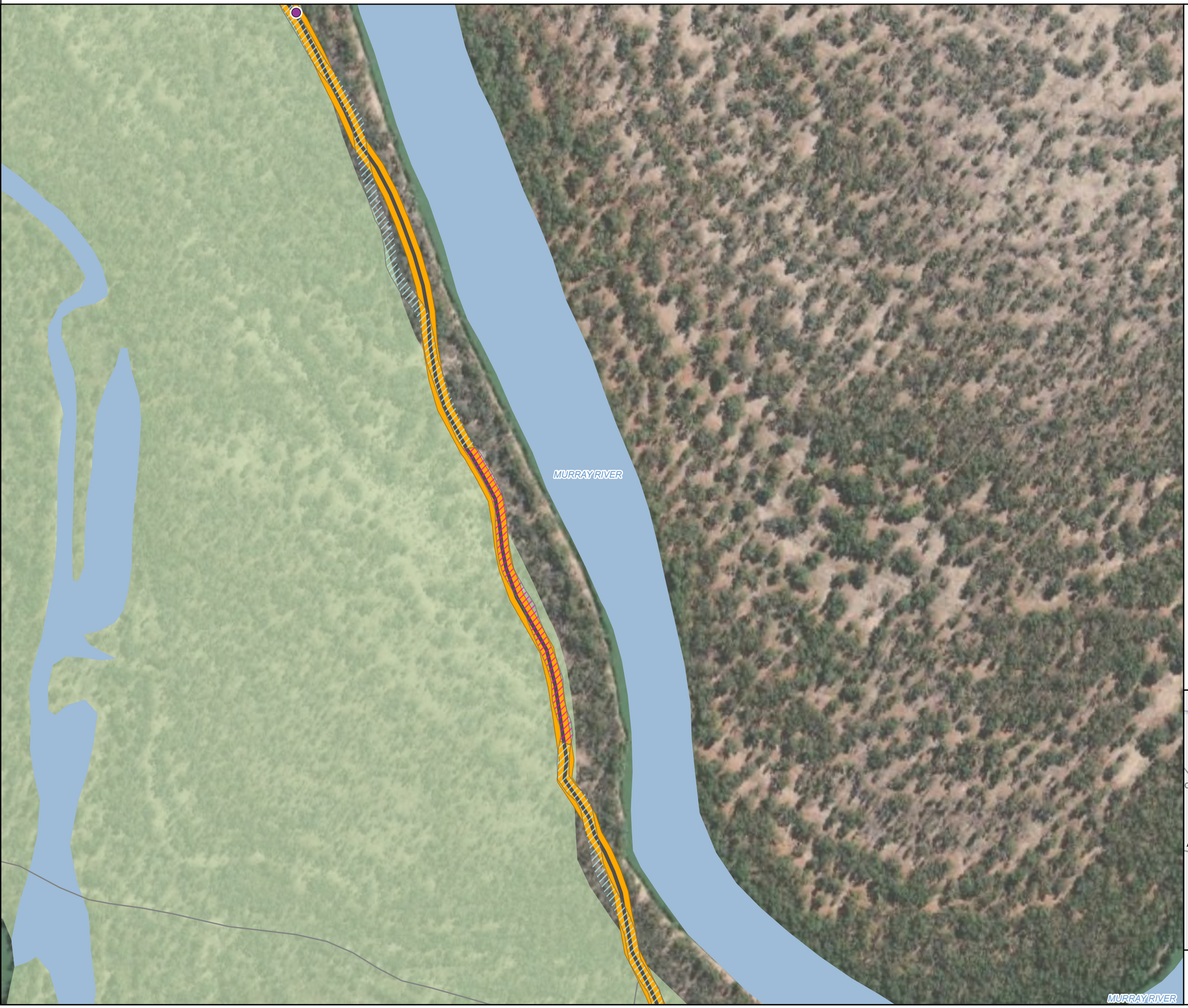




Legend

Threatened Flora Species

- Acacia oswaldii

EVC (recorded 2016)

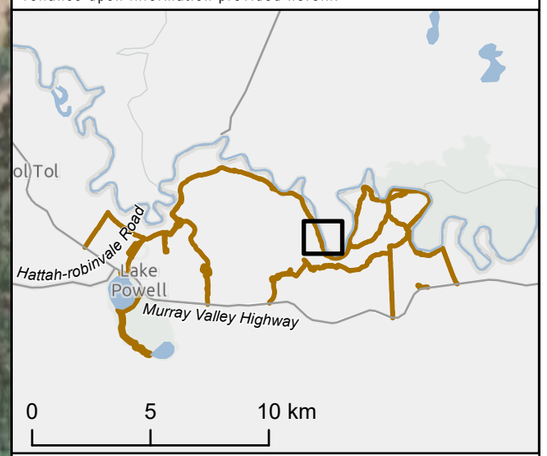
- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

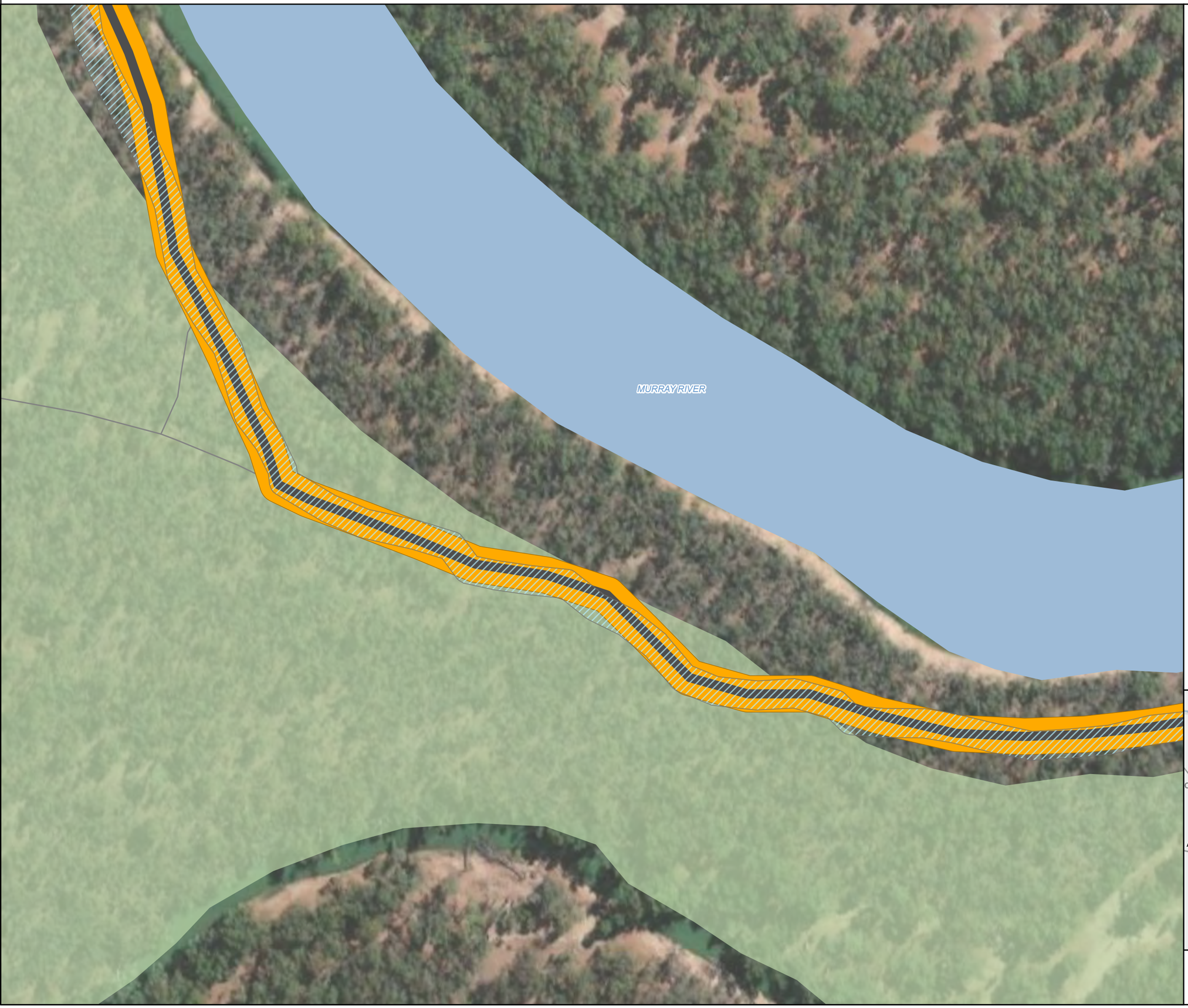
Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140 Meters



R8



Legend

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

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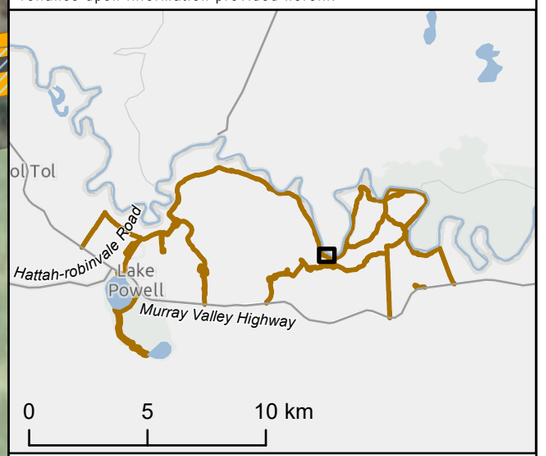
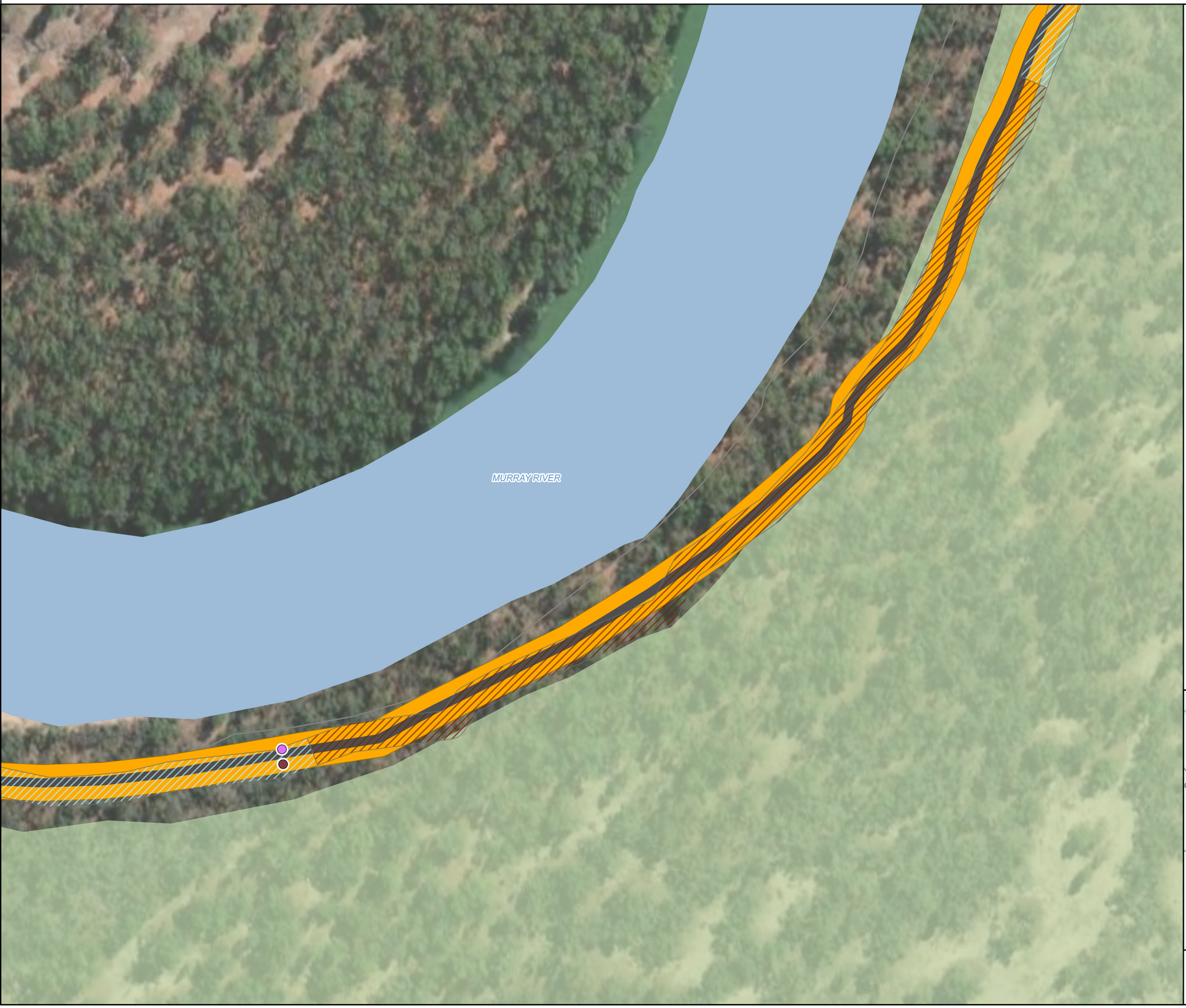




Legend

Threatened Flora Species

- Eremophila divaricata subsp. divaricata
- Eremophila maculata subsp. maculata

EVC (recorded 2016)

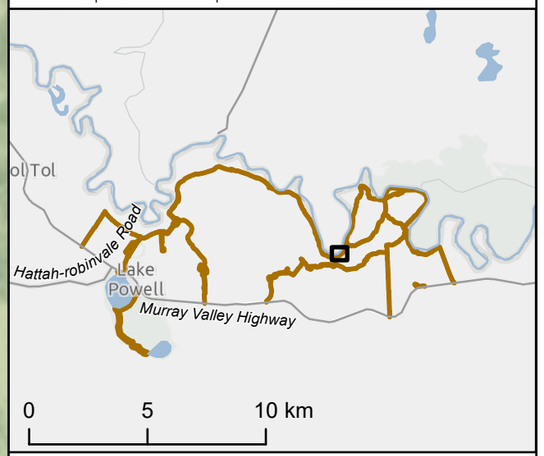
- 103,Riverine Chenopod Woodland
- 295,Riverine Grassy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters



MURRAY RIVER

Legend

Canopy Tree

Threatened Flora Species

Eremophila divaricata subsp. divaricata

Lepidium papillosum

Threatened Fauna Species

Plumed Egret

Regent Parrot

EVC (recorded 2016)

103,Riverine Chenopod Woodland

106,Grassy Riverine Forest

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

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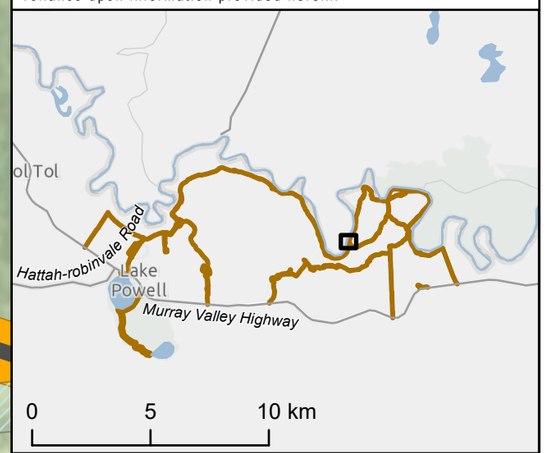

Legend

Threatened Flora Species

- Acacia oswaldii

- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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Legend

- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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Legend

- Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Eremophila divaricata subsp. divaricata

Threatened Fauna Species

- Regent Parrot
- Square-tailed Kite

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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R8

Legend

Threatened Flora Species

- Acacia melvillei
- Acacia oswaldii
- Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

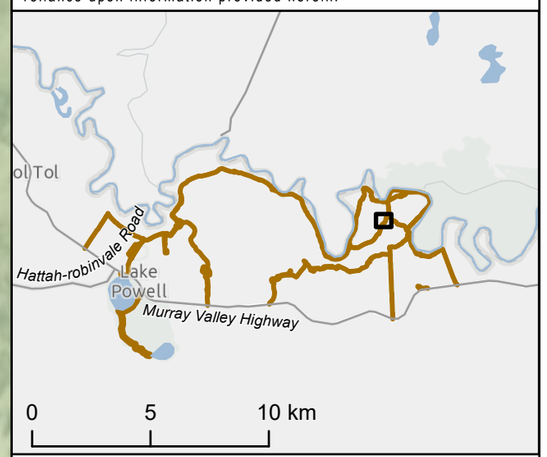
- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



R8

Legend

Threatened Flora Species

- Acacia oswaldii
- Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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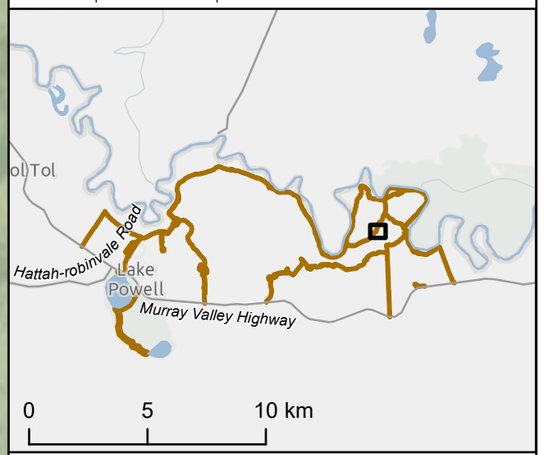

Appendix G. Ecological Values mapped in the Construction Footprints at Belsar Yungera

Legend

Threatened Flora Species

- Acacia melvillei
- Acacia oswaldii

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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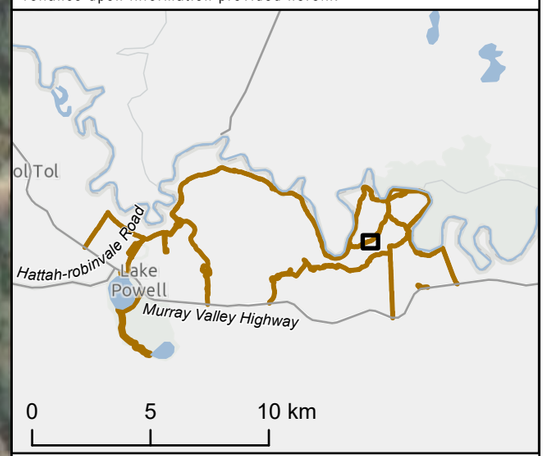


Legend

Threatened Flora Species

- Acacia melvillei
- Acacia oswaldii

EVC (recorded 2016)

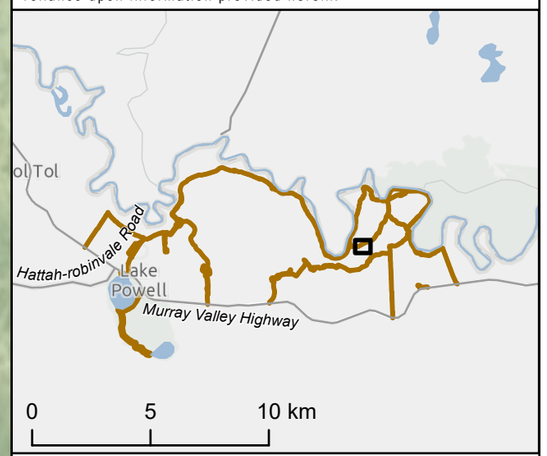
- 103,Riverine Chenopod Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



Legend

- Canopy Tree

Threatened Flora Species

- Lepidium papillosum

Threatened Fauna Species

- Regent Parrot

EVC (recorded 2016)

- 106,Grassy Riverine Forest
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

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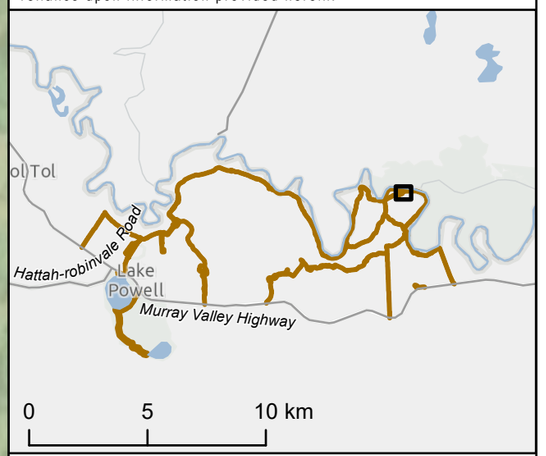
Meters



Legend

Threatened Flora Species

- Picris squarrosa
- Stemodia glabella s.s.
- Verbena officinalis var. gaudichaudii

EVC (recorded 2016)

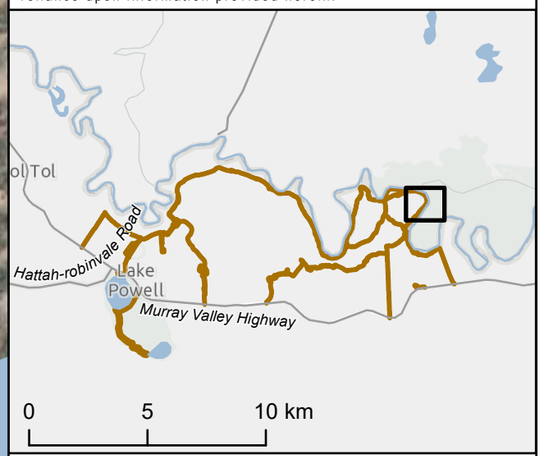
- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 295,Riverine Grassy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters



R8

Legend

Canopy Tree

Threatened Flora Species

- Cynodon dactylon var. pulchellus
- Eremophila maculata subsp. maculata
- Lepidium papillosum
- Stemodia glabella s.s.
- Verbena officinalis var. africana
- Verbena officinalis var. gaudichaudii

Threatened Fauna Species

- Regent Parrot
- Square-tailed Kite

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 813,Intermittent Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

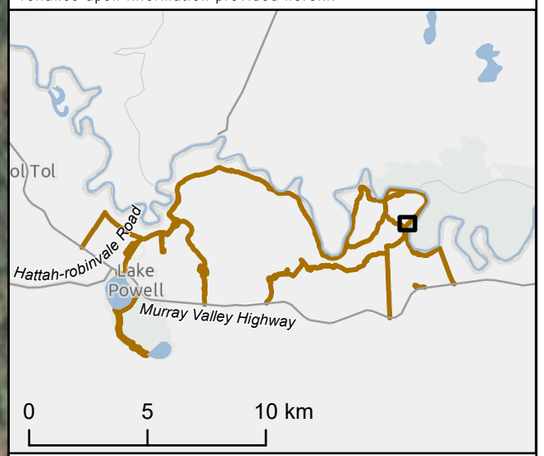
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters



R8

Legend

Threatened Flora Species

- Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 813,Intermittent Swampy Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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R8

MURRAY RIVER

Legend

- Canopy Tree
- Threatened Flora Species
  - Atriplex pseudocampanulata
  - Eremophila divaricata subsp. divaricata
  - Verbena officinalis var. africana
- Threatened Fauna Species
  - Azure Kingfisher (nest observed)
  - Regent Parrot
- EVC (recorded 2016)
  - 106,Grassy Riverine Forest
  - 813,Intermittent Swampy Woodland
  - Minor Road
  - Waterbody
  - Reserve
  - Development Footprint
  - Construction Footprint Tracks
  - Construction Footprint Structures
  - Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25
Meters

DATA SOURCES
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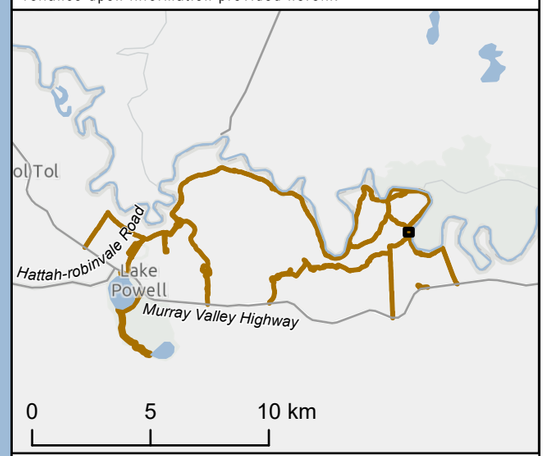

R8

MURRAY RIVER

Legend

- Canopy Tree
- Regent Parrot
- Square-tailed Kite

Threatened Flora Species

- Atriplex pseudocampanulata
- Cynodon dactylon var. pulchellus
- Eremophila divaricata subsp. divaricata
- Malacocera tricornis
- Picris squarrosa
- Sclerolaena patenticuspis
- Stemodia glabella s.s.
- Verbena officinalis var. africana
- Verbena officinalis var. gaudichaudii

- Atriplex pseudocampanulata
- Malacocera tricornis

Threatened Fauna Species

- Azure Kingfisher (nest observed)

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 813,Intermittent Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25 Meters

DATA SOURCES
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Legend

Canopy Tree

Threatened Flora Species

Acacia oswaldii

EVC (recorded 2016)

103,Riverine Chenopod Woodland

Minor Road

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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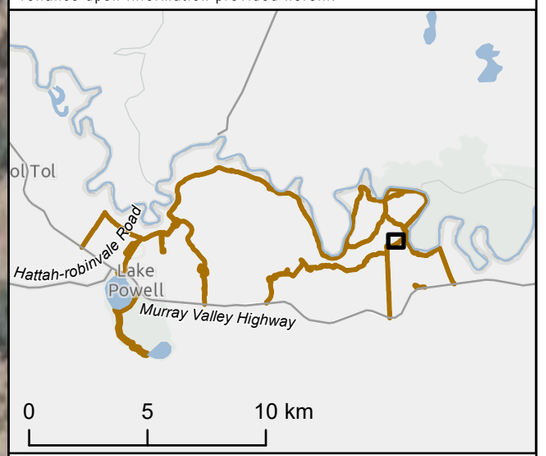


R8

Legend

Threatened Flora Species

- Acacia oswaldii
- Atriplex lindleyi subsp. lindleyi
- Atriplex pseudocampanulata
- Malacocera tricornis
- Malacocera tricornis

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 813,Intermittent Swampy Woodland
- 823,Lignum Swampy Woodland
- Minor Road

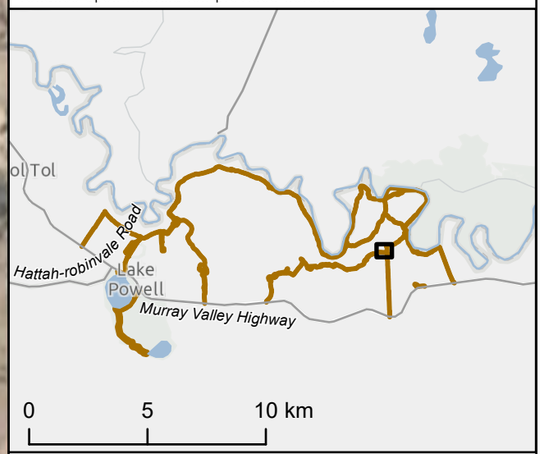
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



Legend

- Canopy Tree

EVC (recorded 2016)

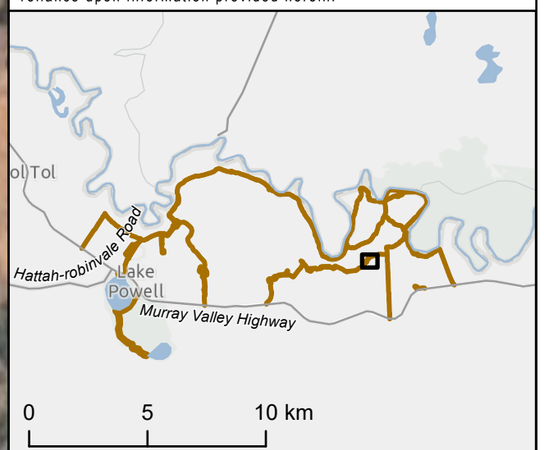
- 103,Riverine Chenopod Woodland
- 813,Intermittent Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters



R8

Legend

Threatened Flora Species

- Cullen tenax
- Eremophila divaricata subsp. divaricata
- Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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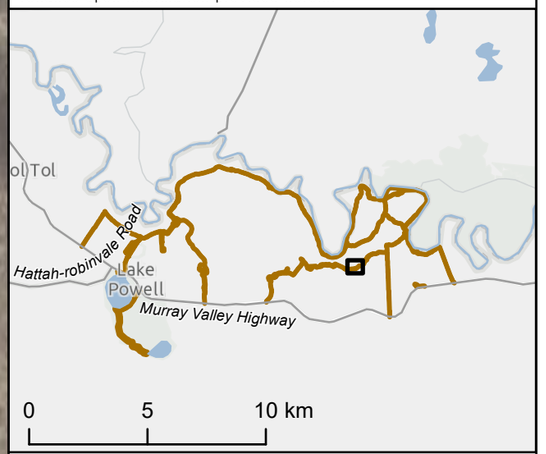


Legend

- Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Asperula gemella
- Cullen tenax
- Eremophila divaricata subsp. divaricata
- Lepidium papillosum
- Eremophila divaricata subsp. divaricata
- Malacocera tricornis

EVC (recorded 2016)

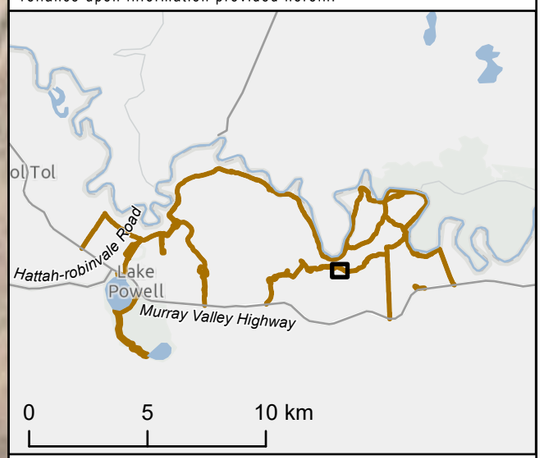
- 823,Lignum Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



Legend

Canopy Tree

Threatened Flora Species

Asperula gemella

Asperula wimmerana

Cullen tenax

Eremophila divaricata subsp. divaricata

Lepidium papillosum

Asperula wimmerana

EVC (recorded 2016)

106,Grassy Riverine Forest

823,Lignum Swampy Woodland

Minor Road

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters

DATA SOURCES
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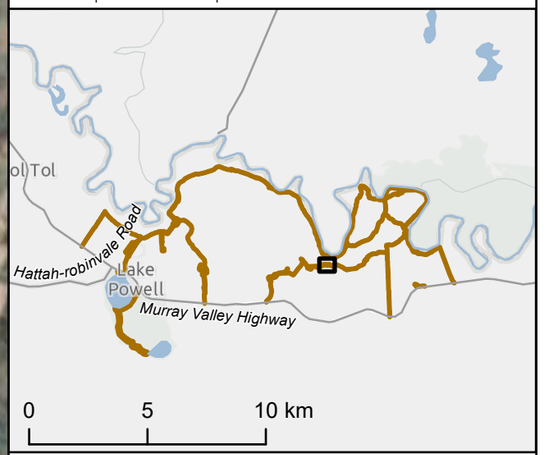

Legend

Canopy Tree

Threatened Flora Species

Asperula wimmerana

Eremophila divaricata subsp. divaricata

Eremophila maculata subsp. maculata

Malacocera tricornis

EVC (recorded 2016)

103,Riverine Chenopod Woodland

106,Grassy Riverine Forest

823,Lignum Swampy Woodland

Minor Road

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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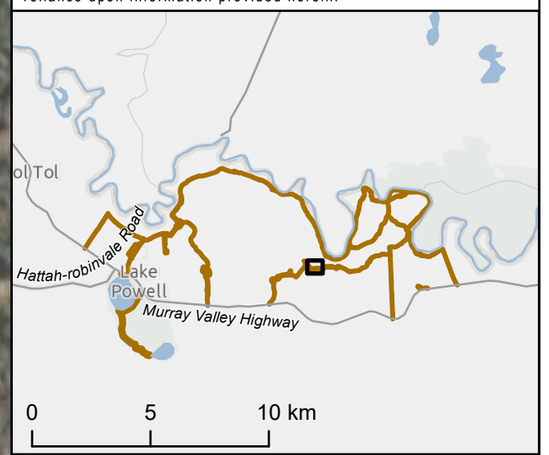

R8

Legend

Threatened Flora Species

- Acacia oswaldii
- Asperula gemella
- Eremophila divaricata subsp. divaricata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 808,Lignum Shrubland
- 823,Lignum Swampy Woodland
- Minor Road
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

DATA SOURCES
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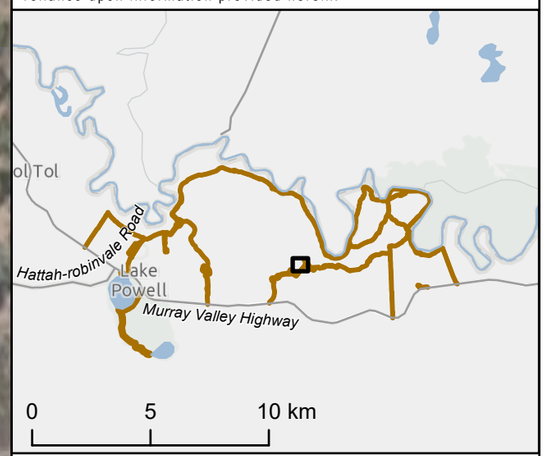
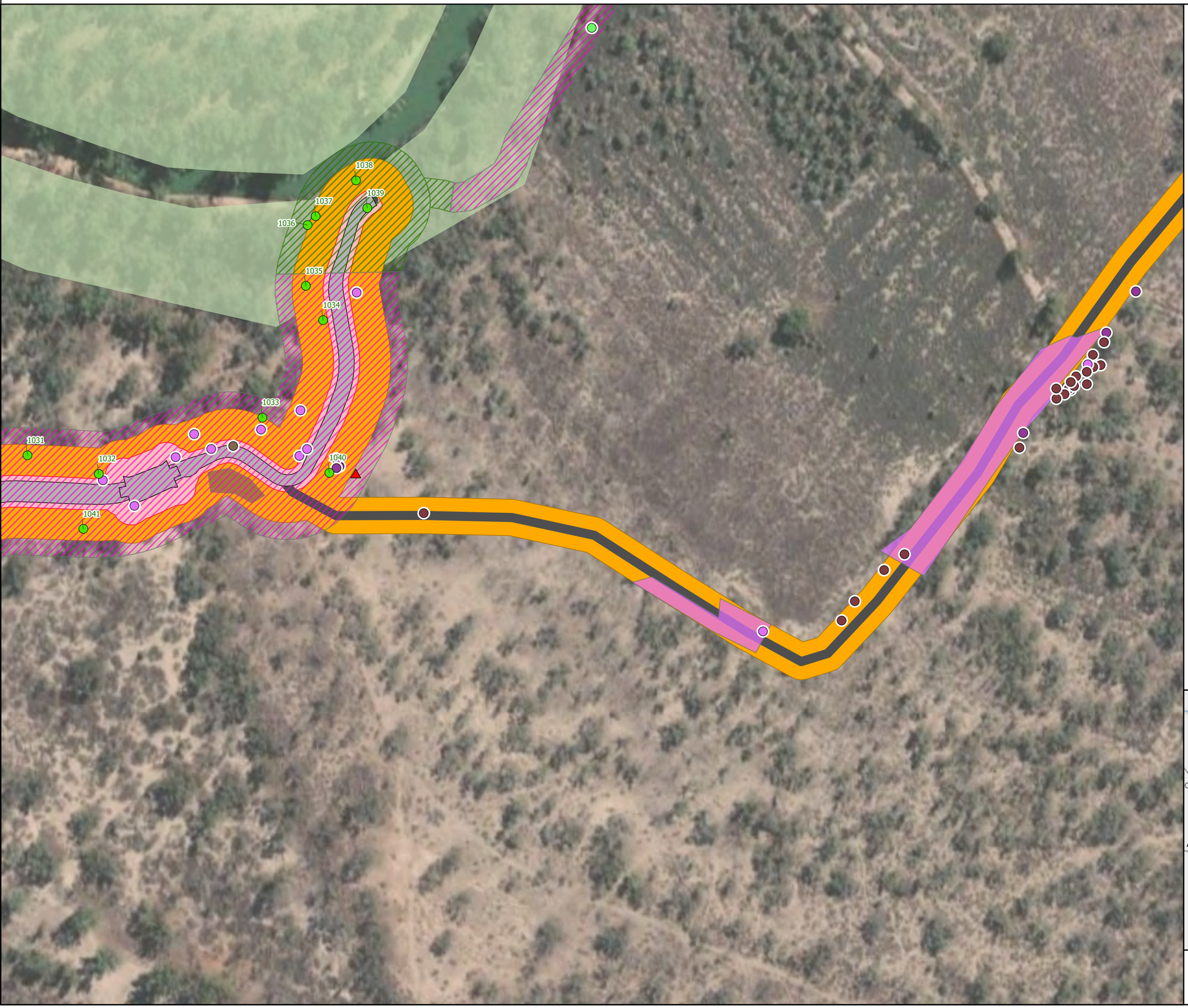




Legend

Canopy Tree

Threatened Flora Species

Acacia oswaldii

Asperula gemella

Eremophila divaricata subsp. divaricata

Eremophila maculata subsp. maculata

Malacocera tricornis

Eremophila divaricata subsp. divaricata

Eremophila maculata subsp. maculata

Malacocera tricornis

Threatened Fauna Species

Regent Parrot

EVC (recorded 2016)

106,Grassy Riverine Forest

823,Lignum Swampy Woodland

Minor Road

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

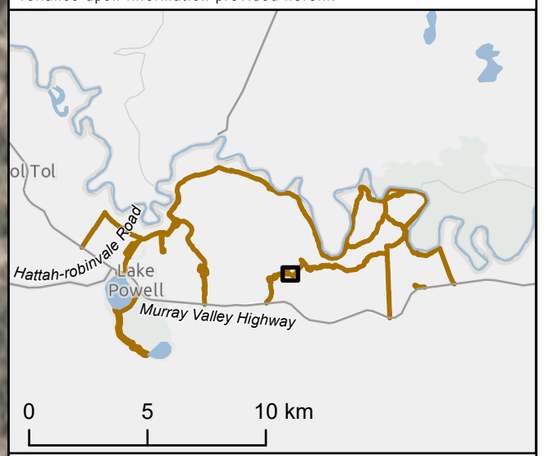
Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



R8

Legend

Canopy Tree

Threatened Flora Species

- Asperula gemella
- Atriplex lindleyi subsp. lindleyi
- Atriplex pseudocampanulata
- Eremophila divaricata subsp. divaricata
- Lepidium papillosum
- Sclerolaena birchii
- Sclerolaena intricata
- Sclerolaena patenticuspis

Asperula gemella

EVC (recorded 2016)

- 106,Grassy Riverine Forest
- 823,Lignum Swampy Woodland

Minor Road

Waterbody

Reserve

Development Footprint

Construction Footprint Tracks

Construction Footprint Structures

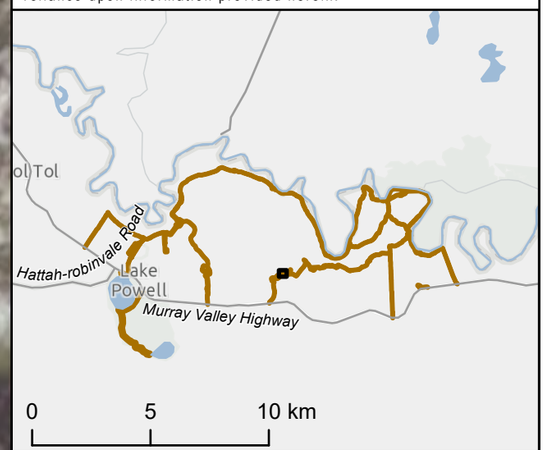
Area of Investigation

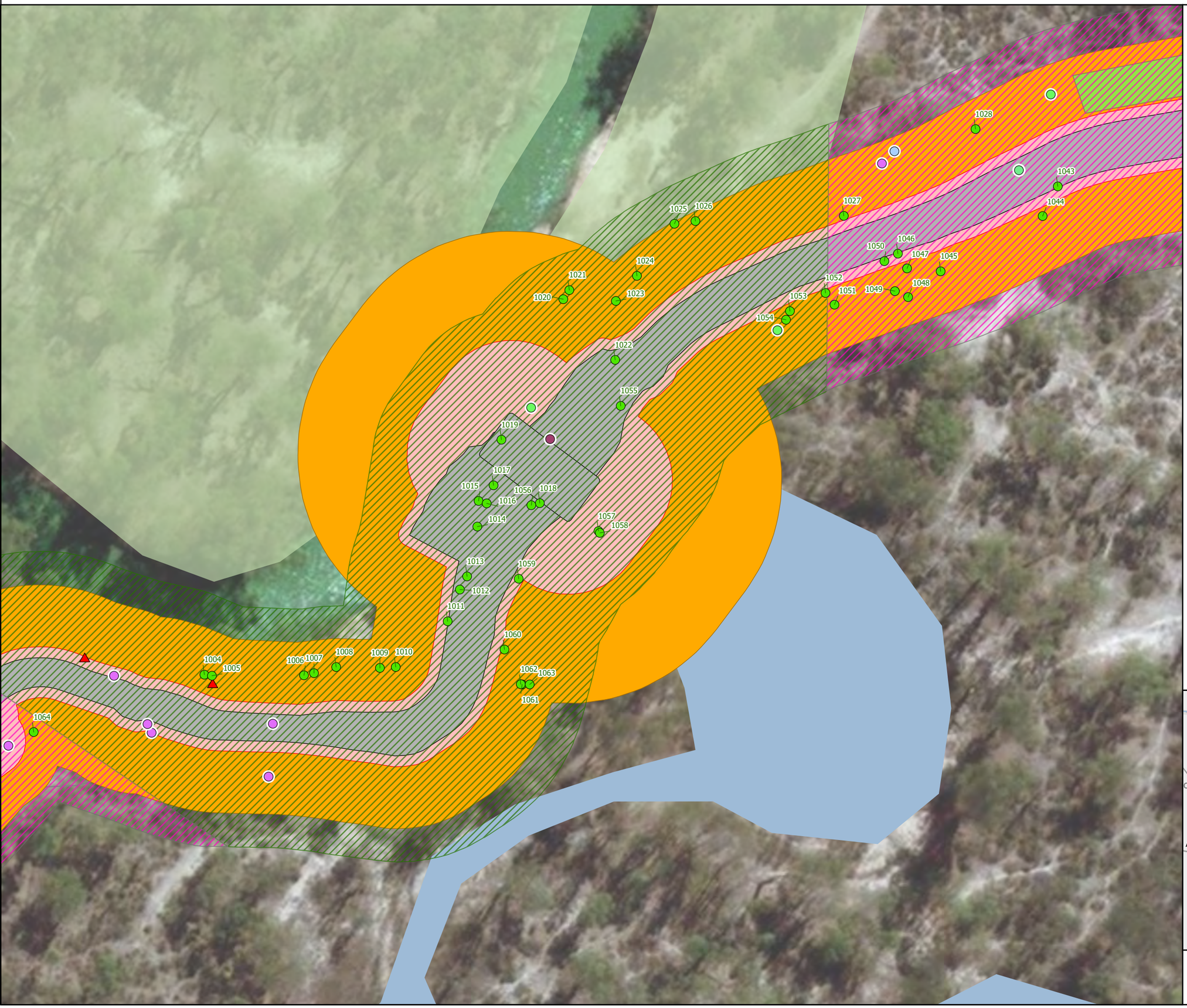
N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25
Meters





Legend

- Canopy Tree

Threatened Flora Species

- Asperula gemella
- Atriplex lindleyi subsp. lindleyi
- Eremophila divaricata subsp. divaricata
- Lepidium papillosum
- Sclerolaena birchii
- Sclerolaena intricata
- Sclerolaena patenticuspis
- Verbena officinalis var. africana
- Asperula gemella

Threatened Fauna Species

- Regent Parrot

EVC (recorded 2016)

- 106,Grassy Riverine Forest
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25
Meters

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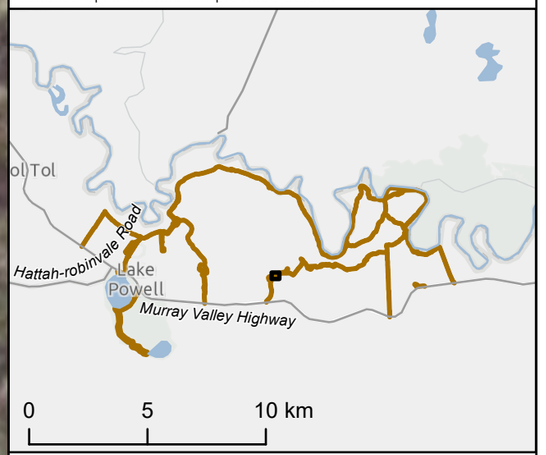

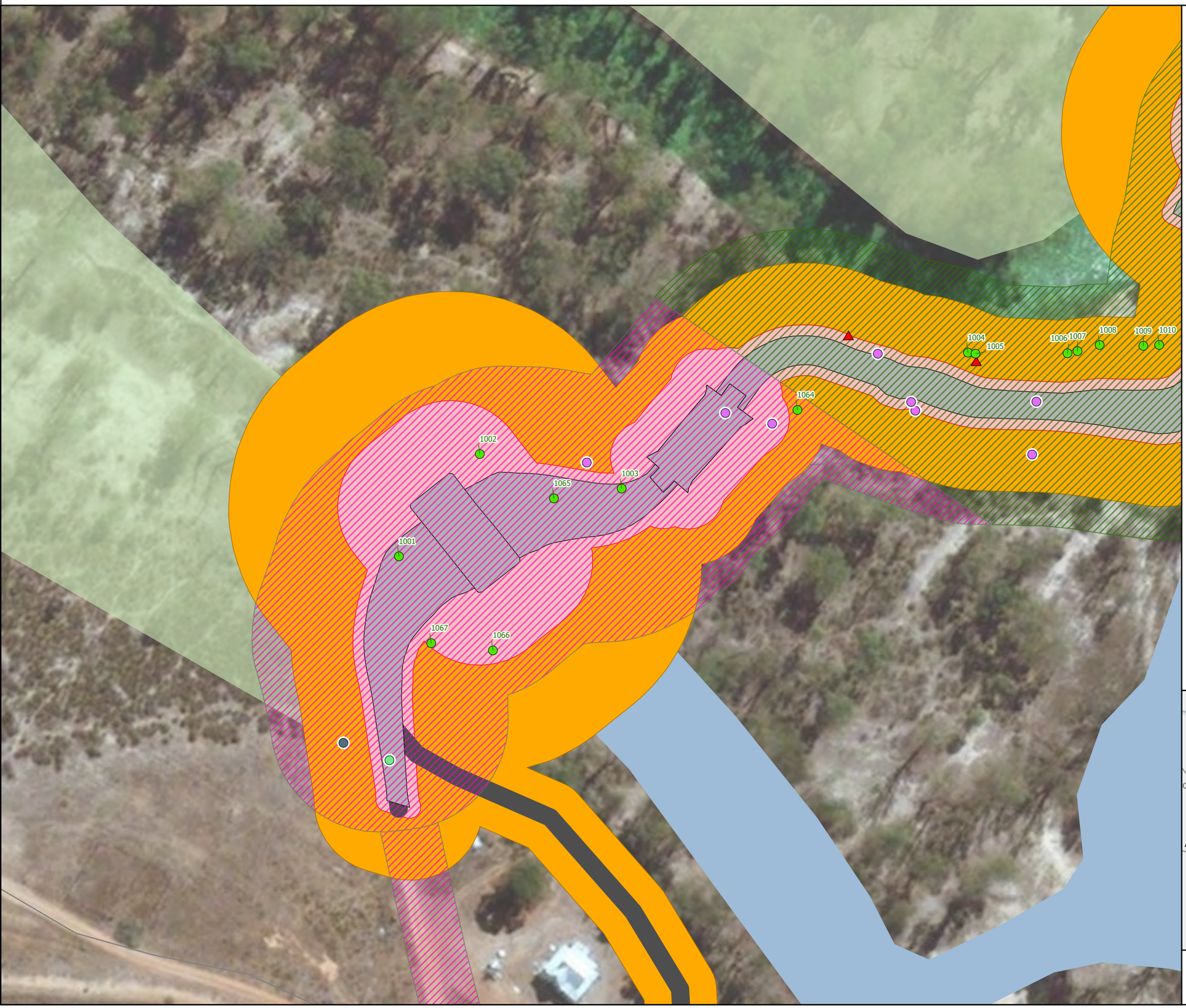

Legend

- Canopy Tree

Threatened Flora Species

- Eremophila divaricata subsp. divaricata
- Sclerolaena muricata var. muricata
- Sclerolaena patenticuspis

Threatened Fauna Species

- Regent Parrot

EVC (recorded 2016)

- 106,Grassy Riverine Forest
- 823,Lignum Swampy Woodland
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 12.5 25
Meters

DATA SOURCES
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Legend

- Canopy Tree

Threatened Flora Species

- Atriplex lindleyi subsp. lindleyi
- Atriplex pseudocampanulata
- Eremophila divaricata subsp. divaricata
- Malacocera tricornis
- Sclerolaena muricata var. muricata
- Sclerolaena patenticuspis

EVC (recorded 2016)

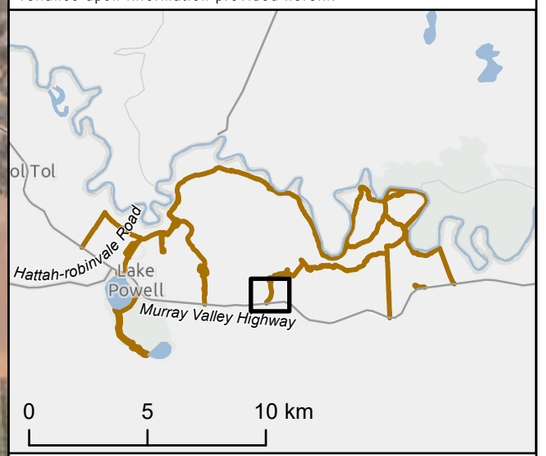
- 0,Non-remnant
- 103,Riverine Chenopod Woodland
- 106,Grassy Riverine Forest
- 823,Lignum Swampy Woodland
- Major Road
- Minor Road
- Waterbody
- Reserve
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140 Meters



Legend

Threatened Flora Species

- Acacia oswaldii
- Atriplex pseudocampanulata
- Malacocera tricornis

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 823,Lignum Swampy Woodland
- Minor Road

- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

R8

Legend

Threatened Flora Species

- Minuria denticulata
- Minuria integerrima

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- 808,Lignum Shrubland
- 823,Lignum Swampy Woodland
- Minor Road

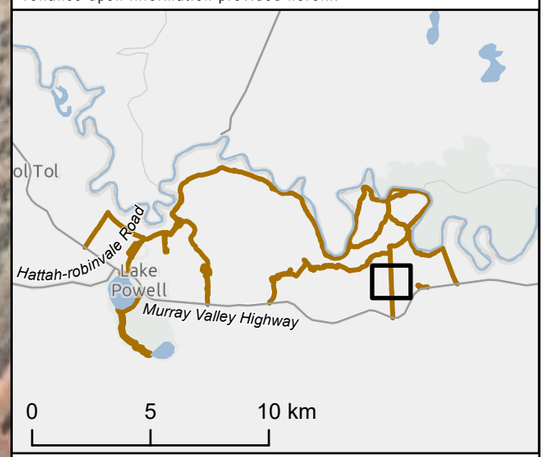
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters



Murray Valley Highway

Legend

Threatened Flora Species

- Minuria denticulata

EVC (recorded 2016)

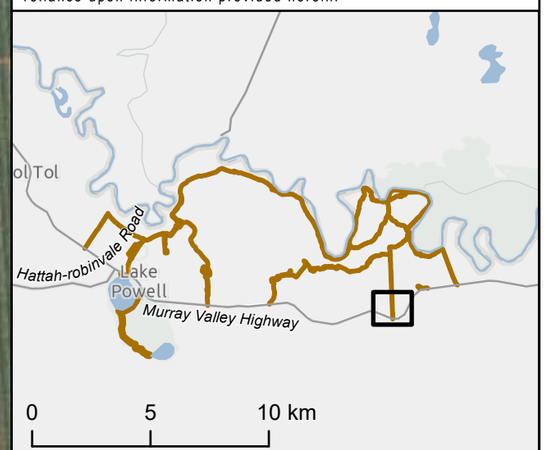
- 103,Riverine Chenopod Woodland
- 808,Lignum Shrubland
- 823,Lignum Swampy Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters



Legend

Threatened Flora Species

- Eremophila divaricata subsp. divaricata
- Lepidium papillosum
- Malacocera tricornis

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

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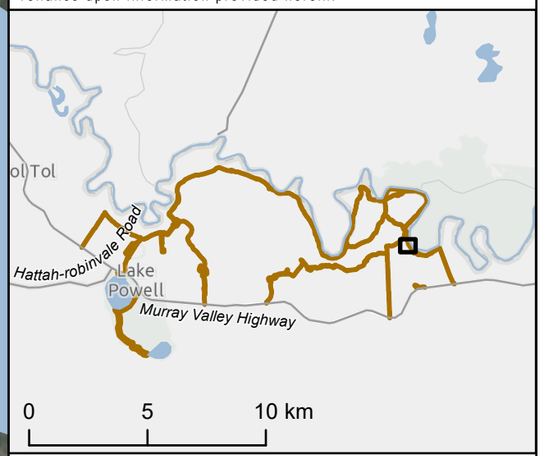


R8

Legend

- Canopy Tree

Threatened Flora Species

- Atriplex pseudocampanulata
- Eremophila divaricata subsp. divaricata
- Lepidium papillosum

EVC (recorded 2016)

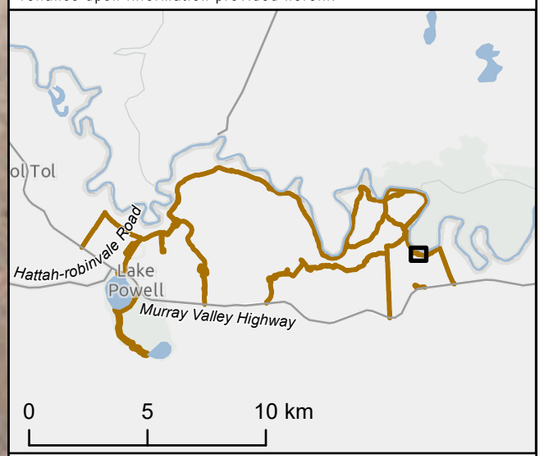
- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters



R8

MURRAY RIVER

MURRAY RIVER

Legend

Threatened Flora Species

- Acacia oswaldii
- Malacocera tricornis
- Sclerolaena patenticuspis
- Atriplex pseudocampanulata

EVC (recorded 2016)

- 103,Riverine Chenopod Woodland
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 70 140
Meters

DATA SOURCES
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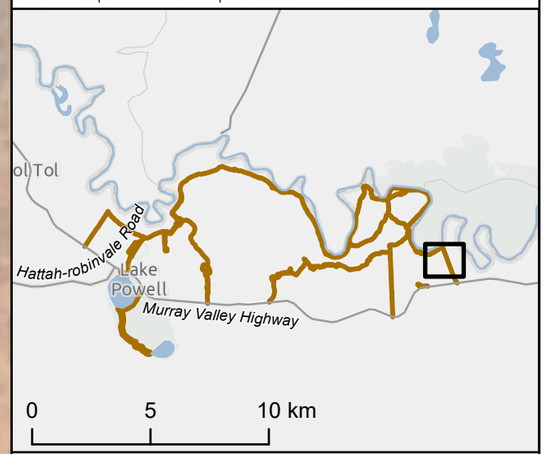


Legend

Threatened Flora Species

- Acacia oswaldii

EVC (recorded 2016)

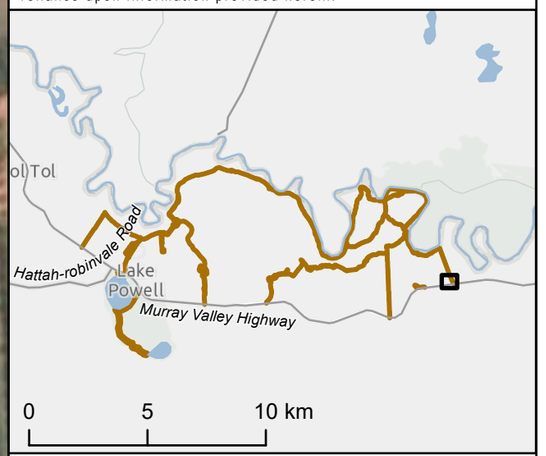
- 103,Riverine Chenopod Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters



R8

Legend

EVC (recorded 2016)

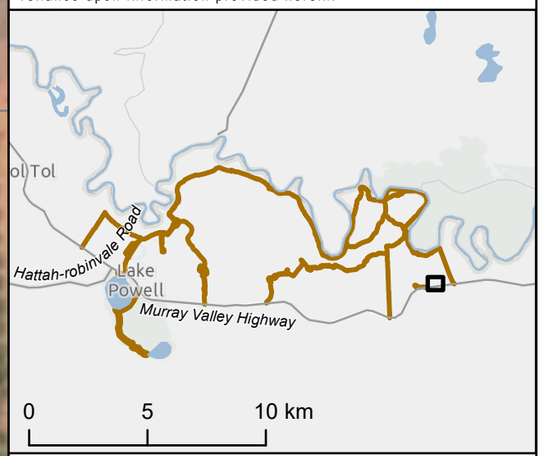
- 103,Riverine Chenopod Woodland
- Major Road
- Minor Road
- Waterbody
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50 Meters



R8

Legend

- Canopy Tree

Threatened Flora Species

- Acacia oswaldii
- Lepidium papillosum
- Malacocera tricornis
- Sclerolaena muricata var. muricata

EVC (recorded 2016)

- 86,Woorinen Sands Mallee
- 103,Riverine Chenopod Woodland
- Major Road
- Minor Road
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 25 50
Meters

Appendix H. Trees Recorded within the Belsar Yungera Project Site

Tree ID	Tree Species	DBH (cm)	Retained / Removed
1	Black Box	93	Retained
2	Black Box	8	Retained
3	Black Box	29	Retained
4	Black Box	48	Removed
5	Black Box	40	Removed
6	Black Box	35	Retained
7	Black Box	38	Retained
8	Black Box	26	Retained
9	Black Box	46	Retained
10	Black Box	61	Retained
11	Black Box	32	Retained
12	River Red-gum	125	Retained
13	River Red-gum	145	Retained
14	Black Box	120	Removed
15	River Red-gum	150	Removed
16	Black Box	52	Removed
17	River Red-gum	156	Removed
18	River Red-gum	156	Removed
19	River Red-gum	176	Removed
20	River Red-gum	170	Removed
21	River Red-gum	170	Removed
22	River Red-gum	161	Removed
23	River Red-gum	121	Removed
24	River Red-gum	152	Retained
25	River Red-gum	176	Retained
26	River Red-gum	170	Removed
27	River Red-gum	178	Retained
28	River Red-gum	92	Removed
29	River Red-gum	182	Retained
30	River Red-gum	140	Retained
31	River Red-gum	147	Retained
32	River Red-gum	189	Retained
33	River Red-gum	133	Removed
34	River Red-gum	11	Retained
35	Black Box	9	Retained
36	River Red-gum	7	Retained
37	River Red-gum	2	Retained
38	River Red-gum	7	Retained
39	River Red-gum	9	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
40	River Red-gum	3	Retained
41	River Red-gum	5	Retained
42	River Red-gum	8	Retained
43	River Red-gum	5	Retained
44	River Red-gum	8	Retained
45	River Red-gum	10	Retained
46	River Red-gum	14	Retained
47	River Red-gum	12	Retained
48	River Red-gum	5	Retained
49	River Red-gum	5	Retained
50	River Red-gum	14	Retained
51	River Red-gum	13	Retained
52	River Red-gum	11	Retained
53	River Red-gum	10	Retained
54	River Red-gum	14	Retained
55	River Red-gum	12	Retained
56	River Red-gum	6	Retained
57	River Red-gum	15	Retained
58	River Red-gum	13	Retained
59	River Red-gum	11	Retained
60	River Red-gum	141	Removed
61	River Red-gum	21	Retained
62	River Red-gum	9	Retained
63	River Red-gum	15	Retained
64	River Red-gum	55	Retained
65	Black Box	70	Retained
66	River Red-gum	62	Retained
67	River Red-gum	53	Retained
68	River Red-gum	49	Retained
69	River Red-gum	190	Retained
70	River Red-gum	195	Retained
71	River Red-gum	123	Retained
72	Stag	160	Removed
73	River Red-gum	108	Removed
74	Stag	86	Retained
75	River Red-gum	91	Retained
76	River Red-gum	60	Retained
77	River Red-gum	93	Retained
78	Black Box	137	Retained
79	Black Box	50	Retained
80	Black Box	41	Retained
81	Black Box	32	Retained
82	Black Box	21	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
83	Black Box	6	Retained
84	Black Box	11	Retained
85	Black Box	13	Retained
86	Black Box	98	Retained
87	Black Box	71	Retained
88	Black Box	29	Retained
89	Black Box	22	Retained
90	Black Box	6	Retained
91	River Red-gum	72	Removed
92	River Red-gum	50	Removed
93	Black Box	133	Retained
94	Black Box	94	Retained
95	River Red-gum	191	Retained
96	River Red-gum	152	Retained
97	River Red-gum	125	Retained
98	River Red-gum	93	Retained
99	River Red-gum	76	Retained
100	River Red-gum	30	Retained
101	River Red-gum	66	Retained
102	River Red-gum	75	Retained
103	River Red-gum	69	Retained
104	River Red-gum	42	Retained
105	River Red-gum	47	Retained
106	Black Box	20	Retained
107	River Red-gum	51	Retained
108	River Red-gum	90	Retained
109	River Red-gum	69	Retained
110	River Red-gum	62	Retained
111	River Red-gum	63	Retained
112	Black Box	39	Retained
113	Stag	211	Retained
114	River Red-gum	54	Retained
115	River Red-gum	27	Retained
116	River Red-gum	76	Retained
117	River Red-gum	58	Retained
118	River Red-gum	38	Retained
119	River Red-gum	31	Retained
120	River Red-gum	44	Retained
121	River Red-gum	58	Retained
122	River Red-gum	53	Retained
123	River Red-gum	52	Retained
124	River Red-gum	27	Retained
125	Stag	62	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
126	River Red-gum	158	Removed
127	River Red-gum	153	Removed
128	River Red-gum	95	Removed
129	Stag	100	Removed
130	River Red-gum	113	Removed
131	Black Box	111	Removed
132	River Red-gum	159	Removed
133	Stag	65	Removed
134	River Red-gum	140	Removed
135	River Red-gum	170	Removed
136	River Red-gum	211	Removed
137	Stag	208	Removed
138	River Red-gum	113	Retained
139	River Red-gum	171	Retained
140	River Red-gum	97	Retained
141	River Red-gum	88	Retained
142	River Red-gum	129	Retained
143	River Red-gum	62	Retained
144	Stag	76	Retained
145	River Red-gum	118	Retained
146	Stag	76	Retained
147	River Red-gum	162	Removed
148	River Red-gum	59	Retained
149	River Red-gum	128	Retained
150	River Red-gum	54	Retained
151	River Red-gum	55	Retained
152	River Red-gum	101	Retained
153	River Red-gum	56	Retained
154	River Red-gum	109	Retained
155	River Red-gum	50	Retained
156	River Red-gum	57	Retained
157	Stag	80	Removed
158	Stag	56	Retained
159	Black Box	47	Retained
160	River Red-gum	191	Removed
161	River Red-gum	196	Removed
162	River Red-gum	188	Removed
163	River Red-gum	64	Retained
164	River Red-gum	48	Retained
165	River Red-gum	88	Removed
166	River Red-gum	52	Retained
167	River Red-gum	68	Retained
168	River Red-gum	53	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
169	River Red-gum	50	Retained
170	River Red-gum	92	Removed
171	River Red-gum	56	Retained
172	River Red-gum	168	Removed
173	River Red-gum	61	Retained
174	River Red-gum	97	Removed
175	River Red-gum	133	Removed
176	River Red-gum	178	Retained
177	River Red-gum	168	Removed
178	River Red-gum	173	Removed
179	River Red-gum	158	Removed
180	River Red-gum	56	Retained
181	Stag	96	Removed
182	River Red-gum	84	Retained
183	River Red-gum	123	Retained
184	River Red-gum	75	Retained
185	River Red-gum	90	Retained
186	River Red-gum	55	Retained
187	River Red-gum	123	Retained
188	River Red-gum	193	Retained
189	River Red-gum	97	Retained
190	River Red-gum	66	Retained
191	River Red-gum	107	Retained
192	River Red-gum	140	Removed
193	River Red-gum	171	Retained
194	River Red-gum	138	Retained
195	River Red-gum	119	Removed
196	River Red-gum	194	Removed
197	River Red-gum	218	Removed
198	River Red-gum	98	Removed
199	River Red-gum	71	Removed
200	River Red-gum	134	Removed
201	River Red-gum	62	Retained
202	River Red-gum	140	Removed
203	River Red-gum	59	Retained
204	River Red-gum	56	Retained
205	Stag	215	Retained
206	River Red-gum	222	Retained
207	River Red-gum	140	Removed
208	River Red-gum	143	Removed
209	River Red-gum	61	Retained
210	River Red-gum	71	Retained
211	River Red-gum	53	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
212	River Red-gum	100	Retained
213	River Red-gum	52	Retained
214	River Red-gum	132	Retained
215	River Red-gum	81	Retained
216	River Red-gum	56	Retained
217	River Red-gum	122	Removed
218	River Red-gum	63	Removed
219	River Red-gum	78	Retained
220	Black Box	88	Retained
221	Black Box	52	Retained
222	Black Box	67	Retained
223	Black Box	60	Retained
224	Black Box	60	Retained
225	River Red-gum	58	Retained
226	Black Box	57	Retained
227	River Red-gum	122	Retained
228	River Red-gum	88	Retained
229	River Red-gum	55	Retained
230	River Red-gum	83	Retained
231	River Red-gum	56	Retained
232	River Red-gum	71	Retained
233	River Red-gum	154	Retained
234	Black Box	53	Removed
235	Black Box	88	Removed
236	Stag	155	Removed
237	River Red-gum	77	Removed
238	River Red-gum	57	Retained
239	River Red-gum	61	Retained
240	Stag	69	Removed
241	River Red-gum	109	Removed
242	Stag	55	Removed
243	River Red-gum	169	Removed
244	River Red-gum	63	Retained
245	River Red-gum	52	Retained
246	River Red-gum	96	Retained
247	River Red-gum	78	Retained
248	River Red-gum	52	Retained
249	River Red-gum	82	Retained
250	Stag	58	Retained
251	River Red-gum	48	Retained
252	Stag	91	Retained
253	River Red-gum	87	Retained
254	River Red-gum	97	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
255	River Red-gum	128	Removed
256	River Red-gum	162	Retained
257	River Red-gum	260	Retained
258	River Red-gum	150	Retained
259	River Red-gum	53	Retained
260	River Red-gum	67	Retained
261	River Red-gum	79	Retained
262	River Red-gum	67	Retained
263	River Red-gum	87	Retained
264	River Red-gum	57	Retained
265	River Red-gum	64	Retained
266	River Red-gum	58	Retained
267	River Red-gum	56	Retained
268	River Red-gum	58	Retained
269	River Red-gum	52	Retained
270	River Red-gum	68	Retained
271	River Red-gum	93	Retained
272	River Red-gum	59	Retained
273	River Red-gum	60	Retained
274	River Red-gum	80	Retained
275	River Red-gum	182	Retained
276	Stag	143	Retained
277	River Red-gum	107	Retained
278	Stag	69	Retained
279	Stag	113	Retained
280	River Red-gum	118	Retained
281	River Red-gum	65	Retained
282	River Red-gum	155	Retained
283	River Red-gum	106	Retained
284	River Red-gum	171	Retained
285	River Red-gum	77	Removed
286	River Red-gum	92	Removed
287	River Red-gum	107	Removed
288	River Red-gum	55	Retained
289	River Red-gum	74	Removed
290	River Red-gum	115	Removed
291	River Red-gum	96	Removed
292	River Red-gum	77	Removed
293	River Red-gum	88	Retained
294	River Red-gum	79	Removed
295	River Red-gum	58	Retained
296	Stag	62	Retained
297	River Red-gum	76	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
298	River Red-gum	89	Retained
299	River Red-gum	96	Retained
300	River Red-gum	72	Retained
301	River Red-gum	71	Retained
302	River Red-gum	65	Retained
303	River Red-gum	64	Retained
304	Black Box	61	Retained
305	River Red-gum	82	Retained
306	Stag	81	Removed
307	River Red-gum	59	Retained
308	River Red-gum	50	Retained
309	Black Box	55	Removed
310	River Red-gum	165	Removed
311	Stag	102	Removed
312	River Red-gum	52	Retained
313	River Red-gum	47	Removed
314	River Red-gum	81	Retained
315	River Red-gum	112	Retained
316	River Red-gum	61	Retained
317	Stag	61	Retained
318	River Red-gum	93	Retained
319	River Red-gum	100	Retained
320	Stag	69	Retained
321	Stag	104	Removed
322	River Red-gum	70	Retained
323	River Red-gum	54	Retained
324	River Red-gum	63	Removed
325	River Red-gum	68	Retained
326	River Red-gum	171	Removed
327	River Red-gum	58	Retained
328	Stag	65	Retained
329	River Red-gum	84	Removed
330	River Red-gum	70	Removed
331	Black Box	61	Removed
332	Stag	106	Retained
333	River Red-gum	122	Removed
334	River Red-gum	104	Removed
335	River Red-gum	54	Retained
336	River Red-gum	54	Retained
337	River Red-gum	79	Removed
338	River Red-gum	152	Removed
339	River Red-gum	94	Retained
340	River Red-gum	70	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
341	River Red-gum	66	Retained
342	River Red-gum	116	Removed
343	Stag	254	Removed
344	River Red-gum	50	Retained
345	River Red-gum	144	Removed
346	River Red-gum	150	Removed
347	River Red-gum	55	Retained
348	Black Box	49	Retained
349	River Red-gum	45	Retained
350	River Red-gum	49	Retained
351	Stag	80	Removed
352	Black Box	68	Removed
353	Black Box	53	Retained
354	Black Box	47	Removed
355	Black Box	54	Removed
356	Black Box	84	Removed
357	Black Box	48	Retained
358	River Red-gum	79	Retained
359	Stag	146	Removed
360	River Red-gum	65	Retained
361	Stag	85	Removed
362	River Red-gum	109	Removed
363	River Red-gum	57	Removed
364	River Red-gum	49	Retained
365	River Red-gum	19	Retained
366	River Red-gum	48	Retained
367	River Red-gum	42	Retained
368	River Red-gum	63	Retained
369	River Red-gum	40	Retained
370	River Red-gum	81	Removed
371	Stag	53	Removed
372	Black Box	74	Removed
373	River Red-gum	60	Removed
374	Stag	45	Retained
375	Black Box	59	Removed
376	Black Box	41	Removed
377	Black Box	42	Retained
378	Black Box	43	Removed
379	River Red-gum	151	Retained
380	Black Box	50	Retained
381	Black Box	45	Retained
382	River Red-gum	125	Retained
383	Black Box	32	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
384	Black Box	41	Retained
385	Black Box	39	Retained
386	Black Box	40	Retained
387	Black Box	45	Retained
388	Black Box	52	Removed
389	Black Box	47	Retained
390	Black Box	42	Retained
391	Black Box	62	Retained
392	River Red-gum	136	Retained
393	Black Box	48	Retained
394	Black Box	41	Removed
395	River Red-gum	43	Retained
396	River Red-gum	90	Retained
397	Black Box	41	Removed
398	Black Box	49	Retained
399	Black Box	42	Removed
400	Black Box	40	Retained
401	Black Box	43	Retained
402	Black Box	45	Retained
403	Black Box	47	Retained
404	Black Box	42	Retained
405	Stag	42	Retained
406	Black Box	44	Retained
407	Black Box	48	Retained
408	Black Box	85	Retained
409	Black Box	52	Removed
410	Black Box	48	Retained
411	Black Box	66	Retained
412	Black Box	43	Removed
413	Black Box	41	Removed
414	Black Box	65	Removed
415	Black Box	53	Retained
416	Black Box	43	Retained
417	Black Box	53	Retained
418	Black Box	51	Retained
419	Black Box	41	Removed
420	Black Box	42	Retained
421	Stag	44	Retained
422	Stag	43	Retained
423	Stag	68	Removed
424	Black Box	83	Removed
425	Stag	64	Removed
426	Black Box	68	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
427	Stag	43	Retained
428	Black Box	60	Retained
429	Black Box	44	Removed
430	Stag	56	Retained
431	Black Box	58	Retained
432	Black Box	51	Retained
433	Black Box	76	Retained
434	Black Box	69	Retained
435	Stag	48	Retained
436	Stag	48	Retained
437	Black Box	65	Removed
438	Stag	43	Retained
439	Black Box	57	Retained
440	Black Box	56	Retained
441	Black Box	52	Removed
442	Stag	47	Retained
443	Black Box	52	Retained
444	Black Box	51	Removed
445	Black Box	57	Removed
446	Stag	41	Retained
447	Stag	54	Retained
448	Black Box	45	Removed
449	Stag	69	Retained
450	Black Box	58	Retained
451	Stag	68	Removed
452	Black Box	79	Removed
453	Black Box	50	Retained
454	Black Box	54	Removed
455	Black Box	51	Retained
456	Black Box	56	Retained
457	Black Box	44	Retained
458	Stag	44	Retained
459	Black Box	54	Retained
460	Black Box	56	Removed
461	Black Box	94	Removed
462	Stag	43	Removed
463	River Red-gum	120	Removed
464	Stag	51	Retained
465	River Red-gum	94	Retained
466	Black Box	62	Retained
467	River Red-gum	103	Retained
468	River Red-gum	89	Removed
469	River Red-gum	100	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
470	Stag	111	Removed
471	Stag	59	Retained
472	River Red-gum	110	Removed
473	River Red-gum	125	Removed
474	River Red-gum	211	Removed
475	River Red-gum	92	Removed
476	River Red-gum	103	Removed
477	River Red-gum	109	Removed
478	Stag	105	Removed
479	Stag	125	Removed
480	River Red-gum	128	Removed
481	Stag	118	Removed
482	Stag	54	Removed
483	River Red-gum	92	Removed
484	River Red-gum	95	Removed
485	Stag	85	Removed
486	Black Box	68	Retained
487	Stag	115	Removed
488	Stag	49	Retained
489	River Coobah	42	Retained
490	Stag	45	Retained
491	River Coobah	43	Retained
492	Stag	65	Removed
493	Stag	45	Removed
494	Stag	43	Removed
495	Stag	120	Removed
496	Stag	93	Removed
497	Stag	91	Removed
498	Black Box	41	Retained
499	River Red-gum	115	Retained
500	Black Box	43	Retained
501	River Red-gum	140	Retained
502	River Red-gum	110	Retained
503	River Red-gum	102	Retained
504	River Red-gum	150	Retained
505	River Red-gum	131	Retained
506	Stag	74	Retained
507	Stag	193	Retained
508	River Red-gum	133	Retained
509	River Red-gum	219	Retained
510	River Red-gum	129	Retained
511	River Red-gum	237	Retained
512	River Red-gum	52	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
513	River Red-gum	92	Retained
514	Black Box	48	Retained
515	Black Box	45	Retained
516	Black Box	49	Removed
517	Black Box	45	Removed
518	Black Box	32	Retained
519	Stag	78	Retained
520	River Red-gum	115	Retained
521	River Red-gum	210	Retained
522	Black Box	40	Retained
523	Black Box	53	Retained
524	Black Box	45	Retained
525	River Red-gum	93	Retained
526	Black Box	45	Retained
527	Black Box	70	Retained
528	River Red-gum	130	Retained
529	River Red-gum	143	Retained
530	River Red-gum	57	Retained
531	Black Box	62	Retained
532	River Red-gum	105	Retained
533	Black Box	61	Retained
534	Black Box	70	Retained
535	Black Box	40	Retained
536	River Red-gum	158	Removed
537	Black Box	43	Removed
538	Stag	73	Removed
539	Black Box	59	Removed
540	Black Box	40	Removed
541	Stag	68	Removed
542	Stag	57	Removed
543	Stag	62	Retained
544	Stag	41	Removed
545	Stag	45	Removed
546	Stag	44	Retained
547	Stag	20	Retained
548	Black Box	58	Retained
549	Stag	85	Retained
550	Black Box	56	Retained
551	Black Box	89	Retained
552	Black Box	47	Retained
553	Black Box	79	Retained
554	Black Box	56	Removed
555	Black Box	60	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
556	Black Box	41	Removed
557	Black Box	49	Retained
558	Black Box	48	Removed
559	Black Box	64	Removed
560	Black Box	44	Removed
561	Black Box	48	Retained
562	Black Box	43	Removed
563	Black Box	47	Removed
564	Black Box	61	Removed
565	Black Box	61	Retained
566	Black Box	42	Retained
567	Black Box	68	Retained
568	Black Box	76	Retained
569	Black Box	49	Retained
570	Black Box	81	Retained
571	Black Box	46	Retained
572	Stag	140	Retained
573	Black Box	47	Retained
574	Black Box	102	Retained
575	Black Box	65	Retained
576	Black Box	78	Removed
577	Stag	82	Retained
578	Black Box	114	Retained
579	River Red-gum	125	Retained
580	Black Box	44	Retained
581	Black Box	46	Retained
582	Black Box	46	Removed
583	Black Box	54	Retained
584	Black Box	69	Retained
585	Black Box	46	Retained
586	Black Box	67	Retained
587	Black Box	58	Retained
588	Black Box	50	Removed
589	Black Box	73	Retained
590	Black Box	84	Retained
591	Black Box	45	Retained
592	Black Box	45	Retained
593	Black Box	42	Retained
594	Black Box	45	Retained
595	Black Box	80	Removed
596	Black Box	54	Removed
597	Black Box	85	Removed
598	Black Box	63	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
599	Black Box	54	Retained
600	River Red-gum	110	Retained
601	Black Box	42	Retained
602	Black Box	52	Retained
603	Stag	57	Retained
604	Stag	49	Retained
605	Black Box	50	Retained
606	Black Box	65	Retained
607	Black Box	66	Retained
608	Stag	73	Retained
609	Stag	76	Retained
610	Stag	120	Retained
611	Black Box	76	Retained
612	Black Box	35	Retained
613	Stag	45	Retained
614	Black Box	64	Retained
615	Black Box	65	Retained
616	Black Box	63	Retained
617	Black Box	69	Retained
618	Black Box	51	Retained
619	Black Box	53	Retained
620	Black Box	59	Retained
621	Stag	57	Retained
622	Black Box	66	Retained
623	Stag	47	Retained
624	Stag	42	Removed
625	Black Box	75	Removed
626	Black Box	53	Retained
627	Stag	48	Retained
628	Black Box	77	Retained
629	Black Box	45	Retained
630	Black Box	40	Retained
631	Black Box	88	Removed
632	Black Box	71	Retained
633	Black Box	66	Removed
634	Black Box	68	Retained
635	Black Box	69	Removed
636	Stag	67	Retained
637	Black Box	76	Retained
638	Stag	98	Removed
639	Black Box	77	Removed
640	Stag	75	Retained
641	Stag	58	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
642	Black Box	68	Retained
643	Stag	46	Removed
644	Stag	68	Retained
645	Black Box	76	Removed
646	Black Box	58	Removed
647	Black Box	57	Removed
648	Stag	69	Removed
649	Black Box	61	Retained
650	Black Box	72	Retained
651	Stag	63	Removed
652	Black Box	57	Retained
653	Stag	59	Removed
654	Black Box	72	Removed
655	Black Box	40	Retained
656	Black Box	60	Retained
657	Stag	50	Removed
658	Stag	46	Removed
659	Stag	59	Removed
660	Stag	71	Removed
661	Stag	94	Retained
662	Black Box	97	Retained
663	Stag	46	Retained
664	Black Box	41	Retained
665	Stag	56	Retained
666	Stag	79	Retained
667	Stag	64	Retained
668	Stag	42	Retained
669	Stag	62	Retained
670	Black Box	46	Retained
671	Black Box	60	Retained
672	Black Box	44	Retained
673	Black Box	53	Retained
674	Black Box	73	Retained
675	Black Box	50	Retained
676	Black Box	47	Retained
677	Black Box	50	Retained
678	Black Box	55	Retained
679	Stag	51	Retained
680	Black Box	50	Retained
681	Black Box	43	Retained
682	Black Box	43	Retained
683	Black Box	104	Retained
684	Black Box	59	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
685	Black Box	50	Retained
686	Black Box	48	Retained
687	Stag	69	Retained
688	Black Box	47	Retained
689	Black Box	44	Retained
690	Black Box	50	Retained
691	Black Box	45	Retained
692	Black Box	45	Retained
693	Black Box	48	Retained
694	Black Box	49	Retained
695	Black Box	51	Retained
696	Black Box	74	Retained
697	Black Box	64	Retained
698	Black Box	56	Retained
699	Black Box	50	Retained
700	Black Box	56	Retained
701	Black Box	46	Retained
702	Black Box	55	Retained
703	Black Box	51	Retained
704	Black Box	45	Retained
705	Black Box	50	Retained
706	Black Box	55	Retained
707	Black Box	44	Retained
708	Black Box	48	Retained
709	Stag	44	Retained
710	Black Box	82	Retained
711	Black Box	61	Retained
712	Black Box	55	Retained
713	Black Box	60	Retained
714	Stag	75	Retained
715	Black Box	77	Retained
716	Stag	49	Retained
717	Stag	68	Retained
718	Stag	63	Retained
719	Black Box	45	Retained
720	Black Box	50	Retained
721	Black Box	50	Retained
722	Black Box	55	Retained
723	Black Box	53	Retained
724	Stag	53	Retained
725	Stag	48	Retained
726	Stag	44	Retained
727	Stag	52	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
728	Stag	45	Retained
729	Black Box	59	Retained
730	Stag	46	Retained
731	Black Box	73	Retained
732	Stag	41	Retained
733	Stag	52	Retained
734	Black Box	62	Retained
735	Black Box	50	Retained
736	Black Box	68	Retained
737	Black Box	51	Retained
738	Black Box	50	Retained
739	Black Box	71	Retained
740	Stag	42	Retained
741	Black Box	47	Retained
742	Black Box	51	Retained
743	Black Box	42	Retained
744	Black Box	77	Retained
745	Black Box	72	Retained
746	Black Box	47	Retained
747	Stag	73	Retained
748	River Red-gum	64	Retained
749	Stag	82	Retained
750	Stag	98	Retained
751	Black Box	86	Retained
752	Black Box	44	Retained
753	Black Box	44	Removed
754	Black Box	66	Retained
755	Black Box	57	Retained
756	Black Box	63	Retained
757	Black Box	70	Retained
758	Black Box	69	Removed
759	Black Box	89	Removed
760	Black Box	38	Retained
761	Black Box	48	Removed
762	Stag	42	Removed
763	Stag	79	Retained
764	Black Box	142	Retained
765	Stag	52	Retained
766	Black Box	59	Retained
767	Black Box	51	Retained
768	Black Box	46	Retained
769	Black Box	95	Retained
770	Black Box	45	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
771	Black Box	50	Retained
772	Black Box	44	Retained
773	Black Box	46	Retained
774	Black Box	115	Removed
775	Black Box	91	Retained
776	Black Box	57	Retained
777	Stag	52	Retained
778	Black Box	45	Retained
779	Stag	47	Retained
780	Stag	53	Retained
781	River Red-gum	46	Retained
782	River Red-gum	56	Retained
783	River Red-gum	49	Retained
784	Black Box	45	Retained
785	Stag	83	Removed
786	Stag	44	Removed
787	Stag	50	Removed
788	Stag	66	Removed
789	Black Box	71	Removed
790	Black Box	53	Removed
791	Black Box	61	Removed
792	Black Box	105	Removed
793	Black Box	58	Removed
794	Black Box	51	Removed
795	Stag	43	Retained
796	Black Box	90	Retained
797	River Red-gum	37	Retained
798	Stag	106	Retained
799	Stag	135	Retained
800	River Red-gum	120	Retained
801	River Red-gum	74	Retained
802	River Red-gum	90	Retained
803	River Red-gum	83	Retained
804	Black Box	60	Retained
805	Stag	47	Removed
806	Black Box	66	Removed
807	River Red-gum	84	Removed
808	River Red-gum	86	Removed
809	Black Box	53	Retained
810	Black Box	56	Retained
811	Black Box	48	Retained
812	Stag	52	Retained
813	Stag	62	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
814	Black Box	62	Retained
815	Black Box	48	Retained
816	River Red-gum	185	Retained
817	River Red-gum	115	Retained
818	River Red-gum	147	Retained
819	River Red-gum	114	Removed
820	River Red-gum	90	Removed
821	River Red-gum	68	Retained
822	River Red-gum	115	Retained
823	Black Box	145	Removed
824	Stag	50	Retained
825	Stag	59	Retained
826	Stag	76	Removed
827	Stag	41	Retained
828	Stag	107	Retained
829	Stag	44	Retained
830	Black Box	56	Retained
831	Stag	54	Retained
832	Stag	52	Retained
833	Black Box	82	Retained
834	Stag	52	Retained
835	Black Box	70	Retained
836	Stag	42	Retained
837	Black Box	86	Retained
838	Black Box	64	Retained
839	Stag	44	Retained
840	Black Box	63	Removed
841	Stag	63	Retained
842	Stag	83	Retained
843	Stag	51	Retained
844	Stag	80	Retained
845	Black Box	119	Removed
846	Stag	45	Retained
847	Stag	98	Retained
848	Black Box	85	Removed
849	River Red-gum	100	Retained
850	River Red-gum	80	Retained
851	River Red-gum	106	Retained
852	River Red-gum	187	Retained
853	River Red-gum	143	Removed
854	River Red-gum	173	Removed
855	River Red-gum	153	Removed
856	River Red-gum	225	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
857	Stag	155	Removed
858	Stag	155	Removed
859	Stag	87	Retained
860	River Red-gum	158	Retained
861	River Red-gum	272	Retained
862	River Red-gum	115	Retained
863	River Red-gum	102	Removed
864	River Red-gum	128	Retained
865	River Red-gum	106	Retained
866	River Red-gum	108	Removed
867	River Red-gum	95	Removed
868	River Red-gum	111	Removed
869	River Red-gum	116	Removed
870	River Red-gum	104	Removed
871	Stag	84	Removed
872	River Red-gum	104	Removed
873	Stag	96	Removed
874	River Red-gum	127	Removed
875	River Red-gum	96	Removed
876	River Red-gum	135	Removed
877	River Red-gum	88	Removed
878	River Red-gum	97	Removed
879	Stag	88	Removed
880	River Red-gum	162	Removed
881	Stag	82	Removed
882	River Red-gum	91	Removed
883	River Red-gum	123	Removed
884	River Red-gum	84	Removed
885	River Red-gum	132	Retained
886	River Red-gum	162	Retained
887	River Red-gum	186	Retained
888	River Red-gum	190	Retained
889	River Red-gum	90	Retained
890	River Red-gum	81	Removed
891	River Red-gum	84	Removed
892	River Red-gum	168	Removed
893	River Red-gum	128	Retained
894	River Red-gum	117	Retained
895	River Red-gum	117	Retained
896	River Red-gum	143	Retained
897	River Red-gum	153	Removed
898	River Red-gum	112	Removed
899	River Red-gum	111	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
900	River Red-gum	96	Removed
901	River Red-gum	122	Removed
902	River Red-gum	100	Removed
903	Stag	98	Retained
904	Stag	119	Retained
905	River Red-gum	86	Retained
906	River Red-gum	93	Retained
907	River Red-gum	114	Retained
908	River Red-gum	132	Retained
909	River Red-gum	85	Retained
910	Stag	73	Retained
911	River Red-gum	103	Retained
912	Stag	107	Removed
913	River Red-gum	96	Removed
914		0	Retained
915	Stag	174	Retained
916	River Red-gum	144	Retained
917	Stag	87	Retained
918	River Red-gum	132	Retained
919	River Red-gum	146	Removed
920	Stag	78	Retained
921	Stag	113	Retained
922	River Red-gum	134	Retained
923	Stag	89	Retained
924	Black Box	40	Retained
925	Black Box	49	Removed
926	Black Box	43	Retained
927	Black Box	53	Retained
928	Black Box	59	Retained
929	Stag	40	Retained
930	Black Box	38	Retained
931	Black Box	53	Retained
932	Black Box	46	Retained
933	Black Box	40	Retained
934	Black Box	34	Retained
935	Black Box	62	Retained
936	Stag	51	Retained
937	Stag	48	Retained
938	Black Box	61	Removed
939	Black Box	66	Retained
940	Stag	57	Retained
941	Stag	44	Retained
942	Black Box	63	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
943	Stag	54	Retained
944	Black Box	45	Retained
945	Black Box	58	Retained
946	Black Box	62	Retained
947	Black Box	45	Retained
948	River Red-gum	101	Retained
949	River Red-gum	71	Retained
950	River Red-gum	71	Retained
951	River Red-gum	51	Retained
952	River Red-gum	54	Retained
953	stag	83	Retained
954	River Red-gum	82	Retained
955	River Red-gum	55	Retained
956	River Red-gum	63	Retained
957	Black Box	46	Retained
958	Black Box	54	Retained
959	Black Box	44	Retained
960	Black Box	44	Retained
961	Stag	45	Retained
962	Stag	48	Retained
963	Black Box	82	Retained
964	Stag	95	Retained
965	Black Box	36	Retained
966	Black Box	49	Retained
967	Stag	41	Removed
968	Black Box	57	Retained
969	Black Box	46	Retained
970	Black Box	42	Retained
971	Black Box	49	Retained
972	Black Box	48	Retained
973	Black Box	57	Retained
974	Black Box	83	Removed
975	Black Box	62	Removed
976	Black Box	59	Retained
977	River Red-gum	118	Retained
978	Black Box	70	Removed
979	River Red-gum	55	Removed
980	River Red-gum	100	Retained
981	Stag	107	Retained
982	River Red-gum	77	Retained
983	Stag	130	Retained
984	Stag	76	Retained
985	Stag	55	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
986	River Red-gum	87	Removed
987	Stag	80	Retained
988	Stag	53	Retained
989	Stag	58	Retained
990	Black Box	52	Removed
991	Black Box	75	Removed
992	Black Box	110	Retained
993	Stag	49	Retained
994	Stag	65	Retained
995	Black Box	52	Retained
996	Stag	55	Retained
997	Black Box	60	Retained
998	Black Box	80	Retained
999	Black Box	50	Retained
1000	Black Box	60	Retained
1001	River Red-gum	113	Removed
1002	Stag	125	Removed
1003	Black Box	52	Removed
1004	River Red-gum	92	Removed
1005	River Red-gum	115	Removed
1006	River Red-gum	90	Retained
1007	River Red-gum	113	Retained
1008	River Red-gum	185	Retained
1009	River Red-gum	119	Retained
1010	River Red-gum	110	Removed
1011	River Red-gum	147	Removed
1012	River Red-gum	138	Removed
1013	River Red-gum	144	Removed
1014	River Red-gum	116	Removed
1015	Stag	68	Removed
1016	River Red-gum	100	Removed
1017	Stag	93	Removed
1018	River Red-gum	140	Removed
1019	River Red-gum	186	Removed
1020	River Red-gum	174	Retained
1021	River Red-gum	154	Retained
1022	River Red-gum	91	Removed
1023	River Red-gum	137	Removed
1024	River Red-gum	120	Retained
1025	River Red-gum	103	Retained
1026	River Red-gum	112	Retained
1027	Stag	60	Removed
1028	Black Box	127	Retained

Tree ID	Tree Species	DBH (cm)	Retained / Removed
1029	Black Box	54	Removed
1030	Black Box	58	Removed
1031	Black Box	67	Retained
1032	Black Box	59	Removed
1033	Black Box	64	Retained
1034	Black Box	39	Removed
1035	Black Box	55	Retained
1036	River Red-gum	118	Retained
1037	River Red-gum	134	Retained
1038	River Red-gum	155	Retained
1039	River Red-gum	142	Removed
1040	Black Box	62	Retained
1041	Black Box	88	Retained
1042	Stag	99	Retained
1043	Black Box	68	Removed
1044	Black Box	54	Removed
1045	Black Box	93	Removed
1046	Black Box	52	Removed
1047	Black Box	61	Removed
1048	Black Box	60	Retained
1049	Black Box	55	Retained
1050	Black Box	72	Removed
1051	Stag	88	Removed
1052	River Red-gum	99	Removed
1053	Stag	69	Removed
1054	River Red-gum	96	Removed
1055	River Red-gum	132	Removed
1056	River Red-gum	118	Removed
1057	Stag	109	Removed
1058	Stag	116	Removed
1059	River Red-gum	99	Removed
1060	Stag	80	Removed
1061	River Red-gum	123	Removed
1062	Stag	63	Retained
1063	Stag	94	Retained
1064	Black Box	70	Removed
1065	Stag	96	Removed
1066	River Red-gum	226	Removed
1067	Stag	101	Removed
1068	Stag	73	Removed
1069	River Red-gum	129	Removed
1070	River Red-gum	109	Removed
1071	Stag	134	Removed

Tree ID	Tree Species	DBH (cm)	Retained / Removed
1072	River Red-gum	133	Removed
1073	River Red-gum	174	Removed
1074	River Red-gum	211	Removed
1075	Black Box	66	Removed
1076	Stag	108	Removed
1077	Black Box	57	Removed
1078	River Red-gum	101	Removed
1079	River Red-gum	107	Removed
1080	Stag	73	Retained
1081	River Red-gum	115	Retained
1082	River Red-gum	84	Retained
1083	River Red-gum	80	Removed
1084	River Red-gum	124	Removed
1085	River Red-gum	109	Removed
1086	Black Box	65	Removed
1087	Black Box	68	Retained
1088	Black Box	108	Retained
1089	Black Box	66	Retained
1090	River Red-gum	148	Removed
1091	Stag	51	Retained
1092	River Red-gum	101	Removed
1093	Stag	89	Removed
1094	River Red-gum	100	Removed
1095	River Red-gum	83	Retained
1096	Black Box	86	Removed
1097	Black Box	59	Retained
1098	Black Box	62	Retained
1099	River Red-gum	76	Removed
1100	Black Box	86	Removed
1101	Stag	126	Removed
1102	Black Box	111	Retained
1103	Black Box	62	Removed
1104	Black Box	66	Removed
1105	Stag	84	Retained
1106	River Red-gum	70	Removed
1107	Black Box	79	Removed
1108	Black Box	91	Retained
1109	River Red-gum	109	Retained
1110	Black Box	59	Removed
1111	River Red-gum	103	Retained
1112	Black Box	51	Retained
1113	Black Box	46	Retained
1114	Black Box	48	Retained

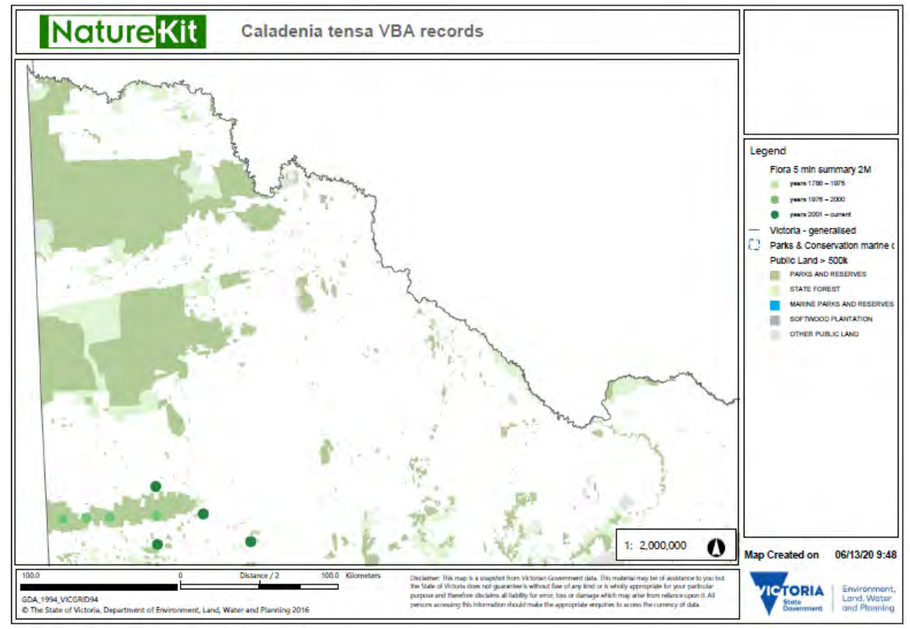
Tree ID	Tree Species	DBH (cm)	Retained / Removed
1115	Black Box	42	Removed
1116	Black Box	50	Retained
1117	Black Box	46	Retained
1118	Black Box	71	Removed
1119	Black Box	59	Removed
1120	Black Box	42	Removed
1121	Black Box	58	Removed
1122	Black Box	52	Removed
1123	Stag	59	Removed
1124	Black Box	55	Retained
1125	Black Box	73	Retained
1126	Stag	43	Removed
1127	Black Box	42	Retained
1128	Black Box	72	Retained
1129	Black Box	92	Retained
1130	Black Box	63	Removed
1131	Black Box	54	Removed
1132	Black Box	70	Removed
1133	Black Box	51	Removed
1134	Black Box	133	Removed
1135	Stag	52	Retained
1136	Black Box	43	Removed
1137	Black Box	89	Retained
1138	Black Box	57	Retained
1139	Black Box	85	Retained
1140	Black Box	51	Retained
1141	Black Box	45	Retained
1142	River Red-gum	83	Retained
1143	Black Box	40	Retained
1144	Black Box	47	Retained
1145	Black Box	49	Retained
1146	Dumosa Mallee	21	Retained
1147	Dumosa Mallee	33	Retained

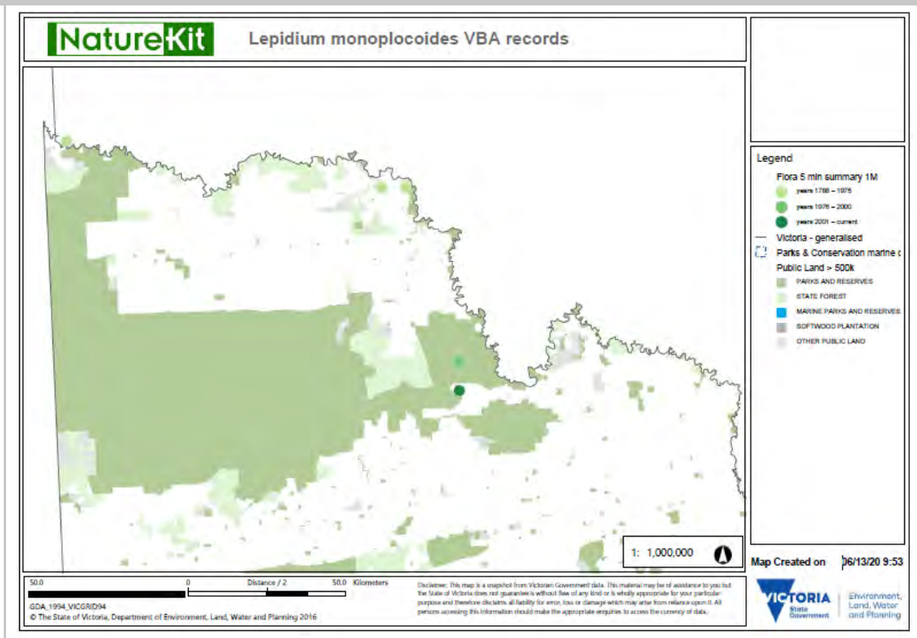
Appendix I. Significance assessment for EPBC Act-listed flora

EPBC Act	Below are the significant impact criteria for flora species identified during the PMST search that are listed under the EPBC Act as Vulnerable and Endangered. **NB – What is an important population of a species?** 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 **Endangered species - Significant impact criteria** 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: • Lead to a long-term decrease in the size of a population • Reduce the area of occupancy of the species • Fragment an existing population into two or more populations • Adversely affect habitat critical to the survival of a species • Disrupt the breeding cycle of a population • Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline • Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat • Introduce disease that may cause the species to decline, or • Interfere with the recovery of the species. **Vulnerable species - Significant impact criteria** An action is likely to have a significant impact on a vulnerable 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 a species • Reduce the area of occupancy of an important population • Fragment an existing important population into two or more populations • Adversely affect habitat critical to the survival of a species • Disrupt the breeding cycle of an important population • Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline • Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat • Introduce disease that may cause the species to decline, or • Interfere substantially with the recovery of the species.

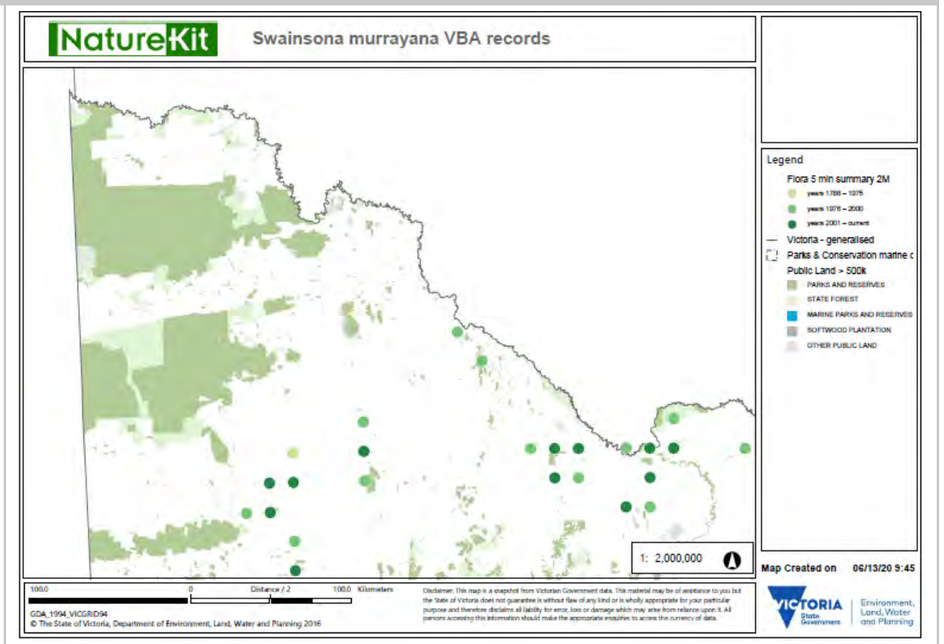
FFG Act / EE Act	An assessment of the potential for a significant effect on FFG Act 1988 listed flora under the EE Act 1978 was made, using the *'Ministerial guidelines for assessment of environmental effects under the Environmental Effects (EE) At 1978'* which lists a number of triggers for an Environmental Effects Statement (EES) referral, which for threatened species includes: • Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria. • Matters listed under the Flora and Fauna Guarantee Act 1988: – Potential loss of a significant area of a listed ecological community; or – Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or – Potential loss of critical habitat; or – Potential significant effects on habitat values of a wetland supporting migratory bird species

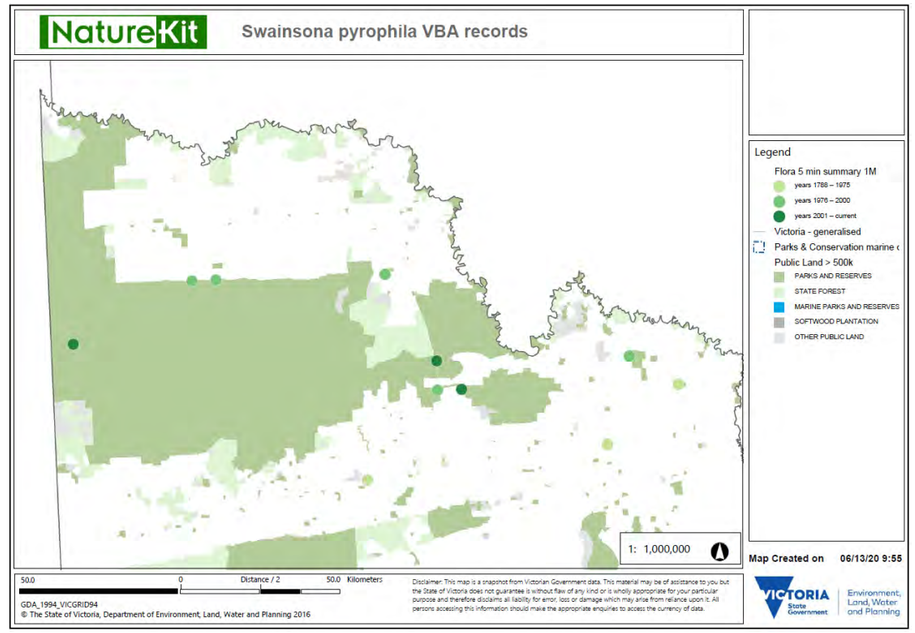
Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
Austrostipa metatoris A Spear Grass	VU	NSW species. Grows in sandy areas of the Murray Valley	**Construction Footprint** **Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. And no records within 50 km of site. **Inundation Area:** **Highly Unlikely.** NSW species only. Suitable habitat could be present within the Inundation Area, but not in known distribution area.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • As the species is known only to occur in NSW, it's unlikely that any sandy areas potentially containing suitable habitat, would be considered critical to the survival of the species. • As the species has not been recorded in Victoria, it is unlikely that the proposed works would impact the lifecycle of this species, or that the works would modify, destroy, remove or isolate or decrease the availability or quality of habitat for this species. • As the species is known only to occur in NSW, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is known only to occur in NSW, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded in Victoria, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded in Victoria, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	**No known records of this species in Victoria.**
Brachyscome papillosa Mossgiel Daisy	VU	NSW species. Grows on saltbush plains; chiefly from Mossgiel to Urana.	**Construction Footprint: Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. And no records within 50 km of site. **Inundation Area:** **Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • As the species is known only to occur in NSW, it's unlikely that any saltbush plain areas potentially containing suitable habitat, would be considered critical to the survival of the species. • As the species has not been recorded in Victoria, it is unlikely that the proposed works would impact the lifecycle of this species, or that the works would modify, destroy, remove or isolate or decrease the availability or quality of habitat for this species. • As the species is known only to occur in NSW, it is unlikely that the	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded in Victoria, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded in Victoria, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	**No known records of this species in Victoria.**

Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
				proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is known only to occur in NSW, it's unlikely that the proposed works would interfere with the recovery of the species.		
Caladenia tensa Greencomb Spider-orchid	EN, vu	In Victoria found mainly in the Little Desert area (also with an isolated record for near Wood Wood) in Eucalyptus/Callitris woodland on well-drained sandy soil (Walsh & Entwisle 1994).	**Construction Footprint: Highly Unlikely.** No suitable habitat recorded in the Construction Footprint, and no records within 100 km of the site. **Inundation Area:** **Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated, and no records within 100 km of the site.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur within the vicinity of Little Desert National Park, over 100 km to the south. Therefore there are no populations of the species present or likely to be impacted by the proposed works. • As the species has not been recorded within 100 km of Belsar-Yungera, the works will not decrease the size of a population of this species, reduce the area of occupancy of the species, or fragment an existing population of the species. • As the species is not known to occur within 100 km of Belsar-Yungera, the proposed works are unlikely to affect critical habitat for the species, or to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. • As the species is not known to occur within 100 km of Belsar-Yungera, it is unlikely that the proposed works would impact the lifecycle of individuals within a known population of the species. • As the species is known only to occur in the Little Desert National Park region in Victoria, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is not known to occur within 100 km of Belsar-Yungera, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur from the Little Desert National Park region in Victoria. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded within 100 km of Belsar-Yungera, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded within 100 km of Belsar-Yungera, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	

Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
Lepidium monoplocoides Winged Peppercress	EN, L, en	Uncommon in north western quarter of state, mostly on heavy soils near lakes and watercourses. Flowers mostly spring-summer (Walsh & Entwisle 1996).	**Construction Footprint: Unlikely.** Suitable habitat, but not in known distribution area, and no records within 50 km of site. **Inundation Area:** **Unlikely.** Suitable habitat could be present within the Inundation Area, but not in known distribution area (the nearest records are over 50 km west at Hattah Kulkyne National Park.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and despite extensive surveys for this species across the region, the nearest known population is in Hattah-Kulkyne National Park, over 50 km to the west. Therefore there are no populations of the species present or likely to be impacted by the proposed works. • As the species has not been recorded within 50 km of Belsar-Yungera, the works will not decrease the size of a population of this species, reduce the area of occupancy of the species, or fragment an existing population of the species. • As the species is not known to occur within 50 km of Belsar-Yungera, the proposed works are unlikely to affect critical habitat for the species, or to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. • As the species is not known to occur within 50 km of Belsar-Yungera, it is unlikely that the proposed works would impact the lifecycle of individuals within a known population of the species. • As the species is known only to occur in the distinct locations in Victoria, with the closest population over 50 km west of Belsar-Yungera at Hattah-Kulkyne National Park, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is not known to occur within 50 km of Belsar-Yungera, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and the nearest known occurrence is over 50 km away in Hattah Kulkyne National Park. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded within 50 km of Belsar-Yungera, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded within 50 km of Belsar-Yungera, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	

Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
Solanum karsense Menindee Nightshade	VU	Grows in flooded depressions.	**Construction Footprint: Highly Unlikely.** NSW species only. Suitable habitat was identified during survey, but not recorded in 2013, 2015 or 2019 surveys. **Inundation Area:** **Highly Unlikely.** NSW species only. Suitable habitat could be present within the Inundation Area, but not in known distribution area.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • As the species is known only to occur in NSW, it's unlikely that any flooded depressions potentially containing suitable habitat, would be considered critical to the survival of the species. • As the species has not been recorded in Victoria, it is unlikely that the proposed works would impact the lifecycle of this species, or that the works would modify, destroy, remove or isolate or decrease the availability or quality of habitat for this species. • As the species is known only to occur in NSW, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is known only to occur in NSW, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is only known to occur in NSW. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded in Victoria, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded in Victoria, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	**No known records of this species in Victoria.**

Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
Swainsona murrayana Slender Darling-pea	VU, L, en	Rare species, apparently restricted to a few sites in north-central Victoria (mostly between Bendigo and the Murray River) where it grows in grassland on heavy red soils and is now almost confined to roadside remnants (Walsh and Entwisle 1999).	**Construction Footprint: Highly Unlikely.** No suitable habitat recorded in study sites. Nearest record approximately 100 km away. **Inundation Area:** **Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated. Nearest record approximately 100 km away.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is the closest records in Victoria occur >100 km to the south. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • As the species is known only to occur 100 km to the south of Belsar-Yungera in Victoria, it's unlikely that any grasslands on heavy red soils at the site potentially containing suitable habitat, would be considered critical to the survival of the species. • As the species is known only to occur 100 km to the south of Belsar-Yungera in Victoria, it is unlikely that the proposed works would impact the lifecycle of this species, or that the works would modify, destroy, remove or isolate or decrease the availability or quality of habitat for this species. • As the species is known only to occur 100 km to the south of Belsar-Yungera in Victoria, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the species is known only to occur 100 km to the south of Belsar-Yungera in Victoria, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and the nearest known occurrence is over 100 km away to the south. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded within 100 km of Belsar-Yungera, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded within 100 km of Belsar-Yungera, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	

Scientific Name	Status	Habitat	Likelihood of Occurrence/Impact	Assessment of Significance under EPBC Act	Assessment of significance under FFG Act and EE Act	Victorian Distribution
Swainsona pyrophila Yellow Swainson-pea	VU, vu	Rare in Victoria, known only from the far north west where rare. Grows in mallee scrub on sandy or loamy soil and usually found only after fire (Walsh and Entwisle 1996).	**Construction Footprint: Highly Unlikely.** No suitable habitat recorded in study sites. **Inundation Area:** **Highly Unlikely.** Suitable habitat is unlikely to be present within the floodplain areas proposed to be inundated	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and in fact is the closest records in Victoria occur over 50 km to the west. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species inhabits mallee scrub, and the nearest known location is >50 km to the west of Belsar-Yungera. No mallee scrub was identified within the Construction Footprint or in the Inundation Area, therefore it's considered unlikely that there is any habitat critical for the survival of this species present. • As the nearest known record of the species is >50 km to the west of Belsar-Yungera in Victoria, it is unlikely that the proposed works would impact the lifecycle of this species, or that the works would modify, destroy, remove or isolate or decrease the availability or quality of habitat for this species. • As the nearest known record of the species is >50 km to the west of Belsar-Yungera in Victoria, it is unlikely that the proposed works would result in invasive species invading habitat for the species, or introducing disease that may cause the species to decline. • As the nearest known record of the species is >50 km to the west of Belsar-Yungera in Victoria, it's unlikely that the proposed works would interfere with the recovery of the species.	It is unlikely that the proposed works will have a significant impact on this species. • The species has not been recorded at Belsar-Yungera, and the nearest known occurrence is over 50 km away in Hattah Kulkyne National Park. Therefore there are no important populations of the species present or likely to be impacted by the proposed works. • The species has not been recorded within 50 km of Belsar-Yungera, therefore the works won't impact known habitat or a known population of this species. • The species has not been recorded within 50 km of Belsar-Yungera, therefore the works won't impact a genetically important population of the species or any habitat considered critical for the species.	

Appendix J. Significance assessment for EPBC-listed fauna

Below are the significant impact criteria for species listed under the EPBC Act as Vulnerable and Critically Endangered. The criteria are addressed below for the EPBC Act Vulnerable (VU) listed Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*), Painted Honeyeater (Grantiella picta), Growling Grass Frog (*Litoria raniformis*) and Murray Cod (*Maccullochella peelii*), and Critically Endangered Silver Perch (*Bidyanus bidyanus*), and any potential impacts to these species from the proposed works.

NB – What is an important population of a species?

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

Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*) - EPBC Act – Vulnerable, FFG Act – Listed, Victorian Advisory List - Vulnerable
Lead to a long-term decrease in the size of an important population of a species
The Regent Parrot is well known and frequently recorded throughout Belsar-Yungera Islands and the adjacent Peacock Creek area in NSW, with a number of well-known breeding populations within both of these areas along the Murray River, including within the Area of Investigation. The proposed Construction Footprints each represent very small areas, but one (S108) is close to known breeding areas along Gearbox Loop Track. Other Construction Footprints are in areas of potential Regent Parrot breeding habitat (ER3, ER1, S7 and the Bonyaricall Creek hard stand). All of these Construction Footprints were targeted for nesting surveys using the standardised two-hour point count (THPC) method during the breeding season, and despite much Regent Parrot activity no nesting activity was observed. Where possibly, siting of Construction Footprints has been in areas that avoid potential Regent Parrot nesting areas; large River Red-gums. Based on the results of the targeted nest surveys, it is considered unlikely that the proposed actions will lead to a long-term decrease in the size of an important population of this species. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy woodlands for foraging (Seran BL&A 2018).
Reduce the area of occupancy of an important population
The proposed Construction Footprint areas represent less than 0.61% of the potential habitat for this species (50.35 hectares within the 8,300 hectare Belsar-Yungera Floodplain complex of high quality native vegetation within the surrounding State Park, and represent very small, isolated and discreet areas of habitat within an extensive area in the broader landscape of many thousands of hectares of suitable habitat for this highly mobile species. This will not significantly reduce the area of occupancy of this population as the structures will be established on already disturbed tracks and levees. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy woodlands for foraging (Seran BL&A 2018).
Fragment an existing important population into two or more populations
The proposed Construction Footprint areas represent less than 0.61% of the potential habitat for this species (50.35 hectares within the 8,300 hectares of Belsar-Yungera Floodplain complex) within the surrounding Belsar-Yungera state forest habitat, and represent very small, isolated and discreet areas of habitat within an extensive area in the broader landscape of many tens of thousands of hectares of suitable habitat for this highly mobile species, and will not fragment the existing population into two or more populations. Previous similar and larger impacts in this area for The Living Murray projects did not negatively impact Regent Parrot nesting extent and success.

Adversely affect habitat critical to the survival of a species
The proposed Construction Footprints each represent very small areas, but one (S108) is close to known breeding areas along Gearbox Loop Track. Other Construction Footprints are in areas of potential Regent Parrot breeding habitat (ER3, ER1, S7 and Bonyaricall Creek hard stand). All of these Construction Footprints were targeted for nesting surveys using the standardised two-hour point count (THPC) method during the breeding season, and despite much Regent Parrot activity no nesting activity was observed. Where possibly, siting of Construction Footprints has been in areas that avoid potential Regent Parrot nesting areas; large River Red-gums. Based on the results of the targeted nest surveys, it is considered unlikely that the proposed Construction Footprints will remove any potential nesting habitat, or adversely affect habitat critical to the survival of this species, as Construction Footprints represent very small, isolated and discreet areas of habitat within an extensive area of suitable habitat for this highly mobile species. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy woodlands for foraging (Seran BL&A 2018).
Disrupt the breeding cycle of an important population
The proposed Construction Footprints each represent very small areas, but one (S108) is close to known breeding areas along Gearbox Loop Track. Other Construction Footprints are in areas of potential Regent Parrot breeding habitat (ER3, ER1, S7 and Bonyaricall Creek hard stand). All of these Construction Footprints were targeted for nesting surveys using the standardised two-hour point count (THPC) method during the breeding season, and despite much Regent Parrot activity no nesting activity was observed. Where possibly, siting of Construction Footprints has been in areas that avoid potential Regent Parrot nesting areas; large River Red-gums. Based on the results of the targeted nest surveys, it is considered unlikely that the proposed Construction Footprints will disrupt the breeding cycle of an important population of the Regent Parrot, as Construction Footprints represent very small, isolated and discreet areas of habitat within an extensive area of suitable habitat for this highly mobile species. The project is likely to sustain and enhance large areas of habitat for this species, in particular potential breeding habitat, by promoting healthy woodlands for foraging (Seran BL&A 2018).
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed Construction Footprints represent relatively small (~50.35ha), isolated and discreet areas of suitable habitat within an extensive area of suitable habitat (over 8,300 ha Belsar-Yungera Floodplain complex, of which 2,374 ha will be inundated) surrounded by a much broader landscape (over ten thousand hectares) mapped as likely important breeding habitat for this species within the National Recovery Plan (Baker and Hurley 2011). The proposed Construction Footprints will not impact known nesting trees or areas considered high quality foraging habitat, and therefore will not significantly modify, destroy, remove, isolate or decrease the availability or quality of Regent Parrot habitat within the area. The project is likely to sustain and enhance large areas of habitat for this species, by promoting healthy woodlands for foraging (Seran BL&A 2018).
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
Weed infiltration is possible from the proposed works, within the limited areas of construction. Appropriate systems must be set in place and followed to minimise the possibility of weed dispersal and exotic predator control, and will be included in a Construction Environmental Management Plan (CEMP). Impacts to this species from invasive species have not been identified as a threatening process previously and are highly unlikely in this case.

Introduce disease that may cause the species to decline
The proposed construction works are not expected to introduce any avifauna diseases to the Regent Parrot populations of the Study Area (the greatest chance for this to occur will be transmittal of disease from captive birds to wild birds, with a very low chance of this occurring), particularly with hygiene protocols for vehicles/machinery/staff that will be further described in a CEMP that will be prepared for the project.
Interfere substantially with the recovery of the species.
The proposed construction activities will not interfere substantially with the recovery of the species, as this species and its breeding and foraging habitats will not be substationally impacted by the proposed works, directly or indirectly. As noted above, the construction footprints represent relatively small, isolated and discreet areas of suitable habitat within an extensive area of suitable habitat. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy woodlands for foraging (Seran BL&A 2018).

Painted Honeyeater (*Grantiella picta*) EPBC Act – Vulnerable, FFG Act – Listed, Victorian Advisory List - Vulnerable
Lead to a long-term decrease in the size of an important population of a species
The Painted Honeyeater has not been previously recorded within 10 km of the Construction Footprint or Inundation Area, but has the potential to utilise habitats within these areas, and may occasionally forage in mistletoe within areas of woodland. The proposed Construction Footprints are however not likely to significantly impact any areas of important habitat to this extremely mobile nomadic species, which forages widely over large areas in pursuit of mistletoe and flowering eucalypts. The proposed Construction Footprint represents a very small, low quality area of foraging habitat for this highly mobile species, and is considered highly unlikely to lead to a long-term decrease in the size of an important population of this species. The area does not represent core habitat or range for this species.
Reduce the area of occupancy of an important population
The proposed Construction Footprint are centred on existing tracks and degraded areas wherever possible. This will not significantly reduce the area of occupancy of any population as most structures will be established on previously disturbed tracks and clearances. The area does not represent core habitat or range for this species.
Fragment an existing important population into two or more populations
The proposed Construction Footprint represent small, isolated and discreet areas of habitat within an extensive area of potentially suitable habitat for this highly mobile species, and will not fragment an existing population into two or more populations. The area does not represent core habitat or range for this species.
Adversely affect habitat critical to the survival of a species
The proposed Construction Footprint represents small, isolated and discreet areas of habitat within an extensive area of potentially suitable, but largely marginal habitat for this highly mobile species, and will not fragment an existing population into two or more populations. The area does not represent core habitat or range for this species.
Disrupt the breeding cycle of an important population
The proposed Construction Footprint represents small, isolated and discreet areas of habitat within an extensive area of potentially suitable, but largely marginal habitat for this highly mobile species, and it is extremely unlikely to disrupt the breeding cycle of any population of this species. The area does not represent core habitat or range for this species.

Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed Construction Footprint represents small, isolated and discreet areas of habitat within an extensive area of potentially suitable, but largely marginal habitat for this highly mobile species, and it is extremely 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. The area does not represent core habitat or range for this species. The proposed construction works will not impact known or potential nesting trees or suitable foraging habitat, and therefore will not significantly modify, destroy, remove, isolate or decrease the availability or quality of Painted Honeyeater habitat within the area.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
Weed infiltration is possible from the proposed works, within the limited areas of construction. Appropriate systems must be set in place and followed to minimise the possibility of weed dispersal and exotic predator control, and will be included in a Construction Environmental Management Plan (CEMP). Impacts to this species from invasive species have not been identified as a threatening process previously and are highly unlikely in this case.
Introduce disease that may cause the species to decline
The proposed construction works are not expected to introduce any avifauna diseases to the Regent Parrot populations of the Study Area (the greatest chance for this to occur will be transmittal of disease from captive birds to wild birds, with a very low chance of this occurring), particularly with hygiene protocols for vehicles/machinery/staff that will be further described in a CEMP that will be prepared for the project.
Interfere substantially with the recovery of the species.
The proposed construction activities will not interfere substantially with the recovery of the species, as this species and its breeding and foraging habitats will not be impacted by the proposed works, directly or indirectly. The project is likely to enhance habitat for this species, by promoting healthy woodlands suitable for foraging (Seran BL&A 2018)

Growling Grass Frog (*Litoria raniformis*) - EPBC Act – Vulnerable, FFG Act – Listed, Victorian Advisory List - Endangered

Summary: Species recorded just four times previously within 10 km of the Construction Footprints and Inundation Area, with the last record in 1959 (VBA). Targeted surveys for this species in Construction Footprints in areas of potential habitat in 2012 (GHD 2013), 2013 (GHD 2014) and 2019 (this study) did not record any sign of Growling Grass Frog.

Lead to a long-term decrease in the size of an important population of a species

Growling Grass Frog has been recorded just four times within the broader Study Area, and was last recorded within 10 km of the Construction Footprints in 1959. Despite the long absence of records of this species, the presence of suitable habitat, and the ability of this species to recolonise areas suggest that it has potential to occur in the area, and a reintroduction of more suitable ecological watering regimes may help facilitate this.

The proposed Construction Footprints each represent very small, discreet areas, and total less than 0.61% of the potential floodplain habitat for this species (50.35 hectares within the 8,300 hectare Belsar-Yungera Floodplain complex) within the surrounding State Park. The Construction Footprints are predominantly dry areas, centred on existing tracks and degraded areas. Based on the results of the targeted surveys, it is considered unlikely that the proposed actions will lead to a long-term decrease in the size of an important population of this species.

Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider these aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water

The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy wetlands (Seran BL&A 2018).

Reduce the area of occupancy of an important population

The proposed Construction Footprints each represent very small, discreet areas, and total less than 0.61% of the potential floodplain habitat for this species (50.35 hectares within the 8,300 hectare Belsar-Yungera Floodplain complex) within the surrounding State Park. The proposed Construction Footprints are centred on existing tracks and degraded areas which will be predominantly dry during the construction process. Based on the results of the targeted surveys, it is considered unlikely that the proposed actions will significantly reduce the area of occupancy of this population as the structures will be established on dry, previously disturbed tracks and areas.

The project is likely to sustain and enhance large areas of habitat for this species, by promoting healthy wetlands.

Fragment an existing important population into two or more populations

The proposed Construction Footprints represent very small, isolated and discreet areas of habitat within an extensive area of potentially suitable habitat for this reasonably mobile species, and will not fragment an existing population into two or more populations. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy wetlands.

Adversely affect habitat critical to the survival of a species

The proposed Construction Footprints each represent very small, discreet areas, less than 0.61% of the potential floodplain habitat for this species (50.35 hectares within the 8,300 hectare Belsar-Yungera Floodplain complex) within the surrounding State Park, and are centred on existing tracks and degraded areas. Based on the results of the targeted surveys, it is considered unlikely that the proposed Construction Footprints will remove any potential critical habitat, or adversely affect habitat critical to the survival of this species.

The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy wetlands.

Disrupt the breeding cycle of an important population
The proposed Construction Footprints are predominately in dry areas, and construction will occur within these dry areas, which will not disrupt the breeding cycle of any populations of this species within these areas. Based on the results of the targeted surveys, it is considered unlikely that the proposed Construction Footprints will disrupt the breeding cycle of an important population of the Growling Grass Frog, as Construction Footprints represent very small, isolated and discreet areas of habitat within a broader area of potentially suitable habitat for this species.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed Construction Footprints represent relatively small (less than 0.61% of the potential floodplain habitat for this species (50.35 hectares within the 8,300 hectare Belsar-Yungera Floodplain complex)), isolated and discreet areas, surrounded by a much broader landscape (several tens of thousands of hectares) of potential habitat for this species. The proposed Construction Footprints are in predominantly dry areas and will not impact known breeding areas or areas considered high quality habitat, and therefore will not significantly modify, destroy, remove, isolate or decrease the availability or quality of Growling Grass Frog habitat within the area. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider these aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy wetland habitats.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
Weed infiltration is possible from the proposed works, within the limited areas of construction. Appropriate systems must be set in place and followed to minimise the possibility of weed dispersal and exotic predator control, and will be included in a Construction Environmental Management Plan (CEMP). Impacts to this species from invasive species have not been identified as a threatening process previously and are highly unlikely in this case.
Introduce disease that may cause the species to decline
Whilst direct impacts from works are not predicted for the Growling Grass Frog, indirect impacts from the proposed works may include the introduction or spread of Chytrid Fungus. Transmission of the disease from vehicles is unlikely, however, hygiene protocols for Chytrid Fungus should be included in a site specific CEMP as per Murray et al (2011) to minimise the risk of water and mud being transferred by vehicles between sites. Additionally if the handling of frogs is required during the proposed works (i.e. during salvage), a suitably qualified and experienced ecologist should be engaged, and employ hygiene protocols identified in Murray et al (2011). No significant impacts are expected, as per the significant impact thresholds by DEWHA 2010 for Growling Grass Frog. The return of environmental watering to the Construction Footprint will restore and enhance important ecological values, including suitable habitat for this species (DEWHA 2010), and many other species reliant of periodic flooding.
Interfere substantially with the recovery of the species.
The proposed construction activities will not interfere substantially with the recovery of the species, as this species and its breeding and foraging habitats will not be impacted by the proposed works, directly or indirectly. The project is likely to sustain and enhance large areas habitat for this species, by promoting healthy wetland habitats.

Murray Cod (*Maccullochella peelii*) - EPBC Act – Vulnerable, FFG Act – Listed, Victorian Advisory List - Vulnerable
Lead to a long-term decrease in the size of an important population of a species
The Murray Cod is known from the Belsar-Yungera area and has been previously recorded within the Study Area (GHD 2009). Murray Cod has the potential to occur at any of the wet sites on the Murray River or major creeks including the Bonyaricall, Narcooyia and Yungera Creeks, where localised impacts are possible. The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed actions will lead to a long-term decrease in the size of an important population of this species. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider this species. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Reduce the area of occupancy of an important population
The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed actions will lead to a reduction in the area of occupancy of an important population of this species. Murray Cod are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Bonyaricall, Narcooyia and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider this species. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Fragment an existing important population into two or more populations
The proposed Construction Footprints are in predominantly dry areas, and will not fragment an existing population into two or more populations. Murray Cod are likely to benefit from improved habitat connectivity following environmental watering. Under minor flood peaks the operation of Bonyaricall, Narcooyia and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Adversely affect habitat critical to the survival of a species
The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed Construction Footprints will remove any potential critical habitat, or adversely affect habitat critical to the survival of this species. Murray Cod are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Bonyaricall, Narcooyia and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented.

A construction specific aquatic fauna management plan would be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water. Blackwater management measures and a related water quality monitoring program on-site and within the Murray River would be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Murray cod within the Murray River.
Disrupt the breeding cycle of an important population
The proposed Construction Footprints are predominately in dry areas, and construction will occur within these dry areas, which will not disrupt the breeding cycle of any populations of this species present. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed Construction Footprints are in predominantly dry areas and will not impact known breeding areas or areas considered high quality habitat, and therefore will not significantly modify, destroy, remove, isolate or decrease the availability or quality of Murray Cod habitat within the area. Murray Cod are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Bonyaricall, Narcooyia and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider this species. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water. Blackwater management measures and a related water quality monitoring program on-site and within the Murray River would be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Murray Cod within the Murray River.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
Eleven alien fish species are now established in the Murray-Darling River system, with Carp *Cyprinus carpio*, Redfin Perch *Perca fluviatilis*, Goldfish *Carassius auratus* and Eastern Gambusia *Gambusia holbrooki* the most widespread (NMCRT, 2010). These species are already established in the vicinity of the project site. The construction phase of the project is not likely to lead to an increase in these species. Inundation of floodplain habitat during the operational phase has a high likelihood of increasing carp populations within wetland habitat and also in aquatic habitat that remains following flood events. Wetlands are not the preferred habitat for the species and the inundation events will mimic natural over-bank flows. That said, the impact of operation will create conditions that are likely to benefit carp, which may negatively impact Murray Cod. Following recommended mitigation measures (see DELWP, 2018) to control carp may minimise their colonisation. This could include measures such as implementing a winter fill regime, developing a native fish exit strategy to strand carp and drying of weltands with high carp density.
Introduce disease that may cause the species to decline
The likelihood of the introduction of disease during the construction phase is minimal if standard hygiene protocols are implemented.

Interfere substantially with the recovery of the species.
The proposed construction activities will not interfere substantially with the recovery of the species, as potential impacts to this species and its breeding and foraging habitats will be mitigated through a construction specific aquatic fauna management plan, design of infrastructure and adapative management of risks associated with blackwater, water quality and carp as is currently implemented on other watering projects (e.g. Hattah Lakes TLM works). This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.

EPBC Act listed Critically Endangered Species:

Silver Perch (*Bidyanus bidyanus*) - EPBC Act – Critically Endangered, FFG Act – Listed, Victorian Advisory List - Vulnerable
Lead to a long-term decrease in the size of a population
The Silver Perch has not been recorded previously from the Belsar-Yungera area, but suitable flowing habitat is likely to be present in Narcooyia, Bonyaricall and Yungera Creeks. Floodplain wetlands are likely to provide short-term foraging habitat. This species has the potential to occur at any of the wetland sites on the Murray River or major creeks including the Narcooyia, Bonyaricall and Yungera Creeks. The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed actions will lead to a long-term decrease in the size of an important population of this species. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider these aquatic fauna to avoid potential localised impacts. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Reduce the area of occupancy of the species
The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed actions will lead to a reduction in the area of occupancy of an important population of this species. Silver Perch are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Narcooyia, Bonyaricall and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider these aquatic fauna. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Fragment an existing important population into two or more populations
The proposed Construction Footprints are in predominantly dry areas, and will not fragment an existing population into two or more populations. Silver Perch are likely to benefit from improved habitat connectivity following environmental watering. Under minor flood peaks the operation of Narcooyia, Bonyaricall and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.

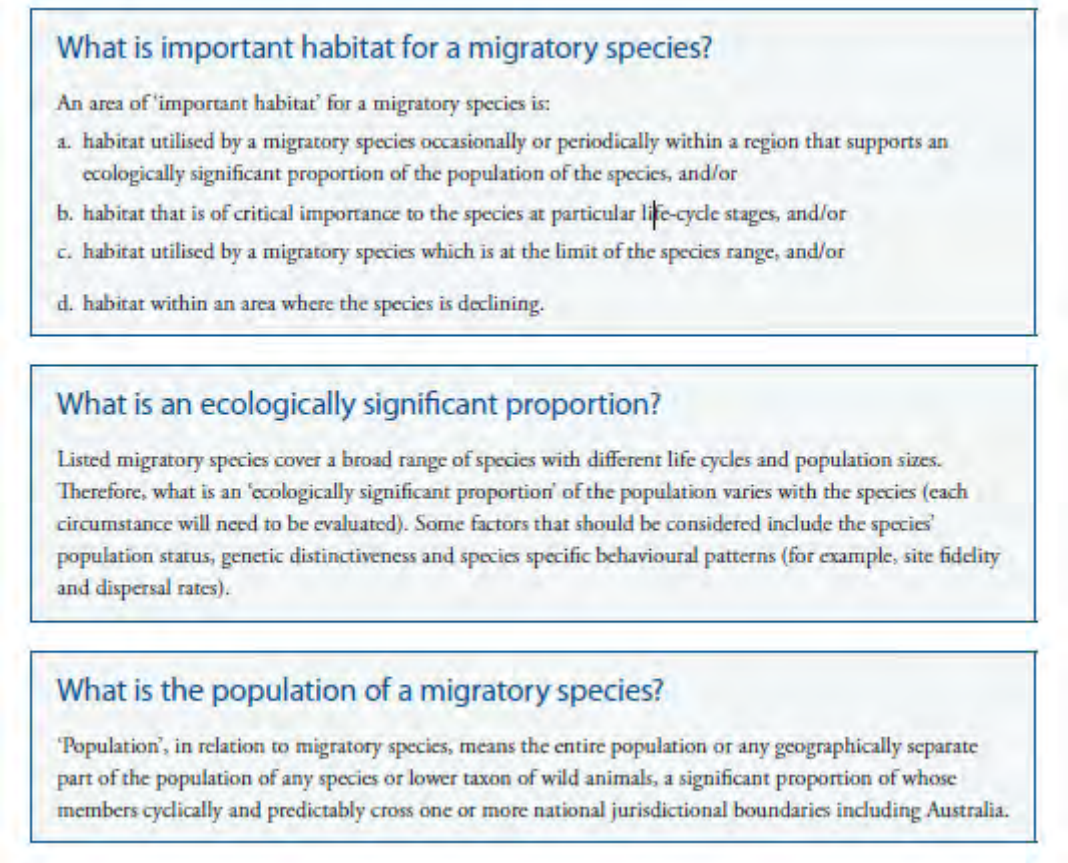
Adversely affect habitat critical to the survival of a species
The proposed Construction Footprints are in predominantly dry areas, and it is considered unlikely that the proposed Construction Footprints will remove any potential critical habitat, or adversely affect habitat critical to the survival of this species. Silver Perch are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Narcooyia, Bonyaricall and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. A construction specific aquatic fauna management plan would be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water. Blackwater management measures and a related water quality monitoring program on-site and within the Murray River would be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Murray cod within the Murray River.
Disrupt the breeding cycle of a population
The proposed Construction Footprints are predominately in dry areas, and construction will occur within these dry areas, which will not disrupt the breeding cycle of any populations of this species within these areas. A construction specific aquatic fauna management plan should be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The proposed Construction Footprints are in predominantly dry areas and will not impact known breeding areas or areas considered high quality habitat, and therefore will not significantly modify, destroy, remove, isolate or decrease the availability or quality of Silver Perch habitat within the area. Silver Perch are likely to benefit from improved habitat conditions following environmental watering. Under minor flood peaks the operation of Narcooyia, Bonyaricall and Yungera Creeks as flow-through systems will provide seasonal flowing conditions that are likely to be suitable for the species. Larger flood events will lead to a loss of flowing conditions but allow for foraging in wetland habitat. The provision of fish passage at the ER1 regulator and passive fish passage at other regulators will allow for fish to exit to the Murray River, provided a suitable drawdown regime is implemented. Consideration of any in-stream works such as coffer dam construction, dewatering works, and any potential for sediment/ contaminant run-off into wet areas from Construction Footprints must consider these aquatic fauna. A construction specific aquatic fauna management plan would be developed for all works around waterways. This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water. Blackwater management measures and a related water quality monitoring program on-site and within the Murray River would be established to adaptively manage risks to the downstream aquatic environment, which would afford protection to Silver Perch within the Murray River.
Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered of critically endangered species' habitat
Eleven alien fish species are now established in the Murray-Darling River system, with Carp *Cyprinus carpio*, Redfin Perch *Perca fluviatilis*, Goldfish *Carassius auratus* and Eastern Gambusia *Gambusia holbrooki* the most widespread (NMCRT, 2010). These species are already established in the vicinity of the project site. The construction phase of the project is not likely to lead to an increase in these species. Inundation of floodplain habitat during the operational phase has a high likelihood of increasing carp populations within wetland habitat and also in aquatic habitat that remains following flood events. Wetlands are not the preferred habitat for the species and the inundation events will mimic natural over-bank flows.

That said, the impact of operation will create conditions that are likely to benefit carp, which may negatively impact Silver Perch. Following recommended mitigation measures (see DELWP, 2018) to control carp may minimise their colonisation. This could include measures such as implementing a winter fill regime, developing a native fish exit strategy to strand carp and drying of weltands with high carp density.
Introduce disease that may cause the species to decline
Silver perch are highly susceptible to several diseases including Epizootic Haematopoietic Necrosis Virus (EHNV) (Langdon 1989). The likelihood of the introduction of disease during the construction phase is minimal if standard hygiene protocols are implemented. The return of environmental watering to the Construction Footprint will restore and enhance important ecological values, including suitable habitat for this species, and many other species reliant of periodic flooding.
Interfere with the recovery of the species.
The proposed construction activities will not interfere substantially with the recovery of the species, as potential impacts to this species and its breeding and foraging habitats will be mitigated through a construction specific aquatic fauna management plan, design of infrastructure and adapative management of risks associated with blackwater, water quality and carp as is currently implemented on other watering projects (e.g. Hattah Lakes TLM works). This species is considered likely to benefit from expanded habitat during, and improved habitat condition following environmental water.

Appendix K. Significance assessment for Migratory Species

Below are the significant impact criteria for EPBC Act listed migratory species used to determine whether there is a chance of a significant impact. They were applied to all species identified by the VBA and PMST database searches. The likelihood of occurrence, and likelihood of impact for these species has also been considered for the Construction Footprints (Appendix E) and Inundation Area (Appendix F). These species are Fork-tailed Swift (*Apus pacificus*), Yellow Wagtail (*Motacilla flava*), Satin Flycatcher (*Myiagra cyanoleuca*), Rufous Fantail (*Rhipidura rufifrons*), Common Sandpiper (*Actitis hypoleucus*), Sharp-tailed Sandpiper (*Calidris acuminata*), Curlew Sandpiper (*Calidris ferruginea*), Pectoral Sandpiper (*Calidris melanotos*), Latham's Snipe/Japanese Snipe (*Gallinago hardwickii*), Eastern Curlew (*Numenius madagascariensis*) and Common Greenshank (*Tringa nebularia*).

Important information regarding migratory species includes the following (taken from DAWE Significant Impact guidelines 2013):



What is important habitat for a migratory species?

An area of 'important habitat' for a migratory species is:

a. 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

b. habitat that is of critical importance to the species at particular life-cycle stages, and/or

c. habitat utilised by a migratory species which is at the limit of the species range, and/or

d. habitat within an area where the species is declining.

What is an ecologically significant proportion?

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, what is an 'ecologically significant proportion' of the population varies with the species (each circumstance will need to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness and species specific behavioural patterns (for example, site fidelity and dispersal rates).

What is the population of a migratory species?

'Population', in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one or more national jurisdictional boundaries including Australia.

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
Eleven migratory species were identified as having the potential to occur within the Construction Footprints (PMST and VBA). Most of these species are either highly unlikely to occur (e.g. Eastern Curlew) or will very rarely use airspace over these footprints (e.g. Fork-tailed Swift). It is highly unlikely that the Construction Footprints support habitat that will be considered important for these migratory species foraging or breeding activity or support an ecologically significant proportion of a population of migratory species. Within the proposed Construction Footprints, it is considered unlikely that the proposed Belsar-Yungera project will result in the introduction of invasive species that might be harmful to migratory species. A Construction Environmental Management Plan will be developed for the project that will include measures such as vehicle hygiene protocols to mitigate the potential spread of weeds. Migratory species are also expected to benefit from the reinstatement of historical environmental flows. Such enhancements correspond to increased productivity of the swamp forest communities, increased vegetation diversity and structure from more dominant drought-tolerant species and increase the overall health and integrity of the area, which will likely improve breeding, foraging and refuge resources for listed Migratory species, such as the Curlew Sandpiper (*Calidris ferruginea*) and Sharp-tailed Sandpiper (*Calidris acuminata*). There is potential for the introduction of environmental water to lead to an increase in abundance of feral predators (cats, foxes), herbivores (e.g. goats) and omnivores (e.g. pigs) due to the associated increase in productivity. Some of the species such as cats and foxes could potentially prey on migratory waterbirds. An accompanying feral animal management and control program will need to be implemented within the inundation extent, however this may simply require Parks Victoria to expand current pest control programs within the park. Given that the proposed Construction Footprints do not provide important habitat for listed migratory species, it is considered unlikely that the planned works will disrupt the lifecycle of an ecologically significant proportion of a population of a migratory species.
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species
Within the proposed Construction Footprints it is unlikely that the proposed Belsar-Yungera Project will result in the introduction of invasive species that might be harmful to migratory species. A Construction Environmental Management Plan will be developed for the project that will include measures such as vehicle hygiene protocols to mitigate the potential spread of weeds. There is potential for the introduction of environmental water to lead to an increase in abundance of feral predators (cats, foxes), herbivores (e.g. goats) and omnivores (e.g. pigs) due to the associated increase in productivity. Some of the species such as cats and foxes could potentially prey on migratory waterbirds. An accompanying feral animal management and control program will need to be implemented within the inundation extent, however this may simply require Parks Victoria to expand current pest control programs within the park.

Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.
Given that the proposed Construction Footprints do not provide important habitat for listed migratory species, it is unlikely that the planned works will disrupt the lifecycle of an ecologically significant proportion of a population of a migratory species. Migratory species are also expected to benefit from the reinstatement of historical environmental flows. Such enhancements correspond to increased productivity of the swamp forest communities, increased vegetation diversity and structure from more dominant drought-tolerant species and increase the overall health and integrity of the area, which will likely improve breeding, foraging and refuge resources for listed Migratory species, such as the Curlew Sandpiper (*Calidris ferruginea*) and Sharp-tailed Sandpiper (*Calidris acuminata*).

Appendix L. Assessment of the potential for significant effect on FFG Act 1988 listed fauna under the EE Act 1978

An assessment of the potential for a significant effect on FFG Act 1988 listed fauna under the EE Act 1978 was made, using the *'Ministerial guidelines for assessment of environmental effects under the Environmental Effects (EE) At 1978'* which lists a number of triggers for an Environmental Effects Statement (EES) referral, which for threatened species includes:

- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.
- Matters listed under the Flora and Fauna Guarantee Act 1988:
  - potential loss of a significant area of a listed ecological community; or
  - potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or
  - potential loss of critical habitat; or
  - potential significant effects on habitat values of a wetland supporting migratory bird species

The criteria are addressed below for the FFG Act listed Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*), Painted Honeyeater (*Grantiella picta*), Growling Grass Frog (*Litoria raniformis*) and Murray Cod (*Maccullochella peelii*), and Critically Endangered Silver Perch (*Bidyanus bidyanus*), and any potential impacts to these species from the proposed works.

Regent Parrot (eastern) (*Polytelis anthopeplus monarchoides*)

The proposed project has been identified as having the potential to have a significant adverse effect on the Regent Parrot (*Polytelis anthopeplus monarchoides*). This species is listed as threatened under the Victorian *Flora and Fauna Guarantee* (FFG) *Act 1988* and Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999.*

An assessment of the Regent Parrot population within the proposed Belsar Construction Footprint and immediate vicinity is provided below, with each of the relevant EE Act referral triggers assessed.

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.

The Regent Parrot typically nests within suitable hollows of River Red-gum (*Eucalyptus camaldulensis*), with the male initially travelling up to 20 km to forage within mallee habitats, returning to feed the female (when incubating eggs) and later the nestlings (Higgins 1999). There are records of this species from across the broader landscape (Figure 11, Figure 12) and R8 recorded the species at five of the proposed construction sites within the study area (ER1, ER3, S108, S7 and Bonyaricall Creek Hard Stand) and breeding activity has been observed previously within the broader Belsar area along the Gearbox Loop Track and on the opposite bank of the Murray River in NSW at Peacock Creek (Webster and Belcher 2008; GHD 2009) (also see Figure 13).

It is currently estimated that approximately 1,500 birds exist within SE Australia, with 500 – 750 birds in Victoria (Sluiter *et al.,* 2007, Garnett *et al.*, 2010, Hurley 2014), with this number stabilising (V. Hurley *pers. comm.*). Additionally, recent (though unsubstantiated) surveys in the Annuello Flora and Fauna Reserve recorded as many as 1,600 Regent Parrots (Parks Victoria 2016). Based on the EE referral triggers, to result in loss to a significant proportion of the species, the current proposal for the Belsar Project will need to result in the loss of approximately five to 25 birds (1-5% of 500 birds, which is based on a conservative appraisal of a lower population estimate rather than the up to 1,600 birds possibly observed at Annuello).

For the current assessment, 10 separate Regent Parrot records were identified from the VBA. Data from the Atlas of Living Australia (https://spatial.ala.org.au/?q=lsid:urn:lsid:biodiversity.org.au:afd.taxon:0a200cc7-ddb2-43f0-8d84-41b90590c303) and Birdlife Australia's Birdata (https://birdata.birdlife.org.au/explore#map=-34.6822370_142.9356257_11&species_id=278) shows numerous records throughout and surrounding Belsar-Yungera State Park (Figure 11 and Figure 12).

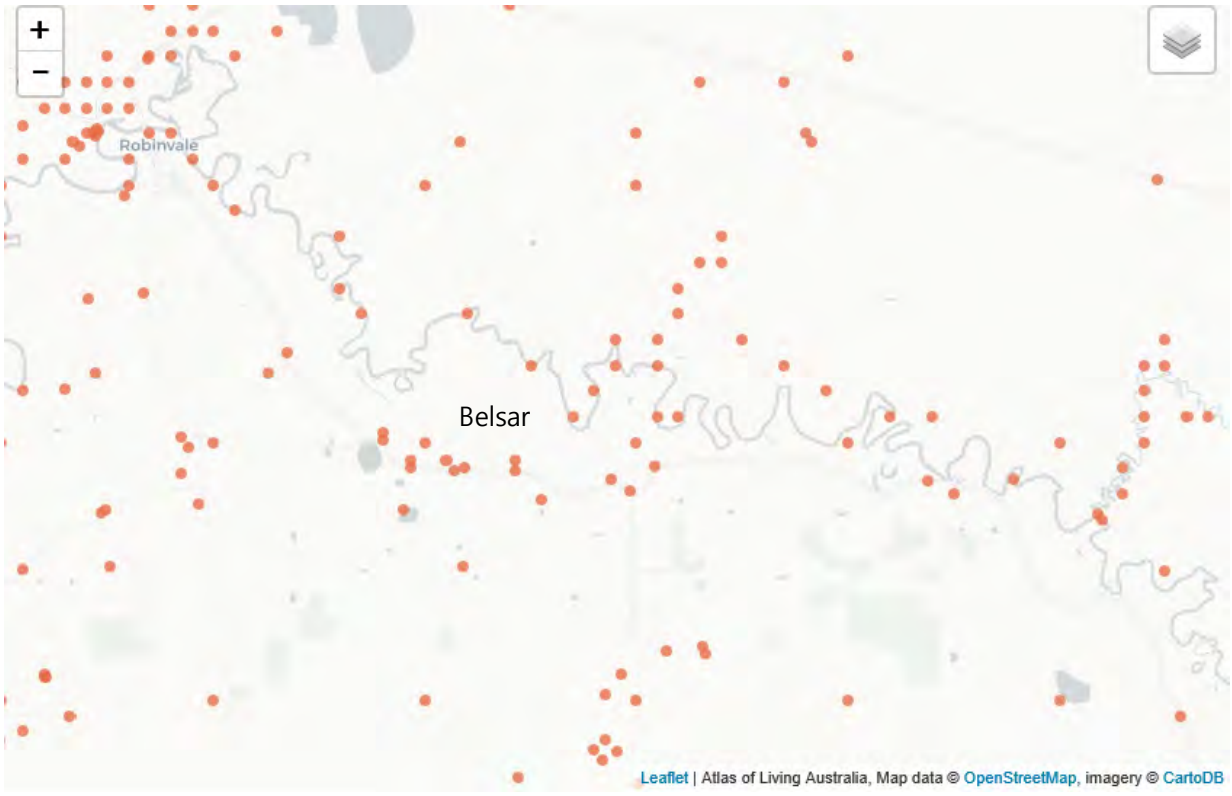


Figure 11 Regent Parrot records, accessed from the Atlas of Living Australia ala.org.au

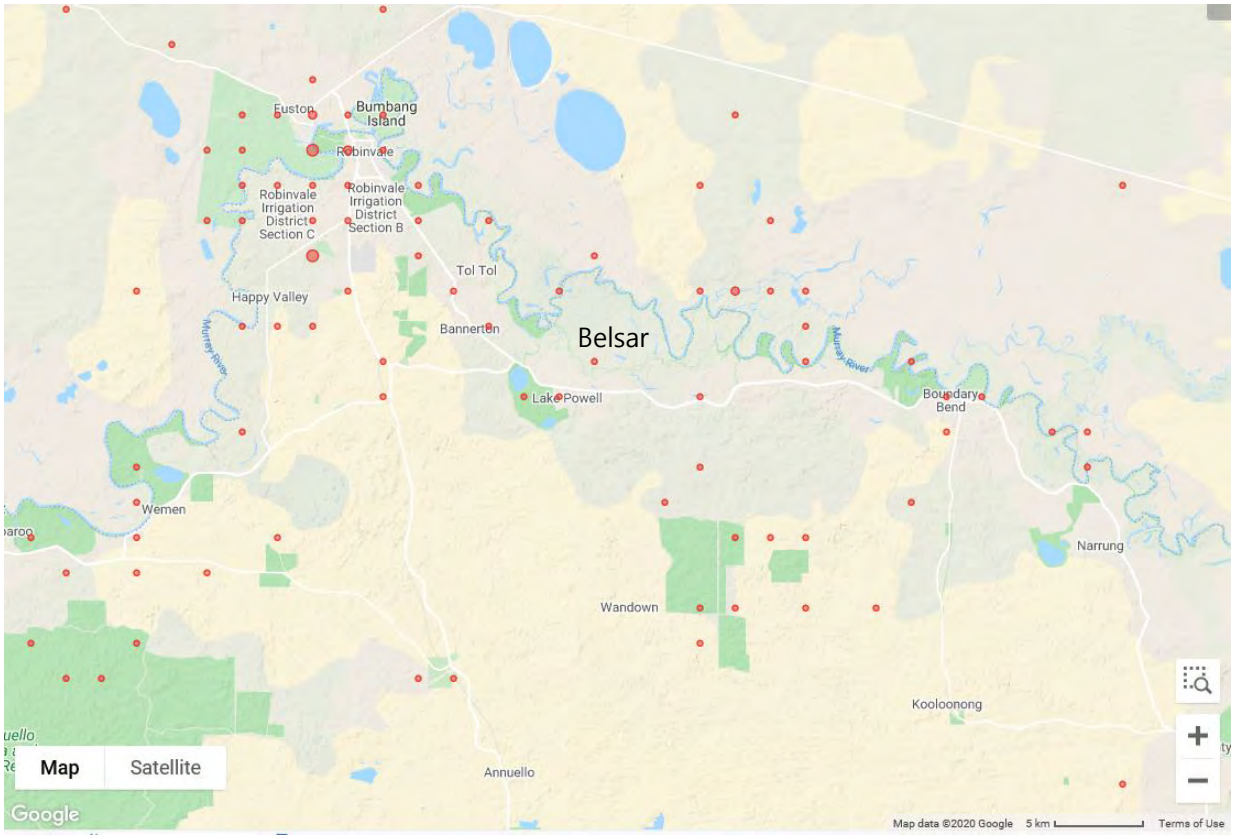


Figure 12 Regent Parrot records, accessed from Birdlife Australia BirdData www.birdata.birdlife.org.au

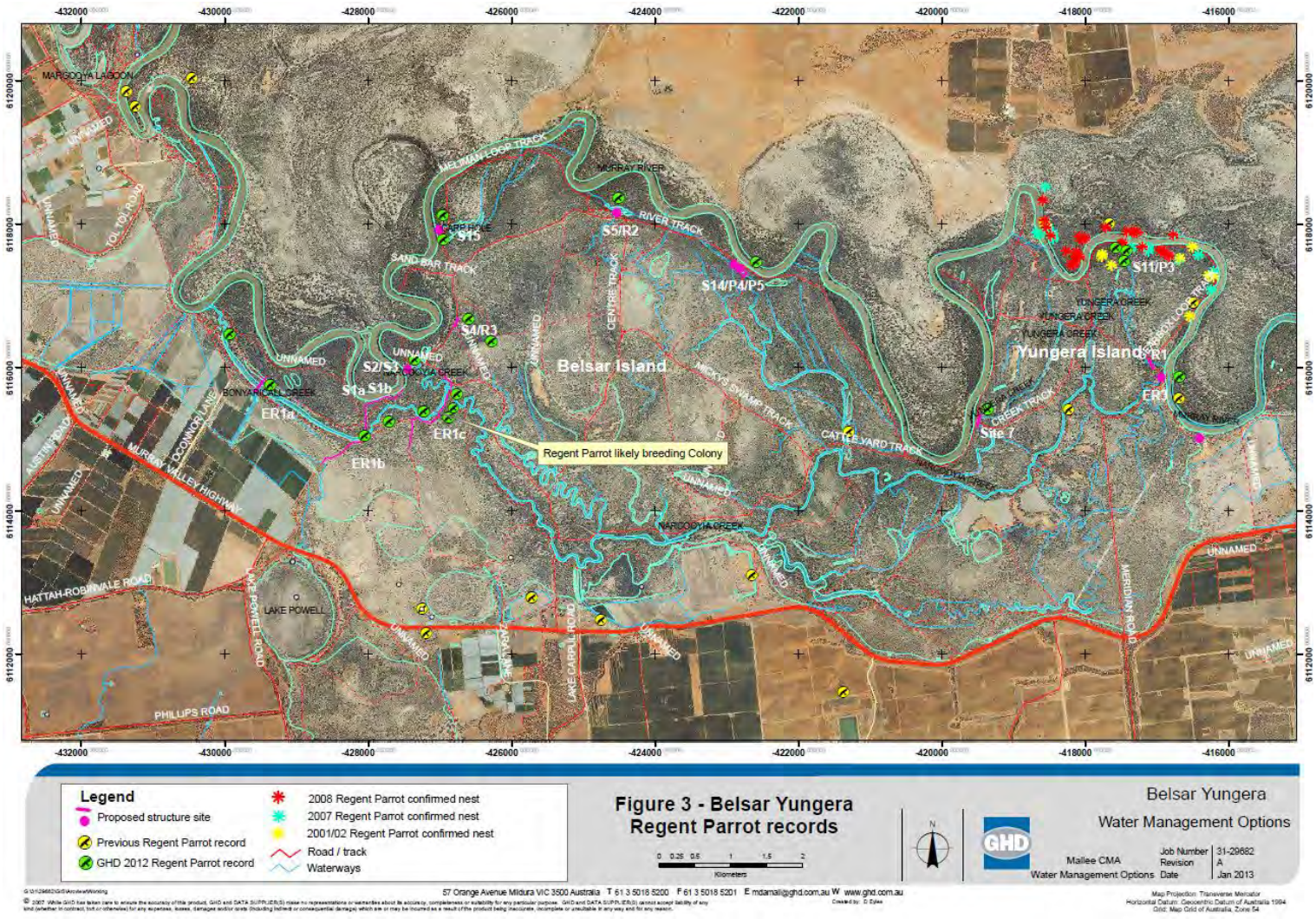


Figure 13 Regent Parrot confirmed and likely nests (THPS = Two Hour Point Survey method, RPNT = Regent Parrot Nest Tree) with data from Webster, R. and Belcher, C. (2008) and GHD (2009)

Throughout Belsar-Yungera State Park, previous surveys have recorded at least 21 individual Regent Parrot nests, with an additional 26 in adjacent Peacock Creek in NSW (these are individual nests, with multiple nests possible within the same tree) (Webster and Belcher 2008, GHD 2009).

An analysis of possible Regent Parrot habitat [i.e. Ecological Vegetation Classes (EVC) that are likely to support suitable large hollow-bearing River Red Gums] was undertaken, specifically assessing the extent of Riverine Grassy Woodland (EVC 295), Intermittent Swampy Woodland (EVC 813) and Grassy Riverine Forest/Floodway Pond Herbland (EVC 813) within the Belsar-Yungera State Park. The analysis returned an area of 39.42 ha for Grassy Riverine Forest, 172.36 ha for Intermittent Swampy Woodland and 61.50 ha for Grassy Riverine Forest/Floodway Pond Herbland (273.29 ha total) (see Figure 13 and Table 13, map showing possible Regent Parrot nesting habitat). This analysis at least at a broad level demonstrates that there is a very large area of potential habitat that may support suitable nesting trees within the project area and certainly along the major creeks and riparian corridor along the Murray River. The proposed project plans to remove 1.4 ha of Intermittent Swampy Woodland, 3.3 ha of Riverine Grassy Woodland and 7.72 ha of Grassy Riverine Forest or 12.42 ha in total (4.54%) of conservatively estimated nesting habitat of which approximately half of this figure is comprised of track upgrades. The combined availability of suitable nesting habitat and number of known nests indicate that the Belsar-Yungera Islands and surrounds support a nationally significant population of the Regent Parrot. However, this also demonstrates the ready availability and existence of nesting habitat for Regent Parrots over a broad area that does not include the proposed Construction Footprints.

Table 13 Area of potential nesting habitat for Regent Parrot

EVC No.	EVC Name	Area Ha
106	Grassy Riverine Forest	39.42
811	Grassy Riverine Forest/Floodway Pond Herbland Complex	61.50
813	Intermittent Swampy Woodland	172.36
	TOTAL	**273.29**

The proposed Construction Footprint areas themselves have been specifically surveyed for evidence of Regent Parrot breeding (GHD 2013, R8 2019) and shown to not be used for breeding, and to a limited extent for foraging and dispersal by this species. The habitats present at most construction sites are only suitable as occasional low quality foraging and dispersal habitats as they are comprised of open Black Box woodland and grassland and not the preferred mallee (foraging) or River Red-gum (nesting) habitats. During the R8 2019 surveys, it was considered 'likely' nesting was occurring within 150-300 m of the S108 regulator Construction Footprint on the Gearbox Loop Track, but not within the proposed Construction Footprint (Figure 14). The area within and surrounding the S108 regulator Construction Footprint is comprised of lower quality River Red-gum habitats that are unlikely to support breeding.

Based on previous experience during the Hattah Lakes TLM project, (where works occurred at sites within two well-known Regent Parrot breeding colonies at the Messenger's and Oatey's Regulators and involved vegetation clearing (with eight known Regent Parrot nests removed by that project) for large hollow-bearing tree removal and construction of two large regulators and a 1,000 ML/day pump station), it is highly unlikely that the proposed works will impact on the nearby (~100-300 m from Construction Footprint) Regent Parrot nesting colony. Surveys of Hattah TLM sites following the nest tree removal and construction found Regent Parrots nesting in these areas immediately after construction and over five subsequent years, with no significant change observed in breeding numbers and the peak in active nests recorded the year following construction (Hurley 2014, Robertson and Hurley 2015, GHD 2016, Eyles, Cheers, and Loyn 2018). Mitigation measures were implemented at these sites including the exclusion of tree removal and particularly noisy activities such as pile driving during the breeding season (i.e. managing the impact of indirect impacts such as noise, vibration and dust) and avoiding construction during the breeding season if possible. These mitigation measures will be implemented for the VMFRP project.

Based on the above information, it is highly unlikely that the proposed Belsar project will result in the loss of 1-5% of the Victorian population of the Regent Parrot (or conservatively 5-25 birds). Also worthy of consideration, potential nesting habitat (large old River Red-gums) and foraging habitat (Black Box woodlands with shrubby and chenopod understory) is likely to be present within the Inundation Area and this potential habitat is likely to maintained and enhanced by environmental watering. The Regent Parrot overall is likely to benefit from broadly improved habitat condition following environmental watering and it is likely that under future climate change scenarios, river regulation and drought that works such as these will be absolutely essential to sustain the River Red-gums that comprise essential nesting habitat for this species.

Also of note, indications from R. Loyn *pers comm* suggest that early studies emphasised the importance of Mallee as feeding habitat, but this may understate the birds' versatility, and the importance of other feeding habitats including nearby farmland and (of greater relevance to this project) Black Box woodland. Loyn *et al* studies in Black Box woodland since 2014 has shown that flocks of up to ~50 Regent Parrots often feed in Black Box woodland and associated lake-beds, especially when they have been recently flooded (1-3 years post-flooding). At that stage the parrots are attracted to feed on the seeds of a range of low shrubs within the woodland and on the fringes of receding lakes, including introduced and native plant species.

Hence the proposed project is likely to increase food supplies for Regent Parrots by delivering water to substantial areas of Black Box woodland and associated habitats in the Belsar-Yungera floodplain.

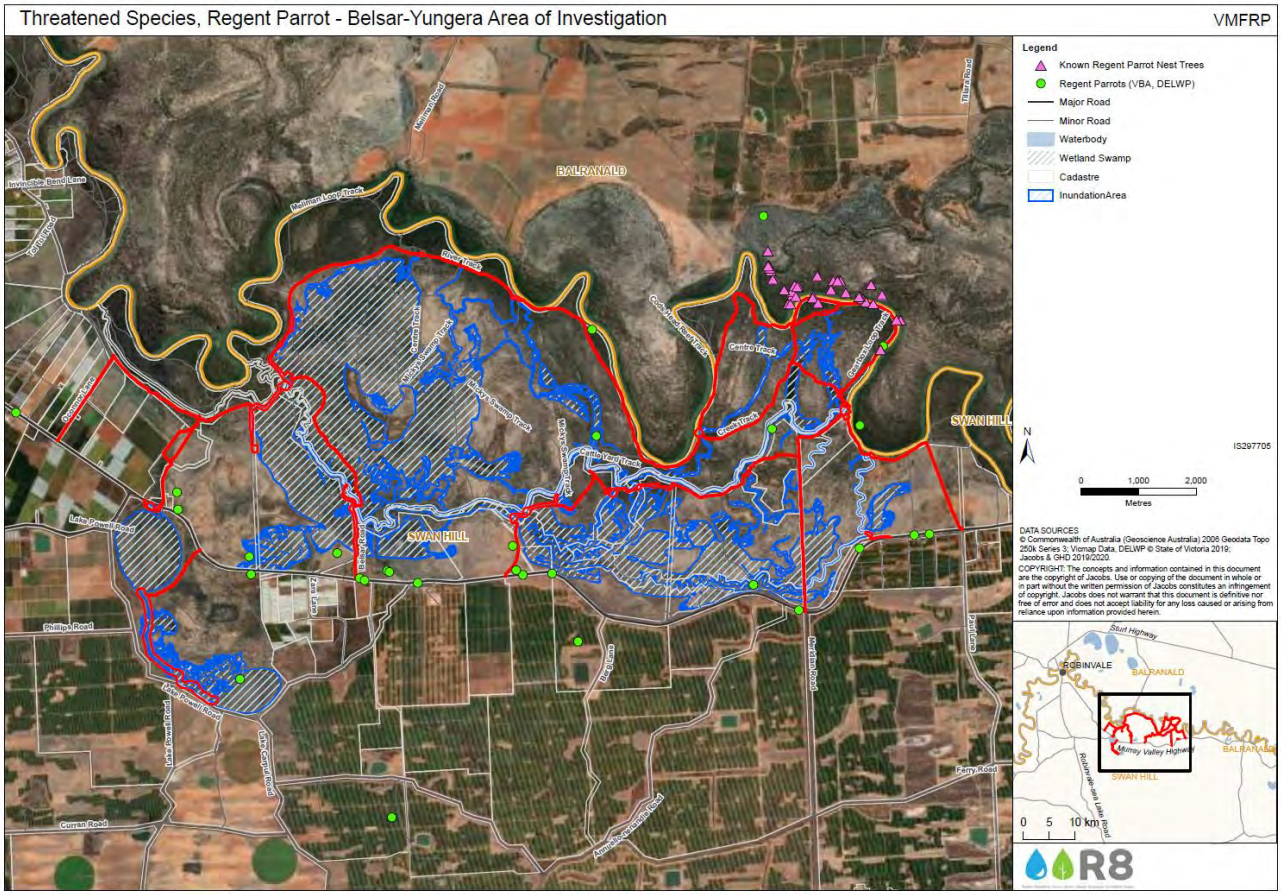


Figure 14 Figure showing previous known Regent Parrot nests recorded by Webster and Belcher 2008, and GHD (2009) close to the S108 regulator.

Matters listed under the Flora and Fauna Guarantee Act 1988 – questions of relevance to the Regent Parrot:

- **Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or**

- **Potential loss of critical habitat.**

As discussed above, the proposed Belsar project will not result in the loss of preferred nesting habitat for the Regent Parrot and will result in the loss of a small proportion of sub-optimal foraging and dispersal habitat only. The proposed Construction Footprint areas are centred on existing tracks and degraded areas, and represent less than 0.61% of the potential habitat for this species within the Belsar project area (50.35 hectares to be cleared within the 8,300 hectare Belsar Yungera floodplain complex of high quality native vegetation within the surrounding State Park) itself surrounded by a much broader landscape (tens of thousands of hectares) mapped as likely important breeding habitat for this species within the National Recovery Plan (Baker and Hurley 2011). This will not significantly reduce the area of occupancy of this population as the structures will be established on already disturbed tracks and levees. As discussed above, the project is highly unlikely to result in the loss of 1-5% of the Victorian proportion of the population of Regent Parrot (conservatively 5-25 birds) and in fact the trade-off of the loss of a small area of sub-optimal foraging and dispersal habitat (50.35 ha) is the future maintenance of Regent Parrot potential nesting and feeding habitat across the 2,374 Ha inundation zone including the known nesting habitat close to the S108 regulator on the Gearbox Loop Track.

The Belsar project will not result in the fragmentation of important Regent Parrot habitat as the State Park supports over 8,300 ha of contiguous habitat, most of which is suitable for Regent Parrot foraging and nesting, with the proposed construction footprint located on existing tracks and disturbed areas within an unbroken canopy of open woodland vegetation. Important nesting habitat will not be adversely impacted by the project and no known nests have been located to date despite extensive survey (GHD 2020). The proposed Construction Footprint areas will not adversely affect habitat critical to the survival of this species, as Construction Footprints represent very small, isolated and discrete areas of habitat within an extensive area of suitable habitat for this highly mobile species.

The eastern subspecies of the Regent Parrot occurs over a relatively continuous and mobile population across the three states of South Australia, New South Wales and Victoria. There are no distinct genetic populations listed or reported and as such the project is unlikely to adversely impact on a genetically important population of this species.

The 'National Recovery Plan for the Regent Parrot (eastern subspecies) *Polytelis anthopeplus monarchoides*' (Baker-Gabb and Hurley 2011) lists a range of threatening processes including disturbance around nesting colonies. The proposed Construction Footprint at S108 regulator and its associated access track along the existing Gearbox Loop Track is located in an area within approximately 150 m of known Regent Parrot nesting habitat. Construction activities at this site and access track have the potential to disturb nesting activities, and therefore all construction activities should be completed outside of the Regent Parrot breeding season if possible (August-December, Baker-Gabb and Hurley, 2011). However, similar previous activities for The Living Murray (TLM) project at Hattah-Kulkyne National Park were carried out in close proximity to known Regent Parrot breeding colonies with no long term impacts to the nesting activity (GHD 2016, Eyles *et al.*, 2018). Based on current and previous assessment of Regent Parrot habitat in the Construction Footprint it seems reasonable to suggest that disturbance to known nesting colonies is likely to be low, provided appropriate mitigation measures are applied.

In closing, it should be noted that one of the protection measures outlined in the recovery plan mentioned "the use of environmental water to initially rescue River Red-gum from drought was first undertaken in Victoria in 2002". The recovery plan then mentions that this continued under The Living Murray (TLM) project with important breeding sites for Regent Parrot such as those at nearby Hattah being listed as one of six 'icon' sites and targeted for the construction of water regulation structures to provide a more natural watering regime to these wetland ecosystems. The VMFRP project has similar objectives to TLM and will aim to maintain and enhance the condition of River Red-gum habitats and broader floodplain and wetland habitats which are likely to be critical to the long term recovery of the eastern subspecies of the Regent Parrot.

Painted Honeyeater (*Grantiella picta*)

The proposed project has been identified as having the potential to have a significant adverse effect on the Painted Honeyeater (*Grantiella picta*). This species is listed as threatened under the Victorian *Flora and Fauna Guarantee* (FFG) *Act 1988* and Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999.*

An assessment of the Painted Honeyeater within the proposed Belsar Project Construction Footprint and immediate vicinity is provided below, with each of the relevant EE Act referral triggers assessed.

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria

The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The greatest concentrations and almost all records of breeding come from south of 26ºS, on inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland (Higgins et al., 2001). During the winter it is more likely to be found in the north of its distribution (https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10357).

The painted honeyeater is the only small to medium honeyeater with a wholly or mostly pink bill, and the only yellow-winged honeyeater with almost wholly white underparts (marked only with sparse, fine and short black streaks) (Higgins *et al.,* 2001). This species generally uses the following habitats:

- Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) 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*.
- Insects and nectar from mistletoe or eucalypts are occasionally eaten.
- Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.

The species exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched (Barea and Watson, 2007). Many birds move after breeding to semi-arid regions such as north-eastern South Australia, central and western Queensland, and central Northern Territory. Considering its dispersive habits, the species is considered to have a single population (Garnett et al., 2011).

Painted Honeyeater, is considered to have potential to utilise habitats within the proposed construction area and broader Inundation Area, albeit on a very infrequent basis. This species has not been previously recorded within 10 km of the Construction Footprints, with the nearest records more than 30km away, and very few records across local landscape (see Figure 15 below from recent Bird Data records and Figure 16 from recent Atlas of Living Australia records), however they are known to be highly mobile and have the potential to rarely forage in the woodlands of the Belsar Project area.

An analysis of possible Painted Honeyeater foraging habitat [i.e. Ecological Vegetation Classes (EVC) across the Belsar-Yungera State Park that may support occasional foraging habitat which includes open woodland] was undertaken, specifically assessing the extent of Riverine Chenopod Woodland (EVC 103), Grassy Riverine Forest (EVC 106), Riverine Grassy Woodland (EVC 295), Intermittent Swampy Woodland (EVC 813), Grassy Riverine Forest/Floodway Pond Herbland (EVC 813), Shrubby Riverine Woodland (EVC 818) and Lignum Swampy Woodland (EVC 823) within the Belsar-Yungera State Park. The analysis returned an area of potential foraging habitat of 2,128.20 ha (see Table 14). This analysis at least at a broad level demonstrates that there is a very large area of potential foraging habitat that may support this species when the appropriate episodic conditions for mistletoe fruiting and flowing occur, and that the Construction Footprints represent very small isolated patches within a broader intact landscape of woodland habitat.

Table 14 Area of potential foraging habitat for Painted Honeyeater

EVC No.	EVC Name	Area (Ha)
103	Riverine Chenopod Woodland	788.28
106	Grassy Riverine Forest	39.42
295	Riverine Grassy Woodland	144.66
811	Grassy Riverine Forest/Floodway Pond Herbland Complex	61.50
813	Intermittent Swampy Woodland	172.36
818	Shrubby Riverine Woodland	239.78
823	Lignum Swampy Woodland	682.18
	TOTAL	**2,128.20**

According to Garnett *et al.*, 2011, estimating population size is difficult given the species' rarity in most of its range. However, the total number of mature individuals is likely to be <10 000. The total number of mature individuals is not considered extremely low, very low or low (Garnett *et al.*, 2011). Given the difficulty of assessing the national population of Painted Honeyeater, there is no Victorian population estimate available. Given the highly nomadic nature of this species, there is unlikely to be a permanent population of this species present in the broader Mallee Region, nor the Belsar Project area, and the availability of suitable foraging resources (mistletoe) is likely to be seasonal and dependent on rainfall (and also potentially in response to flooding) dictating when there is the potential for this species to occur. It is highly unlikely that the Belsar project will lead to a long-term loss of 1-5% of the Victorian population of the Painted Honeyeater, a species that is very rarely present within the park and will only sporadically support suitable habitat for this species.

Figure 15 Painted Honeyeater records from Birdlife Australia BirdData www.birdata.birdlife.org.au

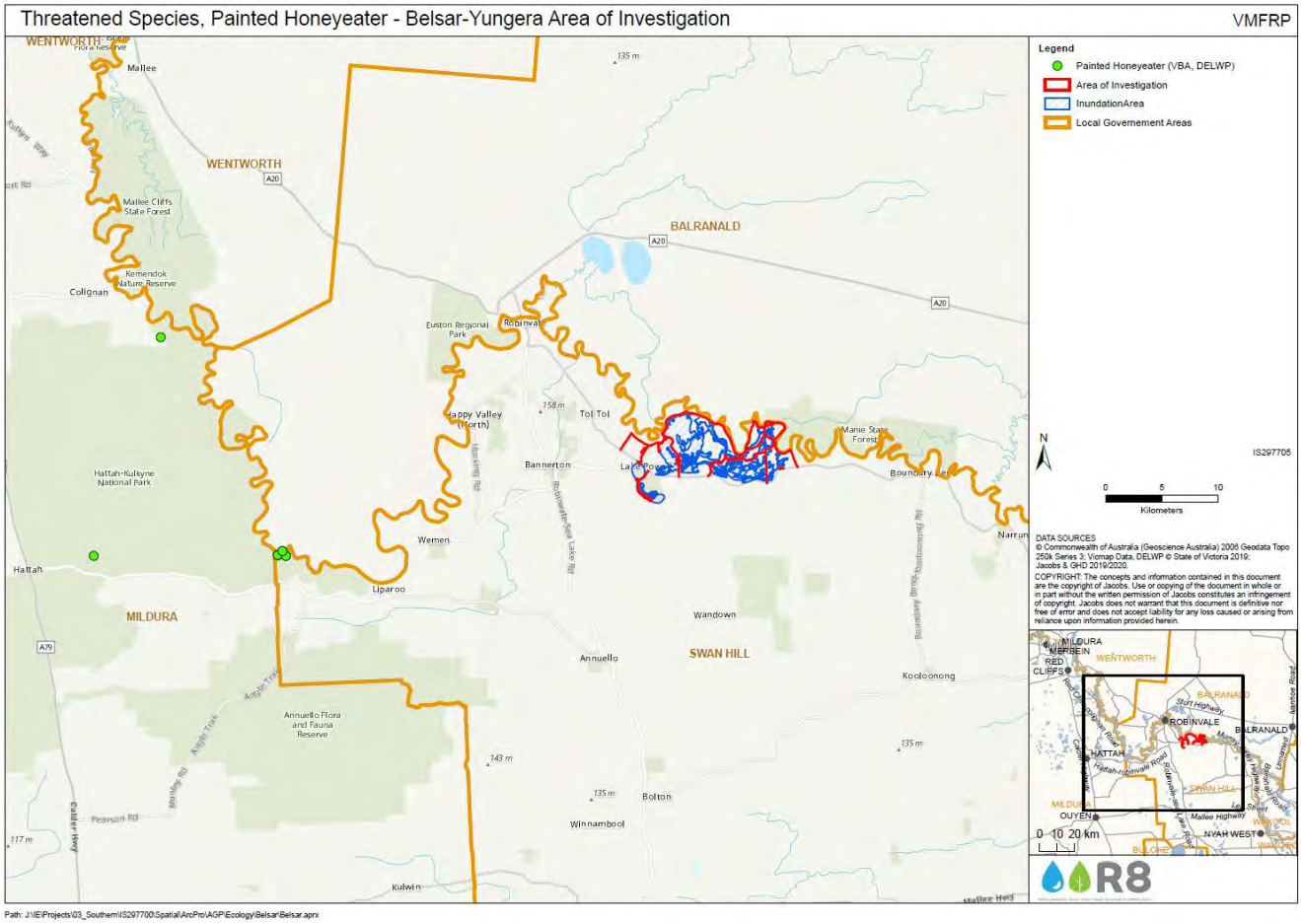


Figure 16 Painted Honeyeater records from the VBA

Matters listed under the Flora and Fauna Guarantee Act 1988 – questions of relevance to the Painted Honeyeater:

- **Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or**

- **Potential loss of critical habitat.**

As discussed above, the proposed Belsar project will not result in the loss of preferred foraging or nesting habitat for the Painted Honeyeater and will result in the loss of a small proportion of sub-optimal foraging, nesting and dispersal habitat only. The proposed Construction Footprint areas represent less than 0.61% of the potential habitat for this species (50.35 hectares within 8,300+ hectares of high quality native vegetation within the surrounding State Park), and are centred on existing tracks and degraded areas. This will not significantly reduce the area of occupancy of this population as the structures will be established on already disturbed tracks and levees. As discussed above, the project is highly unlikely to result in the loss of 1-5% of the Victorian proportion of the population of Painted Honeyeater and in fact the trade-off of the loss of a small area of sub-optimal foraging and dispersal habitat (50.35 ha) is the future maintenance of Painted Honeyeater potential foraging habitat in the 2,374 Ha inundation zone.

The Belsar project is highly unlikely to result in the fragmentation of important Painted Honeyeater habitat as the park supports more than 8,300 ha of contiguous habitat, with the proposed Construction Footprints located on existing tracks and disturbed areas within an unbroken canopy of open woodland vegetation. The proposed Construction Footprint areas will not adversely affect habitat critical to the survival of this species, as Construction Footprints represent very small, isolated and discrete areas of habitat within an extensive area of rarely used habitats for this highly mobile and infrequently recorded species.

The Painted Honeyeater occurs over a broad national population across South Australia, the Northern Territory, Queensland, New South Wales and Victoria. There are no distinct genetic populations listed or reported and as such the project is unlikely to adversely impact on a genetically important population of this extremely mobile nomadic species, which forages widely over large areas in pursuit of mistletoe and flowering eucalypts.

Loyn and Dutson (2018) have been studying woodland bird habitat use, abundance and diversity in black box habitats during and after inundation events and have shown that frequently inundated sites may be more productive than sites which rarely flood, but are only useful to small birds, including rare species such as Black Honeyeater (*Sugomel niger*) when Noisy Miners are absent. There is some potential that the inundation proposed by the Belsar project may be beneficial to the Painted Honeyeater in the future, particularly in areas of habitat where Noisy Miners are absent.

Growling Grass Frog (*Litoria raniformis*)

The proposed project has been identified as having the potential to have a significant adverse effect on the Growling Grass Frog (*Litoria raniformis*). This species is listed as threatened under the Victorian *Flora and Fauna Guarantee* (FFG) *Act 1988* and Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999.*

An assessment of the Growling Grass Frog within the proposed Belsar Project Construction Footprint and immediate vicinity is provided below, with each of the relevant EE Act referral triggers assessed.

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria

The Growling Grass Frog is one of the largest frog species in Australia, and was once distributed across a large area of south-eastern Australia, including Tasmania. The species was previously widespread across Victoria and absent only from the western desert regions and the eastern alpine regions (Littlejohn 1963, 1982; Hero et al. 1991 in Mahony 1999). The species has disappeared from most of its former range across Victoria, and persists in isolated populations in the greater Melbourne area, in the south-west of Victoria and a few sites in central Victoria and Gippsland (Atlas of Victorian Wildlife database cited in Clemann and Gillespie 2004).

This species is mostly found amongst emergent vegetation (Robinson 1993), 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 (NSW DEC 2005). The Growling Grass Frog can be found floating in warmer waters in temperatures between 18–25°C. Additionally, this species can occur in clays or well-watered sandy soils; open grassland, open forest, and ephemeral and permanent non-saline marshes and swamps. Growling Grass Frog specifically require areas of basking habitat (such as emergent aquatic vegetation or logs), breeding habitat (shallow freshwater lagoons) and refuge habitat (typically soil cracks, fallen timber and dense low vegetation).

Submerged vegetation is important habitat for breeding success as it provides egg-laying sites, calling stages for males, and food and shelter for tadpoles. Grassland provides habitat for foraging, dispersal and shelter, and may also provide overwintering sites for Growling Grass Frogs (Clemann & Gillespie 2004; Hamer & Organ 2006). Hamer and Organ (2006) found that large and relatively permanent waterbodies, with a high proportion of emergent vegetation cover, were more likely to be occupied by the Growling Grass Frog.

The Growling Grass Frog is a highly mobile species, capable of moving up to one kilometre in 24 hours (K. Jervis undated, pers. comm. cited in Robertson et al. 2002; S. Wassens undated, per. comm. cited in NSW DEC 2005). Recent research suggests that, in areas other than the semi-arid/riverine part of the species' range, there are interactions between neighbouring populations (Clemann and Gillespie 2004). When the Growling Grass Frog is occupying ephemeral waterbodies, it has significantly higher levels of dispersal than in permanent waterbodies, indicating lower site fidelity, with individuals moving large distances (Wassens 2005).

The Growling Grass Frog is considered to have potential to utilise habitats within the proposed construction area and broader Inundation Area. This species has not been recorded within 10 km of the Construction Footprints and Inundation Area since 1959, has not been detected despite targeted surveys in 2012 (GHD 2013), 2013 (GHD 2013), 2015 (Ecology Australia 2016) and 2019 (the present R8 studies), and there are presently no known populations nearby, though the species is capable of dispersing large distances, and in times of broadscale flooding this is particularly likely. Previous records from the VBA are shown in Figure 17.

A broad analysis of potential Growling Grass Frog habitat (i.e. Ecological Vegetation Classes (EVC) across the Belsar project Inundation Area that have potential to support this species) was undertaken, specifically assessing the extent of wetland and associated EVCs within the Belsar project Inundation Area. The analysis returned an area of potential habitat of 1,882.72 ha (see Table 15) This analysis at least at a broad level demonstrates that there is a very large area of potential habitat that may support this species when the appropriate episodic wetland conditions occur, and that the Construction Footprints represent very small isolated patches within a much broader intact landscape of potentially suitable habitat.

Table 15 Area of potential habitat and vegetation loss for Growling Grass Frog

EVC No.	EVC Name	Inundation Area (Ha)	Vegetation Losses (Ha)
810	Floodway Pond Herbland	21.38	
106/810	Grassy Riverine Forest / Floodway Pond Herbland Complex	9.25	7.72
813	Intermittent Swampy Woodland	116.43	1.4
107	Lake Bed Herbland	129.78	
808	Lignum Shrubland	505.52	1.57
104	Lignum Swamp	152.82	
823	Lignum Swampy Woodland	879.37	18.06
295	Riverine Grassy Woodland	1.02	3.30
819	Spike Sedge Wetland	2.04	0.33
	Waterbody – Fresh	56.36	
	Shallow Freshwater Marsh	8.75	
	TOTAL	**1,882.72**	**32.38**

According to Clemann and Gillespie (2012) within the broad distribution of the Southern Bell Frog, there are two apparently distinct biogeographical groups, differentiated by differences in biology and ecology. Populations at Belsar align with those in the northern and western parts of its range (NSW and parts of Victoria and South Australia bordering the Murray River), where breeding is triggered by flooding of ephemeral waterbodies during spring or summer, and the larval period can be as short as two months (Schultz 2007, 2008). In this area the frogs are concentrated in refugia prior to flooding, then disperse across the landscape during flooding / breeding events (Wassens 2006; Schultz 2007). Much of the habitat for this species has been isolated or fragmented, restricting the opportunity for important population processes such dispersal and colonisation. Populations persist in scattered localities throughout lowland regions, particularly along major watercourses. Populations of Growling Grass Frogs in the Mallee region do persist along the Murray River, such as at Lindsay Island in the far north-west, but are likely to have become isolated and fragmented through the lack of regular inundation of the floodplain and provision of suitable areas of habitat between sites, in the form of shallow waterbodies.

Major watercourses such as the Murray River within the species' range have been substantially altered by impoundments, river regulation and irrigation release schemes. Alterations to the timing, frequency and extent of flooding events have resulted in dramatic changes to many natural processes, such as preventing or greatly reducing spring flood events across natural floodplains. Cold water releases from impoundments have had a considerable impact on downstream ecological processes and native fish populations (MDBC 2003), and are likely to adversely affect the development rates and survivorship of eggs and tadpoles. Natural flooding of floodplains probably triggered breeding activity in semi-arid areas in the past (Wassens 2006), and altered hydrological regimes have grossly modified natural processes around extant populations.

No Australian, Victorian, or north-western range population estimates for Growling Grass Frog are available, but the total number of mature individuals is likely to be <10 000. Based on the absence of records from the Belsar project area in the last 60 years (and a total of just four records before that), it is considered very unlikely that a permanent population of this species exists in the Belsar project area. It is therefore considered highly unlikely that the Belsar project will lead to a long-term loss of 1-5% of the Victorian population of the Growling Grass Frog, a species that may not have been present within the area in the last 60 years.

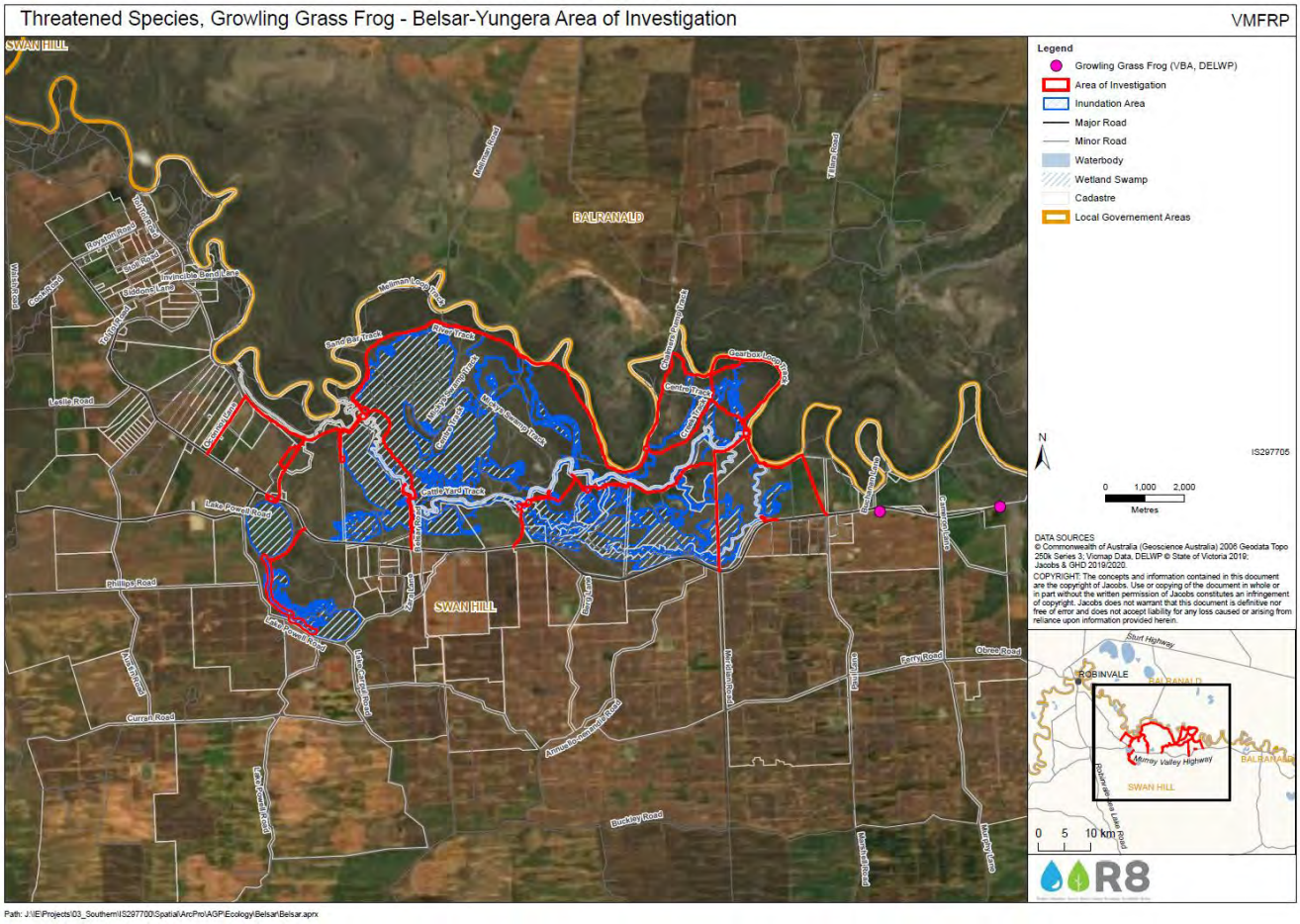


Figure 17 Growling Grass Frog records from the Victorian VBA

Matters listed under the Flora and Fauna Guarantee Act 1988 – questions of relevance to the Growling Grass Frog:

- **Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or**
- **Potential loss of critical habitat.**

As discussed above, the proposed Belsar project will not result in the loss of preferred habitat for the Growling Grass Frog and will result in the loss of an umeasurably small proportion of potential habitat only. The proposed Construction Footprint areas represent less than 1.72% of the potential habitat for this species in the area (32.38 hectares of wetland EVCs within 1,882.72 hectares of high quality, suitable wetland EVCs within the Inundation Area, as per Table 15 above), and are centred on existing tracks and degraded areas. This will not significantly reduce the area of occupancy of this population as the structures will be established on already disturbed tracks and levees. As discussed above, the project is highly unlikely to result in the loss of 1-5% of the Victorian proportion of the population of Growling Grass Frog and in fact the trade-off of the loss of a small area of sub-optimal potential habitat (32.38 ha) is the creation and future maintenance of a large area (1,882.72+ ha) of potential Growling Grass Frog habitat in the 2,374 Ha inundation zone.

The Belsar project will not result in the fragmentation of important Growling Grass Frog habitat as the park is unlikely to presently support a population of this species, and contains very limited potential habitat. The proposed Construction Footprint areas will not adversely affect habitat critical to the survival of this species, as Construction Footprints represent very small, isolated and discrete areas of habitat within an extensive area of rarely used habitats. Operation of the proposed Belsar project to deliver environmental water to these areas has the potential to create and maintain a large area (1,882.72+ ha) of potential Growling Grass Frog habitat in the 2,374 Ha inundation zone. If external populations of this species recolonise the area, it is likely that these works may increase connectivity for this species across the landscape and Mallee region.

The Growling Grass Frog occurs as a broad national population across Victoria, New South Wales, South Australia and Tasmania. As noted previously this species occurs in two apparently distinct populations, of which animals at Belsar will be considered part of the NSW and Murray River ephemeral waters population. Despite this, the project is unlikely to adversely impact on a genetically important population of this species, as it is unlikely to impact any individuals of the species, and has the potential to provide an increased and improved area of habitat that may help link otherwise disjointed populations upstream and downstream of the Belsar project area. The National Recovery Plan for the Growling Grass Frog also states that '*In addition, a population of L. raniformis could be considered an important population if it is near the limit of the species' range (for example small isolated populations in South Australia)*' (Clemann and Gillespie 2012), and any population in the Belsar project area is likely to be close to the northern or north-western limit of the species distribution, and may therefore be considered an important population. Given that is it considered unlikely that the species currently persists in the Belsar area, and that environmental watering of this floodplain could provide habitat suitable for recolonization, the completion of these works may actually increase or re-create an important population of Growling Grass Frog.

Murray Cod (*Maccullochella peelii*)

The proposed project has been identified as having the potential to have a significant adverse effect on Murray Cod (*Maccullochella peelii*) This species is listed as Vulnerable under the Victorian *Flora and Fauna Guarantee* (FFG) *Act 1988* and Vulnerable under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999.*

An assessment of the Murray Cod within the proposed Belsar Project Construction Footprint and immediate vicinity is provided below, with each of the relevant EE Act referral triggers assessed.

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.

In terms of population status, the Murray cod population in Victoria has experienced large historic declines, both in size and in extent of distribution. The species has been successfully stocked into a number of waters within its distribution in Victoria, but there are few tributaries of the Murray River where it could be considered common (DoE, 2016). However, there is no overall Murray Cod population monitoring programme within Victoria (National Murray Cod Recovery Team 2010 cited in DOE, 2020) to provide an understanding of current population status. The last statewide estimate of recreational catch of Murray Cod in Victoria was measured as part of the National Recreational and Indigenous Fishing Survey conducted from 2000 to 2001 (Ye et al. 2014). Hatchery-produced Murray Cod have been stocked in Victoria since 1981. In 2013, approximately 600 000 Murray Cod were stocked into 29 waters across Victoria. Other surveys, such as the Murray–Darling Basin Authority Sustainable Rivers Audit, indicate fish biomass to have increased in some catchments (Ovens, Goulburn and Loddon rivers) and declined in others (Broken and Kiewa rivers). In the absence of current statewide recreational fishing survey data, insufficient information is available to confidently classify the biomass of Murray Cod (Ye et al. 2014).

In terms of habitat, The Murray Cod utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW, to slow-flowing, turbid lowland rivers and billabongs (McDowall 1996). That said, Murray Cod are frequently found in the main channels of rivers and larger tributaries. The species is, therefore, considered a main-channel specialist (DoE, 2020). Preferred microhabitat consists of complex structural features in streams such as large rocks, snags (pieces of large submerged woody debris), overhanging stream banks and vegetation, tree stumps, logs, branches and other woody structures. Such structures reduce or influence stream flows and provide Murray Cod with shelter from fast-flowing water (Koehn 2009).

The current population status and distribution in Victoria is unknown. Therefore an assessment of impacts to habitat (i.e. physical habitat and water quality/hydrology) allows for the most valid assessment of potential long-term impacts. Murray Cod are considered to be present in the Murray River adjacent to the Belsar-Yungera floodplain and it is likely that habitat exists within Bonyaricall, Narcooyia and Yungera Creeks that could support the species. Although only a limited number of surveys have been completed on the site they have been recorded from Narcooyia Creek. Under current conditions Narcooyia Creek provides structural habitat that is likely to provide hydraulic complexity and suitable physical habitat (i.e. snags) that could support the species (DELWP, 2018). During operation of the project these conditions would be enhanced, as discussed below.

Construction phase

Construction of the project is unlikely to lead to a significant loss of habitat – no construction of works will occur in the Murray River and removal of a block bank on Narcooyia Creek will allow for improved fish passage (and therefore better access to habitat), as discussed below. Provided that the recommended mitigation measures are implemented:

- Management of run-off, spills and sediment to avoid impacts on the Murray River, Bonyaricall Creek, and any other waterways.

- Development and implementation of an Aquatic Fauna Management Plan to manage impacts to aquatic values. This Plan will include measures to manage any construction activities that could lead to entrapment of fauna or temporary loss of habitat (e.g. due to the use of coffer dams and dewatering).

Operation phase

Under current conditions Narcooyia Creek provides structural habitat that is likely to provide hydraulic complexity and suitable physical habitat (i.e. snags) (DELWP, 2018). These conditions would be enhanced by the project as inclusion of a vertical slot fishway at Regulator ER1 would provide fish passage that is not available under current conditions, along with flow-through conditions during minor flood peaks that would benefit the species by potentially reducing silt blockages that currently occur in the creek. Once the floodplain is inundated (during moderate to large flood peaks) the fishway at ER1 regulator will be in operation to allow fish to enter and exit the Inundation Areas. Floodplain inundation would provide foraging opportunities for the species as it is likely to lead to an increase in productivity in wetland habitat that will benefit small-bodied wetland fish species, which will in turn provide a food source for Murray cod. Provision of a native fish drawdown strategy would allow fish to exit to the Murray River and distribute regionally. Implementation of blackwater management measures and a related water quality monitoring program on-site and within the Murray River would inform adaptive management of risks to the downstream aquatic environment, which would afford protection to Murray cod within the Murray River.

Therefore, operation of the project is unlikely to lead to a long-term loss of a significant proportion of known remaining habitat or population of Murray cod and has the potential to benefit the species by enhancing habitat conditions.

Matters listed under the Flora and Fauna Guarantee Act 1988 – questions of relevance to Murray cod:

- **Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or**
- **Potential loss of critical habitat.**

As discussed above, the construction and operation of the project is unlikely to significantly impact available habitat for Murray cod and has the potential to improve habitat conditions by improving fish passage and flows through the site. As such, it is unlikely that construction or operation of the project will lead to a loss of a genetically important Murray cod population. Likewise, the project is unlikely to fragment available habitat and has the potential to *re-connect* habitat present in Narcoooyia Creek with the Murray River.

Any section of a waterway that comprises a connected system of habitats suitable for sustained use by a Murray cod population for sheltering, foraging, breeding and upstream and downstream movement is considered by DoE (2016) to be habitat critical to the survival of the species**.** The project is unlikely to lead to a loss of critical habitat but does have the potential to enhance critical habitat for the species, as discussed previously.

Silver Perch (*Bidyanus bidyanus*)

The proposed project has been identified as having the potential to have a significant adverse effect on Silver perch *Bidyanus*. This species is listed as Threatened under the Victorian *Flora and Fauna Guarantee* (FFG) *Act 1988* and Critically Endangered under the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999.*

The '*Ministerial guidelines for assessment of environmental effects under the Environmental Effects* (EE) *Act 1978*' lists a number of triggers for an Environmental Effects Statement (EES) referral, which for threatened species include the following:

- Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.
- Matters listed under the *Flora and Fauna Guarantee Act 1988*:
  - potential loss of a significant area of a listed ecological community; or
  - potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or

- potential loss of critical habitat; or
- potential significant effects on habitat values of a wetland supporting migratory bird species

An assessment of Silver perch within the proposed Belsar Project Construction Footprint and immediate vicinity is provided below, with each of the relevant EE Act referral triggers assessed.

Potential long-term loss of a significant proportion (e.g. 1 to 5 percent depending on the conservation status of the species) of known remaining habitat or population of a threatened species within Victoria.

In Victoria, Silver perch have been recorded from twelve river basins. These include eight basins where populations occur naturally - Upper Murray (Lake Hume stocking), Ovens River, Broken River, Goulburn River, Campaspe River, Loddon River, Murray Riverina and the Mallee. Silver perch have been introduced into the other four river basins - Wimmera River, Yarra River, Werribee River and Corangamite. The majority of records are from the Goulburn River, Loddon River, Murray Riverina, and Mallee (Clunie and Koehn, 2001).

In terms of habitat, Silver perch use main river channel habitats for feeding, refuge, spawning, survival and recruitment. They inhabit Lock 11-26 reach of the Murray River because this encompasses the longest unregulated river reach on the main stem of the Murray River and thus provides 500+ km of their preferred flowing water habitat (DELWP, 2018). Although they are an obligate riverine species, predominantly occupying large fast flowing river regions (e.g. Murray and Darling Rivers) over sand and structure (Clunie and Koehn, 2001; Merrick and Schmida, 1984), they have also been reported in the slow flowing, turbid waters of lower reaches (Rowland 1995). Cadwallader and Backhouse (1983) also suggest they prefer open waters devoid of snags. Small numbers of fish utilise tributaries of main channel and they rarely enter floodplain lakes (DELWP, 2018).

The current population status and distribution in Victoria is unknown. Therefore an assessment of impacts to habitat (i.e. physical habitat and water quality/hydrology) allows for the most valid assessment of potential long-term impacts. Silver perch are considered to be present in the Murray River adjacent to the Belsar-Yungera floodplain and it is possible that habitat exists within Bonyaricall, Narcooyia and Yungera Creeks that could support the species on a seasonal basis. It should be noted that no records exist from these creeks so their likelihood of presence under current conditions may be low. Under current conditions Narcooyia Creek provides structural habitat that is likely to provide hydraulic complexity and suitable physical habitat (i.e. snags) (DELWP, 2018). During operation of the project conditions would be enhanced, as discussed below.

Construction phase

Construction of the project is unlikely to lead to a significant loss of habitat – no construction of works will occur in the Murray River and removal of a block bank on Narcooyia Creek will allow for improved fish passage (and therefore better access to habitat), as discussed below. Provided that the recommended mitigation measures are implemented:

- Management of run-off, spills and sediment to avoid impacts on the Murray River, Bonyaricall Creek, and any other waterways.
- Development and implementation of an Aquatic Fauna Management Plan to manage impacts to aquatic values. This Plan will include measures to manage any construction activities that could lead to entrapment of fauna or temporary loss of habitat (e.g. due to the use of coffer dams and dewatering).

Operation phase

Under current conditions Narcooyia Creek provides structural habitat that is likely to provide hydraulic complexity and suitable physical habitat (i.e. snags) (DELWP, 2018) if the species is present. These conditions would be enhanced by the project as inclusion of a vertical slot fishway at Regulator ER1 would provide fish passage that is not available under current conditions, along with flow-through conditions during minor flood peaks that would benefit the species by potentially reducing silt blockages that currently occur in the creek. Once the floodplain is inundated (during moderate to large flood peaks) the fishway at ER1 regulator will be in operation to allow fish to enter and exit the Inundation Areas. Floodplain inundation would provide foraging opportunities for the species as it will lead to an increase in productivity in wetland habitat that will benefit zooplankton and macroinvertebrates, which will in turn provide a food source for Silver perch. Provision of a native fish drawdown strategy would allow fish to exit to the Murray River and distribute regionally. Implementation of blackwater nanagement measures and a related water quality monitoring program on-site and within the Murray River would inform adaptive management of risks to the downstream aquatic environment, which would afford protection to Silver perch within the Murray River.

Therefore, operation of the project is unlikely to lead to a long-term loss of a significant proportion of known remaining habitat or population of Silver perch and has the potential to benefit the species by enhancing habitat conditions.

Matters listed under the Flora and Fauna Guarantee Act 1988 – questions of relevance to Murray cod:

- **Potential loss of a genetically important population of an endangered or threatened species (listed or nominated for listing), including as a result of loss or fragmentation of habitats; or**

- **Potential loss of critical habitat.**

As discussed above, the construction and operation of the project is unlikely to significantly impact available habitat for Silver perch and has the potential to improve habitat conditions by improving fish passage and flows through the site. As such, it is unlikely that construction or operation of the project will lead to a loss of a genetically important Silver perch population. Likewise, the project is unlikely to fragment available habitat and has the potential to *re-connect* habitat present in Narcoooyia Creek with the Murray River.

No critical habitat has been listed for Silver perch. However, given that the project is unlikely to significantly impact the Murray River (where the species is known to exist) and also provide additional habitat during operation, it is considered unlikely that a loss of habitat will occur.

Appendix M. Fauna species recorded during R8 surveys

Summary of the fauna species recorded during surveys on October 9, 17, 19 and November 19, 2019.

Key:

V – Vulnerable under EPBC Act

L – Listed under FFG Act

vu – Vulnerable under Victorian Advisory List

Common Name (Scientific Name)	Number	Comments
October 9 2019 – 7:09. Meridian Road.	**20 Total Abundance**	**5 species**
Peaceful Dove (*Geopelia placida*)	1	
Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)	1	vu / L / -
Sulphur-crested Cockatoo (*Cacatua galerita*)	10	
Grey Shrikethrush (*Colluricincla harmonica*)	1	
White-winged Chough (*Corcorax melanorhamphos*)	7	
October 9 2019 – 7:17. ER3.	**178 Total Abundance**	**44 species**
Emu (*Dromaius novae-hollandiae*)	1	
Australian Wood Duck (*Chenonetta jubata*)	4	
Pacific Black Duck (*Anas superciliosa*)	4	
Common Bronzewing (*Phaps chalcoptera*)	2	
Peaceful Dove (*Geopelia placida*)	4	
Wedge-tailed Eagle (*Aquila audax*)	1	
Collared Sparrowhawk (*Accipiter cirrocephalus*)	1	
Whistling Kite (*Haliastur sphenurus*)	1	
Laughing Kookaburra (*Dacelo novaeguineae*)	1	
Sacred Kingfisher (*Todiramphus sanctus*)	2	
Galah (*Eolophus roseicapilla*)	12	
Little Corella (*Cacatua sanguinea*)	30	
Sulphur-crested Cockatoo (*Cacatua galerita*)	15	
Regent Parrot (*Polytelis anthopeplus*)	15	vu / L / V
Australian Ringneck (*Barnardius zonarius barnardi*)	2	
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	4	
Red-rumped Parrot (*Psephotus haematonotus*)	6	
Brown Treecreeper (*Climacteris picumnus*)	2	
Purple-backed Fairywren (*Malurus assimilis*)	4	
Superb Fairywren (*Malurus cyaneus*)	2	
White-plumed Honeyeater (*Ptilotula penicillata*)	4	
Brown-headed Honeyeater (*Melithreptus brevirostris*)	2	
Black-chinned Honeyeater (*Melithreptus gularis*)	1	

Common Name (Scientific Name)	Number	Comments
Striped Honeyeater (*Plectorhyncha lanceolata*)	2	
Little Friarbird (*Philemon citreogularis*)	1	
Spotted Pardalote (*Pardalotus punctatus*)	1	
Striated Pardalote (*Pardalotus striatus*)	1	
Inland Thornbill (*Acanthiza apicalis*)	4	
Chestnut-rumped Thornbill (*Acanthiza uropygialis*)	1	
Weebill (*Smicrornis brevirostris*)	8	
Western Gerygone (*Gerygone fusca*)	1	
White-browed Babbler (*Pomatostomus superciliosus*)	4	
Black-faced Cuckooshrike (*Coracina novaehollandiae*)	2	
Grey Shrikethrush (*Colluricincla harmonica*)	3	
Grey Butcherbird (*Cracticus torquatus*)	1	
Pied Butcherbird (*Cracticus nigrogularis*)	1	
Australian Magpie (*Gymnorhina tibicen*)	1	
Willie Wagtail (*Rhipidura leucophrys*)	2	
Magpie-lark (*Grallina cyanoleuca*)	2	
White-winged Chough (*Corcorax melanorhamphos*)	12	
Australian Raven (*Corvus coronoides*)	1	
Red-capped Robin (*Petroica goodenovii*)	1	
Welcome Swallow (*Hirundo neoxena*)	1	
Tree Martin (*Petrochelidon nigricans*)	8	
October 17 2019 – 7:46. ER1 - Long Levee.	**30 Total Abundance**	**12 species**
Pacific Black Duck (*Anas superciliosa*)	1	
Peaceful Dove (*Geopelia placida*)	3	
Laughing Kookaburra (*Dacelo novaeguineae*)	2	
Sulphur-crested Cockatoo (*Cacatua galerita*)	2	
Regent Parrot (*Polytelis anthopeplus*)	6	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	2	
Red-rumped Parrot (*Psephotus haematonotus*)	2	
Brown Treecreeper (*Climacteris picumnus*)	2	
White-plumed Honeyeater (*Ptilotula penicillata*)	4	
Little Friarbird (*Philemon citreogularis*)	2	
Dusky Woodswallow (*Artamus cyanopterus*)	2	
Willie Wagtail (*Rhipidura leucophrys*)	2	
October 17 2019 – 10:12. Site 7 Creek Regulator.	**36 Total Abundance**	**9 species**
Galah (*Eolophus roseicapilla*)	4	
Regent Parrot (*Polytelis anthopeplus*)	15	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	2	
Red-rumped Parrot (*Psephotus haematonotus*)	4	
Brown Treecreeper (*Climacteris picumnus*)	2	

Common Name (Scientific Name)	Number	Comments
White-plumed Honeyeater (*Ptilotula penicillata*)	4	
Striped Honeyeater (*Plectorhyncha lanceolata*)	1	
Striated Pardalote (*Pardalotus striatus*)	2	
Magpie-lark (*Grallina cyanoleuca*)	2	
October 17 2019 – 12:35. ER3.	**59 Total Abundance**	**16 species**
Pacific Black Duck (*Anas superciliosa*)	1	
Peaceful Dove (*Geopelia placida*)	1	
Square-tailed Kite (*Lophoictinia isura*)	2	vu / L / -
Whistling Kite (*Haliastur sphenurus*)	1	
Azure Kingfisher (*Ceyx azureus*)	1	
Sulphur-crested Cockatoo (*Cacatua galerita*)	4	
Regent Parrot (*Polytelis anthopeplus*)	4	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	4	
Red-rumped Parrot (*Psephotus haematonotus*)	8	
Brown Treecreeper (*Climacteris picumnus*)	8	
White-plumed Honeyeater (*Ptilotula penicillata*)	4	
Little Friarbird (*Philemon citreogularis*)	2	
Grey Shrikethrush (*Colluricincla harmonica*)	1	
Dusky Woodswallow (*Artamus cyanopterus*)	4	
Welcome Swallow (*Hirundo neoxena*)	4	
Tree Martin (*Petrochelidon nigricans*)	10	
October 17 2019 – 14:57. S108 Gearbox Loop.	**34 Total Abundance**	**7 species**
Common Bronzewing (*Phaps chalcoptera*)	1	
Regent Parrot (*Polytelis anthopeplus*)	8	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	4	
Red-rumped Parrot (*Psephotus haematonotus*)	6	
Brown Treecreeper (*Climacteris picumnus*)	4	
White-plumed Honeyeater (*Ptilotula penicillata*)	8	
Tree Martin (*Petrochelidon nigricans*)	3	
October 22 2019 – 8:02. ER3.	**65 Total Abundance**	**18 species**
Australian Wood Duck (*Chenonetta jubata*)	4	
Peaceful Dove (*Geopelia placida*)	3	
Horsfield's Bronze-Cuckoo (*Chrysococcyx basalis*)	1	
Whistling Kite (*Haliastur sphenurus*)	2	
Azure Kingfisher (*Ceyx azureus*)	2	Breeding in creek bank
Sacred Kingfisher (*Todiramphus sanctus*)	1	
Galah (*Eolophus roseicapilla*)	4	
Sulphur-crested Cockatoo (*Cacatua galerita*)	4	
Regent Parrot (*Polytelis anthopeplus*)	14	vu / L / V

Common Name (Scientific Name)	Number	Comments
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	4	
Red-rumped Parrot (*Psephotus haematonotus*)	4	
Brown Treecreeper (*Climacteris picumnus*)	3	
White-plumed Honeyeater (*Ptilotula penicillata*)	6	
Blue-faced Honeyeater (*Entomyzon cyanotis*)	1	
Little Friarbird (*Philemon citreogularis*)	2	
Magpie-lark (*Grallina cyanoleuca*)	2	
Welcome Swallow (*Hirundo neoxena*)	4	
Tree Martin (*Petrochelidon nigricans*)	4	
October 22 2019 – 10:27. S108 Gearbox Loop.	**70 Total Abundance**	**19 species**
Square-tailed Kite (*Lophoictinia isura*)	1	vu / L / -
Laughing Kookaburra (*Dacelo novaeguineae*)	1	
Sulphur-crested Cockatoo (*Cacatua galerita*)	2	
Regent Parrot (*Polytelis anthopeplus*)	6	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	4	
Red-rumped Parrot (*Psephotus haematonotus*)	6	
Brown Treecreeper (*Climacteris picumnus*)	4	
White-plumed Honeyeater (*Ptilotula penicillata*)	8	
Brown-headed Honeyeater (*Melithreptus brevirostris*)	2	
Little Friarbird (*Philemon citreogularis*)	4	
Striated Pardalote (*Pardalotus striatus*)	5	
Buff-rumped Thornbill (*Acanthiza reguloides*)	8	
Weebill (*Smicrornis brevirostris*)	4	
Western Gerygone (*Gerygone fusca*)	1	
White-winged Triller (*Lalage tricolor*)	2	
Grey Shrikethrush (*Colluricincla harmonica*)	2	
Rufous Whistler (*Pachycephala rufiventris*)	1	
Dusky Woodswallow (*Artamus cyanopterus*)	1	
White-winged Chough (*Corcorax melanorhamphos*)	8	
October 22 2019 – 12:55. Site 7 Creek Regulator.	**59 Total Abundance**	**18 species**
Common Bronzewing (*Phaps chalcoptera*)	1	
Peaceful Dove (*Geopelia placida*)	2	
Horsfield's Bronze-Cuckoo (*Chrysococcyx basalis*)	1	
Little Black Cormorant (*Phalacrocorax sulcirostris*)	1	
Sacred Kingfisher (*Todiramphus sanctus*)	2	
Regent Parrot (*Polytelis anthopeplus*)	6	vu / L / V
Red-rumped Parrot (*Psephotus haematonotus*)	6	
Brown Treecreeper (*Climacteris picumnus*)	3	
White-plumed Honeyeater (*Ptilotula penicillata*)	6	
Striped Honeyeater (*Plectorhyncha lanceolata*)	2	

Common Name (Scientific Name)	Number	Comments
Little Friarbird (*Philemon citreogularis*)	3	
Striated Pardalote (*Pardalotus striatus*)	5	
Black-faced Cuckooshrike (*Coracina novaehollandiae*)	2	
Crested Shrike-tit (*Falcunculus frontatus*)	2	
Grey Shrikethrush (*Colluricincla harmonica*)	2	
Dusky Woodswallow (*Artamus cyanopterus*)	3	
Welcome Swallow (*Hirundo neoxena*)	4	
Tree Martin (*Petrochelidon nigricans*)	8	
November 19 2019 – 7:49. ER1 - Long Levee.	**132 Total Abundance**	**31 species**
Common Bronzewing (*Phaps chalcoptera*)	1	
Great Cormorant (*Phalacrocorax carbo*)	1	
Australian Pelican (*Pelecanus conspicillatus*)	2	
Nankeen Night-Heron (*Nycticorax caledonicus*)	1	
Whistling Kite (*Haliastur sphenurus*)	2	
Laughing Kookaburra (*Dacelo novaeguineae*)	2	
Sacred Kingfisher (*Todiramphus sanctus*)	4	
Australian Hobby (*Falco longipennis*)	2	
Major Mitchell's Cockatoo (*Lophochroa leadbeateri*)	4	vu / L / -
Galah (*Eolophus roseicapilla*)	4	
Little Corella (*Cacatua sanguinea*)	6	
Sulphur-crested Cockatoo (*Cacatua galerita*)	4	
Regent Parrot (*Polytelis anthopeplus*)	20	vu / L / V
Australian Ringneck (Mallee) (*Barnardius zonarius*)	2	
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	6	
Red-rumped Parrot (*Psephotus haematonotus*)	2	
Brown Treecreeper (*Climacteris picumnus*)	3	
Purple-backed Fairywren (*Malurus assimilis*)	2	
White-plumed Honeyeater (*Ptilotula penicillata*)	6	
Brown-headed Honeyeater (*Melithreptus brevirostris*)	4	
Little Friarbird (*Philemon citreogularis*)	3	
Striated Pardalote (*Pardalotus striatus*)	6	
Western Gerygone (*Gerygone fusca*)	1	
Rufous Whistler (*Pachycephala rufiventris*)	3	
White-browed Woodswallow (*Artamus superciliosus*)	25	
Australian Magpie (*Gymnorhina tibicen*)	3	
Willie Wagtail (*Rhipidura leucophrys*)	2	
Magpie-lark (*Grallina cyanoleuca*)	2	
White-winged Chough (*Corcorax melanorhamphos*)	6	
Australian Raven (*Corvus coronoides*)	2	
Tree Martin (*Petrochelidon nigricans*)	1	

Common Name (Scientific Name)	Number	Comments
November 19 2019 – 10:21. Bonyaricall Creek hard stand.	**72 Total Abundance**	**22 species**
Grey Teal (*Anas gracilis*)	2	
Peaceful Dove (*Geopelia placida*)	2	
Little Black Cormorant (*Phalacrocorax sulcirostris*)	1	
Whistling Kite (*Haliastur sphenurus*)	2	
Sacred Kingfisher (*Todiramphus sanctus*)	2	
Regent Parrot (*Polytelis anthopeplus*)	8	vu / L / V
Crimson Rosella (Yellow) (*Platycercus elegans flaveolus*)	6	
Red-rumped Parrot (*Psephotus haematonotus*)	4	
Brown Treecreeper (*Climacteris picumnus*)	2	
White-plumed Honeyeater (*Ptilotula penicillata*)	5	
Little Friarbird (*Philemon citreogularis*)	3	
Striated Pardalote (*Pardalotus striatus*)	4	
Western Gerygone (*Gerygone fusca*)	1	
Grey Shrikethrush (*Colluricincla harmonica*)	2	
Rufous Whistler (*Pachycephala rufiventris*)	2	
Masked Woodswallow (*Artamus personatus*)	1	
White-browed Woodswallow (*Artamus superciliosus*)	12	
Dusky Woodswallow (*Artamus cyanopterus*)	2	
Willie Wagtail (*Rhipidura leucophrys*)	2	
Magpie-lark (*Grallina cyanoleuca*)	2	
White-winged Chough (*Corcorax melanorhamphos*)	6	
Australian Raven (*Corvus coronoides*)	1	
November 19 2019 – 12:47. ER3.	**25 Total Abundance**	**11 species**
Pacific Black Duck (*Anas superciliosa*)	2	
Whistling Kite (*Haliastur sphenurus*)	2	
Azure Kingfisher (*Ceyx azureus*)	2	Breeding in creek bank
Laughing Kookaburra (*Dacelo novaeguineae*)	1	
Sacred Kingfisher (*Todiramphus sanctus*)	1	
Red-rumped Parrot (*Psephotus haematonotus*)	4	
Brown Treecreeper (*Climacteris picumnus*)	2	
Little Friarbird (*Philemon citreogularis*)	2	
White-browed Woodswallow (*Artamus superciliosus*)	4	
Tree Martin (*Petrochelidon nigricans*)	4	
Mistletoebird (*Dicaeum hirundinaceum*)	1	

Appendix N. Results of Regent Parrot Two Hour Point Surveys (THPS)

Summary of the results of targeted Regent Parrot nest surveys at Belsar-Yungera Construction Footprint areas during surveys on October 8, 17, 22, and November 19, 2019.

9/10/2019

7:17. Site ER3. THPS x2.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity, 15 individuals observed. Birds moving between trees but breeding activity not observed or suspected.

10:15. Site ER1 – Long Levee. THPS x2.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area, 6 birds observed. Birds moving between trees but breeding activity not observed or suspected.

12:57. Site S108 Gearbox Loop. THPS x2.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area, no birds observed in Construction Footprint or immediate surrounds but much activity in surrounding area (100+ m away).

15:11. Site Bonyaricall Creek hard stand. THPS x2

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area. Birds moving between trees but breeding activity not observed or suspected.

17/10/2019

7:46. Site ER1 – Long Levee. THPS x2.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area, 6 birds observed. Birds moving between trees but breeding activity not observed or suspected.

10:12. S7 Creek Regulator. THPS x2.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity in general area, at least 15 individuals observed. Birds moving between trees but breeding activity not observed or suspected.

12:35. Site ER3. THPS x2.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area, 4 birds observed. Birds moving between trees but breeding activity not observed or suspected.

14:57. Site S108 Gearbox Loop. THPS x2.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity in general area, 8 birds observed in Construction Footprint and immediate surrounds but much activity in surrounding area (100+ m away), breeding activity not observed or suspected within immediate area, but likely occurring in broader area (100+m away).

22/10/2019

8:02. Site ER3. THPS x3.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity in general area, 14 birds observed. Birds moving between trees but breeding activity not observed or suspected.

10:27. Site S108 Gearbox Loop. THPS x3.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity in general area, 6 birds observed in Construction Footprint and immediate surrounds but much activity in surrounding area (100+ m away), breeding activity not observed or suspected within immediate area, but likely occurring in broader area (100+m away).

12:55. S7 Regulator. THPS x3.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area and much activity on opposite bk of Murray River (200-300m away), 6 individuals observed. Birds moving between trees but breeding activity not observed or suspected.

19/11/2019

7:49. Site ER1. THPS x4.

No Regent Parrot breeding activity observed. Lots of Regent Parrot activity in general area, 20+ birds observed. Birds moving between trees but breeding activity not observed or suspected.

10:21. Site Bonyaricall Creek hard stand. THPS x4.

No Regent Parrot breeding activity observed. Some Regent Parrot activity in general area. Birds moving between trees but breeding activity not observed or suspected.

12:47. Site ER3. THPS x4.

No Regent Parrot activity detected. No Regent Parrots observed.

Summary of Regent Parrot Two-hour point surveys

Site	Date and number of THPS	Total THPS
ER1	9/10/19 (x2). 17/10/19 (x2). 19/11/19 (x4).	8
ER3	9/10/19 (x2). 17/10/19 (x2). 22/10/19 (x3). 19/11/19 (x4).	11
S7	17/10/19 (x2). 22/10/19 (x3).	5
S108	9/10/19 (x2). 17/10/19 (x2). 22/10/19 (x3).	7
Bonyaricall Creek hard stand	9/10/19 (x2). 19/11/19 (x4).	6
TOTAL		37

Appendix O. Native Vegetation Removal Report (NVRR)

Scenario test – native vegetation removal

This report provides offset requirements for internal testing of different proposals to remove native vegetation. **This report DOES NOT support an application to remove, destroy or lop native vegetation under Clause 52.16 or 52.17 of planning schemes in Victoria.** A report must be obtained from the Department of Environment, Land, Water and Planning (DELWP).

Date of issue: 14/04/2020
Time of issue: 6:29 pm

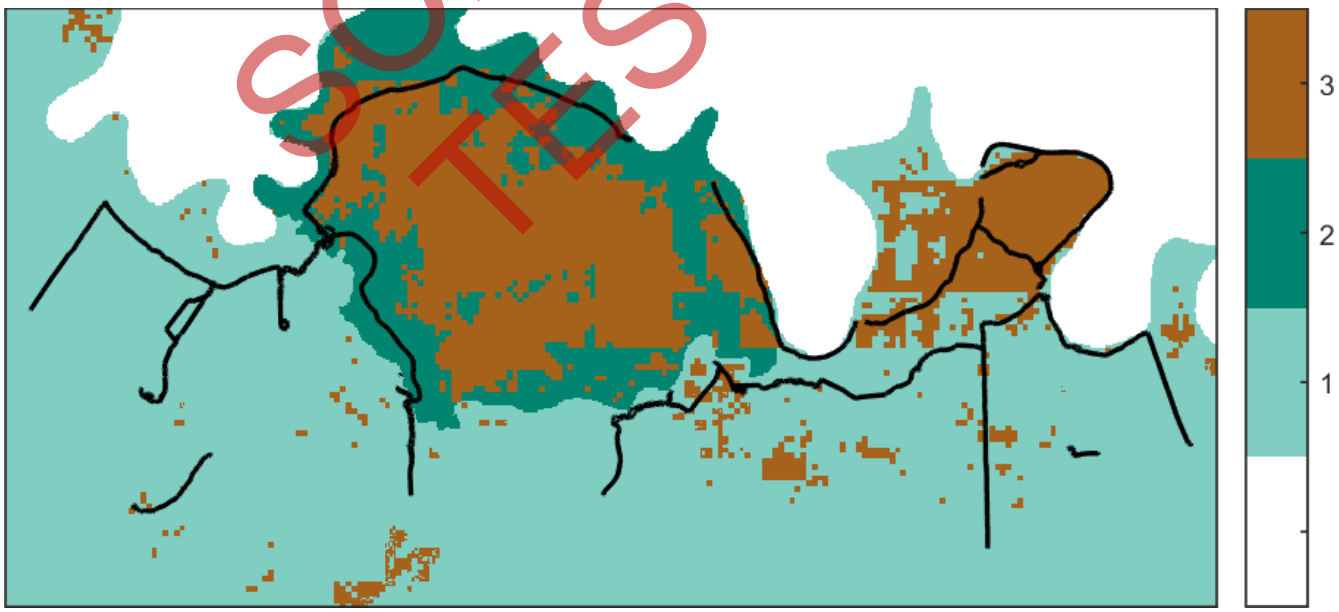
Report ID: Scenario Testing

Project ID	DELWP_NVR_Template_no32_15__66_40_49

Assessment pathway

Assessment pathway	**Detailed Assessment Pathway**
Extent including past and proposed	45.056 ha
Extent of past removal	0.000 ha
Extent of proposed removal	45.056 ha
No. Large trees proposed to be removed	321
Location category of proposed removal	Location 3 The native vegetation is in an area where the removal of less than 0.5 hectares could have a significant impact on habitat for one or more rare or threatened species.The native vegetation is also in an area mapped as a wetland listed in the Directory of Important Wetlands of Australia.

1. Location map



Scenario test – native vegetation removal

Offset requirements if a permit is granted

Any approval granted will include a condition to obtain an offset that meets the following requirements:

Scenario test – native vegetation removal

Species offset amount[1]	58.167 species units of habitat for Grow ling Grass Frog, *Litoria raniformis* 55.368 species units of habitat for Darling Lily, *Crinum flaccidum* 49.895 species units of habitat for Bignonia Emu-bush, *Eremophila bignoniiflora* 44.364 species units of habitat for Plains Spurge, *Euphorbia planiticola* 38.357 species units of habitat for Desert Glassw ort, *Tecticornia triandra* 32.208 species units of habitat for Poverty Bush, *Sclerolaena intricata* 51.887 species units of habitat for Yakka Grass, *Sporobolus caroli* 46.573 species units of habitat for Small Pop Saltbush, *Atriplex spongiosa* 30.561 species units of habitat for Soda Bush, *Neobassia proceriflora* 34.552 species units of habitat for Native Madder, *Synaptantha tillaeacea var. tillaeacea* 22.360 species units of habitat for Red-chested Button-quail, *Turnix pyrrhothorax* 54.184 species units of habitat for Bush Stone-curlew , *Burhinus grallarius* 56.010 species units of habitat for Regent Parrot, *Polytelis anthopeplus monarchoides* 45.543 species units of habitat for Grey-crow ned Babbler, *Pomatostomus temporalis temporalis* 41.755 species units of habitat for Spotted Bow erbird, *Ptilonorhynchus maculatus* 47.104 species units of habitat for Dw arf Burrow ing Skink, *Lerista timida* 13.258 species units of habitat for Murray Hardyhead, *Craterocephalus fluviatilis* 56.404 species units of habitat for Carpet Python, *Morelia spilota metcalfei* 58.056 species units of habitat for Desert Lantern, *Abutilon otocarpum* 58.065 species units of habitat for Nealie, *Acacia loderi* 58.066 species units of habitat for Yarran, *Acacia melvillei* 58.055 species units of habitat for Bramble Wattle, *Acacia victoriae subsp. victoriae* 53.491 species units of habitat for Jerry-jerry, *Ammannia multiflora* 55.314 species units of habitat for Tw in-leaf Bedstraw , *Asperula gemella* 58.107 species units of habitat for Spreading Saltbush, *Atriplex limbata* 58.004 species units of habitat for Coral Saltbush, *Atriplex papillata* 57.571 species units of habitat for Mealy Saltbush, *Atriplex pseudocampanulata* 54.488 species units of habitat for Silver Saltbush, *Atriplex rhagodioides* 58.040 species units of habitat for Small Water-fire, *Bergia trimera* 48.292 species units of habitat for Blue Burr-daisy, *Calotis cuneifolia* 56.976 species units of habitat for Sw amp Sheoak, *Casuarina obesa* 43.609 species units of habitat for Bear's-ear, *Cymbonotus lawsonianus* 52.377 species units of habitat for Silky Umbrella-grass, *Digitaria ammophila* 56.894 species units of habitat for Tw in-flow er Saltbush, *Dissocarpus biflorus var. biflorus* 55.363 species units of habitat for Flat Spike-sedge, *Eleocharis plana* 58.072 species units of habitat for Cane Grass, *Eragrostis australasica* 58.066 species units of habitat for Purple Love-grass, *Eragrostis lacunaria* 58.077 species units of habitat for Bristly Love-grass, *Eragrostis setifolia* 58.093 species units of habitat for Spreading Emu-bush, *Eremophila divaricata subsp. divaricata*

[1] The species offset amount(s) required is the sum of all species habitat units in Appendix 1.

Scenario test – native vegetation removal

	58.065 species units of habitat for Spotted Emu-bush, *Eremophila maculata subsp. maculata* 55.268 species units of habitat for Bristly Sea-heath, *Frankenia serpyllifolia* 56.810 species units of habitat for Veined Peppercress, *Lepidium phlebopetalum* 52.145 species units of habitat for Pearl Bluebush, *Maireana sedifolia* 58.063 species units of habitat for Three-wing Bluebush, *Maireana triptera* 56.826 species units of habitat for Goat Head, *Malacocera tricornis* 58.078 species units of habitat for Small Monkey-flower, *Elacholoma prostrata* 56.347 species units of habitat for Bush Minuria, *Minuria cunninghamii* 53.267 species units of habitat for Woolly Minuria, *Minuria denticulata* 55.307 species units of habitat for Smooth Minuria, *Minuria integerrima* 58.067 species units of habitat for Spiny Lignum, *Duma horrida subsp. horrida* 50.718 species units of habitat for Mallee Cucumber, *Austrobryonia micrantha* 54.649 species units of habitat for Lagoon Spurge, *Phyllanthus lacunarius* 56.893 species units of habitat for Woolly Scurf-pea, *Cullen pallidum* 55.300 species units of habitat for Tough Scurf-pea, *Cullen tenax* 57.826 species units of habitat for Dwarf Bitter-cress, *Rorippa eustylis* 53.736 species units of habitat for Northern Sandalwood, *Santalum lanceolatum* 50.021 species units of habitat for Woolly Copperburr, *Sclerolaena lanicuspis* 58.053 species units of habitat for Spear-fruit Copperburr, *Sclerolaena patenticuspis* 58.069 species units of habitat for Sand Sida, *Sida ammophila* 58.066 species units of habitat for Pin Sida, *Sida fibulifera* 58.069 species units of habitat for Twiggy Sida, *Sida intricata* 36.420 species units of habitat for Hairy Darling-pea, *Swainsona greyana* 56.948 species units of habitat for Small-leaf Swainson-pea, *Swainsona microphylla* 55.361 species units of habitat for Rye Beetle-grass, *Tripogon loliiformis* 55.363 species units of habitat for Winged New Holland Daisy, *Vittadinia pterochaeta* 52.641 species units of habitat for Sandhill Spurge, *Phyllanthus lacunellus* 58.069 species units of habitat for White Twin-leaf, *Zygophyllum simile* 58.066 species units of habitat for Riverine Flax-lily, *Dianella porracea* 57.495 species units of habitat for Spiny-fruit Saltbush, *Atriplex spinibractea* 55.309 species units of habitat for Squat Picris, *Picris squarrosa* 53.438 species units of habitat for Silky Swainson-pea, *Swainsona sericea* 54.632 species units of habitat for Riverina Bitter-cress, *Cardamine moirensis* 46.895 species units of habitat for Dookie Daisy, *Brachyscome gracilis* 45.360 species units of habitat for Cotton Sneezeweed, *Centipeda nidiformis* 49.878 species units of habitat for Pale Flax-lily, *Dianella sp. aff. longifolia (Riverina)*
Large trees	321 trees

NB: values within tables in this document may not add to the totals shown above due to rounding

Appendix 1 includes information about the native vegetation to be removed

Appendix P. Current Wetlands maps of Belsar-Yungera

Current Wetlands at Belsar Yungera

VMFRP

MURRAY RIVER
CARP HOLE
MURRAY RIVER
NARCOOYIA CREEK
BONYARICALL CREEK
Hattah-robinvale Road
LAKE POWELL
Murray Valley Highway
LAKE CARPUL

Legend

- Current Wetlands
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation
- Railway
- Major Road
- Minor Road
- Channel / Drain
- Watercourse Stream
- Waterbody
- Wetland Swamp

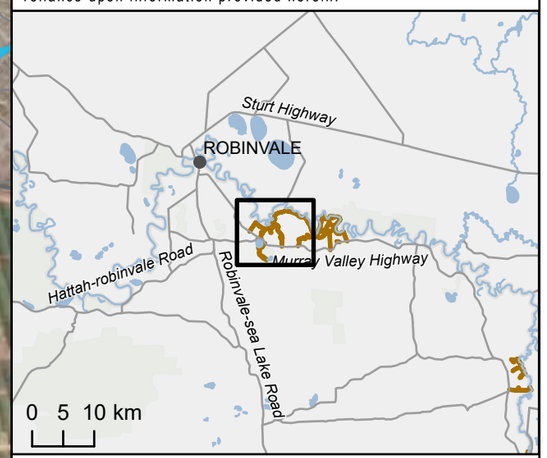
N

Spatial Reference
Name: GDA 1994 MGA Zone 55
Datum: GDA 1994
Projection: Transverse Mercator

IS297701

0 500 1000 Meters

DATA SOURCES
© Commonwealth of Australia (Geoscience Australia) 2006 Geodata Topo 250k Series 3; Vicmap Data © State of Victoria 2020; GHD 2020.



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Current Wetlands at Belsar Yungera

VMFRP

PEACOCK CREEK
BOGGY CREEK
MANIE CREEK
MANIE CREEK
MURRAY RIVER
YUNGERA CREEK
Murray Valley Highway

Legend

- Current Wetlands
- Development Footprint
- Construction Footprint Tracks
- Construction Footprint Structures
- Area of Investigation
- Railway
- Major Road
- Minor Road
- Channel / Drain
- Watercourse Stream
- Waterbody
- Wetland Swamp

N

Spatial Reference
Name: GDA 1994 MGA Zone 55
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IS297701

0 500 1000
Meters

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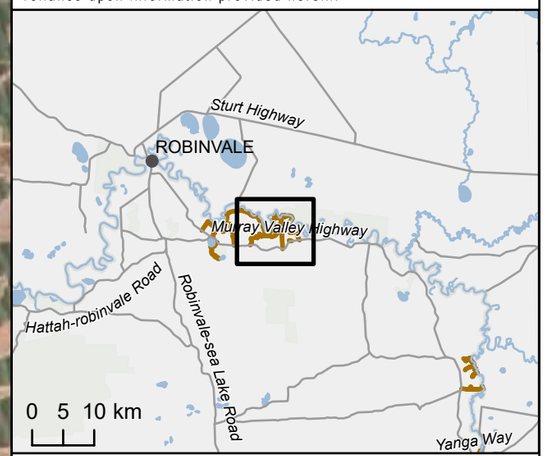

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