APPENDIX A

METHODS

APPENDIX A-1
BAM VEGETATION INTEGRITY PLOT SURVEY LOCATION DETAILS

Table A.1 Location and orientation of vegetation integrity plots

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q27	PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	615262	6206652	35°
Q28	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)	619366	6217575	260°
Q29	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)	618592	6214971	285°
Q30	Unassigned	–	–	–
Q31	PCT216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion (modified)	615895	6207039	215°
Q32	PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	615661	6206524	225°
Q33	PCT17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	615126	6206641	15°
Q34	PCT11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	614807	6206719	185°
Q35	PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (derived)	615992	6207157	45°
Q36	PCT19 – Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)	616027	6207281	0°
Q37	PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)	615170	6226843	30°
Q38	PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)	611171	6231817	115°
Q39	PCT 63 – Spiny Lignum – Slender Glasswort open forbland saline wetland on lake edges in the semi-arid and arid climate zones (modified)	597239	6248103	15°
Q40	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)	512165	6248719	206°
Q41	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)	500298	6250698	100°

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q42	PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)	500421	6250803	152°
Q43	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)	502765	6250374	87°
Q44	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)	505151	6250401	285°
Q45	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)	507238	6250634	276°
Q46	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)	512656	6249935	291°
Q47	PCT 154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)	520786	6248698	85°
Q48	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'boninka')	543161	6256148	228°
Q49	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'lunette')	543395	6256215	177°
Q50	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'lunette')	543105	6255512	230°
Q51	PCT 221 – Black Oak – Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones (modified)	542328	6254142	225°
Q52	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)	541042	6252197	272°
Q53	PCT 154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)	539387	6249678	304°
Q54	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	528947	6248930	58°
Q55	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	523282	6248355	80°
Q56	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'lunette')	543561	6255497	223°
Q57	PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (derived)	546071	6256276	245°
Q58	PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (derived)	550238	6256420	4°
Q59	PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (modified)	553544	6255507	173°

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q60	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)	556381	6255746	106°
Q61	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)	560002	6254756	25°
Q62	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified bull)	560549	6254674	229°
Q63	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)	562311	6254377	128°
Q64	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'lunette')	543216	6255100	50°
Q65	PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains (modified 'boninka')	543420	6255532	10°
Q66	PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)	538935	6249145	240°
Q67	PCT 154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)	522263	6248524	321°
Q68	PCT 19 – Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)	564982	6254145	210°
Q69	PCT 19 – Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)	565168	6254222	60°
Q70	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	566134	6254292	325°
Q71	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)	572000	6253663	285°
Q72	PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (modified)	571055	6253655	250°
Q73	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	567077	6254087	122°
Q74	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)	575590	6253211	49°

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q75	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)	576094	6253237	200°
Q76	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	586026	6255785	202°
Q77	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	590253	6255762	160°
Q78	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	588626	6255942	240°
Q79	PCT 139 – Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions (modified)	593341	6253049	52°
Q80	PCT 139 – Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions (modified)	592913	6255219	315°
Q81	PCT 166 – Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW (modified)	592981	6253125	146°
Q82	PCT 166 – Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW (modified)	592651	6253138	13°
Q83	PCT11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	592535	6253104	319°
Q84	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	594520	6251560	218°
Q85	PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	596833	6248832	178°
Q86	PCT 63 – Spiny Lignum – Slender Glasswort open forbland saline wetland on lake edges in the semi-arid and arid climate zones (modified)	592791	6253032	176°
Q87	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	598546	6246826	312°
Q88	PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)	600228	6244814	287°
Q89	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified bull)	601230	6243693	227°

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q90	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified bull)	601573	6243203	261°
Q91	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified bull)	601950	6242844	231°
Q92	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified bull)	604248	6240048	108°
Q93	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified bull)	604961	6239256	196°
Q94	PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)	605069	6239087	138°
Q95	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified bull)	606577	6237381	255°
Q96	PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)	606283	6237751	208°
Q97	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)	611272	6231722	271°
Q98	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)	611620	6231229	192°
Q99	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)	613064	6229443	185°
Q100	PCT 143 – Narrow-leaved Hopbush – Scrub Turpentine – Senna shrubland on semi-arid and arid sandplains and dunes (modified)	505692	6250510	279°
Q101	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)	509718	6250331	89°
Q102	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)	510636	6250327	65°
Q103	PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	614938	6206256	4°
Q104	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)	514528	6249466	90°
Q105 (E5)	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)	608328	6235234	4°
Q106	PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)	513872	6249693	78°
Q107 (E6)	PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)	606110	6237914	0°

PLOT	VEGETATION TYPE AND ZONE	EASTING	NORTHING	ORIENTATION
Q108 (E18)	PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)	603871	6240499	0°
Q109	PCT 221 – Black Oak – Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones (modified)	542111	6253869	337°
Q110	PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)	536899	6248956	83°
Q111 (E35)	PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whipstick)	608218	6235408	207°
Q112	PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (derived)	550258	6256450	0°

Note: Plots Q105 (E5), Q107 (E6) and Q108 (E18) were undertaken by Jacobs 2019.

APPENDIX A-2
CANDIDATE THREATENED FLORA SPECIES SURVEY EFFORT

Table A.2 Summary of targeted candidate threatened flora survey effort

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Acacia acanthoclada	Harrow Wattle	E	–	Aug – Nov Survey notes: based on flowering Observational notes: the species is readily identifiable based on phyllodes and growth form all year	PCT 170, PCT 171 & PCT 172 Deep silicious sands	Note: survey effort focused on deep silicious sands with specific emphasis on PCT 171 and PCT 172. Inspections of shrubs with similar growth form being: *Acacia wilhelmiana*, *Cryptandra* sp. and *Westringia rigida* were regularly undertaken. Representative parallel field traverses (PCT 171 & PCT 172): — 13-24 Oct 2019: On 22 Oct 2019, this species was recorded (2 individuals) from PCT 171 modified whipstick variant. The individuals were not flowering at the time. Plant material was collected for positive herbarium identification. On 30 Oct 2019 plant material was forwarded to the National Herbarium of NSW. — 26-30 Nov 2019: Species not recorded during traverses. — 18-21 Feb 2020: On 21 Feb 2020, this species was recorded (1 individual) from PCT 171 modified whipstick variant. The individual was not flowering at the time. — 29-31 Apr 2020: Species not recorded during traverses. — 2-5 & 7 Sep 2020: Species not recorded during traverses. Previously located plants were flowering in September 2020. Active searches during BAM plot surveys: — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species observed flowering 22 July 2020.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Acacia carneorum	Purple-wood Wattle	V	–	All year Survey notes: not listed	PCT 21 & PCT 58 Most records of this species occur north of Menindee well outside the proposal locality.	Note: targeted surveys for *Acacia carneorum* involved regular close inspection of other similar spiny phyllode species such as *Acacia colletioides* and *Acacia nyssophylla*. Representative parallel field traverses (PCT 21 & PCT 58): — 13–24 Oct 2019: Species not recorded during traverses. — 26–30 Nov 2019: Species not recorded during traverses. — 20-22 Dec 2019: Species not recorded during traverses. — 18-21 Feb 2020: Species not recorded during traverses. — 29-31 Apr 2020: Species not recorded during traverses. — 2-4 & 6-8 Sept 2020: Species not recorded during traverses. Active searches during BAM plot surveys: — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Atriplex infrequens	A saltbush	V	–	Nov – Feb Survey notes: Use fruiting bodies to accurately identify. Fruit available between Nov - Feb, 4 to 6 weeks after above average rainfall. Suitable months presumed based on recorded emergence of seedlings in Dec.	PCT 17, PCT 153, PCT 166, PCT 170 & PCT 216 *Atriplex infrequens* is associated with broad drainage tracts, clay flats and possibly occasionally inundated habitats.	Note: *Atriplex infrequens* is closely related *Atriplex semibaccata* both were collected during field surveys and forwarded to the National Herbarium of NSW for reference purpose. Representative parallel field traverses (PCT 153, PCT 166, PCT 170 & PCT 216): — 26–30 Nov 2019: Species not recorded during traverses. — 20-22 Dec 2019: Species not recorded during traverses. — 18-21 Feb 2020: Species not recorded during traverses. — 29-31 Apr 2020 (Following above average rainfall): Species not recorded during traverses. — 2-9 Sept 2020 (Following above average rainfall): Species not recorded during traverses (apart from relocating known plants in PCT 17). Active searches during BAM plot surveys — 1-6 May 2020: Recorded species from Q33. — 15-22 July 2020. Species recorded from PCT 17. Microhabitat searches of PCT 17: — 2 May 2020: Recorded species from Q33 and surrounding associated habitat. Plant material collected including fruiting bracteoles for positive identification. 4 May 2020 plant material forwarded to the National Herbarium of NSW. — 22 July 2020: Recorded species from PCT 17. Additional plant material collected including fruiting bracteoles. 31 Jul 2020 additional plant material forwarded to the National Herbarium of NSW. — 5 Sept 2020: Relocated previously recorded plants in PCT 17 and additional plant material collected for identification.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Austrostipa metatoris	A spear-grass	V	–	Oct – Nov Survey notes: very little is known about this species - flowers in response to rain.	PCT 19 & PCT 170	Representative parallel field traverses (PCT 19 & PCT 170): — 13-24 Oct 2019: Species not recorded during traverses. — 26-30 Nov 2019: Species not recorded during traverses. — 29-31 Apr 2020 (Following above average rainfall): Species not recorded during traverses. — 2-5 & 7-9 Sept 2020 (Following above average rainfall): Species not recorded during traverses. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Austrostipa nullanulla	A spear-grass	E	Yes	Sep – Dec Survey notes: Sep - Dec, about 4-6 weeks after significant rain. May flower at other times of the year after a significant rainfall event	PCT 154 & PCT 253 Land containing gypseous lunettes and copi rises	Representative parallel field traverses (PCT 154): — 26-30 Nov 2019: Species not recorded during traverses. Inspection of reference populations (Bluff Gilchrist, Nulla Tank and Woomera): — 18 Mar 2020: No fertile flowering material was recorded at any of the reference sites. Habitat mapping of PCT 253 gypseous lunette variant: — 16-18 & 22 Jul 2020: Mapping of PCT 253 gypseous lunette variant to the east of Nulla Station. — 8 Sept 2020: An additional area of PCT 253 gypseous lunette variant was identified approximately 40 km to the east of the known population at Anabranch South located in Wentworth between the Silver City Highway and the High Darling Road. Microhabitat searches of PCT 253: — 18 Mar 2020: Species not recorded during traverses. — 6 May 2020 (Following above average rainfall): Recorded *Austrostipa* sp. basal nubs (presumed *Austrostipa nullanulla*) from gypseous lunettes at Anabranch South. Recorded habitat was consistent with that observed at reference populations. — 3 Sept 2020 (Following above average rainfall): Searched gypseous lunettes in known location at Anabranch South. Recorded resprouting *Austrostipa* sp. basal nubs and seedlings consistent with *Austrostipa nullanulla*. Specimens collected for identification. — 8 Sept 2020 (Following above average rainfall): Searches of an additional area of PCT 253 gypseous lunette variant in Wentworth. Plants apparently consistent with *Austrostipa nullanulla* collected for identification.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Calotis moorei	A burr-daisy	E	Yes	Sep – Nov Survey notes: short-lived perennial. Use flowering/fruiting material to locate. Flowering occurs in the first year of growth. Flowering is recorded for September and fruit have been collected in October.	PCT 139, PCT 143, PCT 153, PCT 154 & PCT 170	Representative parallel field traverses (PCT 139, PCT 143, PCT 153, PCT 154 & PCT 170): — 13-24 Oct 2019: Species not recorded during traverses. — 26-30 Nov 2019: Species not recorded during traverses. — 2-9 September 2020 (Following above average rainfall): Species not recorded during traverses. No yellow flowered *Calotis* sp. recorded during traverses.
Cratystylis conocephala	Bluebush Daisy	E	–	All year Survey notes: identified by foliage year round by a skilled botanist familiar with species, as can be easily confused with the foliage of *Maireana Sedifolia*. Is also difficult to locate in understorey.	PCT 58, PCT 170, PCT 171, PCT 172, PCT 221 & PCT 252	Note: Surveys involved regular foliage inspection of *Maireana Sedifolia* plants. The known plant on Rufus River Rd approximately 10 km south of Renmark Rd (Catalogue number NSW 809068) was visited and had flower buds in September 2020. Parallel field traverses (PCT 171 & PCT 172): Species not recorded during traverses. Representative parallel field traverses (PCT 58, PCT 170, PCT 221 & PCT 252): — 13-24 Oct 2019: Species not recorded during traverses. — 26-30 Nov 2019: Species not recorded during traverses. — 20-22 Dec 2019: Species not recorded during traverses. — 18-21 Feb 2020: Species not recorded during traverses. — 29-31 Apr 2020: Species not recorded during traverses. — 2-5 & 7 Sept 2020: Species not recorded during traverses. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Dodonaea stenozyga	Desert Hopbush	CE	Yes	All year Survey notes: not listed	PCT 170, PCT 171 & PCT 172	Note: Can be easily confused with the foliage of *Eremophila sturtii* and *Senna artemisioides* subsp. *filifolia* when fruiting bodies not present. Regular checks of *Eremophila sturtii* and *Senna artemisioides* subsp. *filifolia* were undertaken. Parallel filed traverses (PCT 171 & PCT 172): Species not recorded during traverses. Representative parallel field traverses (PCT 170): — 13–24 Oct 2019: Species not recorded during traverses. — 26–30 Nov 2019: 27 Nov 2019 recorded species within PCT 171 modified whipstick variant. Plant material, including fruiting bodies, collected for positive identification. 6 Dec 2019 plant material forwarded to the National Herbarium of NSW. — 20-22 Dec 2019: Species not recorded during traverses. — 18-21 Feb 2020: 19 Feb 2020 recorded species within PCT 171 modified whipstick variant adjacent to the proposal study area as part of broader population survey. — 29-31 Apr 2020: Species not recorded during traverses. — 2-5 & 7-9 Sept 2020: Species not recorded during traverses. Active searches during BAM plot surveys: — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Eucalyptus leucoxylon subsp. *pruinosa*	Yellow Gum	V	–	All year Survey notes: not listed	PCT 11, PCT 13, PCT 15 & PCT 19 Occurs at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion	Representative parallel field traverses (PCT 11, PCT 13, PCT 15 & PCT 19): — 13-24 Oct 2019: Species not recorded. — 26-30 Nov 2019: Species not recorded. — 3-5 & 7-9 Sept 2020: Species not recorded.
Kippistia suaedifolia	Fleshy Minuria	E	No	All year Survey notes: survey after above average rainfall. Flowers from August to October, mostly from September to November.	PCT 143, PCT 166, PCT 153, PCT 154 & PCT 253 Grows around saline lakes and depressions, often in association with gypsum. Rare in NSW, recorded only from a restricted area on a loamy and highly gypseous soil.	Representative parallel field traverses (PCT 154): — 26–30 Nov 2019: Species not recorded. — 4, 6 & 7 Sept 2020 (Following above average rainfall): Species not recorded. Microhabitat searches of PCT 253: — 18 Mar 2020: Species not recorded. — 6 May 2020 (Following above average rainfall): Species not recorded. — 16-18 & 22 Jul 2020 (Following above average rainfall): Species not recorded. — 3 & 8 Sept 2020 (Following above average rainfall): Species not recorded. Active searches during BAM plot surveys: — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Lasiopetalum behrii	Pink Velvet Bush	CE	Yes	All year Survey notes: not listed Flowering period is late winter to spring	PCT 170, PCT 171 & PCT 172 Shallow sandy soils Grows in mallee and red dune and swale country.	Parallel field traverses (PCT 170, PCT 171 & PCT 172): — 13–24 Oct 2019: Species not recorded. — 26–30 Nov 2019: Species not recorded. — 18-21 Feb 2020: Species not recorded. — 29-31 Apr 2020: Species not recorded. — 2-5 & 7-9 Sept 2020: Species not recorded. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.
Lepidium monoplocoides	Winged Peppercress	E	–	Nov – Feb Survey notes: use seed-heads to identify. Survey about 1 month after significant rain. Plants emerge about 1 month after rain and only persist for a few months.	PCT 15, PCT 153, PCT 170 & PCT 216 Mostly restricted to seasonally moist sites	Note: Conditions for *Lepidium* flowering and fruit set were good in September 2020. Regular checks of any *Lepidium* spp. found were undertaken. *Lepidium papillosum, L. phlebopetalum,* and *L. fasciculatum* were examined closely. Representative parallel field traverses (PCT 15, PCT 153, PCT 170 & PCT 216): — 26–30 Nov 2019: Species not recorded. — 20-22 Dec 2019: Species not recorded. — 18-21 Feb 2020: Species not recorded. — 29-31 Apr 2020 (Following above average rainfall): Species not recorded. — 2-9 Sept 2020 (Following above average rainfall): Species not recorded. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Leptorhynchos waitzia	Button Immortelle	E	Yes	Sep – Nov Survey notes: not listed Limited survey information is known for this species in NSW.	PCT 63, PCT 153, PCT 166 & PCT 170	Representative parallel field traverses (PCT 153, PCT 166 & PCT 170): — 13-24 Oct 2019: Species not recorded. — 26-30 Nov 2019: Species not recorded. — 2-9 Sept 2020: Species not recorded. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded. Microhabitat searches of PCT 63 following above average rainfall — 5 May 2020: Species not recorded. — 20-21 Jul 2020: 20 Jul 2020 recorded apparent *Leptorhynchos waitzia* in early flowering from spiny lignum swamp vegetation (PCT 63). Plant material, including flowers, collected for positive identification. 31 Jul 2020 plant material forwarded to the National Herbarium of NSW. — 4 Sept 2020: PCT 63 checked again and species determined to be a common species of *Pycnosorus* not *Leptorhynchos waitzia*. The plants were in full flower in September 2020 and more easily identified. Species not recorded.
Pimelea serpyllifolia subsp. *serpyllifolia*	Thyme Rice-Flower	E	Yes	Jul – Nov Survey notes: not listed	PCT 170, PCT 171 & PCT 172 Grows in scrub and woodland on calcareous soils. Often found in sandy red soils supporting mallee scrub.	Note: Regular checks of any *Pimelea* spp. found were undertaken. Parallel field traverses (PCT 170, PCT 171 & PCT 172): — 13-24 Oct 2019: Species not recorded. — 26-30 Nov 2019: Species not recorded. — 2-5 & 7 Sept 2020: Species not recorded. Active searches during BAM plot surveys: — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Santalum murrayanum	Bitter Quandong	E	–	All year Survey notes: not listed Fruits seen mostly during September and October, however fruiting collections have also been made from January to August.	PCT 170, PCT 171 & PCT 172 Sandy loam or loamy sand	Parallel field traverses (PCT 170, PCT 171 & PCT 172): — 13-24 Oct 2019: Species not recorded. — 26-30 Nov 2019: 27 Nov 2019 recorded species (2 individuals) from PCT 171 modified whipstick variant. 29 Nov 2019 recorded species (2 individuals) from PCT171 modified whipstick variant and (1 individual) from PCT 170 modified whipstick variant. Plant material was collected for positive herbarium identification. 6 Dec 2019 plant material forwarded to the National Herbarium of NSW. — 20-22 Dec 2019: 22 Dec 2019 species recorded (5 individuals) within PCT 171 modified whipstick variant adjacent to the proposal study area as part of broader population survey. — 18-21 Feb 2020: Species not recorded. — 29-31 Apr 2020: 30 Apr 2020 recorded species (36 individuals) from PCT 171 modified whipstick variant. — 2-5 & 7 Sept 2020: No additional plants recorded. Active searches during BAM plot surveys — 1-6 May 2020: — 15-22 July 2020:
Solanum karsense	Menindee Nightshade	V	–	Sep – Nov Survey notes: survey after flood recession if possible as flowering is driven by flood disturbance. Species does not flower every year.	PCT 15, PCT 17, PCT 63, PCT 153 & PCT 166 Semi-permanent/ephemeral wet areas	Note: Regular checks of any *Solanum* spp. found were undertaken. Representative parallel field traverses (PCT 15, PCT 17, PCT 63, PCT 153 & PCT 166): — 29-31 Apr 2020 (Following above average rainfall): Species not recorded. — 2-9 Sept 2020 (Following above average rainfall): Species not recorded. Active searches during BAM plot surveys — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Swainsona colutoides	Bladder Senna	E	–	All year Survey notes: survey after soaking rain and when night-time temperatures are above frost temperatures. Survey up to 2 years after fire.	PCT 170, PCT 171 & PCT 172 Grows on sandy flats or skeletal hillside soils in mallee woodland.	Note: Surveys were undertaken after above average rainfall. Much of PCT 172 was in post fire recovery (+2 years). Disturbed edges and areas of recent mallee clearing were targeted. All *Swainsona* spp. located in the field were checked. Only *Swainsona microphylla* and *S. phacoides* were found. Representative parallel field traverses (PCT 170, PCT 171 & PCT 172): — 29-31 Apr 2020 (Following above average rainfall): Species not recorded. — 2-5 & 7 Sept 2020 (Following above average rainfall): Species not recorded. Active searches during BAM plot surveys: — 1-6 May 2020: Species not recorded. — 15-22 July 2020: Species not recorded.
Swainsona pyrophila	Yellow Swainson-pea	V	–	Sep – Nov Survey notes: not listed Flowers mainly from September to December.	PCT 170, PCT 171 & PCT 172 Grows in mallee scrub on sandy or loamy soil, usually found only after fire.	Note: Surveys were undertaken after above average rainfall. Much of PCT 172 was in post fire recovery (+2 years). Disturbed edges and areas of recent mallee clearing were targeted. All *Swainsona* spp. located in the field were checked. Only *Swainsona microphylla* and *S. phacoides* were found. Representative parallel field traverses (PCT 170, PCT 171 & PCT 172): — 13-24 Oct 2019: Species not recorded. — 26-30 Nov 2019: Species not recorded. — 2-5 & 7 Sept 2020 (Following above average rainfall): Species not recorded.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	SAII	OPTIMAL SURVEY PERIOD[3]	VEGETATION TYPE / HABITAT CONSTRAINTS	SURVEY EFFORT
Swainsona murrayana	Slender Darling Pea	V	–	Sep Survey notes: not listed	PCT 253 A single record from 2010 occurs from Nanya Station (~80 km north of the proposal study area). At Nanya Station, *Swainsona murrayana* was recorded from a gypseous rise approximately 2 m above a saline clay playa.	Note: Surveys were undertaken after above average rainfall. All *Swainsona* spp. located in the field were checked. Only *Swainsona microphylla* and *S. phacoides* were found. Microhabitat searches of PCT 253: — 3 Sept 2020 (Following above average rainfall): Searched gypseous lunettes at Anabranch South. Species not recorded. — 8 Sept 2020 (Following above average rainfall): Searches of an additional area of PCT 253 gypseous lunette variant in Wentworth. Species not recorded.
Swainsona sericea	Silky Swain-pea	V	–	Sep – Nov Survey notes: survey months differ based on location. Survey Oct – Nov on Monaro. Survey Sep – Oct in the Riverina.	Associated vegetation types not recorded within the proposal study area. Records of this species occur near Red Cliff in Victoria from Kings Billabong Park. Assumed suitable habitat within the proposal study area is PCT13. PCT 19 was also targeted for this species.	Note: Surveys were undertaken after above average rainfall. All *Swainsona* spp. located in the field were checked. Only *Swainsona microphylla* and *S. phacoides* were found. Parallel field traverses (PCT 13 & PCT 19): — 2, 4 & 5-8 Sept 2020 (Following above average rainfall): Species not recorded.

(1) Threat status under the BC Act: V = vulnerable, E = endangered, CE = critically endangered

APPENDIX A-3
CANDIDATE THREATENED FAUNA SPECIES SURVEY EFFORT

Table A.3 Targeted candidate threatened flora survey effort

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Amytornis striatus	Striated Grasswren	V	✓	–	–	–	Predicted habitat for this species occurs within PCT171, 172. *Habitats occurring within the proposal study area were found to be of inadequate quality, in terms of size, density and continuity of cover regarding Triodia spinifex grass condition for this species. It is considered very unlikely to occur, due to the considerable deficiencies in observed habitat.*	Arid woodlands/shrublands (spinifex mallee): Formal 20 minute/2 ha targeted surveys (12 sites) 15, 17, 18, 21/10/2019 Opportunistic surveys 30/04/2020 Opportunistic surveys throughout the survey period, combined with habitat quality assessments and identification of highest quality habitats. Target habitat searches PCT171/PCT172: associated with formal search dates/habitats, throughout spinifex mallee habitat in border habitats, Anabranch west, Pooncarie Road to Arumpo Road and Trentham Cliffs to Red Cliffs link.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Ardeotis australis	Australian Bustard		✓	–	–	–	Predicted habitat for this species occurs within PCT15, 58, 166, 221, 252	Surveys conducted throughout the survey period in Arid woodlands/shrublands and riverine woodlands within PCT15, 58, 166, 221, 252. Formal 20 minute/2ha targeted surveys (32 sites) 15, 17, 18, 20, 21/10/2019; Opportunistic surveys 15, 16, 17/04/2020 in predicted habitats. Further opportunistic surveys within predicted habitats throughout the survey period, combined with habitat quality assessments. Additional formal 20 minute/2 ha targeted surveys and extensive opportunistic surveys conducted throughout open habitats such as chenopod shrublands in PCT's 153/154 as occur along Renmark Road and Rufus River Road, while traversing to and from western sites throughout the survey period. Formal 20 minute/2ha targeted surveys (6 sites) 15, 16, 17/10/2019

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Burhinus grallarius	Bush Stone-curlew	V	✓	✓	✓	✓	Predicted habitat for this species occurs within Riparian habitats PCT 15, 58, 221, 252	Surveys conducted throughout the survey period in Arid woodlands/shrublands and riverine woodlands within PCT15, 58, 221, 252. Formal 20 minute/2ha targeted surveys (24 sites) 15, 17, 18, 20, 21/10/2019; Opportunistic surveys undertaken during habitat assessments and nocturnal surveys. PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct 2019 B46, B47 Nocturnal call playback surveys Anabranch south and Darling River 7&9 – Oct 2020 Spotlighting surveys 26&28 – Nov 2019 15&16 – Jul 2020 7&9 – Sep 2020 PCT58: Targeted formal bird surveys in predicted habitat 15 – Oct 2019 B2, 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, B27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT221: 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B8 20 – Oct 2019 B29 27 – Nov 2019 opportunistic PCT252: Targeted formal bird surveys and opportunistic surveys in predicted habitat 18 – Oct 2019 B21 20 – Oct 2019 B21 20 – Oct 2019 B29

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Calidris ferruginea	Curlew Sandpiper	E1	✓	✓	✓	✓	Predicted habitat for this species occurs within Riparian habitats PCT99996, 99997 May use PCT10, 11 areas when inundated. Old records for this species to the west in SA, suitable habitats exist and used by other *Calidris* spp. during records in the Chowilla Regional Reserve.	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link Survey of wetland habitats associated with the proposal study area locality. Chowilla Nature Reserve 14 – Oct 2019 26 – Nov 2019 Rufus River Weir 13 – Oct 2019 26 – Nov 2019 17 – Jul 2020 Lake Victoria 14 – Oct 2019 26 – Nov 2019 17 – Jul 2020

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Hamirostra melanosternon	Black-breasted Buzzard	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT10, 11, 13, 15, 16, 17, 21, 58, 63, 139, 143, 154, 166, 170, 171, 172, 216, 221, 252	Surveys conducted throughout the survey period in Arid woodlands/shrublands and riverine woodlands within PCT10, 11, 13, 15, 16, 17, 21, 58, 63, 139, 143 154, 166, 170, 171, 172, 216, 221, 252. Formal 20 minute/2ha targeted surveys (24 sites) 15, 17, 18, 20, 21, 23/10/2019; Targeted bird surveys 1, 15/05/2020 15/07/2020 Opportunistic surveys undertaken during habitat assessments and nocturnal surveys 14, 15, 18/10/2019 19/02/2020 1, 3, 15/05/2020 17/07/2020 PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT15: 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT17: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT21: Opportunistic surveys 14 – Oct 2019 15 – Oct 2019 19 – Feb 2020 17 – Jul 2020 30 – Apr 2020 PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT63: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT139: Not surveyed

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT139: 26 – Nov 2019 opportunistic 27 – Nov 2019 opportunistic PCT143: 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic 22 – Oct 2019 opportunistic 26 – Nov 2019 opportunistic 27 – Nov 2019 opportunistic 6 – May 2020 opportunistic 15 – May 2020 Red Cliffs link PCT153: Formal targeted surveys and opportunistic surveys also conducted in habitats assessed as suitable, as represented by large open areas of this PCT 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B10, B11 And PCT154: 15 – Oct 2019 B12, B13, B14, B15 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic PCT166: 16 – Oct 2019 opportunistic

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT172: 30 – Apr 2020 Opportunistic surveys PCT216: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT221: 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B8 20 – Oct 2019 B29 27 – Nov 2019 opportunistic
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT10, 11, 13, 15, 16, 17, 19, 21, 58, 63, 139, 143, 166, 170, 171	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT17: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT19: Opportunistic surveys 30 – Apr 2020 PCT21: Opportunistic surveys 30 – Apr 2020 PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT143: 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic 22 – Oct 2019 opportunistic 26 – Nov 2019 opportunistic 27 – Nov 2019 opportunistic 6 – May 2020 opportunistic 15 – May 2020 Red Cliffs link PCT153: Formal targeted surveys and opportunistic surveys also conducted in habitats assessed as suitable, as represented by large open areas of this PCT 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B10, B11

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT166: 16 – Oct 2019 opportunistic PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B34 21 – Oct 2019 B39, B41, B42, B44, B45 30 – Apr 2020 B49, B52, B53 PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT216: Surveyed opportunistically in association with PCT13 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Hieraaetus morphnoides	Little Eagle	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT10, 11, 13, 15, 16, 17, 19, 21, 58, 63, 139, 143, 154, 166, 170, 171, 172, 216, 221, 252, 253	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT17: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT19: Opportunistic surveys 30 – Apr 2020

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT21: Opportunistic surveys 30 – Apr 2020 PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT63: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT139: Opportunistic surveys 26 – Nov 2019 27 – Nov 2019 PCT143: Opportunistic surveys 15 – Oct 2019 16 – Oct 2019 17 – Oct 2019 22 – Oct 2019 26 – Nov 2019 27 – Nov 2019 6 – May 2020 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT154: Formal targeted surveys and opportunistic surveys also conducted in habitats assessed as suitable, as represented by large open areas of this PCT 15 – Oct 2019 B12, B13, B14, B15 16 – Oct 2019 opportunistic surveys 17 – Oct 2019 opportunistic surveys PCT166: 16 – Oct 2019 opportunistic surveys PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B34 21 – Oct 2019 B39, B41, B42, B44, B45 30 – Apr 2020 B49, B52, B53 PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic surveys

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT172: 30 – Apr 2020 opportunistic surveys PCT221: 16 – Oct 2019 opportunistic surveys 17 – Oct 2019 B8 27 – Nov 2019 opportunistic PCT252: Targeted formal bird surveys and opportunistic surveys in predicted habitat 18 – Oct 2019 B21 PCT253: Targeted formal bird surveys and opportunistic surveys in predicted habitat 17 – Oct 2019 20 – Oct 2019, B28
Lasiorhinus latifrons	Southern Hairy-nosed Wombat	E	✓	✓	–	–	Predicted habitat for this species occurs within PCT 58, 153, 154, 170, 171, 172	Opportunistic searches throughout spring 2019 late summer, autumn and winter 2020, encompassing semi-arid open country and wooded habitats including Mallee, Black Oak, Rosewood community associations. PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT153: Formal targeted surveys and opportunistic surveys also conducted in habitats assessed as suitable, as represented by large open areas of this PCT 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B10, B11

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT154: 15 – Oct 2019 B12, B13, B14, B15 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT172: 30 – Apr 2020 opportunistic surveys

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Lathamus discolor	Swift Parrot	E	-	-	-	✓	Predicted habitat for this species occurs within PCT10, 11	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link
Litoria raniformis	Southern Bell Frog	E	-	-	-	✓	Predicted habitat for this species occurs within PCT 11, 13, 17	PCT11: Targeted surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 (including Nocturnal survey) Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link PCT17: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link Riverine habitat call playback 9 – Sep 2020 Darling River

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT10, 11, 13, 15, 16, 19, 21, 58, 63, 139, 143, 153, 154, 166, 170, 171, 172, 221, 252, 253	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT19: Opportunistic surveys 30 – Apr 2020 PCT21: Opportunistic surveys 14 – Oct 2019 15 – Oct 2019 19 – Feb 2020 17 – Jul 2020 30 – Apr 2020

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT63: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT139: Not surveyed PCT139: 26 – Nov 2019 opportunistic 27 – Nov 2019 opportunistic PCT143: 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic 22 – Oct 2019 opportunistic 26 – Nov 2019 opportunistic 27 – Nov 2019 opportunistic 6 – May 2020 opportunistic 15 – May 2020 Red Cliffs link PCT153: Formal targeted surveys and opportunistic surveys also conducted in habitats assessed as suitable, as represented by large open areas of this PCT 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B10, B11

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								And PCT154: 15 – Oct 2019 B12, B13, B14, B15 16 – Oct 2019 opportunistic 17 – Oct 2019 opportunistic PCT166: 16 – Oct 2019 opportunistic PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT172: 30 – Apr 2020 Opportunistic surveys PCT221: 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B8 20 – Oct 2019 B29 27 – Nov 2019 opportunistic PCT252: Targeted formal bird surveys and opportunistic surveys in predicted habitat 18 – Oct 2019 B21 PCT253: Targeted formal bird surveys and opportunistic surveys in predicted habitat 17 – Oct 2019 20 – Oct 2019, B28
Lophoictinia isura	Square-tailed Kite	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT 10, 11, 13, 15, 16, 21, 58, 221, 252	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT21: Opportunistic surveys 30 – Apr 2020 PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT221: 16 – Oct 2019 opportunistic surveys 17 – Oct 2019 B8 27 – Nov 2019 opportunistic PCT252: Targeted formal bird surveys and opportunistic surveys in predicted habitat 18 – Oct 2019 B21

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Lucasium stenodactylum	Crowned Gecko	V	✓	–	–	–	Predicted habitat for this species occurs within PCT 143, 153, 154, 170, 221 ***The known range of this species does not extend to the proposal study area study area. A closely related species L. damaeum (*Beaded Gecko*) was observed during nocturnal surveys in PCT15, PCT170 and PCT172. Another closely related species L. steindachneri (*Box-patterned Gecko*) was observed in PCT58 and PCT170.***	PCT143: Opportunistic surveys 15 – Oct 2019 16 – Oct 2019 17 – Oct 2019 22 – Oct 2019 26 – Nov 2019 27 – Nov 2019 6 – May 2020 15 – May 2020 Red Cliffs link PCT153: Opportunistic surveys 15 – Oct 2019 opportunistic 16 – Oct 2019 opportunistic 17 – Oct 2019 B10, B11 PCT154: Opportunistic surveys 15 – Oct 2019 B12, B13, B14, B15 16 – Oct 2019 opportunistic surveys 17 – Oct 2019 opportunistic surveys PCT170: Opportunistic surveys 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT221: 16 – Oct 2019 opportunistic surveys 17 – Oct 2019 B8 27 – Nov 2019 opportunistic Chenopod shrubland pitfall and funnel trap surveys conducted 3-6 – Sep 2020 (Pf 12 nights; Fun 12 nights) Arid Woodland pitfall and funnel trap surveys conducted 17-21 – Mar (Pf 72 nights; Fun 48 nights) 2-10 – Sep (Pf 80 nights; Fun 120 nights)
Manorina melanotis	Black-eared Miner	CE	✓	–	–	–	Predicted habitat for this species occurs within PCT170, 171, 172	PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT172: 30 – Apr 2020 Opportunistic surveys
Pachycephala rufogularis	Red-lored Whistler	CE	✓	-	-	-	Predicted habitat for this species occurs within PCT171, 172.	PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT172: 30 – Apr 2020 Opportunistic surveys
Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	E	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT 10, 11, 13, 15, 16, 58, 170, 171	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct B46, B47 PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B29, B34 21 – Oct 2019 B39, B41, B42, B44, B45 27 – Nov 2019 opportunistic 30 – Apr 2020 B49, B52, B53 6 – May 2020 opportunistic

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic
Pseudomys desertor	Desert Mouse	CE	✓	–	–	–	Predicted habitat for this species occurs within PCT 171, 172	PCT171: Targeted formal surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT172: 30 – Apr 2020 Opportunistic surveys Arid Woodland pitfall/funnel trap and Elliot A and E trap surveys conducted 17-21 – Mar (Pf 72 nights; Fun 48 nights; El-A 300 nights; E-E 64 nights) 2-10 – Sep (Pf 80 nights; Fun 120 nights; El-A 500 nights; E-E 80 nights)

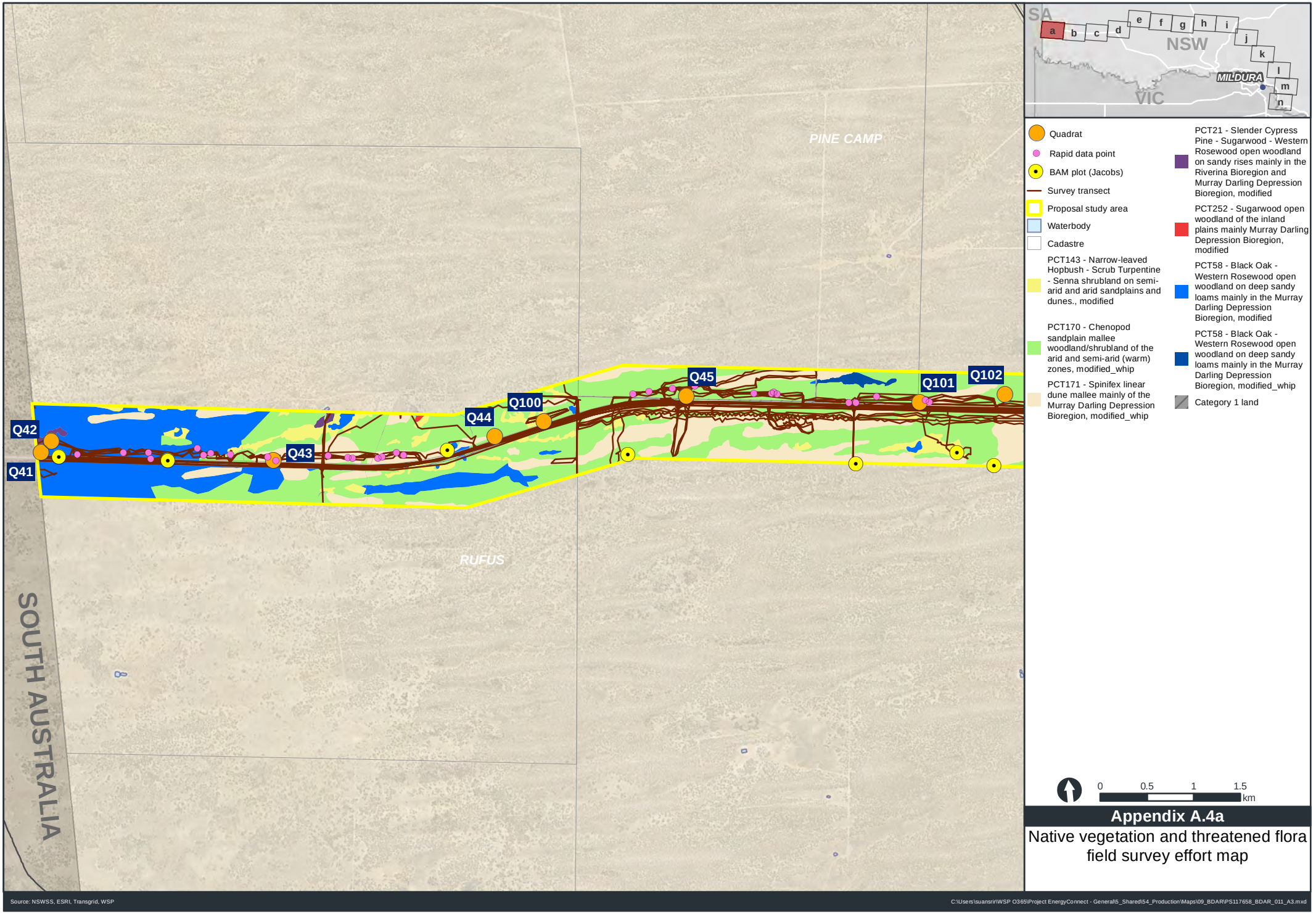
SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Neobatrachus pictus	Painted Burrowing Frog	E	✓	✓	✓	–	Predicted habitat for this species occurs within PCT11, 15, 58, 153, 154, 170, 171, 221, 252	PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 (including Nocturnal survey) Red Cliffs link PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct 2019 B46, B47 16 – Jul 2020 Nocturnal Surveys (Anabranch) PCT58: 17 – Oct 2019 B9, B16 18 – Oct 2019 B19, B22, B26, 27 20 – Oct 2019 B30, B31, B32, B32a, B32b 21 – Oct 2019 B38 PCT170: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B3, 16 – Oct 2019 B4, B4a, B5, B5a, B6, B7 17 – Oct 2019 B8 18 – Oct 2019 B21 20 – Oct 2019 B34 21 – Oct 2019 B39, B41, B42, B44, B45 30 – Apr 2020 B49, B52, B53

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
								PCT171: Targeted formal bird surveys and opportunistic surveys in predicted habitat 15 – Oct 2019 B1, B1a, B3, B3a 17 – Oct 2019 B17 18 – Oct 2019 B18, B20 21 – Oct 2019 B37, B40, B43, B44 27 – Nov 2019 opportunistic 30 – Apr 2020 B50 6 – May 2020 opportunistic PCT221: 16 – Oct 2019 opportunistic 17 – Oct 2019 B8 27 – Nov 2019 opportunistic PCT252: Targeted formal bird surveys and opportunistic surveys in predicted habitat 18 – Oct 2019 B21 Chenopod shrubland pitfall and funnel trap surveys conducted 3-6 – Sep 2020 (Pf 12 nights; Fun 12 nights) Arid Woodland pitfall and funnel trap surveys conducted 17-21 – Mar (Pf 72 nights; Fun 48 nights) 2-10 – Sep (Pf 80 nights; Fun 120 nights) Riverine pitfall and funnel trap surveys conducted 17-21 – Mar 2020 (Pf 32 nights; Fun 32 nights)

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	IBRA SUBREGIONS				HABITAT/BREEDING FEATURES	SURVEY EFFORT
			SOP	GDA	PD	RP		
Ninox connivens	Barking Owl	V	✓	✓	✓	✓	Predicted habitat for this species occurs within PCT 10, 11, 13, 15, 16	PCT10: Targeted bird surveys in predicted habitat 15 – May 2020 Red Cliffs link 15 – Jul 2020 (including Nocturnal survey) Red Cliffs link PCT11: Targeted formal bird surveys in predicted habitat 23 – Oct 2019 B48 Darling crossing 15 – May 2020 Red Cliffs link 15 – Jul 2020 (including Nocturnal survey) Red Cliffs link PCT13: 1 – May 2020 Opportunistic surveys 3 – May 2020 Opportunistic surveys 15 – May 2020 Red Cliffs link PCT15: Targeted formal bird surveys in predicted habitat 18 – Oct 2019 B23, B24, B25 20 – Oct 2019 B33, B35, B36 21 – Oct 2019 B46, B47 26 – Nov 2019 Nocturnal surveys (Kelly) 28 – Nov 2019 Nocturnal surveys (Anabranch) 16 – Jul 2020 Nocturnal Surveys (Anabranch) PCT16: Opportunistic surveys 1 – May 2020 Red Cliffs link 3 – May 2020 Red Cliffs link 15 – May 2020 Red Cliffs link Riverine spotlighting call playback surveys conducted 26&28 – Nov 2019 Anabranch and Kelly's 15&16 – Jul 2020 Anabranch and Murray River 7&9 – Sep 2020 Anabranch and Darling River

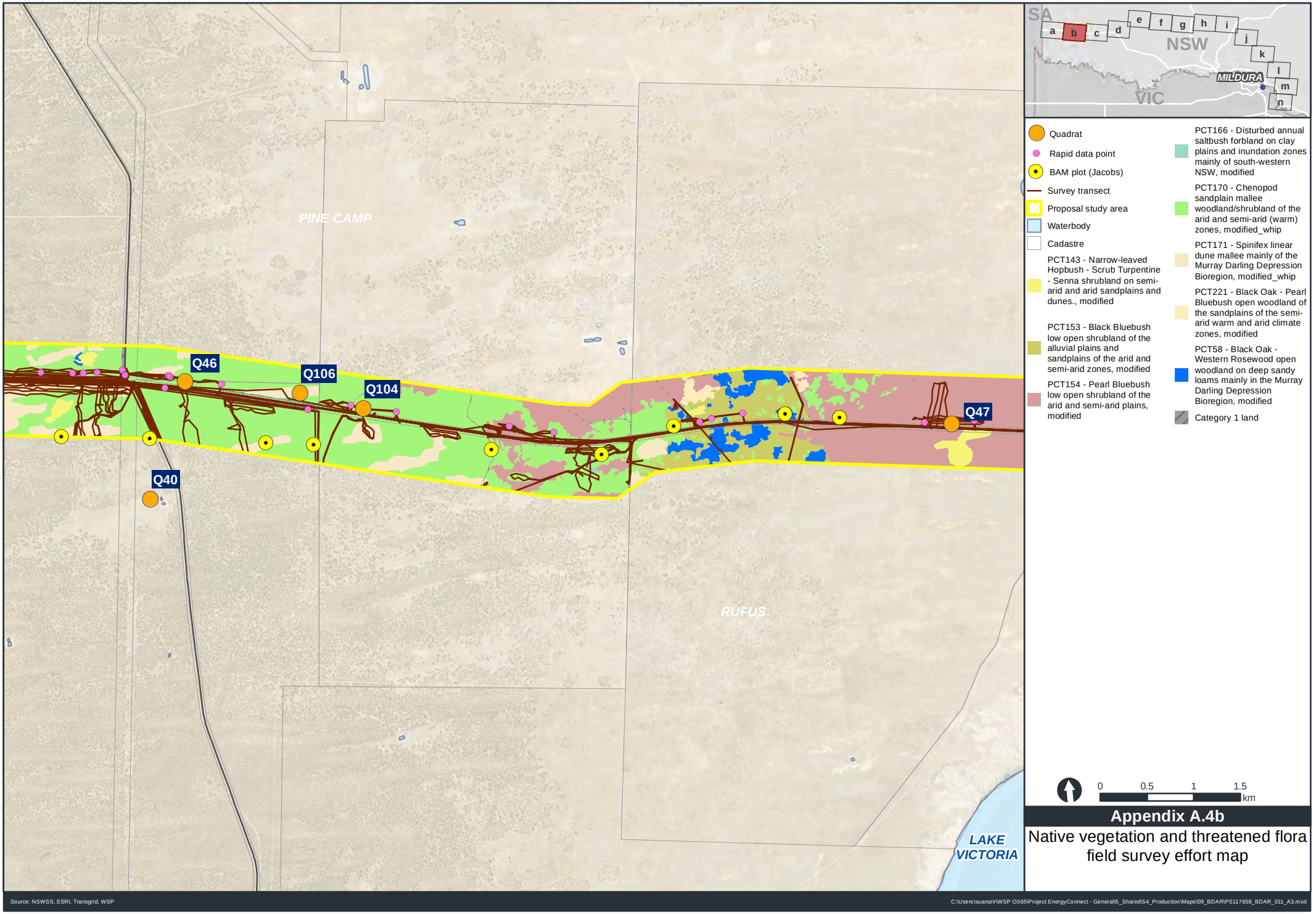
Note: IBRA subregions
SOP – South Olary Plain
GDA – Great Darling Anabranch
PD – Pooncarie-Darling
RP – Robinvale Plain

APPENDIX A-4
NATIVE VEGETATION AND THREATENED FLORA SURVEY EFFORT MAP



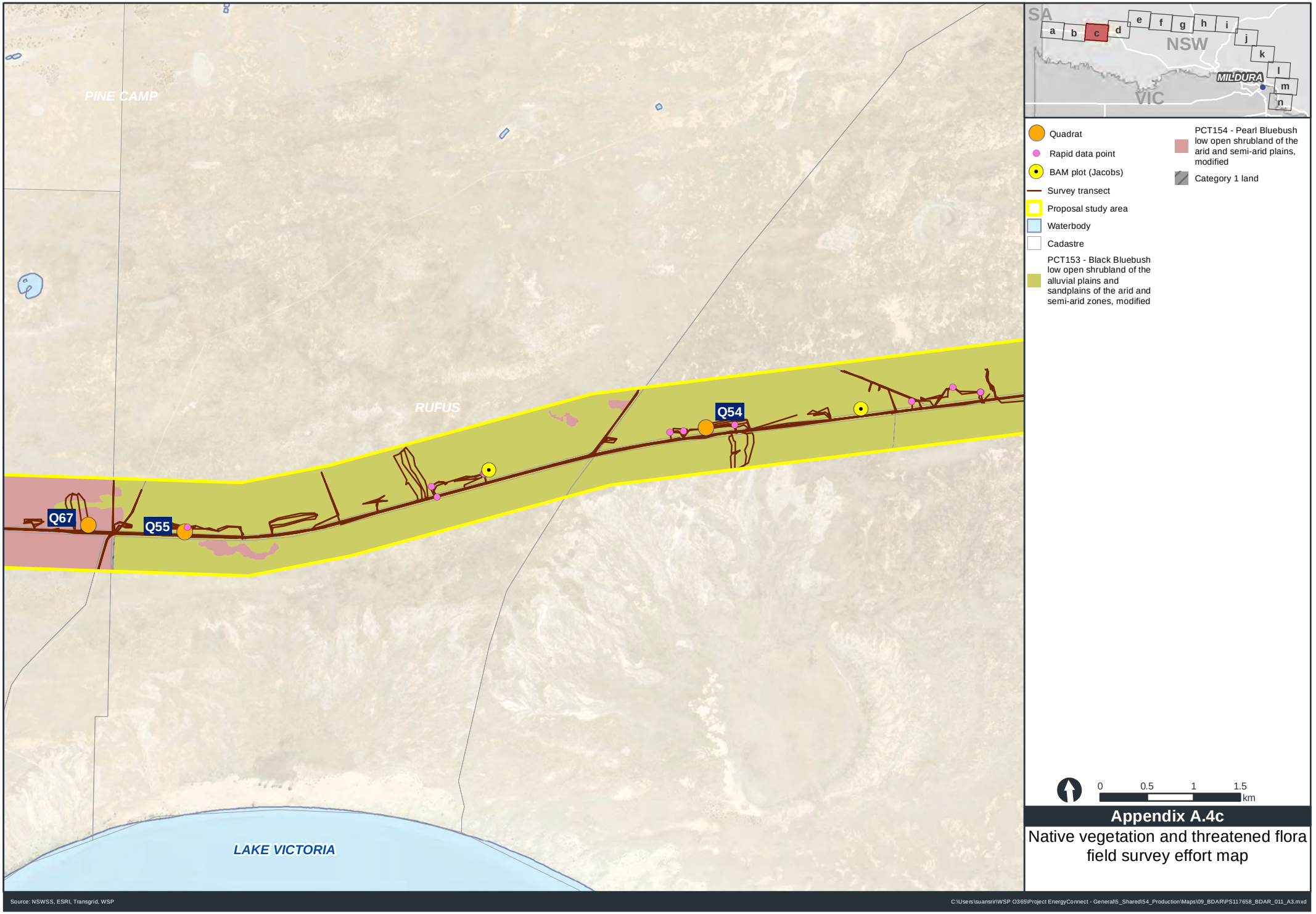
Appendix A.4a

Native vegetation and threatened flora field survey effort map



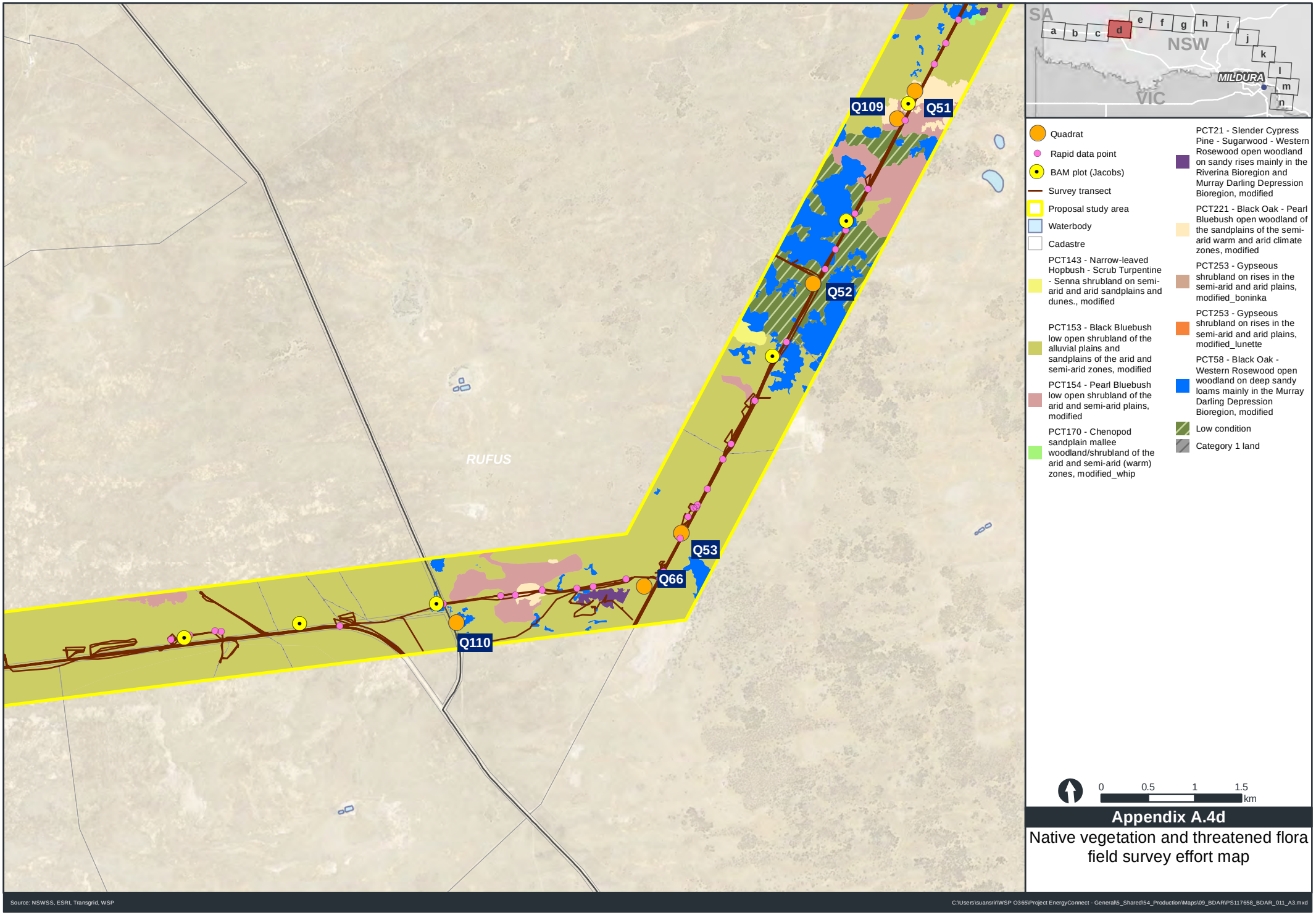
Appendix A.4b

Native vegetation and threatened flora field survey effort map



Appendix A.4c

Native vegetation and threatened flora field survey effort map



Source: NSWSS, ESRI, Transgrid, WSP

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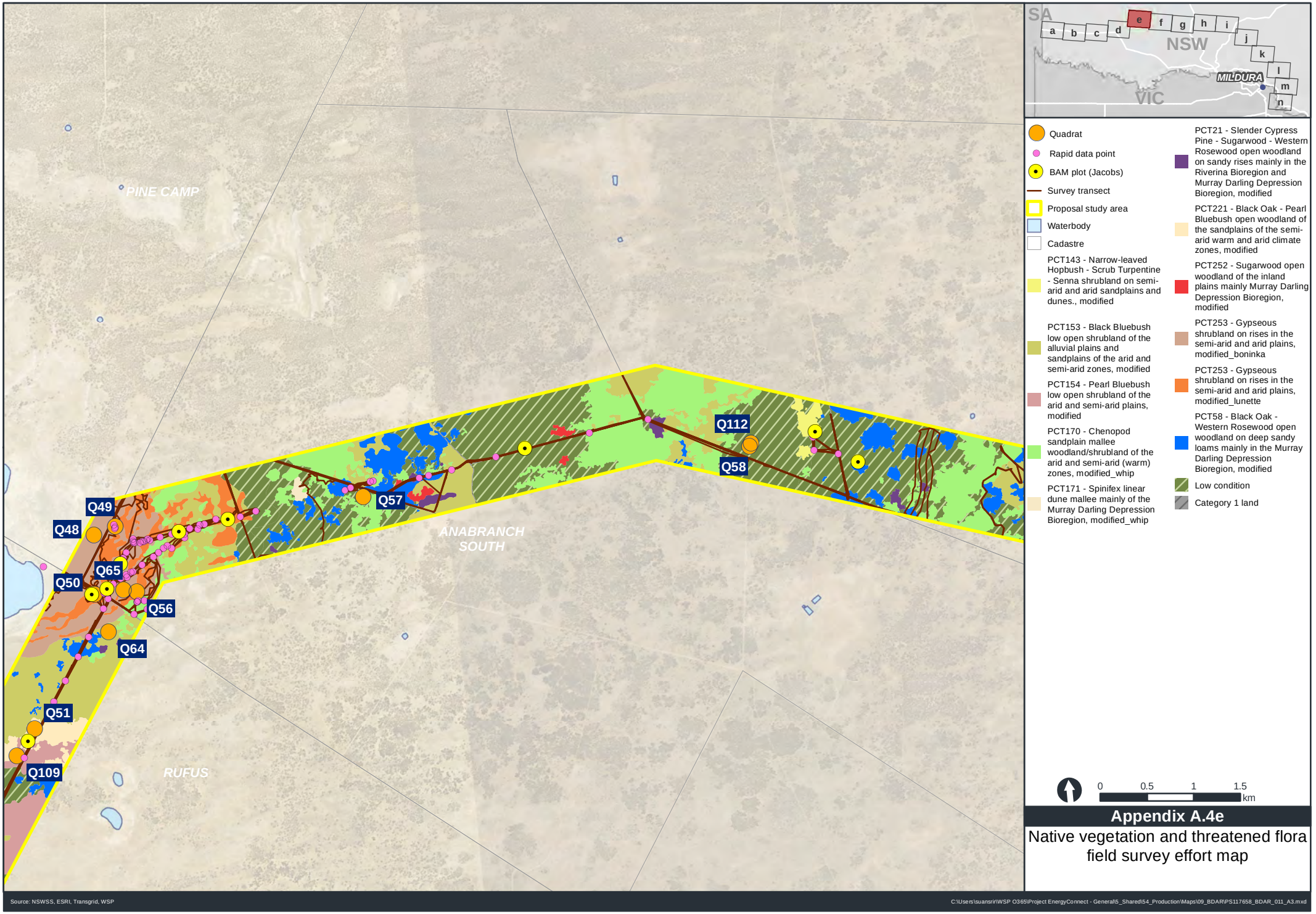
Appendix A.4d

Native vegetation and threatened flora field survey effort map



Source: NSWSS, ESRI, Transgrid, WSP

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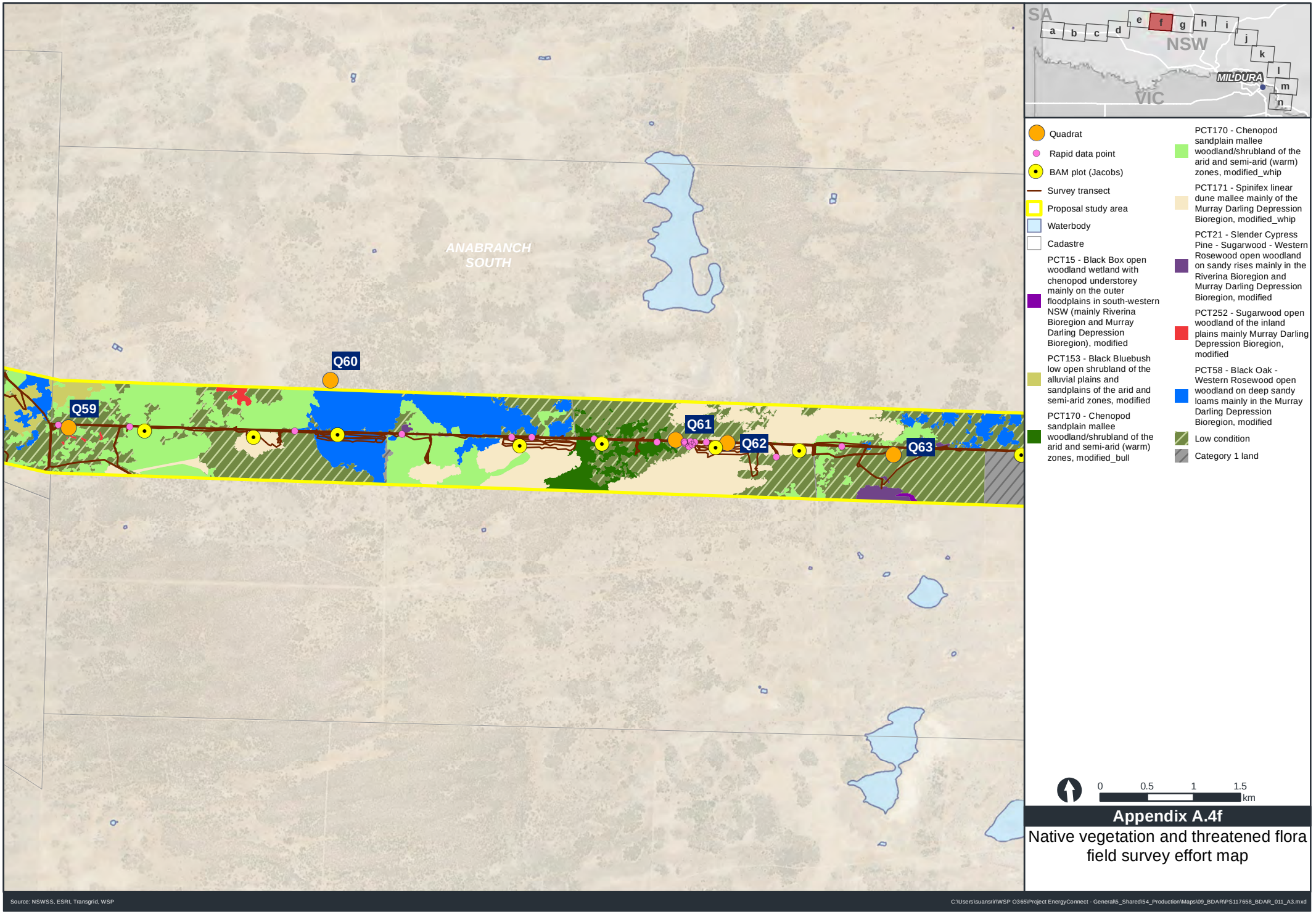
Appendix A.4e

Native vegetation and threatened flora field survey effort map



Appendix A.4f

Native vegetation and threatened flora field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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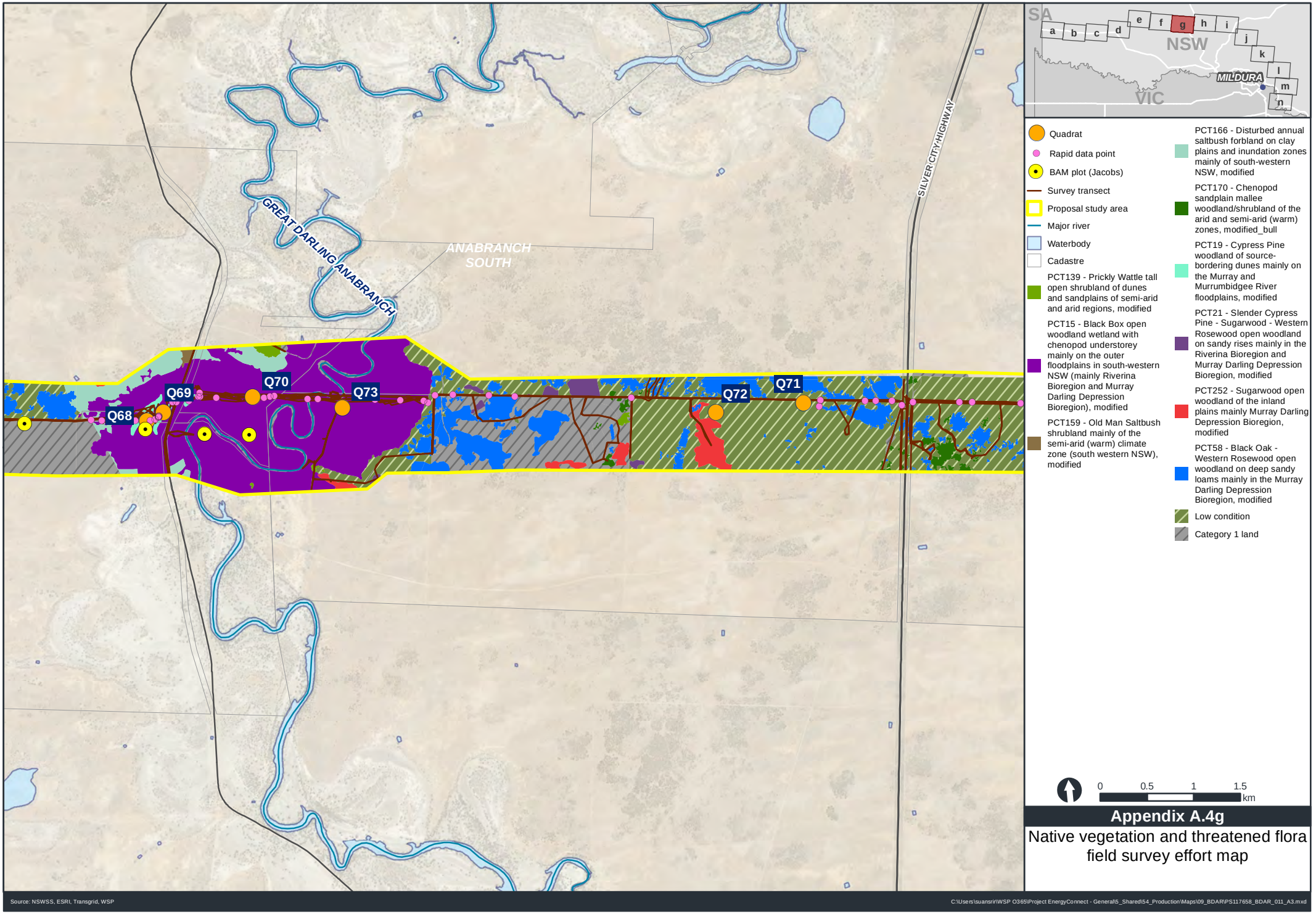
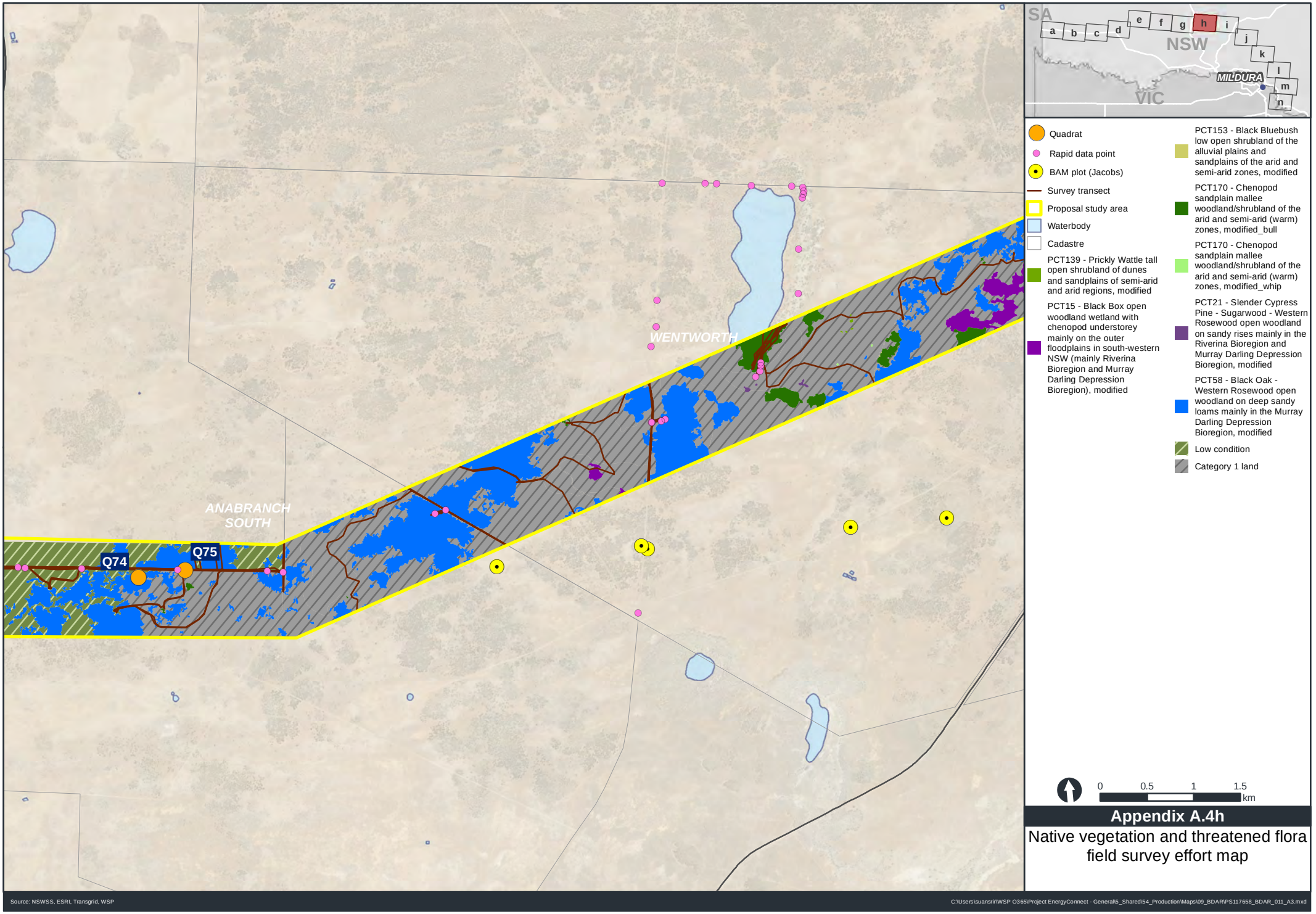


Appendix A.4g

Native vegetation and threatened flora field survey effort map



Appendix A.4h

Native vegetation and threatened flora field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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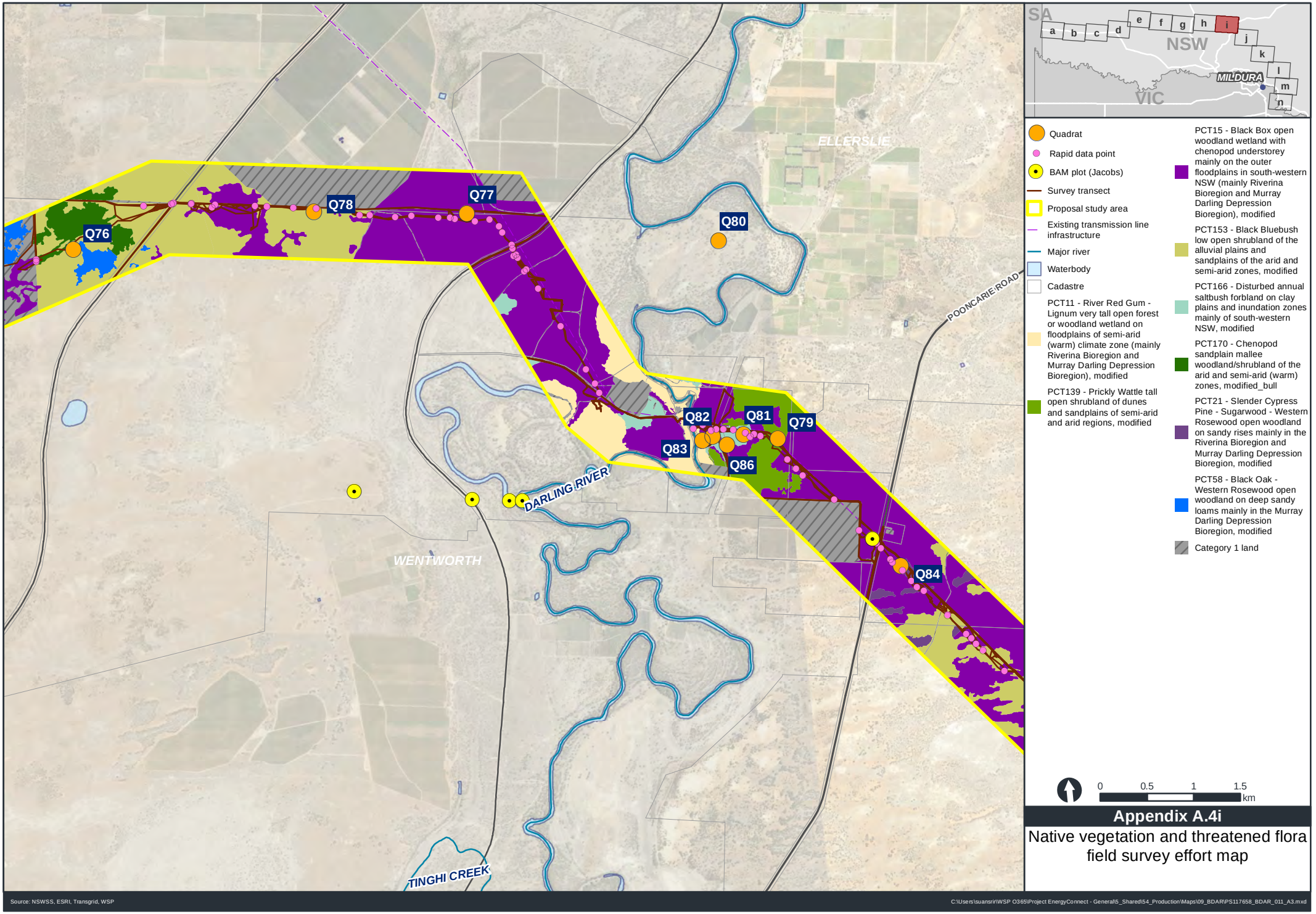
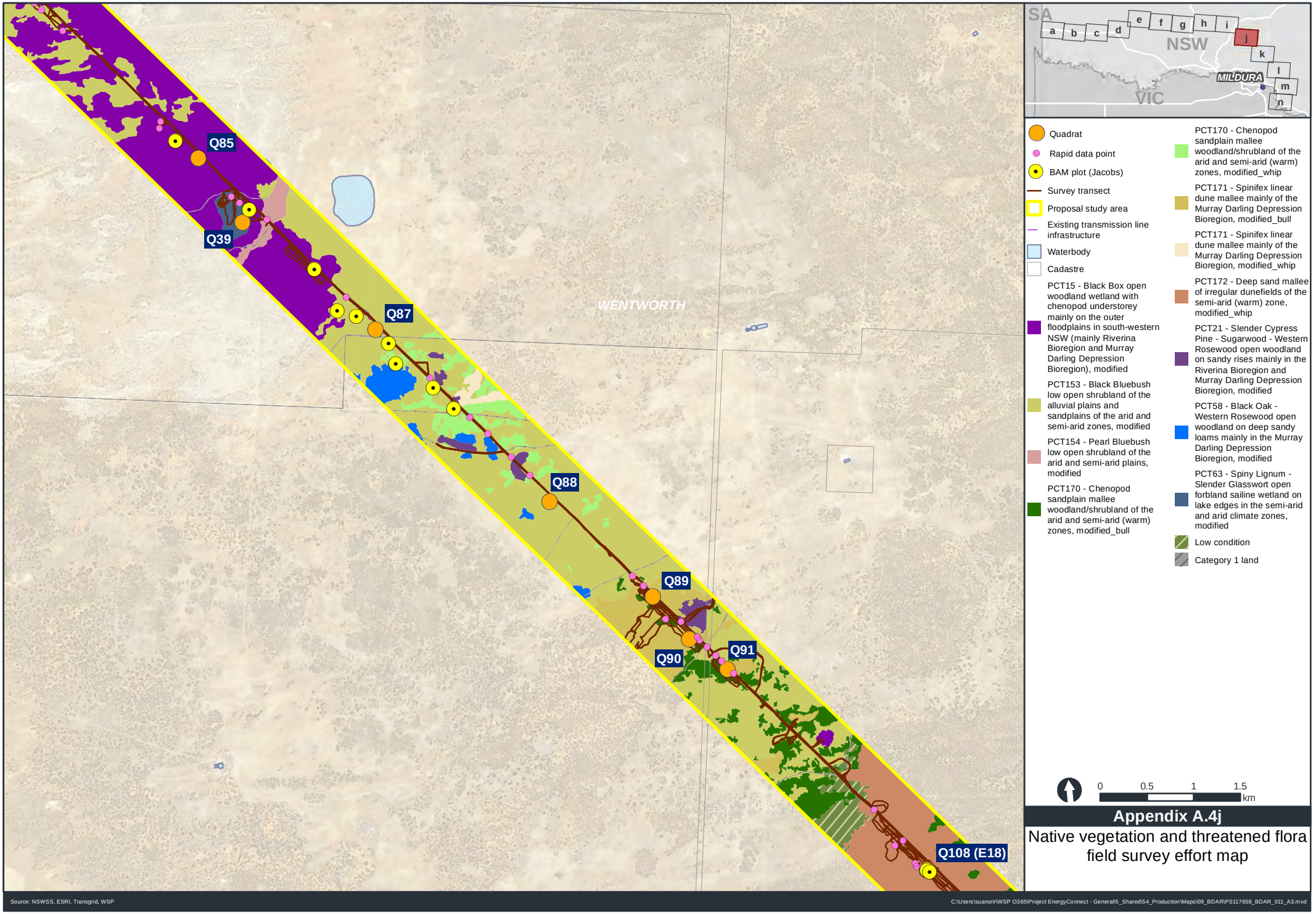


Appendix A.4i

Native vegetation and threatened flora field survey effort map



Appendix A.4j

Native vegetation and threatened flora field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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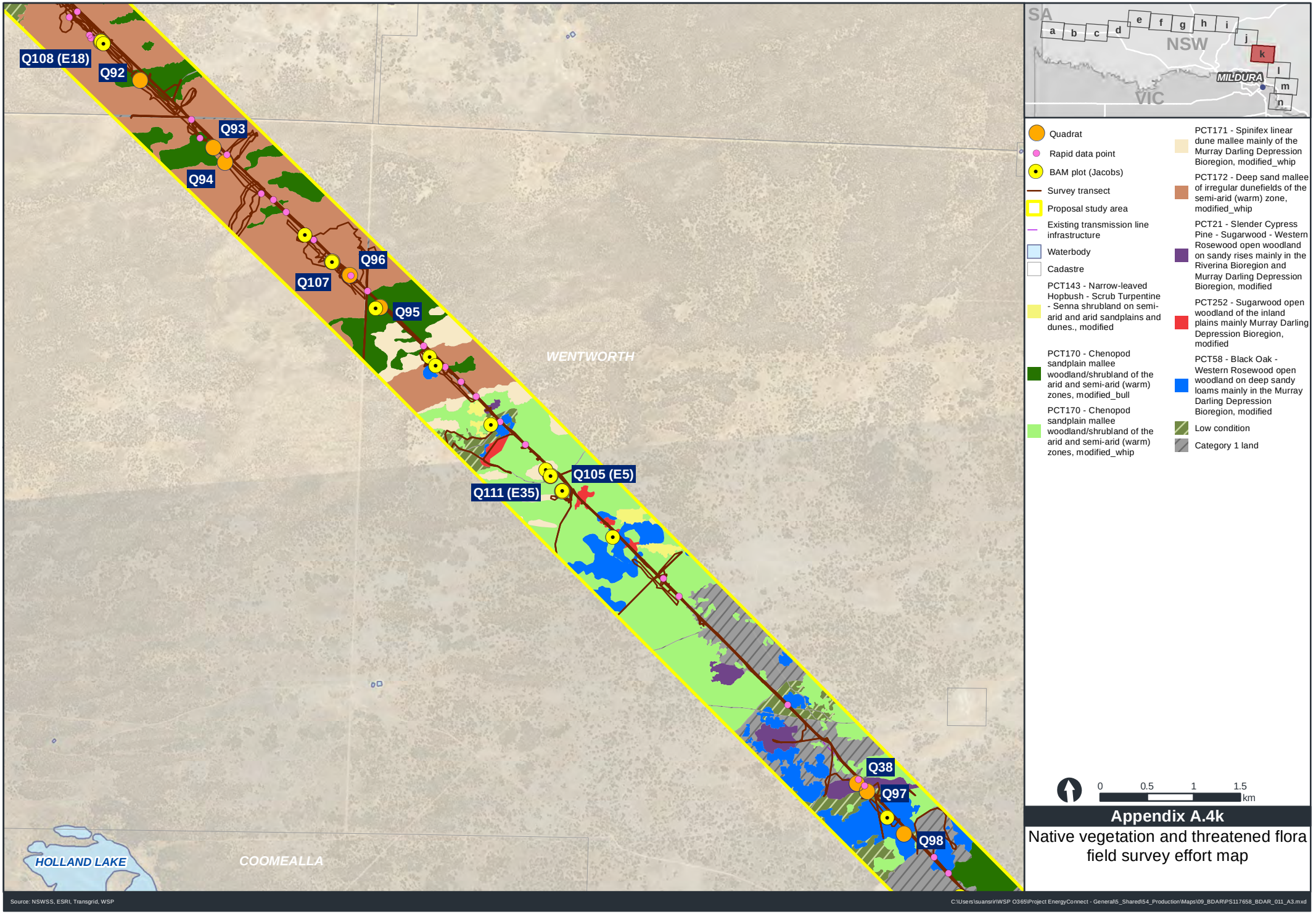
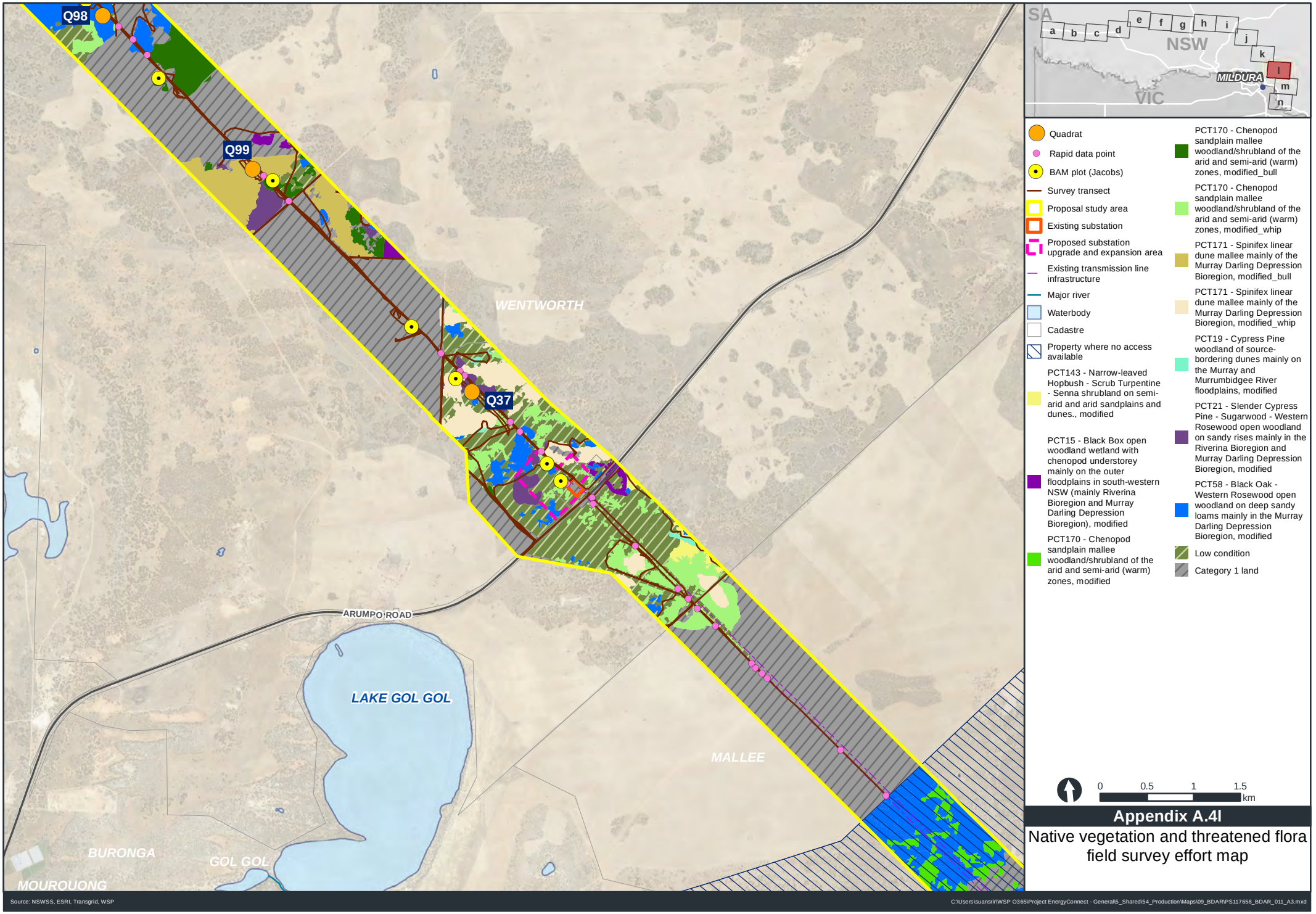


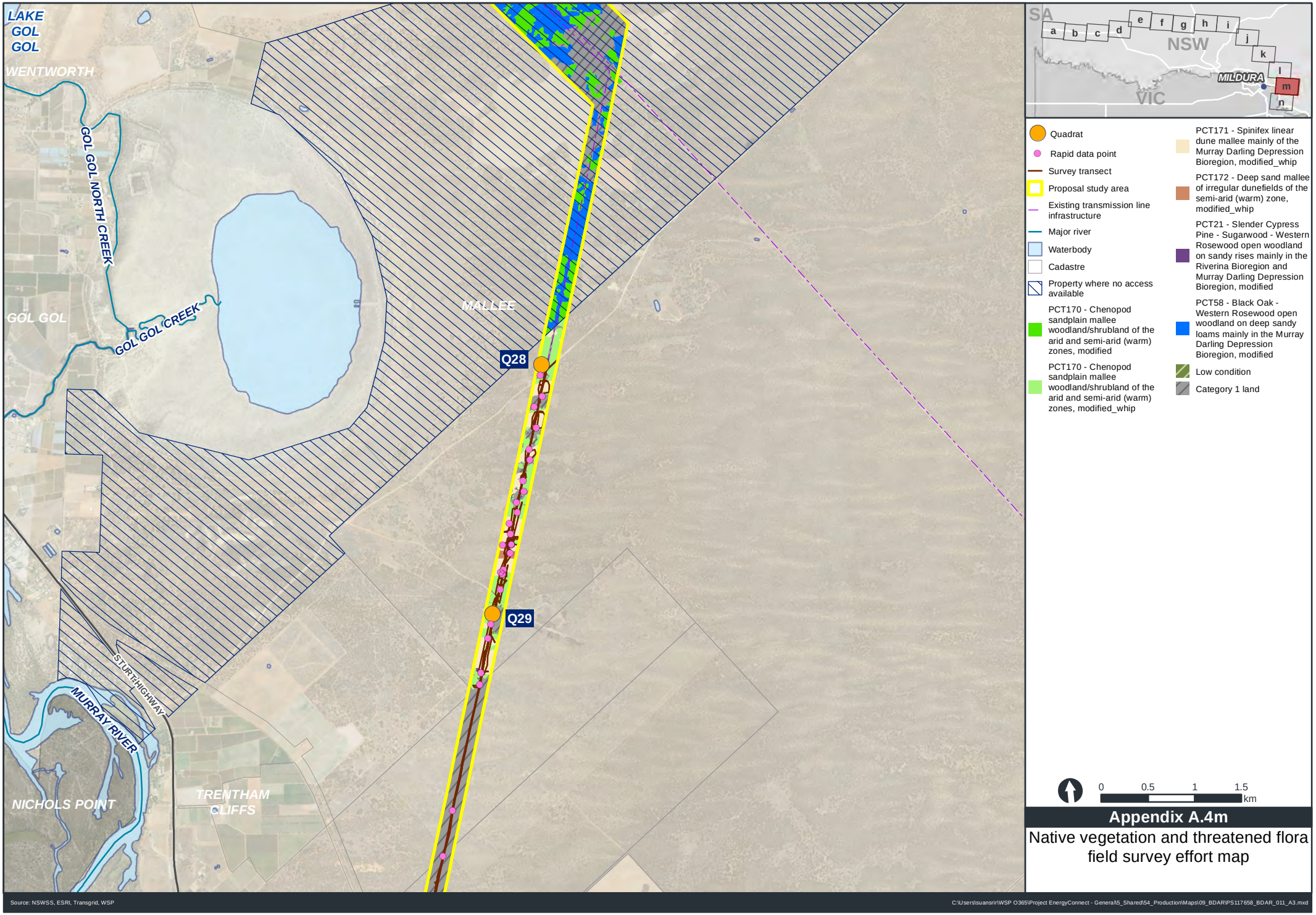
Appendix A.4k

Native vegetation and threatened flora field survey effort map



Appendix A.4l

Native vegetation and threatened flora field survey effort map



Appendix A.4m

Native vegetation and threatened flora field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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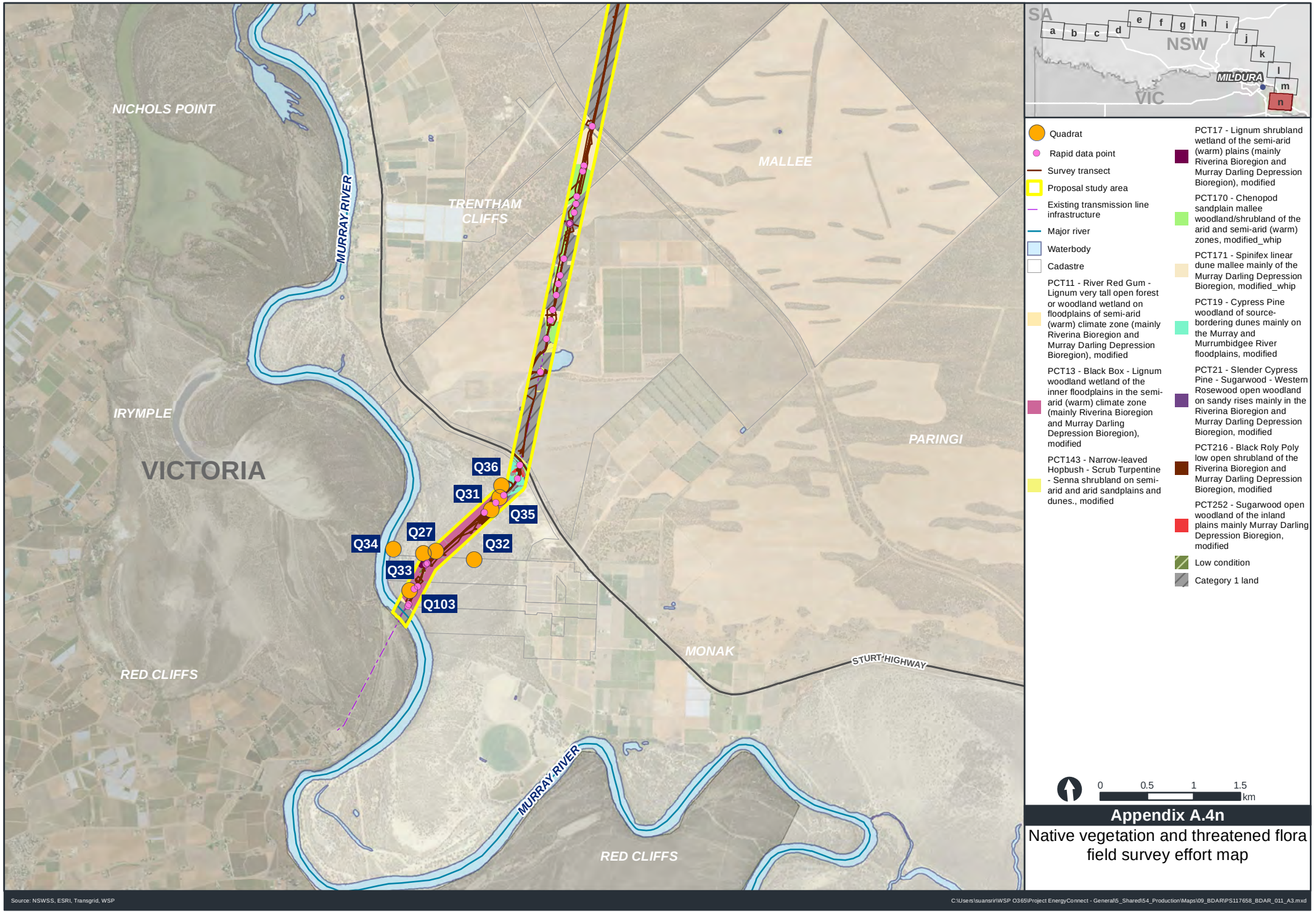

Appendix A.4n

Native vegetation and threatened flora field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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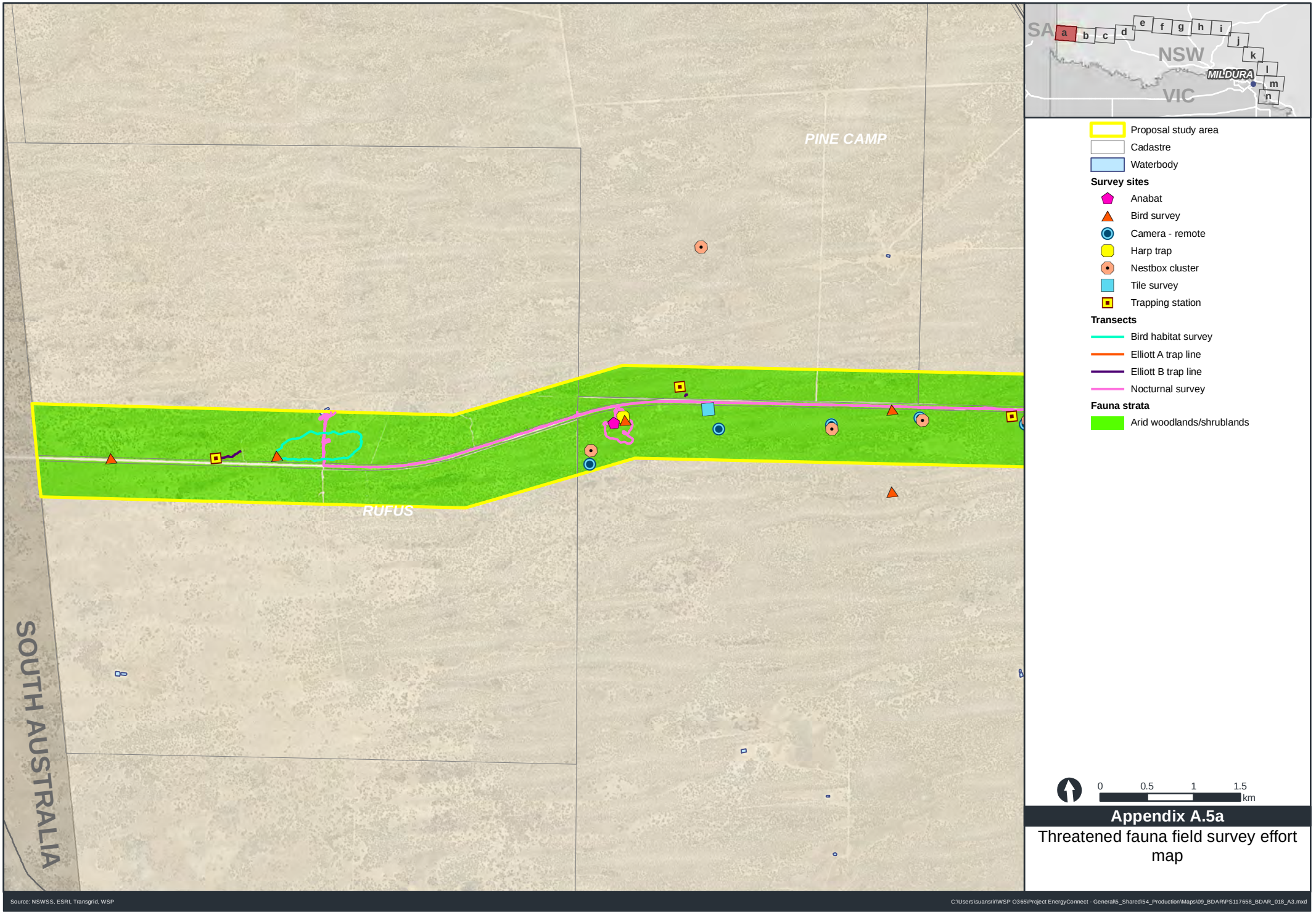
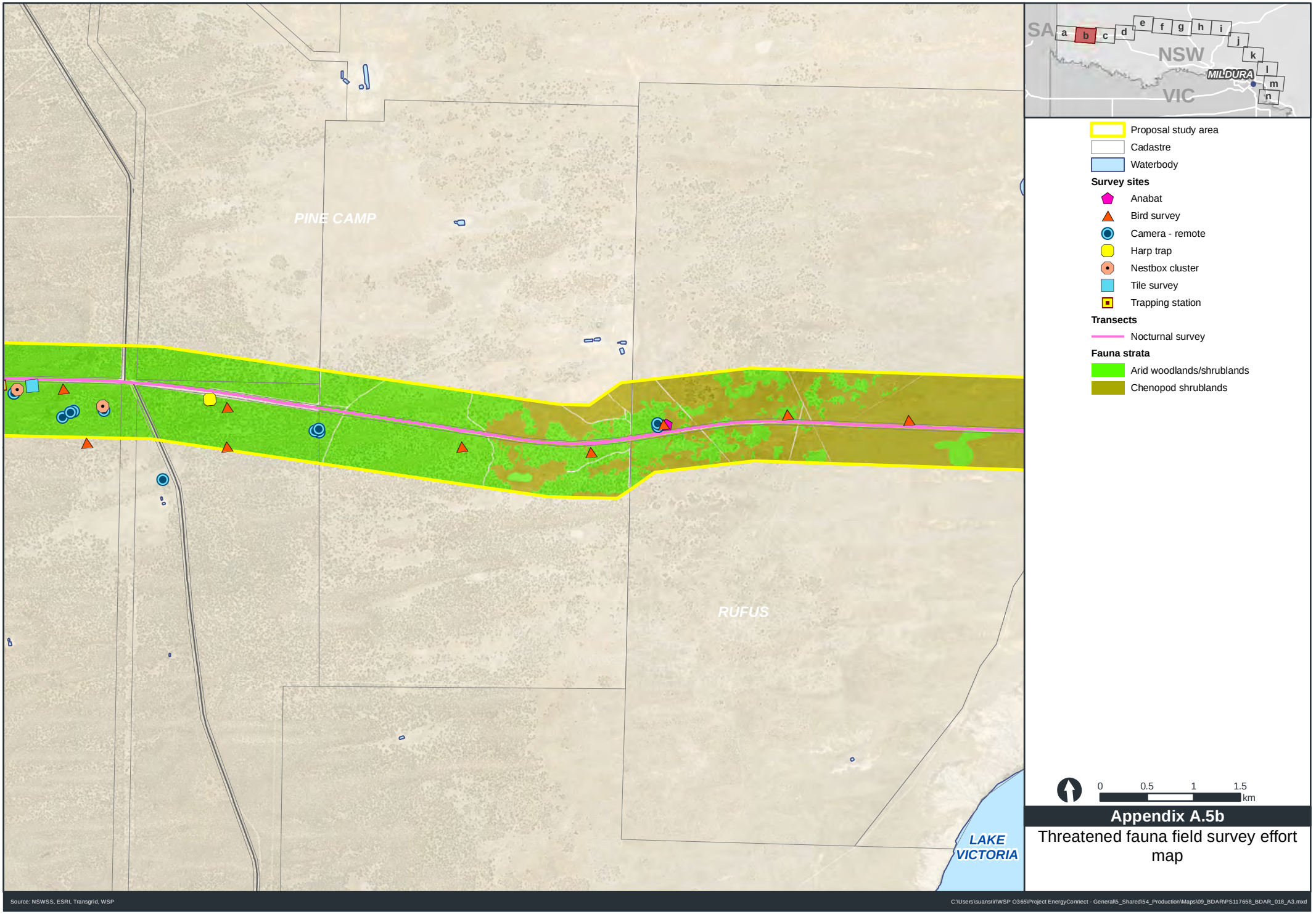
APPENDIX A-5
THREATENED FAUNA FIELD SURVEY EFFORT MAP



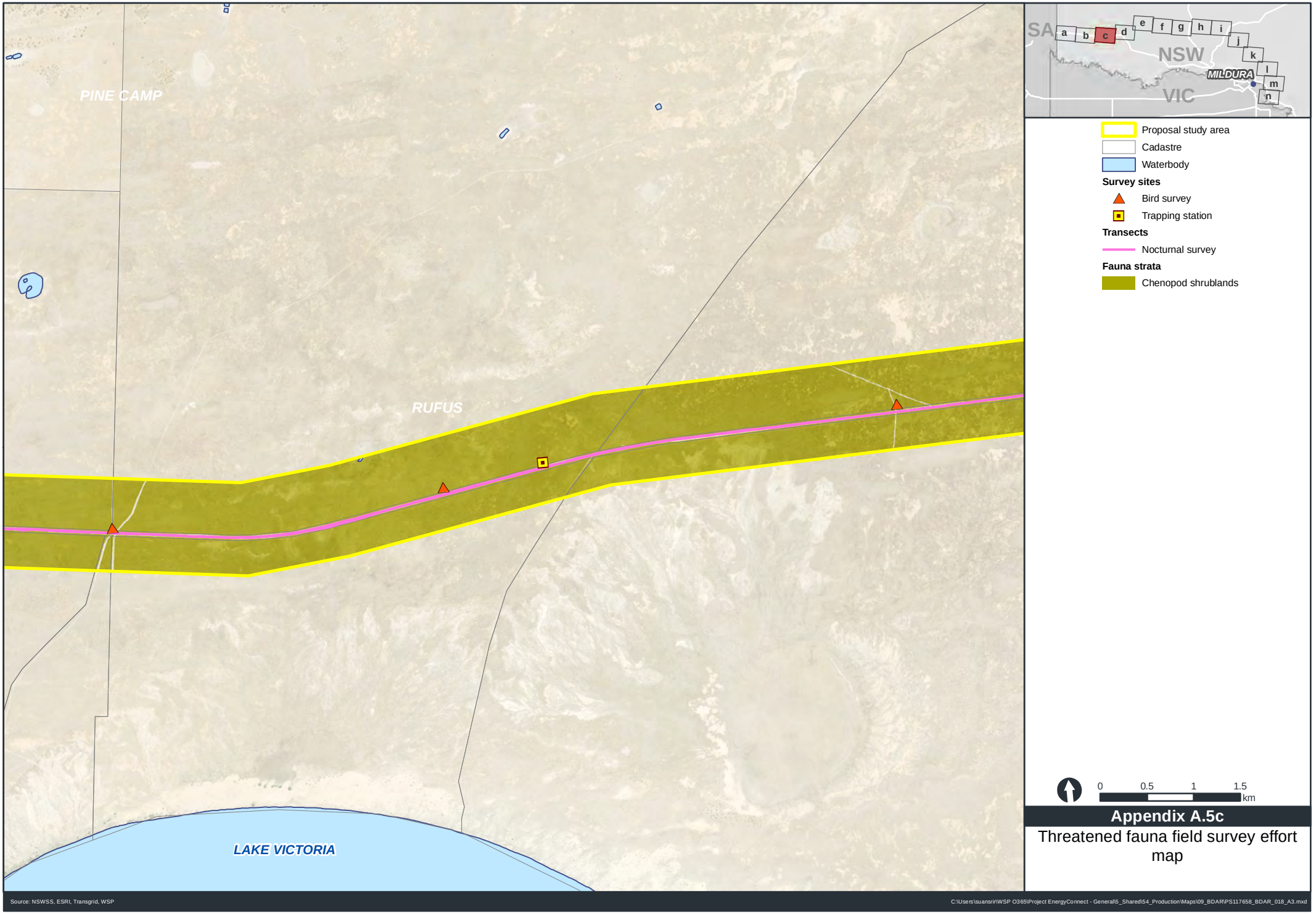
Appendix A.5a

Threatened fauna field survey effort map



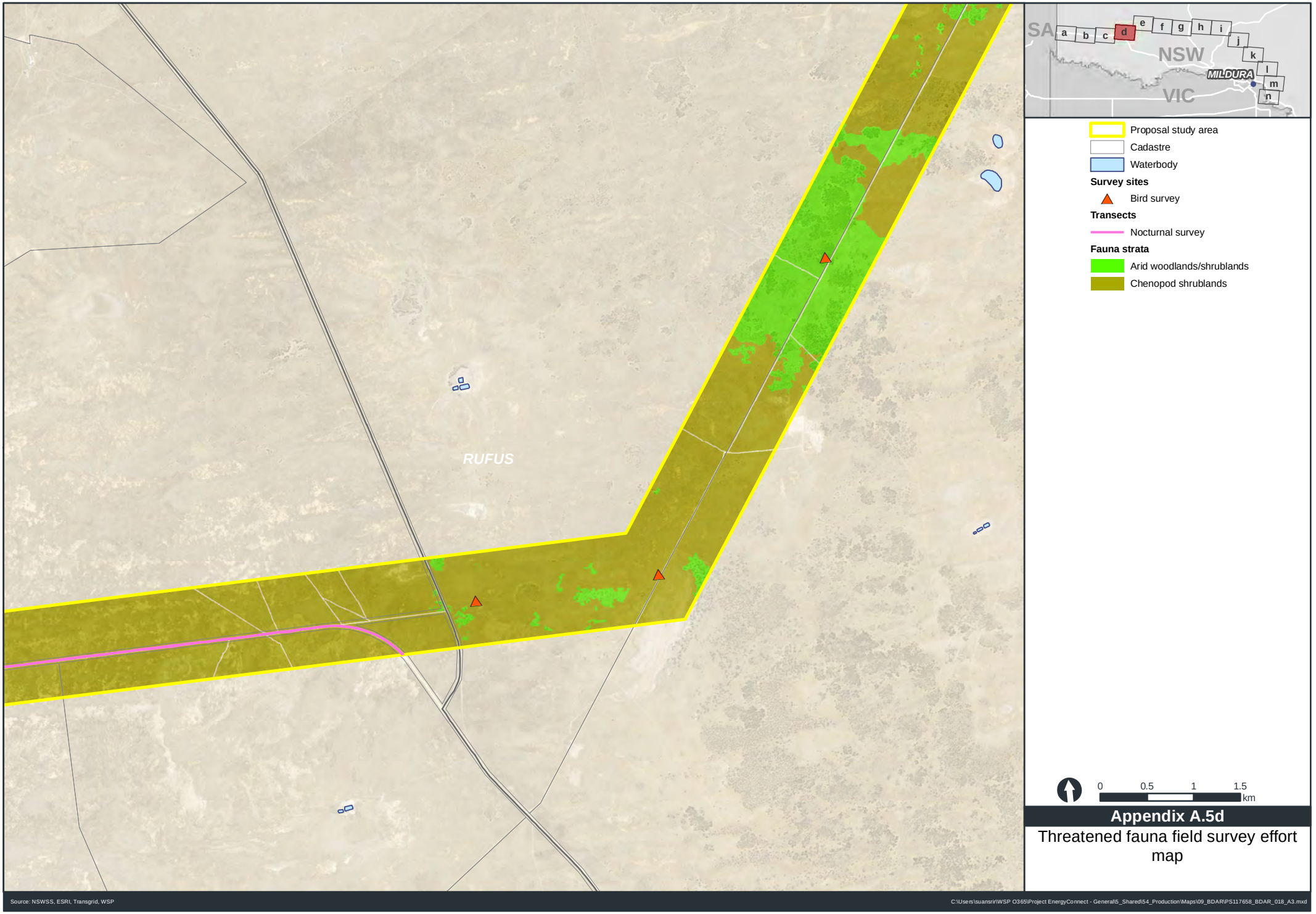
Appendix A.5b

Threatened fauna field survey effort map



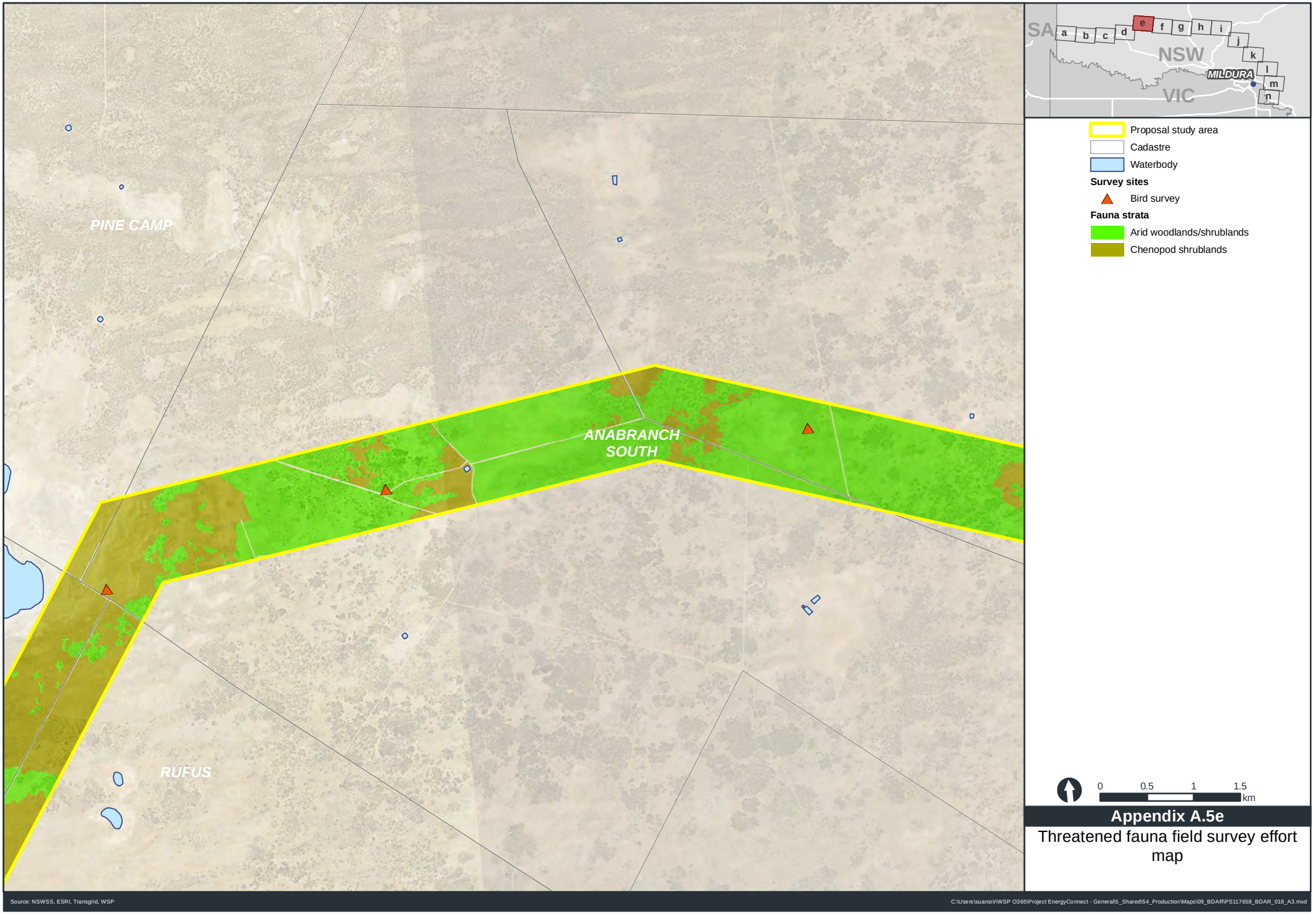
Appendix A.5c

Threatened fauna field survey effort map



Appendix A.5d

Threatened fauna field survey effort map



Appendix A.5e

Threatened fauna field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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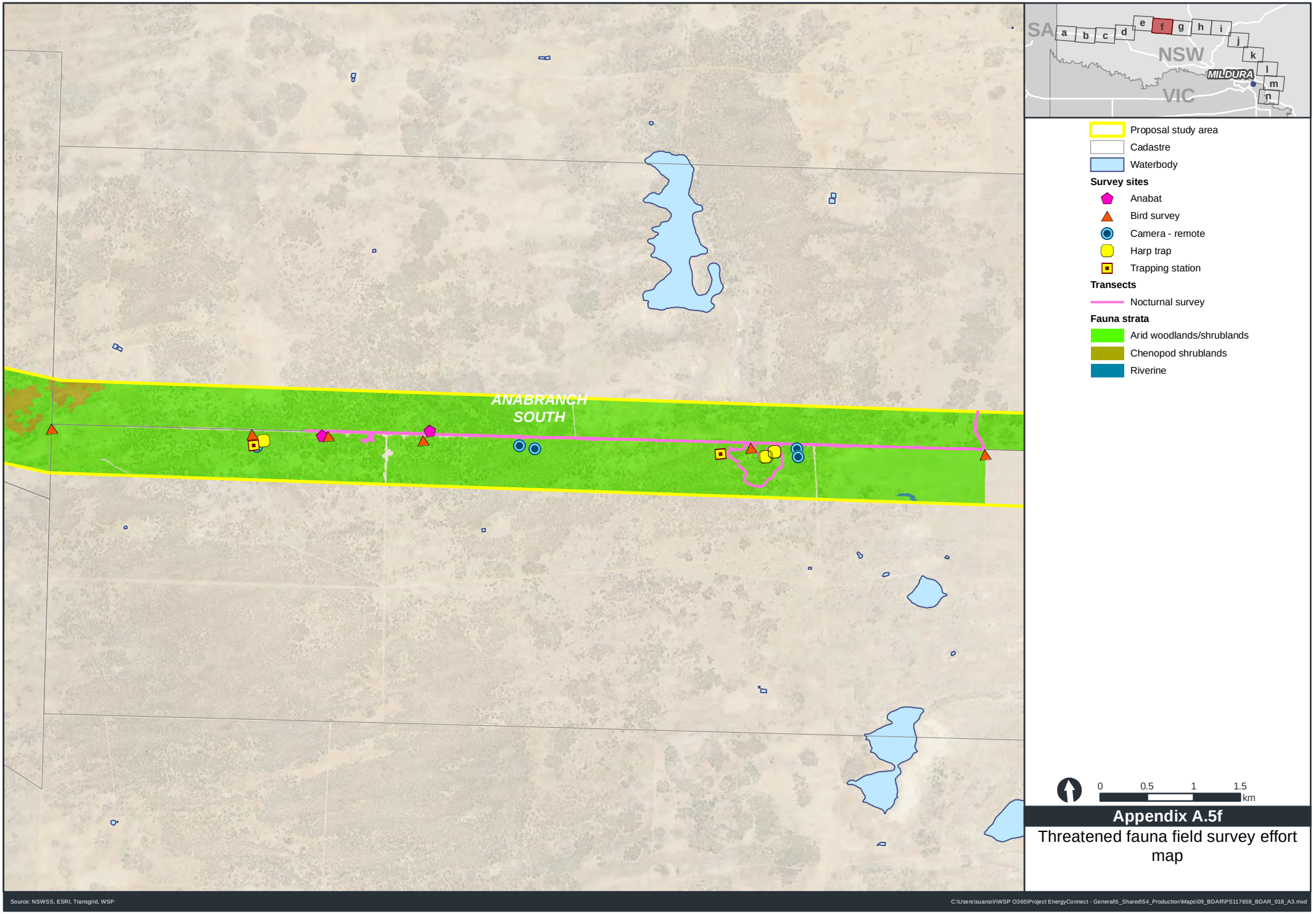
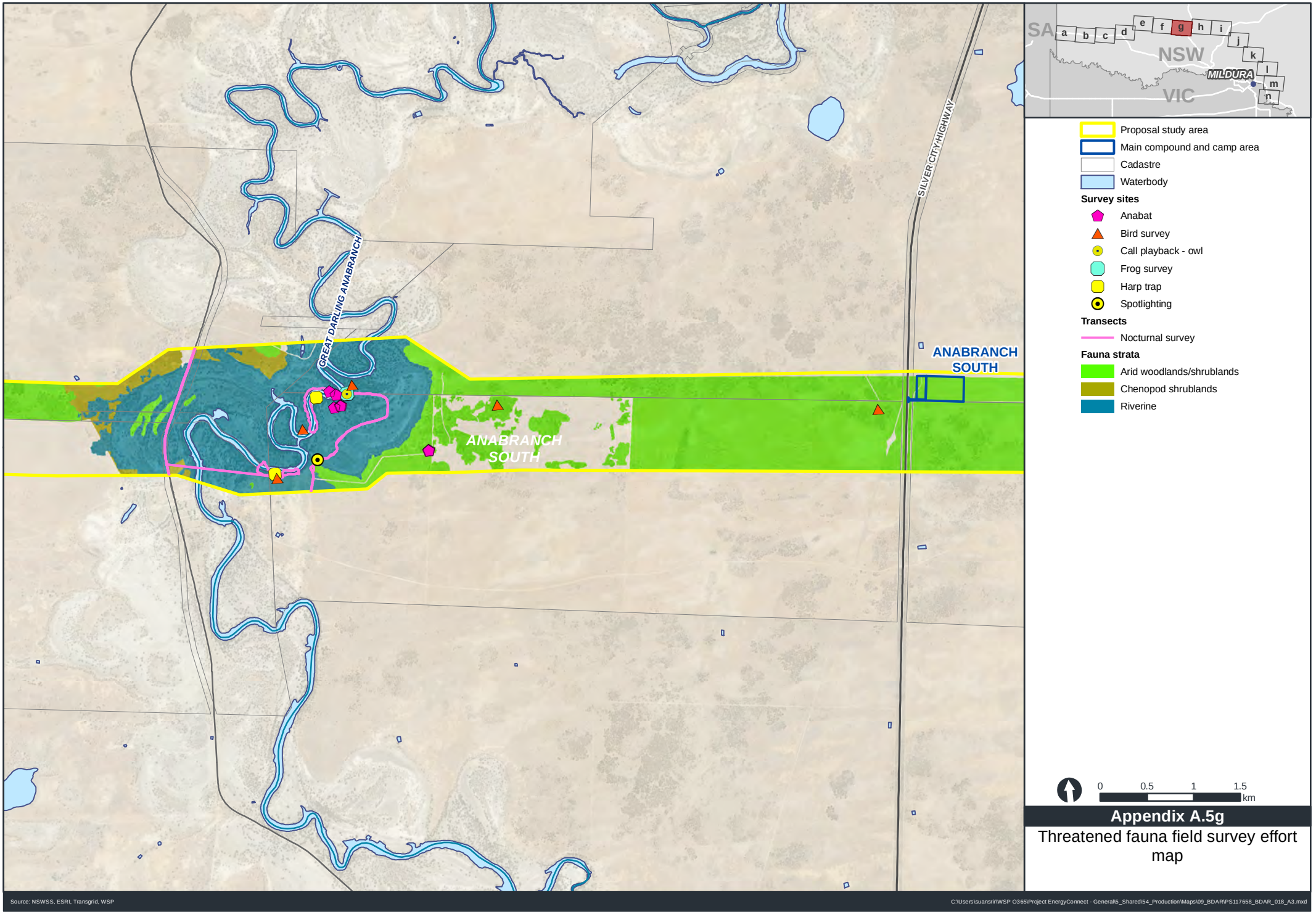


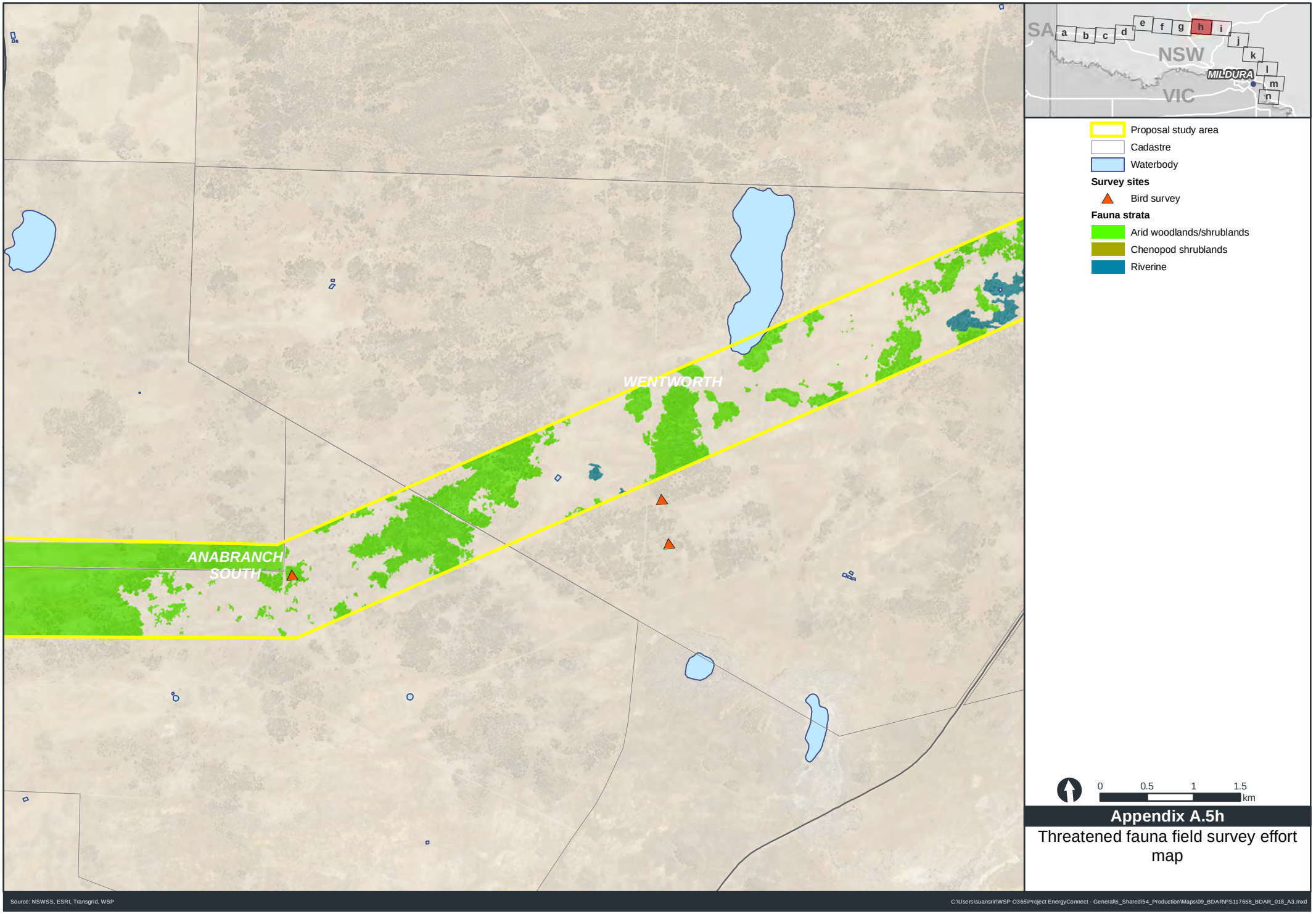
Appendix A.5f

Threatened fauna field survey effort map



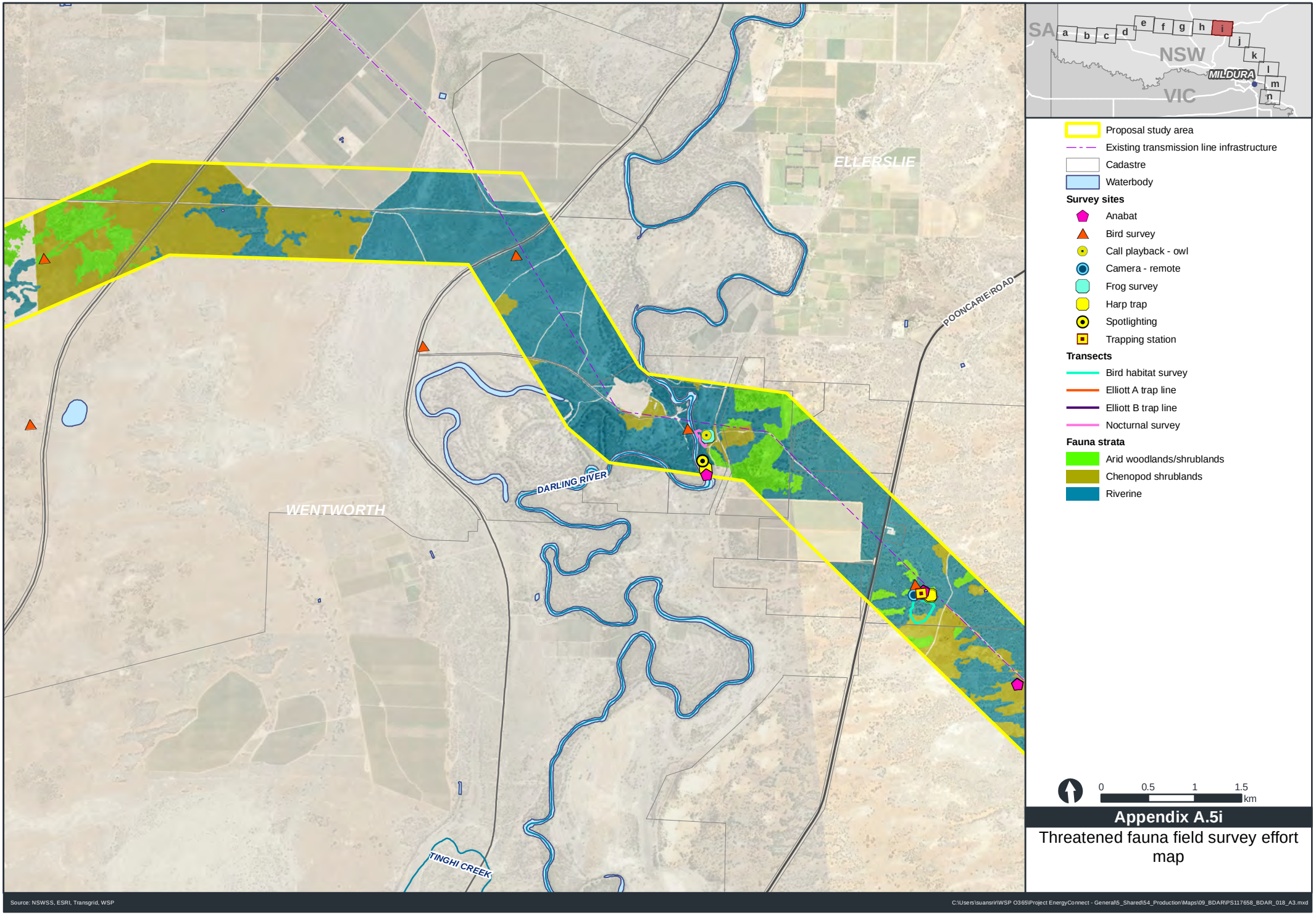
Appendix A.5g

Threatened fauna field survey effort map



Appendix A.5h

Threatened fauna field survey effort map



Appendix A.5i

Threatened fauna field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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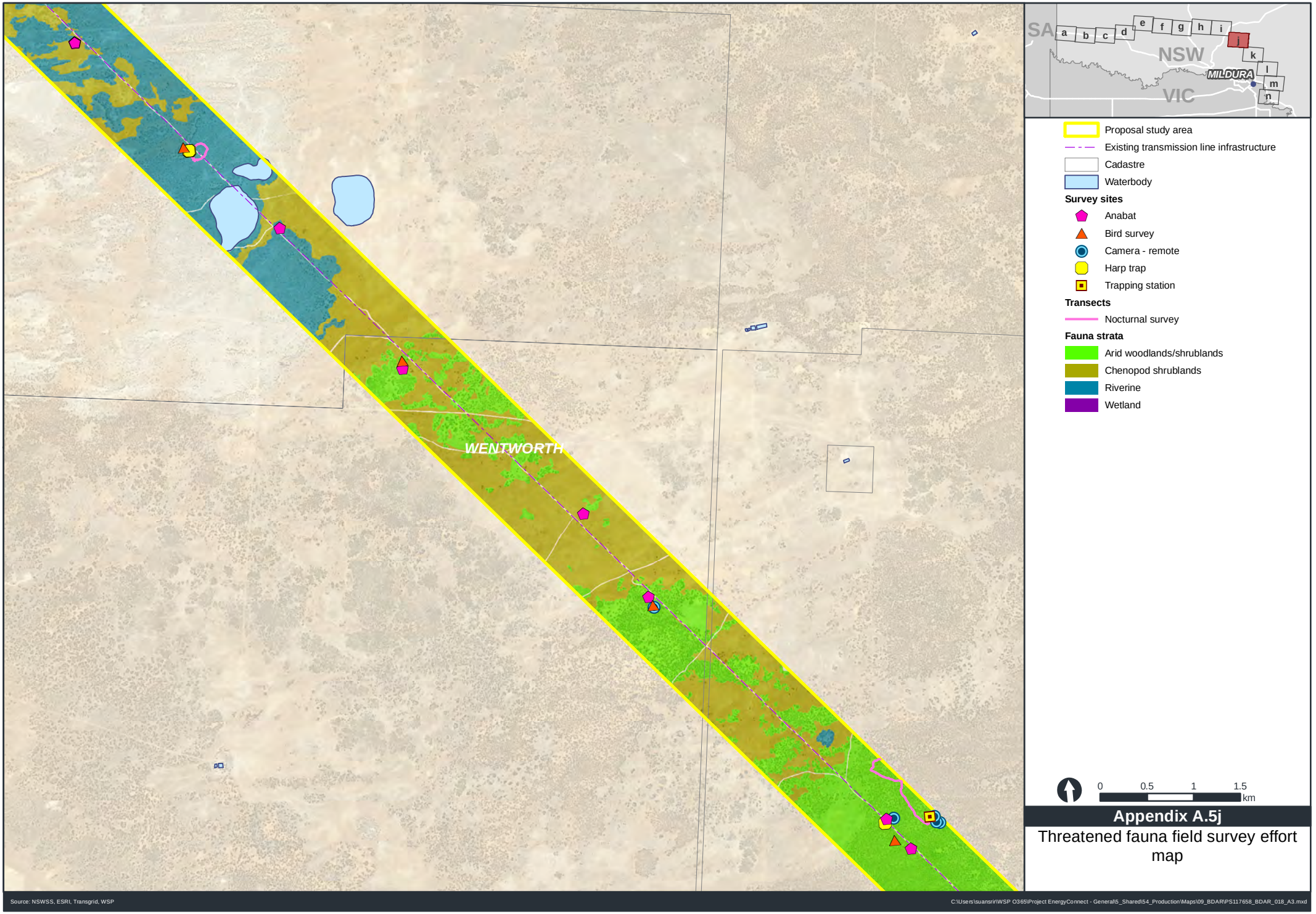

Appendix A.5j

Threatened fauna field survey effort map

Source: NSWSS, ESRI, Transgrid, WSP

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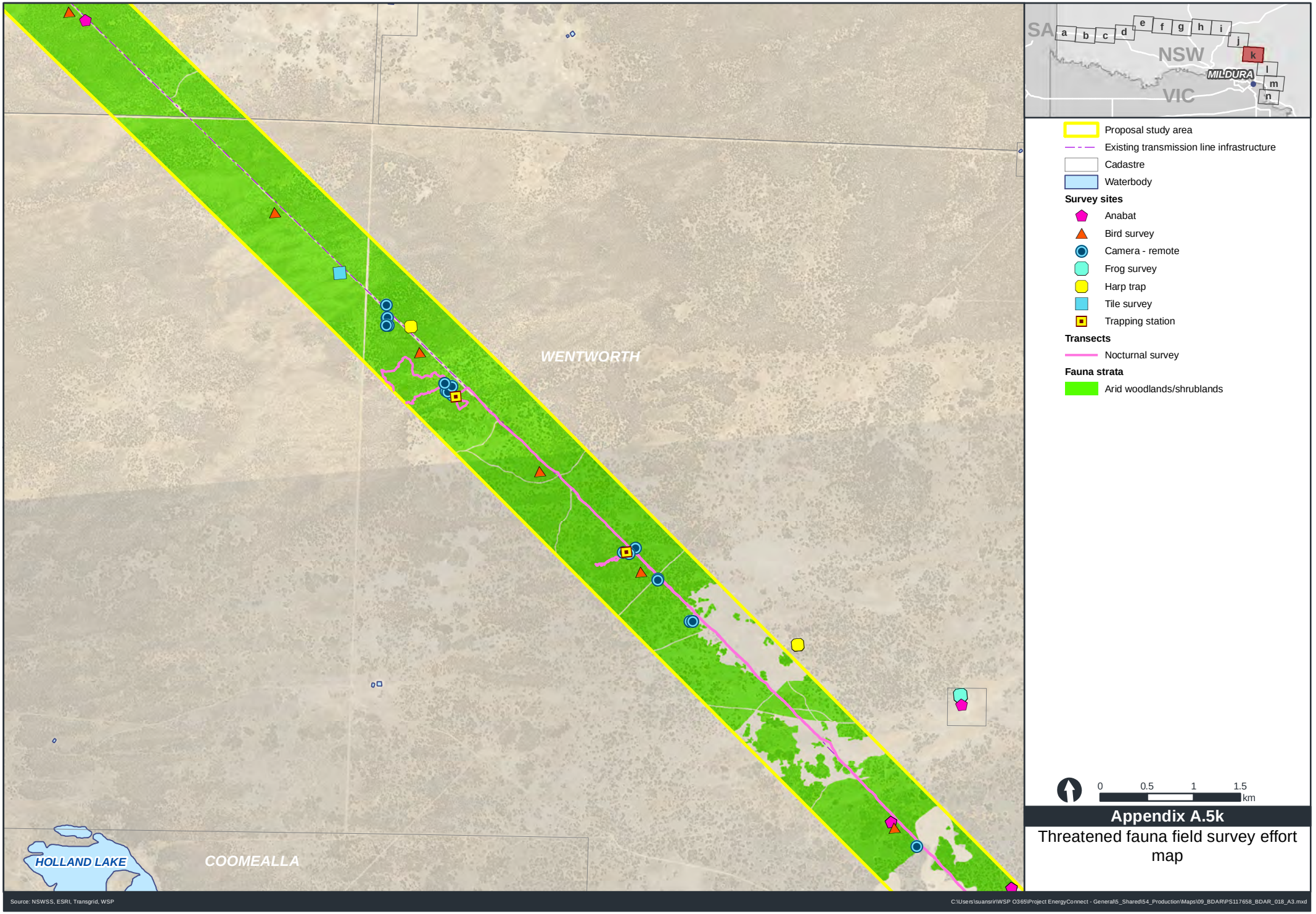
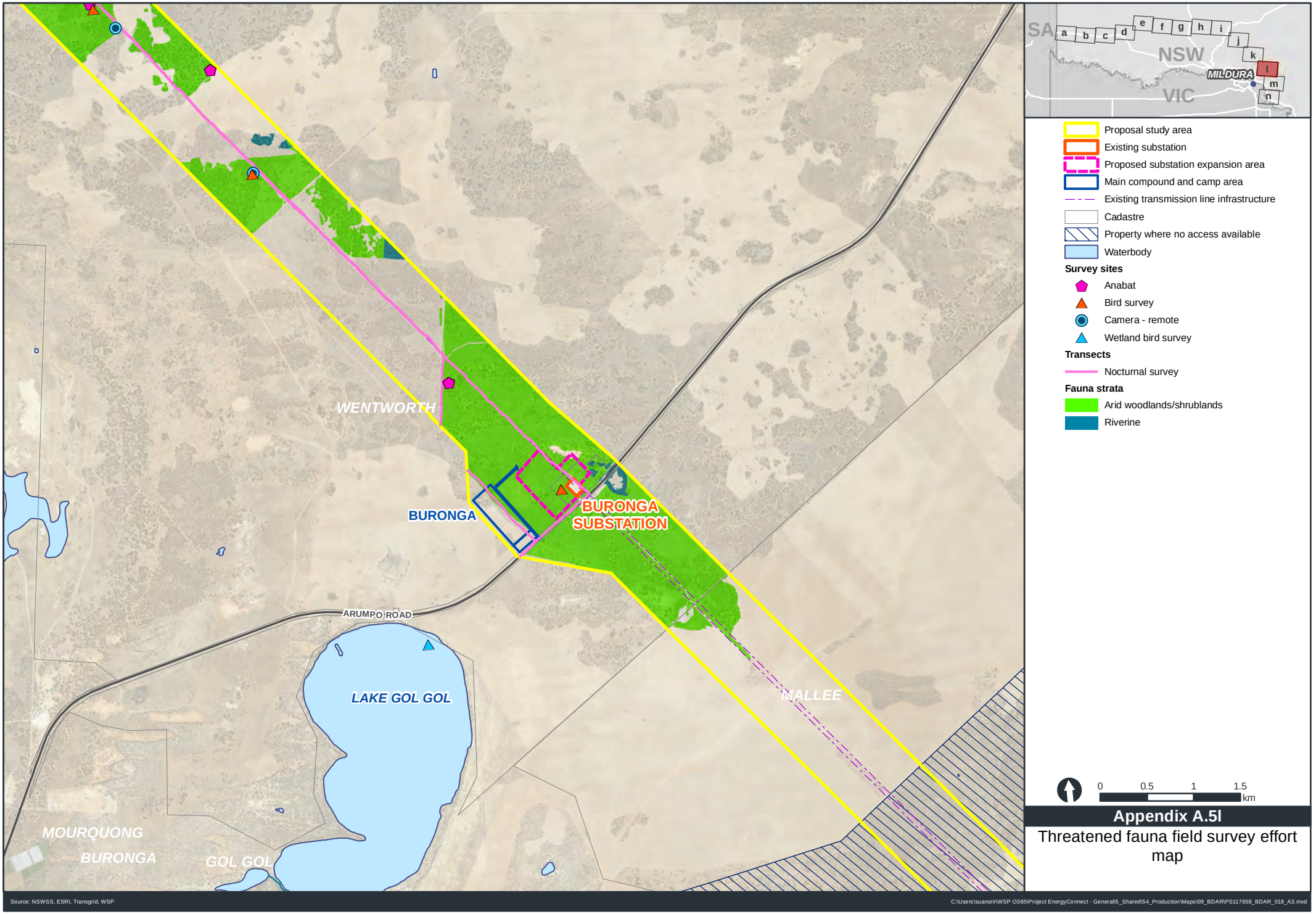


Appendix A.5k

Threatened fauna field survey effort map

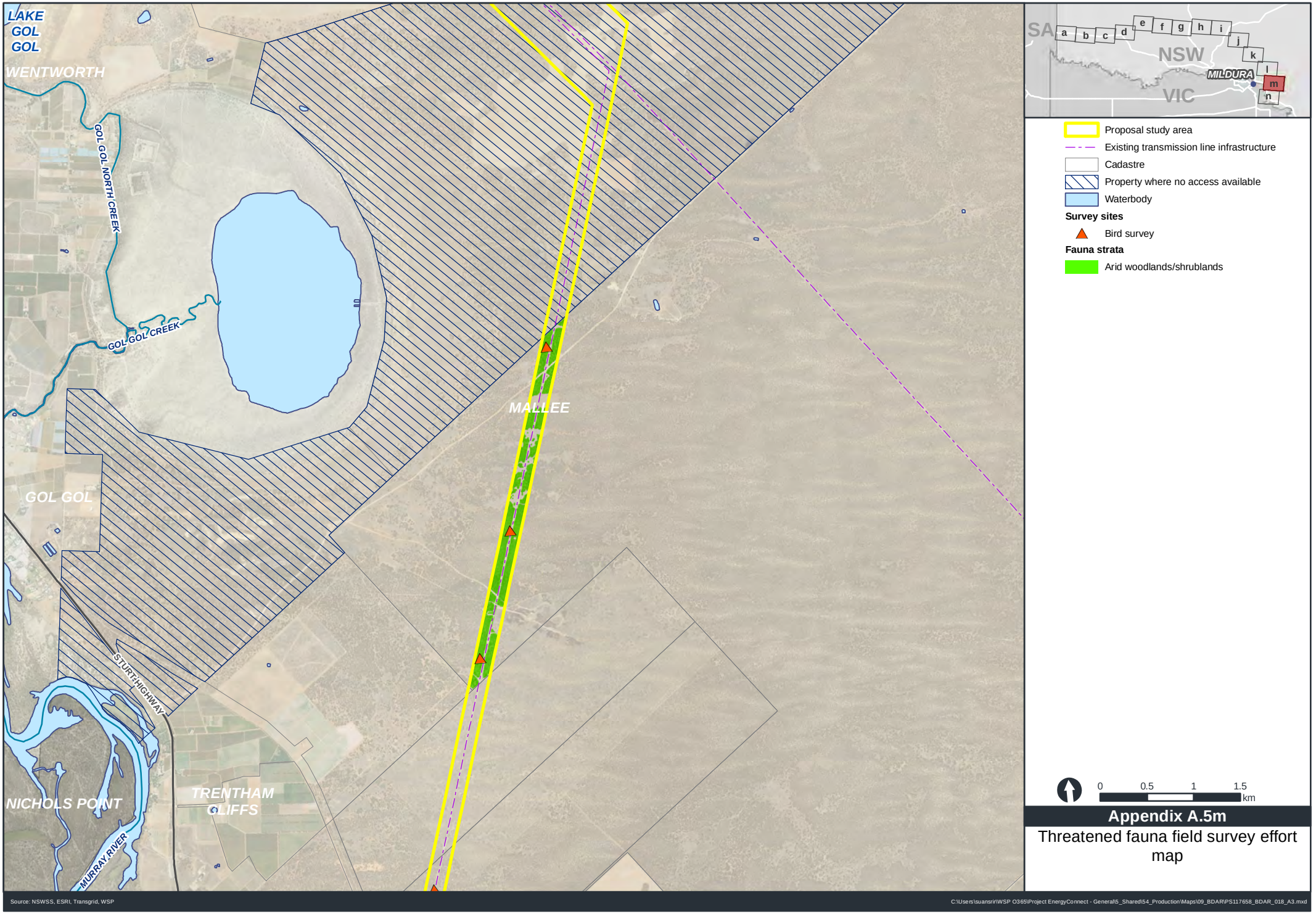


Appendix A.5l

Threatened fauna field survey effort map

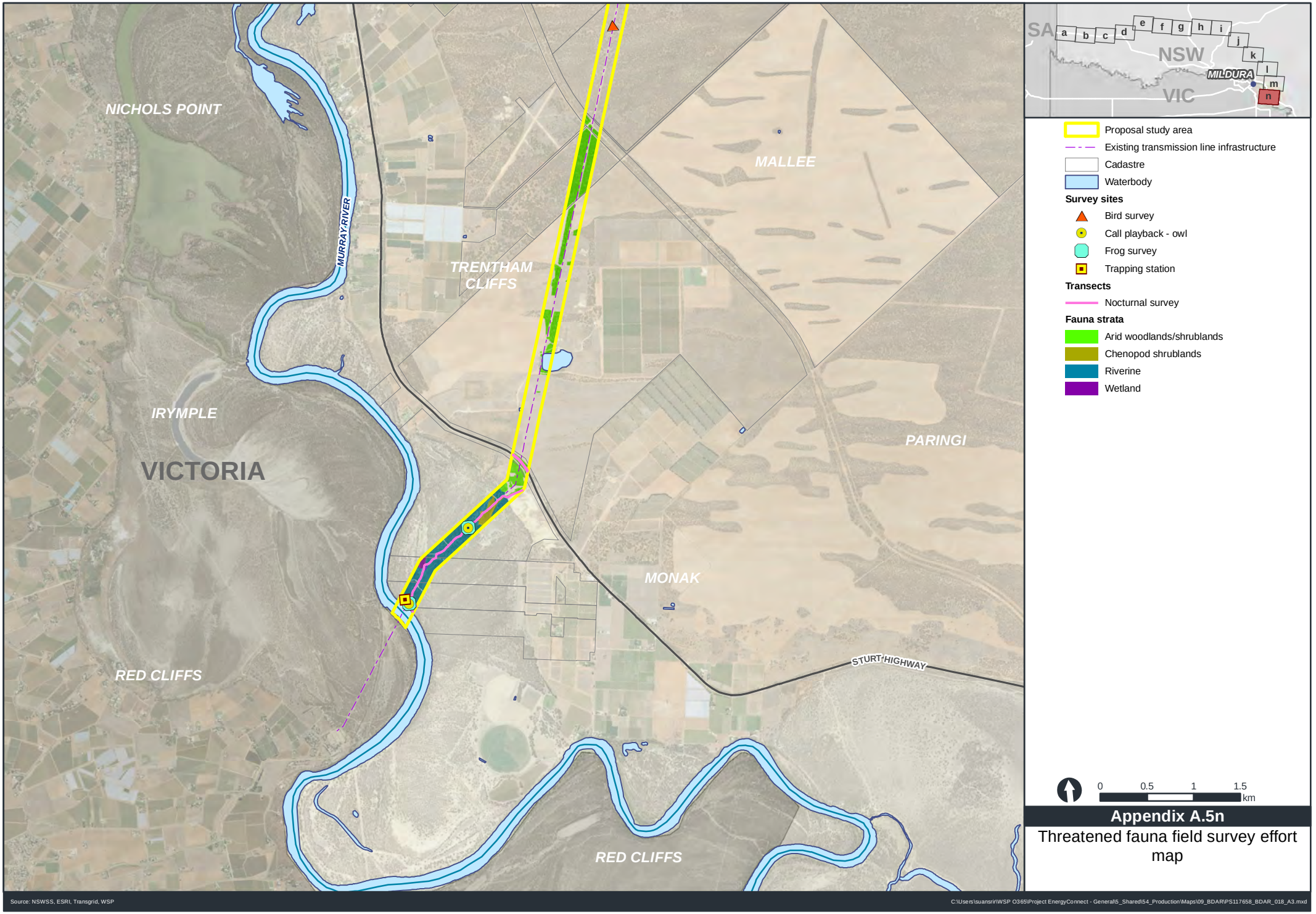
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_018_A3.mxd



Appendix A.5m

Threatened fauna field survey effort map



Appendix A.5n

Threatened fauna field survey effort map

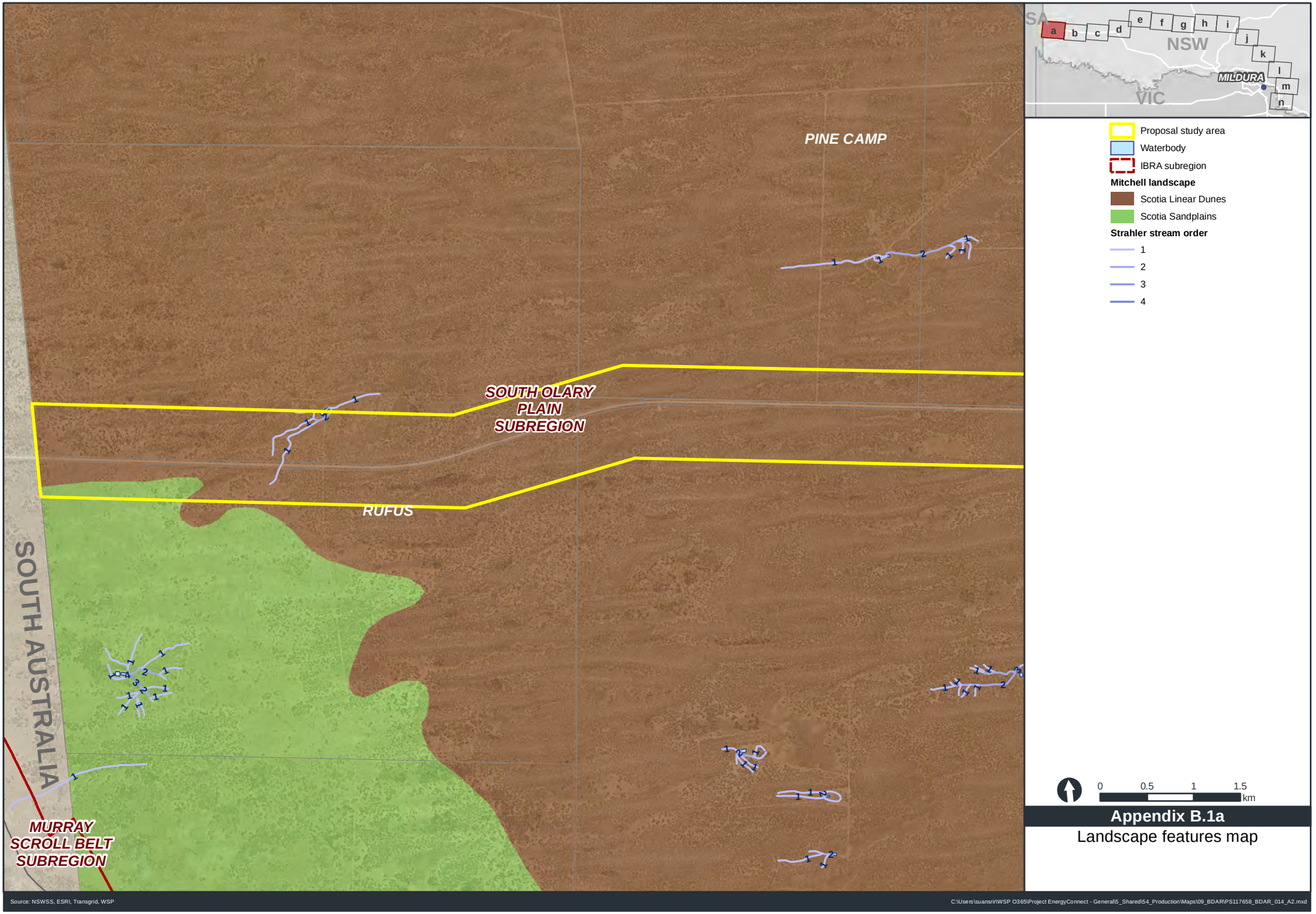
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_018_A3.mxd

APPENDIX B

LANDSCAPE CONTEXT

APPENDIX B-1
LANDSCAPE FEATURES MAPPING

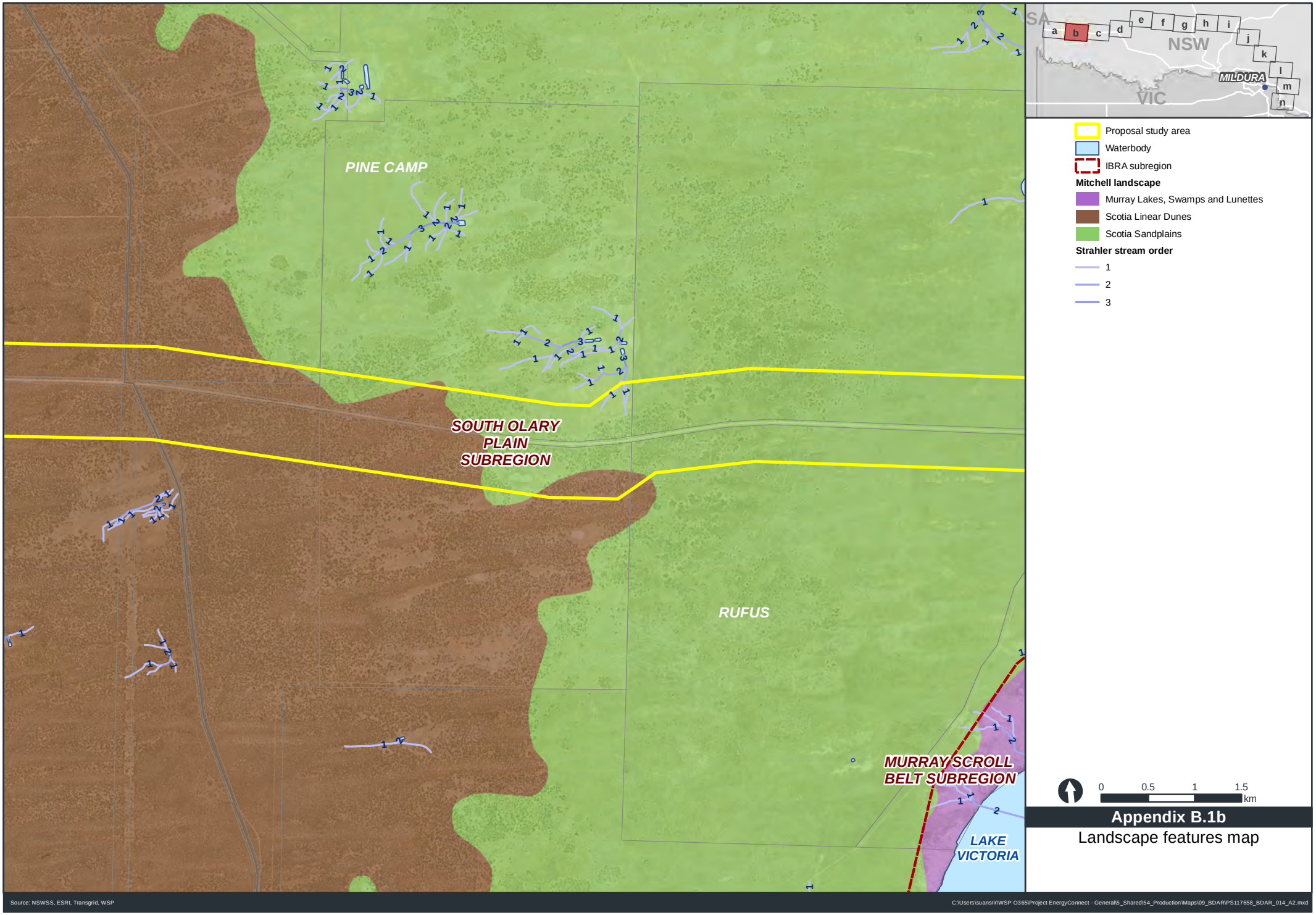


Appendix B.1a

Landscape features map

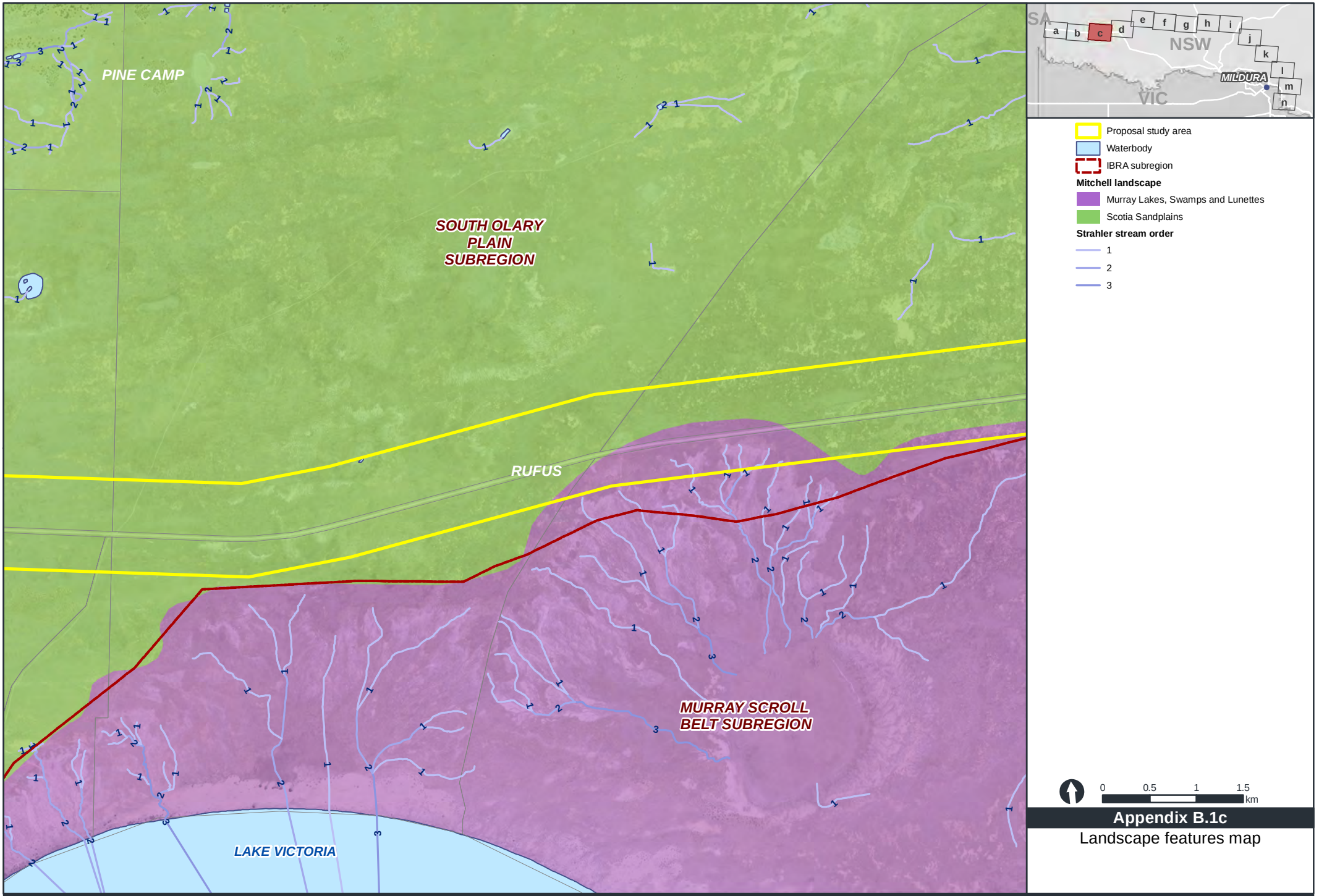
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_014_A2.mxd



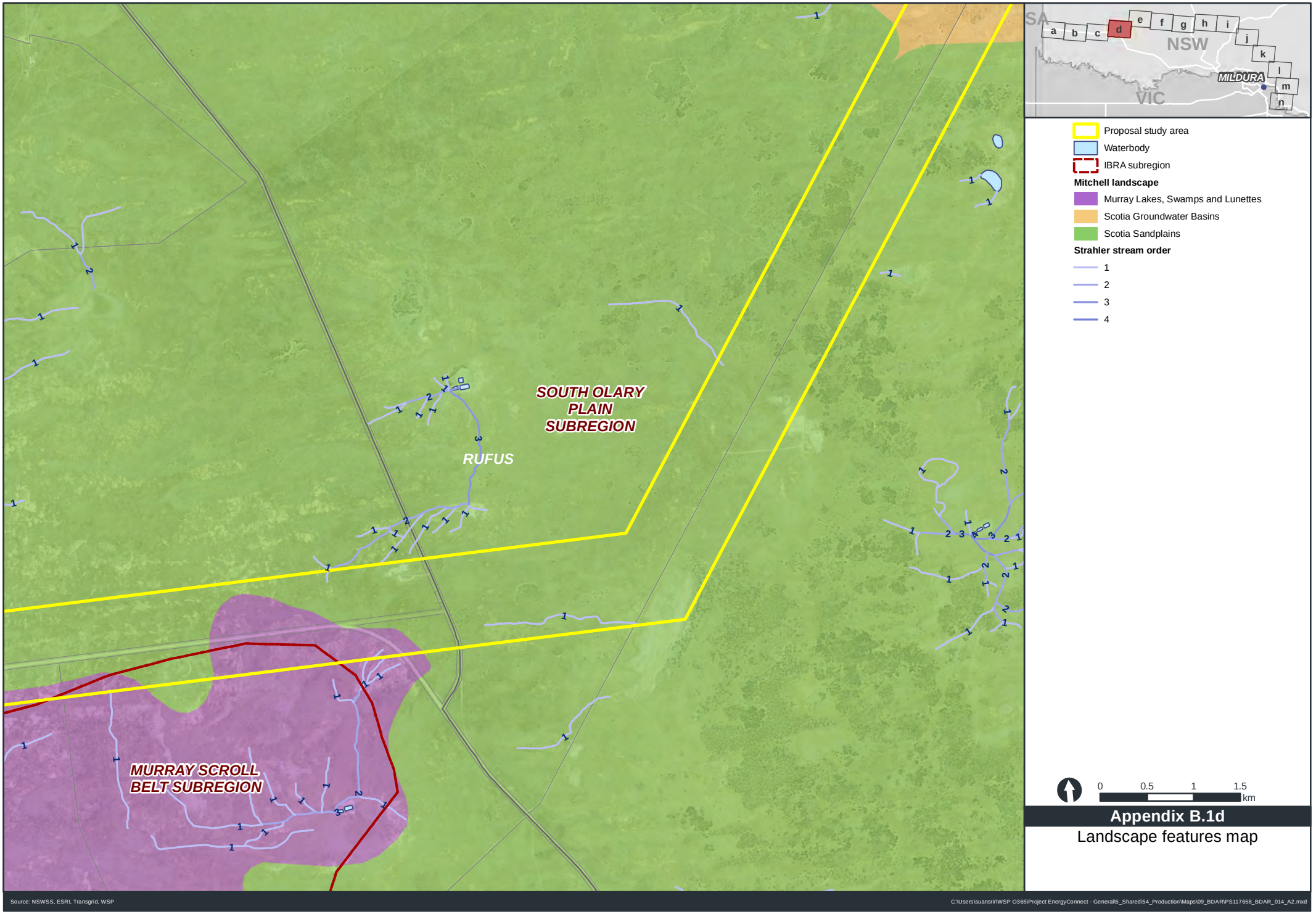
Appendix B.1b

Landscape features map



Appendix B.1c

Landscape features map



Appendix B.1d

Landscape features map

Source: NSWSS, ESRI, Transgrid, WSP

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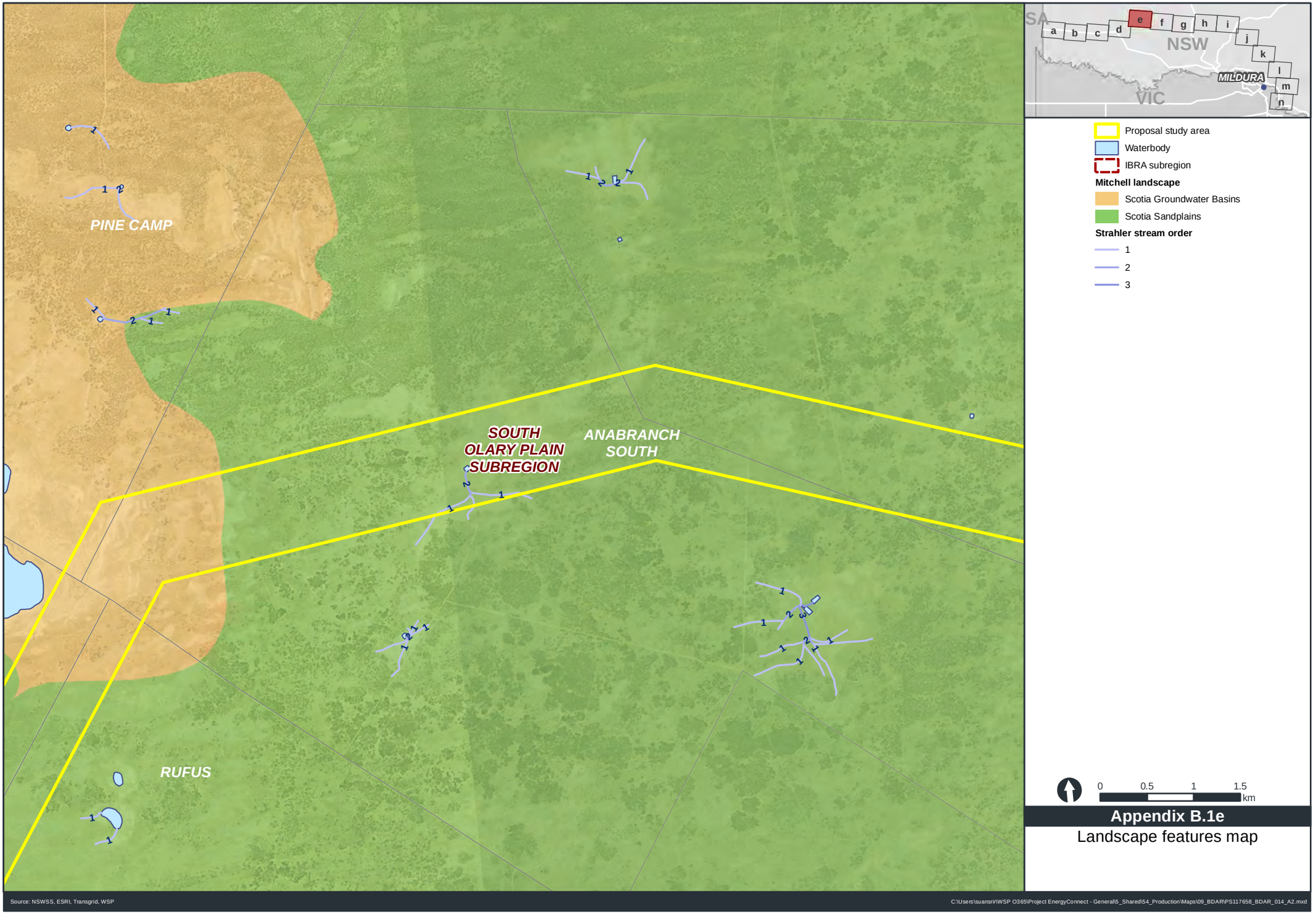
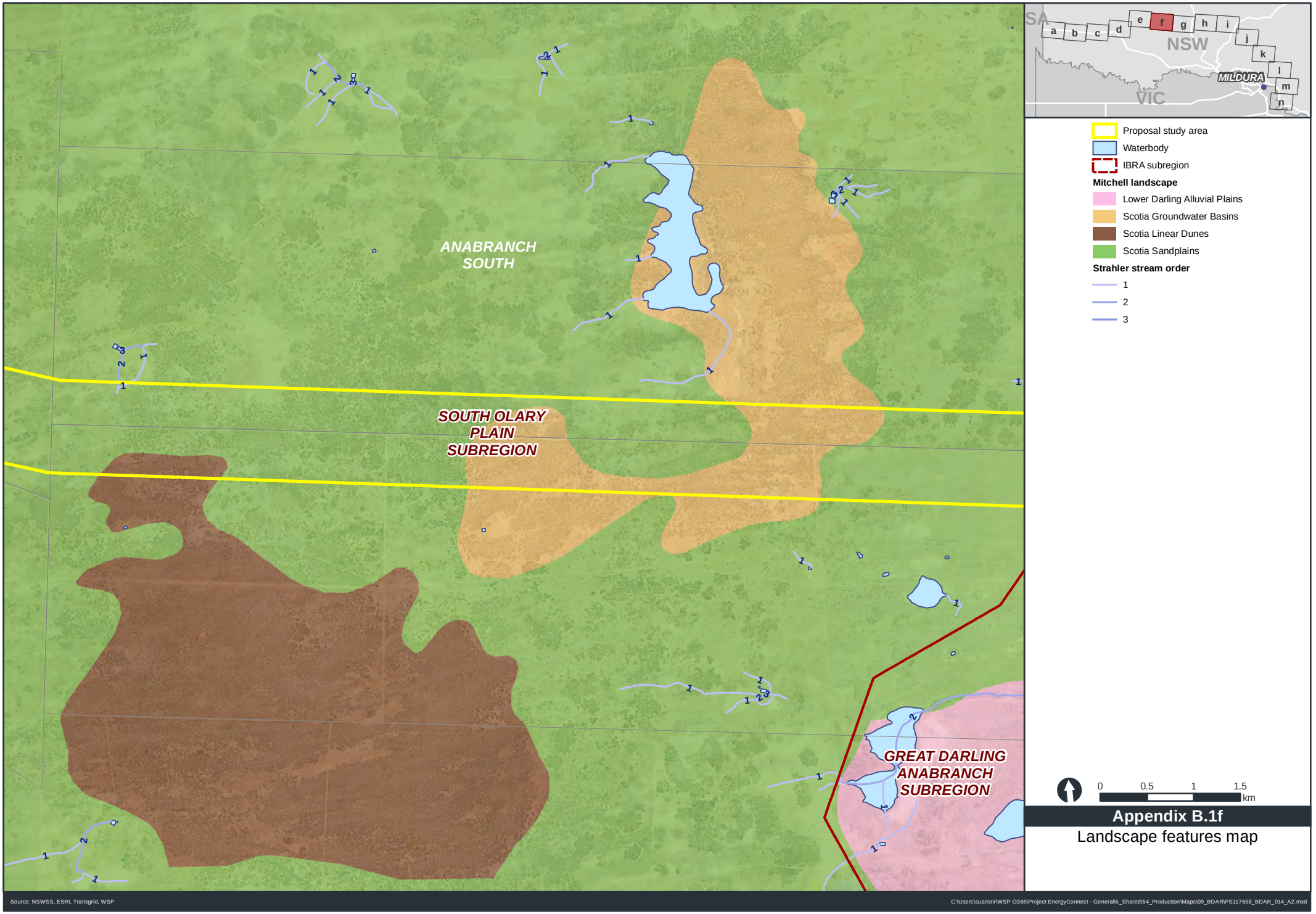


Appendix B.1e

Landscape features map

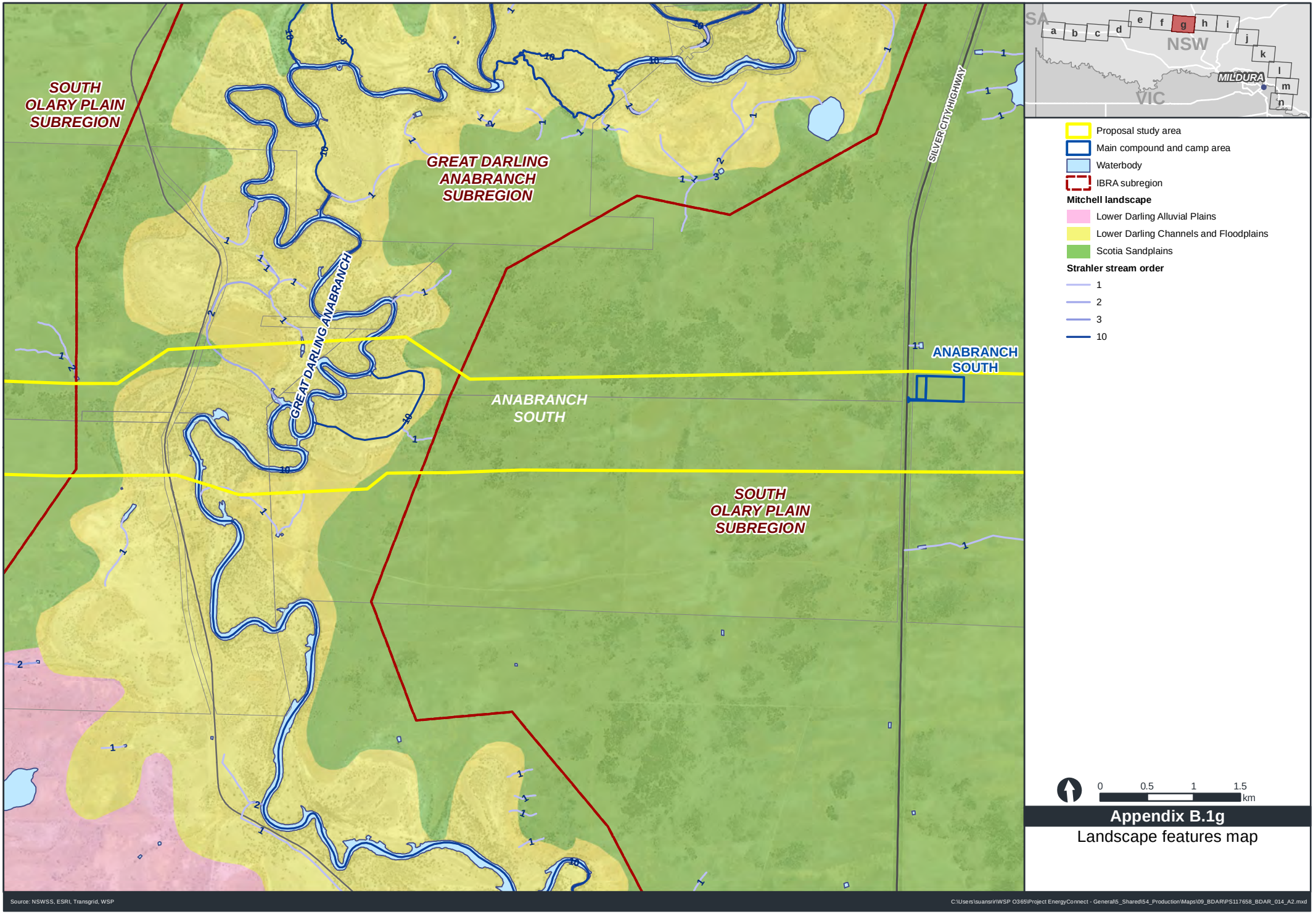


Appendix B.1f

Landscape features map

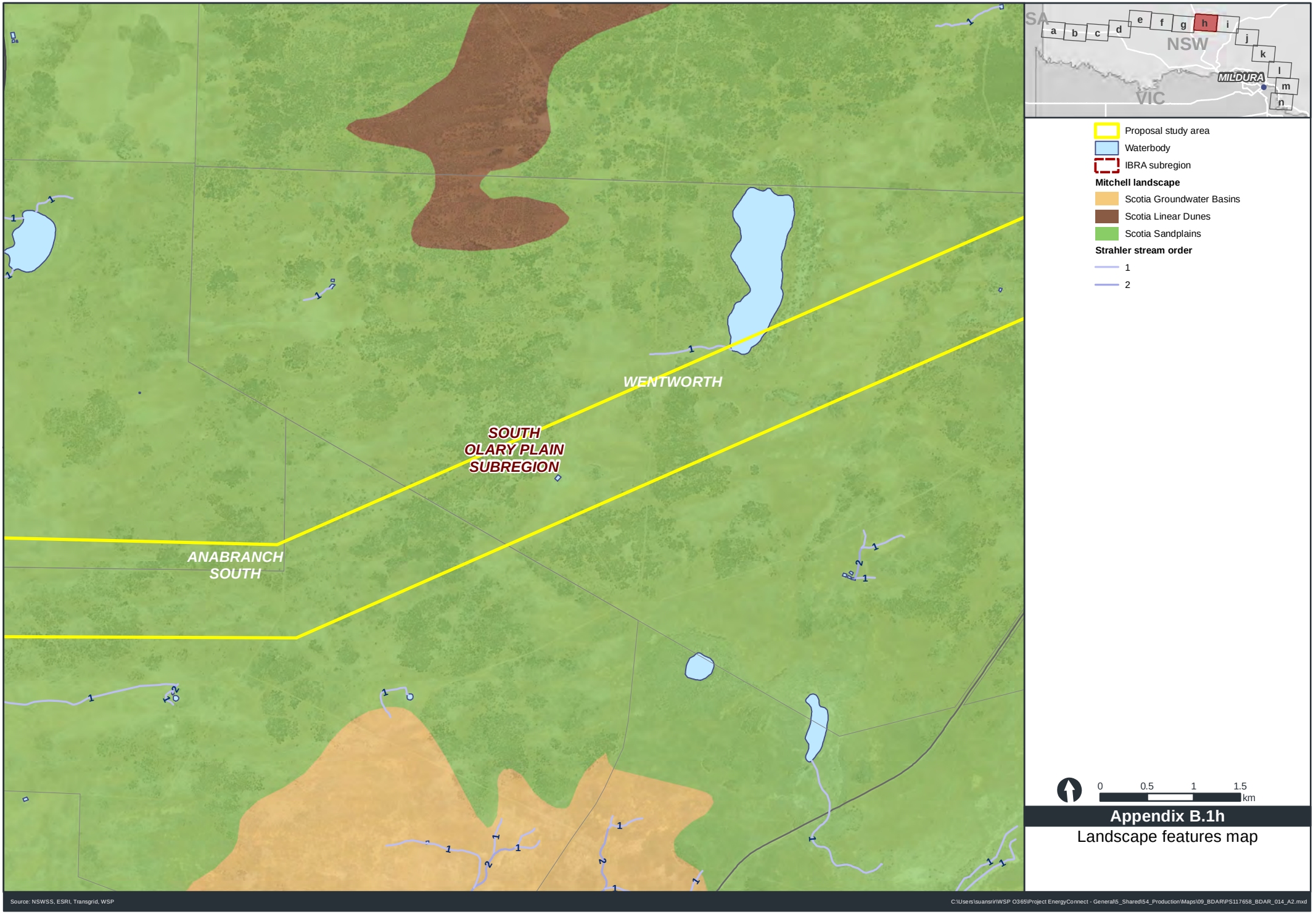
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_014_A2.mxd



Appendix B.1g

Landscape features map

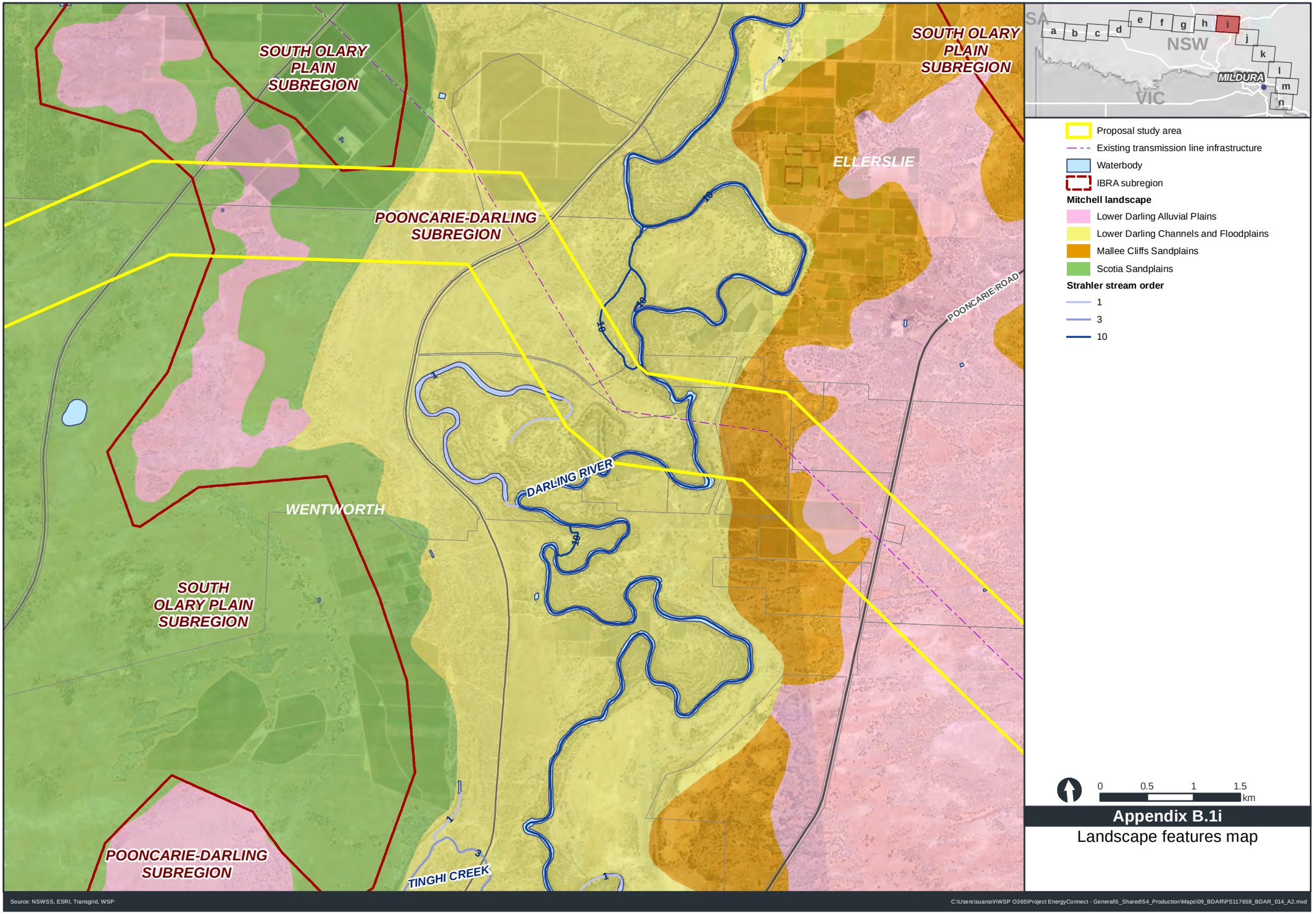


Appendix B.1h

Landscape features map

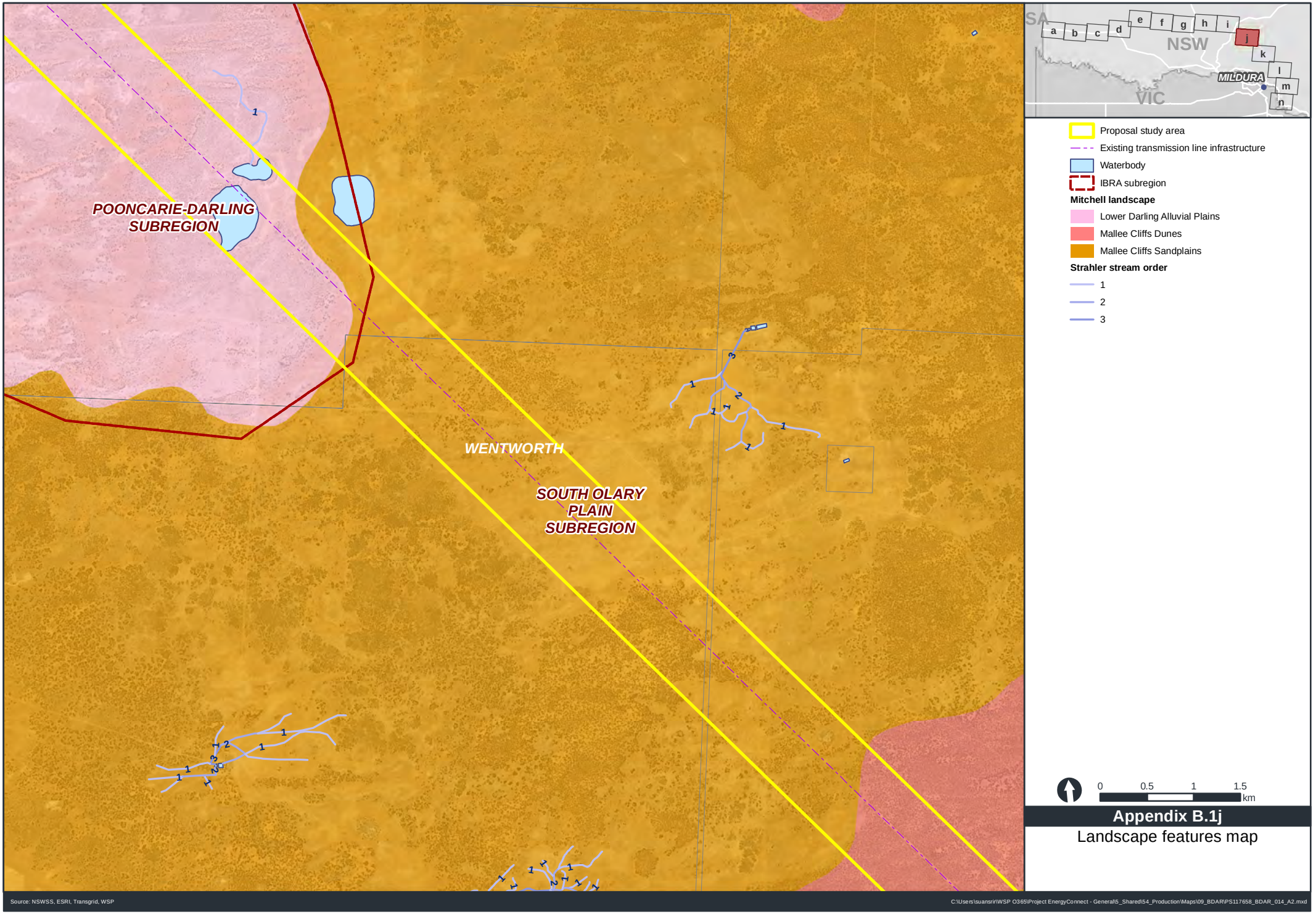
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_014_A2.mxd



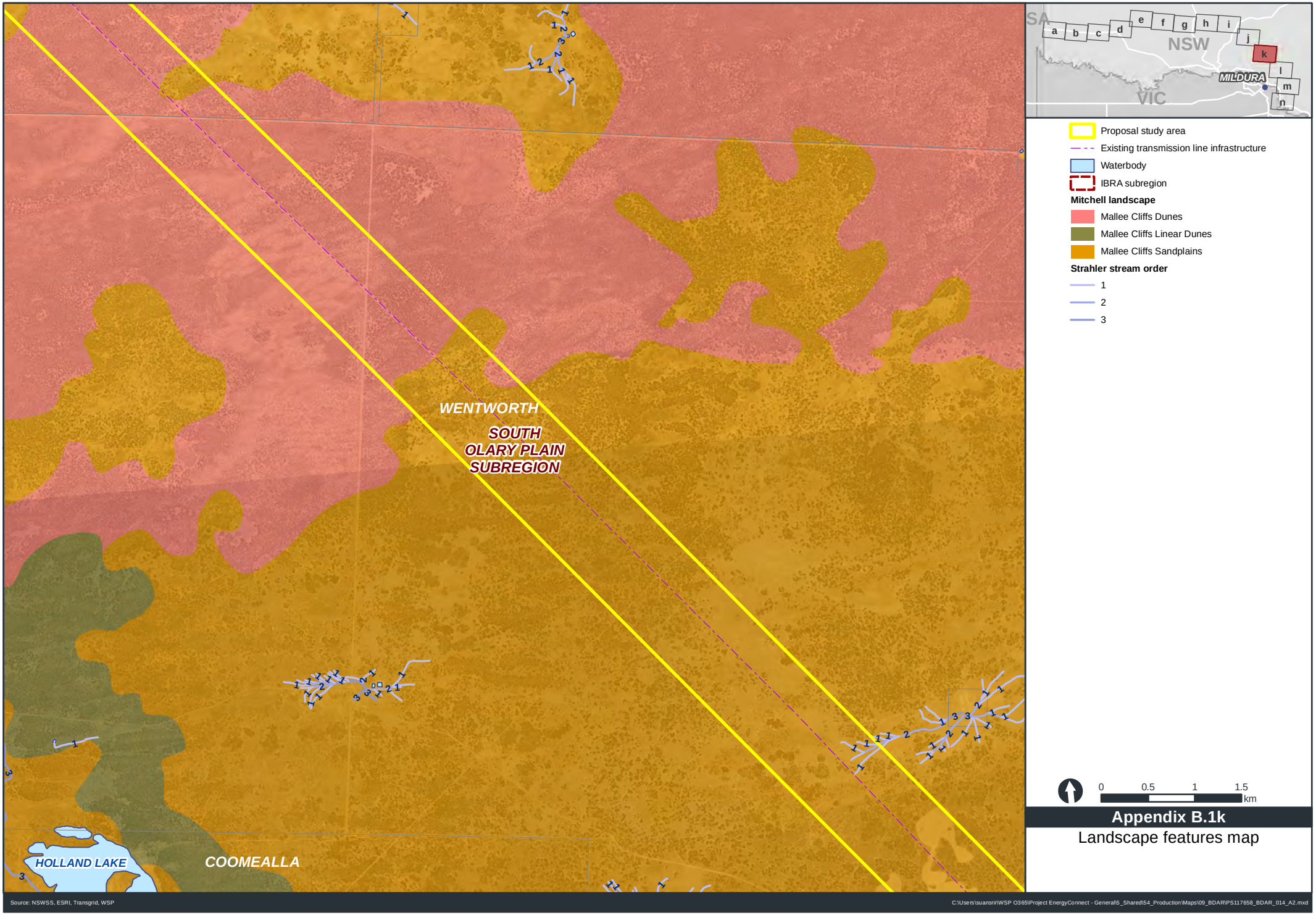
Appendix B.1i

Landscape features map



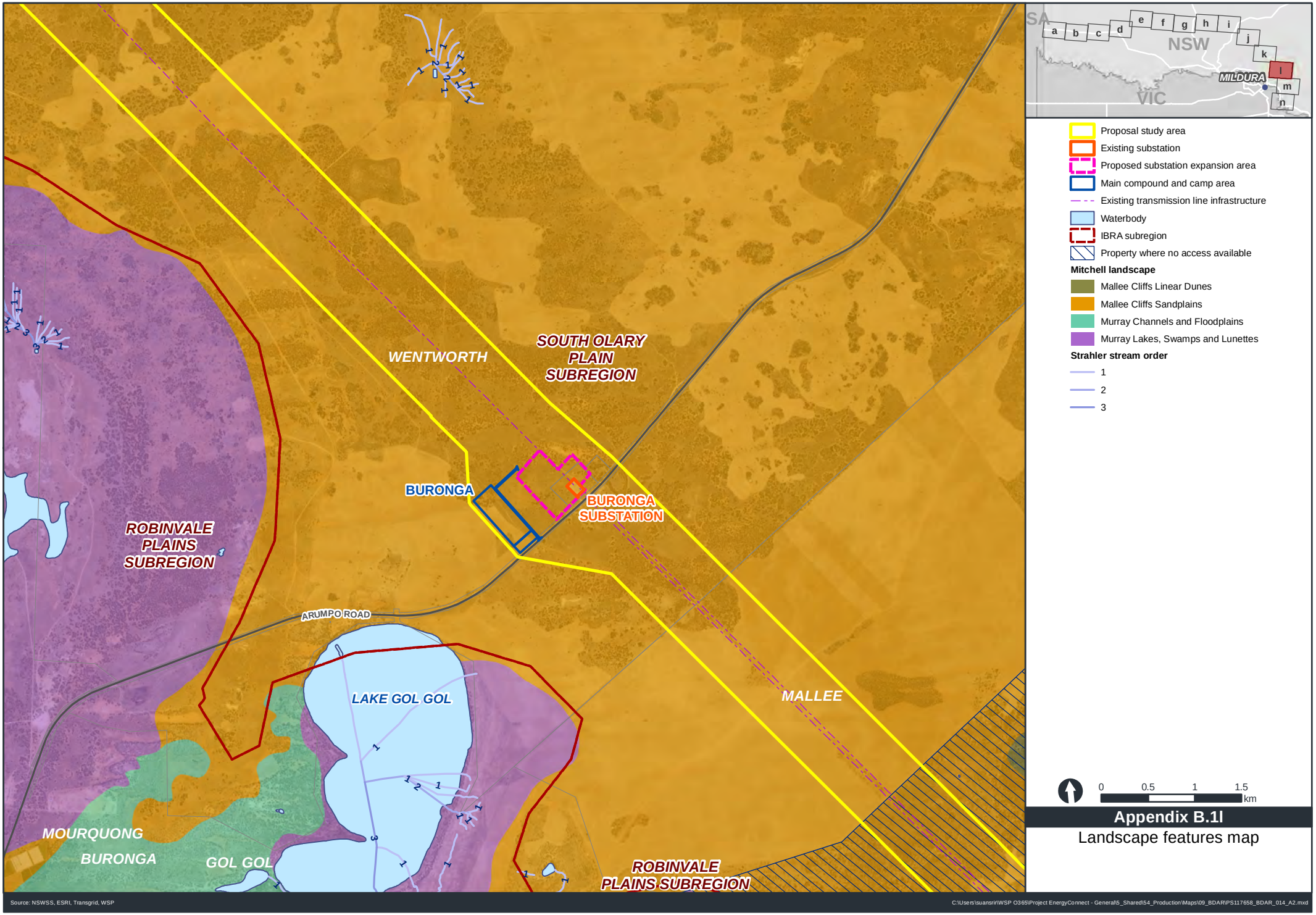
Appendix B.1j

Landscape features map



Appendix B.1k

Landscape features map

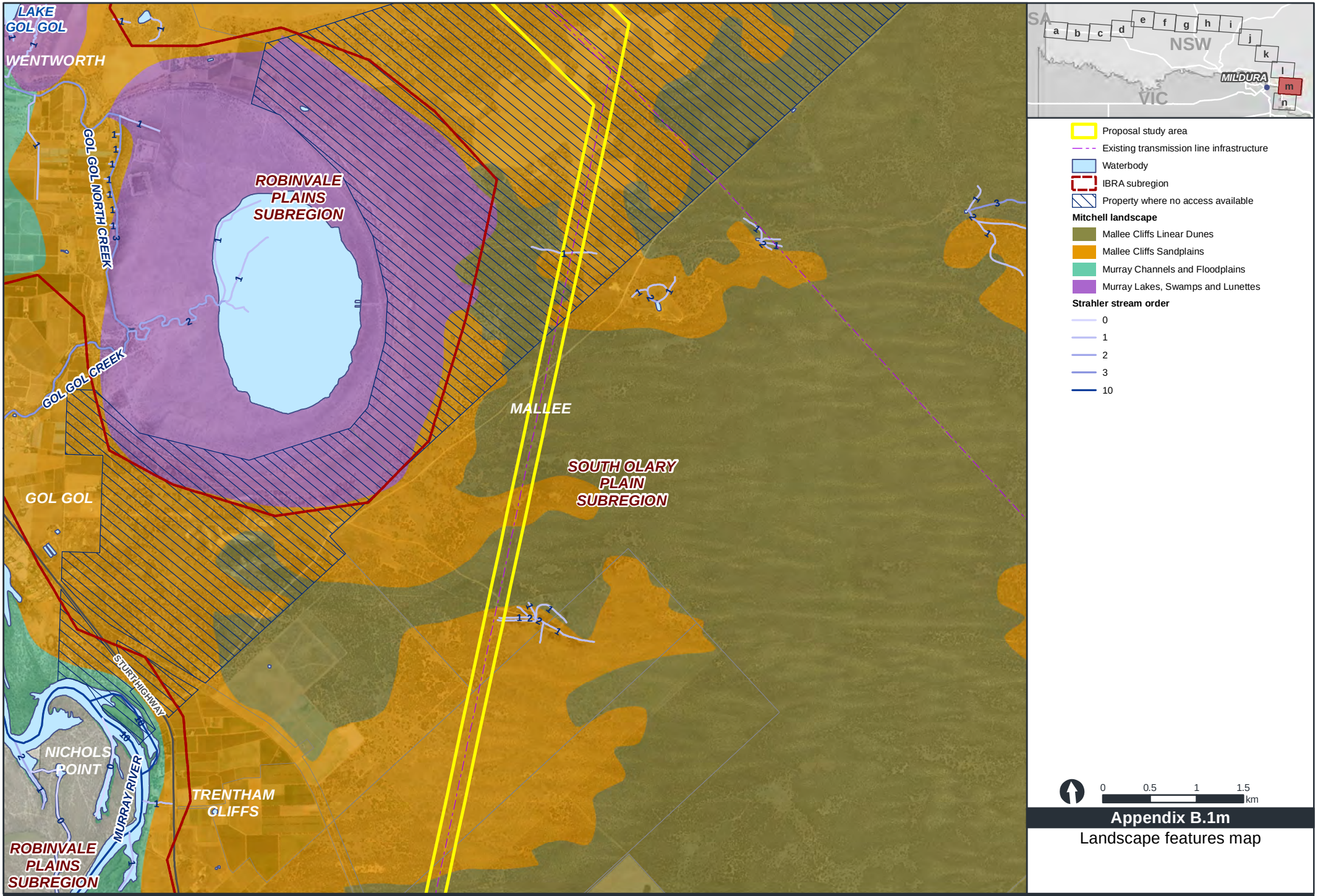


Appendix B.1l

Landscape features map

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_014_A2.mxd



Appendix B.1m

Landscape features map

Source: NSWSS, ESRI, Transgrid, WSP

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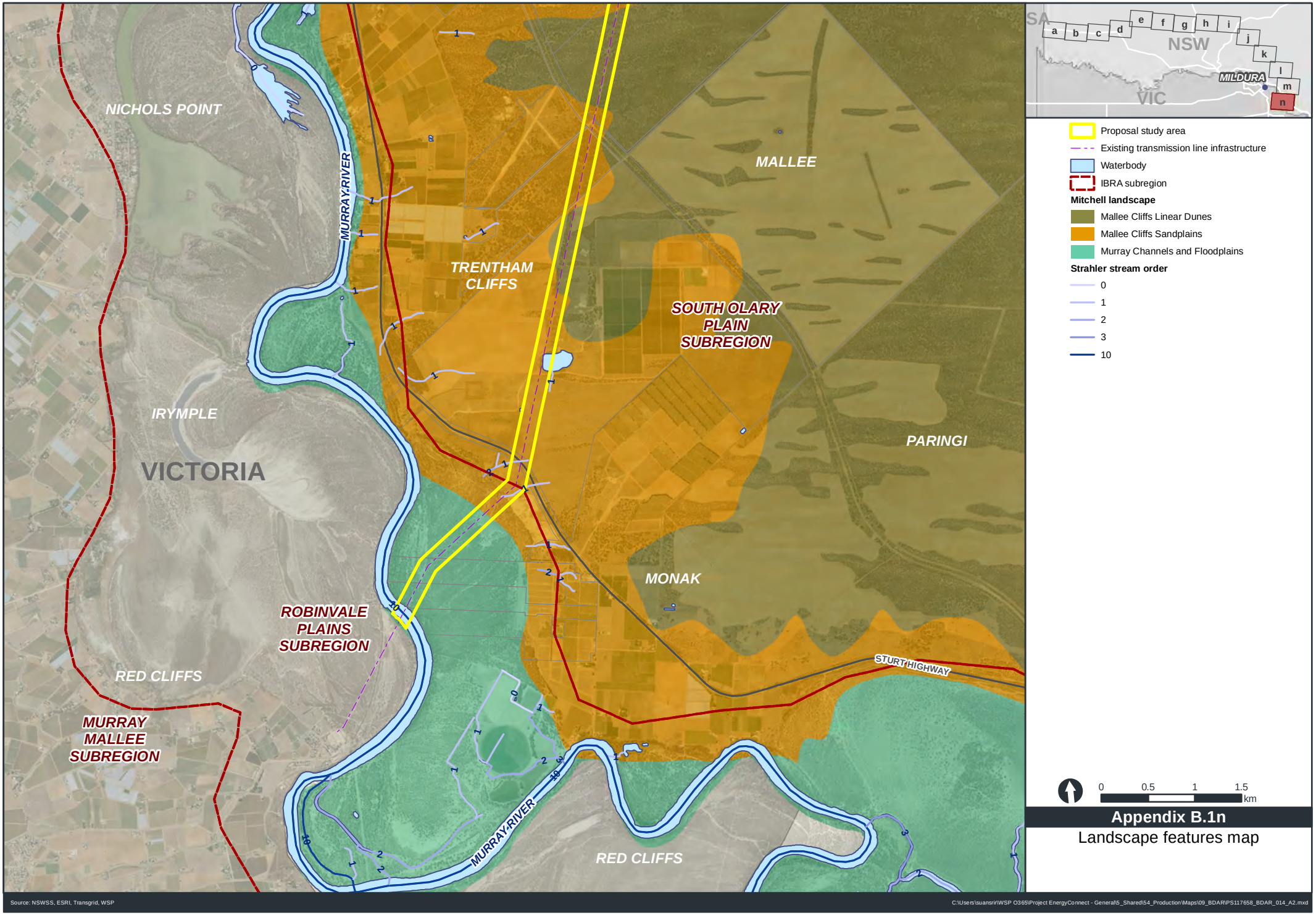


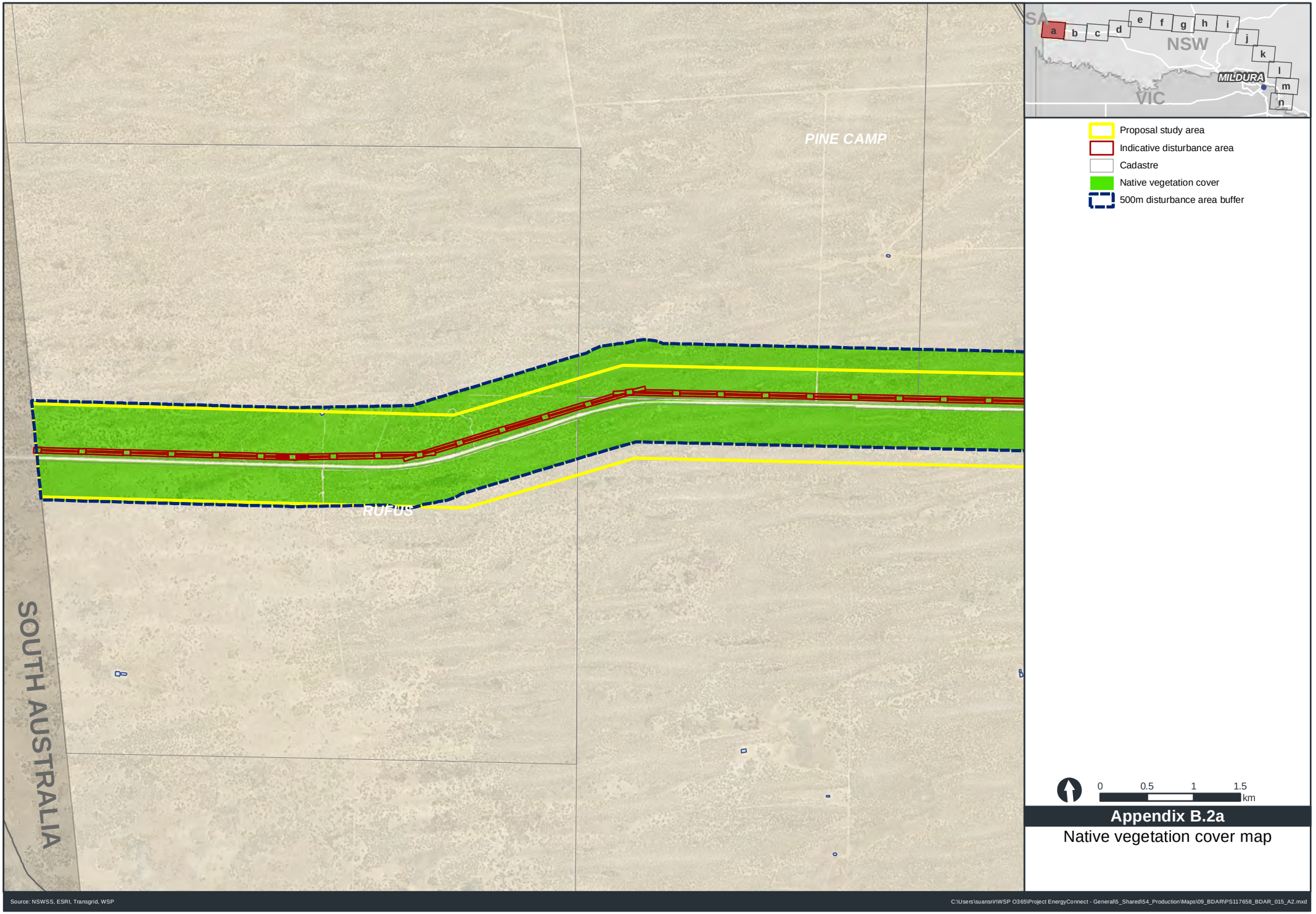
Appendix B.1n

Landscape features map

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_014_A2.mxd

APPENDIX B-2
NATIVE VEGETATION COVER MAPPING

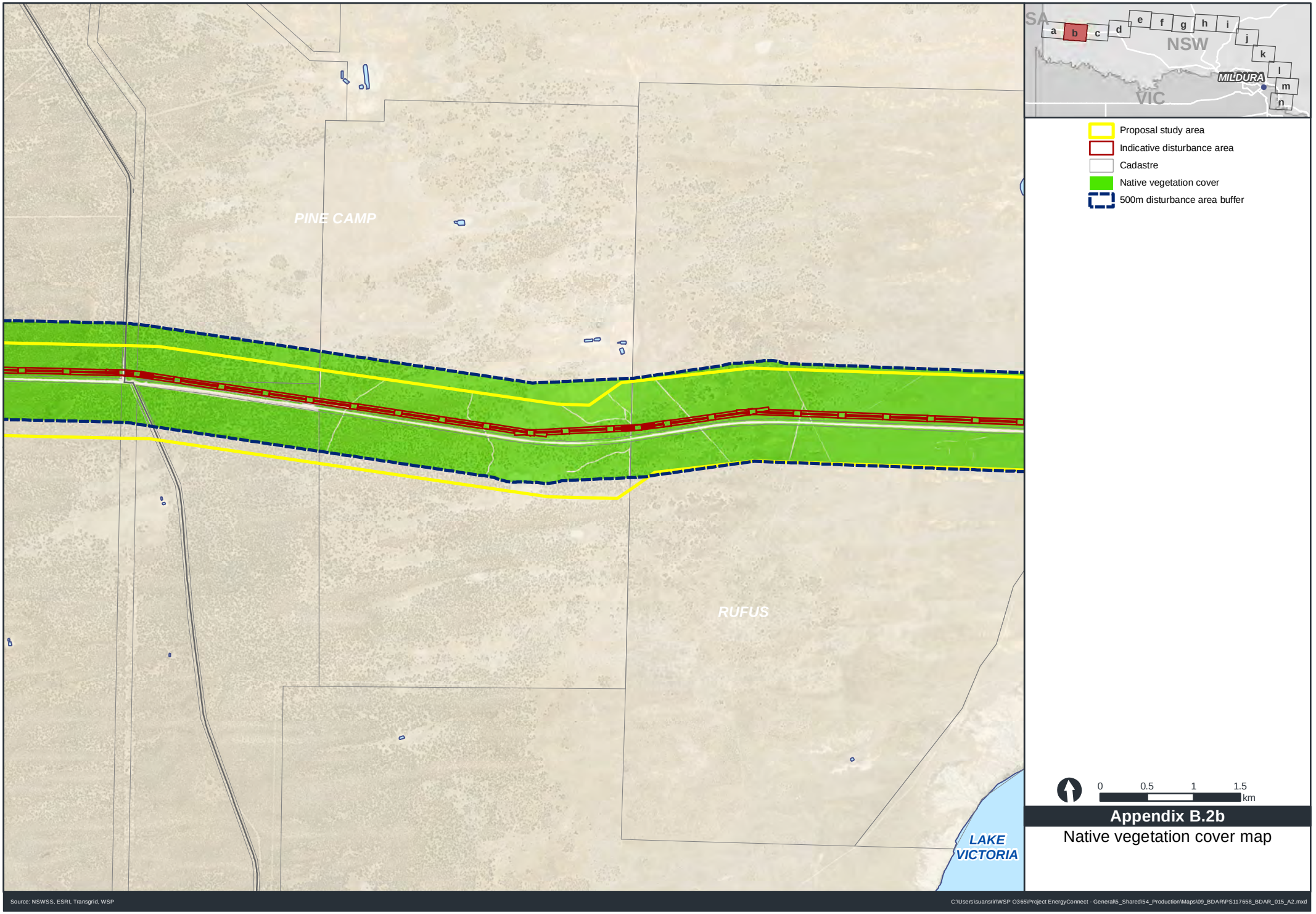


Appendix B.2a

Native vegetation cover map

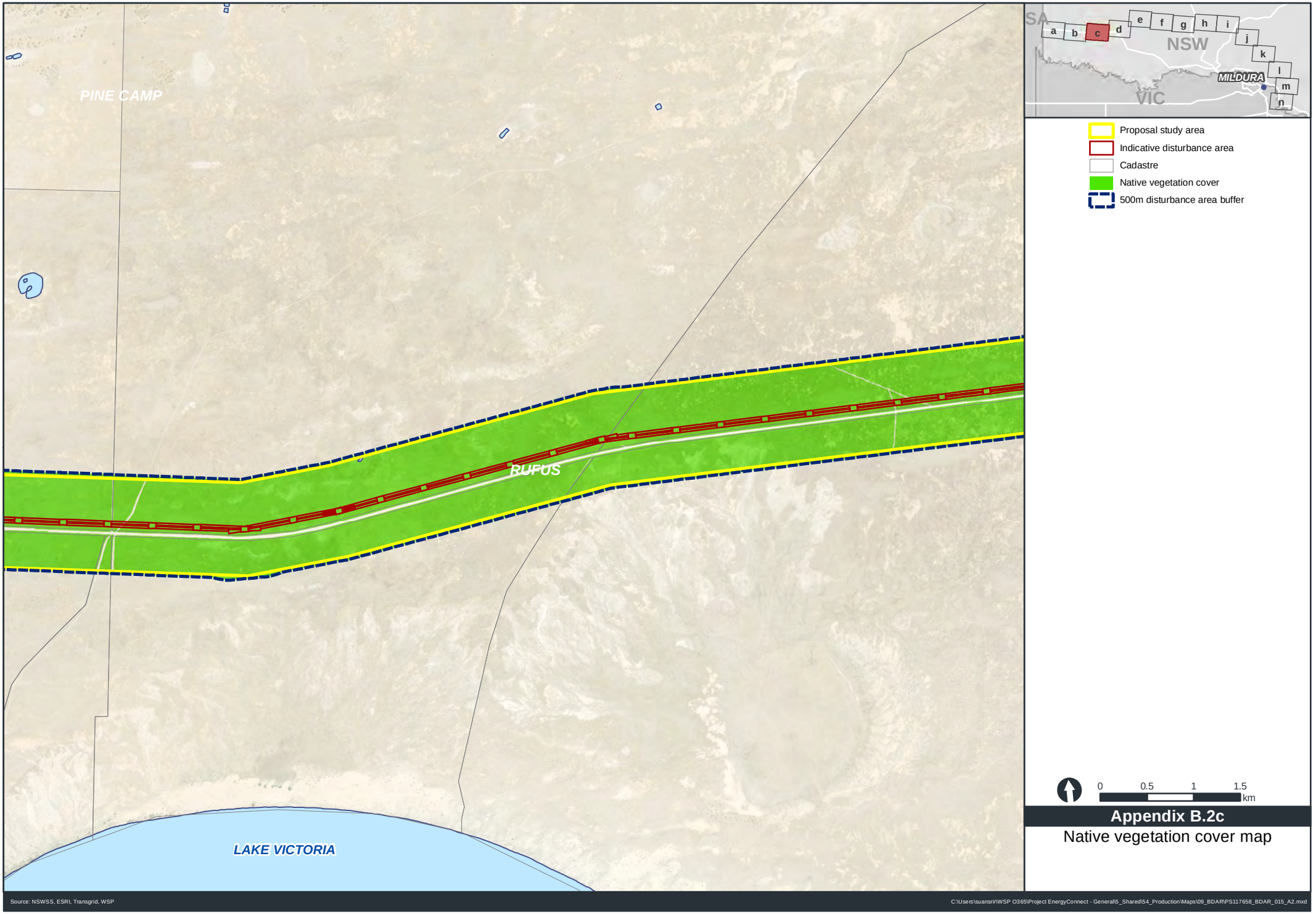
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_015_A2.mxd



Appendix B.2b

Native vegetation cover map

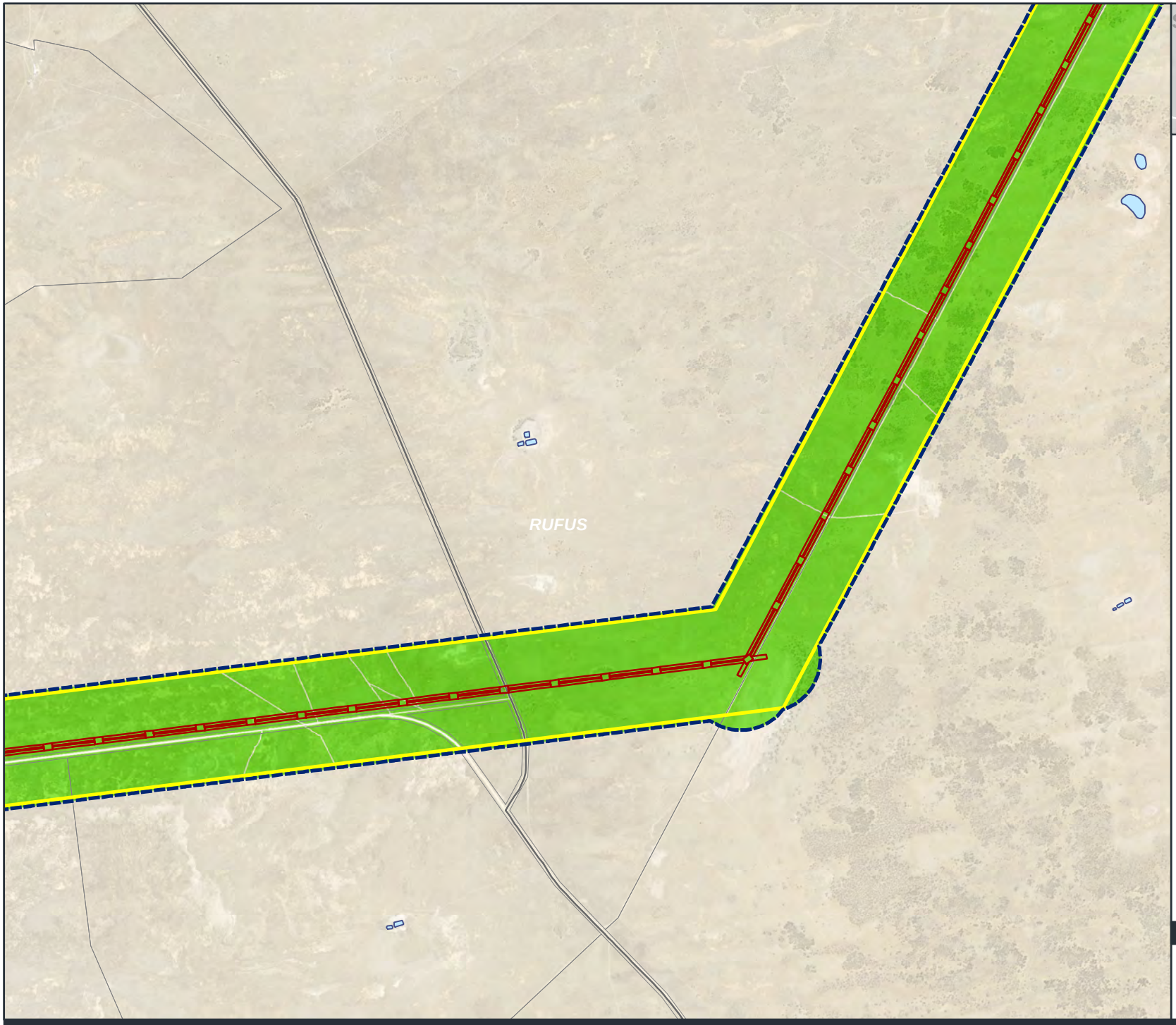


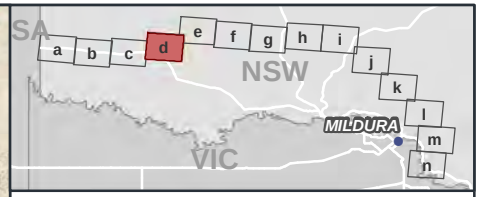
Appendix B.2c

Native vegetation cover map

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_015_A2.mxd





Proposal study area
Indicative disturbance area
Cadastre
Native vegetation cover
500m disturbance area buffer

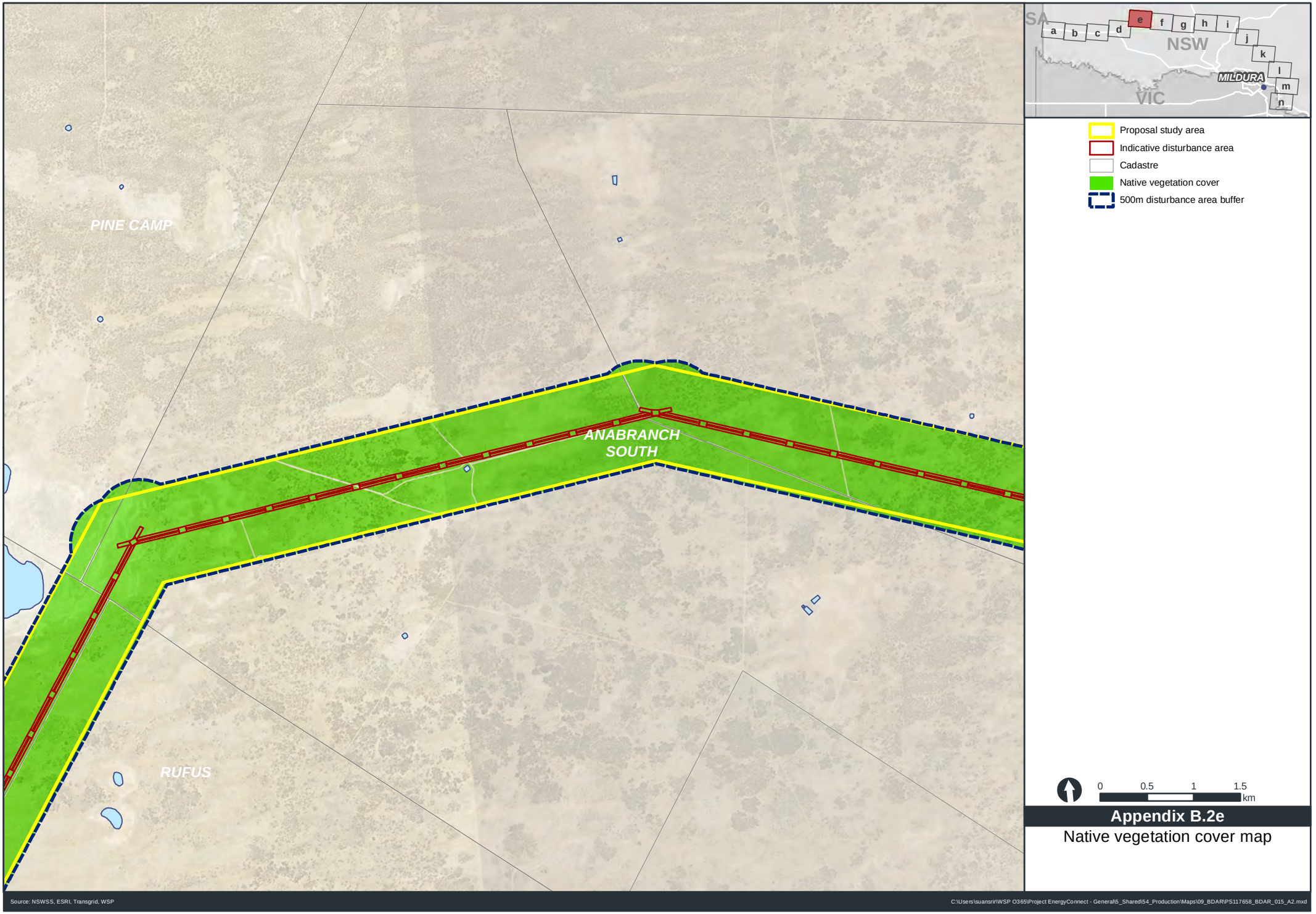
0 0.5 1 1.5 km

Appendix B.2d

Native vegetation cover map

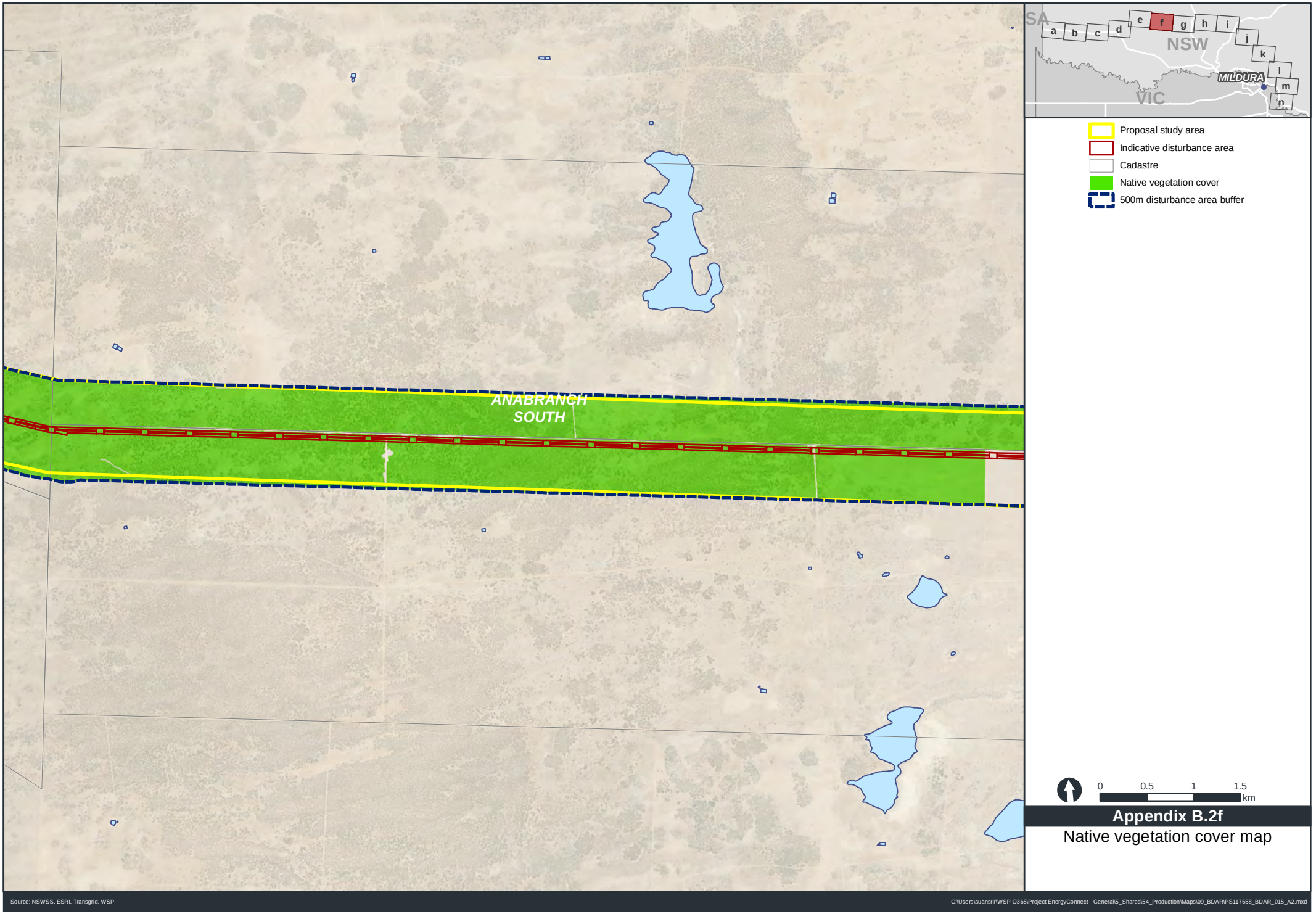
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_015_A2.mxd



Appendix B.2e

Native vegetation cover map



Appendix B.2f

Native vegetation cover map

Source: NSWSS, ESRI, Transgrid, WSP

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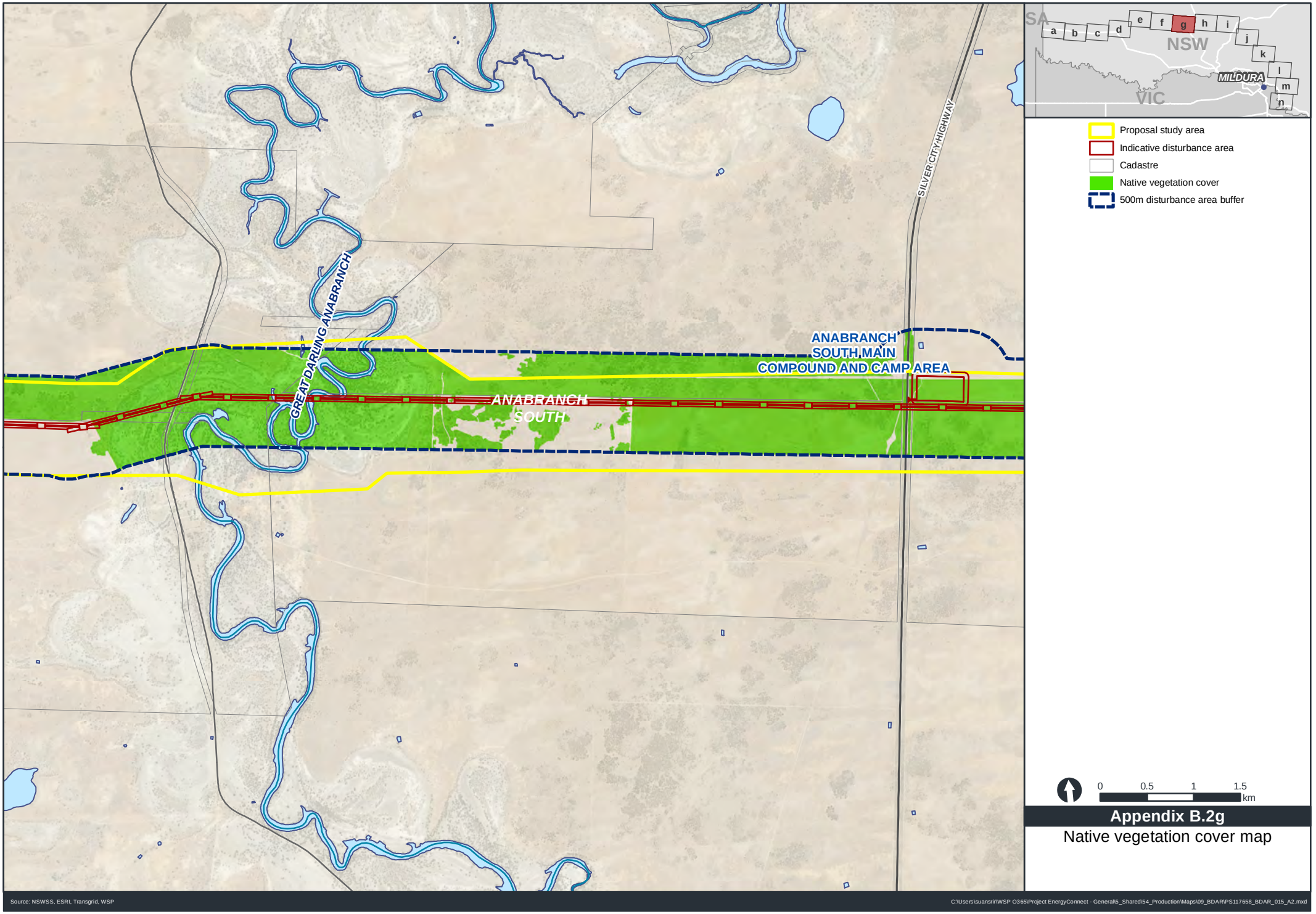
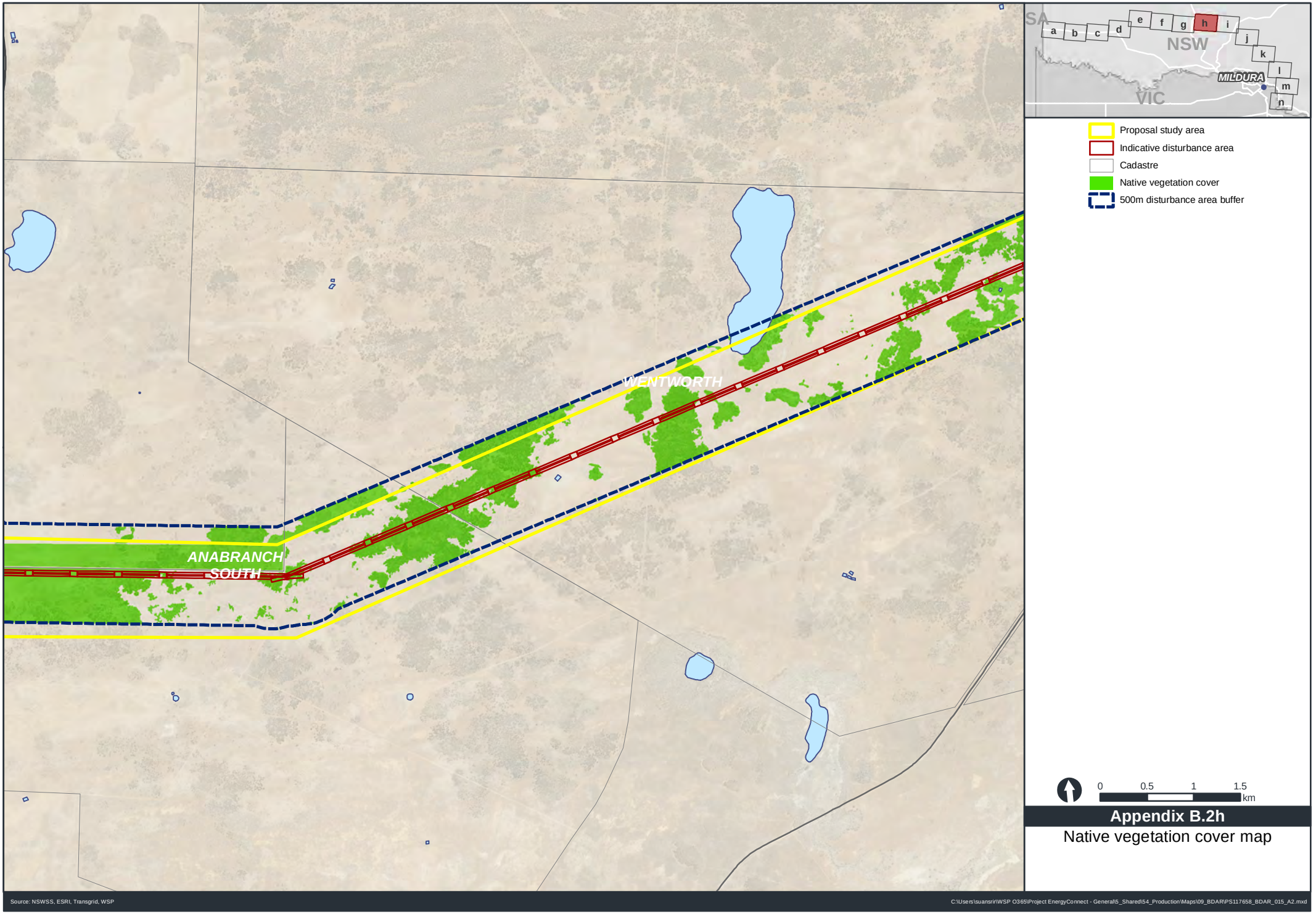


Appendix B.2g

Native vegetation cover map



Appendix B.2h

Native vegetation cover map

Source: NSWSS, ESRI, Transgrid, WSP

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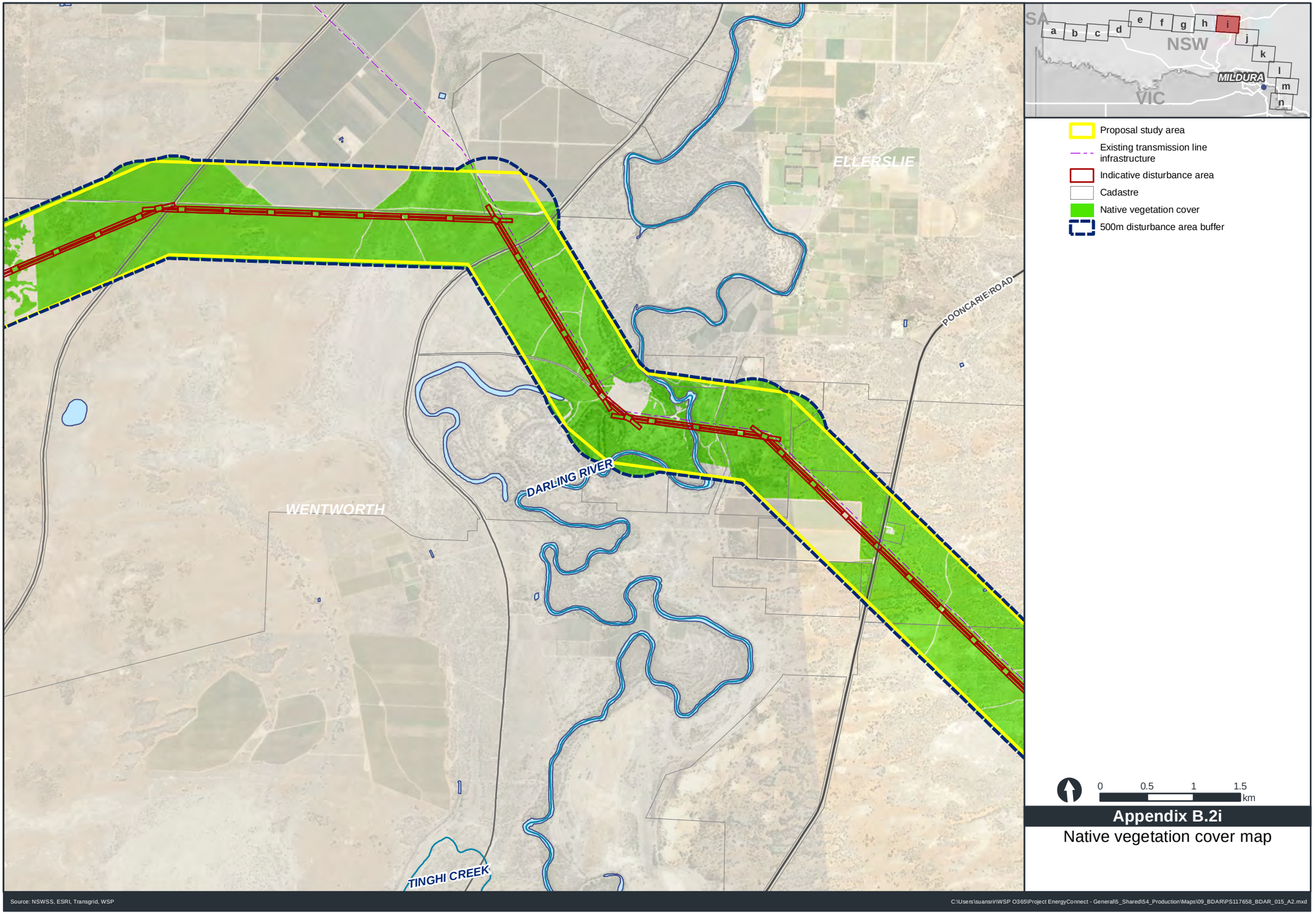
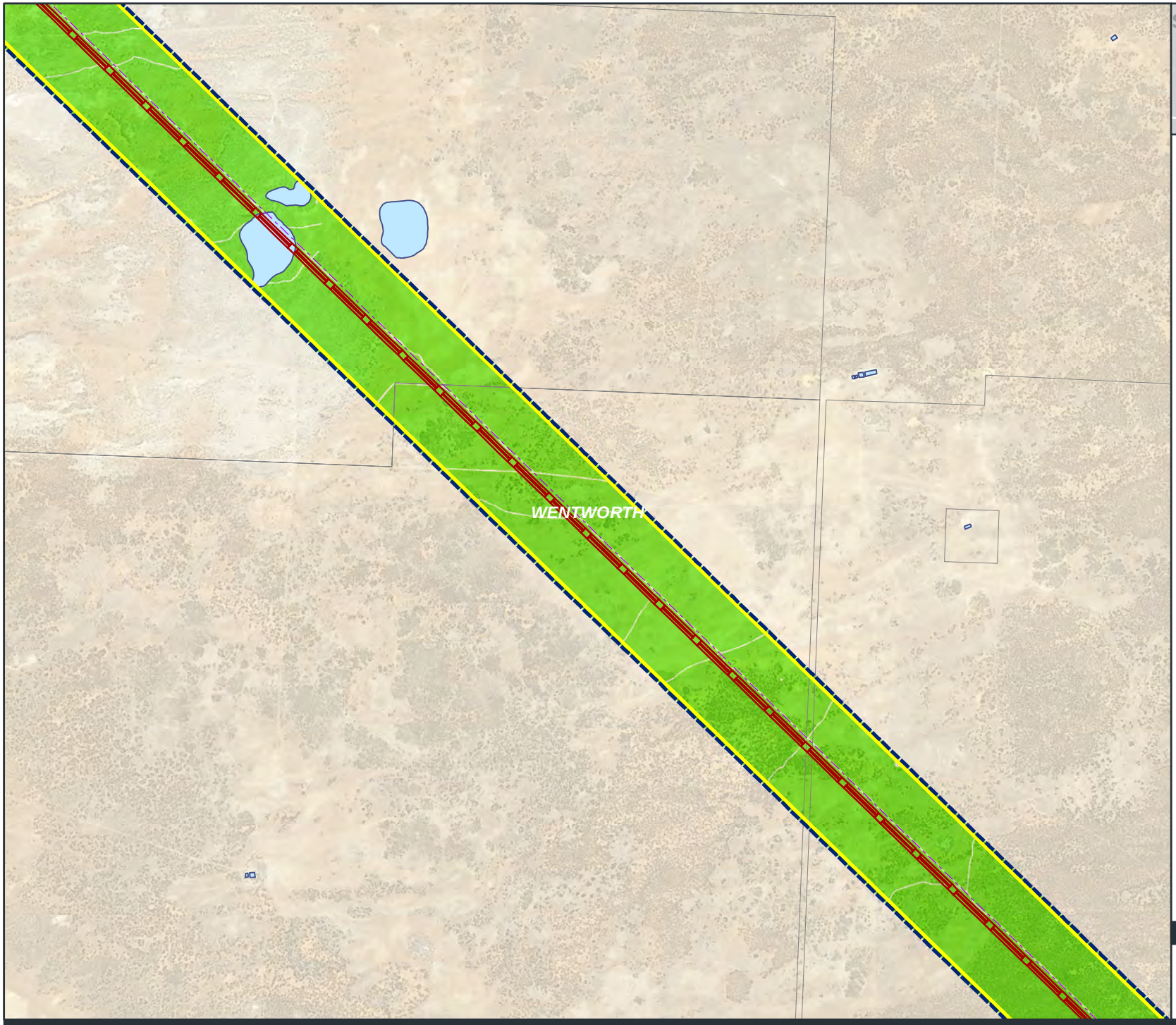


Appendix B.2i

Native vegetation cover map



Proposal study area

Existing transmission line infrastructure

Indicative disturbance area

Cadastre

Native vegetation cover

500m disturbance area buffer

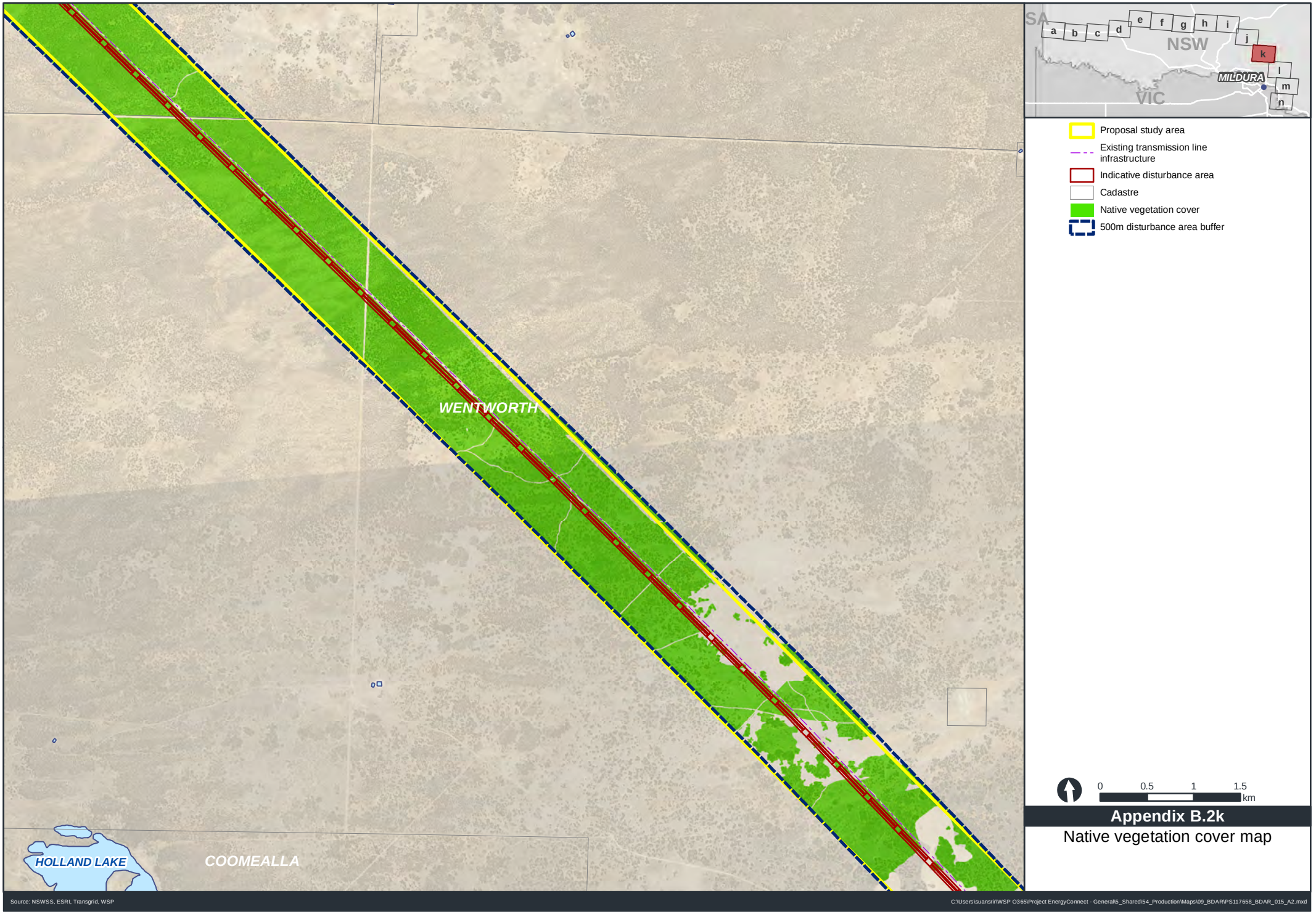
0 0.5 1 1.5 km

Appendix B.2j

Native vegetation cover map

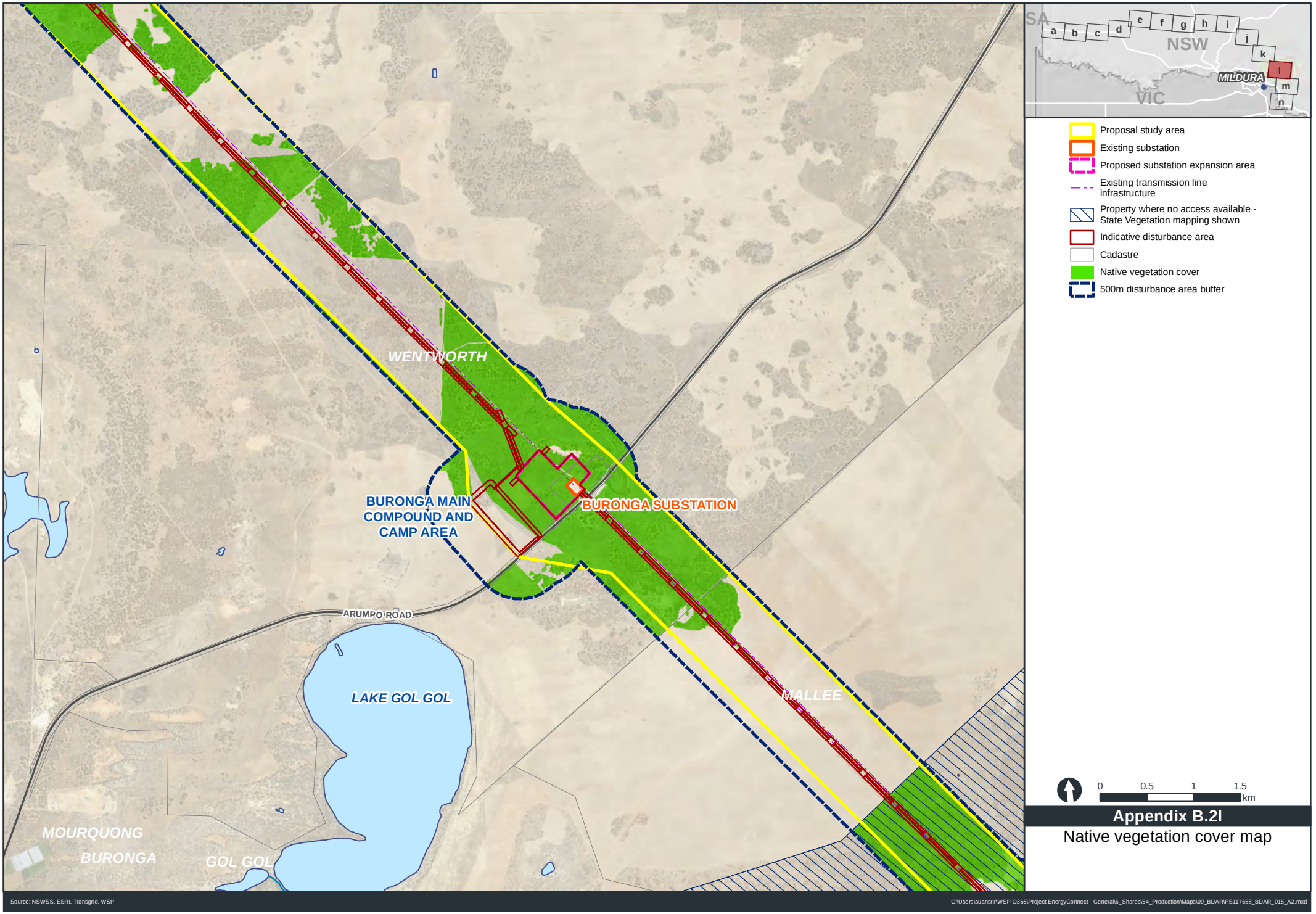
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_015_A2.mxd



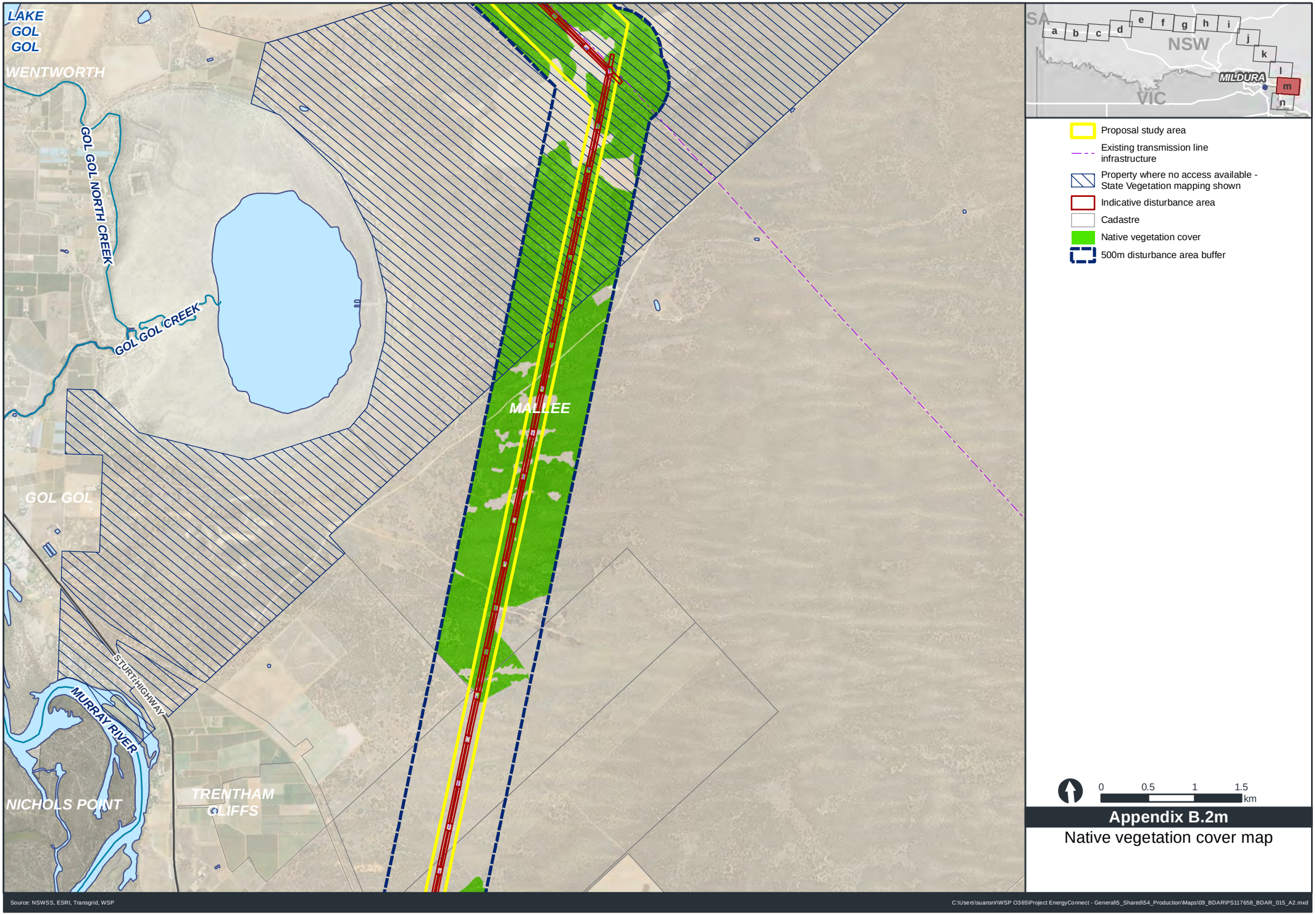
Appendix B.2k

Native vegetation cover map



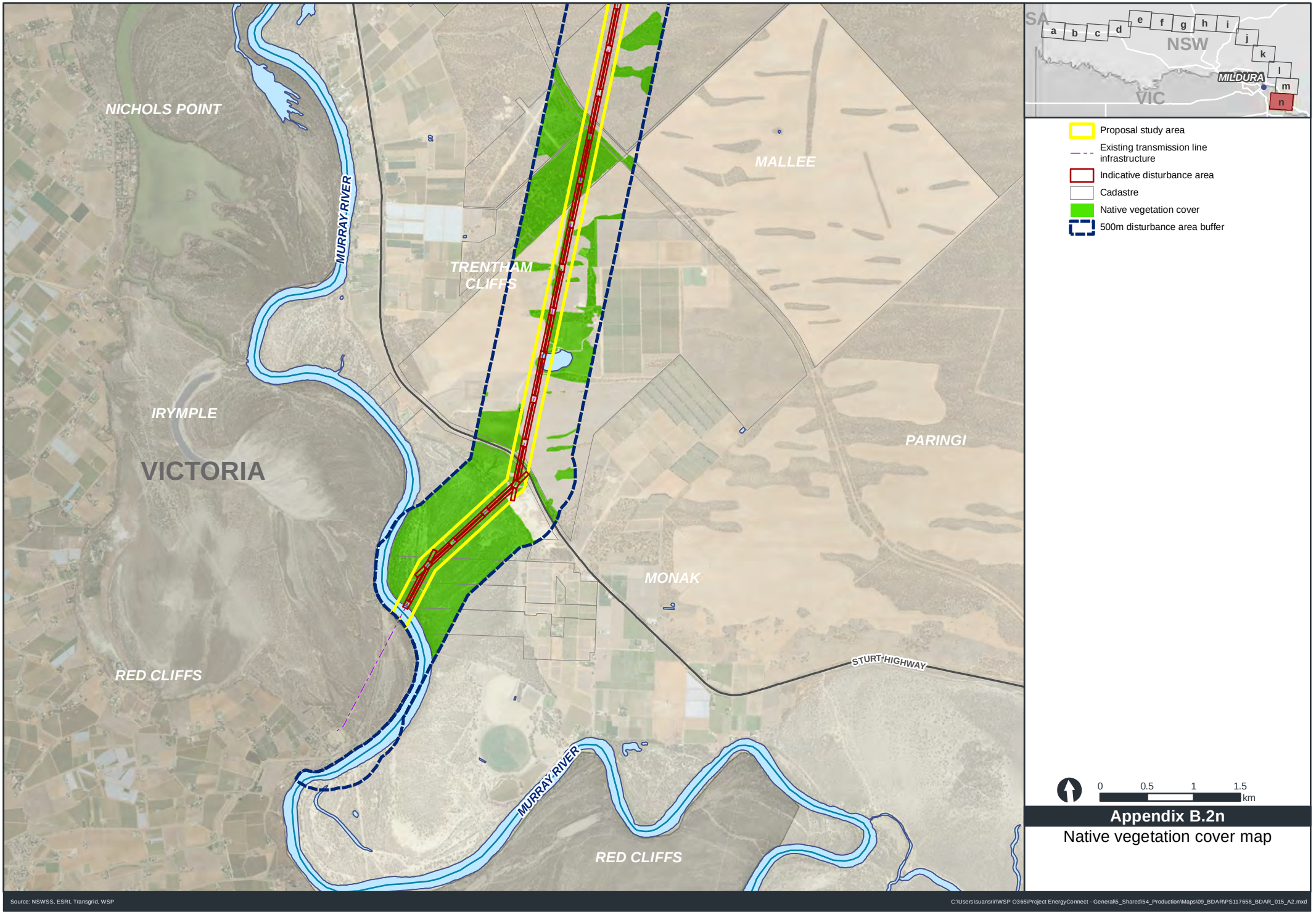
Appendix B.2l

Native vegetation cover map



Appendix B.2m

Native vegetation cover map



Appendix B.2n

Native vegetation cover map

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_015_A2.mxd

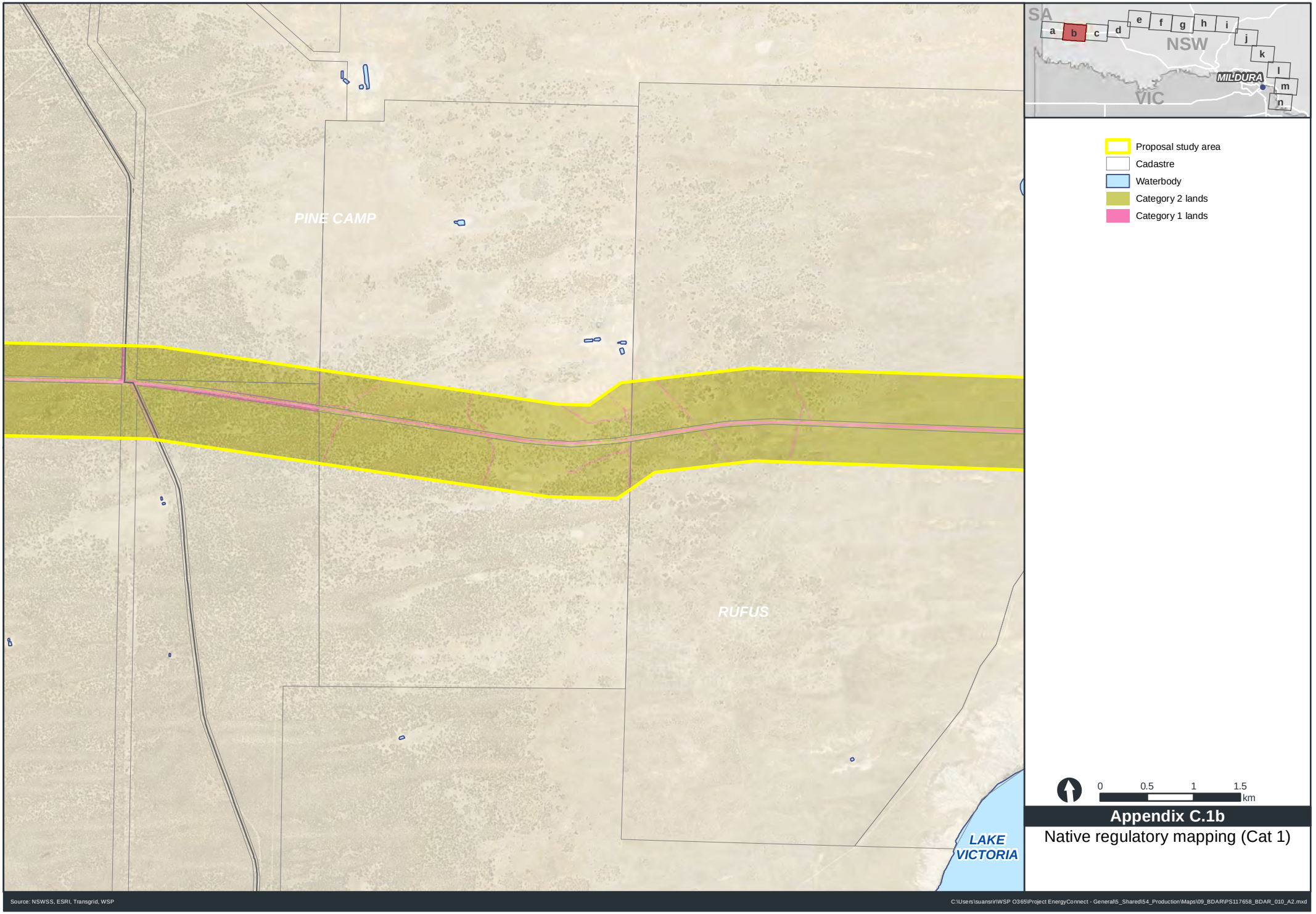
APPENDIX C

NATIVE VEGETATION

APPENDIX C-1
NATIVE VEGETATION REGULATORY MAPPING

Appendix C.1a

Native regulatory mapping (Cat 1)



Appendix C.1b

Native regulatory mapping (Cat 1)

Source: NSWSS, ESRI, Transgrid, WSP

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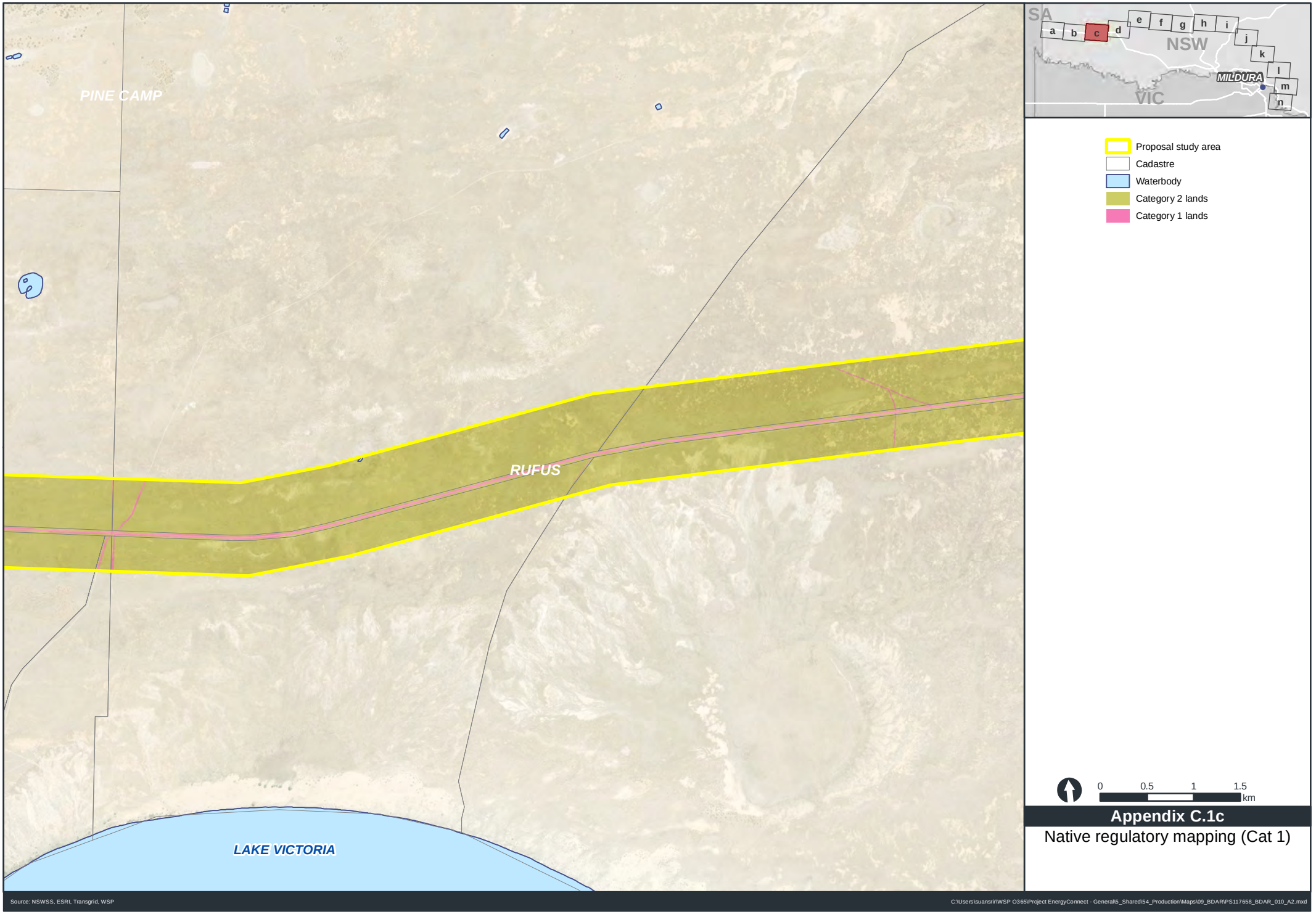
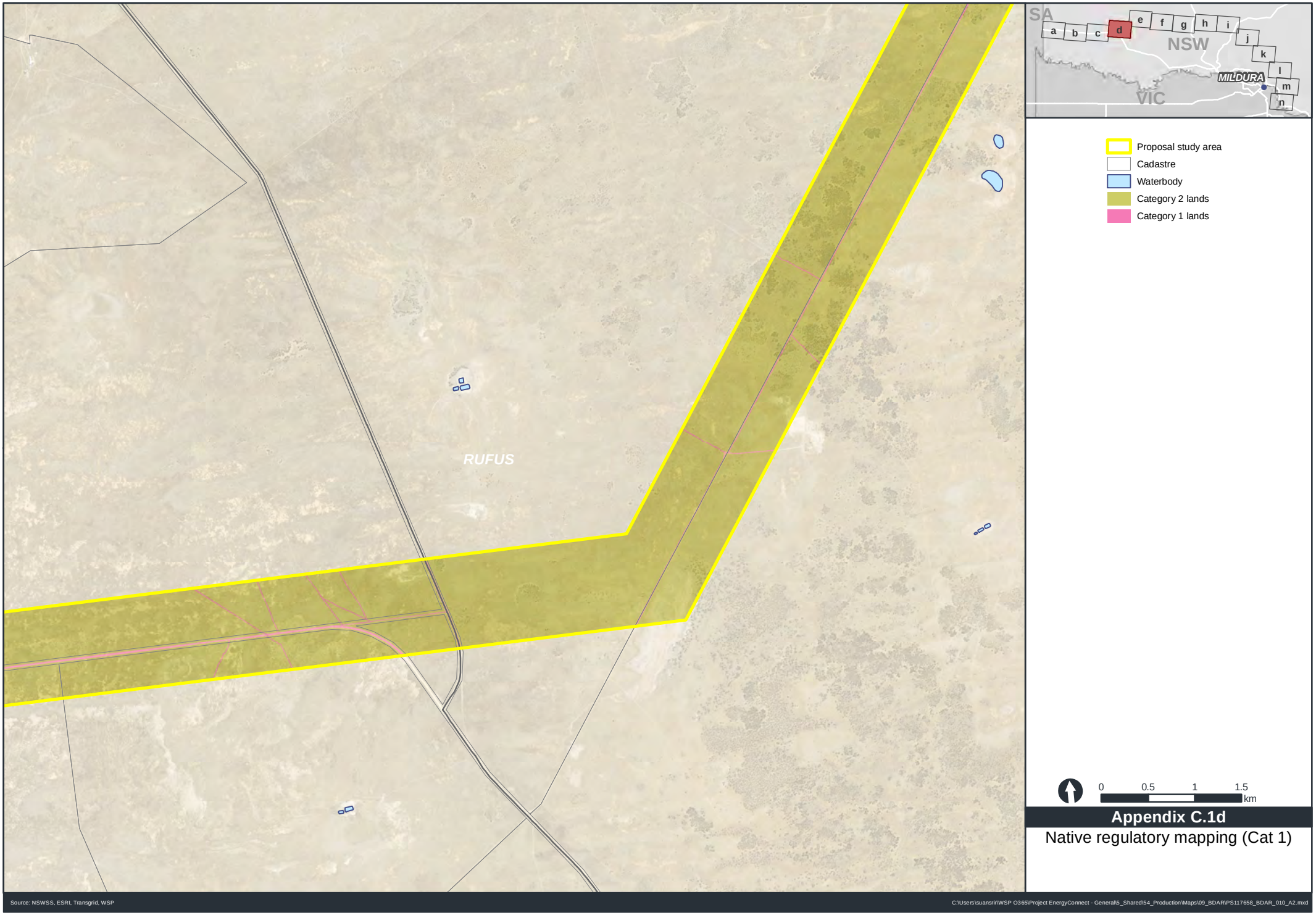


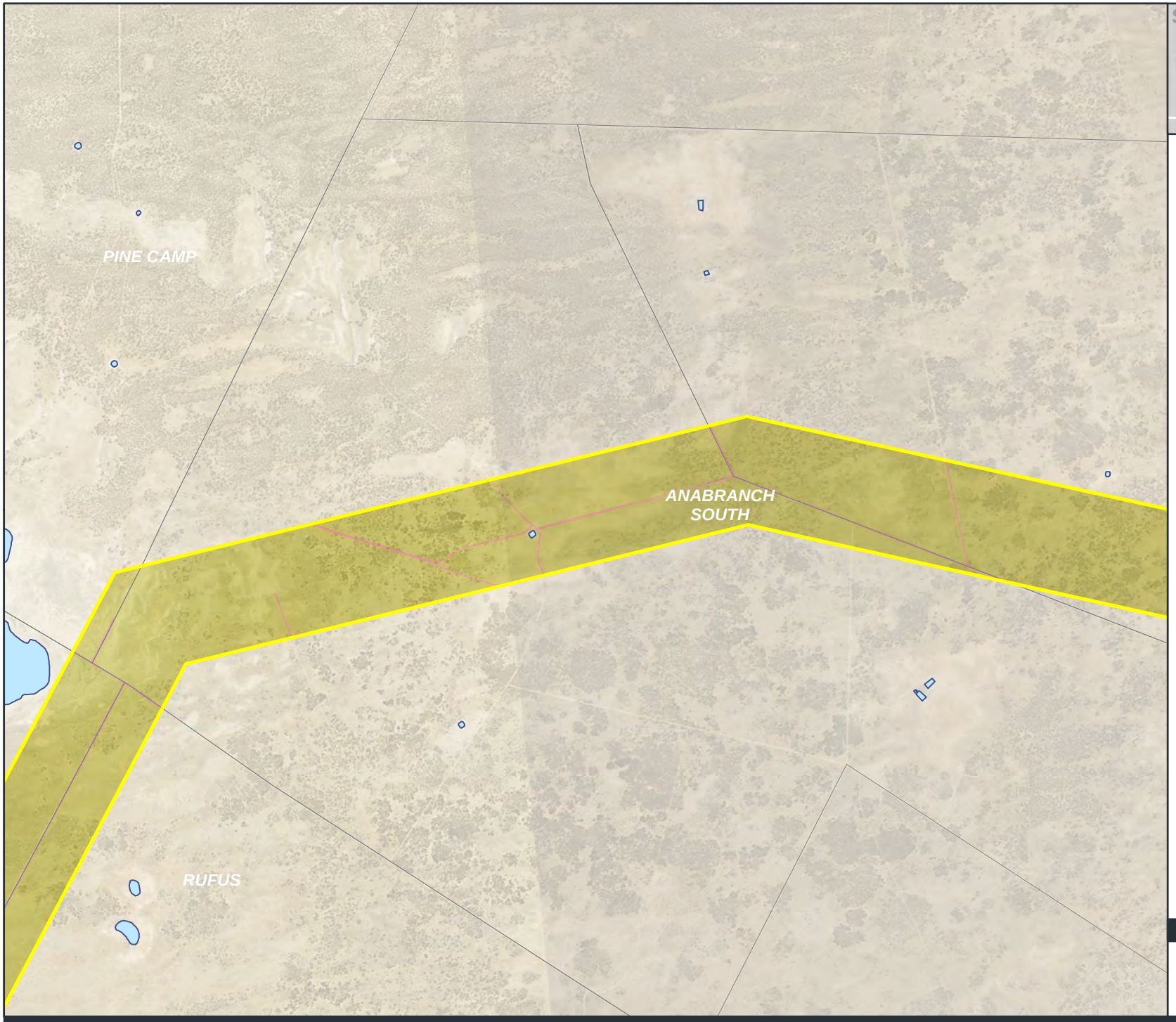
Appendix C.1c

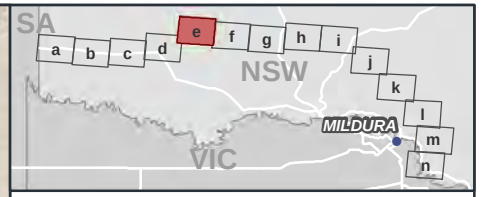
Native regulatory mapping (Cat 1)



Appendix C.1d

Native regulatory mapping (Cat 1)





Proposal study area
Cadastre
Waterbody
Category 2 lands
Category 1 lands

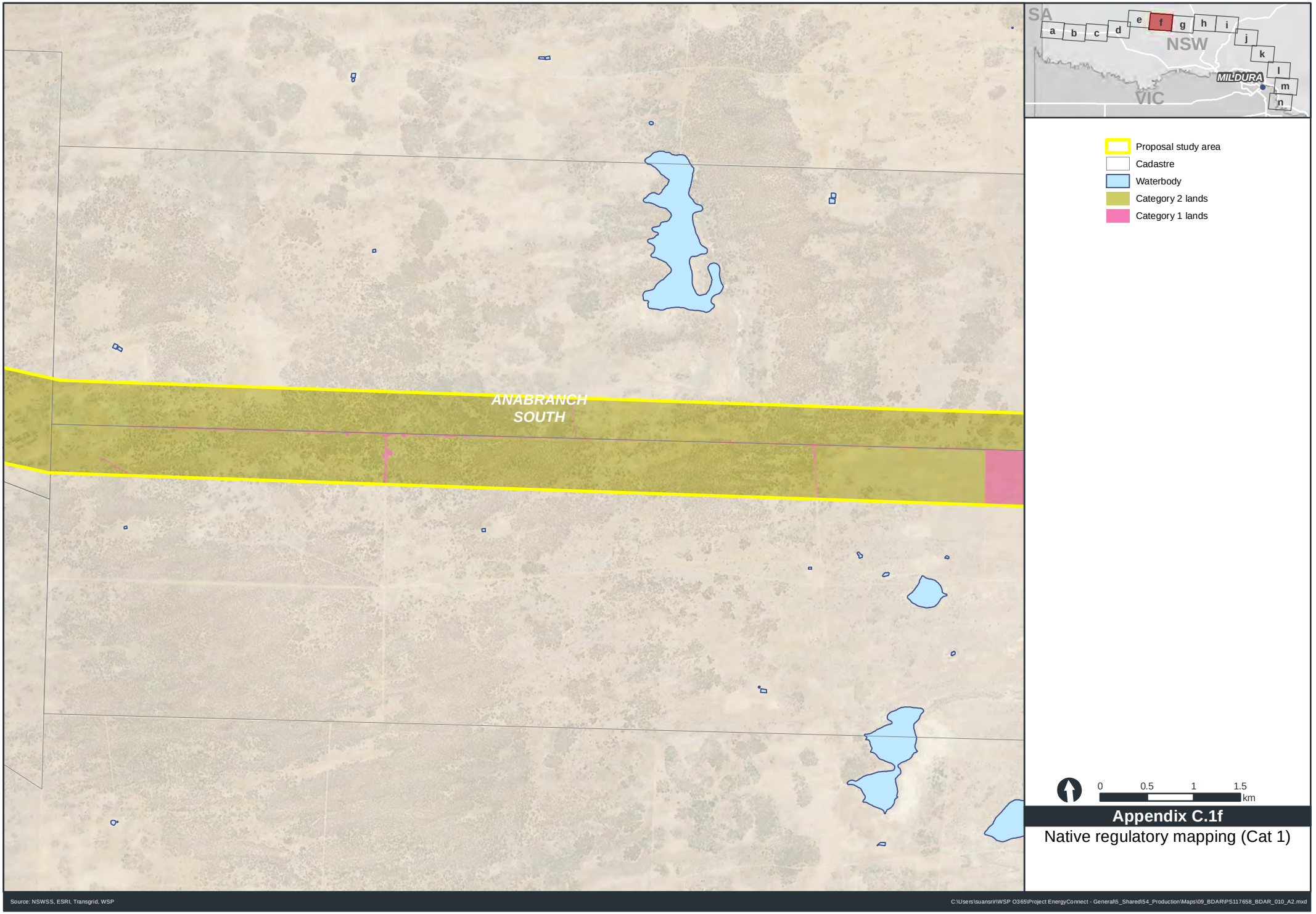
0 0.5 1 1.5 km

Appendix C.1e

Native regulatory mapping (Cat 1)

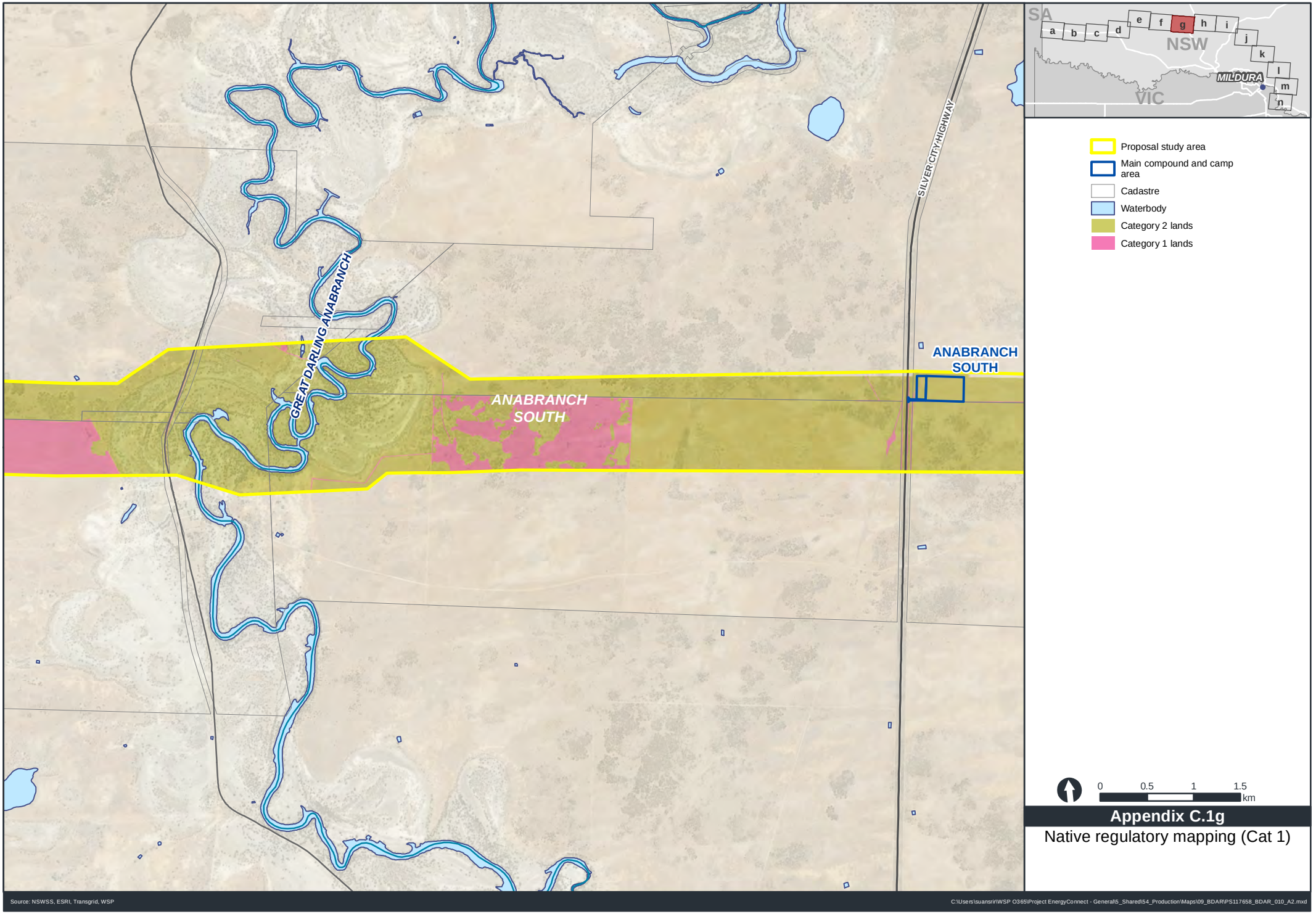
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_010_A2.mxd



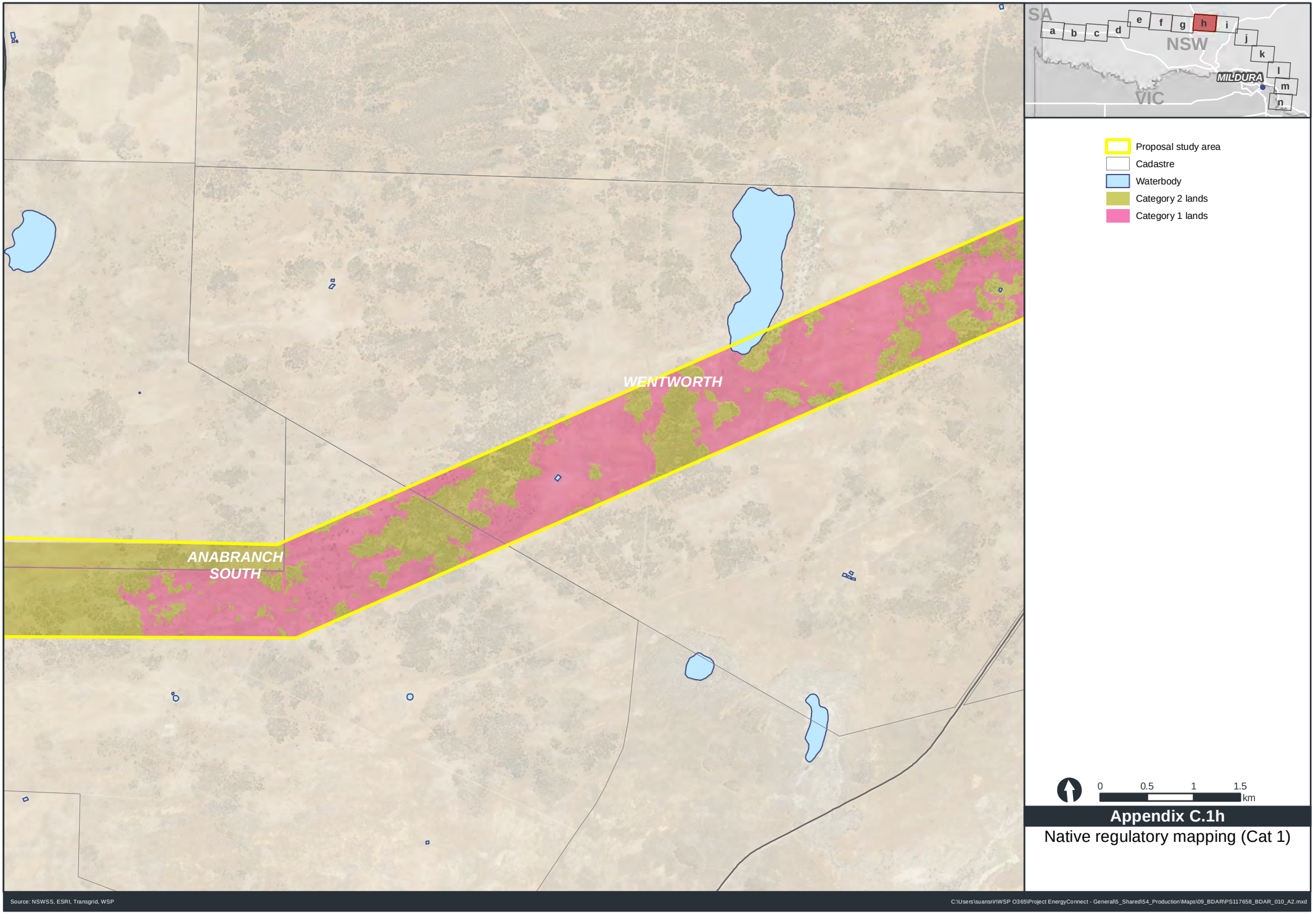
Appendix C.1f

Native regulatory mapping (Cat 1)



Appendix C.1g

Native regulatory mapping (Cat 1)



Appendix C.1h

Native regulatory mapping (Cat 1)

Source: NSWSS, ESRI, Transgrid, WSP

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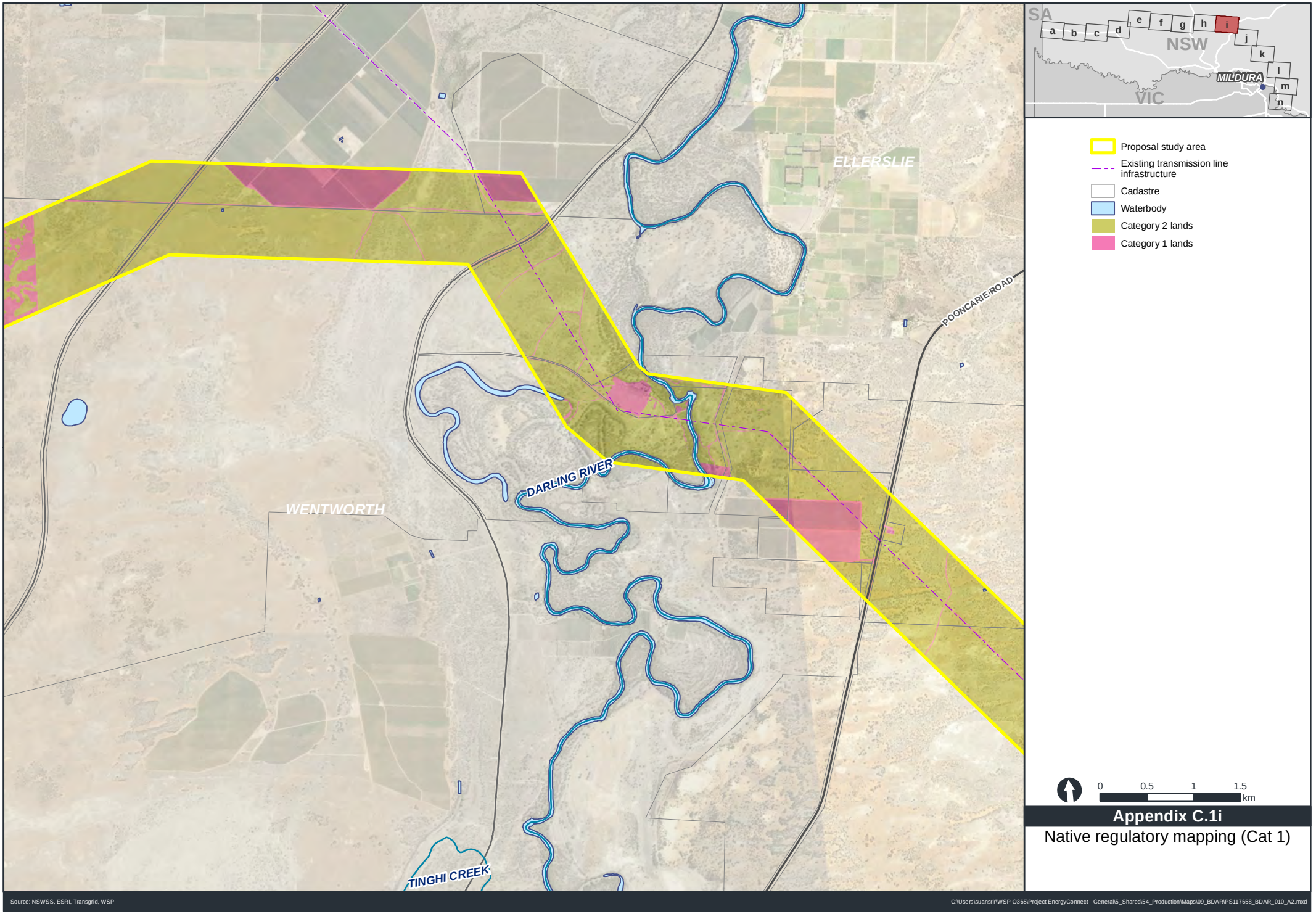
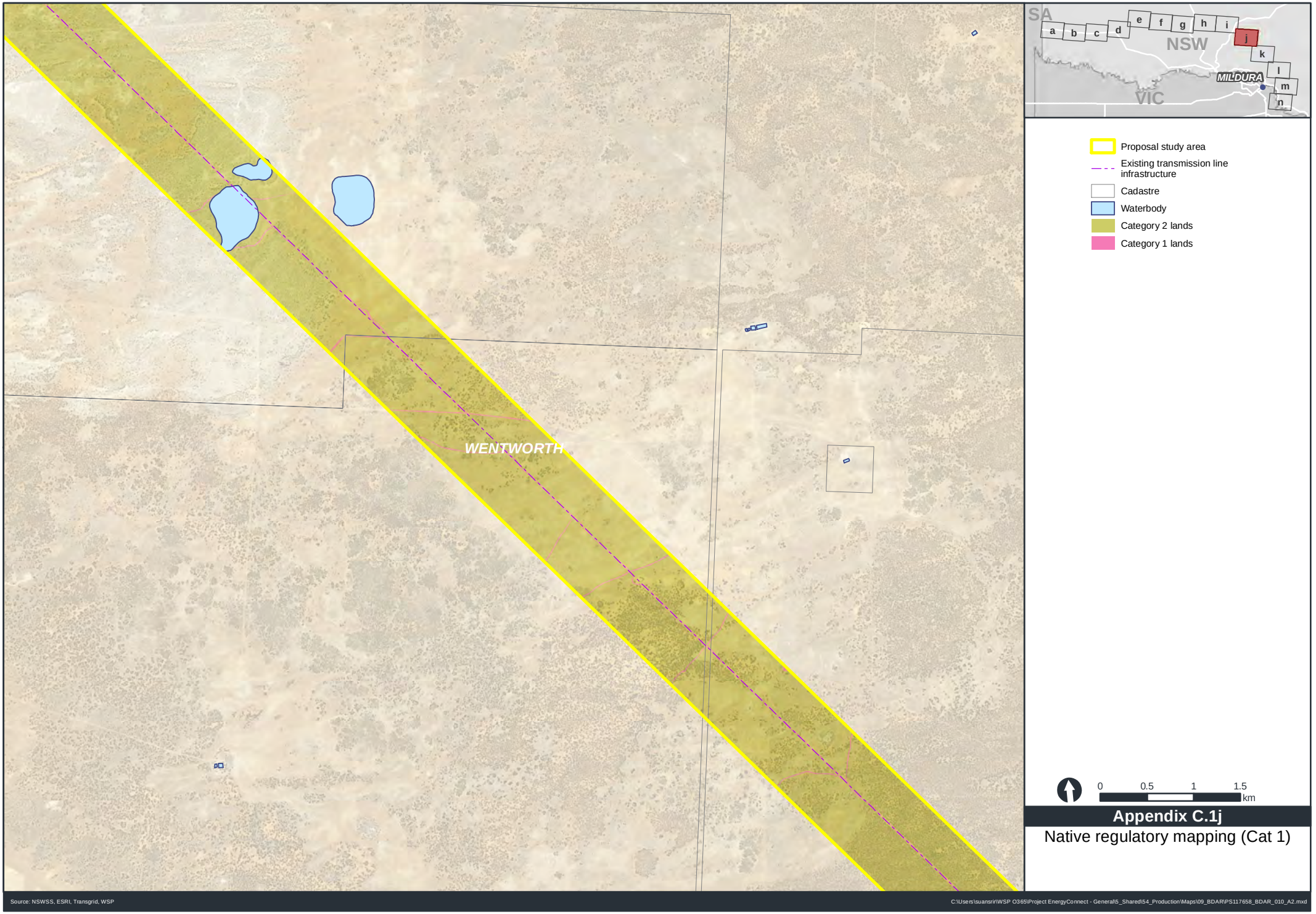


Appendix C.1i

Native regulatory mapping (Cat 1)

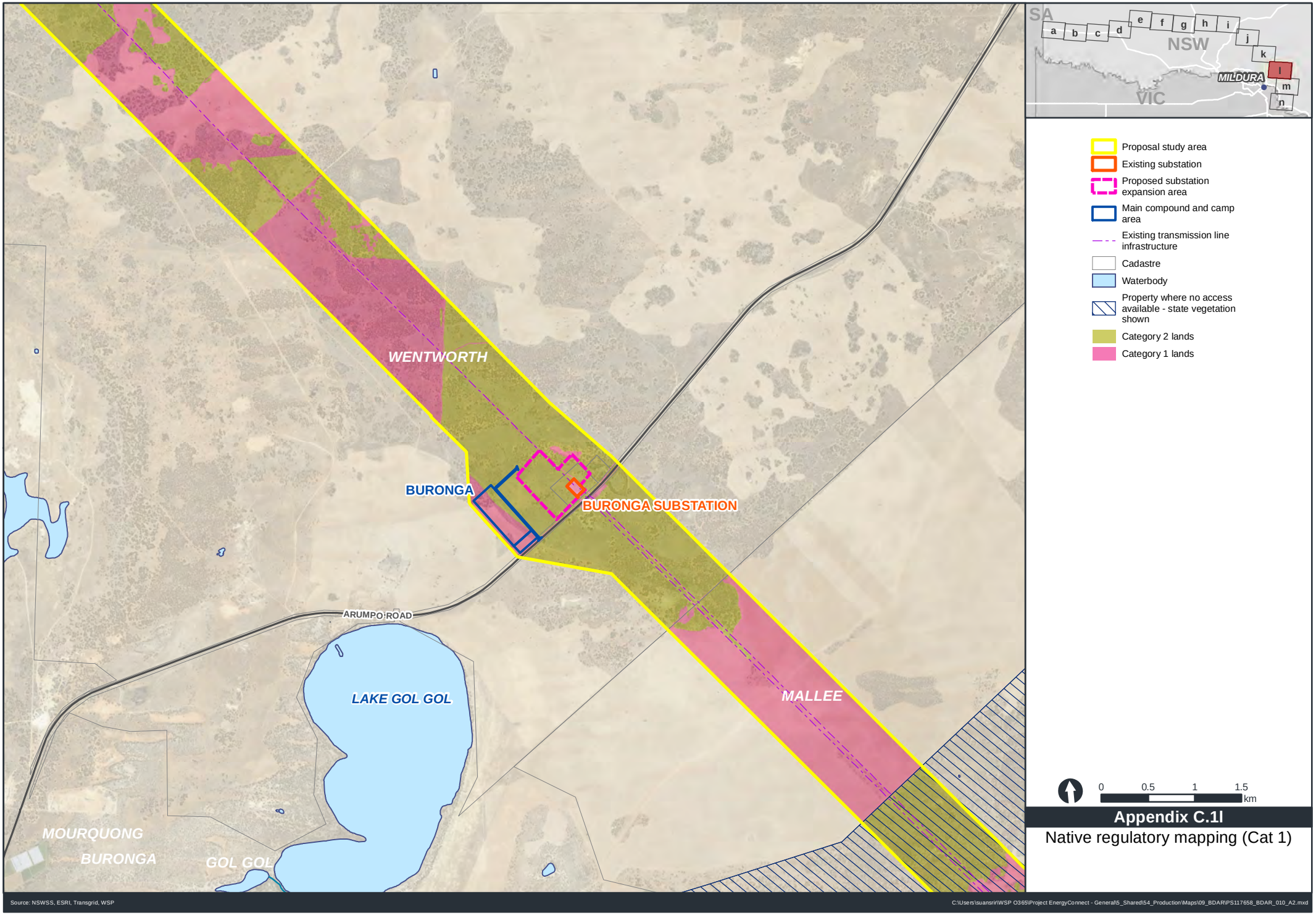


Appendix C.1j

Native regulatory mapping (Cat 1)

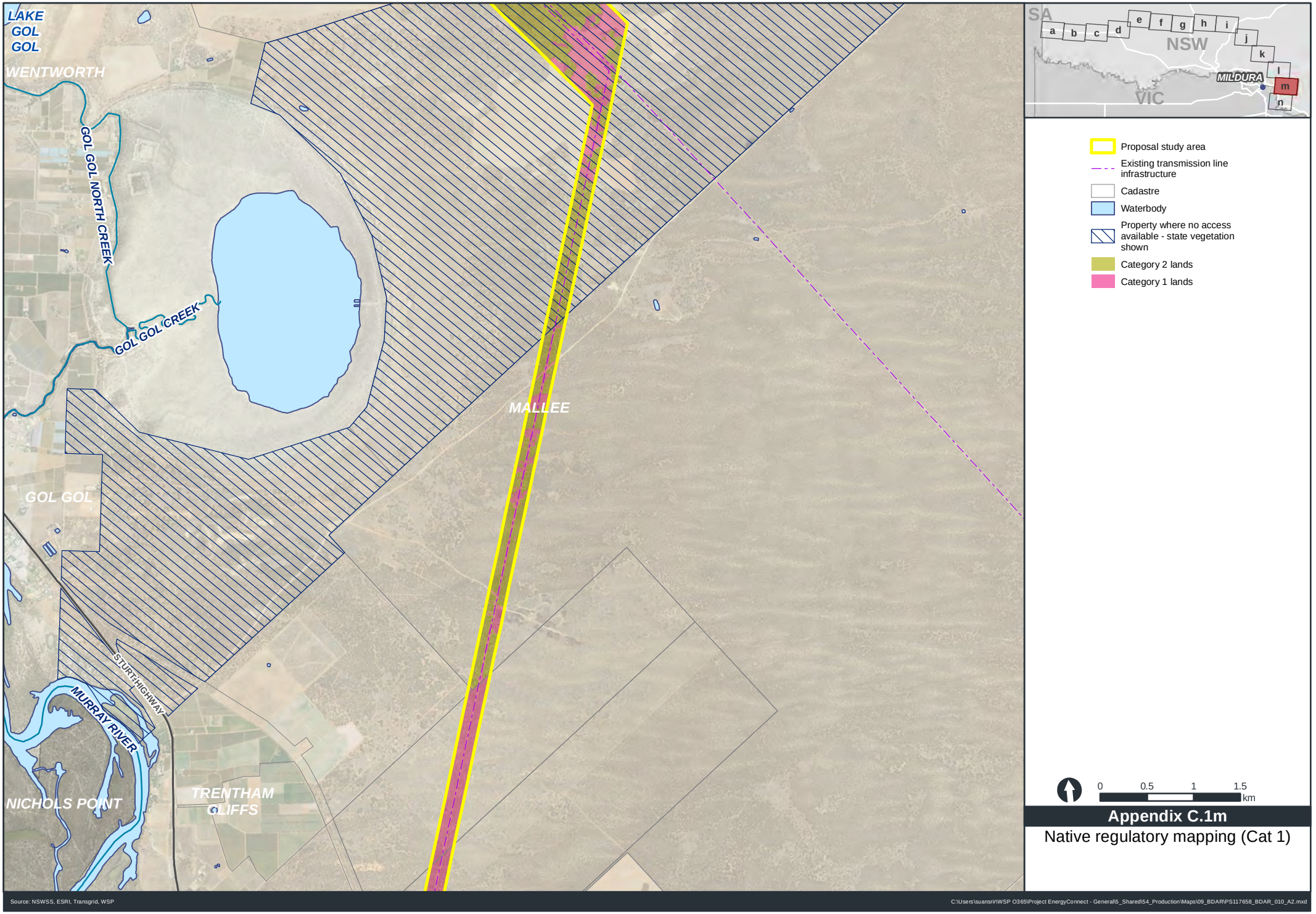
Appendix C.1k

Native regulatory mapping (Cat 1)



Appendix C.1l

Native regulatory mapping (Cat 1)



Appendix C.1m

Native regulatory mapping (Cat 1)

Source: NSWSS, ESRI, Transgrid, WSP

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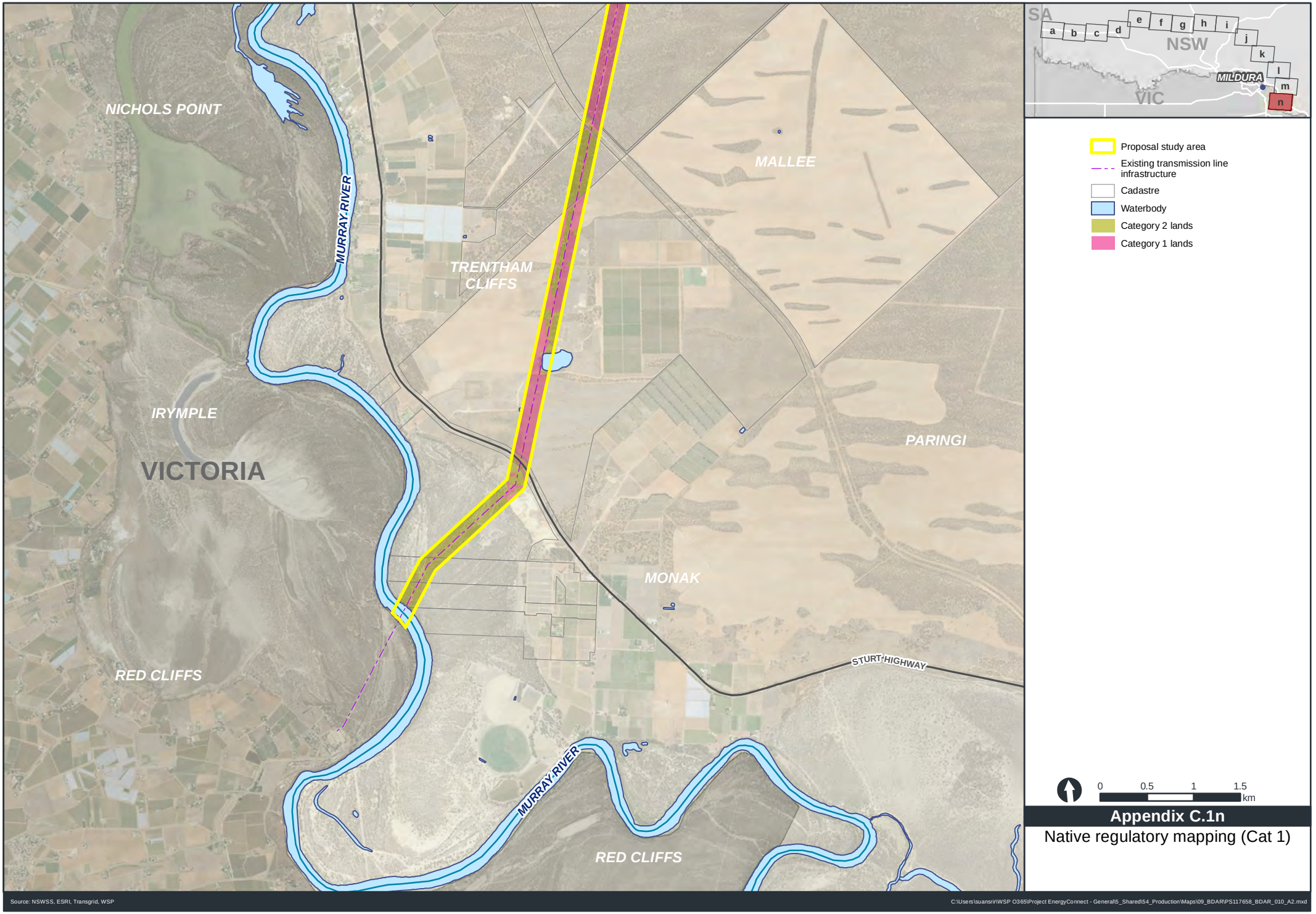

NICHOLS POINT
MURRAY RIVER
TRENTHAM CLIFFS
MALLEE
IRYMPLE
VICTORIA
PARINGI
MONAK
RED CLIFFS
STURT HIGHWAY
MURRAY RIVER
RED CLIFFS
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Existing transmission line infrastructure
Cadastre
Waterbody
Category 2 lands
Category 1 lands
0
0.5
1
1.5
km
Appendix C.1n
Native regulatory mapping (Cat 1)
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_010_A2.mxd

APPENDIX C-2
PLANT COMMUNITY TYPE PROFILES

C-2.1 PLANT COMMUNITY TYPE PROFILES

C-2.1.1 ARID SHRUBLANDS (ACACIA SUB-FORMATION)

PCT 139 – PRICKLY WATTLE TALL OPEN SHRUBLAND OF DUNES AND SANDPLAINS OF SEMI-ARID AND ARID REGIONS

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 139 – Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions is provided in Table C-2.1 and is photographically represented below.

Table C-2.1 Summary of PCT 139 – Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions

PCT 139 – PRICKLY WATTLE TALL OPEN SHRUBLAND OF DUNES AND SANDPLAINS OF SEMI-ARID AND ARID REGIONS	
Vegetation formation	KF_CH12A Arid Shrublands (Acacia Sub-formation)
Vegetation class	Sand Plain Mulga Shrublands
PCT percent cleared	50%
TEC	Not listed
Landscape position	This PCT was recorded in the Pooncarie – Darling IBRA subregion on sand dunes above and surrounding the broader floodplain.
PCT justification	This vegetation was recorded as patches of tall open shrubland dominated by *Acacia victoriae* (Prickly Wattle) growing on sandy loam soil and aeolian sand dunes within proximity to the Darling River. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure and dominant shrub species were used as search criteria. PCT 139 and PCT 143 had a total of five matches and were considered for further analysis. PCT 143 is dominated by *Dodonaea viscosa* subsp. *angustissima* (Narrow-leaved Hopbush), *Eremophila sturtii* (Turpentine) and various sub-species of *Senna artemisioides.* Alternatively, PCT 139 is dominated by *Acacia victoriae* (Prickly Wattle). Given the dominance of *Acacia victoriae* (Prickly Wattle) recorded within the vegetation type it was considered the most appropriate PCT. PCT 143 was recorded in adjacent areas where *Acacia victoriae* (Prickly Wattle) was replaced by *Dodonaea viscosa subsp. angustissima* (Narrow-leaved Hopbush) as the dominant shrub species. Furthermore, PCT 139 within the proposal study area appeared to be a derived version of PCT 19 and PCT 21 as it occurred in areas likely to have been historically dominated by Callitris species. This feature is more characteristic of PCT 139 as opposed to PCT 143 which is more likely to be a derived PCT of Black Oak and Western Rosewood communities (EES Group, 2020). Based on floristic, geographic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 139.

PCT 139 – PRICKLY WATTLE TALL OPEN SHRUBLAND OF DUNES AND SANDPLAINS OF SEMI-ARID AND ARID REGIONS	
Characteristic floristic composition and structure	
Species upper stratum (4-5m)	*Acacia victoriae* (Prickly Wattle) with occasional *Lysiana exocarpi* subsp. *exocarpi.*
Species middle stratum (<2)	Scattered occurrences of *Maireana pyramidata.*
Species ground stratum (<1 m)	*Calotis hispidula, Dissocarpus paradoxus, Enchylaena tomentosa, Enneapogon avenaceus, Salsola australis, Isoetopsis graminifolia, Goodenia pinnatifida, Crassula colorata* subsp. *acuminatum, Millotia perpusilla, Polycalymma stuartii, Tetragonia moorei, Wurmbea citrina* and *Sclerolaena obliquicuspis*.
Vegetation condition	Modified: This vegetation type was recorded in a modified condition as it exhibited evidence of historic clearing and ongoing agricultural grazing.

PCT 139 – Modified condition

PCT 139 – *Acacia victoriae* (Prickly Wattle)

PCT 139 – Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions (Q79)

PCT 143 – NARROW-LEAVED HOPBUSH – SCRUB TURPENTINE – SENNA SHRUBLAND ON SEMI-ARID AND ARID SANDPLAINS AND DUNES

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 143 – Narrow-leaved Hopbush – Scrub Turpentine – Senna shrubland on semi-arid and arid sandplains and dunes is provided in Table C-2.2 and is photographically represented below.

Table C-2.2 Summary of PCT 143 – Narrow-leaved Hopbush – Scrub Turpentine – Senna shrubland on semi-arid and arid sandplains and dunes

PCT 143 – NARROW-LEAVED HOPBUSH – SCRUB TURPENTINE – SENNA SHRUBLAND ON SEMI-ARID AND ARID SANDPLAINS AND DUNES	
Vegetation formation	KF_CH12A Arid Shrublands (Acacia Sub-formation)
Vegetation class	Sand Plain Mulga Shrublands
PCT percent cleared	30%
TEC	Not listed
Landscape position	This PCT was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion in low lying swales between aeolian sand dunes dominated by mallee communities (PCT 170 and PCT 171). It is unclear if PCT 143 is a remnant or derived community type. Based on observations made, it is suspected that this community is largely a derived form of PCT 58 as it was recorded in similar landscape positions in proximity to modified patches of PCT 143. PCT 143 also occurred in other areas which had been subject to historical disturbance (i.e. clearing under powerlines) where *Dodonaea viscosa* subsp. *angustissima* appeared as a colonising species.
PCT justification	This community is known to be dominated by *Dodonaea viscosa* subsp. *angustissima* and *Eremophila sturtii* which are colonising woody shrub species that are non-palatable to stock and occur as regrowth after clearing of mallee and Black Oak communities. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure and dominant shrub species were used as search criteria. PCT 28, PCT 128 and PCT 143 had a total of seven matches and were considered for further analysis. PCT 28 and PCT 128 were dismissed due to the absence of *Acacia melvillei* or *Acacia loderi*, which dominate these communities. Vegetation is considered most closely aligned to PCT 143 due to the high cover of *Dodonaea viscosa* subsp. *angustissima*, *Eremophila sturtii* and various sub-species of *Senna artemisioides* which were observed dominating this community in the proposal study area. Based on floristic, geographic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 143.

PCT 143 – NARROW-LEAVED HOPBUSH – SCRUB TURPENTINE – SENNA SHRUBLAND ON SEMI-ARID AND ARID SANDPLAINS AND DUNES	
Characteristic floristic composition and structure	
Species upper stratum (<2 m)	Dominated by *Dodonaea viscosa* subsp. *angustissima* and *Eremophila sturtii* with *Acacia colletioides, Acacia nyssophylla* and various subspecies of *Senna artemisiodes.*
Species middle stratum (<2 m)	*Eremophila glabra, Olearia pimeleoides, Maireana pyramidata* and *Rhagodia spinescens.*
Species ground stratum (<1 m)	*Atriplex stipitata* subsp. *miscella, Calotis hispidula, Daucus glochidiatus, Enchylaena tomentosa, Maireana pentatropis, Erodium crinitum, Enneapogon avenaceus, Goodenia pinnatifida, Lemooria burkittii, Sclerolaena diacantha, Podolepis capillaris, Plantago drummondii, Roepera apiculatum, Sclerolaena obliquicuspis, Sida intricata* and *Tetragonia eremaea.* Exotic species included *Carrichtera annua*, Medicago laciniata** and *Medicago minima*.*
Vegetation condition	Modified: This vegetation zone was recorded with an intact native shrub stratum and sparse native understorey. This community exhibited evidence of historic clearing and ongoing agricultural grazing.

PCT 143 – Modified condition

PCT 143 – Modified condition

C-2.1.2 ARID SHRUBLANDS (CHENOPOD SUB-FORMATION)

PCT 153 – BLACK BLUEBUSH LOW OPEN SHRUBLAND OF THE ALLUVIAL PLAINS AND SANDPLAINS OF THE ARID AND SEMI-ARID ZONES

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones is provided in Table C-2.3 and is photographically represented below.

Table C-2.3 Summary of PCT 153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones

PCT 153 – BLACK BLUEBUSH LOW OPEN SHRUBLAND OF THE ALLUVIAL PLAINS AND SANDPLAINS OF THE ARID AND SEMI-ARID ZONES	
Vegetation formation	KF_CH12B Arid Shrublands (Chenopod sub-formation)
Vegetation class	Aeolian Chenopod Shrublands
PCT percent cleared	60%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) and Darling Riverine Plains IBRA region (Pooncarie – Darling subregion) on plain landscapes with sandy-loam or loam-clay soils with little undulation and at lower elevations. Large patches of this community were recorded colonising wind-driven sand lunettes which have formed on the north-eastern margin of Lake Victoria. This community is known to occur in the transition zone between the aeolian sand sheets (further west) and sandplain landscapes (further east) (EES Group, 2020).
PCT justification	Vegetation assigned to PCT 153 occurred as a shrubland in areas where there was no or limited canopy and generally subject to a history of grazing pressures. It should be noted that *Maireana pyramidata* is palatable to stock as it contains high levels of protein and produces a prolific amount of seed which persists in the landscape during drought conditions resulting in it sometimes forming dense stands (UNFS, 2018). Due to this, this community is often subject to livestock grazing (particularly sheep). Various Medicago species were dominant in some areas, it is suspected that these species may have been aerial seeded to support higher stocking rates. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, vegetation formation and dominant shrub species were used as search criteria. Searches for the Murray Darling Depression and Darling Riverine Plains IBRA region returned the highest number of matches for PCT 154, PCT 128, PCT 153 and PCT 163. PCT 154, PCT 128 and PCT 163 were dismissed due to the lack of dominant species which characterise these communities; being *Maireana sedifolia*, *Acacia loderi* and *Nitraria billardierei.* PCT 153 was determined to be the most suitable PCT for this vegetation type given the dominance of *Maireana pyramidata.* Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 153.
Characteristic floristic composition and structure	
Species upper stratum (4–8 m)	Absent except for occasional scattered *Alectryon oleifolius* subsp. *canescens* individual.

PCT 153 – BLACK BLUEBUSH LOW OPEN SHRUBLAND OF THE ALLUVIAL PLAINS AND SANDPLAINS OF THE ARID AND SEMI-ARID ZONES	
Species middle stratum (<2 m)	Dominated by *Maireana pyramidata* with *Nitraria billardierei, Rhagodia spinescens, Maireana georgei, Enchylaena tomentosa, Sclerolaena divaricata, Maireana appressa* and occasional *Maireana sedifolia* and *Dodonaea viscosa* subsp. *angustissima* especially where PCT 153 transitioned into PCT 154 and PCT 143 respectively.
Species ground stratum (<1 m)	*Atriplex lindleyi* subsp. *conduplicata, Atriplex stipitata* subsp. *miscella, Dissocarpus paradoxus, Sclerolaena diacantha, Sclerolaena obliquicuspis, Euphorbia drummondii, Erodium crinitum, Enneapogon avenaceus, Calotis hispidula, Rhodanthe pygmaea, Isoetopsis graminifolia, Dysphania cristata, Boerhavia coccinea, Maireana triptera, Tragus australianus, Brachyscome lineariloba* and various Austrostipa and Roepera species. Exotic species included *Asphodelus fistulosus*, Medicago minima*, Medicago laciniata*, Alyssum linifolium** and *Schismus barbatus**
Vegetation condition	Modified: PCT 153 was the dominant native vegetation community within the proposal study area. This community was generally subject to varying levels of livestock and native herbivore grazing. Native species and diversity varied across sampling plots due to varying stocking rates, time since grazing pressure and other agricultural practices (e.g. aerial seeding).

PCT 153 – Modified condition (Q78)

PCT 153 – Modified condition (Q88)

PCT 153 – Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones

PCT 154 – PEARL BLUEBUSH LOW OPEN SHRUBLAND OF THE ARID AND SEMI-ARID PLAINS

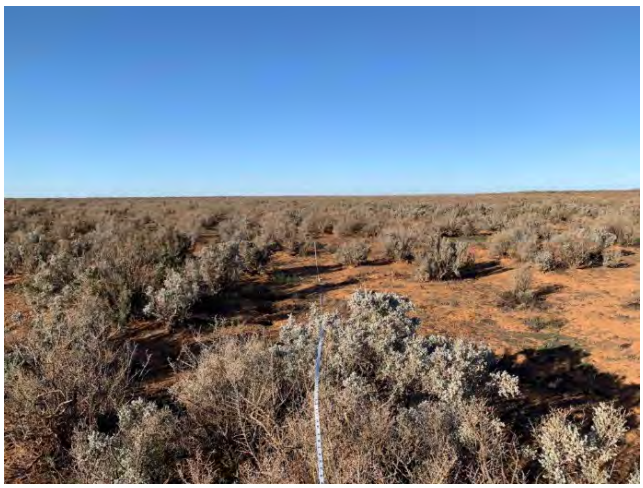
The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains is provided in Table C-2.4 and is photographically represented below.

Table C-2.4 Summary of PCT 154 – Pearl Bluebush low open shrubland of the arid and semi-arid plains

PCT 154 – PEARL BLUEBUSH LOW OPEN SHRUBLAND OF THE ARID AND SEMI-ARID PLAINS	
Vegetation formation	KF_CH12B Arid Shrublands (Chenopod sub-formation)
Vegetation class	Aeolian Chenopod Shrublands
PCT percent cleared	43%
TEC	Not listed
Landscape position	This PCT was recorded in the Murray Darling Depression (South Olary Plain subregion) and Darling Riverine Plains (Pooncarie-Darling subregion) IBRA region on low rises and plains. Large patches of this community were recorded colonising wind-driven sand lunettes which have formed on the north and north-western margin of Lake Victoria. PCT 154 occurs in similar landscapes to PCT 153, but changes in soil acidity driven by the presence of lime dictates each community's distribution.
PCT justification	Vegetation assigned to this community was dominated by *Maireana sedifolia* occasionally with emergent *Casuarina pauper* near PCT 221 ecotones. This community colonises soils higher in lime than those colonised by PCT 153 (*Maireana pyramidata*) (EES Group, 2020). *Maireana sedifolia* is known to be an indicator of alkaline and light textured soils (Wotton, 1993). A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, vegetation formation and dominant shrub species were used as search criteria. PCT 154 returned the highest number of matches for this vegetation type within both the Murray Darling Depression and Darling Riverine Plains IBRA region searches. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 154.
Characteristic floristic composition and structure	
Species upper stratum (4–8 m)	Absent except for occasional scattered *Casuarina pauper* and *Alectryon oleifolius* subsp. *canescens* individuals.
Species middle stratum (<2 m)	Dominated by *Maireana sedifolia* with *Rhagodia spinescens, Maireana pyramidata* and *Maireana georgei*.
Species ground stratum (<1 m)	*Sclerolaena obliquicuspis, Maireana sclerolaenoides, Austrostipa nitida, Atriplex stipitata* subsp. *miscella, Dissocarpus paradoxus, Sclerolaena brachyptera, Lotus cruentus, Sclerolaena diacantha, Brachyscome lineariloba, Sclerolaena brachyptera, Calotis hispidula, Bulbine alata, Hyalosperma semisterile, Pycnosorus pleiocephalus, Plantago drummondii, Rhodanthe pygmaea, Isoetopsis graminifolia, Tetragonia eremaea, Rhodanthe moschata* and various Roepera species. Exotic species included *Asphodelus fistulosus*, Carrichtera annua*, Sisymbrium erysimoides*, Alyssum linifolium** and *Medicago minima**.

PCT 154 – PEARL BLUEBUSH LOW OPEN SHRUBLAND OF THE ARID AND SEMI-ARID PLAINS	
Vegetation condition	Modified: *Maireana sedifolia* is palatable to stock however not a preferred fodder species possibly due to relatively low digestibility (Wotton, 1993). As such, grazing pressure in this community was less evident than PCT 153. Native species cover however was varied, possibly due to this species ability to defoliate during times of stress. Sampling plots collected in winter 2019 show varied data compared to those collected in 2020.

PCT 154 – Modified condition



PCT 154 – Modified condition

PCT 216 – BLACK ROLY POLY LOW OPEN SHRUBLAND OF THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion is provided in Table C-2.5 and is photographically represented below.

Table C-2.5 Summary of PCT 216 – Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion

PCT 216 – BLACK ROLY POLY LOW OPEN SHRUBLAND OF THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION	
Vegetation formation	KF_CH12B Arid Shrublands (Chenopod sub-formation)
Vegetation class	Riverine Chenopod Shrublands
PCT percent cleared	0%
TEC	Not listed
Landscape position	This vegetation was recorded in the Riverina IBRA region (Robinvale Plains subregion) in the eastern portion of the proposal study area on landscapes within proximity to the Murray River. PCT 216 is known to occur on alluvial plains and dry lake beds created by low gradient river systems which meander over time (EES Group, 2020).
PCT justification	Vegetation assigned to this PCT was generally treeless the only exception to this was the occasional scattered *Eucalyptus largiflorens* at ecotones with Black Box PCTs. This PCT colonises saline soils which support a range of chenopods and occurs in depressions in the landscape. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation and dominant shrub species were used as search criteria. PCT 216 returned the highest number of matches and was considered the most appropriate match as it is consistent with the scientific description and distribution information outlined for PCT 216. Therefore, based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 216.
Characteristic floristic composition and structure	
Species upper stratum (6–8 m)	Generally absent, scattered *Eucalyptus largiflorens* in some ecotonal areas.
Species middle stratum	Absent.
Species ground stratum (<1 m)	Dominated by *Sclerolaena muricata* var. *semiglabra* with *Sclerolaena divaricata, Sclerolaena diacantha. Atriplex semibaccata, Enchylaena tomentosa, Sclerolaena tricuspis, Scleroblitum atriplicinum, Sclerolaena brachyptera, Salsola australis, Sida trichopoda* and *Atriplex lindleyi.* Exotic species included *Asphodelus fistulosus*, Medicago laciniata** and *Erodium cicutarium*.*
Vegetation condition	Modified: Native species diversity in this community is typically low and was varied across sampling plots due to rainfall. This community showed evidence of disturbance from grazing pressure.

PCT 216 – Modified condition

PCT 216 – Modified condition

C-2.1.3 FORESTED WETLANDS

PCT 11 – RIVER RED GUM – LIGNUM VERY TALL OPEN FOREST OR WOODLAND WETLAND ON FLOODPLAINS OF SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) is provided in Table C-2.6 and is photographically represented below.

Table C-2.6 Summary of PCT 11 – River Red Gum – Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

PCT 11 – RIVER RED GUM – LIGNUM VERY TALL OPEN FOREST OR WOODLAND WETLAND ON FLOODPLAINS OF SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Vegetation formation	KF_CH9 Forests Wetlands
Vegetation class	Inland Riverine Forests
PCT percent cleared	42%
TEC	Not listed
Landscape position	This vegetation was recorded in the Darling Riverine Plains (Pooncarie – Darling subregion) and Riverina (Robinvale Plains subregion) IBRA bioregions where it occurred on the floodplain on the Darling River and Murray River. On the Darling River, this PCT was recorded in areas adjacent to the river system and on recent meander scars. On the Murray River, this community was restricted to the levee bank and inner benches.
PCT justification	This vegetation was recorded on clay/silt alluvium on soils that are periodically inundated and in proximity to major river systems. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation, vegetation class, dominant canopy and shrub species were used as search criteria. Searches returned PCT 8, PCT 10, PCT 11, PCT 13 and PCT 36 for the Darling Riverine and Riverina IBRA bioregions. PCT 8 is a grassy River Red Gum community which is distributed along the Murray River west of the Murrumbidgee confluence to the east of the proposal study area. The absence of *Duma florulenta* from the scientific description of PCT 8 is not consistent with the vegetation recorded within the proposal study area. As such, this PCT was not considered further. Furthermore, PCT 10, PCT 13 and PCT 36 were dismissed as PCT 10 displays *Eucalyptus camaldulensis* subsp. *camaldulensis* and *Eucalyptus largiflorens* as co-dominant species. PCT 13 and PCT 36 are recorded in different landscape positions. PCT 13 also occurs in areas higher in the floodplain and does not generally line the banks of major channels where PCT 36 is distributed on the floodplains of major rivers and creeks of central-northern western NSW. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 11.

PCT 11 – RIVER RED GUM – LIGNUM VERY TALL OPEN FOREST OR WOODLAND WETLAND ON FLOODPLAINS OF SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Characteristic floristic composition and structure	
Species upper stratum (18-26m)	Dominated by *Eucalyptus camaldulensis* subsp. *camaldulensis* and occasional *Amyema miquelii*
Species middle stratum (1-4m)	*Acacia stenophylla, Duma florulenta, Enchylaena tomentosa, Swainsona greyana* and *Rhagodia spinescens*
Species ground stratum (<1m)	*Cynodon dactylon, Einadia nutans* subsp. *nutans, Haloragis glauca, Paspalidium jubiflorum, Pratia concolor, Wahlenbergia fluminalis, Atriplex semibaccata, Euphorbia drummondii, Eclipta platyglossa, Goodenia glauca, Marsilea drummondii, Oxalis perennans, Alternanthera denticulata, Rumex brownii* and *Solanum esuriale.* Exotic species included *Brassica tournefortii*, Echium plantagineum** and *Hypochaeris glabra*.*
Vegetation condition	Modified: Vegetation assigned to modified was subject to selective clearing (firewood collection), grazing and exotic species invasion.

PCT 11 – Modified condition

PCT 11 – Modified condition (Q83)

PCT 11 – Modified condition containing large tree (*Eucalyptus camaldulensis* subsp. *camaldulensis*)

PCT 11 – Modified condition (Q83) showing historic regeneration, most likely after a flooding event

C-2.1.4 FRESHWATER WETLANDS

PCT 17 – LIGNUM SHRUBLAND WETLAND OF THE SEMI-ARID (WARM) PLAINS (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion is provided in Table C-2.7 and is photographically represented below.

Table C-2.7 Summary of PCT 17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

PCT 17 – LIGNUM SHRUBLAND WETLAND OF THE SEMI-ARID (WARM) PLAINS (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Vegetation formation	KF_CH8 Freshwater Wetlands
Vegetation class	Inland Floodplain Shrublands
PCT percent cleared	63%
TEC	Not listed
Landscape position	This PCT was recorded in the Riverina IBRA region (Robinvale Plains subregion) and was restricted to the floodplain of the Murray River in a prior flood channel subject to occasional flooding.
PCT justification	This vegetation was recorded on soils with a high clay content in a prior flood channel on the floodplain of the Murray River. The middle stratum of this vegetation was dominated by *Duma florulenta* which is a characteristic species of PCT 17 and an important habitat component (Keith, 2004). A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation, vegetation class, dominant shrub and understorey species were used as search criteria. PCT 24 and PCT 17 had the highest number of matches. As PCT 24 is dominated by *Eragrostis australasica* which forms a tussock grassland on alluvial plains it was dismissed and not considered further. Based on landform position, floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 17.
Characteristic floristic composition and structure	
Species upper stratum (4-6m)	Occasional scattered *Eucalyptus largiflorens*
Species middle stratum (<2m)	*Duma florulenta, Acacia stenophylla* and *Chenopodium nitrariaceum*
Species ground stratum (<1m)	*Atriplex infrequens, Atriplex lindleyi, Marsilea drummondii, Sclerolaena stelligera, Atriplex pseudocampanulata, Sclerolaena divaricata, Einadia nutans* subsp. *nutans* and *Enteropogon acicularis.* Exotic species included *Cucumis myriocarpus** and *Mesembryanthemum nodiflorum**.

PCT 17 – LIGNUM SHRUBLAND WETLAND OF THE SEMI-ARID (WARM) PLAINS (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Vegetation condition	Modified: Floristic composition of PCT 17 is largely dependent on flooding history and grazing pressures whereby regular flooding (3-10 year intervals) will support dense stands of *Duma florulenta.* Additionally, grazing pressure generally leads to an increase in less palatable Sclerolaena species and decreases in Maireana and Atriplex species. Given the abundance of *Duma florulenta* it is suspected that this community within the proposal study area although subjected to regular flooding. Although the community contained a diversity of chenopods, evidence of grazing and agricultural pressures which have modified the overall structure where observed. As such, the community was assigned to the modified condition class.

PCT 17 – Modified condition

PCT 17 – Modified condition

C-2.1.5 SALINE WETLANDS

PCT 63 – SPINY LIGNUM – SLENDER GLASSWORT OPEN FORBLAND SALINE WETLAND ON LAKE EDGES IN THE SEMI-ARID AND ARID CLIMATE ZONES)

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 63 – Spiny Lignum – Slender Glasswort open forbland saline wetland on lake edges in the semi-arid and arid climate zones is provided in Table C-2.8 and is photographically represented below.

Table C-2.8 Summary of PCT 63 – Spiny Lignum – Slender Glasswort open forbland saline wetland on lake edges in the semi-arid and arid climate zones

PCT 63 – SPINY LIGNUM – SLENDER GLASSWORT OPEN FORBLAND SALINE WETLAND ON LAKE EDGES IN THE SEMI-ARID AND ARID CLIMATE ZONES	
Vegetation formation	KF_CH10 Saline Wetlands
Vegetation class	Inland Saline Lakes
PCT percent cleared	10%
TEC	Not listed
Landscape position	This PCT was recorded in the Darling Riverine Plains IBRA bioregion (Pooncarie – Darling subregion) on the outskirts of the Darling River Floodplain within an ephemeral saline depression which may remain dry for decades.
PCT justification	This vegetation was recorded on saline soils with a high clay content in an ephemeral depression on the historic Darling floodplain. Due to the mobile nature of the meandering Darling River, these areas are largely no longer influenced by flooding events. Salinity within this community varies with rainfall. During these times halite (mineral salt) crystals form on the crust of the soil surface as salt from the surrounding landscape accumulates in the depression (Keith, 2004). Halite and a different suite of species to the surrounding PCT 15 (i.e. higher diversity of forb species, less common species such as *Atriplex eardleyae* and *Duma horrida* subsp. *horrida*) where recorded from PCT 63. These flora species, which are known to occur in hypersaline environments, were restricted to the microhabitats assigned to PCT 63. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation and dominant shrub and understorey species were used as search criteria. PCT 63, PCT 166 and PCT 253 returned the highest number of matches. Both PCT 166 and PCT 253 were dismissed as PCT 166 is a disturbed open chenopod herbland dominated by annual saltbushes as well as various Sclerolaena and Maireana species whilst PCT 253 is restricted to soil rich in gypsum on the periphery of large salt lakes. Based on landform position, floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 63. This is due to the dominance of *Duma horrida* subsp. *horrida* and diversity of hypersaline chenopods within the understorey. Furthermore, the occurrence of this community within a saline depression on heavy clay soils on the floodplain of the Darling River is most characteristic of PCT 63.

PCT 63 – SPINY LIGNUM – SLENDER GLASSWORT OPEN FORBLAND SALINE WETLAND ON LAKE EDGES IN THE SEMI-ARID AND ARID CLIMATE ZONES	
Characteristic floristic composition and structure	
Species upper stratum	Absent
Species middle stratum (<2 m)	Dominated by *Duma horrida* subsp. *horrida* with *Maireana pyramidata* and *Chenopodium nitrariaceum*
Species ground stratum (<1 m)	*Atriplex holocarpa, Atriplex lindleyi, Atriplex eardleyae, Brachyscome lineariloba, Calotis hispidula, Enchylaena tomentosa, Erodium crinitum, Osteocarpum acropterum* var. *acropterum, Pycnosorus pleiocephalus, Sclerolaena obliquicuspis, Sclerolaena brachyptera, Rhodanthe moschata* and *Tetragonia eremaea.* Exotic species included *Alyssum linifolium*, Medicago minima** and *Rostraria pumila*.*
Vegetation condition	Modified: Native vegetation diversity and cover is highly dependent on rainfall and grazing pressure. This vegetation was assigned to modified based on the evidence of *Duma horrida* subsp. *horrida* grazing and exotic species cover.

PCT 63 – Modified condition (Q86)

PCT 63 – Modified condition

PCT 63 – Modified condition with *Duma horrida* subsp. *horrida*

PCT 63 – Modified condition (Q86)

PCT 166 – DISTURBED ANNUAL SALTBUSH FORBLAND ON CLAY PLAINS AND INUNDATION ZONES MAINLY OF SOUTH-WESTERN NSW

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 166 – Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW is provided in Table C-2.9 and is photographically represented below.

Table C-2.9 Summary of PCT 166 – Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW

PCT 166 – DISTURBED ANNUAL SALTBUSH FORBLAND ON CLAY PLAINS AND INUNDATION ZONES MAINLY OF SOUTH-WESTERN NSW	
Vegetation formation	KF_CH10 Saline Wetlands
Vegetation class	Inland Saline Lakes
PCT percent cleared	34%
TEC	Not listed
Landscape position	This PCT was recorded in the Darling Riverine Plains (Great Darling Anabranch & Pooncarie - Darling subregions) and Riverina (Robinvale Plains subregion) IBRA bioregions and was restricted to the outskirts of the Great Darling Anabranch, Darling River and Murray River floodplains.
PCT justification	Vegetation assigned to this community occurred predominately on clay soils in dry lakes beds and alluvial areas associated with the floodplains of major rivers. Vegetation assigned to this PCT occurred on less salty inland lakes and disturbed areas dominated by forbs and herbs with emergent perennial shrubs. Canopy was recorded in ecotonal areas (often near PCT 15) on the outskirts of the floodplain. This community naturally has few species with most usually restricted to the Aizoaceae Chenopodiaceae and Polygonaceae families though soil salinity and inundation can influence floristics leading to a diverse range of characteristics species. Increases in salinity through unnatural processes such as dryland salinity has led to an increase in the extent of this community in some areas and presence of halophytes which are normally restricted to hypersaline environments. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation, vegetation class and dominant shrub and understorey species were used as search criteria. PCT 63, PCT 65, PCT 166, PCT 189, PCT 262 and PCT 263 returned the highest number of searches. PCT 63, PCT 65 and PCT 262 occur on salt lakes and PCT 263 occurs on permanent wetlands dominated by submerged macrophyte plant species. Furthermore, PCT 189 is dominated by ephemeral forb species. As the vegetation being assessed did not contain these characteristics, these PCTs were dismissed and not considered further. PCT 166 was considered the most appropriate vegetation type based on the landform position, floristic and geological characteristics as it occurs as a disturbed open chenopod herbland dominated by annual saltbushes as well as Sclerolaena and Maireana species.

PCT 166 – DISTURBED ANNUAL SALTBUSH FORBLAND ON CLAY PLAINS AND INUNDATION ZONES MAINLY OF SOUTH-WESTERN NSW	
Characteristic floristic composition and structure	
Species upper stratum	Absent
Species middle stratum (<2 m)	Dominated by *Sclerolaena divaricata* with *Enchylaena tomentosa*, *Maireana pyramidata*, *Rhagodia spinescens* and *Salsola australis.*
Species ground stratum (<1 m)	*Atriplex holocarpa*, *Atriplex lindleyi*, *Brachyscome lineariloba*, *Calotis hispidula*, *Enneapogon avenaceus*, *Geococcus pusillus*, *Euphorbia drummondii*, *Goodenia pinnatifida*, *Osteocarpum acropterum* var. *acropterum*, *Sclerolaena brachyptera*, *Sclerolaena obliquicuspis* and *Tetragonia eremaea*. Exotic species included *Medicago minima**, *Medicago polymorpha**, *Mesembryanthemum nodiflorum**
Vegetation condition	Modified: Vegetation was assigned to modified condition based on the evidence of heavy grazing.

PCT 166 – Modified condition (Q81)

PCT 166 – Modified condition

PCT 166 – Modified condition (Q82)

PCT 166 – Modified condition

PCT 253 – GYPSEOUS SHRUBLAND ON RISES IN THE SEMI-ARID AND ARID PLAINS

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains is provided in Table C-2.10 and is photographically represented below.

Table C-2.10 Summary of PCT 253 – Gypseous shrubland on rises in the semi-arid and arid plains

PCT 253 – GYPSEOUS SHRUBLAND ON RISES IN THE SEMI-ARID AND ARID PLAINS	
Vegetation formation	KF_CH10 Saline Wetlands
Vegetation class	Inland Saline Lakes
PCT percent cleared	30%
TEC	Not listed
Landscape position	This PCT was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion on the periphery of an inland salt lake on gypseous soils derived from the Nulla Nulla saline discharge complex. The community occurred as a series of gypseous plains and irregular shaped low rises which are formed by prevailing winds.
PCT justification	Vegetation assigned to this PCT was restricted to soil rich in gypsum on the periphery of a large salt lake on Nulla Nulla Station. The gypsum component on the soil within the proposal study area occurred as a powder and in crystallised form (evaporate residue left after the water from saline waterbodies has been dehydrated (Sluiter, 2010)). Two distinct variations of this community were recorded within the proposal study area; being 'Boinka' and 'Lunette'. These two variants respectively align to the gypseous plains and rises mentioned above. The PCT was split into these variants to distinguish the variability of floristics, vegetation cover, structure and the differing habitats they provided for rare and threatened plants. For example, *Austrostipa nulla nulla* and *Elachanthus glaber* were restricted to the 'Lunette' variant. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation, vegetation class and dominant shrub and groundcover species were used as search criteria. PCT 62, PCT 64, PCT 153 and PCT 253 returned the highest number of matches. PCT 62, PCT 64 and PCT 153 were dismissed as candidate PCTs. This was based on PCT 62 occurring on saline soils in far north-western NSW. Although PCT 64 has a similar landscape position to that of the vegetation recorded (including soils often crusted with salt on the bed and fringes of salt lakes or salt clay pans) the floristics composition did not align with the vegetation recorded i.e. was not largely dominated by Tecticornia species with sea-heaths (*Frankenia angustipetala* and *Frankenia foliosa*) and saltbushes occurring as sub-dominants. Furthermore, PCT 153 is dominated by *Maireana pyramidata* and is generally not recorded on gypsum soils. Based on geological characteristics and landscape positioning, this vegetation type is considered consistent with the scientific description and distribution information for PCT 253.

PCT 253 – GYPSEOUS SHRUBLAND ON RISES IN THE SEMI-ARID AND ARID PLAINS	
Characteristic floristic composition and structure	
Species upper stratum	Absent
Species middle stratum (<2m)	*Nitraria billardierei*, *Maireana pyramidata*, *Salsola australis* and *Nicotiana glauca**.
Species ground stratum (<1m)	*Atriplex vesicaria* subsp. *vesicaria*, *Roepera compressa*, *Lawrencia glomerata*, *Sclerolaena brachyptera* and *Sclerolaena obliquicuspis* were recorded across both variants. *Frankenia foliosa*, *Tecticornia pergranulata* subsp. *pergranulata*, *Osteocarpum acropterum* var. *acropterum*, *Atriplex holocarpa* and *Eragrostis dielsii* were more dominant in the Boinka variant. *Austrostipa nullanulla*, *Elachanthus glaber*, *Dissocarpus paradoxus*, *Calotis hispidula*, *Maireana appressa* and a variety of Roepera species were more dominant in the lunette variation. Exotic species included *Mesembryanthemum nodiflorum**, *Rostraria pumilo**, *Schismus barbatus** and *Alyssum linifolium**.
Vegetation condition	Modified (Boinka): Vegetation in saline discharge complexes or 'Boinkas'. Showed evidence of grazing pressures and therefore was assigned to the modified condition class. Modified (Lunette): Vegetation on small windblown rises. Showed evidence of grazing pressures and therefore was assigned to the modified condition class.

PCT 253 – Modified condition (Boinka variant)

PCT 253 – Modified condition (Boinka variant)

PCT 253 – Modified condition (Lunette variant)

PCT 253 – Modified condition (Lunette variant)

PCT 253 – Modified condition showing gypsum soils

PCT 253 – Modified condition Boinka variant in the foreground and Lunette variant in the background

PCT 253 – Modified condition (Lunette variant) supporting rare and threatened plant species including *Austrostipa nullanulla, Roepera compressa* and *Elachanthus glaber*

PCT 253 – Modified condition (Lunette variant) showing exposed gypsum soils

C-2.1.6 SEMI-ARID WOODLANDS (GRASSY FORMATION)

PCT 13 – BLACK BOX – LIGNUM WOODLAND WETLAND OF THE INNER FLOODPLAINS IN THE SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) is provided in Table C-2.11 and is photographically represented below.

Table C-2.11 Summary of PCT 13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

PCT 13 – BLACK BOX – LIGNUM WOODLAND WETLAND OF THE INNER FLOODPLAINS IN THE SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Vegetation formation	KF_CH11A Semi-arid Woodlands (Grassy sub-formation)
Vegetation class	Inland Floodplain Woodlands
PCT percent cleared	57%
TEC	Not listed
Landscape position	This vegetation was recorded in the Riverina IBRA region (Robinvale Plains subregion) on floodplain terraces of the Murray River.
PCT justification	Vegetation assigned to this community occurred on fine heavy grey clay soils which featured gilgais. This vegetation grades into the more regularly flooded River Red Gum communities (PCT 10 and PCT 11) as elevation drops in proximity to the major rivers. As elevation increases PCT 11 grades into PCT 15 as *Duma florulenta* grades out and is replaced by an understorey dominated by chenopods. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in all stratums were used as search criteria. PCT 13, PCT 15 and PCT 630 returned the highest number of matches and are all *Eucalyptus largiflorens* dominated communities which occur on similar landscape positions. PCT 15 and PCT 630 are characterised by the dominance of chenopods such as Atriplex and Maireana species in the understorey. Alternatively, PCT 13 is characterised by stands of *Duma florulenta* in the understorey with a combination of chenopods and forbs. PCT 13 was considered the most appropriate vegetation type based on the floristic composition and structure (i.e. occurrence of *Duma florulenta* as a key understorey component), landscape position and geological attributes which are consistent with the scientific description and distribution information outlined for PCT 13.
Characteristic floristic composition and structure	
Species upper stratum (8–15 m)	Dominated by *Eucalyptus largiflorens.*
Species middle stratum (<2 m)	Dominated by *Duma florulenta, Chenopodium nitrariaceum, Rhagodia spinescens, Eremophila divaricata* subsp. *divaricata, Maireana brevifolia* and *Enchylaena tomentosa.*

PCT 13 – BLACK BOX – LIGNUM WOODLAND WETLAND OF THE INNER FLOODPLAINS IN THE SEMI-ARID (WARM) CLIMATE ZONE (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Species ground stratum (<1 m)	*Alternanthera denticulata, Atriplex lindleyi, Atriplex pseudocampanulata, Atriplex semibaccata, Atriplex stipitata* subsp. *miscella, Disphyma crassifolium* subsp. *clavellatum, Enteropogon acicularis, Dissocarpus paradoxus, Oxalis perennans, Sclerolaena obliquicuspis, Sclerolaena tricuspis, Sida trichopoda, Teucrium racemosum* and *Wahlenbergia fluminalis.* Exotic species included *Brassica tournefortii** and *Sisymbrium erysimoides**.
Vegetation condition	Modified: Subject to grazing which was evident through the presence of livestock (sheep) and low groundcover abundance/cover. Derived: Canopy was absent, but the ground and shrub stratum were present and characteristics of PCT 13. This condition type was recorded in areas adjacent to modified condition.

PCT 13 – Modified condition (Q103)

PCT 13 – Modified condition

PCT 13 – Modified condition

PCT 13 – Modified condition

PCT 15 – BLACK BOX OPEN WOODLAND WETLAND WITH CHENOPOD UNDERSTOREY MAINLY ON THE OUTER FLOODPLAINS IN SOUTH-WESTERN NSW (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) is provided in Table C-2.12 and is photographically represented below.

Table C-2.12 Summary of PCT 15 – Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

PCT 15 – BLACK BOX OPEN WOODLAND WETLAND WITH CHENOPOD UNDERSTOREY MAINLY ON THE OUTER FLOODPLAINS IN SOUTH-WESTERN NSW (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Vegetation formation	KF_CH11A Semi-arid Woodlands (Grassy sub-formation)
Vegetation class	Inland Floodplain Woodlands
PCT percent cleared	50%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) and Darling Riverine Plains (Great Darling Anabranch & Pooncarie – Darling subregion) IBRA bioregions and generally occurred on the higher elevations on the floodplains of the major rivers where flooding is less frequent.
PCT justification	Vegetation assigned to PCT 15 is similar to PCT 13 in that it occurs on fine heavy grey clays which often feature gilgais. However, the dominance of chenopods in the understorey is a key characteristic feature of PCT 15 compared to PCT 13 which contains high covers of *Duma florulenta*. Increases in distance from the major river systems and subsequent increases in elevation lead to less frequent flooding and an increase in salinity which supports more Atriplex, Maireana and Sclerolaena species characteristic of PCT 15. Alternatively, as elevation and distance to the major river systems decreases flooding becomes more frequent leading to a higher prevalence of *Duma florulenta* in the understorey. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, vegetation formation, vegetation class and dominant shrub and understorey species were used as search criteria. PCT 15 had the highest number of matches. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 15.

PCT 15 – BLACK BOX OPEN WOODLAND WETLAND WITH CHENOPOD UNDERSTOREY MAINLY ON THE OUTER FLOODPLAINS IN SOUTH-WESTERN NSW (MAINLY RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION)	
Characteristic floristic composition and structure	
Species upper stratum (8–10 m)	Dominated by *Eucalyptus largiflorens.*
Species middle stratum (<2 m)	Dominated by *Maireana pyramidata, Enchylaena tomentosa* and *Rhagodia spinescens* with *Chenopodium nitrariaceum, Maireana pentatropis* and *Salsola australis.*
Species ground stratum (<1 m)	*Dissocarpus paradoxus, Sclerolaena obliquicuspis, Sclerolaena diacantha, Sclerolaena brachyptera, Euphorbia drummondii, Tripogon loliiformis, Sida corrugata, Brachyscome lineariloba, Calotis hispidula, Austrostipa nitida, Dysphania cristata, Osteocarpum acropterum* var. *acropterum, Atriplex holocarpa, Atriplex lindleyi, Erodium crinitum, Atriplex eardleyae* and various Roepera and *Tetragonia* species. Exotic species included *Alyssum linifolium*, Erodium cicutarium*, Malva parviflora*, Medicago minima*, Mesembryanthemum nodiflorum*, Psilocaulon granulicaule*, Schismus barbatus** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified: Subject to grazing which was evident through the presence of livestock (sheep) and low groundcover abundance/cover. Derived: Canopy was absent, but the ground and shrub stratum were present and characteristics of PCT 15. This condition type was recorded in areas adjacent to modified condition.

PCT 15 – Modified condition

PCT 15 – Modified condition (Q70)

PCT 15 – Modified condition (Q77)

PCT 15 – Modified condition (Q85)

PCT 15 – Modified condition (Q73)

PCT 15 – Modified condition (Q84)

PCT 15 – Modified condition

PCT 15 – Modified condition

C-2.1.7 SEMI-ARID WOODLANDS (SHRUBBY FORMATION)

PCT 19 – CYPRESS PINE WOODLAND OF SOURCE-BORDERING DUNES MAINLY ON THE MURRAY AND MURRUMBIDGEE RIVER FLOODPLAINS

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 19 – Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains is provided in Table C-2.13 and is photographically represented below.

Table C-2.13 Summary of PCT 19 – Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

PCT 19 – CYPRESS PINE WOODLAND OF SOURCE-BORDERING DUNES MAINLY ON THE MURRAY AND MURRUMBIDGEE RIVER FLOODPLAINS	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Riverine Sandhill Woodlands
PCT percent cleared	70%
TEC	This PCT is consistent with Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions, an Endangered Ecological Community listed under the NSW BC Act.
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion), Darling Riverine Plains (Great Darling Anabranch subregion) and Riverina (Robinvale Plains subregion) IBRA bioregions on source-bordering sand dunes.
PCT justification	Vegetation assigned to this PCT occurred on sandy soils which formed crescent shaped source-bordering dunes on the outskirts of the floodplains of major river systems. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in the upper storey and shrub stratums were used as search criteria. PCT 19, PCT 28, PCT 58 and PCT 252 returned the highest number of matches. PCT 58 and PCT 252 were dismissed as the dominant species characterise these communities (i.e. *Casuarina pauper* and *Myoporum platycarpum* subsp. *platycarpum*) were not dominant or present. PCT 19 and PCT 21 were distinguished from one another based on landform and landscape position rather than floristics which are relatively similar and highly variable based on disturbance regimes. PCT 19 occurs on source-bordering sand dunes in proximity to floodplains whereas PCT 21 generally occurs more on calcareous sandy loam soils on dunefields and has a higher dominance of *Callitris gracilis* subsp. *murrayensis*. *Callitris glaucophylla* and *Callitris gracilis* subsp. *murrayensis* both occurred within vegetation assigned to this community. Based on geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 19.

PCT 19 – CYPRESS PINE WOODLAND OF SOURCE-BORDERING DUNES MAINLY ON THE MURRAY AND MURRUMBIDGEE RIVER FLOODPLAINS	
Characteristic floristic composition and structure	
Species upper stratum (8–15 m)	Dominated by scattered remnant *Callitris glaucophylla* and *Callitris gracilis* subsp. *murrayensis.*
Species middle stratum (<2 m)	Largely absent except for the occasional *Acacia colletioides, Dodonaea viscosa* subsp. *angustissima, Enchylaena tomentosa, Exocarpos aphyllus, Myoporum platycarpum* subsp. *platycarpum, Rhagodia spinescens* and *Salsola australis.*
Species ground stratum (<1 m)	*Calandrinia eremaea, Calotis hispidula, Dysphania cristata, Erodium crinitum, Nicotiana velutina, Phyllanthus lacunarius, Polycalymma stuartii, Swainsona microphylla, Isoetopsis graminifolia, Millotia perpusilla, Omphalolappula concava, Sclerolaena obliquicuspis, Sclerolaena diacantha, Roepera ammophila, Triraphis mollis* and *Tragus australianus.* Exotic species include *Erodium cicutarium*, Hordeum glaucum*, Medicago laciniata*, Medicago minima** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified: All areas of this community occurred in a modified state. Callitris species have been selectively felled (for building fences etc.) resulting in this community occurring as scattered trees. The understorey is also highly disturbed due to grazing.

PCT 19 – Modified condition (Q68)

PCT 19 – Modified condition

PCT 21 – SLENDER CYPRESS PINE – SUGARWOOD – WESTERN ROSEWOOD OPEN WOODLAND ON SANDY RISES MAINLY IN THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion is provided in Table C-2.14 and is photographically represented below.

Table C-2.14 Summary of PCT 21 – Slender Cypress Pine – Sugarwood – Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion

PCT 21 – SLENDER CYPRESS PINE – SUGARWOOD – WESTERN ROSEWOOD OPEN WOODLAND ON SANDY RISES MAINLY IN THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Riverine Sandhill Woodlands
PCT percent cleared	80%
TEC	This PCT is consistent with Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions, an Endangered Ecological Community listed under the NSW BC Act.
Landscape position	This PCT was recorded in the Murray Darling Depression (South Olary Plain subregion) and Darling Riverine Plains (Pooncarie – Darling subregion) IBRA bioregions on calcareous sandy loam soils on sand hills in dunefields. These generally occur away from the floodplain where PCT 21 is replaced by PCT 19 which occurs on source-bordering dunes.
PCT justification	Vegetation assigned to this PCT colonised small rises in the landscape which have been formed from aeolian processes. *Callitris gracilis* subsp. *murrayensis* was the dominant canopy species in this community with no *Callitris glaucophylla* being recorded (unlike PCT 19). Shrub stratum was variable across this vegetation with some areas containing relatively dense shrub cover of *Dodonaea viscosa* subsp. *angustissima* with other areas displaying very limited shrub cover. This variation can be attributed to disturbance history. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in all stratums were used as search criteria. PCT 21 and PCT 22 returned the highest number of matches. PCT 22 has a co-dominant canopy of *Allocasuarina luehmannii* and *Callitris gracilis* subsp. *murrayensis* and is restricted to the Balranald region. Given no *Allocasuarina luehmannii* was recorded in this community and the proposal study area does not fall within the Balranald region PCT 22 was dismissed. PCT 21 was considered the most appropriate vegetation community as it is consistent with the scientific description and distribution information outlined for PCT 21.

PCT 21 – SLENDER CYPRESS PINE – SUGARWOOD – WESTERN ROSEWOOD OPEN WOODLAND ON SANDY RISES MAINLY IN THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION	
Characteristic floristic composition and structure	
Species upper stratum (8–15 m)	Dominated by scattered *Callitris gracilis* subsp. *murrayensis* with occasional *Alectryon oleifolius* subsp. *canescens* and *Myoporum platycarpum* subsp. *platycarpum* especially at ecotones with other PCTs.
Species middle stratum (<2 m)	*Acacia colletioides, Dodonaea viscosa* subsp. *angustissima, Acacia oswaldii, Acacia victoriae, Rhagodia spinescens, Maireana pyramidata, Maireana georgei, Maireana pentatropis, Maireana triptera* and *Enchylaena tomentosa.*
Species ground stratum (<1 m)	*Atriplex stipitata* subsp. *miscella, Calandrinia eremaea, Boerhavia coccinea, Calotis hispidula, Chthonocephalus pseudevax, Dissocarpus paradoxus, Dysphania cristata, Enneapogon avenaceus, Erodium crinitum, Euphorbia drummondii, Harmsiodoxa brevipes* var. *brevipes, Lemooria burkittii, Nicotiana velutina, Phyllanthus lacunarius, Pimelea simplex, Rhodanthe moschata, Sclerolaena obliquicuspis, Tetragonia eremaea* and various Roepera species. Exotic species included *Medicago laciniata*, Medicago minima*, Schismus barbatus* and Sisymbrium erysimoides*.*
Vegetation condition	Modified: All areas of this community occurred in a modified state. *Callitris gracilis* subsp. *murrayensis* has been selectively felled (for building fences etc.) for many generations resulting in this community largely occurring as scattered trees. The understorey is also highly disturbed due to grazing.

PCT 21 – Modified condition

PCT 21 – Modified condition

PCT 58 – BLACK OAK – WESTERN ROSEWOOD OPEN WOODLAND ON DEEP SANDY LOAMS MAINLY IN THE MURRAY DARLING DEPRESSION BIOREGION

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion is provided in Table C-2.15 and is photographically represented below.

Table C-2.15 Summary of PCT 58 – Black Oak – Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

PCT 58 – BLACK OAK – WESTERN ROSEWOOD OPEN WOODLAND ON DEEP SANDY LOAMS MAINLY IN THE MURRAY DARLING DEPRESSION BIOREGION	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Semi-arid Sand Plain Woodlands
PCT percent cleared	50%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) and Darling Riverine Plains (Great Darling Anabranch subregion) IBRA bioregions in a range of landscape positions. In the Western section of the proposal study area PCT 58 was recorded in low-lying swales. As the proposal study area continues further east PCT 58 was recorded on footslopes and undulating hills.
PCT justification	The distribution of this community was heavily influenced by soil type and acidity. Soils which supported this vegetation were sandy loams with a solonised clay component. These soils were calcium carbonate (lime) rich due to a reaction between calcium in the topsoil and sodium introduced by salt-laden winds. Small deposits of limestone are known to occur on the surface of these alkaline soils. *Casuarina pauper* was the dominant canopy species of this community which is an indicator species of this geology as this species will not colonise acidic soils (Keith, 2004). Vegetation assigned to this PCT were dominated by *Casuarina pauper* with *Alectryon oleifolius* subsp. *canescens* and *Myoporum platycarpum* subsp. *platycarpum* occurring as co-dominant species in some locations. As such, this PCT was distinct in landscape. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in all stratums were used as search criteria. Plot data from Modified condition vegetation was considered most representative of this community and was used to inform this analysis. PCT 28 and PCT 58 returned the highest number of matches. PCT 28 is a community dominated by *Callitris glaucophylla* and occurs on prior streams, source-bordering sand dunes and sand plains. This PCT is often recorded in areas adjacent to PCT 58 however was dismissed as this vegetation community did not contain the PCT 28 characteristics mentioned above. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 58.

PCT 58 – BLACK OAK – WESTERN ROSEWOOD OPEN WOODLAND ON DEEP SANDY LOAMS MAINLY IN THE MURRAY DARLING DEPRESSION BIOREGION	
Characteristic floristic composition and structure	
Species upper stratum (6–10 m)	Dominated by *Casuarina pauper* with *Alectryon oleifolius* subsp. *canescens, Myoporum platycarpum* subsp. *platycarpum* and *Amyema linophyllum* subsp. *orientale.* In some locations *Alectryon oleifolius* subsp. *canescens* and *Myoporum platycarpum* subsp. *platycarpum* occurred as a co-dominant canopy species.
Species middle stratum (<2 m)	*Enchylaena tomentosa, Maireana pentatropis, Maireana trichoptera, Rhagodia spinescens* and *Chenopodium desertorum* subsp. *desertorum.*
Species ground stratum (<1 m)	*Calandrinia eremaea, Dissocarpus paradoxus, Erodium crinitum, Euphorbia drummondii, Maireana sclerolaenoides, Roepera ammophila, Roepera apiculatum, Roepera ovata, Rhyncharrhena linearis, Pycnosorus pleiocephalus, Sclerolaena diacantha, Sclerolaena obliquicuspis, Stenopetalum sphaerocarpum* and *Tetragonia eremaea* and various Roepera species. Exotic species included *Carrichtera annua*, Medicago laciniata*, Medicago minima*, Psilocaulon granulicaule** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified: Encompasses all areas which contained an intact canopy. The shrub and understorey were variable depending on the level of grazing pressure and disturbance history. In areas where grazing was absent or not apparent the middle and ground stratum displayed a slightly higher diversity. Derived: Vegetation assigned to derived condition displayed either a very sparse or absent canopy stratum. The understorey in this condition was >50% native and displayed diversity of grasses and forbs.

PCT 58 – Modified condition

PCT 58 – Derived condition (Q63)

PCT 170 – CHENOPOD SANDPLAIN MALLEE WOODLAND/SHRUBLAND OF THE ARID AND SEMI-ARID (WARM) ZONES

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones is provided in Table C-2.16 and is photographically represented below.

Table C-2.16 Summary of PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

PCT 170 - CHENOPOD SANDPLAIN MALLEE WOODLAND/SHRUBLAND OF THE ARID AND SEMI-ARID (WARM) ZONES	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Sand Plain Mallee Woodlands
PCT percent cleared	41%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion in swales at slightly lower elevations to east-west linear sand dunes. Across the proposal study area, this vegetation occurred in aeolian dunefields and on sandplains.
PCT justification	Soils which support this community are sandy loam with a higher clay content than that of the surrounding east-west linear sand dunes where PCT 171 and PCT 172 dominate. Vegetation assigned to this PCT occurred as a mallee woodland dominated by a variety of Eucalypt species. The floristics within this community were variable and heavily dependent on soil type, fire history and fire intervals. The landscape position, absence of very sandy soils, dominance of chenopods and absence of *Triodia scariosa* var. *scariosa* defined this community in the field and distinguished it from PCT 171 and PCT 172. PCT 170 within the proposal study area has been classified as two variants; being ‘Bull’ and ‘Whipstick’. These variants were used to distinguish between areas which either contained a mature or semi-mature canopy cohort due to past disturbances such as fire regimes and past tree clearing. Where these disturbances were higher the canopy cohort was generally younger and had not yet had time to form hollows (whipstick variant). Where these disturbances were less the canopy cohort was generally older and contained hollow bearing trees. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in the canopy and shrub stratum were used as search criteria. PCT 170 returned the highest number of matches. The vegetation recorded was consistent with the floristics, geology, landscape position and scientific description of PCT 170.

PCT 170 - CHENOPOD SANDPLAIN MALLEE WOODLAND/SHRUBLAND OF THE ARID AND SEMI-ARID (WARM) ZONES	
Characteristic floristic composition and structure	
Species upper stratum (6–8 m)	A mixed canopy of mallee Eucalypt species including *Eucalyptus dumosa, Eucalyptus oleosa, Eucalyptus socialis, Eucalyptus leptophylla* and *Eucalyptus gracilis.* Community also contained a sparse sub-canopy of *Pittosporum angustifolium, Acacia oswaldii, Myoporum platycarpum* subsp. *platycarpum* as well as the occasional *Santalum acuminatum* and *Santalum murrayanum*.
Species middle stratum (<2 m)	Subshrub species included *Chenopodium desertorum* subsp. *desertorum, Chenopodium desertorum* subsp. *rectum, Dissocarpus paradoxus, Enchylaena tomentosa, Maireana appressa, Maireana brevifolia, Maireana pentatropis, Maireana pyramidata, Maireana triptera, Olearia muelleri, Olearia pimeleoides, Rhagodia spinescens* and *Rhagodia ulicina.* Larger shrub species included *Acacia burkittii, Acacia colletioides, Acacia nyssophylla, Dodonaea viscosa* subsp. *angustissima, Grevillea huegelii, Eremophila sturtii, Exocarpos aphyllus, Senna artemisioides* subsp. x *coriacea, Senna artemisioides* subsp. x *petiolaris* and *Eremophila glabra.*
Species ground stratum (<1 m)	*Brachyscome lineariloba, Calandrinia eremaea, Dysphania cristata, Erodium crinitum, Enneapogon gracilis, Goodenia pinnatifida, Oxalis perennans, Ptilotus seminudus, Rhodanthe pygmaea, Roepera apiculata, Roepera ovata, Maireana sclerolaenoides, Stenopetalum lineare, Sclerolaena diacantha and Sclerolaena obliquicuspis.* Exotic species included *Brassica tournefortii*, Marrubium vulgare*, Medicago laciniata*, Medicago minima*, Psilocaulon granulicaule** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified (Bull): Vegetation assigned to modified bull displayed larger stem classes and contained hollows. All areas recorded were subject to varying degrees of grazing with some areas displaying a less diverse mid and understorey due to intense grazing pressures. Modified (Whip): Vegetation assigned to modified whip generally displayed small stem classes and an absence of hollows. All areas recorded were subject to varying degrees of grazing with some areas displaying a less diverse mid and understorey due to intense grazing pressures. Derived: Vegetation assigned to derived condition lacking a canopy stratum. The understorey in this condition was >50% native and was recorded in areas adjacent to modified whip or modified bull PCT 170.

PCT 170 – Modified condition whipstick variant

PCT 170 – Modified condition whipstick variant

PCT 170 – Modified condition whipstick variant

PCT 170 – Modified condition whipstick variant (Q44)

PCT 170 – Modified condition bull variant

PCT 170 – Modified condition bull variant

PCT 170 – Modified condition bull variant

PCT 170 – Modified condition bull variant (Q92)

PCT 171 – SPINIFEX LINEAR DUNE MALLEE MAINLY OF THE MURRAY DARLING DEPRESSION BIOREGION

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion is provided in Table C-2.17 and is photographically represented below.

Table C-2.17 Summary of PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion

PCT 171 – SPINIFEX LINEAR DUNE MALLEE MAINLY OF THE MURRAY DARLING DEPRESSION BIOREGION	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Dune Mallee Woodlands
PCT percent cleared	19%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression IBRA bioregion (South Olary Plain subregion) on east-west linear sand dunes.
PCT justification	This community occurred on calcareous brown to red sandy soils that formed linear east to west sand dunes. PCT 171 is characterised by the east-west linear sand dunes and a groundcover dominated by *Triodia scariosa* var. *scariosa*. These sand dunes support a variety of mallee specialist biota which are threatened or considered rare in NSW including *Acacia acanthoclada, Santalum murrayanum, Cryptandra magniflora* and *Dodonaea stenozyga.* As clay content in the soil increases between the linear sand dunes swales occur which support another mallee community; being PCT 170. It is at these locations were *Triodia scariosa* var. *scariosa* drops out and is replaced with an understorey of chenopod species which prefer a higher clay content. PCT 171 within the proposal study area has been classified as two variants; being 'Bull' and 'Whipstick'. These variants were used to distinguish between areas which either contained a mature or semi-mature canopy cohort due to past disturbances such as fire regimes and past tree clearing. Where these disturbances were higher the canopy cohort was generally younger and had not yet had time to form hollows (whipstick variant). Where these disturbances were less the canopy cohort was generally older and contained hollow bearing trees. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The vegetation formation, vegetation class, IBRA region and subregion, dominant species in the canopy and ground stratum were used as search criteria. PCT 171 returned the highest number of matches. The vegetation recorded within the proposal study area was considered to be consistent with the floristics, geology, landscape position and scientific description of PCT 171.

PCT 171 – SPINIFEX LINEAR DUNE MALLEE MAINLY OF THE MURRAY DARLING DEPRESSION BIOREGION	
Characteristic floristic composition and structure	
Species upper stratum (5–8 m)	A mixed canopy of mallee Eucalypt species including *Eucalyptus dumosa, Eucalyptus gracilis Eucalyptus oleosa, Eucalyptus socialis, Eucalyptus leptophylla, Eucalyptus phenax* and *Eucalyptus costata.* Community also contained a sparse sub-canopy of *Pittosporum angustifolium, Acacia oswaldii, Myoporum platycarpum* subsp. *platycarpum* as well as the occasional *Callitris verrucosa, Santalum acuminatum* and *Santalum murrayanum*.
Species middle stratum (<2 m)	Subshrub species included *Atriplex stipitata* subsp. *miscella, Atriplex stipata* subsp. *stipata, Bossiaea walker, Beyeria opaca, Chenopodium desertorum* subsp. *desertorum, Chenopodium desertorum* subsp. *rectum, Chenopodium curvispicatum, Dissocarpus paradoxus, Enchylaena tomentosa, Eutaxia microphylla, Halgania cyanea, Maireana pentatropis, Maireana triptera, Olearia muelleri, Olearia pimeleoides, Cryptandra magniflora, Rhagodia ulicina, Templetonia sulcata* and *Westringia rigida.* Larger shrub species included *Acacia acanthoclada, Acacia burkittii, Acacia colletioides, Acacia halliana, Acacia ligulata, Acacia nyssophylla, Acacia wilhelmiana, Acacia sclerophylla* subsp. *sclerophylla, Dodonaea viscosa* subsp. *angustissima, Dodonaea stenozyga, Grevillea huegelii, Eremophila sturtii, Exocarpos aphyllus, Senna artemisioides* subsp. x *coriacea, Senna artemisioides* subsp. x *petiolaris* and *Eremophila glabra.*
Species ground stratum (<1 m)	*Triodia scariosa* subsp. *scariosa* was the most characteristic understorey species present in PCT 171. The understorey was also comprised of a range of herbs and forbs including *Ajuga australis, Brachyscome lineariloba, Calandrinia eremaea, Calotis hispidula, Daucus glochidiatus, Dysphania cristata, Erodium crinitum, Omphalolappula concava, Podolepis capillaris, Lomandra effusa, Lomandra leucocephala* subsp. *leucocephala, Sclerolaena diacantha, Sclerolaena parviflora, Stenopetalum lineare, Stenopetalum sphaerocarpum* and *Thysanotus bauera.*
Vegetation condition	Modified (Bull): Vegetation assigned to modified bull displayed larger stem classes and contained hollows. All areas recorded were subject to varying degrees of grazing with some areas displaying a less diverse mid and understorey due to intense grazing pressures. Modified (Whip): Vegetation assigned to modified whip generally displayed small stem classes and an absence of hollows. All areas recorded were subject to varying degrees of grazing with some areas displaying a less diverse mid and understorey due to intense grazing pressures.

PCT 171 – Modified condition bull variant (Q89)

PCT 171 – Modified condition bull variant (Q90)

PCT 171 – Modified condition bull variant (Q89)

PCT 171 – Modified condition whipstick variant (Q43)

PCT 171 – Modified condition whipstick variant (Q45)

PCT 171 – Modified condition whipstick variant (Q45)

PCT 171 – Modified condition whipstick variant (Q45)

PCT 171 – Modified condition whipstick variant (Q101)

PCT 172 – DEEP SAND MALLEE OF IRREGULAR DUNEFIELDS OF THE SEMI-ARID (WARM) ZONE

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone is provided in Table C-2.18 and is photographically represented below.

Table C-2.18 Summary of PCT 172 – Deep sand mallee of irregular dunefields of the semi-arid (warm) zone

PCT 172 – DEEP SAND MALLEE OF IRREGULAR DUNEFIELDS OF THE SEMI-ARID (WARM) ZONE	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Dune Mallee Woodlands
PCT percent cleared	1%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion on aeolian dunefields in areas of highest elevation to the east of the Darling River and as large sand sheets north-east of Wentworth. PCT 172 formed a mosaic with PCT 170 on these parabolic dunefields where PCT 170 was recorded in the lower swales and PCT 172 was recorded in the areas of highest elevation. This vegetation graded into PCT 171 as sand masses became east-west linear sand dunes in areas of slightly lower elevation.
PCT justification	This community occurred on deep calcareous red sandy soils which formed large sand sheet masses. This community occurred as a stunted mallee shrubland largely occupied by whipstick mallee due to recent fire regimes. These sand dunes support a variety of mallee specialist biota which are threatened or considered rare in NSW including *Santalum murrayanum.* Mallee Eucalypt species recorded in PCT 170 and PCT 171 also occur in PCT 172. Differences in canopy diversity include the higher dominance of *Eucalyptus costata* and the occurrence of *Codonocarpus cotinifolius* which is a pioneer species which flourishes following fire. A sparse to moderately dense shrub stratum was characteristic of PCT 172 within the proposal study area and contained various Acacia, Dodonaea, Eremophila and Myoporum species. The understorey was dominated by *Triodia scariosa* subsp. *scariosa* and contained a large range of forbs, herbs and grasses recorded, particularly after rainfall. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The vegetation formation, vegetation class, IBRA region and subregion, dominant species in all stratums were used as search criteria. PCT 172 had the highest number of matches. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 172.

PCT 172 – DEEP SAND MALLEE OF IRREGULAR DUNEFIELDS OF THE SEMI-ARID (WARM) ZONE	
Characteristic floristic composition and structure	
Species upper stratum (3–6 m)	A mixed canopy of mallee Eucalypt species including *Eucalyptus dumosa, Eucalyptus gracilis Eucalyptus oleosa, Eucalyptus socialis, Eucalyptus leptophylla* and *Eucalyptus costata. Eucalyptus costata* and *Codonocarpus cotinifolius* occurred as the dominant tree species throughout large portions of the community. Other species which formed a sparse sub-canopy included *Pittosporum angustifolium, Acacia oswaldii, Callitris verrucosa* and the occasional *Santalum acuminatum* and *Santalum murrayanum*.
Species middle stratum (<2 m)	*Acacia colletioides, Acacia ligulata, Acacia rigens, Acacia wilhelmiana, Beyeria opaca, Daviesia arenaria, Dodonaea viscosa* subsp. *angustissima, Eremophila glabra, Grevillea huegelii, Myoporum platycarpum subsp. platycarpum, Chenopodium desertorum* subsp. *desertorum* and *Halgania cyanea.*
Species ground stratum (<1 m)	*Triodia scariosa* subsp. *scariosa* was the most characteristic understorey species present in PCT 172. The understorey was also comprised of a diverse range of herbs and forbs including *Actinobole uliginosum, Brachycome lineariloba, Brachyscome ciliaris, Calandrinia eremaea, Crassula colorata subsp. acuminatum, Calotis hispidula, Daucus glochidiatus, Dissocarpus paradoxus, Dysphania cristata, Goodenia pinnatifida, Goodenia willisiana, Haloragis odontocarpa, Isoetopsis graminifolia, Lomandra leucocephala* subsp. *leucocephala, Pimelea simplex, Podolepis capillaris, Polycalymma stuartii, Rhodanthe pygmaea, Roepera apiculata, Scleranthus minusculus, Sclerolaena parviflora, Senecio glossanthus, Stenopetalum lineare, Stenopetalum sphaerocarpum, Thysanotus bauera* and *Vittadinia dissecta* var. *hirta.* Exotic species included *Alyssum linifolium*, Brassica tournefortii*, Erodium cicutarium*, Hordeum glaucum*, Hypochaeris glabra*, Medicago minima*, Rostraria pumila*, Schismus barbatus*, Silene apetala** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified (Whip): Vegetation assigned to modified whip generally displayed small stem classes and an absence of hollows. All areas recorded were either subject to varying degrees of grazing and/or fire regimes. This community generally contained a diverse array of species however its structure had been largely modified.

PCT 172 – Intact condition whipstick with *Codonocarpus cotinifolius*

PCT 172 – Intact condition whipstick (Q94)

PCT 172 – Intact condition whipstick showing regenerating Eucalyptus species

PCT 172 – Intact condition whipstick showing regenerating *Callitris verrucosa*

PCT 172 – Intact condition whipstick (Q96)

PCT 172 – Intact condition whipstick showing high cover of *Triodia scariosa* subsp. *scariosa*

PCT 221 – BLACK OAK – PEARL BLUEBUSH OPEN WOODLAND OF THE SANDPLAINS OF THE SEMI-ARID WARM AND ARID CLIMATE ZONES

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 221 – Black Oak – Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones is provided in Table C-2.19 and is photographically represented below.

Table C-2.19 Summary of PCT 221 – Black Oak – Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones

PCT 221 – BLACK OAK – PEARL BLUEBUSH OPEN WOODLAND OF THE SANDPLAINS OF THE SEMI-ARID WARM AND ARID CLIMATE ZONES	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Semi-arid Sand Plain Woodlands
PCT percent cleared	30%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion and was recorded in low-lying areas of sandplains.
PCT justification	This community occurred on red to brown calcareous sandy loam soils. Vegetation assigned to this PCT were dominated by *Casuarina pauper* with *Alectryon oleifolius* subsp. *canescens* occurring as co-dominant species in some locations and an understorey of *Maireana sedifolia*. PCT 221 graded into PCT 154 Pearl Bluebush low open shrubland of the arid and semi-arid plains in all occurrences within the proposal study area. As such, this PCT was distinct in landscape. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in all stratums were used as search criteria. PCT 221 returned the highest number of matches. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 58.
Characteristic floristic composition and structure	
Species upper stratum (5–10 m)	Dominated by *Casuarina pauper* with areas co-dominated by *Alectryon oleifolius* subsp. *canescens*
Species middle stratum (<2 m)	Dominated by *Maireana sedifolia* with *Chenopodium desertorum* subsp. *desertorum, Enchylaena tomentosa, Rhagodia spinescens, Maireana pyramidata* and *Maireana georgei*
Species ground stratum (<1 m)	*Atriplex stipata* subsp. *miscella, Maireana sclerolaenoides, Roepera crenata, Roepera iodocarpa, Roepera ovata, Sclerolaena diacantha* and *Sclerolaena obliquicuspis.* Exotic species included *Alyssum linifolium*, Carrichtera annua*, Medicago minima*, Rostraria pumilo** and *Sisymbrium erysimoides*.*
Vegetation condition	Modified: Canopy stratum was largely intact however the understorey was structurally modified due to varying degrees of grazing pressures.

PCT 221 – Modified condition

PCT 221 – Modified condition (Q51)

PCT 221 – Modified condition

PCT 252 – SUGARWOOD OPEN WOODLAND OF THE INLAND PLAINS MAINLY MURRAY DARLING DEPRESSION BIOREGION

The occurrence of this vegetation type within the proposal study area is illustrated in Figure 4.2 and Appendix C-4. A profile summary of PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion is provided in Table C-2.20 and is photographically represented below.

Table C-2.20 Summary of PCT 252 – Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion

PCT 252 – SUGARWOOD OPEN WOODLAND OF THE INLAND PLAINS MAINLY MURRAY DARLING DEPRESSION BIOREGION	
Vegetation formation	KF_CH11B Semi-arid Woodlands (Shrubby sub-formation)
Vegetation class	Semi-arid Sand Plain Woodlands
PCT percent cleared	50%
TEC	Not listed
Landscape position	This vegetation was recorded in the Murray Darling Depression (South Olary Plain subregion) IBRA bioregion on sandplains.
PCT justification	Community occurred on red to brown sandy loam soils with a slight clay content. This community was similar in floristic composition and occurred on similar landscape positions as PCT 58 except *Myoporum platycarpum* subsp. *platycarpum* was the dominant canopy species. Additionally, this community generally contained higher shrub diversity and a sparse understorey of chenopods, grasses and forbs. *Myoporum platycarpum* subsp. *platycarpum* is a palatable species and readily grazed by stock as well as exotic and native herbivores. This was supported by no regeneration or seedling recruitment of this species was observed in the field. A quantitative analysis was undertaken for this community using the BioNet Vegetation Classification PCT filter tool (EES Group, 2020). The IBRA region and subregion, community structure, dominant species in all stratums were used as search criteria. Based on floristic and geological characteristics, this vegetation type is considered consistent with the scientific description and distribution information outlined for PCT 252.
Characteristic floristic composition and structure	
Species upper stratum (6–8 m)	Dominated by *Myoporum platycarpum* subsp. *platycarpum* with *Alectryon oleifolius* subsp. *canescens* and *Pittosporum angustifolium* forming a sparse sub-canopy. *Casuarina pauper* also occurs in areas of this community however was never dominant.
Species middle stratum (<2 m)	*Acacia colletioides, Acacia nyssophylla, Acacia oswaldii, Chenopodium desertorum* subsp. *desertorum, Dodonaea viscosa* subsp. *angustissima, Grevillea huegelii, Eremophila sturtii, Exocarpos aphyllus, Maireana appressa, Maireana brevifolia, Maireana pentatropis, Maireana pyramidata, Salsola australis, Senna artemisioides* subsp. x *coriacea, Senna artemisioides* subsp. x *petiolaris* and *Eremophila glabra.*
Species ground stratum (<1 m)	*Atriplex stipata* subsp. *miscella, Austrostipa nitida, Bulbine semibarbata, Calotis hispidula, Convolvulus crispifolius, Dysphania cristata, Enneapogon avenaceus, Erodium crinitum, Goodenia pinnatifida, Maireana sclerolaenoides, Roepera ammophila, Roepera crenata, Sclerolaena diacantha, Sclerolaena obliquicuspis* and *Tetragonia eremaea.* Exotic species included *Brassica tournefortii*, Limonium lobatum*, Medicago laciniata*, Medicago minima*, Onopordum acaulon** and *Psilocaulon granulicaule*.*

PCT 252 – SUGARWOOD OPEN WOODLAND OF THE INLAND PLAINS MAINLY MURRAY DARLING DEPRESSION BIOREGION	
Vegetation condition	Modified: Canopy component were largely intact. The shrub and understorey were highly variable depending heavily on grazing pressures and disturbance history. All occurrences of this community were in a modified state due to grazing. Derived: Vegetation assigned to derived condition displayed either a very sparse or absent canopy stratum. The understorey in this condition was >50% native and displayed diversity of grasses and forbs.

PCT 252 – Modified condition

PCT 252 – Derived condition (Q72)

APPENDIX C-3
BAM VEGETATION INTEGRITY PLOT DATA

Table C-3.1 BAM vegetation integrity plot data

Q27			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (Modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 01/05/2020			22	21	1	10	0	10	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			43.8	**43.7**	15	24.4	0	4.3	0	0	**0.1**	0
Atriplex lindleyi	3	100	FG					3				
Atriplex sp.	0.1	1	FG					0.1				
Brassica tournefortii	0.1	20	EX								0.1	
Chenopodium nitrariaceum	1	1	SG			1						
Disphyma crassifolium subsp. clavellatum	0.2	3	FG					0.2				
Dissocarpus paradoxus	1	50	SG			1						
Duma florulenta	2	10	SG			2						
Enchylaena tomentosa	5	200	SG			5						
Eremophila divaricata subsp. divaricata	4	8	SG			4						
Eucalyptus largiflorens	15	7	TG		15							
Goodenia heteromera	0.1	1	FG					0.1				
Maireana brevifolia	0.8	20	SG			0.8						
Rhagodia spinescens	10	40	SG			10						
Roepera aurantiaca	0.3	100	FG					0.3				
Senna artemisioides subsp. x coriacea	0.2	1	SG			0.2						
Tetragonia tetragonioides	0.1	15	FG					0.1				
Wahlenbergia fluminalis	0.1	1	FG					0.1				
Atriplex sp.	0.1	1	FG					0.1				
Maireana sp.	0.1	1	SG			0.1						
Sclerolaena divaricata	0.3	20	SG			0.3						
Sida trichopoda	0.1	4	FG					0.1				
Solanum sp. (Juvenile)	0.2	12	FG					0.2				

Easting	615262
Northing	6206652
Orientation	35°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	2
Length logs (m)	23
BAM Attributes 1x1 plot (%)	
Litter (%)	28

Q28			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 01/05/2020			0	9	0	7	1	1	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			0	**17.9**	0	15.5	2	0.4	0	0	**0**	0
Atriplex stipitata	5	80	SG			5						
Dissocarpus paradoxus	0.2	3	SG			0.2						
Enchylaena tomentosa	0.2	1	SG			0.2						
Maireana sclerolaenoides	5	100	SG			5						
Maireana triptera	0.1	1	SG			0.1						
Poaceae sp. (No fertile material, basal tuft only)	2	50	GG				2					
Roepera aurantiaca	0.4	30	FG					0.4				
Sclerolaena divaricata	3	80	SG			3						
Sclerolaena obliquicuspis	2	50	SG			2						

Easting	619366
Northing	6217575
Orientation	260°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	1.8

Q29			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 02/05/2020			18	14	0	8	2	4	0	0	4	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			38.1	**34.6**	0	19.3	2.1	13.2	0	0	**3.5**	1.4
Atriplex stipitata	3	50	SG			3						
Carrichtera annua	0.4	100	HT									0.4
Dissocarpus paradoxus	0.4	20	SG			0.4						
Enchylaena tomentosa	0.1	1	SG			0.1						
Enneapogon avenaceus	0.1	1	GG				0.1					
Enteropogon acicularis	2	50	GG				2					
Erodium crinitum	0.1	10	FG					0.1				
Euphorbia drummondii	0.1	1	FG					0.1				
Maireana sclerolaenoides	5	100	SG			5						
Maireana triptera	0.1	1	SG			0.1						
Medicago lacinata	2	500	EX								2	
Psilocaulon granulicaule	1	5	HT									1
Roepera aurantiacum	1	200	FG					1				
Salsola australis	0.5	30	SG			0.5						
Sclerolaena divaricata	0.2	4	SG			0.2						
Sclerolaena obliquicuspis	10	300	SG			10						
Sida corrugata	12	200	FG					12				
Tribulus terrestris	0.1	2	EX								0.1	

Easting	618592
Northing	6214971
Orientation	285°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	3

Q30			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
Unassigned			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			14	7	0	4	0	3	0	0	7	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			47	44.4	0	41.3	0	3.1	0	0	2.6	0.1
Aspodelus fistulosus	0.4	50	EX								0.4	
Brassica tournefortii	0.1	2	EX								0.1	
Carrichtera annua	0.1	2	HT									0.1
Enchylaena tomentosa	30	60	SG			30						
Euphorbia drummondii	1	200	FG					1				
Maireana georgei	10	20	SG			10						
Marrubium vulgare	0.8	100	EX								0.8	
Medicago lacinata	1	500	EX								1	
Roepera apiculatum	2	200	FG					2				
Salsola australis	1	100	SG			1						
Schismus barbatus	0.1	20	EX								0.1	
Sclerolaena obliquicuspis	0.3	20	SG			0.3						
Tetragonia tetragonioides	0.1	2	FG					0.1				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	616222
Northing	6207438
Orientation	260°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	2

Q31			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 216 Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 02/05/2020			13	9	0	5	0	4	0	0	4	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			36.2	32.6	0	28.2	0	4.4	0	0	3.6	0
Aspodelus fistulosus	2	200	EX								2	
Atriplex lindleyi	3	50	FG					3				
Atriplex sp.	0.1	1	FG					0.1				
Brassica tournefortii	0.1	2	EX								0.1	
Enchylaena tomentosa	1	50	SG			1						
Erodium cicutarium	1	200	EX								1	
Maireana sp.	0.1	1	SG			0.1						
Medicago lacinata	0.5	200	EX								0.5	
Zaleya galericulata subsp. galericulata	1	200	FG					1				
Sclerolaena diacantha	2	50	SG			2						
Sclerolaena muricata var. semiglabra	25	100	SG			25						
Sclerolaena tricuspis	0.1	2	SG			0.1						
Tetragonia tetragonioides	0.3	30	FG					0.3				

Easting	615895
Northing	6207039
Orientation	215°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	8.6

Q32			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			18	18	1	9	1	7	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			67.4	67.4	18	48.3	0.1	1	0	0	0	0
Atriplex lindleyi	0.2	10	FG					0.2				
Atriplex stipitata	4	60	SG			4						
Atriplex semibaccata	0.1	10	SG			0.1						
Chenopodium nitrariaceum	0.4	1	SG			0.4						
Duma florulenta	15	80	SG			15						
Enchylaena tomentosa	15	100	SG			15						
Enteropogon acicularis	0.1	1	GG				0.1					
Eremophila divaricata subsp. divaricata	0.3	1	SG			0.3						
Erodium crinitum	0.2	30	FG					0.2				
Eucalyptus largiflorens	18	9	TG		18							
Maireana brevifolia	1	20	SG			1						
Rhagodia spinescens	12	50	SG			12						
Roepera aurantiaca	0.2	50	FG					0.2				
Sclerolaena diacantha	0.5	40	SG			0.5						
Sida trichopoda	0.1	5	FG					0.1				
Solanum sp. (juvenile)	0.1	30	FG					0.1				
Tetragonia tetragonioides	0.1	10	FG					0.1				
Teucrium racemosum	0.1	8	FG					0.1				

Easting	615661
Northing	6206824
Orientation	225°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	Yes
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	4
Length logs (m)	38
BAM Attributes 1x1 plot (%)	
Litter (%)	22

Q33			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 17 - Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			11	10	0	7	0	3	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			37.9	37.8	0	24.9	0	12.9	0	0	0.1	0
Atriplex infrequens	0.1	2	FG					0.1				
Atriplex lindleyi	12	300	FG					12				
Atriplex pseudocampanulata	7	200	SG			7						
Chenopodium nitrariaceum	1	1	SG			1						
Cucmis myriocarpus	0.1	1	EX								0.1	
Duma florulenta	16	20	SG			16						
Maireana sp.	0.1	2	SG			0.1						
Sclerolaena divaricata	0.6	30	SG			0.6						
Sclerolaena muricata var. semiglabra	0.1	1	SG			0.1						
Sclerolaena stelligera	0.1	1	SG			0.1						
Tetragonia tetragonioides	0.8	80	FG					0.8				

Easting	615126
Northing	6206641
Orientation	15°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	17

Q34			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			18	16	3	3	5	5	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			104.3	**104.1**	50	43	10.2	0.9	0	0	**0.2**	0
Acacia stenophylla	20	40	TG		20							
Brassica tournefortii	0.1	2	EX								0.1	
Calotis cuneifolia	0.1	4	FG					0.1				
Cynodon dactylon	0.4	20	GG				0.4					
Cyperus gymnocaulos	5	200	GG				5					
Duma florulenta	3	20	SG			3						
Dysphania pumilo	0.2	40	FG					0.2				
Einadia nutans subsp. nutans	0.4	20	FG					0.4				
Enchylaena tomentosa	5	50	SG			5						
Eragrostis sp.	0.4	30	GG				0.4					
Eucalyptus camaldulensis	22	6	TG		22							
Eucalyptus largiflorens	8	2	TG		8							
Haloragis glauca	0.1	1	FG					0.1				
Hypochaeris glabra	0.1	1	EX								0.1	
Paspalidium jubiflorum	4	40	GG				4					
Rhagodia spinescens	35	50	SG			35						
Schoenoplectus validus	0.4	10	GG				0.4					
Wahlenbergia fluminalis	0.1	10	FG					0.1				

Easting	614807
Northing	6206719
Orientation	185°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	2
50-79	1
30-49	Yes
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	7 (3≥20cm+)
Length logs (m)	22
BAM Attributes 1x1 plot (%)	
Litter (%)	57

Q35			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			18	13	0	6	0	7	0	0	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			73.5	72.4	0	56.8	0	15.6	0	0	1.1	0
Aspodelus fistulosus	0.3	20	EX								0.3	
Atriplex lindleyi	0.1	1	FG					0.1				
Brassica tournefortii	0.1	10	EX								0.1	
Calotis sp.	0.1	3	FG					0.1				
Convolvulus remotus	0.1	10	FG					0.1				
Duma florulenta	0.4	1	SG			0.4						
Enchylaena tomentosa	30	200	SG			30						
Erodium cicutarium	0.1	2	EX								0.1	
Geococcus pusillus	0.1	2	FG					0.1				
Hypochaeris glabra	0.1	1	EX								0.1	
Maireana brevifolia	9	60	SG			9						
Medicago lacinata	0.5	500	EX								0.5	
Rhagodia spinescens	5	10	SG			5						
Roepera aurantiaca	0.1	1	FG					0.1				
Salsola australis	0.4	8	SG			0.4						
Sclerolaena diacantha	12	100	SG			12						
Solanum sp. (juvenile)	0.1	2	FG					0.1				
Tetragonia tetragonioides	15	1000	FG					15				

Easting	615992
Northing	6207157
Orientation	45°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	7.4

Q36			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 19 - Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 03/05/2020			22	17	1	7	0	8	0	1	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			35.8	**34.9**	6	15.3	0	13	0	0.6	**0.9**	0
Acacia colletioides	0.4	1	SG			0.4						
Boerhavia dominii	0.1	1	FG					0.1				
Calandrinia eremaea	0.4	20	FG					0.4				
Callitris gracilis subsp. murrayensis	6	3	TG		6							
Calotis sp. (No fertile material)	0.1	1	FG					0.1				
Cucmis myriocarpus	0.1	1	EX								0.1	
Daucus glochidiatus	0.1	1	FG					0.1				
Dodonaea viscosa subsp. angustissima	8	9	SG			8						
Enchylaena tomentosa	0.6	5	SG			0.6						
Erodium cicutarium	0.2	20	EX								0.2	
Euphorbia drummondii	0.1	4	FG					0.1				
Exocarpos aphyllus	1	1	SG			1						
Geococcus pusillus	0.1	2	FG					0.1				
Goodenia heteromera	0.1	5	FG					0.1				
Lysiana exocarpi subsp. exocarpi	0.6	3	OG							0.6		
Marrubium vulgare	0.1	10	EX								0.1	
Medicago lacinata	0.4	200	EX								0.4	
Myoporum platycarpum subsp. platycarpum	5	2	SG			5						
Rhagodia spinescens	0.1	1	SG			0.1						
Schismus barbatus	0.1	20	EX								0.1	
Sclerolaena diacantha	0.2	10	SG			0.2						
Tetragonia tetragonioides	12	1000	FG					12				

Easting	616027
Northing	6207281
Orientation	0°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	12
BAM Attributes 1x1 plot (%)	
Litter (%)	9.6

Q37			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (Modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 05/05/2020			39	30	1	9	5	13	0	2	9	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			53.5	**47.5**	10	15.8	4.3	17.2	0	0.2	**6**	1
Acacia colletioides	3	3	SG			3						
Atriplex stipitata	0.2	2	SG			0.2						
Austrostipa spp.	1	50	GG				1					
Brassica tournefortii	0.5	30	EX								0.5	
Callitris gracilis subsp. murrayensis	10	2	TG		10							
Carrichtera annua	1	100	HT									1
Convolvulus remotus	0.3	30	FG					0.3				
Dodonaea viscosa subsp. angustissima	4	3	SG			4						
Dysphania cristata	3	200	FG					3				
Echium plantagineum	0.5	20	EX								0.5	
Enchylaena tomentosa	2	20	SG			2						
Enneapogon avenaceus	1	60	GG				1					
Enteropogon acicularis	2	50	GG				2					
Erodium crinitum	2	200	FG					2				
Euphorbia drummondii	5	300	FG					5				
Geococcus pusillus	0.1	2	FG					0.1				
Goodenia sp.	0.1	10	FG					0.1				
Heliotropium curassavicum	0.1	1	EX								0.1	
Maireana brevifolia	0.2	2	SG			0.2						
Marrubium vulgare	0.1	10	EX								0.1	
Marsdenia australis	0.1	4	OG							0.1		
Medicago lacinata	0.7	100	EX								0.7	
Oxalis perennans	0.1	2	FG					0.1				
Paspalidium constrictum	0.1	1	GG				0.1					
Pimelea microcephala subsp. microcephala	0.3	1	SG			0.3						
Poaceae sp. (No fertile material, basal tuft only)	0.2	10	GG				0.2					
Rhyncharrhena linearis	0.1	4	OG							0.1		
Roepera apiculata	1	30	FG					1				
Salsola australis	0.1	2	SG			0.1						
Schismus barbatus	1	30	EX								1	
Sclerolaena diacantha	2	30	SG			2						
Sclerolaena obliquicuspis	4	100	SG			4						
Sida corrugata	0.1	1	FG					0.1				
Sisymbrium erysimoides	2	20	EX								2	
Solanum esuriale	0.3	20	FG					0.3				
Sonchus oleraceus	0.1	5	EX								0.1	
Tetragonia tetragonioides	5	200	FG					5				
Vittadinia dissecta var. hirta	0.1	2	FG					0.1				
Vittadinia pp. (No fertile material)	0.1	2	FG					0.1				

Easting	615170
Northing	6226543
Orientation	30°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	28
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Q38			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 05/05/2020			26	17	1	6	2	8	0	0	9	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			53.5	**41.3**	10	10.4	1	19.9	0	0	**12.2**	0.1
Aspodelus fistulosus	0.1	10	EX								0.1	
Austrostipa sp.	0.2	30	GG				0.2					
Callitris gracilis subsp. murrayensis	10	4	TG		10							
Calotis sp. (No fertile material)	0.1	10	FG					0.1				
Carrichtera annua	0.1	3	HT									0.1
Convolvulus remotus	0.1	5	FG					0.1				
Dysphania cristata	8	500	FG					8				
Enchylaena tomentosa	0.4	20	SG			0.4						
Enneapogon avenaceus	0.8	50	GG				0.8					
Erodium cicutarium	0.3	40	EX								0.3	
Erodium crinitum	0.1	10	FG					0.1				
Euphorbia drummondii	3	100	FG					3				
Geococcus pusillus	0.1	2	FG					0.1				
Hakea leucoptera subsp. leucoptera	1	1	SG			1						
Maireana pyramidata	2	1	SG			2						
Marrubium vulgare	0.1	2	EX								0.1	
Medicago lacinata	10	1000	EX								10	
Rhagodia spinescens	2	2	SG			2						
Roepera aurantiaca	0.5	30	FG					0.5				
Salsola australis	1	40	SG			1						
Schismus barbatus	1	50	EX								1	
Sclerolaena obliquicuspis	4	200	SG			4						
Sisymbrium erysimoides	0.4	30	EX								0.4	
Sonchus oleraceus	0.1	1	EX								0.1	
Tetragonia tetragonioides	8	200	FG					8				
Tribulus terrestris	0.1	10	EX								0.1	

Easting	611171
Northing	6231817
Orientation	115°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	12
BAM Attributes 1x1 plot (%)	
Litter (%)	15

Q39			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 63 - Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones (Modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 05/05/2020			11	9	0	5	0	4	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			24	19.7	0	16	0	3.7	0	0	4.3	0
Atriplex lindleyi	0.4	30	FG					0.4				
Chenopodium nitrariaceum	3	4	SG			3						
Duma horrida subsp. horrida	2	20	SG			2						
Erodium cicutarium	0.3	100	EX								0.3	
Erodium crinitum	0.1	20	FG					0.1				
Medicago lacinata	4	500	EX								4	
Nitraria billardierei	6	2	SG			6						
Osteocarpum acropterum var. deminuta	1	50	SG			1						
Pycnosorus pleiocephalus	0.2	10	FG					0.2				
Sclerolaena obliquicuspis	4	300	SG			4						
Tetragonia tetragonioides	3	300	FG					3				

Easting	597239
Northing	6248103
Orientation	15°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	1.2

Q40			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			26	21	0	7	2	12	0	0	5	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			17.4	**16.3**	0	13.1	1	2.2	0	0	**1.1**	0.3
Alyssum linifolium	0.1	3	EX								0.1	
Atriplex stipitata	0.1	4	SG			0.1						
Austrostipa nitida	0.8	200	GG				0.8					
Calotis hispidula	0.1	2	FG					0.1				
Carrichtera annua	0.3	40	HT									0.3
Chenopodium desortorum	0.2	4	FG					0.2				
Erodium cicutarium	0.1	40	EX								0.1	
Erodium crinitum	0.3	200	FG					0.3				
Euphorbia drummondii	0.1	1	FG					0.1				
Maireana pentagona	0.1	10	FG					0.1				
Maireana pyramidata	0.5	2	SG			0.5						
Maireana sclerolaenoides	0.1	1	SG			0.1						
Maireana sedifolia	0.2	1	SG			0.2						
Maireana triptera	12	100	SG			12						
Marrubium vulgare	0.1	2	EX								0.1	
Medicago minima	0.5	200	EX								0.5	
Nicotina goodspeedii	0.1	2	SG			0.1						
Poaceae sp.	0.2	50	GG				0.2					
Pogonolepis muelleriana	0.1	1	FG					0.1				
Rhodanthe pygmaea	0.1	1	FG					0.1				
Roepera ammophila	0.1	5	FG					0.1				
Roepera iodocarpa	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	0.1	10	SG			0.1						
Spergularia brevifolia	0.1	1	FG					0.1				
Tetragonia tetragonioides	0.3	40	FG					0.3				
Teucrium racemosum	0.6	100	FG					0.6				

Easting	512165
Northing	6248719
Orientation	206°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.26

Q41			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			28	21	1	7	1	10	0	2	7	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			44.7	**40.7**	8	16.8	2	13.3	0	0.6	**4**	0
Amyema linophyllum subsp. orientale	0.5	2	OG							0.5		
Atriplex stipitata	0.1	1	SG			0.1						
Austrostipa nitida	2	60	GG				2					
Calandrinia eremaea	0.3	50	FG					0.3				
Calotis hispidula	0.1	3	FG					0.1				
Casuarina pauper	8	2	TG		8							
Cucmis myriocarpus	0.1	1	EX								0.1	
Dysphania cristata	0.1	10	FG					0.1				
Enchylaena tomentosa	2	15	SG			2						
Erodium crinitum	0.2	50	FG					0.2				
Euphorbia drummondii	0.1	10	FG					0.1				
Maireana pentagona	0.1	2	FG					0.1				
Maireana pentatropis	2	20	SG			2						
Maireana trichoptera	0.5	3	SG			0.5						
Marsdenia australis	0.1	1	OG							0.1		
Medicago lacinata	3	500	EX								3	
Medicago minima	0.5	100	EX								0.5	
Nicotina goodspeedii	0.1	1	SG			0.1						
Onopordum acaulon	0.1	1	EX								0.1	
Roepera apiculatum	0.2	20	FG					0.2				
Roepera aurantiaca	0.1	1	FG					0.1				
Roepera similis	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	12	200	SG			12						
Senna artemisioides subsp. x coriacea	0.1	2	SG			0.1						
Silene apetala	0.1	2	EX								0.1	
Sisymbrium erysimoides	0.1	5	EX								0.1	
Tetragonia tetragonioides	12	200	FG					12				
Tribulus terrestris	0.1	2	EX								0.1	

Easting	500298
Northing	6250698
Orientation	100°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	32
BAM Attributes 1x1 plot (%)	
Litter (%)	30

Q42			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 21 Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			30	26	2	7	2	15	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			57.1	**46.9**	8	20.2	4.1	14.6	0	0	**10.2**	0
Alectryon oleifolius subsp. canescens	3	1	TG		3							
Aspodelus fistulosus	0.1	5	EX								0.1	
Atriplex stipitata	0.1	1	SG			0.1						
Austrostipa nitida	4	200	GG				4					
Brachyscome ciliaris	0.1	1	FG					0.1				
Calandrinia eremaea	2	300	FG					2				
Callitris gracilis subsp. murrayensis	5	1	TG		5							
Calotis hispidula	0.1	1	FG					0.1				
Chthonocephalus pseudevax	0.1	30	FG					0.1				
Crassula colorata var. acuminata	0.1	30	FG					0.1				
Cucmis myriocarpus	0.1	1	EX								0.1	
Dysphania cristata	0.1	2	FG					0.1				
Erodium crinitum	0.4	50	FG					0.4				
Euphorbia drummondii	0.1	10	FG					0.1				
Harmsiodoxa brevipes var. brevipes	0.1	1	FG					0.1				
Lemooria burkittii	5	200	FG					5				
Maireana georgei	6	40	SG			6						
Maireana pentatropis	5	60	SG			5						
Maireana pyramidata	1	2	SG			1						
Maireana triptera	3	50	SG			3						
Medicago lacinata	8	800	EX								8	
Medicago minima	2	200	EX								2	
Nicotiana velutina	0.1	10	FG					0.1				
Pimelea simplex	0.1	1	FG					0.1				
Poaceae spp.	0.1	20	GG				0.1					
Rhodanthe pygmaea	0.1	2	FG					0.1				
Roepera ammophila	0.2	10	FG					0.2				
Salsola australis	0.1	1	SG			0.1						
Sclerolaena obliquicuspis	5	100	SG			5						
Tetragonia tetragonioides	6	200	FG					6				

Easting	500421
Northing	6250803
Orientation	152°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	1
20-29	No
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	27
BAM Attributes 1x1 plot (%)	
Litter (%)	18

Q43			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified "whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			23	22	2	9	2	9	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			52	**51.9**	17	13	20.2	1.7	0	0	**0.1**	0
Austrostipa nitida	0.2	40	GG				0.2					
Calandrinia eremaea	0.4	100	FG					0.4				
Calotis hispidula	0.1	20	FG					0.1				
Chenopodium curvispicatum	0.1	6	SG			0.1						
Crassula colorata var. acuminata	0.1	10	FG					0.1				
Dysphania cristata	0.1	2	FG					0.1				
Eremophila deserti	3	2	SG			3						
Eucalyptus dumosa	12	7	TG		12							
Eucalyptus gracilis	5	3	TG		5							
Lepidium leptopetalum	0.1	1	SG			0.1						
Maireana appressa	0.1	1	SG			0.1						
Maireana georgei	0.5	20	SG			0.5						
Maireana pentatropis	4	100	SG			4						
Maireana sclerolaenoides	0.1	1	SG			0.1						
*Onopordum acaulon**	0.1	1	EX								0.1	
Roepera ammophila	0.6	60	FG					0.6				
Roepera apiculata	0.1	1	FG					0.1				
Roepera aurantiaca	0.1	1	FG					0.1				
Sclerolaena parviflora	0.1	5	SG			0.1						
Senna artemisioides subsp. x petiolaris	5	5	SG			5						
Stenopetalum sphaerocarpum	0.1	8	FG					0.1				
Thysanotus baueri	0.1	20	FG					0.1				
Triodia scariosa subsp. scariosa	20	50	GG				20					

Easting	502765
Northing	6250374
Orientation	87°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	1
Length logs (m)	38
BAM Attributes 1x1 plot (%)	
Litter (%)	26

Q44			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified "whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			34	34	3	14	2	14	0	1	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			57.6	**57.6**	22	33.2	0.3	2	0	0.1	**0**	0
Acacia colletioides	4	2	SG			4						
Austrostipa nitida	0.2	40	GG				0.2					
Brachyscome lineariloba	0.1	20	FG					0.1				
Calandrinia eremaea	0.2	30	FG					0.2				
Calotis hispidula	0.2	50	FG					0.2				
Chenopodium curvispicatum	0.1	1	SG			0.1						
Crassula colorata var. acuminata	0.1	20	FG					0.1				
Daucus glochidiatus	0.1	1	FG					0.1				
Enchylaena tomentosa	0.3	20	SG			0.3						
Eremophila glabra	0.5	3	SG			0.5						
Eremophila sturtii	10	30	SG			10						
Erodium crinitum	0.1	1	FG					0.1				
Eucalyptus dumosa	2	1	TG		2							
Eucalyptus oleosa	18	12	TG		18							
Eucalyptus socialis	2	1	TG		2							
Grevillea huegelii	0.1	1	SG			0.1						
Lepidium leptopetalum	6	100	SG			6						
Maireana georgei	2	50	SG			2						
Maireana pentagona	0.1	2	FG					0.1				
Maireana pentatropis	3	80	SG			3						
Maireana trichoptera	0.1	1	SG			0.1						
Maireana triptera	2	40	SG			2						
Marsdenia australis	0.1	2	OG							0.1		
Plantago drummondii	0.1	10	FG					0.1				
Poaceae sp.	0.1	2	GG				0.1					
Podolepis capillaris	0.1	1	FG					0.1				
Roepera apiculata	0.1	1	FG					0.1				
Roepera aurantiaca	0.5	80	FG					0.5				
Rosette in mallee with out flower	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	0.1	3	SG			0.1						
Senna artemisioides subsp. x coriacea	1	2	SG			1						
Senna artemisioides subsp. x petiolaris	4	8	SG			4						
Stenopetalum sphaerocarpum	0.1	5	FG					0.1				
Thysanotus baueri	0.1	5	FG					0.1				

Easting	505151
Northing	6250401
Orientation	285°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	12
BAM Attributes 1x1 plot (%)	
Litter (%)	48

Q45			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified "whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			24	24	3	12	2	7	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			53.6	**53.6**	24	18.7	10.2	0.7	0	0	**0**	0
Acacia nyssophylla	0.1	1	SG			0.1						
Austrostipa nitida	0.2	30	GG				0.2					
Beyeria opaca	0.3	1	SG			0.3						
Calandrinia eremaea	0.1	20	FG					0.1				
Enchylaena tomentosa	0.1	1	SG			0.1						
Eremophila sturtii	2	4	SG			2						
Eucalyptus dumosa	2	1	TG		2							
Eucalyptus gracilis	6	8	TG		6							
Eucalyptus socialis	16	9	TG		16							
Lepidium leptopetalum	4	40	SG			4						
Maireana georgei	1	40	SG			1						
Maireana pentatropis	0.6	30	SG			0.6						
Maireana triptera	1	40	SG			1						
Olearia muelleri	3	20	SG			3						
Podolepis capillaris	0.1	1	FG					0.1				
Roepera apiculata	0.1	8	FG					0.1				
Roepera aurantiaca	0.1	5	FG					0.1				
Ptilotus seminudus	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	0.6	40	SG			0.6						
Senna artemisioides subsp. x coriacea	2	4	SG			2						
Senna artemisioides subsp. x petiolaris	4	6	SG			4						
Stenopetalum sphaerocarpum	0.1	1	FG					0.1				
Thysanotus baueri	0.1	10	FG					0.1				
Triodia scariosa subsp. scariosa	10	10	GG				10					

Easting	507238
Northing	6250634
Orientation	276°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	16
BAM Attributes 1x1 plot (%)	
Litter (%)	29

Q46			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified "whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			17	15	2	7	2	4	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			38.6	**38.3**	12	23.9	0.3	2.1	0	0	**0.3**	0
Austrostipa nitida	0.2	50	GG				0.2					
Chenopodium curvispicatum	0.1	1	SG			0.1						
Eucalyptus dumosa	8	6	TG		8							
Eucalyptus oleosa	4	3	TG		4							
Maireana georgei	1	40	SG			1						
Maireana pentagona	0.1	10	FG					0.1				
Maireana pyramidata	22	80	SG			22						
Maireana sclerolaenoides	0.1	2	SG			0.1						
Maireana sedifolia	0.1	1	SG			0.1						
Medicago minima	0.2	100	EX								0.2	
Poaceae sp. (No fertile material, basal tuft only)	0.1	1	GG				0.1					
Roepera ammophila	0.2	40	FG					0.2				
Roepera apiculata	1	100	FG					1				
Salsola australis	0.2	20	SG			0.2						
Sclerolaena obliquicuspis	0.4	30	SG			0.4						
Sisymbrium erysimoides	0.1	2	EX								0.1	
Tetragonia tetragonioides	0.8	200	FG					0.8				

Easting	512656
Northing	6249935
Orientation	291°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	20

Q47			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 154 Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 15/07/2020			13	9	0	3	2	4	0	0	4	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			50.8	**43.9**	0	42	0.6	1.3	0	0	**6.9**	3
Aspodelus fistulosus	0.8	100	EX								0.8	
Austrostipa nitida	0.5	100	GG				0.5					
Carrichtera annua	3	500	HT									3
Enneapogon avenaceus	0.1	6	GG				0.1					
Erodium crinitum	0.6	100	FG					0.6				
Euphorbia drummondii	0.1	4	FG					0.1				
Maireana pyramidata	8	50	SG			8						
Maireana sedifolia	32	200	SG			32						
Marrubium vulgare	0.1	1	EX								0.1	
Medicago minima	3	500	EX								3	
Roepera crenata	0.1	20	FG					0.1				
Sclerolaena obliquicuspis	2	200	SG			2						
Tetragonia tetragonioides	0.5	80	FG					0.5				

Easting	520786
Northing	6248698
Orientation	85°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	4

Q48			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "boinka")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			23	19	0	8	1	10	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			28.1	**24.4**	0	3.9	2	18.5	0	0	**3.7**	0
Atriplex holocarpa	5	500	FG					5				
Atriplex vesicaria subsp. vesicaria	2	40	SG			2						
Brachyscome lineariloba	0.1	1	FG					0.1				
Dysphania cristata	0.1	20	FG					0.1				
Eragrostis dielsii	2	500	GG				2					
Frankenia foliosa	0.8	20	FG					0.8				
Maireana appressa	0.4	20	SG			0.4						
Nitraria billardierei	0.1	1	SG			0.1						
Osteocarpum dipterocarpum	0.5	60	SG			0.5						
Roepera compressa	4	200	FG					4				
Hordeum glaucum	0.1	2	EX								0.1	
Maireana pyramidata	0.1	40	SG			0.1						
Spergularia brevifolia	0.2	100	FG					0.2				
Roepera crenata	0.1	1	FG					0.1				
Roepera iodocarpa	0.1	1	FG					0.1				
Medicago minima	0.5	200	EX								0.5	
Roepera ammophila	0.1	3	FG					0.1				
Rostraria pumila	3	1000	EX								3	
Lawrencia glomerata	0.3	30	SG			0.3						
Malacocera tricornis	0.4	40	SG			0.4						
Tecticornia pergranulata subsp. pergranulata	8	60	FG					8				
Schismus barbatus	0.1	10	EX								0.1	
Sclerolaena obliquicuspis	0.1	1	SG			0.1						

Easting	543161
Northing	6256148
Orientation	228°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q49			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "lunette")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			16	11	0	2	1	8	0	0	5	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			30.8	29.2	0	1.1	0.8	27.3	0	0	1.6	0
Alyssum linifolium	0.1	1	EX								0.1	
Austrostipa nullanulla	0.8	200	GG				0.8					
Brachyscome ciliaris	0.3	40	FG					0.3				
Elachanthus glaber	0.6	100	FG					0.6				
Erodium cicutarium	0.3	100	EX								0.3	
Frankenia foliosa	16	100	FG					16				
Hordeum glaucum	0.1	1	EX								0.1	
Isoetopsis graminifolia	0.1	1	FG					0.1				
Lawrencia glomerata	0.2	20	SG			0.2						
Medicago minima	0.3	100	EX								0.3	
Plantago drummondii	0.1	1	FG					0.1				
Roepera compressa	7	500	FG					7				
Roepera ammophila	0.2	20	FG					0.2				
Rostraria pumila	0.8	500	EX								0.8	
Sclerolaena obliquicuspis	0.9	100	SG			0.9						
Tecticornia pergranulata subsp. pergranulata	3	20	FG					3				

Easting	543395
Northing	6256215
Orientation	177°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q50			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "lunette")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			17	14	0	7	3	4	0	0	3	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			34.1	32.5	0	20.7	2.2	9.6	0	0	1.6	0
Alyssum linifolium	0.5	500	EX								0.5	
Atriplex vesicaria subsp. vesicaria	12	50	SG			12						
Austrostipa nullanulla	0.1	10	GG				0.1					
Enneapogon avenaceus	0.1	2	GG				0.1					
Eragrostis dielsii	2	300	GG				2					
Sclerolaena brachyptera	3	500	SG			3						
Maireana appressa	3	20	SG			3						
Osteocarpum dipterocarpum	0.1	15	SG			0.1						
Salsola australis	0.3	20	SG			0.3						
Euphorbia drummondii	1	100	FG					1				
Maireana pyramidata	2	10	SG			2						
Tetragonia tetragonioides	3	200	FG					3				
Medicago minima	1	500	EX								1	
Plantago drummondii	5	1000	FG					5				
Roepera ammophila	0.6	40	FG					0.6				
Rostraria pumila	0.1	20	EX								0.1	
Sclerolaena obliquicuspis	0.3	40	SG			0.3						

Easting	543105
Northing	6255512
Orientation	230°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q51			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 221 Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			14	13	1	5	3	4	0	0	1	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			46.1	**45.5**	13	29.4	1.3	1.8	0	0	**0.6**	0.6
Austrostipa nitida	0.3	80	GG				0.3					
Carrichtera annua	0.6	200	HT									0.6
Casuarina pauper	13	14	TG		13							
Enchylaena tomentosa	0.1	1	SG			0.1						
Eragrostis dielsii	0.5	40	GG				0.5					
Maireana pyramidata	3	20	SG			3						
Maireana sclerolaenoides	0.3	40	SG			0.3						
Maireana sedifolia	25	100	SG			25						
Poaceae sp. (No fertile material, basal tuft only)	0.5	40	GG				0.5					
Roepera crenata	0.3	30	FG					0.3				
Roepera iodocarpa	0.4	80	FG					0.4				
Roepera ovata	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	1	100	SG			1						
Tetragonia tetragonioides	1	200	FG					1				

Easting	542328
Northing	6254142
Orientation	225°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	66
BAM Attributes 1x1 plot (%)	
Litter (%)	46

Q52			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			18	16	0	3	2	11	0	0	2	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			54	**28**	0	3.5	10.1	14.4	0	0	**26**	18
Austrostipa nitida	10	500	GG				10					
Brachyscome ciliaris	0.3	40	FG					0.3				
Calotis hispidula	0.1	1	FG					0.1				
Carrichtera annua	18	500	HT									18
Enneapogon avenaceus	0.1	1	GG				0.1					
Erodium crinitum	0.6	50	FG					0.6				
Euphorbia drummondii	0.3	40	FG					0.3				
Maireana sclerolaenoides	0.3	30	SG			0.3						
Maireana pentagona	0.2	20	FG					0.2				
Maireana sedifolia	0.2	2	SG			0.2						
Isoetopsis graminifolia	0.1	5	FG					0.1				
Medicago lacinata	8	500	EX								8	
Sclerolaena obliquicuspis	3	50	SG			3						
Roepera iodocarpa	0.1	5	FG					0.1				
Rhodanthe pygmaea	0.2	30	FG					0.2				
Roepera ammophila	0.1	1	FG					0.1				
Tetragonia tetragonioides	0.4	20	FG					0.4				
Vittadinia eremaea	12	500	FG					12				

Easting	541042
Northing	6252197
Orientation	272°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.26

Q53			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 154 Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			34	28	0	6	4	18	0	0	6	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			76.6	**64.5**	0	34.3	8.9	21.3	0	0	**12.1**	0.1
Austrostipa sp.	0.4	40	GG				0.4					
Brachyscome lineariloba	0.3	40	FG					0.3				
Bulbine alata	0.2	30	FG					0.2				
Calandrinia eremaea	0.1	20	FG					0.1				
Calotis hispidula	2	100	FG					2				
Carrichtera annua	0.1	8	HT									0.1
Convolvulus crispifolius	0.2	40	FG					0.2				
Daucus glochidiatus	6	200	FG					6				
Dysphania cristata	0.8	100	FG					0.8				
Enneapogon avenaceus	0.4	50	GG				0.4					
Eragrostis dielsii	8	500	GG				8					
Erodium crinitum	2	200	FG					2				
Euphorbia drummondii	2	50	FG					2				
hairy rutidosis pterocaulen	0.1	1	FG					0.1				
lily sp thin cyclimdrical	6	150	FG					6				
Limonium lobatum	3	10	EX								3	
Maireana pyramidata	15	40	SG			15						
Maireana sedifolia	0.1	2	SG			0.1						
Maireana spp.	0.1	2	SG			0.1						
Marrubium vulgare	3	200	EX								3	
Medicago minima	1	30	EX								1	
Plantago drummondii	0.6	80	FG					0.6				
Poaceae sp. (No fertile material, basal tuft only)	0.1	2	GG				0.1					
Podolepis capillaris	0.1	1	FG					0.1				
Rhodanthe pygmaea	0.1	1	FG					0.1				
Roepera similis	0.1	2	FG					0.1				
Roepera ammophila	0.3	20	FG					0.3				
Salsola australis	7	300	SG			7						
Sclerolaena brachyptera	12	500	SG			12						
Sclerolaena obliquicuspis	0.1	1	SG			0.1						
Sonchus sp.	3	100	EX								3	
Tetragonia tetragonioides	0.1	1	FG					0.1				
Tribulus terrestris	2	100	EX								2	
Vittadinia eremaea	0.3	6	FG					0.3				

Easting	539387
Northing	6249678
Orientation	304°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q54			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			29	23	0	6	5	12	0	0	6	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			46.5	**43.9**	0	22.6	4.5	16.8	0	0	**2.6**	0.8
Alyssum linifolium	0.2	30	EX								0.2	
Atriplex holocarpa	3	40	FG					3				
Austrostipa sp.	0.6	40	GG				0.6					
Bulbine alata	0.1	3	FG					0.1				
Calandrinia eremaea	0.1	1	FG					0.1				
Calotis hispidula	0.1	6	FG					0.1				
Carrichtera annua	0.8	50	HT									0.8
Convolvulus crispifolius	0.1	8	FG					0.1				
Dysphania cristata	1	60	FG					1				
Enneapogon avenaceus	3	200	GG				3					
Eragrostis dielsii	0.2	30	GG				0.2					
Erodium cicutarium	0.1	1	EX								0.1	
Erodium crinitum	4	300	FG					4				
Euphorbia drummondii	2	80	FG					2				
lily sp thin cyclimdrical	0.2	20	FG					0.2				
Limonium lobatum	0.4	30	EX								0.4	
Maireana appressa	10	200	SG			10						
Maireana pyramidata	6	50	SG			6						
Maireana sp.	0.1	1	SG			0.1						
Medicago minima	1	100	EX								1	
Poaceae sp. (No fertile material, basal tuft only)	0.1	20	GG				0.1					
Rhodanthe pygmaea	0.1	2	FG					0.1				
Sclerolaena brachyptera	0.2	10	SG			0.2						
Sclerolaena decurrens	0.3	20	SG			0.3						
Sclerolaena obliquicuspis	6	100	SG			6						
Sonchus sp.	0.1	1	EX								0.1	
Tetragonia eremea	6	200	FG					6				
Tragus australianus	0.6	40	GG				0.6					
Vittadinia eremaea	0.1	2	FG					0.1				

Easting	528947
Northing	6248930
Orientation	58°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q55			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 16/07/2020			25	20	0	7	2	11	0	0	5	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			42.4	**36.6**	0	33.1	1.4	2.1	0	0	**5.8**	2
Alyssum linifolium	0.1	1	EX								0.1	
Austrostipa sp.	1	100	GG				1					
Brachyscome ciliaris	0.1	2	FG					0.1				
Carrichtera annua	2	100	HT									2
Convolvulus crispifolius	0.2	8	FG					0.2				
Enneapogon avenaceus	0.4	80	GG				0.4					
Euphorbia drummondii	0.2	30	FG					0.2				
Goodenia pinnatifida	0.2	12	FG					0.2				
Maireana pyramidata	26	80	SG			26						
Maireana sedifolia	0.6	4	SG			0.6						
Maireana sp.	0.1	1	SG			0.1						
Marrubium vulgare	0.2	12	EX								0.2	
Medicago minima	3	300	EX								3	
Nitraria billardierei	2	6	SG			2						
Plantago drummondii	0.4	50	FG					0.4				
Rhodanthe pygmaea	0.1	5	FG					0.1				
Roepera crenata	0.1	2	FG					0.1				
Roepera eremaea	0.1	2	FG					0.1				
Sclerolaena brachyptera	0.3	20	SG			0.3						
Sclerolaena decurrens	0.1	3	SG			0.1						
Sclerolaena obliquicuspis	4	200	SG			4						
Sisymbrium erysimoides	0.5	15	EX								0.5	
Tetragonia eremea	0.4	60	FG					0.4				
Vittadinia eremaea	0.2	50	FG					0.2				
Vittadinia sp.	0.1	1	FG					0.1				

Easting	523282
Northing	6248355
Orientation	80°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q56			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "lunette")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			22	15	0	6	2	7	0	0	7	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			37.6	**33.6**	0	3.5	1	29.1	0	0	**4**	0
Austrostipa nullanulla	0.2	40	GG				0.2					
Calotis hispidula	0.1	1	FG					0.1				
Dissocarpus paradoxus	0.6	40	SG			0.6						
Eragrostis dielsii	0.8	80	GG				0.8					
Erodium cicutarium	0.5	50	EX								0.5	
Euphorbia drummondii	0.1	30	FG					0.1				
Hordeum glaucum	0.2	40	EX								0.2	
Lawrencia glomerata	0.3	60	SG			0.3						
Maireana pyramidata	0.3	2	SG			0.3						
Medicago minima	2	300	EX								2	
Mesembryanthemum nodiflorum	0.1	20	EX								0.1	
Nicotiana glauca	1	2	EX								1	
Roepera compressa	0.6	30	FG					0.6				
Roepera ovatum	0.2	5	FG					0.2				
Roepera similis	26	200	FG					26				
Rostraria pumila	0.1	20	EX								0.1	
Salsola australis	0.1	10	SG			0.1						
Sclerolaena brachyptera	0.2	10	SG			0.2						
Sclerolaena obliquicuspis	2	80	SG			2						
Stenopetalum sphaerocarpum	0.1	1	FG					0.1				
Tetragonia eremea	2	100	FG					2				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	543561
Northing	6255497
Orientation	223°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q57			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 252 Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			16	14	0	1	4	9	0	0	2	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			38.6	36.4	0	3	24.2	9.2	0	0	2.2	0
Austrostipa nitida	23	1000	GG				23					
Calotis hispidula	4	0.1	FG					4				
Dysphania cristata	0.4	30	FG					0.4				
Enneapogon avenaceus	1	40	GG				1					
Eragrostis dielsii	0.1	15	GG				0.1					
Erodium cicutarium	0.2	20	EX								0.2	
Erodium crinitum	0.1	8	FG					0.1				
Euphorbia drummondii	4	200	FG					4				
Lemooria burkittii	0.1	1	FG					0.1				
Medicago minima	2	300	EX								2	
Pimelea simplex	0.1	1	FG					0.1				
Plantago drummondii	0.1	2	FG					0.1				
Poaceae sp. (No fertile material, basal tuft only)	0.1	20	GG				0.1					
Sclerolaena obliquicuspis	3	100	SG			3						
Tetragonia eremaea	0.3	40	FG					0.3				
Vittadinia eremaea	0.1	4	FG					0.1				

Easting	546091
Northing	6256276
Orientation	245°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q58			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 252 Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			21	18	0	3	3	12	0	0	3	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			30.8	**20.4**	0	7.1	8.3	5	0	0	**10.4**	0
Austrostipa nitida	8	1000	GG				8					
Bulbine alata	0.1	3	FG					0.1				
Calotis hispidula	0.1	5	FG					0.1				
Convolvulus crispifolius	0.2	8	FG					0.2				
Dissocarpus paradoxus	6	500	SG			6						
Enneapogon avenaceus	0.1	1	GG				0.1					
Eragrostis dielsii	0.2	10	GG				0.2					
Erodium crinitum	0.1	10	FG					0.1				
Euphorbia drummondii	0.5	60	FG					0.5				
Goodenia pinnatifida	0.2	15	FG					0.2				
Isoetopsis graminifolia	0.1	1	FG					0.1				
Maireana sclerolaenoides	0.1	2	SG			0.1						
Marrubium vulgare	0.2	20	EX								0.2	
Medicago lacinata	0.2	30	EX								0.2	
Medicago minima	10	500	EX								10	
Plantago drummondii	0.1	5	FG					0.1				
Rhodanthe pygmaea	0.1	2	FG					0.1				
Roepera ammophila	0.1	2	FG					0.1				
Roepera crenata	0.4	18	FG					0.4				
Sclerolaena obliquicuspis	1	40	SG			1						
Tetragonia eremaea	3	100	FG					3				

Easting	550238
Northing	6256420
Orientation	4°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.4

Q59			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 252 Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			17	11	1	3	2	5	0	0	6	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			25.4	**18.7**	6	4.1	6	2.6	0	0	**6.7**	0.2
Austrostipa nitida	4	200	GG				4					
Convolvulus crispifolius	0.1	1	FG					0.1				
Dissocarpus paradoxus	3	200	SG			3						
Eragrostis dielsii	2	200	GG				2					
Erodium cicutarium	0.1	5	EX								0.1	
Maireana appressa	0.1	2	SG			0.1						
Medicago lacinata	0.2	40	EX								0.2	
Medicago minima	6	500	EX								6	
Myoporum platycarpum subsp. platycarpum	6	3	TG		6							
Onopordum acaulon	0.1	1	EX								0.1	
Psilocaulon granulicaule	0.2	15	HT									0.2
Roepera ammophila	0.1	1	FG					0.1				
Roepera crenata	0.3	9	FG					0.3				
Sclerolaena obliquicuspis	1	100	SG			1						
Tetragonia eremaea	2	200	FG					2				
Tribulus terrestris	0.1	1	EX								0.1	
Vittadinia eremaea	0.1	2	FG					0.1				

Easting	553544
Northing	6255507
Orientation	173°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	3
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	25
BAM Attributes 1x1 plot (%)	
Litter (%)	1.8

Q60			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			15	13	2	3	2	5	0	1	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			33	**32.7**	22	7.8	0.4	2.4	0	0.1	**0.3**	0
Alectryon oleifolius subsp. canescens	4	1	TG		4							
Austrostipa nitida	0.2	20	GG				0.2					
Calandrinia eremaea	0.1	1	FG					0.1				
Casuarina pauper	18	25	TG		18							
Dissocarpus paradoxus	0.8	50	SG			0.8						
Dysphania cristata	0.1	6	FG					0.1				
Eragrostis dielsii	0.2	20	GG				0.2					
Marsdenia australis	0.1	2	OG							0.1		
Medicago minima	0.2	50	EX								0.2	
Myoporum platycarpum subsp. platycarpum	3	1	SG			3						
Roepera ammophila	0.1	3	FG					0.1				
Sclerolaena obliquicuspis	4	200	SG			4						
Stenopetalum sphaerocarpum	0.1	1	FG					0.1				
Tetragonia eremaea	2	100	FG					2				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	556381
Northing	6255746
Orientation	106°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	1
Length logs (m)	35
BAM Attributes 1x1 plot (%)	
Litter (%)	15

Q61			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			26	19	0	4	1	14	0	0	7	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			35.7	**29.1**	0	4.5	18	6.6	0	0	**6.6**	0
Alyssum linifolium	0.1	4	EX								0.1	
Austrostipa nitida	18	1000	GG				18					
Bulbine alata	0.1	1	FG					0.1				
Calotis hispidula	0.1	10	FG					0.1				
Convolvulus crispifolius	0.1	10	FG					0.1				
Dissocarpus paradoxus	4	200	SG			4						
Dysphania cristata	0.3	40	FG					0.3				
Erodium cicutarium	0.2	20	EX								0.2	
Erodium crinitum	2	100	FG					2				
Euphorbia drummondii	2	100	FG					2				
Goodenia pinnatifida	0.3	40	FG					0.3				
Limonium lobatum	2	100	EX								2	
Maireana sclerolaenoides	0.1	1	SG			0.1						
Marrubium vulgare	0.4	30	EX								0.4	
Medicago lacinata	0.3	30	EX								0.3	
Medicago minima	3	500	EX								3	
Omphalolappula concava	0.1	1	FG					0.1				
Pogonolepis muelleriana	0.1	2	FG					0.1				
Rhodanthe moschata	0.4	40	FG					0.4				
Rhodanthe pygmaea	0.1	2	FG					0.1				
Roepera ovata	0.1	1	FG					0.1				
Roepera iodocarpa	0.3	12	FG					0.3				
Schismus barbatus	0.6	50	EX								0.6	
Sclerolaena obliquicuspis	0.1	20	SG			0.1						
Sclerolaena patenticuspis	0.3	30	SG			0.3						
Tetragonia eremaea	0.6	50	FG					0.6				

Easting	560002
Northing	6254756
Orientation	25°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.26

Q62			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified "bull")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			24	18	2	3	3	10	0	0	6	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			34.7	**33.9**	16	0.7	14.9	2.3	0	0	**0.8**	0
Arctotheca calendula	0.3	20	EX								0.3	
Austrostipa nitida	0.8	50	GG				0.8					
Brassica tournefortii	0.1	1	EX								0.1	
Calandrinia eremaea	0.5	100	FG					0.5				
Calotis hispidula	0.1	1	FG					0.1				
Chenopodium curvispicatum	0.1	1	SG			0.1						
Dissocarpus paradoxus	0.3	40	SG			0.3						
Dysphania cristata	0.1	5	FG					0.1				
Enneapogon avenaceus	0.1	2	GG				0.1					
Erodium crinitum	0.1	1	FG					0.1				
Eucalyptus gracilis	10	5	TG		10							
Eucalyptus socialis	6	3	TG		6							
Euphorbia drummondii	0.1	2	FG					0.1				
Medicago minima	0.1	20	EX								0.1	
Podolepis capillaris	0.2	30	FG					0.2				
Roepera ammophila	0.5	30	FG					0.5				
Roepera similis	0.1	1	FG					0.1				
Rostraria pumila	0.1	1	EX								0.1	
Sclerolaena patenticuspis	0.3	40	SG			0.3						
Sisymbrium erysimoides	0.1	1	EX								0.1	
Stenopetalum sphaerocarpum	0.1	5	FG					0.1				
Tetragonia tetragonioides	0.5	50	FG					0.5				
Tribulus terrestris	0.1	1	EX								0.1	
Triodia scariosa subsp. scariosa	14	30	GG				14					

Easting	560549
Northing	6254674
Orientation	229°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	4
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	23

Q63			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 17/07/2020			21	13	0	1	1	11	0	0	8	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			30.4	**20.1**	0	6	4	10.1	0	0	**10.3**	0
Alyssum linifolium	0.3	30	EX								0.3	
Austrostipa spp.	4	500	GG				4					
Calotis hispidula	0.2	30	FG					0.2				
Convolvulus crispifolius	0.1	4	FG					0.1				
Daucus glochidiatus	0.1	1	FG					0.1				
Dysphania cristata	0.1	20	FG					0.1				
Limonium lobatum	0.1	1	EX								0.1	
Erodium crinitum	0.2	30	FG					0.2				
Euphorbia drummondii	0.2	20	FG					0.2				
Medicago lacinata	0.5	40	EX								0.5	
Medicago minima	4	200	EX								4	
Marrubium vulgare	0.2	40	EX								0.2	
Onopordum acaulon	0.1	3	EX								0.1	
Sclerolaena obliquicuspis	6	100	SG			6						
Roepera iodocarpa	2	40	FG					2				
Roepera crenata	4	80	FG					4				
Schismus barbatus	5	200	EX								5	
Rhodanthe pygmaea	0.1	3	FG					0.1				
Roepera ammophila	0.1	3	FG					0.1				
Tribulus terrestris	0.1	1	EX								0.1	
Tetragonia eremaea	3	100	FG					3				

Easting	562311
Northing	6254377
Orientation	128°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.06

Q64			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "lunette")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 18/7/2020			18	14	0	8	1	5	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			41.1	**33.4**	0	12.6	0.1	20.7	0	0	**7.7**	0
Alyssum linifolium	0.6	20	EX								0.6	
Atriplex vesicaria subsp. vesicaria	0.4	5	SG			0.4						
Austrostipa nullanulla	0.1	2	GG				0.1					
Chondrilla juncea	0.1	5	EX								0.1	
Dissocarpus paradoxus	1	80	SG			1						
Dysphania cristata	0.6	60	FG					0.6				
Geococcus pusillus	0.1	3	FG					0.1				
Maireana appressa	1	200	SG			1						
Maireana pyramidata	4	30	SG			4						
Osteocarpum acropterum var. deminuta	0.8	50	SG			0.8						
Plantago drummondii	8	1000	FG					8				
Roepera similis	2	80	FG					2				
Rostraria pumila	1	200	EX								1	
Salsola australis	2	80	SG			2						
Schismus barbatus	6	1000	EX								6	
Sclerolaena brachyptera	0.4	20	SG			0.4						
Sclerolaena obliquicuspis	3	200	SG			3						
Tetragonia eremaea	10	1000	FG					10				

Easting	543216
Northing	6255100
Orientation	50°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	4

Q65			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 253 Gypseous shrubland on rises in the semi-arid and arid plains (modified "boninka")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 18/07/2020			29	21	0	8	1	12	0	0	8	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			33.7	**31.5**	0	28.6	0.4	2.5	0	0	**2.2**	0.1
Alyssum linifolium	0.1	1	EX								0.1	
Atriplex holocarpa	0.1	2	FG					0.1				
Atriplex lindleyi	0.1	4	FG					0.1				
Brachyscome lineariloba	0.2	20	FG					0.2				
Calotis hispidula	0.1	5	FG					0.1				
Carrichtera annua	0.1	2	HT									0.1
Crassula colorata subsp. acuminatum	0.1	10	FG					0.1				
Dissocarpus paradoxus	0.6	50	SG			0.6						
Dysphania cristata	0.2	30	FG					0.2				
Eragrostis dielsii	0.4	30	GG				0.4					
Euphorbia drummondii	0.1	8	FG					0.1				
Hordeum glaucum	0.1	3	EX								0.1	
Isoetopsis graminifolia	0.1	5	FG					0.1				
Lawrencia glomerata	0.2	30	SG			0.2						
Maireana pyramidata	15	40	SG			15						
Medicago minima	0.5	100	EX								0.5	
Mesembryanthemum nodiflorum	0.5	80	EX								0.5	
Nitraria billardierei	8	5	SG			8						
Osteocarpum acropterum var. deminuta	1	100	SG			1						
Plantago drummondii	0.3	40	FG					0.3				
Pogonolepis muelleriana	0.1	4	FG					0.1				
Rostraria pumila	0.3	50	EX								0.3	
Salsola australis	0.3	12	SG			0.3						
Schismus barbatus	0.3	30	EX								0.3	
Sclerolaena brachyptera	3	100	SG			3						
Sclerolaena obliquicuspis	0.5	30	SG			0.5						
Sisymbrium erysimoides	0.3	20	EX								0.3	
Spergularia brevifolia	0.1	8	FG					0.1				
Tetragonia eremaea	1	80	FG					1				

Easting	543420
Northing	6255532
Orientation	10°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	18

Q66			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 18/07/2020			33	25	1	9	3	12	0	0	8	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			87.7	**64.7**	6	43.4	6	9.3	0	0	**23**	0.5
Alyssum linifolium	0.1	1	EX								0.1	
Atriplex stipitata	0.1	1	SG			0.1						
Austrostipa nitida	0.4	30	GG				0.4					
Boerhavia coccinea	0.5	50	FG					0.5				
Bulbine alata	0.5	40	FG					0.5				
Callitris gracilis subsp. murrayensis	6	1	TG		6							
Calotis hispidula	0.3	30	FG					0.3				
Carrichtera annua	0.4	20	HT									0.4
Dissocarpus paradoxus	4	100	SG			4						
Dysphania cristata	0.6	200	FG					0.6				
Enchylaena tomentosa	1	8	SG			1						
Enneapogon avenaceus	5	200	GG				5					
Erodium crinitum	2	100	FG					2				
Euphorbia drummondii	0.2	20	FG					0.2				
Hordeum glaucum	3	30	EX								3	
Maireana pyramidata	20	50	SG			20						
Marrubium vulgare	0.3	40	EX								0.3	
Medicago minima	18	500	EX								18	
Nitraria billardierei	2	1	SG			2						
Pimelea simplex	0.6	60	FG					0.6				
Psilocaulon granulicaule	0.1	2	HT									0.1
Rhagodia spinescens	3	10	SG			3						
Rhodanthe moschata	0.7	40	FG					0.7				
Rhodanthe pygmaea	0.2	20	FG					0.2				
Roepera similis	0.4	16	FG					0.4				
Salsola australis	0.7	30	SG			0.7						
Schismus barbatus	0.4	40	EX								0.4	
Sclerolaena diacantha	0.6	20	SG			0.6						
Sclerolaena obliquicuspis	12	1000	SG			12						
Sisymbrium erysimoides	0.7	20	EX								0.7	
Tetragonia eremaea	3	200	FG					3				
Tragus australianus	0.6	40	GG				0.6					
Vittadinia eremaea	0.3	20	FG					0.3				

Easting	538935
Northing	6249145
Orientation	240°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	16
BAM Attributes 1x1 plot (%)	
Litter (%)	8

Q67			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 154 Pearl Bluebush low open shrubland of the arid and semi-arid plains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 18/07/2020			17	14	0	5	2	7	0	0	3	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			61.9	**47.3**	0	31.4	3.3	12.6	0	0	**14.6**	2
Austrostipa spp.	0.3	30	GG				0.3					
Calotis hispidula	0.1	1	FG					0.1				
Carthamus lanatus	2	100	HT									2
Enneapogon avenaceus	3	100	GG				3					
Erodium crinitum	10	500	FG					10				
Euphorbia drummondii	0.5	50	FG					0.5				
Lotus cruentus	0.1	4	FG					0.1				
Maireana appressa	0.1	1	SG			0.1						
Maireana pyramidata	4	10	SG			4						
Maireana sedifolia	24	60	SG			24						
Medicago lacinata	0.6	60	EX								0.6	
Medicago minima	12	500	EX								12	
Roepera crenata	1	30	FG					1				
Sclerolaena diacantha	0.3	8	SG			0.3						
Sclerolaena obliquicuspis	3	100	SG			3						
Tetragonia eremaea	0.8	80	FG					0.8				
Vittadinia eremaea	0.1	4	FG					0.1				

Easting	52263
Northing	6248524
Orientation	321°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	7

Q68			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 19 Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			32	24	1	3	4	16	0	0	8	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			52.3	**40.4**	8	1.7	1.8	28.9	0	0	**11.9**	0
Boerhavia dominii	0.2	10	FG					0.2				
Brassica tournefortii	3	50	EX								3	
Bulbine alata	0.1	5	FG					0.1				
Calandrinia eremaea	0.1	5	FG					0.1				
Callitris gracilis subsp. murrayensis	8	2	TG		8							
Calotis hispidula	0.1	30	FG					0.1				
Chondrilla juncea	0.1	1	EX								0.1	
Chthonocephalus pseudevax	0.2	40	FG					0.2				
Citrullus colocynthis	0.1	1	EX								0.1	
Crassula colorata var. acuminata	0.1	20	FG					0.1				
Cucmis myriocarpus	0.1	2	EX								0.1	
Dysphania cristata	2	100	FG					2				
Enneapogon avenaceus	0.2	30	GG				0.2					
Eragrostis dielsii	1	200	GG				1					
Erodium cicutarium	0.1	1	EX								0.1	
Erodium crinitum	0.3	40	FG					0.3				
Euphorbia drummondii	0.1	2	FG					0.1				
hairy rutidosis pterocaulen	1	30	FG					1				
Hordeum glaucum	0.4	20	EX								0.4	
Hypochaeris glabra	0.1	1	EX								0.1	
Medicago minima	8	1000	EX								8	
Nicotiana velutina	3	50	FG					3				
Phyllanthus lacunarius	0.5	40	FG					0.5				
Poaceae sp. (No fertile material, basal tuft only)	0.1	10	GG				0.1					
Polycalymma stuartii	7	100	FG					7				
Roepera ammophila	12	50	FG					12				
Salsola australis	1	40	SG			1						
Scleranthus minusculus	0.2	50	FG					0.2				
Sclerolaena obliquicuspis	0.6	40	SG			0.6						
Swainsona microphylla	0.1	1	SG			0.1						
Tetragonia moorei	2	100	FG					2				
Tragus australianus	0.5	40	GG				0.5					

Easting	564982
Northing	6254145
Orientation	210°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	3
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	47
BAM Attributes 1x1 plot (%)	
Litter (%)	10

Q69			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 19 Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			29	21	1	4	4	12	0	0	8	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			79.1	**52.4**	7	10.1	0.5	34.8	0	0	**26.7**	0
Boerhavia coccinea	0.2	10	FG					0.2				
Brassica tournefortii	6	200	EX								6	
Bulbine alata	0.2	30	FG					0.2				
Calandrinia eremaea	0.1	20	FG					0.1				
Callitris glaucophylla	7	2	TG		7							
Calotis hispidula	1	0.1	FG					1				
Chondrilla juncea	0.1	4	EX								0.1	
Citrullus colocynthis	0.1	1	EX								0.1	
Cucmis myriocarpus	0.1	3	EX								0.1	
Dysphania cristata	10	200	FG					10				
Enchylaena tomentosa	4	12	SG			4						
Enneapogon avenaceus	0.1	10	GG				0.1					
Hordeum glaucum	3	40	EX								3	
Medicago minima	15	1000	EX								15	
Nicotina velutina	5	100	SG			5						
Panicum effusum	0.2	30	GG				0.2					
Phyllanthus lacunarius	1	80	FG					1				
Poaceae sp. (No fertile material, basal tuft only)	0.1	10	GG				0.1					
Polycalymma stuartii	3	100	FG					3				
Roepera ammophila	16	100	FG					16				
Salsola australis	1	60	SG			1						
Schismus barbatus	2	60	EX								2	
Scleranthus minusculus	0.1	20	FG					0.1				
Sclerolaena obliquicuspis	0.1	5	SG			0.1						
Sisymbrium erysimoides	0.4	10	EX								0.4	
Stenopetalum lineare	0.1	2	FG					0.1				
Tetragonia moorei	3	100	FG					3				
Triraphis mollis	0.1	1	GG				0.1					
Vittadinia eremaea	0.1	1	FG					0.1				

Easting	565168
Northing	6254222
Orientation	60°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	13
BAM Attributes 1x1 plot (%)	
Litter (%)	11

Q70			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 15 Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			20	17	1	6	2	8	0	0	3	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			38.8	**37.7**	15	16.2	2.4	4.1	0	0	**1.1**	0
Brachyscome lineariloba	0.1	1	FG					0.1				
Bulbine alata	0.1	5	FG					0.1				
Calandrinia eremaea	0.1	2	FG					0.1				
Dysphania cristata	2	60	FG					2				
Enchylaena tomentosa	6	40	SG			6						
Eucalyptus largiflorens	15	3	TG		15							
Euphorbia drummondii	1	100	FG					1				
Limonium lobatum	0.2	20	EX								0.2	
Maireana pentatropis	2	100	SG			2						
Maireana pyramidata	3	6	SG			3						
Omphalolappula concava	0.1	1	FG					0.1				
Poaceae sp.	0.4	40	GG				0.4					
Roepera ammophila	0.4	20	FG					0.4				
Salsola australis	0.4	40	SG			0.4						
Schismus barbatus	0.5	50	EX								0.5	
Sclerolaena diacantha	0.8	40	SG			0.8						
Sclerolaena obliquicuspis	4	200	SG			4						
Sisymbrium erysimoides	0.4	20	EX								0.4	
Tetragonia moorei	2	200	GG				2					
Tripogon lolliformis	0.3	50	FG					0.3				

Easting	566134
Northing	6254292
Orientation	325°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	3
20-29	No
10-19	No
5-9	No
<5	No
Hollows	4
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	45

Q71			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			22	11	0	3	2	6	0	0	11	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			47	24.8	0	9	5	10.8	0	0	22.2	0.2
Alyssum linifolium	0.1	5	EX								0.1	
Austrostipa nitida	4	300	GG				4					
Brassica tournefortii	3	80	EX								3	
Bulbine semibarbata	0.6	50	FG					0.6				
Calotis hispidula	0.8	60	FG					0.8				
Carrichtera annua	0.1	1	HT									0.1
Dissocarpus paradoxus	6	500	SG			6						
Eragrostis dielsii	1	60	GG				1					
Erodium crinitum	0.3	30	FG					0.3				
Limonium lobatum	2	100	EX								2	
Marrubium vulgare	0.1	1	EX								0.1	
Medicago lacinata	16	500	EX								16	
Medicago minima	0.5	80	EX								0.5	
Onopordum acaulon	0.1	6	EX								0.1	
Psilocaulon granulicaule	0.1	1	HT									0.1
Roepera crenata	8	100	FG					8				
Roepera ovata	0.1	1	FG					0.1				
Sclerolaena diacantha	2	100	SG			2						
Sclerolaena obliquicuspis	1	50	SG			1						
Sisymbrium erysimoides	0.1	3	EX								0.1	
Tetragonia moorei	1	60	FG					1				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	572000
Northing	6253663
Orientation	285°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	2

Q72			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 252 Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			22	14	1	4	1	8	0	0	8	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			50.8	**35.4**	2	17.5	2	13.9	0	0	**15.4**	0.1
Brassica tournefortii	0.5	30	EX								0.5	
Bulbine semibarbata	2	100	FG					2				
Calotis hispidula	0.3	30	FG					0.3				
Dissocarpus paradoxus	14	500	SG			14						
Dysphania cristata	0.3	40	FG					0.3				
Eragrostis dielsii	2	100	GG				2					
Erodium crinitum	0.4	30	FG					0.4				
Euphorbia drummondii	0.2	40	FG					0.2				
Hordeum glaucum	0.2	10	EX								0.2	
Limonium lobatum	4	100	EX								4	
Medicago lacinata	0.5	50	EX								0.5	
Medicago minima	5	500	EX								5	
Myoporum platycarpum subsp. platycarpum	2	1	TG		2							
Onopordum acaulon	5	90	EX								5	
Psilocaulon granulicaule	0.1	1	HT									0.1
Roepera ammophila	0.7	15	FG					0.7				
Roepera crenata	8	100	FG					8				
Salsola australis	0.5	20	SG			0.5						
Sclerolaena diacantha	2	80	SG			2						
Sclerolaena obliquicuspis	1	40	SG			1						
Tetragonia moorei	2	80	FG					2				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	571055
Northing	6254365
Orientation	250°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.44

Q73			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 15 Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			7	5	1	3	1	0	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			37.8	**36.7**	36	0.5	0.2	0	0	0	**1.1**	0
Enchylaena tomentosa	0.3	20	SG			0.3						
Eucalyptus largiflorens	36	6	TG		36							
Maireana pyramidata	0.1	1	SG			0.1						
Medicago minima	0.1	1	EX								0.1	
Poaceae sp. (basal tuft only, no fertile material)	0.2	30	GG				0.2					
Rhagodia spinescens	0.1	1	SG			0.1						
Sisymbrium erysimoides	1	1000	EX								1	

Easting	567077
Northing	6254087
Orientation	122°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	7
30-49	3
20-29	No
10-19	No
5-9	No
<5	No
Hollows	5
Length logs (m)	54
BAM Attributes 1x1 plot (%)	
Litter (%)	67

Q74			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			11	8	2	2	1	2	0	1	3	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			24.6	**23.9**	21	2.1	0.1	0.6	0	0.1	**0.7**	0
Alectryon oleifolius subsp. canescens	3	2	TG		3							
Austrostipa nitida	0.1	30	GG				0.1					
Casuarina pauper	18	20	TG		18							
Dissocarpus paradoxus	2	300	SG			2						
Limonium lobatum	0.1	8	EX								0.1	
Medicago minima	0.5	100	EX								0.5	
Rhyncharrhena linearis	0.1	2	OG							0.1		
Roepera ammophila	0.5	30	FG					0.5				
Roepera crenata	0.1	1	FG					0.1				
Sclerolaena obliquicuspis	0.1	2	SG			0.1						
Tribulus terrestris	0.1	1	EX								0.1	

Easting	575590
Northing	6253211
Orientation	49°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	85
BAM Attributes 1x1 plot (%)	
Litter (%)	36

Q75			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			21	12	0	3	2	7	0	0	9	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			46.5	**28.5**	0	22.9	0.8	4.8	0	0	**18**	0.1
Alyssum linifolium	0.4	30	EX								0.4	
Brassica tournefortii	0.2	10	EX								0.2	
Bulbine semibarbata	0.1	1	FG					0.1				
Calotis hispidula	0.5	40	FG					0.5				
Carrichtera annua	0.1	1	HT									0.1
Dissocarpus paradoxus	22	2000	SG			22						
Dysphania cristata	2	100	FG					2				
Enneapogon avenaceus	0.7	50	GG				0.7					
Erodium crinitum	0.5	40	FG					0.5				
Euphorbia drummondii	0.4	60	FG					0.4				
Limonium lobatum	6	500	EX								6	
Marrubium vulgare	0.4	30	EX								0.4	
Medicago lacinata	3	200	EX								3	
Medicago minima	7	1000	EX								7	
Poaceae sp. (basal tuft only, no fertile material)	0.1	10	GG				0.1					
Roepera ammophila	0.3	6	FG					0.3				
Roepera crenata	1	15	FG					1				
Salsola australis	0.5	30	SG			0.5						
Schismus barbatus	0.8	50	EX								0.8	
Sclerolaena obliquicuspis	0.4	40	SG			0.4						
Tribulus terrestris	0.1	1	EX								0.1	

Easting	576094
Northing	6253237
Orientation	200°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.5

Q76			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 19/07/2020			6	3	0	2	1	0	0	0	3	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			51.4	**36.1**	0	36	0.1	0	0	0	**15.3**	0
Austrostipa nitida	0.1	4	GG				0.1					
Limonium lobatum	0.2	5	EX								0.2	
Maireana pyramidata	35	120	SG			35						
Medicago minima	15	2000	EX								15	
Schismus barbatus	0.1	5	EX								0.1	
Sclerolaena obliquicuspis	1	50	SG			1						

Easting	586026
Northing	6255785
Orientation	202°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q77			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 15 Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			27	19	1	8	0	10	0	0	8	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			69.3	64.5	14	42.2	0	8.3	0	0	4.8	3
Alyssum linifolium	0.1	1	EX								0.1	
Atriplex holocarpa	0.4	30	FG					0.4				
Atriplex lindleyi	0.1	5	FG					0.1				
Brachyscome lineariloba	0.1	6	FG					0.1				
Calandrinia eremaea	0.1	2	FG					0.1				
Calotis hispidula	0.2	30	FG					0.2				
Crassula colorata var. acuminata	0.3	500	FG					0.3				
Dissocarpus paradoxus	0.5	40	SG			0.5						
Enchylaena tomentosa	4	30	SG			4						
Eucalyptus largiflorens	14	9	TG		14							
Limonium lobatum	0.2	20	EX								0.2	
Maireana georgei	0.1	1	SG			0.1						
Maireana pyramidata	32	100	SG			32						
Malva parviflora	0.3	20	EX								0.3	
Mesembryanthemum nodiflorum	0.3	40	EX								0.3	
Onopordum acaulon	0.1	4	EX								0.1	
Osteocarpum acropterum var. deminuta	0.2	20	SG			0.2						
Plantago cunninghamii	0.1	3	FG					0.1				
Psilocaulon granulicaule	3	50	HT									3
Rhagodia spinescens	0.3	2	SG			0.3						
Roepera eremaea	1	40	FG					1				
Salsola australis	0.1	1	SG			0.1						
Schismus barbatus	0.7	80	EX								0.7	
Sclerolaena diacantha	5	500	SG			5						
Tetragonia eremaea	1	30	FG					1				
Tetragonia moorei	5	100	FG					5				
Tribulus terrestris	0.1	1	EX								0.1	

Easting	590253
Northing	6255762
Orientation	160°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	1
30-49	2
20-29	Yes
10-19	No
5-9	No
<5	Yes
Hollows	1
Length logs (m)	37
BAM Attributes 1x1 plot (%)	
Litter (%)	20

Q78			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			26	20	0	6	4	10	0	0	6	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			52	35	0	22.5	5	7.5	0	0	17	0
Brachyscome lineariloba	0.3	40	FG					0.3				
Brassica tournefortii	0.1	2	EX								0.1	
Bulbine alata	0.2	20	FG					0.2				
Calotis hispidula	0.2	20	FG					0.2				
Dysphania cristata	0.1	2	FG					0.1				
Emex australis	0.2	20	EX								0.2	
Enchylaena tomentosa	0.1	1	SG			0.1						
Enneapogon avenaceus	0.5	60	GG				0.5					
Erodium crinitum	0.6	40	FG					0.6				
Goodenia pinnatifida	0.1	1	FG					0.1				
Hyalosperma semisterile	0.4	40	FG					0.4				
Isoetopsis graminifolia	0.1	1	FG					0.1				
Limonium lobatum	9	500	EX								9	
Maireana appressa	0.1	3	SG			0.1						
Maireana pyramidata	18	80	SG			18						
Medicago minima	7	500	EX								7	
Poaceae sp. (basal tuft only, no fertile material)	0.1	10	GG				0.1					
Rostraria pumila	0.4	50	EX								0.4	
Salsola australis	0.2	6	SG			0.2						
Schismus barbatus	0.3	50	EX								0.3	
Sclerolaena diacantha	0.1	3	SG			0.1						
Sclerolaena obliquicuspis	4	100	SG			4						
Tetragonia eremea	5	100	FG					5				
Tetragonia moorei	0.5	20	FG					0.5				
Tragus australianus	4	600	GG				4					
Tripogon lolliformis	0.4	50	GG				0.4					

Easting	588626
Northing	6255942
Orientation	240°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q79			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 139 Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			28	20	0	5	3	11	0	1	8	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			73.7	**31.9**	0	19.8	1.1	10	0	1	**41.8**	0
Acacia victoriae	15	4	SG			15						
Austrostipa nitida	0.3	20	GG				0.3					
Brassica tournefortii	9	100	EX								9	
Bulbine semibarbata	2	100	FG					2				
Calandrinia eremaea	0.1	10	FG					0.1				
Calotis hispidula	3	80	FG					3				
Crassula colorata var. acuminata	0.1	40	FG					0.1				
Dissocarpus paradoxus	0.1	2	SG			0.1						
Dysphania cristata	0.1	5	FG					0.1				
Echium plantagineum	0.8	30	EX								0.8	
Emex australis	1	50	EX								1	
Enchylaena tomentosa	0.2	1	SG			0.2						
Enneapogon avenaceus	0.3	40	GG				0.3					
Erodium cicutarium	2	80	EX								2	
Geococcus pusillus	0.1	1	FG					0.1				
Hypochaeris radicata	0.2	5	EX								0.2	
Lysiana exocarpi subsp. exocarpi	1	2	OG							1		
Maireana pyramidata	4	4	SG			4						
Medicago minima	28	1000	EX								28	
Millotia perpusilla	0.1	6	FG					0.1				
Nicotiana velutina	2	40	FG					2				
Poaceae sp. (basal tuft only, no fertile material)	0.5	40	GG				0.5					
Polycalymma stuartii	0.4	12	FG					0.4				
Salsola australis	0.5	30	SG			0.5						
Schismus barbatus	0.6	50	EX								0.6	
Silene apetala	0.2	20	EX								0.2	
Tetragonia moorei	2	60	FG					2				
Wurmbea citrina	0.1	20	FG					0.1				

Easting	593341
Northing	6253049
Orientation	52°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	Yes
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	2.6

Q80			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 139 Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			30	21	0	5	3	12	0	1	9	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			53.2	**21.5**	0	12.7	0.4	6.4	0	2	**31.7**	0
Acacia victoriae	12	15	SG			12						
Actinobole uliginosum	0.1	1	FG					0.1				
Austrostipa nitida	0.1	10	GG				0.1					
Brachyscome lineariloba	0.1	1	FG					0.1				
Brassica tournefortii	2	80	EX								2	
Calotis hispidula	0.4	60	FG					0.4				
Crassula colorata var. acuminata	0.1	50	FG					0.1				
Daucus glochidiatus	0.1	2	FG					0.1				
Dysphania cristata	0.1	8	FG					0.1				
Echium plantagineum	10	300	EX								10	
Emex australis	0.5	20	EX								0.5	
Enchylaena tomentosa	0.1	5	SG			0.1						
Enneapogon avenaceus	0.1	30	GG				0.1					
Erodium cicutarium	0.8	60	EX								0.8	
Goodenia pinnatifida	1	200	FG					1				
Hypochaeris radicata	0.1	1	EX								0.1	
Isoetopsis graminifolia	0.8	100	FG					0.8				
Lysiana exocarpi subsp. exocarpi	2	2	OG							2		
Maireana pyramidata	0.1	2	SG			0.1						
Medicago minima	18	1000	EX								18	
Millotia perpusilla	0.5	40	FG					0.5				
Poaceae sp. (basal tuft only, no fertile material)	0.2	40	GG				0.2					
Polycalymma stuartii	0.1	5	FG					0.1				
Rhodanthe moschata	0.1	4	FG					0.1				
Salsola australis	0.3	16	SG			0.3						
Schismus barbatus	0.1	10	EX								0.1	
Sclerolaena obliquicuspis	0.2	30	SG			0.2						
Silene apetala	0.1	30	EX								0.1	
Solanum nigrum	0.1	1	EX								0.1	
Tetragonia moorei	3	100	FG					3				

Easting	592913
Northing	6255219
Orientation	315°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.36

Q81			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 166 Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			20	18	0	7	2	9	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			56.5	54.3	0	22.4	0.2	31.7	0	0	2.2	0
Atriplex holocarpa	1	40	FG					1				
Atriplex lindleyi	3	30	FG					3				
Atriplex sp. (no fruiting bracteoles)	0.1	2	FG					0.1				
Brachyscome lineariloba	0.3	40	FG					0.3				
Calotis hispidula	1	60	FG					1				
Enchylaena tomentosa	0.1	1	SG			0.1						
Enneapogon avenaceus	0.1	20	GG				0.1					
Euphorbia drummondii	0.1	1	FG					0.1				
Geococcus pusillus	0.1	1	FG					0.1				
Goodenia pinnatifida	0.1	2	FG					0.1				
Maireana pyramidata	2	4	SG			2						
Medicago minima	2	100	EX								2	
Osteocarpum acropterum var. deminuta	0.1	1	SG			0.1						
Poaceae sp. (no fertile material)	0.1	10	GG				0.1					
Salsola australis	0.2	30	SG			0.2						
Schismus barbatus	0.2	30	EX								0.2	
Sclerolaena brachyptera	2	80	SG			2						
Sclerolaena divaricata	3	30	SG			3						
Sclerolaena obliquicuspis	15	1000	SG			15						
Tetragonia eremaea	26	1000	FG					26				

Easting	592981
Northing	6253125
Orientation	146°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q82			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 166 Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			18	13	0	6	0	7	0	0	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			27.2	26	0	12.5	0	13.5	0	0	1.2	0
Atriplex holocarpa	0.3	15	FG					0.3				
Bulbine semibarbata	0.1	1	FG					0.1				
Maireana georgei	2	3	SG			2						
Maireana pyramidata	2	8	SG			2						
Medicago minima	0.4	50	EX								0.4	
Medicago polymorpha	0.2	20	EX								0.2	
Mesembryanthemum nodiflorum	0.2	30	EX								0.2	
Osteocarpum acropterum var. deminuta	0.4	60	SG			0.4						
Rhagodia spinescens	0.1	1	SG			0.1						
Roepera ovatum	0.1	1	FG					0.1				
Rostraria pumila	0.1	5	EX								0.1	
Salsola australis	0.2	20	FG					0.2				
Schismus barbatus	0.3	40	EX								0.3	
Sclerolaena brachyptera	0.5	60	FG					0.5				
Sclerolaena divaricata	2	30	SG			2						
Sclerolaena obliquicuspis	6	500	SG			6						
Tetragonia eremaea	12	2000	FG					12				
Tetragonia moorei	0.3	20	FG					0.3				

Easting	592651
Northing	6253138
Orientation	13°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
Oct-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q83			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 11 River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			38	28	1	12	1	11	1	2	10	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			84.4	**54.4**	25	17.9	0.5	9.3	0.5	1.2	**30**	0
Amyema miquelii	1	2	OG							1		
Atriplex pseudocampanulata	1	40	SG			1						
Atriplex semibaccata	0.1	2	SG			0.1						
Brachyscome ciliaris	0.3	40	FG					0.3				
Brassica tournefortii	0.1	1	EX								0.1	
Calotis hispidula	0.1	2	FG					0.1				
*Cirsium vulgare**	0.1	1	FG					0.1				
Cynodon dactylon	0.5	20	GG				0.5					
Duma florulenta	5	8	SG			5						
Echium plantagineum	0.1	1	EX								0.1	
Enchylaena tomentosa	6	40	FG					6				
Eucalyptus camaldulensis	25	1	TG		25							
Euphorbia drummondii	0.1	1	FG					0.1				
Goodenia glauca	0.2	30	FG					0.2				
Hypochaeris radicata	0.1	1	EX								0.1	
Lysiana exocarpi subsp. exocarpi	0.2	1	OG							0.2		
Maireana appressa	0.1	1	SG			0.1						
Maireana brevifolia	0.1	1	SG			0.1						
Malva parviflora	0.3	8	EX								0.3	
Marsilea drummondii	0.5	50	EG						0.5			
Medicago polymorpha	25	200	EX								25	
Mesembryanthemum nodiflorum	0.1	2	EX								0.1	
Oxalis perennans	0.1	2	FG					0.1				
Pittosporum angustifolium	0.1	1	SG			0.1						
Rhagodia spinescens	10	16	SG			10						
Rumex brownii	0.2	14	FG					0.2				
Schismus barbatus	0.1	2	EX								0.1	
Sclerolaena brachyptera	0.1	2	SG			0.1						
Sclerolaena diacantha	0.1	2	SG			0.1						
Sclerolaena divaricata	0.2	5	SG			0.2						
Sclerolaena muricata var. semiglabra	1	12	SG			1						
Sclerolaena tricuspis	0.1	4	SG			0.1						
Silene apetala	0.1	2	EX								0.1	
Sisymbrium erysimoides	4	50	EX								4	
Solanum esuriale	0.2	6	FG					0.2				
Sonchus oleraceus	0.1	1	EX								0.1	
Swainsona greyana	1	8	FG					1				
Tetragonia moorei	1	40	FG					1				

Easting	592535
Northing	6253104
Orientation	319°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	1
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	12.5
BAM Attributes 1x1 plot (%)	
Litter (%)	49

Q84			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 15 Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			23	18	1	6	0	11	0	0	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			59.4	43.8	6	34.7	0	3.1	0	0	15.6	0
Actinobole uliginosum	0.1	1	FG					0.1				
Alyssum linifolium	0.3	30	EX								0.3	
Brassica tournefortii	0.1	1	EX								0.1	
Bulbine alata	0.4	40	FG					0.4				
Crassula colorata var. acuminata	0.1	5	FG					0.1				
Dysphania cristata	0.1	2	FG					0.1				
Einadia nutans subsp. nutans	0.1	2	FG					0.1				
Enchylaena tomentosa	6	30	SG			6						
Eucalyptus largiflorens	6	1	TG		6							
Geococcus pusillus	0.2	16	FG					0.2				
Goodenia pinnatifida	0.8	60	FG					0.8				
Hordeum glaucum	0.1	1	FG					0.1				
Maireana appressa	0.2	1	SG			0.2						
Maireana pyramidata	28	100	SG			28						
Medicago minima	12	1000	EX								12	
Rhodanthe moschata	0.1	1	FG					0.1				
Roepera similis	0.6	50	FG					0.6				
Rostraria pumila	0.2	17	EX								0.2	
Schismus barbatus	3	100	EX								3	
Sclerolaena diacantha	0.1	5	SG			0.1						
Sclerolaena divaricata	0.1	1	SG			0.1						
Sclerolaena obliquicuspis	0.3	30	SG			0.3						
Tetragonia moorei	0.5	30	FG					0.5				

Easting	594520
Northing	6251560
Orientation	218°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	2
30-49	2
20-29	No
10-19	No
5-9	No
<5	No
Hollows	4
Length logs (m)	28
BAM Attributes 1x1 plot (%)	
Litter (%)	8

Q85			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 15 Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			11	7	1	4	0	2	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			58.3	**57**	11	45.4	0	0.6	0	0	**1.3**	0
Alyssum linifolium	0.1	4	EX								0.1	
Enchylaena tomentosa	3	30	SG			3						
Eucalyptus largiflorens	11	4	TG		11							
Maireana georgei	0.3	2	SG			0.3						
Maireana pyramidata	42	200	SG			42						
Medicago minima	1	40	EX								1	
Roepera similis	0.3	30	FG					0.3				
Schismus barbatus	0.1	10	EX								0.1	
Sclerolaena obliquicuspis	0.1	8	SG			0.1						
Sisymbrium erysimoides	0.1	1	EX								0.1	
Tetragonia eremaea	0.3	30	FG					0.3				

Easting	596833
Northing	6248832
Orientation	178°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	Yes
10-19	No
5-9	No
<5	No
Hollows	3
Length logs (m)	26
BAM Attributes 1x1 plot (%)	
Litter (%)	16

Q86			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 63 Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 20/07/2020			20	16	0	8	0	8	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			22.9	21.6	0	9.9	0	11.7	0	0	1.3	0
Alyssum linifolium	0.3	50	EX								0.3	
Atriplex eardleyae	2	100	SG			2						
Atriplex holocarpa	1	30	FG					1				
Atriplex lindleyi	3	60	FG					3				
Brachyscome lineariloba	0.4	80	FG					0.4				
Calotis hispidula	0.1	30	FG					0.1				
Chenopodium nitrariaceum	3	9	SG			3						
Duma horrida subsp. horrida	2	7	SG			2						
Enchylaena tomentosa	0.2	2	SG			0.2						
Erodium cicutarium	0.3	40	EX								0.3	
Erodium crinitum	4	1000	FG					4				
Leptorhynchos waitzia	0.1	1	FG					0.1				
Maireana pyramidata	0.3	2	SG			0.3						
Medicago minima	0.6	80	EX								0.6	
Osteocarpum acropterum var. deminuta	0.3	60	SG			0.3						
Rhodanthe moschata	0.1	3	FG					0.1				
Rostraria pumila	0.1	2	EX								0.1	
Sclerolaena brachyptera	0.1	4	SG			0.1						
Sclerolaena obliquicuspis	2	100	SG			2						
Tetragonia eremaea	3	200	FG					3				

Easting	592791
Northing	6253032
Orientation	176°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q87			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			30	19	0	9	3	7	0	0	11	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			55.8	**27.6**	0	18	2.8	6.8	0	0	**28.2**	0.4
Alyssum linifolium	0.1	5	EX								0.1	
Atriplex stipitata	0.1	1	SG			0.1						
Austrostipa sp.	0.1	10	GG				0.1					
Boerhavia coccinea	0.1	4	FG					0.1				
Brassica tournefortii	0.6	30	EX								0.6	
Convolvulus crispifolius	0.3	30	FG					0.3				
Dissocarpus paradoxus	0.6	30	SG			0.6						
Dysphania cristata	4	300	FG					4				
Echium plantagineum	0.1	2	EX								0.1	
Enchylaena tomentosa	3	10	SG			3						
Enneapogon avenaceus	0.7	50	GG				0.7					
Euphorbia drummondii	0.8	80	FG					0.8				
Goodenia pinnatifida	0.1	2	FG					0.1				
Hordeum leporinum	0.1	2	EX								0.1	
Limonium lobatum	0.3	20	EX								0.3	
Maireana brevifolia	8	25	SG			8						
Maireana pyramidata	4	12	SG			4						
Malva parviflora	0.1	2	EX								0.1	
Marrubium vulgare	0.4	40	EX								0.4	
Medicago minima	25	1000	EX								25	
Onopordum acaulon	0.1	1	EX								0.1	
Psilocaulon granulicaule	0.4	20	HT									0.4
Salsola australis	0.8	40	SG			0.8						
Schismus barbatus	1	80	EX								1	
Sclerolaena brachyptera	0.1	1	SG			0.1						
Sclerolaena obliquicuspis	1	100	SG			1						
Sida intricata	0.4	20	SG			0.4						
Solanum esuriale	0.5	60	FG					0.5				
Tetragonia eremaea	1	80	FG					1				
Tragus australianus	2	100	GG				2					

Easting	598546
Northing	6246826
Orientation	312°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q88			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 153 Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			22	18	0	6	2	10	0	0	4	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			48.8	44.8	0	33.5	3.7	7.6	0	0	4	0
Alyssum linifolium	0.1	15	EX								0.1	
Austrostipa sp.	0.7	100	GG				0.7					
Calotis hispidula	0.1	2	FG					0.1				
Dissocarpus paradoxus	0.4	60	SG			0.4						
Enchylaena tomentosa	0.5	10	SG			0.5						
Enneapogon avenaceus	3	500	GG				3					
Erodium crinitum	5	1000	FG					5				
Euphorbia drummondii	0.4	50	FG					0.4				
Goodenia pinnatifida	0.1	2	FG					0.1				
Isoetopsis graminifolia	0.4	50	FG					0.4				
lily sp thin cyclimdrical (no fertile material)	0.1	7	FG					0.1				
Limonium lobatum	0.4	20	EX								0.4	
Maireana georgei	23	100	SG			23						
Maireana pyramidata	9	20	SG			9						
Maireana sclerolaenoides	0.2	12	SG			0.2						
Medicago minima	3	200	EX								3	
Rhodanthe pygmaea	0.3	30	FG					0.3				
Roepera crenata	1	50	FG					1				
Schismus barbatus	0.5	60	EX								0.5	
Sclerolaena obliquicuspis	0.4	60	SG			0.4						
Tetragonia eremaea	0.1	2	FG					0.1				
Vittadinia sp.	0.1	1	FG					0.1				

Easting	600228
Northing	6244814
Orientation	287°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0

Q89			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/7/2020			28	23	1	8	2	12	0	0	5	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			40.2	**38.8**	18	4.9	12.1	3.8	0	0	**1.4**	0.4
Ajuga australis	0.4	5	FG					0.4				
Atriplex stipitata	0.5	8	SG			0.5						
Austrostipa sp.	0.1	10	GG				0.1					
Brachyscome lineariloba	0.3	40	FG					0.3				
Brassica tournefortii	0.6	50	EX								0.6	
Calandrinia eremaea	0.2	30	FG					0.2				
Calotis hispidula	0.1	2	FG					0.1				
Chenopodium desertorum subsp. desertorum	0.4	13	SG			0.4						
Citrullus colocynthis	0.1	1	EX								0.1	
Daucus glochidiatus	0.1	1	FG					0.1				
Dissocarpus paradoxus	0.3	16	SG			0.3						
Dysphania cristata	0.5	40	FG					0.5				
Einadia nutans subsp. nutans	0.1	1	FG					0.1				
Enchylaena tomentosa	2	15	SG			2						
Erodium crinitum	0.1	4	FG					0.1				
Eucalyptus dumosa	18	8	TG		18							
Hordeum glaucum	0.3	10	EX								0.3	
lily sp thin cyclimdrical (no fertile material)	0.1	1	FG					0.1				
Lycium ferocissimum	0.3	1	HT									0.3
Maireana sclerolaenoides	0.1	2	SG			0.1						
Omphalolappula concava	0.1	2	FG					0.1				
Oxalis perennans	1	30	FG					1				
Psilocaulon granulicaule	0.1	1	HT									0.1
Salsola australis	0.2	8	SG			0.2						
Sclerolaena diacantha	0.9	40	SG			0.9						
Sclerolaena obliquicuspis	0.5	50	SG			0.5						
Tetragonia eremaea	0.8	100	FG					0.8				
Triodia scariosa subsp. scariosa	12	40	GG				12					

Easting	601230
Northing	6243693
Orientation	227°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	4
Length logs (m)	29
BAM Attributes 1x1 plot (%)	
Litter (%)	47

Q90			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/7/2020			14	11	1	7	1	2	0	0	3	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			32.4	31.6	14	4	13	0.6	0	0	0.8	0.2
Atriplex stipitata	0.2	2	SG			0.2						
Brassica tournefortii	0.5	30	EX								0.5	
Chenopodium desertorum subsp. desertorum	0.7	20	SG			0.7						
Chondrilla juncea	0.1	1	EX								0.1	
Einadia nutans subsp. nutans	0.1	2	FG					0.1				
Enchylaena tomentosa	1	16	SG			1						
Eucalyptus socialis	14	6	TG		14							
Maireana brevifolia	0.4	4	SG			0.4						
Maireana pentatropis	0.6	20	SG			0.6						
Oxalis perennans	0.5	20	FG					0.5				
Psilocaulon granulicaule	0.2	5	HT									0.2
Sclerolaena diacantha	1	40	SG			1						
Sclerolaena obliquicuspis	0.1	2	SG			0.1						
Triodia scariosa subsp. scariosa	13	25	GG				13					

Easting	601573
Northing	6243203
Orientation	261°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	4
Length logs (m)	34
BAM Attributes 1x1 plot (%)	
Litter (%)	42

Q91			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			17	15	2	10	1	2	0	0	2	1
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			44.6	40.6	24	16	0.1	0.5	0	0	4	3
Atriplex stipitata	0.1	1	SG			0.1						
Brassica tournefortii	1	40	EX								1	
Chenopodium desertorum subsp. desertorum	0.4	20	SG			0.4						
Dissocarpus paradoxus	0.3	30	SG			0.3						
Enchylaena tomentosa	8	40	SG			8						
Eucalyptus dumosa	6	2	TG		6							
Eucalyptus socialis	18	7	TG		18							
Maireana brevifolia	1	8	SG			1						
Maireana pentatropis	0.1	4	SG			0.1						
Maireana pyramidata	0.7	3	SG			0.7						
Oxalis perennans	0.1	1	FG					0.1				
Poaceae sp.	0.1	2	GG				0.1					
Psilocaulon granulicaule	3	30	HT									3
Salsola australis	0.4	20	SG			0.4						
Sclerolaena diacantha	2	50	SG			2						
Sclerolaena obliquicuspis	3	100	SG			3						
Tetragonia eremaea	0.4	20	FG					0.4				

Easting	601950
Northing	6242844
Orientation	231°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	5
Length logs (m)	20
BAM Attributes 1x1 plot (%)	
Litter (%)	44

Q92			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			19	18	2	11	1	4	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			48.5	**48.2**	25	22.2	0.2	0.8	0	0	**0.3**	0
Atriplex stipitata	0.1	1	SG			0.1						
Brachyscome lineariloba	0.1	2	FG					0.1				
Chenopodium desertorum subsp. desertorum	0.8	20	SG			0.8						
Dissocarpus paradoxus	3	100	SG			3						
Eucalyptus dumosa	20	8	TG		20							
Eucalyptus socialis	5	3	TG		5							
Maireana appressa	0.6	20	SG			0.6						
Maireana pentatropis	14	60	SG			14						
Maireana pyramidata	0.1	1	SG			0.1						
Maireana sclerolaenoides	0.1	2	SG			0.1						
Pittosporum angustifolium	0.1	1	SG			0.1						
Poaceae sp.	0.2	50	GG				0.2					
Ptilotus seminudus	0.1	2	FG					0.1				
Roepera ovata	0.4	30	FG					0.4				
Salsola australis	0.1	2	SG			0.1						
Sclerolaena diacantha	0.3	20	SG			0.3						
Sclerolaena obliquicuspis	3	100	SG			3						
Sisymbrium erysimoides	0.3	30	EX								0.3	
Tetragonia eremaea	0.2	5	FG					0.2				

Easting	604248
Northing	6240048
Orientation	108°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	3
Length logs (m)	32
BAM Attributes 1x1 plot (%)	
Litter (%)	35

Q93			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			39	30	3	13	1	13	0	0	9	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			49	**46.9**	15	27.8	0.3	3.8	0	0	**2.1**	0.2
Alectryon oleifolius subsp. canescens	1	1	TG		1							
Alyssum linifolium	0.1	3	EX								0.1	
Atriplex acutibractea subsp. acutibractea	0.1	3	SG			0.1						
Atriplex stipitata	0.4	8	SG			0.4						
Austrostipa nitida	0.3	60	GG				0.3					
Brachyscome ciliaris	0.1	2	FG					0.1				
Brachyscome lineariloba	0.1	12	FG					0.1				
Carrichtera annua	0.1	3	HT									0.1
Convolvulus crispifolius	0.1	5	FG					0.1				
Dissocarpus paradoxus	8	200	SG			8						
Enchylaena tomentosa	5	40	SG			5						
Eremophila sturtii	1	3	SG			1						
Erodium cicutarium	0.1	1	EX								0.1	
Erodium crinitum	0.1	3	FG					0.1				
Eucalyptus dumosa	6	4	TG		6							
Eucalyptus socialis	8	3	TG		8							
Euphorbia drummondii	0.1	30	FG					0.1				
Goodenia pinnatifida	0.2	30	FG					0.2				
Lemooria burkittii	0.1	1	FG					0.1				
Limonium lobatum	0.1	3	EX								0.1	
Maireana pentatropis	0.3	15	SG			0.3						
Maireana pyramidata	0.5	5	SG			0.5						
Maireana sclerolaenoides	0.4	50	SG			0.4						
Maireana triptera	1	20	SG			1						
Marrubium vulgare	0.3	50	EX								0.3	
Medicago lacinata	0.1	2	EX								0.1	
Medicago minima	0.2	50	EX								0.2	
Psilocaulon granulicaule	0.1	3	HT									0.1
Rhagodia spinescens	4	7	SG			4						
Rhodanthe pygmaea	0.4	50	FG					0.4				
Roepera apiculata	2	80	FG					2				
Roepera glauca	0.1	2	FG					0.1				
Roepera ovata	0.2	8	FG					0.2				
Scleranthus minusculus	0.1	2	SG			0.1						
Sclerolaena diacantha	1	60	SG			1						
Sclerolaena obliquicuspis	6	200	SG			6						
Sisymbrium erysimoides	1	40	EX								1	
Tetragonia eremaea	0.2	40	FG					0.2				
Vittadinia spp.	0.1	4	FG					0.1				

Easting	604961
Northing	6239256
Orientation	196°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	Yes
10-19	No
5-9	Yes
<5	Yes
Hollows	8
Length logs (m)	25
BAM Attributes 1x1 plot (%)	
Litter (%)	33

Q94			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 172 Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified_"whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			48	37	3	14	2	18	0	0	11	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			57	53.7	15	9.5	25.3	3.9	0	0	3.3	0
Acacia wilhelmiana	1	1	SG			1						
Alyssum linifolium	0.2	30	EX								0.2	
Atriplex stipitata	0.1	1	SG			0.1						
Brachyscome ciliaris	0.1	2	FG					0.1				
Brachyscome lineariloba	0.3	50	FG					0.3				
Brassica tournefortii	0.5	60	EX								0.5	
Calandrinia eremaea	0.5	100	FG					0.5				
Calotis hispidula	0.1	2	FG					0.1				
Chenopodium desertorum subsp. desertorum	0.1	1	SG			0.1						
Crassula colorata subsp. acuminatum	0.2	100	FG					0.2				
Cryptandra amara var. floribunda	0.1	1	SG			0.1						
Dissocarpus paradoxus	0.6	40	SG			0.6						
Dodonaea viscosa subsp. angustissima	3	4	SG			3						
Dysphania cristata	0.2	40	FG					0.2				
Einadia nutans subsp. nutans	0.1	1	FG					0.1				
Eremophila glabra	1	2	SG			1						
Erodium cicutarium	0.2	20	EX								0.2	
Erodium crinitum	0.1	2	FG					0.1				
Eucalyptus dumosa	8	10	TG		8							
Eucalyptus gracilis	2	1	TG		2							
Eucalyptus socialis	5	4	TG		5							
Geococcus pusillus	0.1	3	FG					0.1				
Hordeum glaucum	0.1	1	EX								0.1	
Hypochaeris glabra	0.1	2	EX								0.1	
Isoetopsis graminifolia	0.5	100	FG					0.5				
Maireana appressa	0.1	1	SG			0.1						
Maireana brevifolia	1	8	SG			1						
Maireana georgei	0.1	1	SG			0.1						
Maireana pyramidata	1	4	SG			1						
Marrubium vulgare	0.2	30	EX								0.2	
Medicago minima	0.2	30	EX								0.2	
Oxalis perennans	0.1	2	FG					0.1				
Pimelea simplex	0.2	3	FG					0.2				
Poaceae sp.	0.3	50	GG				0.3					
Podolepis capillaris	0.3	50	FG					0.3				
Rhodanthe pygmaea	0.1	2	FG					0.1				
Roepera apiculata	0.5	50	FG					0.5				
Rostraria pumila	0.3	20	EX								0.3	
Schismus barbatus	0.4	100	EX								0.4	
Sclerolaena diacantha	1	80	SG			1						
Sclerolaena obliquicuspis	0.2	10	SG			0.2						
Sclerolaena parviflora	0.2	6	SG			0.2						

Easting	605069
Northing	6239089
Orientation	138°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	2
Length logs (m)	20
BAM Attributes 1x1 plot (%)	
Litter (%)	12

Q94 (cont.)

Silene apetala	0.1	1	EX								0.1				
Sisymbrium erysimoides	1	50	EX								1				
Tetragonia eremaea	0.1	2	FG					0.1							
Thysanotus baueri	0.1	1	FG					0.1							
Triodia scariosa subsp. scariosa	25	40	GG				25								
Vittadinia dissecta var. hirta	0.3	40	FG					0.3							

Q95			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified_bull)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			20	17	3	10	1	3	0	0	3	0
Species	**Cover**	**Abundance**	Sum cover	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum	Sum
			44.3	43.5	23	17.1	0.2	3.2	0	0	0.8	0
Alectryon oleifolius subsp. canescens	5	3	TG		5							
Alyssum linifolium	0.1	2	EX								0.1	
Atriplex stipitata	0.1	1	SG			0.1						
Dissocarpus paradoxus	0.3	40	SG			0.3						
Enchylaena tomentosa	0.3	1	SG			0.3						
Eucalyptus oleosa	4	2	TG		4							
Eucalyptus socialis	14	5	TG		14							
Exocarpos aphyllus	1	1	SG			1						
Hordeum glaucum	0.1	1	EX								0.1	
Maireana appressa	8	60	SG			8						
Maireana pentatropis	3	60	SG			3						
Maireana sclerolaenoides	0.5	50	SG			0.5						
Poaceae sp.	0.2	20	GG				0.2					
Ptilotus seminudus	0.2	30	FG					0.2				
Rhagodia spinescens	3	20	SG			3						
Roepera apiculata	2	60	FG					2				
Roepera ovatum	1	80	FG					1				
Sclerolaena diacantha	0.4	30	SG			0.4						
Sclerolaena obliquicuspis	0.5	40	SG			0.5						
Sisymbrium erysimoides	0.6	50	EX								0.6	

Easting	606577
Northing	6237381
Orientation	255°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	8
Length logs (m)	33
BAM Attributes 1x1 plot (%)	
Litter (%)	47

Q96			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 172 Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified_"whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			44	39	1	12	3	23	0	0	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			75	74.5	14	28.9	25.3	6.3	0	0	0.5	0
Acacia rigens	1	1	SG			1						
Acacia wilhelmiana	3	2	SG			3						
Actinobole uliginosum	0.1	3	FG					0.1				
Alyssum linifolium	0.1	2	EX								0.1	
Brachyscome ciliaris	0.1	1	FG					0.1				
Brachyscome lineariloba	0.2	30	FG					0.2				
Brassica tournefortii	0.1	2	EX								0.1	
Calandrinia eremaea	0.5	500	FG					0.5				
Calotis hispidula	0.1	9	FG					0.1				
Chenopodium desertorum subsp. desertorum	0.1	1	SG			0.1						
Codonocarpus cotinifolius	5	5	SG			5						
Crassula colorata subsp. acuminatum	0.3	500	FG					0.3				
Daucus glochidiatus	0.4	100	FG					0.4				
Dissocarpus paradoxus	0.3	20	SG			0.3						
Dodonaea viscosa subsp. angustissima	7	10	SG			7						
Eremophila glabra	0.4	1	SG			0.4						
Erodium cicutarium	0.1	2	EX								0.1	
Erodium crinitum	0.1	1	FG					0.1				
Eucalyptus costata	14	7	TG		14							
Goodenia pinnatifida	0.2	12	FG					0.2				
Goodenia willisiana	0.2	15	FG					0.2				
Halgania cyanea	8	30	SG			8						
Haloragis odontocarpa	0.6	40	FG					0.6				
Isoetopsis graminifolia	1	300	FG					1				
Lomandra leucocephala subsp. leucocephala	0.1	1	GG				0.1					
Maireana appressa	0.1	1	SG			0.1						
Myoporum platycarpum subsp. platycarpum	3	3	SG			3						
Pimelea simplex	0.5	40	FG					0.5				
Poaceae sp.	0.2	20	GG				0.2					
Podolepis capillaris	0.6	100	FG					0.6				
Polycalymma stuartii	0.4	15	FG					0.4				
Rhodanthe pygmaea	0.1	8	FG					0.1				
Rostraria pumila	0.1	2	EX								0.1	
Scleranthus minusculus	0.1	2	FG					0.1				
Sclerolaena diacantha	0.9	40	SG			0.9						
Sclerolaena parviflora	0.1	3	SG			0.1						
Senecio glossanthus	0.1	1	FG					0.1				
Sisymbrium erysimoides	0.1	6	EX								0.1	
Stenopetalum lineare	0.1	1	FG					0.1				
Stenopetalum sphaerocarpum	0.3	50	FG					0.3				
Thysanotus baueri	0.1	1	FG					0.1				
Triodia scariosa subsp. scariosa	25	60	GG				25					
Vittadinia dissecta var. hirta	0.1	3	FG					0.1				
Vittadinia sp.	0.1	2	FG					0.1				

Easting	606283
Northing	6237751
Orientation	208°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	0
20-29	No
10-19	No
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	13
BAM Attributes 1x1 plot (%)	
Litter (%)	27

Q97			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (derived)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			15	10	0	4	2	4	0	0	5	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			57	26.4	0	6.7	0.3	19.4	0	0	30.6	0
Austrostipa nitida	0.2	30	GG				0.2					
Dissocarpus paradoxus	0.4	50	SG			0.4						
Enneapogon avenaceus	0.1	10	GG				0.1					
Erodium cicutarium	0.2	20	EX								0.2	
Erodium crinitum	0.4	40	FG					0.4				
Goodenia pinnatifida	0.9	40	FG					0.9				
Hordeum glaucum	0.3	30	EX								0.3	
*Medicago lacinata**	5	500	EX								5	
*Medicago minima**	25	1000	EX								25	
Roepera crenata	18	500	FG					18				
Salsola australis	0.1	1	SG			0.1						
Sclerolaena obliquicuspis	6	200	SG			6						
Sida intricata	0.2	30	SG			0.2						
Sisymbrium erysimoides	0.1	2	EX								0.1	
Tetragonia eremaea	0.1	2	FG					0.1				

Easting	611272
Northing	6231722
Orientation	271
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	0.42

Q98			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			14	11	1	7	1	1	0	1	3	2
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			57.8	56.7	35	18.4	0.2	3	0	0.1	1.1	0.9
Atriplex stipitata	0.3	8	SG			0.3						
Carrichtera annua	0.3	30	HT									0.3
Casuarina pauper	35	17	TG		35							
Dissocarpus paradoxus	0.4	40	SG			0.4						
Enchylaena tomentosa	12	50	SG			12						
Maireana pentatropis	0.1	1	SG			0.1						
Marsdenia australis	0.1	1	OG							0.1		
Poaceae sp.	0.2	20	GG				0.2					
Psilocaulon granulicaule	0.6	20	HT									0.6
Rhagodia spinescens	4	15	SG			4						
Roepera ovata	3	100	FG					3				
Sclerolaena diacantha	1	40	SG			1						
Sclerolaena obliquicuspis	0.6	60	SG			0.6						
Sisymbrium erysimoides	0.2	10	EX								0.2	

Easting	611620
Northing	6231229
Orientation	192°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	No
<5	No
Hollows	0
Length logs (m)	27
BAM Attributes 1x1 plot (%)	
Litter (%)	40

Q99			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified_"whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 21/07/2020			15	13	2	3	4	4	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			51	50.8	17	2.4	30.4	1	0	0	0.2	0
Alyssum linifolium	0.1	10	EX								0.1	
Austrostipa elegantissima	0.3	9	GG				0.3					
Brassica tournefortii	0.1	2	EX								0.1	
Calandrinia eremaea	0.2	50	FG					0.2				
Einadia nutans subsp. nutans	0.1	1	FG					0.1				
Enchylaena tomentosa	1	5	SG			1						
Eucalyptus gracilis	10	8	TG		10							
Eucalyptus socialis	7	4	TG		7							
Lomandra effusa	2	4	GG				2					
Maireana pentatropis	0.4	20	SG			0.4						
Poaceae sp.	0.1	10	GG				0.1					
Roepera similis	0.6	30	FG					0.6				
Sclerolaena diacantha	1	40	SG			1						
Thysanotus baueri	0.1	2	FG					0.1				
Triodia scariosa subsp. scariosa	28	70	GG				28					

Easting	613064
Northing	6229443
Orientation	185°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	15
BAM Attributes 1x1 plot (%)	
Litter (%)	28

Q100			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 143 Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 22/07/2020			27	26	1	10	1	13	0	1	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			51.5	51.1	2	38.1	0.1	10.8	0	0.1	0.4	0
Acacia nyssophylla	0.4	1	SG			0.4						
Alectryon oleifolius subsp. canescens	2	1	TG		2							
Austrostipa nitida	0.1	20	GG				0.1					
Brachyscome lineariloba	0.2	20	FG					0.2				
Bulbine alata	0.1	1	FG					0.1				
Calandrinia eremaea	0.4	100	FG					0.4				
Calotis hispidula	0.2	10	FG					0.2				
Crassula colorata subsp. acuminatum	0.3	100	FG					0.3				
Dodonaea viscosa subsp. angustissima	3	2	SG			3						
Eremophila sturtii	14	10	SG			14						
Erodium crinitum	1	100	FG					1				
Goodenia pinnatifida	0.1	2	FG					0.1				
Isoetopsis graminifolia	0.1	2	FG					0.1				
Lemooria burkittii	7	2000	FG					7				
Lepidium leptopetalum	4	8	SG			4						
Maireana sclerolaenoides	0.5	30	SG			0.5						
Maireana trichoptera	4	80	SG			4						
Maireana triptera	9	200	SG			9						
Medicago minima	0.4	60	EX								0.4	
Omphalolappula concava	0.1	2	FG					0.1				
Rhyncharrhena linearis	0.1	1	OG							0.1		
Roepera eremaea	0.2	4	FG					0.2				
Roepera ovata	0.1	1	FG					0.1				
Sclerolaena diacantha	0.2	10	SG			0.2						
Sclerolaena obliquicuspis	1	60	SG			1						
Templetonia egena	2	1	SG			2						
Tetragonia eremaea	1	100	FG					1				

Easting	505692
Northing	6250510
Orientation	279°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	No
5-9	No
<5	No
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	2

Q101			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified_"whipstick")			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 22/7/2020			25	24	2	10	4	8	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			60.6	**60.5**	16	10.1	32.2	2.2	0	0	**0.1**	0
Acacia nyssophylla	1	1	SG			1						
Austrostipa acrocillata	0.1	10	GG				0.1					
Brachyscome lineariloba	0.1	1	FG					0.1				
Brassica tournefortii	0.1	2	EX								0.1	
Calandrinia eremaea	0.3	100	FG					0.3				
Calotis hispidula	0.1	2	FG					0.1				
Chenopodium desertorum subsp. desertorum	0.1	1	SG			0.1						
Crassula colorata subsp. acuminatum	0.3	100	FG					0.3				
Cryptandra amara var. floribunda	0.4	1	SG			0.4						
Dodonaea viscosa subsp. angustissima	2	4	SG			2						
Enchylaena tomentosa	1	5	SG			1						
Eremophila glabra	0.5	1	SG			0.5						
Eucalyptus dumosa	10	6	TG		10							
Eucalyptus socialis	6	2	TG		6							
Lomandra leucocephala subsp. leucocephala	2	20	GG				2					
Maireana pentatropis	0.5	15	SG			0.5						
Poaceae sp.	0.1	2	GG				0.1					
Podolepis capillaris	0.2	20	FG					0.2				
Roepera similis	1	50	FG					1				
Sclerolaena diacantha	0.4	20	SG			0.4						
Sclerolaena parviflora	0.2	8	SG			0.2						
Senna artemisioides subsp. x coriacea	4	2	SG			4						
Stenopetalum lineare	0.1	6	FG					0.1				
Thysanotus baueri	0.1	2	FG					0.1				
Triodia scariosa subsp. scariosa	30	20	GG				30					

Easting	509718
Northing	6250331
Orientation	89°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	17
BAM Attributes 1x1 plot (%)	
Litter (%)	22

Q102			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (Modified_whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 22/7/2020			14	14	2	10	0	2	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			34.7	**34.7**	11	22.8	0	0.9	0	0	**0**	0
Enchylaena tomentosa	0.3	2	SG			0.3						
Eucalyptus oleosa	8	5	TG		8							
Eucalyptus socialis	3	1	TG		3							
Halgania cyanea	0.1	1	SG			0.1						
Lepidium leptopetalum	5	30	SG			5						
Maireana sclerolaenoides	0.6	30	SG			0.6						
Maireana triptera	0.6	30	SG			0.6						
Olearia muelleri	0.6	2	SG			0.6						
Roepera apiculata	0.4	20	FG					0.4				
Roepera similis	0.5	40	FG					0.5				
Sclerolaena diacantha	0.4	20	SG			0.4						
Sclerolaena obliquicuspis	0.2	10	SG			0.2						
Senna artemisioides subsp. x coriacea	8	15	SG			8						
Senna artemisioides subsp. x petiolaris	7	16	SG			7						

Easting	510636
Northing	6250327
Orientation	65°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	30
BAM Attributes 1x1 plot (%)	
Litter (%)	27

Q103			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 13 Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 22/7/2020			10	7	1	4	0	2	0	0	3	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			68.9	**62.6**	14	47.4	0	1.2	0	0	**6.3**	2
Enchylaena tomentosa	14	100	SG			14						
Eucalyptus largiflorens	14	12	TG		14							
Lycium ferocissimum	2	1	HT									2
Maireana brevifolia	5	40	SG			5						
Mesembryanthemum nodiflorum	4	200	EX								4	
Rhagodia spinescens	28	30	SG			28						
Roepera similis	0.2	3	FG					0.2				
Sclerolaena diacantha	0.4	30	SG			0.4						
Sisymbrium erysimoides	0.3	10	EX								0.3	
Tetragonia moorei	1	60	FG					1				

Easting	614938
Northing	6206256
Orientation	4°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	29

Q104			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 2/9/2020			23	21	2	12	1	6	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			51.8	**51.6**	31	17.4	0.5	2.7	0	0	**0.2**	0
Austrostipa acrocillata	0.5	20	GG				0.5					
Calandrinia eremaea	0.3	20	FG					0.3				
Chenopodium desertorum subsp. desertorum	0.1	1	SG			0.1						
Chenopodium desertorum subsp. rectum	0.1	1	SG			0.1						
Enchylaena tomentosa	0.4	5	SG			0.4						
Eucalyptus dumosa	9	3	TG		9							
Eucalyptus oleosa	22	7	TG		22							
Grevillea huegelii	3	1	SG			3						
Lactuca serriola	0.1	1	EX								0.1	
Maireana georgei	0.1	1	SG			0.1						
Maireana pentatropis	6	200	SG			6						
Maireana radiata	0.3	30	SG			0.3						
Maireana sedifolia	1	8	SG			1						
Maireana trichoptera	1	30	SG			1						
Maireana triptera	3	50	SG			3						
Ptilotus seminudus	0.1	3	FG					0.1				
Rhagodia ulicina	0.4	1	SG			0.4						
Roepera apiculatum	2	100	FG					2				
Roepera eremaea	0.1	1	FG					0.1				
Roepera ovatum	0.1	4	FG					0.1				
Roepera similis	0.1	2	FG					0.1				
Schismus barbatus	0.1	10	EX								0.1	
Sclerolaena obliquicuspis	2	100	SG			2						

Easting	514528
Northing	6249466
Orientation	90°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	8
BAM Attributes 1x1 plot (%)	
Litter (%)	41

Q105 (Jacobs E5)			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones (modified whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 7/8/2019			12	11	3	7	0	1	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			23.1	**22.7**	13	9.4	0	0.3	0	0	**0.4**	0
Alectryon oleifolius	2	2	TG		2							
Chenopodium curvispicatum	0.2	2	SG			0.2						
Eucalyptus dumosa	3	2	TG		3							
Eucalyptus oleosa	8	8	TG		8							
Maireana appressa	0.1	2	SG			0.1						
Maireana pentatropis	4	170	SG			4						
Myoporum platycarpum	3	2	SG			3						
Roepera apiculata	0.3	25	FG					0.3				
Schismus barbatus	0.4	300	EX								0.4	
Sclerolaena obliquicuspis	0.1	15	SG			0.1						
Senna artemisioides subsp. x coriacea	1	3	SG			1						
Senna artemisioides subsp. Zygophylla	1	5	SG			1						

Easting	608328
Northing	6235234
Orientation	4°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	0
BAM Attributes 1x1 plot (%)	
Litter (%)	54

Q106			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion (modified whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 2/9/2020			18	18	2	5	2	9	0	0	0	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			72.3	**72.3**	34	9.6	22.6	6.1	0	0	**0**	0
Atriplex stipitata subsp. stipitata	2	5	FG					2				
Austrostipa acrocillata	0.6	40	GG				0.6					
Calandrinia eremaea	2	100	FG					2				
Chenopodium desertorum subsp. rectum	0.5	30	SG			0.5						
Crassula colorata subsp. acuminatum	0.2	50	FG					0.2				
Dysphania cristata	0.1	2	FG					0.1				
Eucalyptus dumosa	16	5	TG		16							
Eucalyptus socialis	18	8	TG		18							
Maireana georgei	1	10	SG			1						
Maireana pentatropis	5	200	SG			5						
Pittosporum angustfolium	0.1	1	SG			0.1						
Ptilotus seminudus	0.1	2	FG					0.1				
Roepera apiculatum	0.2	10	FG					0.2				
Roepera eremaea	0.6	40	FG					0.6				
Roepera similis	0.8	40	FG					0.8				
Sclerolaena diacantha	3	80	SG			3						
Stenopetalum lineare	0.1	10	FG					0.1				
Tridoia scariosa subsp. scariosa	22	50	GG				22					

Easting	513872
Northing	6249693
Orientation	78°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	9
BAM Attributes 1x1 plot (%)	
Litter (%)	32

Q107 (Jacobs E6)			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 7/8/2020			21	20	2	6	1	11	0	0	1	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			59.6	**59.5**	5	13.4	40	1.1	0	0	**0.1**	0
Bulbine alata	0.1	10	FG					0.1				
Calandrinia eremaea	0.1	20	FG					0.1				
Calotis cuneifolia	0.1	1	FG					0.1				
Codonocarpus cotinifolius	3	5	SG			3						
Daucus glochidiatus	0.1	5	FG					0.1				
Dodonaea viscosa	0.1	1	SG			0.1						
Eremophila sturtii	0.1	1	SG			0.1						
Erodium crinitum	0.1	10	FG					0.1				
Eucalyptus dumosa	4	8	TG		4							
Eucalyptus socialis	1	2	TG		1							
Halgania cyanea	10	300	SG			10						
Harmsiodoxa blennodioides	0.1	2	FG					0.1				
Isoetopsis graminifolia	0.1	100	FG					0.1				
Maireana pentatropis	0.1	1	SG			0.1						
Podotheca angustifolia	0.1	1	FG					0.1				
Roepera similis	0.1	2	FG					0.1				
Schismus barbatus	0.1	50	EX								0.1	
Sclerolaena parviflora	0.1	2	SG			0.1						
Senecio glossanthus	0.1	5	FG					0.1				
Stenopetalum lineare	0.1	50	FG					0.1				
Tridoia scariosa subsp. scariosa	40	80	GG				40					

Easting	606110
Northing	6237914
Orientation	0°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	No
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	35
BAM Attributes 1x1 plot (%)	
Litter (%)	15

Q108 (Jacobs E18)			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone (modified whip)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 10/8/2020			22	20	2	5	2	11	0	0	2	0
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			37.1	**36.9**	15.1	0.6	20.1	1.1	0	0	**0.2**	0
Brachyscome dentata	0.1	10	FG					0.1				
Brassica tournefortii	0.1	1	EX								0.1	
Bulbine alata	0.1	200	FG					0.1				
Calandrinia eremaea	0.1	100	FG					0.1				
Calotis hispidula	0.1	300	FG					0.1				
Chenopodium curvispicatum	0.2	50	SG			0.2						
Crassula colorata	0.1	2	FG					0.1				
Dissocarpus paradoxus	0.1	10	SG			0.1						
Enchylaena tomentosa	0.1	3	SG			0.1						
Eucalyptus dumosa	15	12	TG		15							
Eucalyptus gracilis	0.1	1	TG		0.1							
Isoetopsis graminifolia	0.1	1	FG					0.1				
Maireana sclerolaenoides	0.1	70	SG			0.1						
Oxalis perennans	0.1	20	FG					0.1				
Poaceae sp. (assumed native)	0.1	105	GG				0.1					
Roepera similis	0.1	20	FG					0.1				
Schismus barbatus	0.1	10	EX								0.1	
Sclerolaena patenticuspis	0.1	10	SG			0.1						
Senecio glossanthus	0.1	20	FG					0.1				
Stenopetalum sphaerocarpum	0.1	50	FG					0.1				
Tetragonia eremaea	0.1	5	FG					0.1				
Tridoia scariosa subsp. scariosa	20	50	GG				20					

Easting	603871
Northing	6240499
Orientation	0°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	1
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	18
BAM Attributes 1x1 plot (%)	
Litter (%)	48

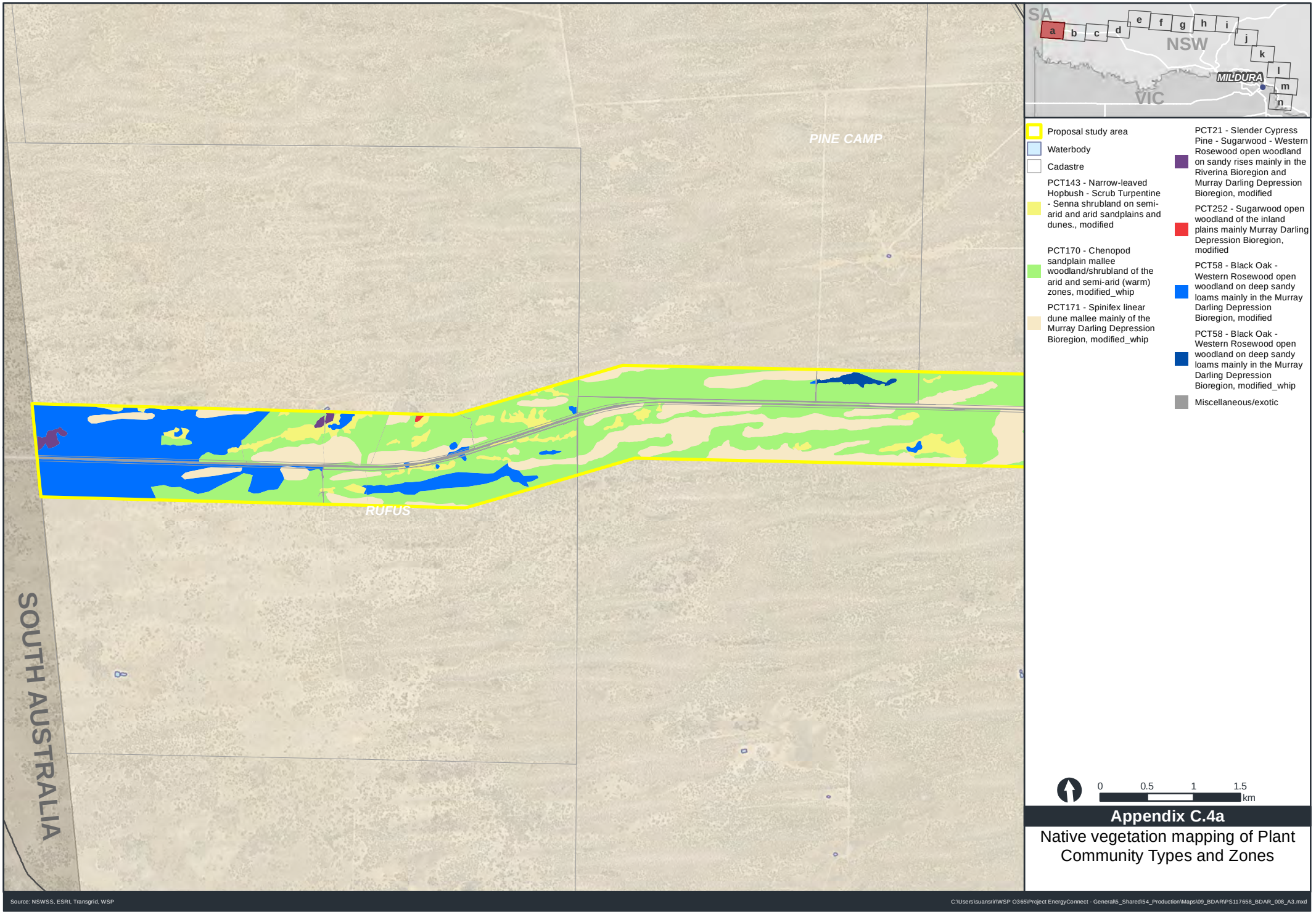
Q109			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 2/9/2020			22	16	1	7	1	7	0	0	6	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			103.7	**80.6**	14	54	2	10.6	0	0	**23.1**	12
Alyssum linifolium	0.2	30	EX								0.2	
Austrostipa nitida	2	40	GG				2					
Carrichtera annua	12	500	HT									12
Casuarina pauper	14	10	TG		14							
Dissocarpus paradoxus	4	100	SG			4						
Dysphania cristata	0.1	10	FG					0.1				
Enchylaena tomentosa	7	30	SG			7						
Erodium crinitum	0.2	20	FG					0.2				
Euphorbia drummondii	0.2	10	FG					0.2				
Limonium lobatum	0.3	30	EX								0.3	
Maireana pentatropis	0.8	40	SG			0.8						
Maireana pyramidata	3	8	SG			3						
Maireana sclerolaenoides	0.2	20	SG			0.2						
Maireana sedifolia	35	40	SG			35						
Medicago minima	4	500	EX								4	
Roepera ovatum	4	80	FG					4				
Roepera ammophila	3	50	FG					3				
Schismus barbatus	6	200	EX								6	
Sclerolaena obliquicuspis	4	100	SG			4						
Sisymbrium erysimoides	0.6	60	EX								0.6	
Tetragonia eremea	3	60	FG					3				
Vittadinia eremaea	0.1	1	FG					0.1				

Easting	614938
Northing	6206256
Orientation	4°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	No
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	14
BAM Attributes 1x1 plot (%)	
Litter (%)	29

Q110			Covers	Native	Trees	Shrubs	Grass	Forb	Fern	Other	Exotic	HighThreat
PCT 58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion (modified)			# spp	Count	Count	Count	Count	Count	Count	Count	Count	Count
Date: 2/9/2020			15	13	1	8	1	3	0	0	2	1
Species	**Cover**	**Abundance**	**Sum cover**	**Sum**	Sum	Sum	Sum	Sum	Sum	Sum	**Sum**	Sum
			95.5	**89.5**	22	48.8	0.1	18.6	0	0	**6**	2
Austrostipa nitida	0.1	1	GG				0.1					
Carrichtera annua	2	100	HT									2
Casuarina pauper	22	10	TG		22							
Chenopodium desertorum subsp. desertorum	2	10	SG			2						
Dissocarpus paradoxus	0.3	30	SG			0.3						
Enchylaena tomentosa	4	30	SG			4						
Maireana pyramidata	12	100	SG			12						
Maireana sclerolaenoides	0.3	30	SG			0.3						
Maireana sedifolia	2	4	SG			2						
Maireana trichoptera	0.2	5	SG			0.2						
Roepera ovatum	14	200	FG					14				
Roepera similis	0.6	40	FG					0.6				
Sclerolaena obliquicuspis	28	2000	SG			28						
Sisymbrium erysimoides	4	200	EX								4	
Tetragonia eremea	4	200	FG					4				

Easting	536899
Northing	6248956
Orientation	83°
Plot size	20x20x50m
BAM Attributes 20x50m plot	
Stem classes	
80+	0
50-79	0
30-49	2
20-29	Yes
10-19	Yes
5-9	Yes
<5	Yes
Hollows	0
Length logs (m)	40
BAM Attributes 1x1 plot (%)	
Litter (%)	25

APPENDIX C-4
NATIVE VEGETATION MAPPING OF PLANT COMMUNITY TYPES AND ZONES

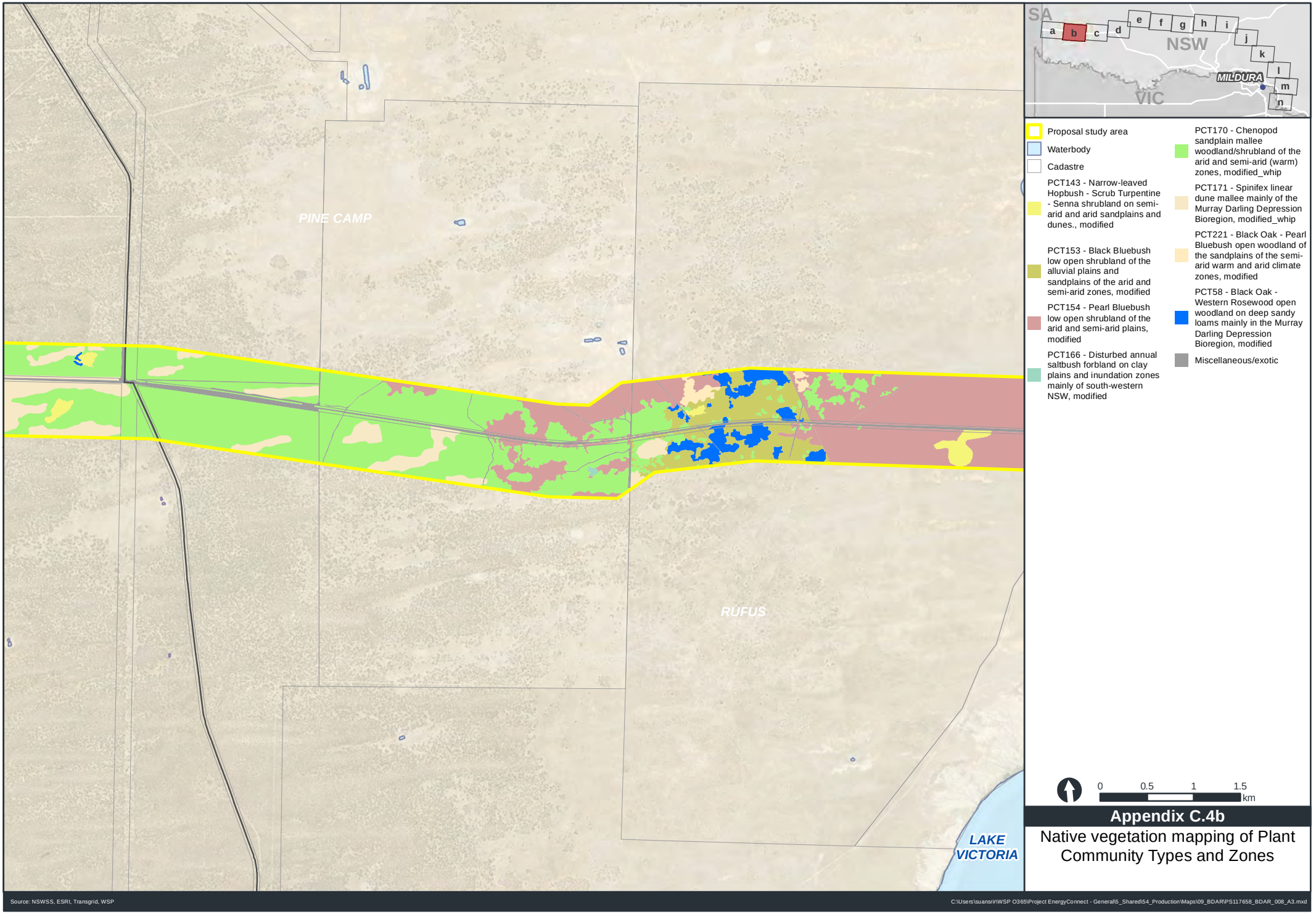


Appendix C.4a

Native vegetation mapping of Plant Community Types and Zones

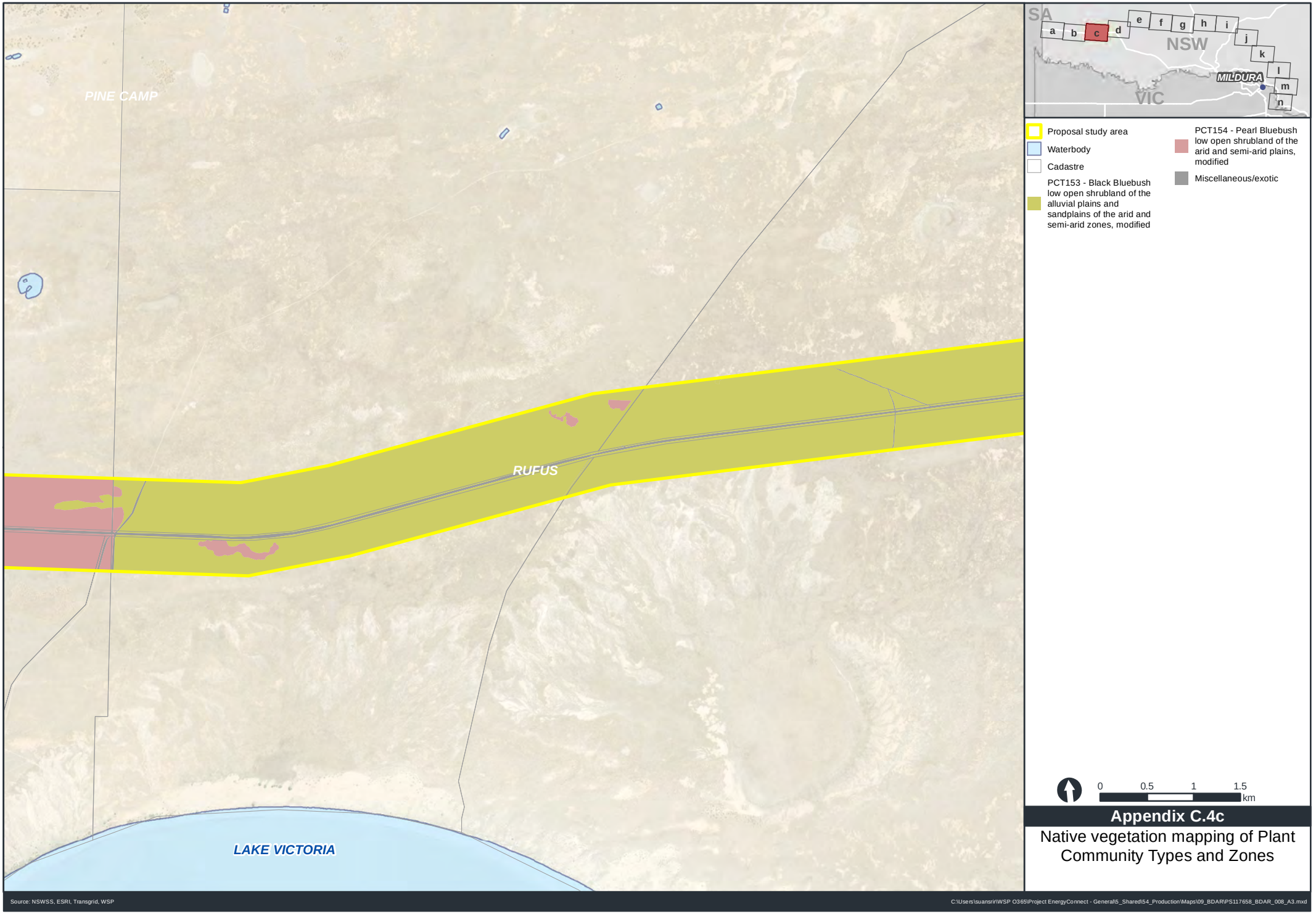
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A3.mxd



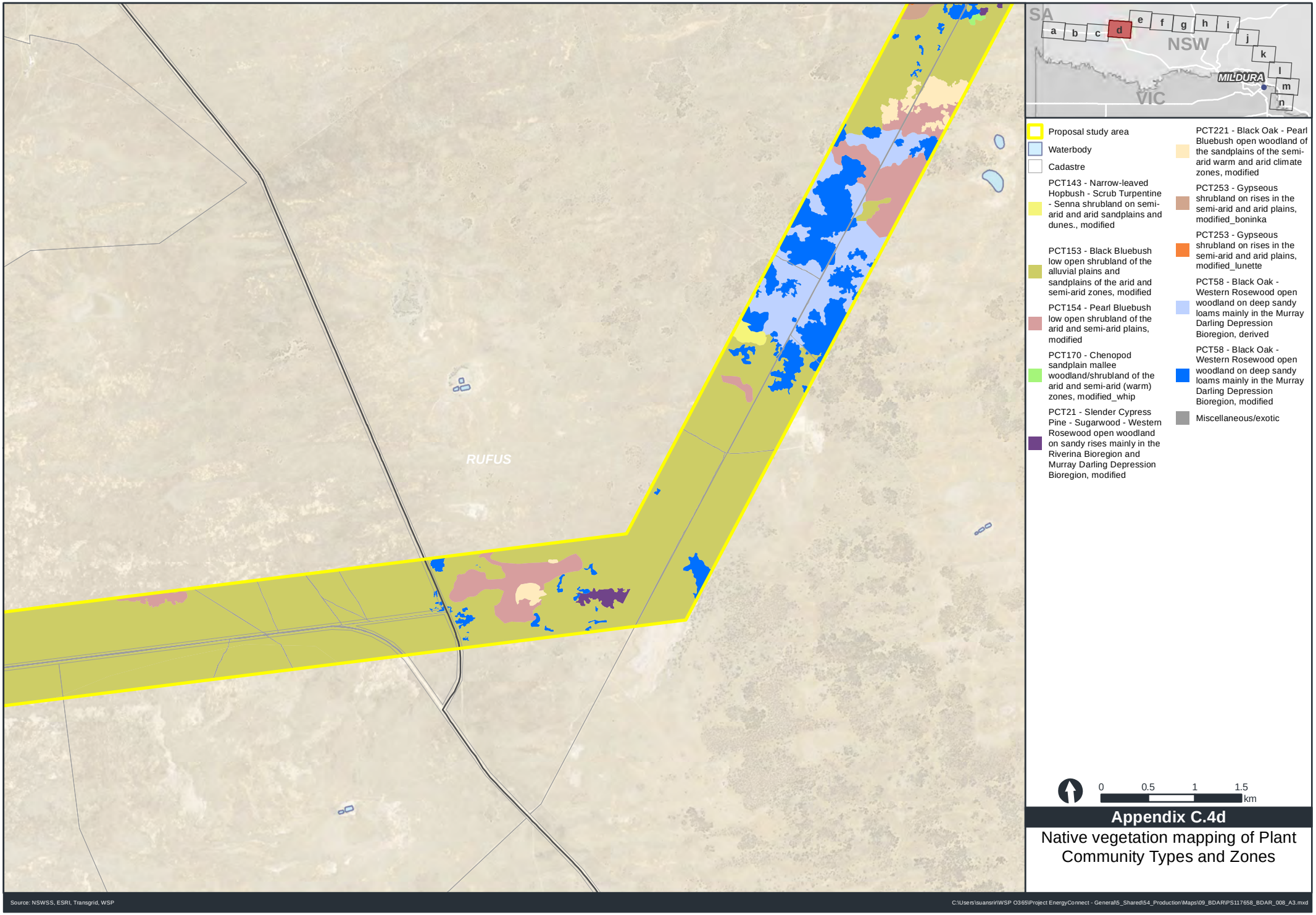
Appendix C.4b

Native vegetation mapping of Plant Community Types and Zones



Appendix C.4c

Native vegetation mapping of Plant Community Types and Zones



Appendix C.4d

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

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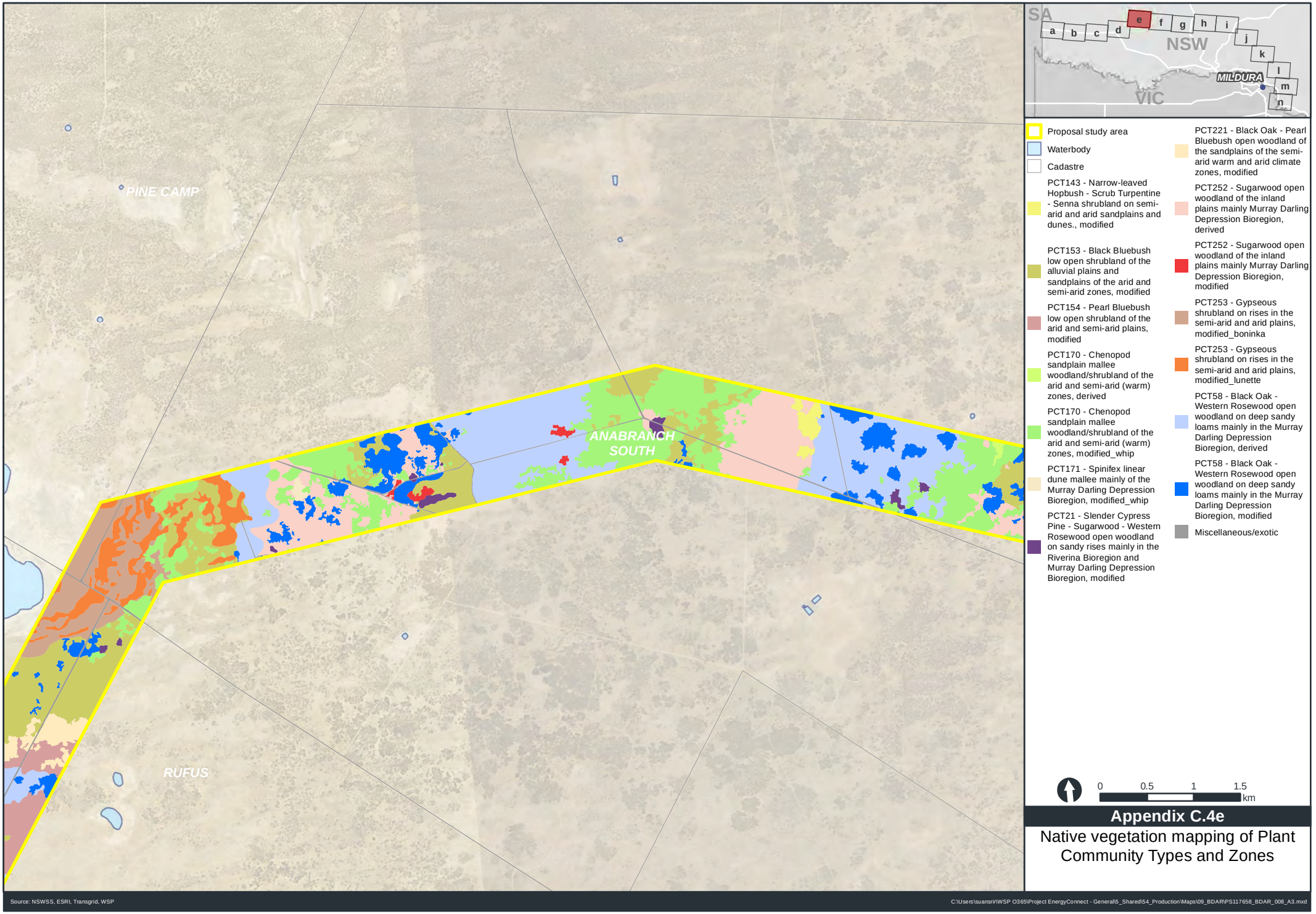

Appendix C.4e

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

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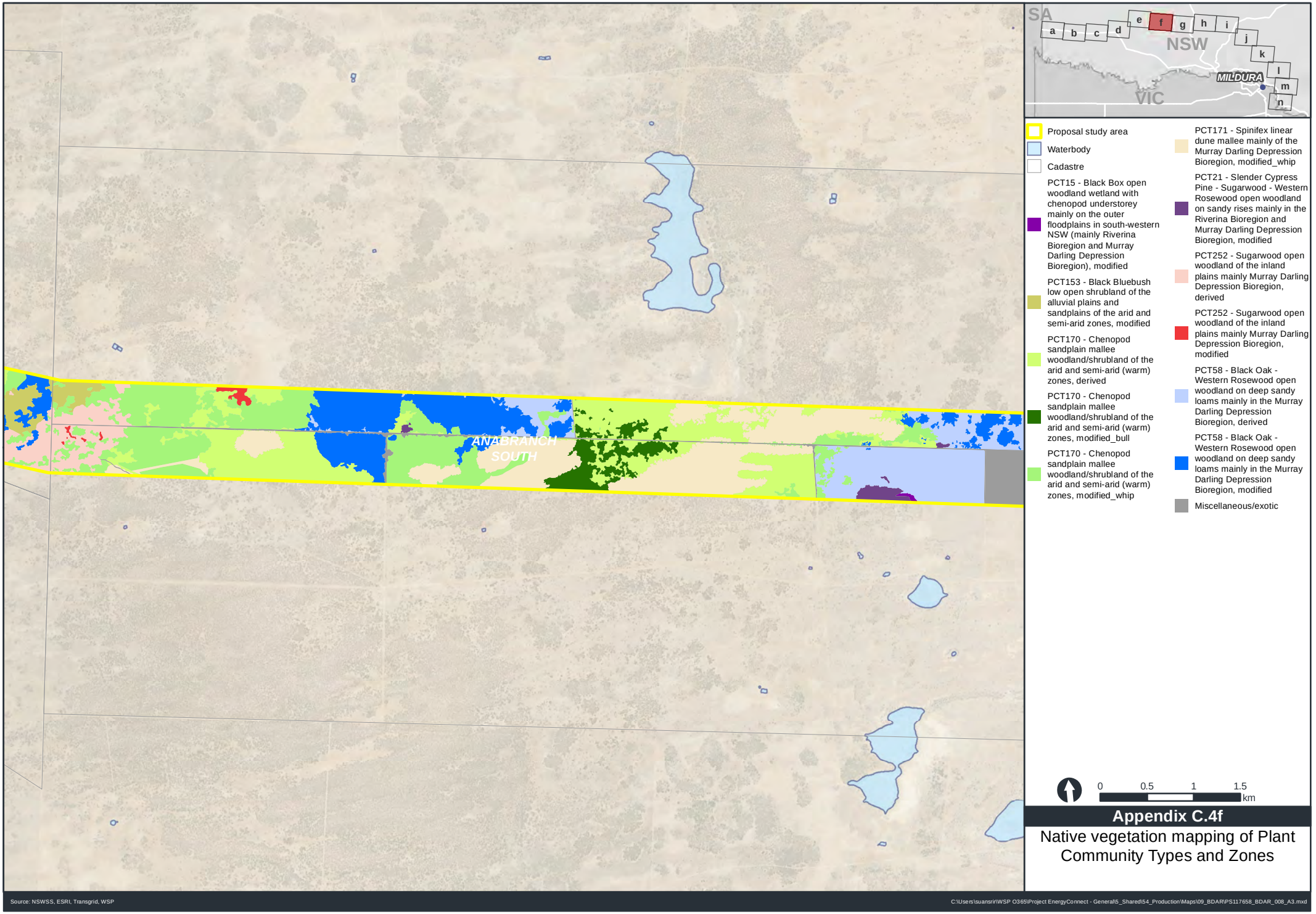

Appendix C.4f

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

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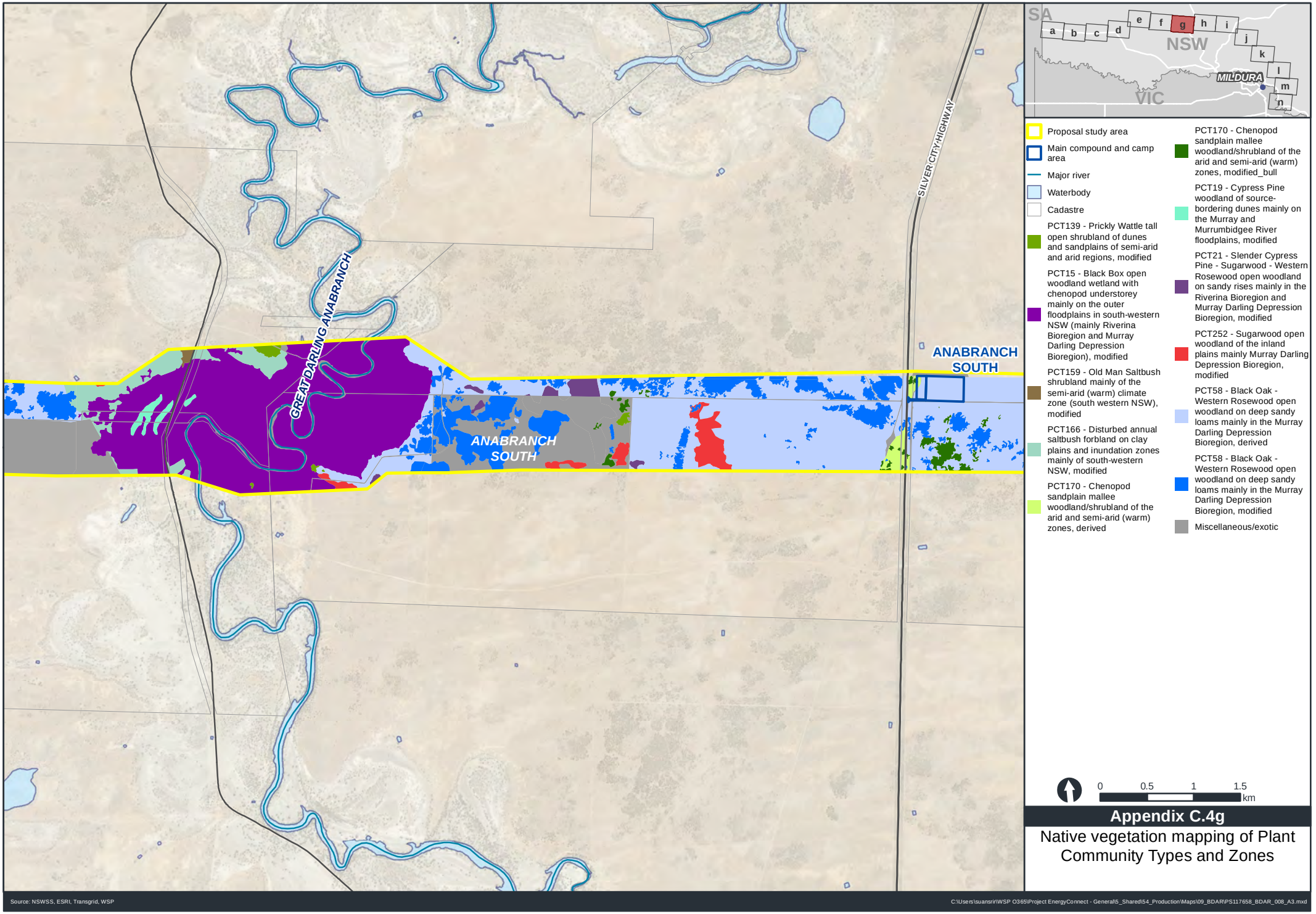
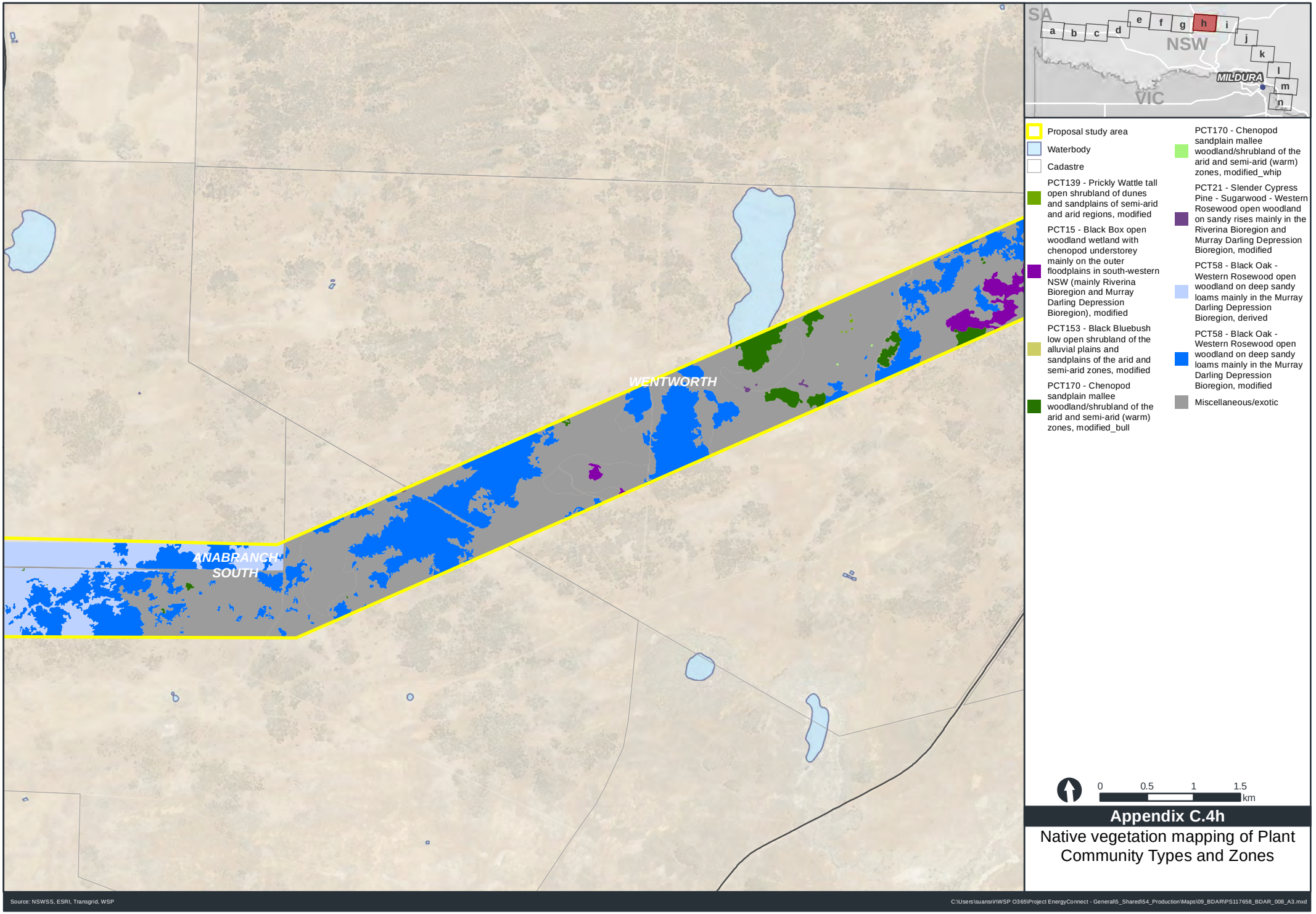


Appendix C.4g

Native vegetation mapping of Plant Community Types and Zones



Appendix C.4h

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

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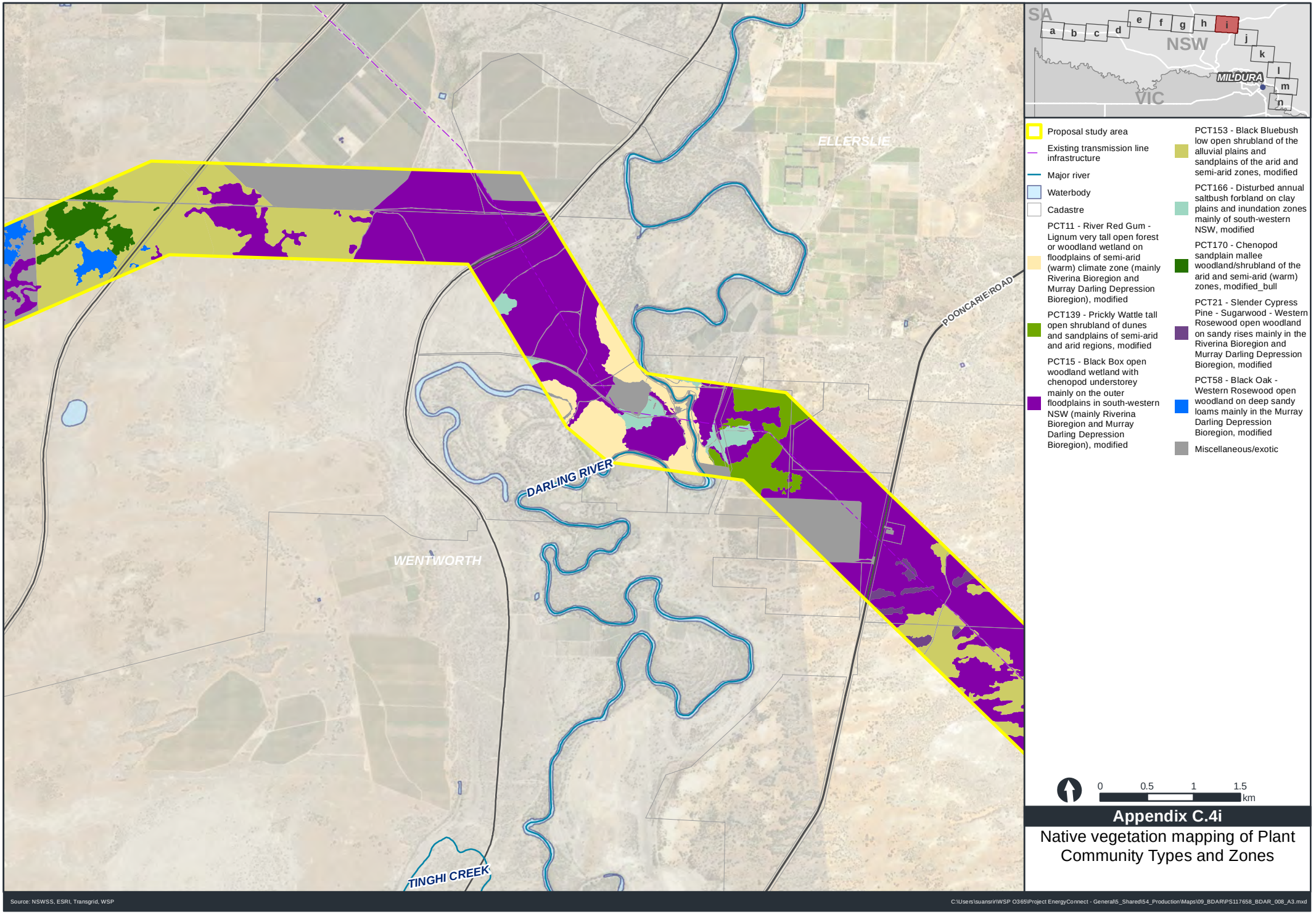
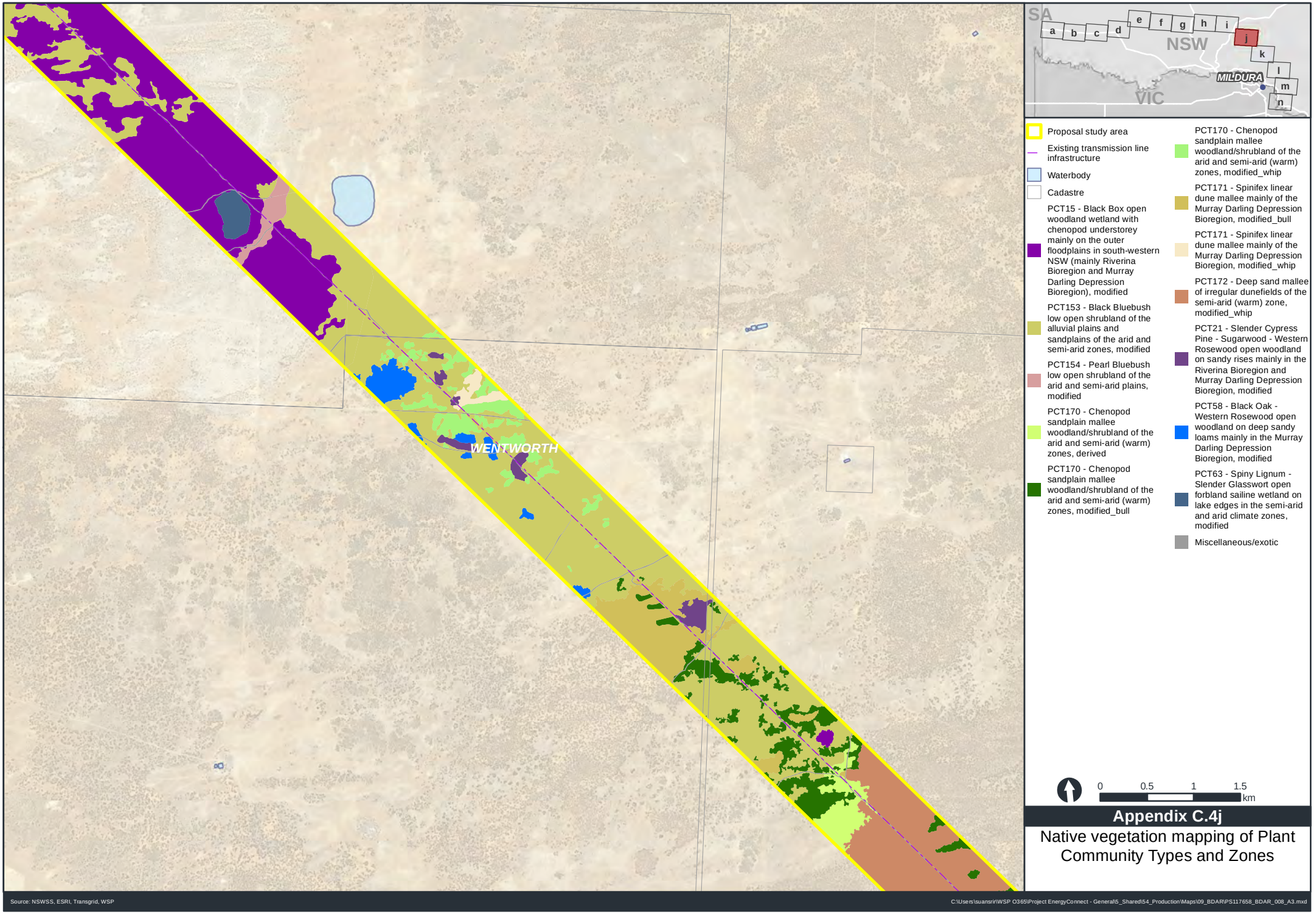


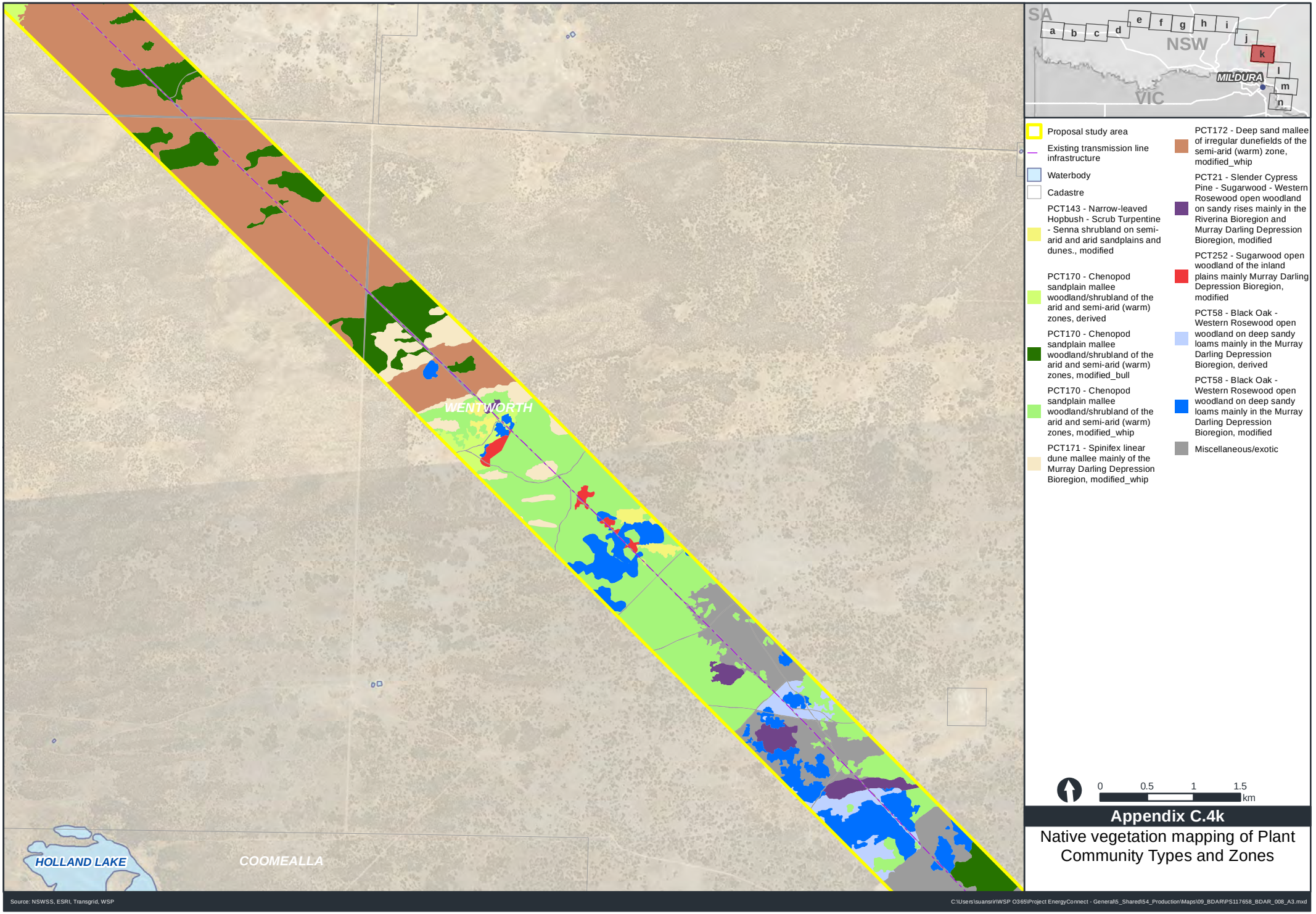
Appendix C.4i

Native vegetation mapping of Plant Community Types and Zones



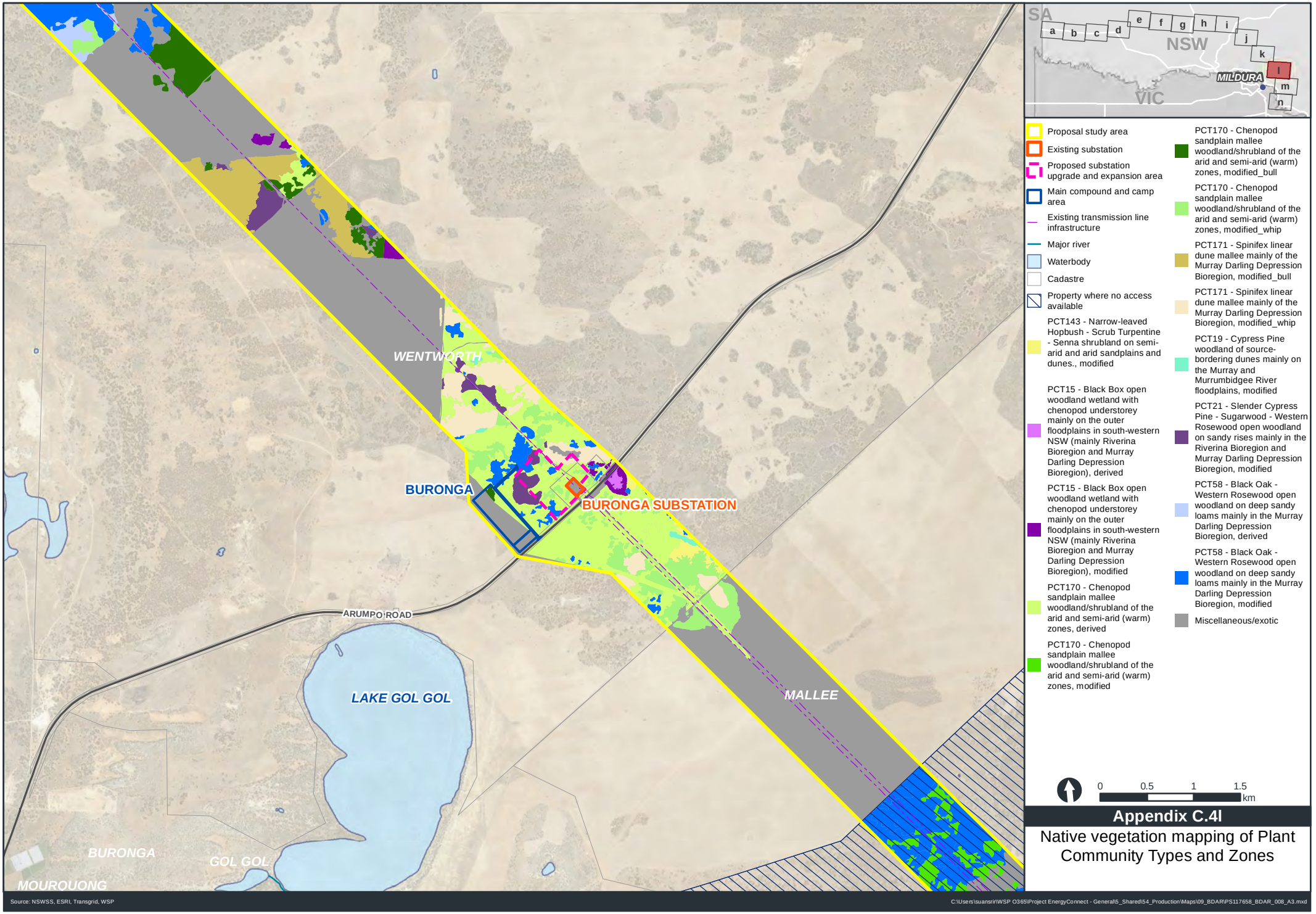
Appendix C.4j

Native vegetation mapping of Plant Community Types and Zones



Appendix C.4k

Native vegetation mapping of Plant Community Types and Zones

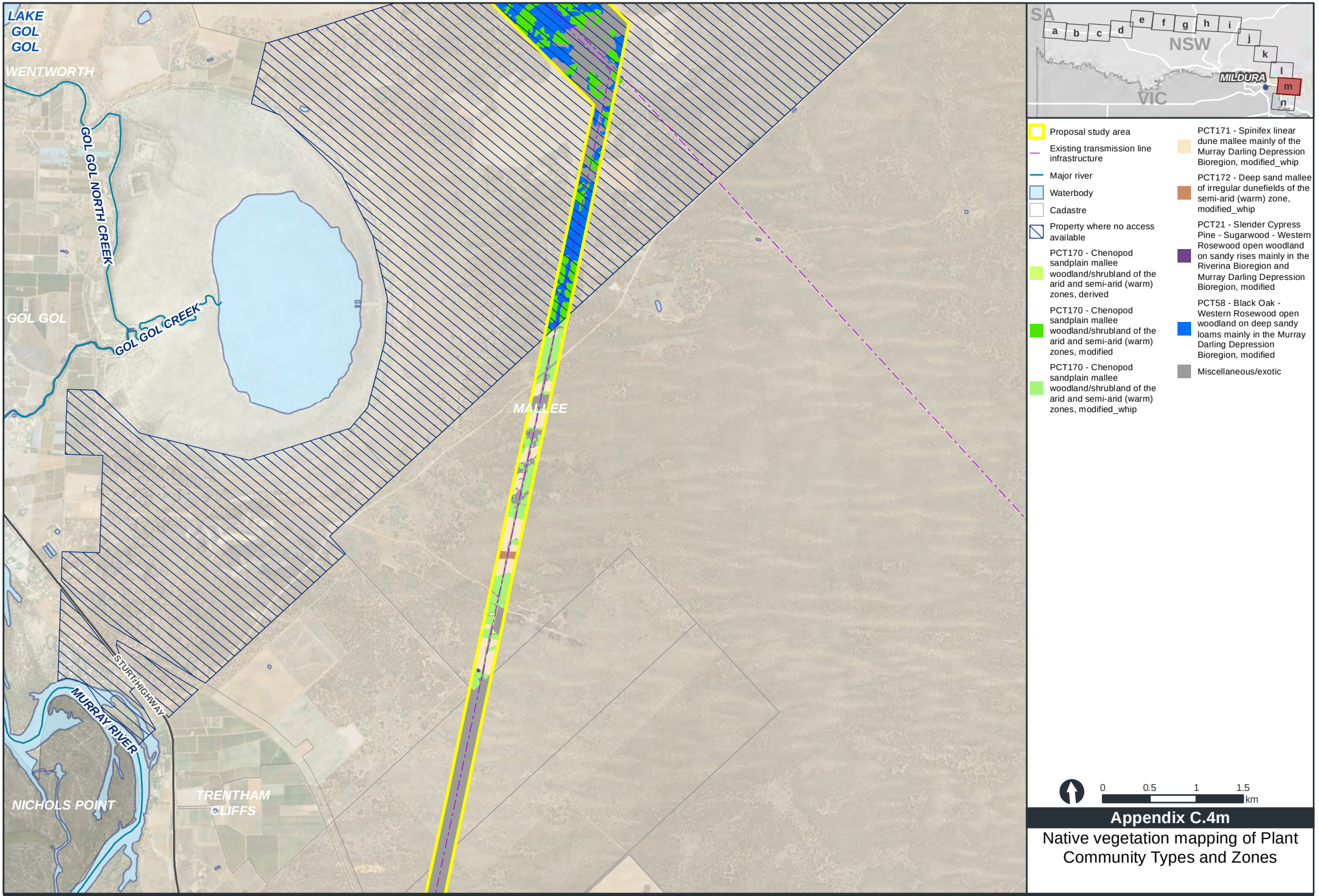


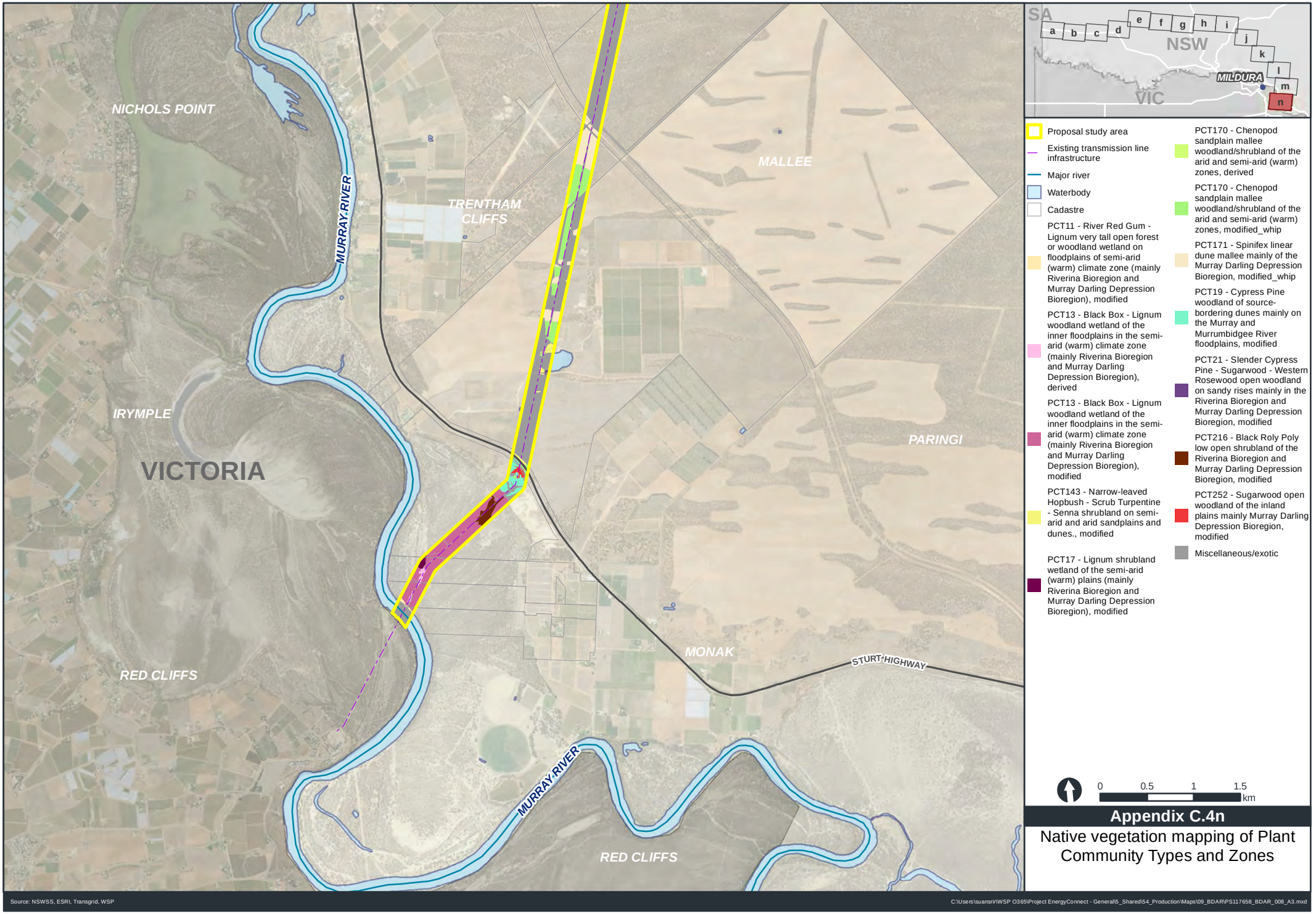
Appendix C.4l

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A3.mxd


LAKE GOL GOL
WENTWORTH
GOL GOL NORTH CREEK
GOL GOL
GOL GOL CREEK
MALLEE
STURT HIGHWAY
MURRAY RIVER
NICHOLS POINT
TRENTHAM CLIFFS
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Existing transmission line infrastructure
Major river
Waterbody
Cadastre
Property where no access available
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, derived
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_whip
PCT171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion, modified_whip
PCT172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone, modified_whip
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified
Miscellaneous/exotic
0
0.5
1
1.5
km
Appendix C.4m
Native vegetation mapping of Plant Community Types and Zones
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A3.mxd



Appendix C.4n

Native vegetation mapping of Plant Community Types and Zones

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A3.mxd

APPENDIX C-5
NSW BC ACT THREATENED ECOLOGICAL COMMUNITIES ANALYSIS

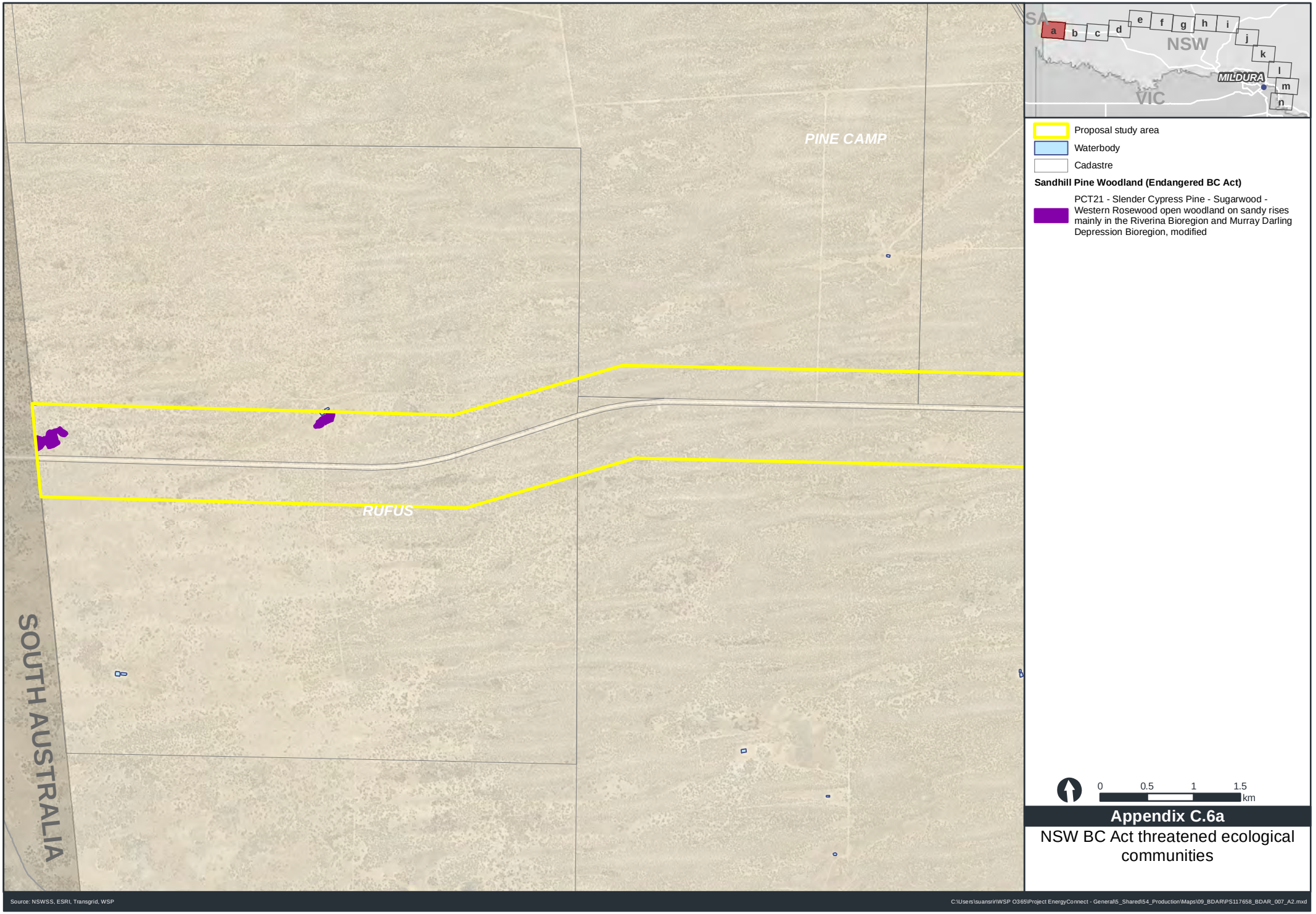
C-5.1 SANDHILL PINE WOODLAND

Table C-5.1 Correlation of BC Act-listed Sandhill Pine Woodland to associated PCTs

SCIENTIFIC DETERMINATION	PCT 19 CYPRESS PINE WOODLAND OF SOURCE-BORDERING DUNES MAINLY ON THE MURRAY AND MURRUMBIDGEE RIVER FLOODPLAINS	PCT 21 SLENDER CYPRESS PINE - SUGARWOOD - WESTERN ROSEWOOD OPEN WOODLAND ON SANDY RISES MAINLY IN THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION
Does the PCT occur in the Riverina, Murray-Darling Depression or South Western Slopes Bioregions?	Yes. Recorded in the Murray Darling Depression, Darling Riverine Plains and Riverina IBRA regions.	Yes. Recorded in the Murray Darling Depression and Darling Riverine Plains IBRA regions.
Is the PCT dominated by *Callitris glaucophylla*?	Yes. This PCT is co-dominated by *Callitris glaucophylla* and *Callitris gracilis subsp. murrayensis.*	No. This PCT was dominated by *Callitris gracilis* subsp. *murrayensis.*
Does the PCT occur on red-brown loamy sands with alkaline sub-soils on the alluvial plain of the Murray River and its tributaries, and on parts of the sandplain in south-western NSW? Or In the Riverina bioregion and the far south-western portion of the NSW South Western Slopes bioregion, the community is typically associated with prior streams and aeolian source-bordering dunes, which are scattered within an extensive alluvial clay plain dominated by chenopod shrublands. Or Murray-Darling Depression bioregion, the community occurs as scattered patches on sandhills and lunettes within an extensive aeolian sandplain dominated by woodlands of mallee eucalypts or belah.	Yes. This PCT occurred on sandy soils and colonised crescent shaped dunes on the outskirts of the floodplain of major river systems.	Yes. This PCT occurred as scattered patches on sand hills in areas of higher elevation away from the floodplain.

SCIENTIFIC DETERMINATION	PCT 19 CYPRESS PINE WOODLAND OF SOURCE-BORDERING DUNES MAINLY ON THE MURRAY AND MURRUMBIDGEE RIVER FLOODPLAINS	PCT 21 SLENDER CYPRESS PINE - SUGARWOOD - WESTERN ROSEWOOD OPEN WOODLAND ON SANDY RISES MAINLY IN THE RIVERINA BIOREGION AND MURRAY DARLING DEPRESSION BIOREGION
Does the PCT structure comprise of an open tree canopy with sometimes sparse, but highly variable ground layer dominated by grasses and herbs, sometimes with scattered shrubs and/or small trees?	Yes. This PCT has an open tree canopy with percentage tree cover ranging from 0-8% The understory is dominated by a high percentage cover of herbs. Lowe percentage cover of grasses and shrubs was recorded.	Yes. This PCT has an open tree canopy with percentage tree cover ranging from 0-10%. The understory is dominated by high percentage cover of shrubs and herbs. A low percentage cover of grasses occurred within this PCT.
Paragraph 2 Does the PCT have the assemblage of species that are listed as frequently and infrequently occurring within this EEC.	Yes. This PCT has 19% of the frequently recorded species and 37% of the infrequently recorded species. Whilst these numbers are relatively low the PCT was heavily degraded within the study area.	Yes. This PCT has 26% of the frequently recorded species and 47% of the infrequently recorded species. The former species diversity was relatively low however infrequently recorded species was half of the species identified within the scientific determination. The PCT was heavily degraded within the study area.
Paragraph 3 There is no condition threshold described for this community in the determination. Any vegetation in which characteristic native species dominate any structural layer present is considered to constitute the community.	Yes. This PCT has characteristic dominant native species in the canopy layer (>50% of cover layer). The herb layer is at least 10% dominant within this community.	Yes. This PCT does not have the canopy species present. However, *Callitris gracilis subsp. murrayensis* was the dominant canopy species. The dominant species in the understorey and groundlayer is consistent with the species listed within the scientific determination. The understorey and groundlayer have high percentage cover for shrubs, herbs and grasses.
Conclusion - does the PCT meet the criteria for this EEC?	**Yes. Meets Criteria.**	**Yes. Meets Criteria.**

APPENDIX C-6
NSW BC ACT THREATENED ECOLOGICAL COMMUNITIES MAPPING



Appendix C.6a

NSW BC Act threatened ecological communities

Source: NSWSS, ESRI, Transgrid, WSP

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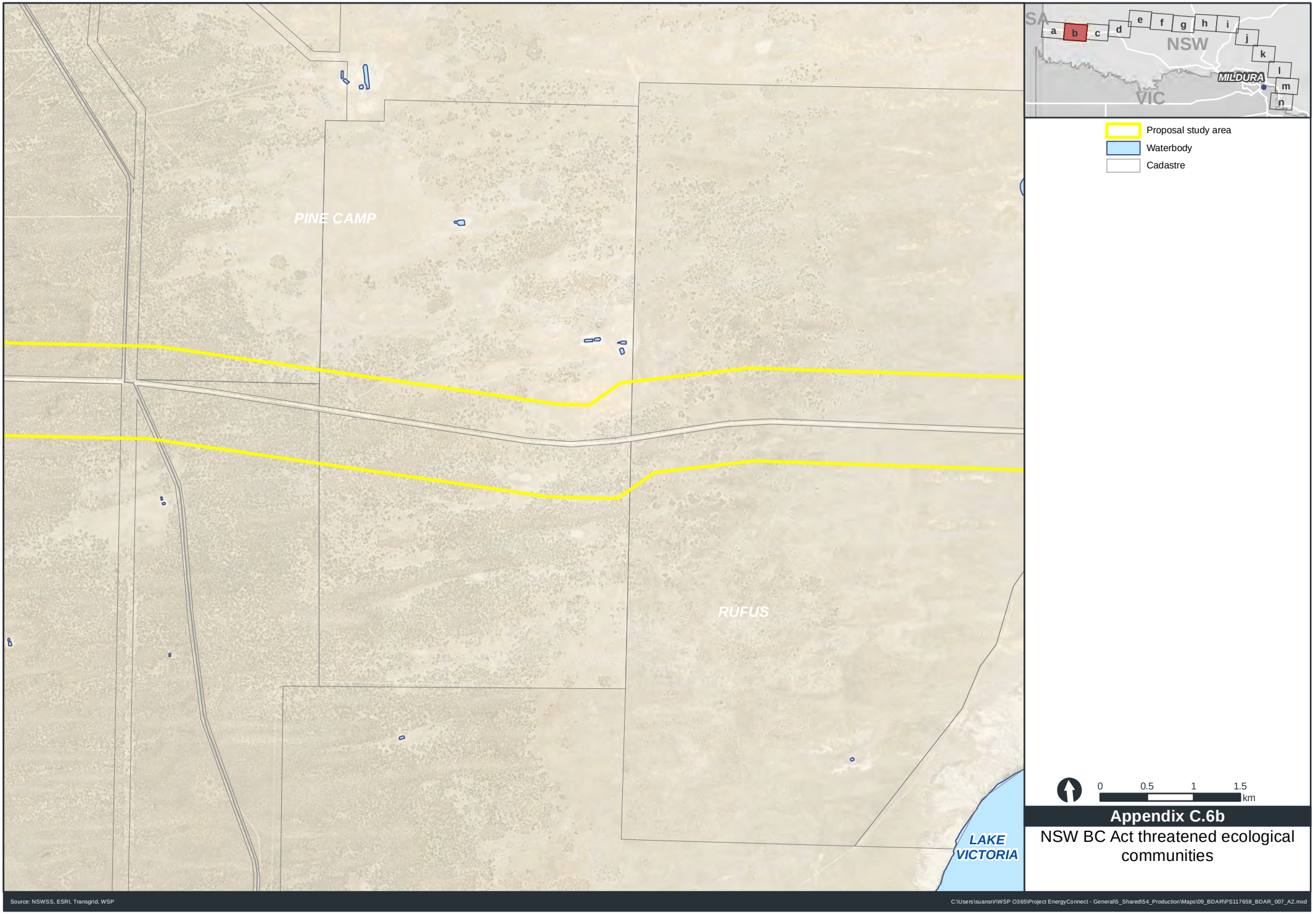

Appendix C.6b

NSW BC Act threatened ecological communities

Source: NSWSS, ESRI, Transgrid, WSP

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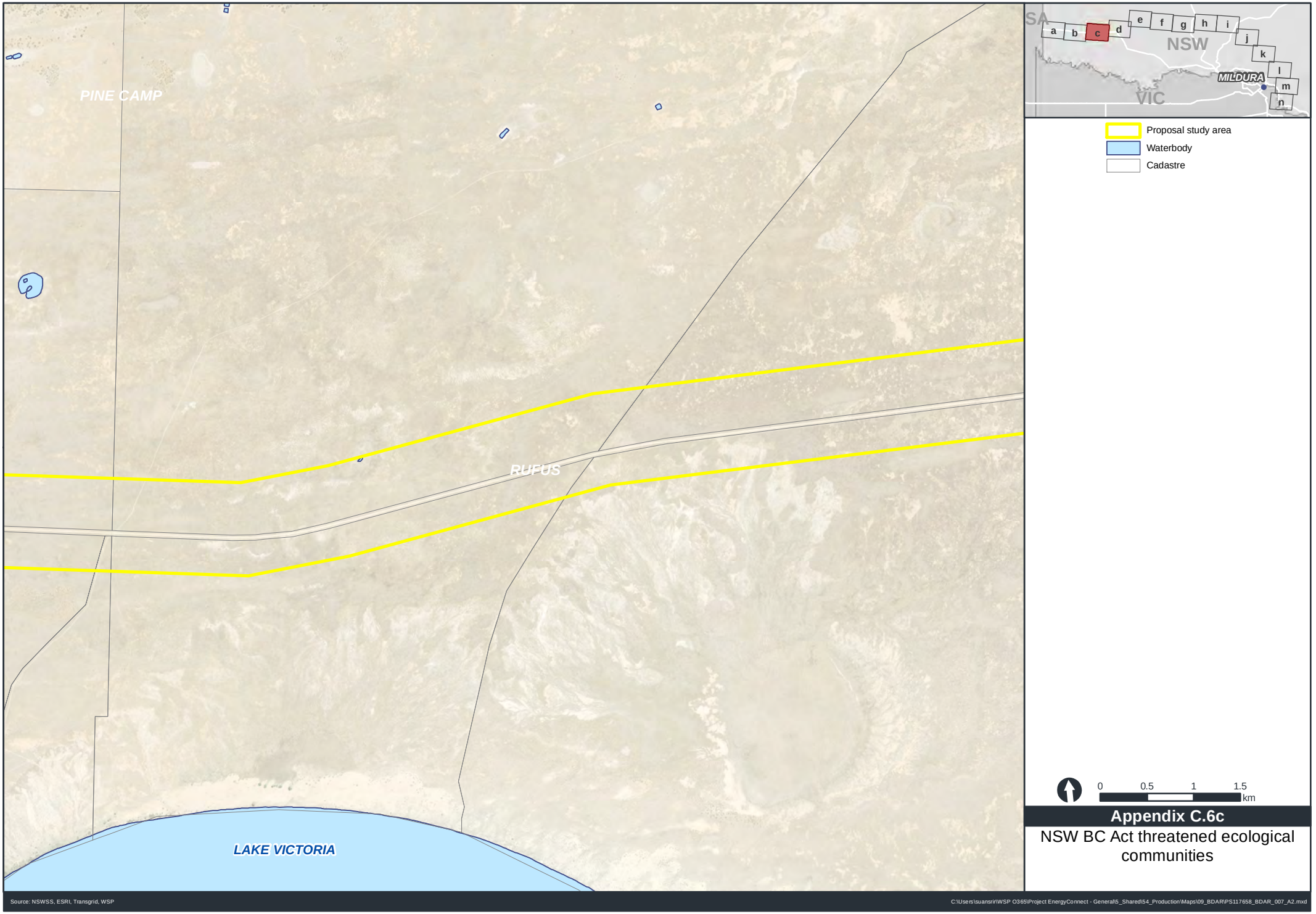
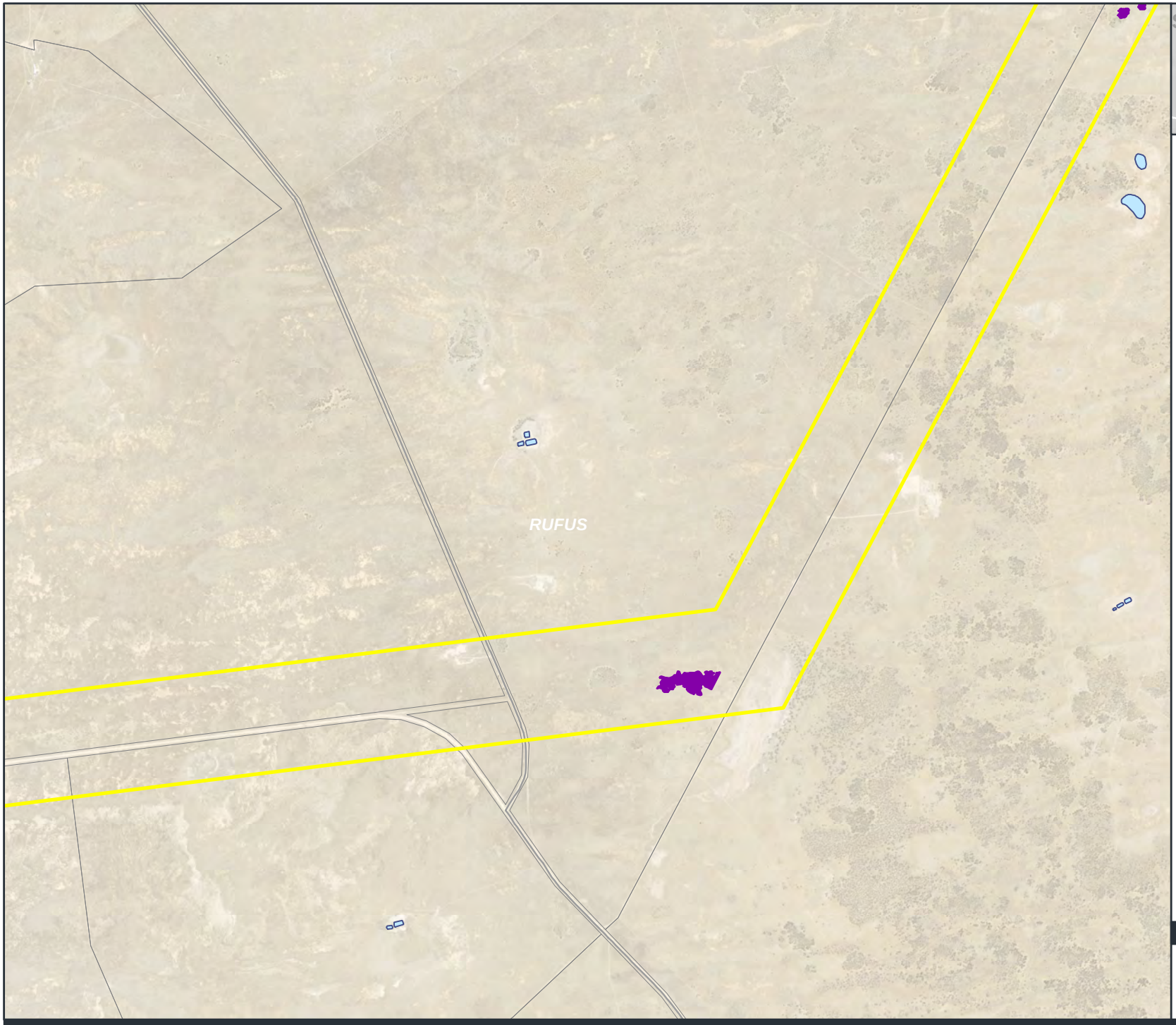
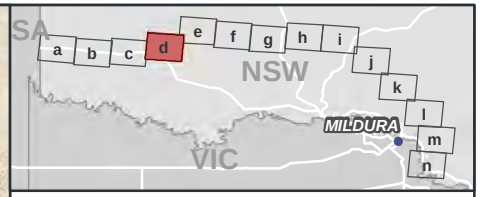


Appendix C.6c

NSW BC Act threatened ecological communities





Proposal study area

Waterbody

Cadastre

Sandhill Pine Woodland (Endangered BC Act)

PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified

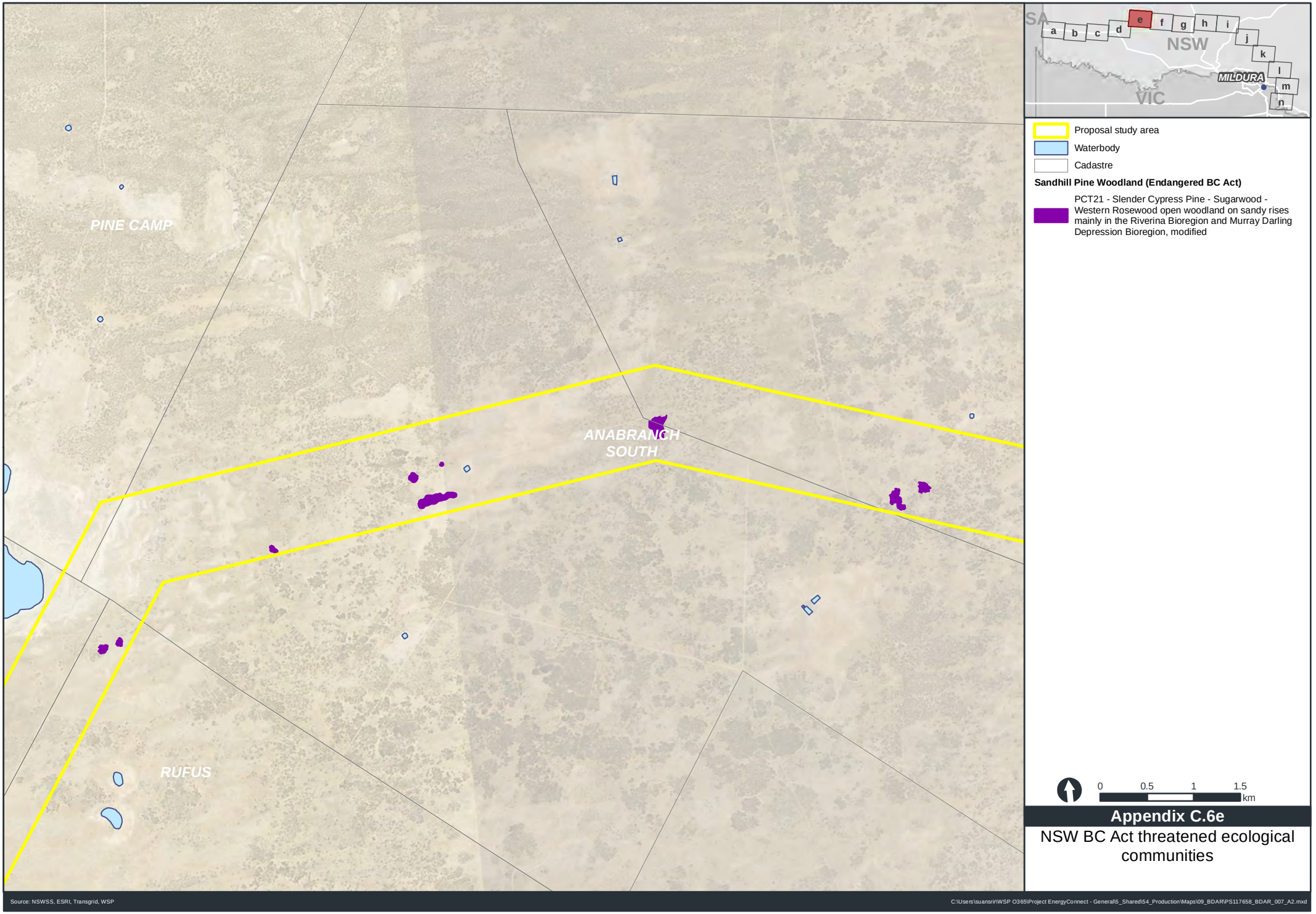
0 0.5 1 1.5 km

Appendix C.6d

NSW BC Act threatened ecological communities

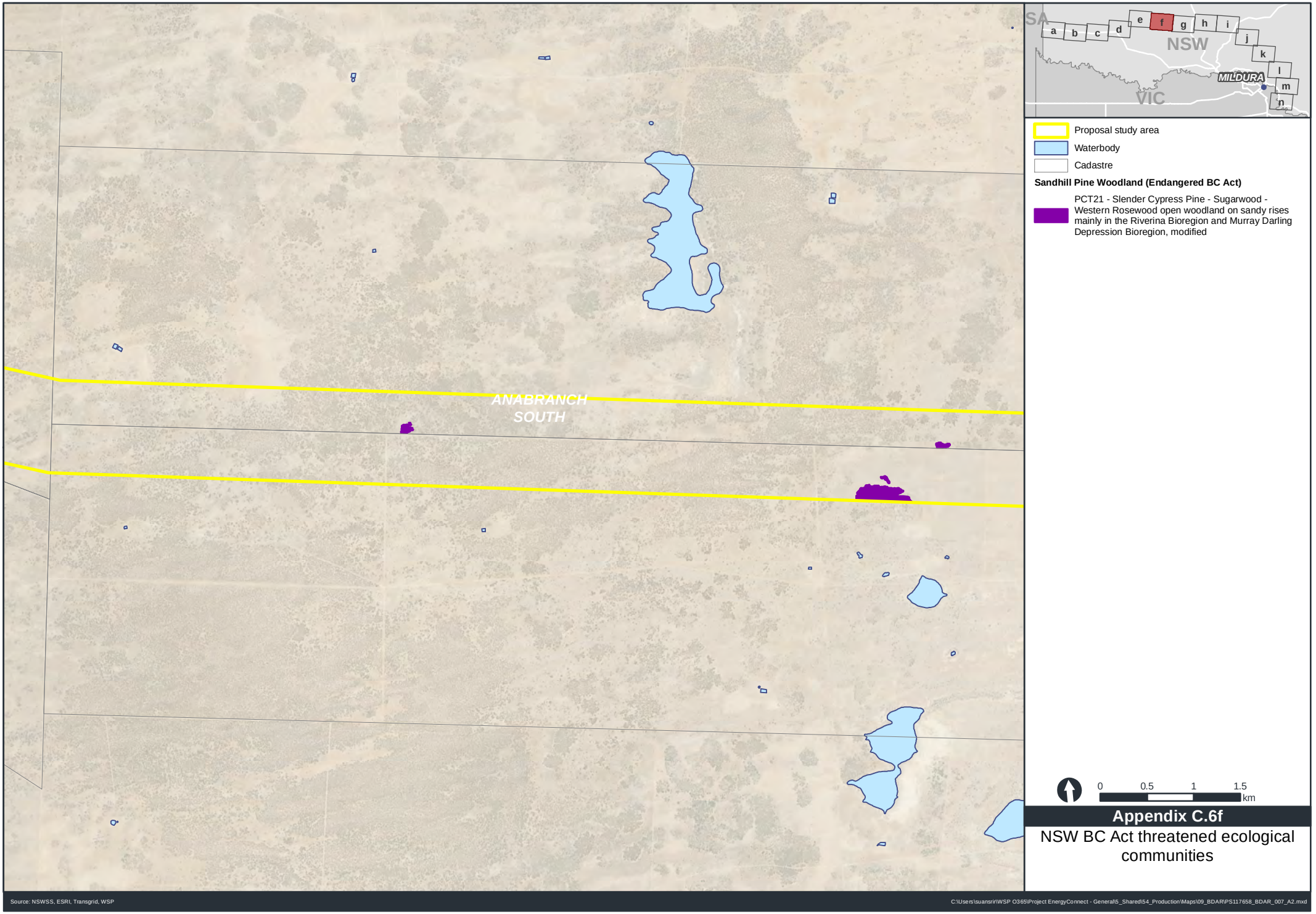
Source: NSWSS, ESRI, Transgrid, WSP

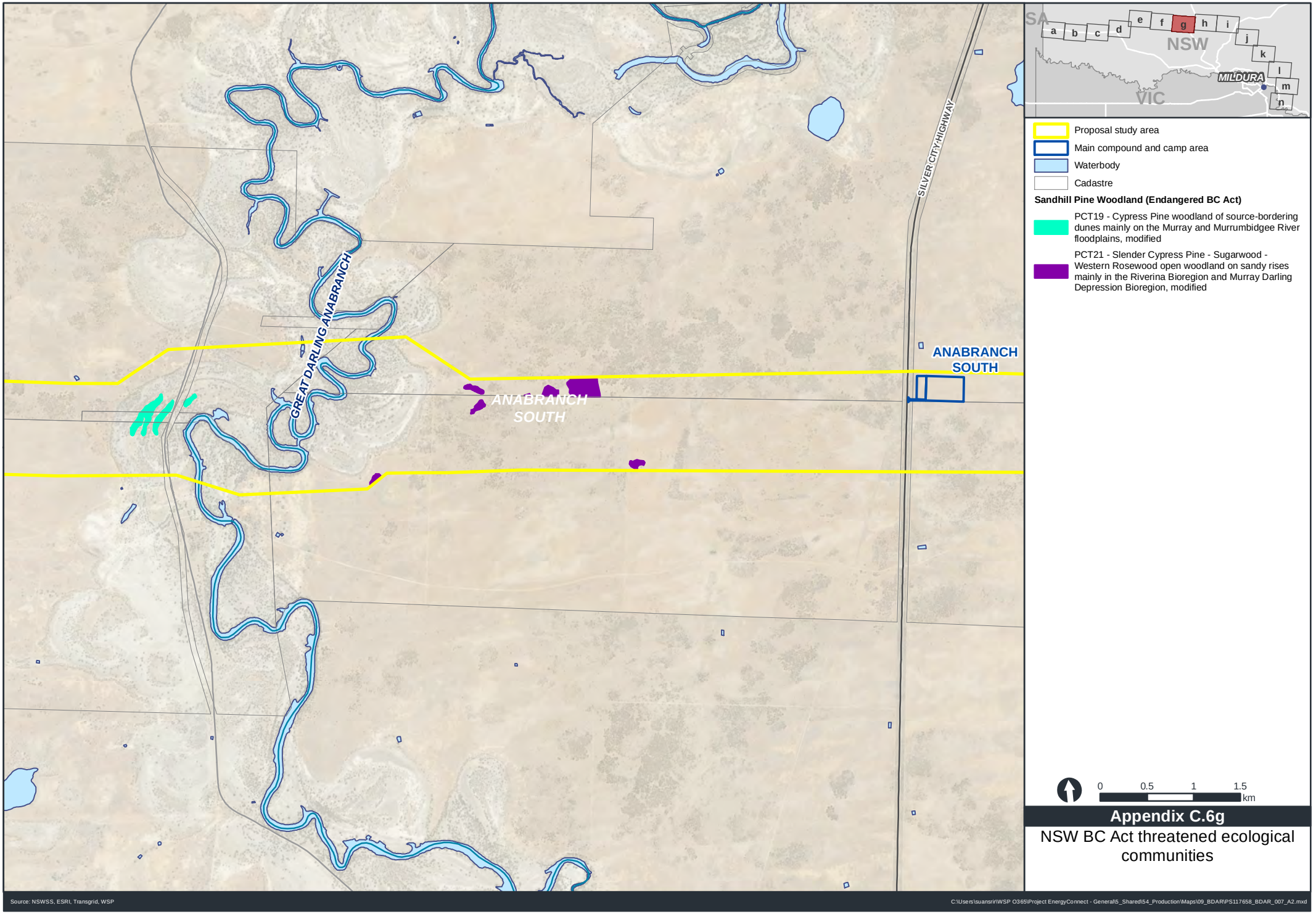
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_007_A2.mxd



Appendix C.6e

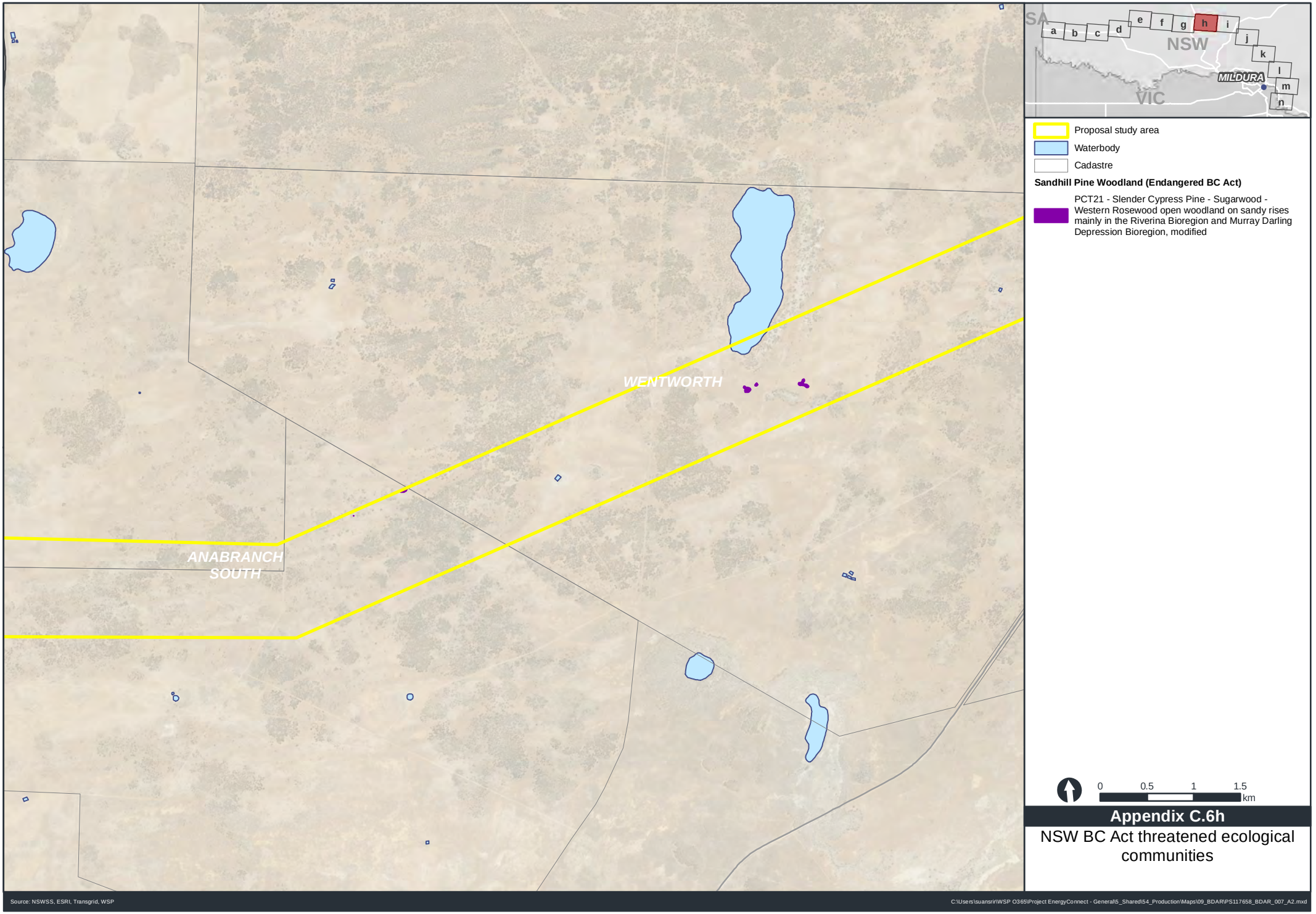
NSW BC Act threatened ecological communities


ANABRANCH
SOUTH
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Waterbody
Cadastre
Sandhill Pine Woodland (Endangered BC Act)
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
0
0.5
1
1.5
km
Appendix C.6f
NSW BC Act threatened ecological communities
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_007_A2.mxd



Appendix C.6g

NSW BC Act threatened ecological communities

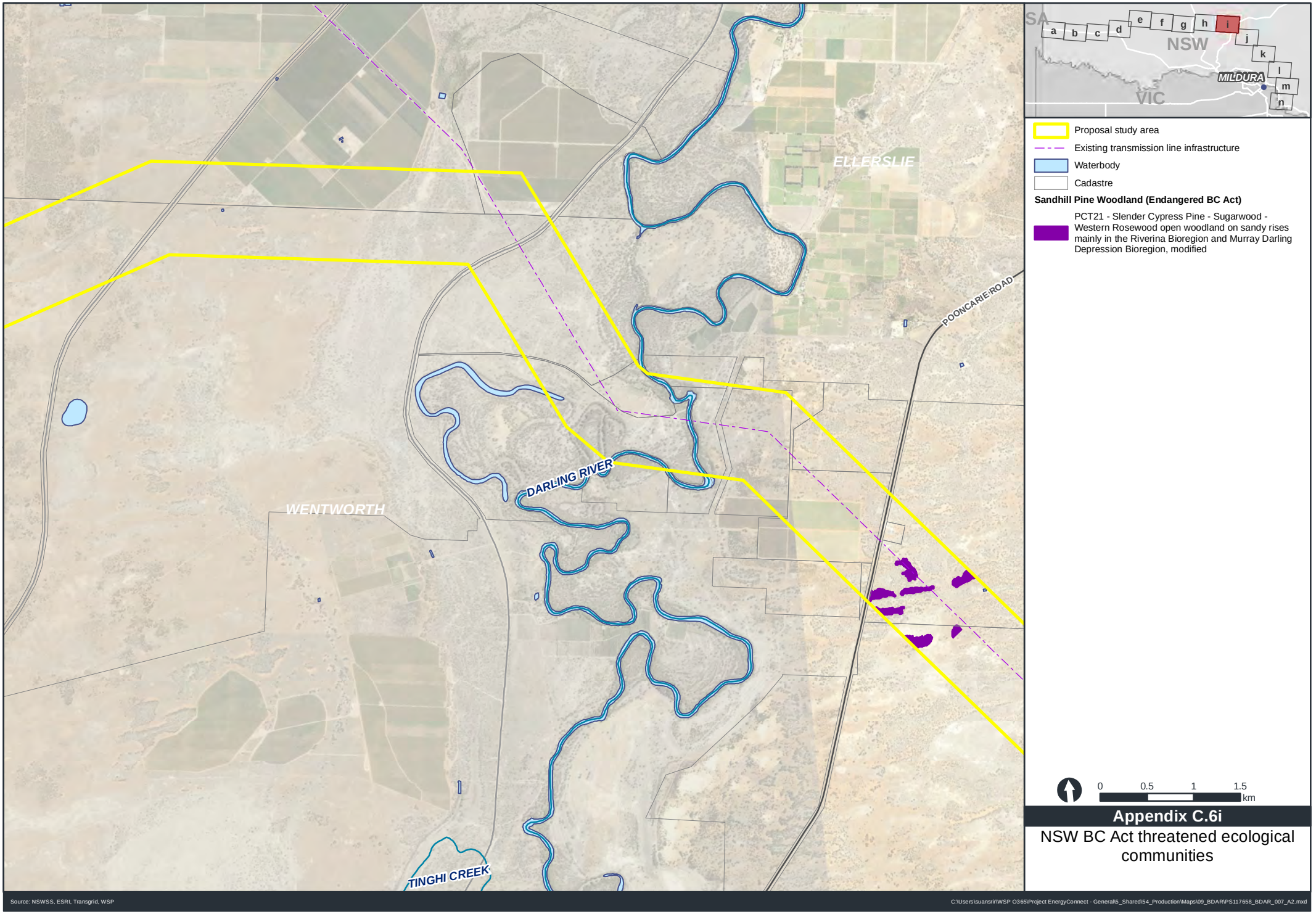


Appendix C.6h

NSW BC Act threatened ecological communities

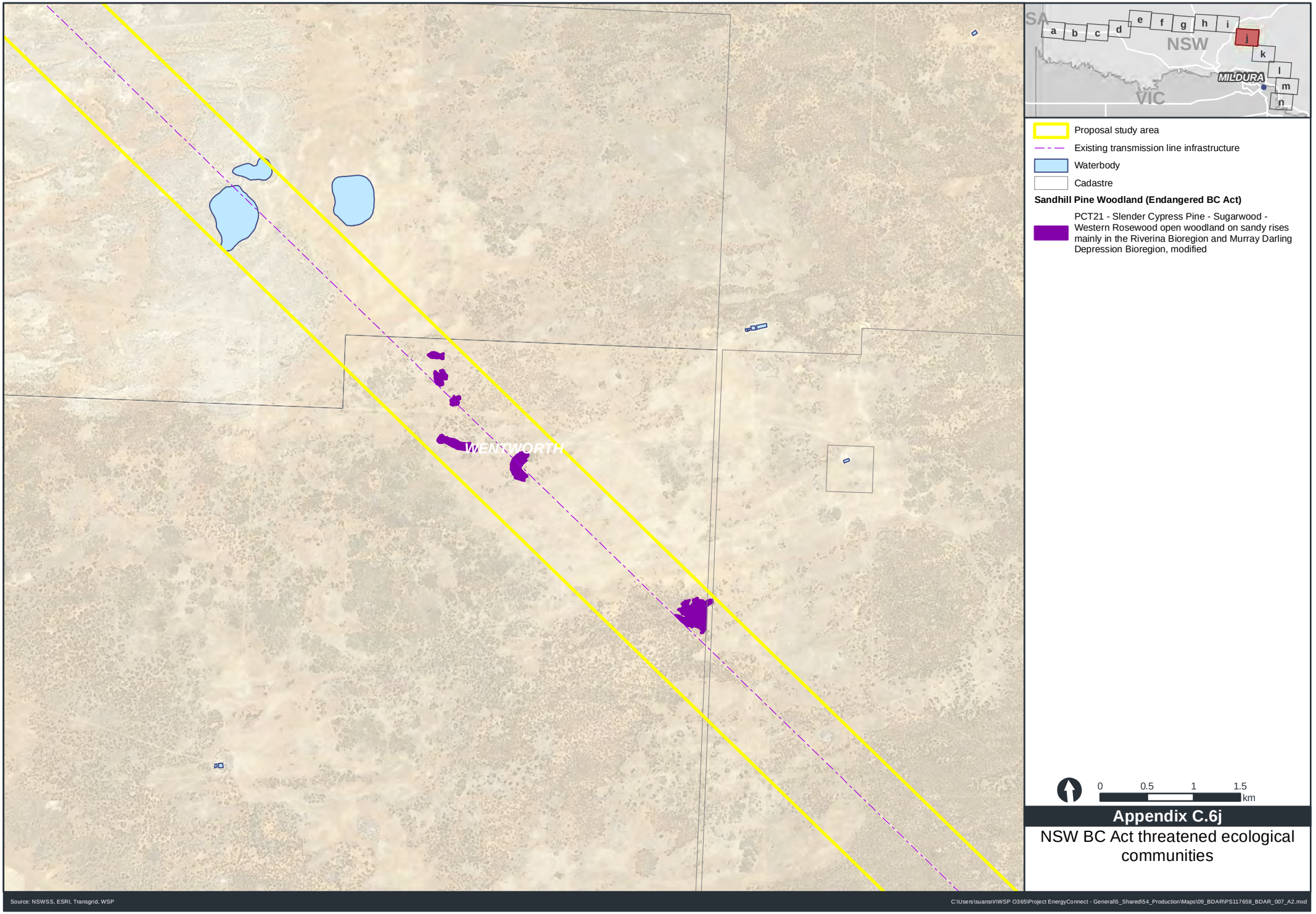
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_007_A2.mxd



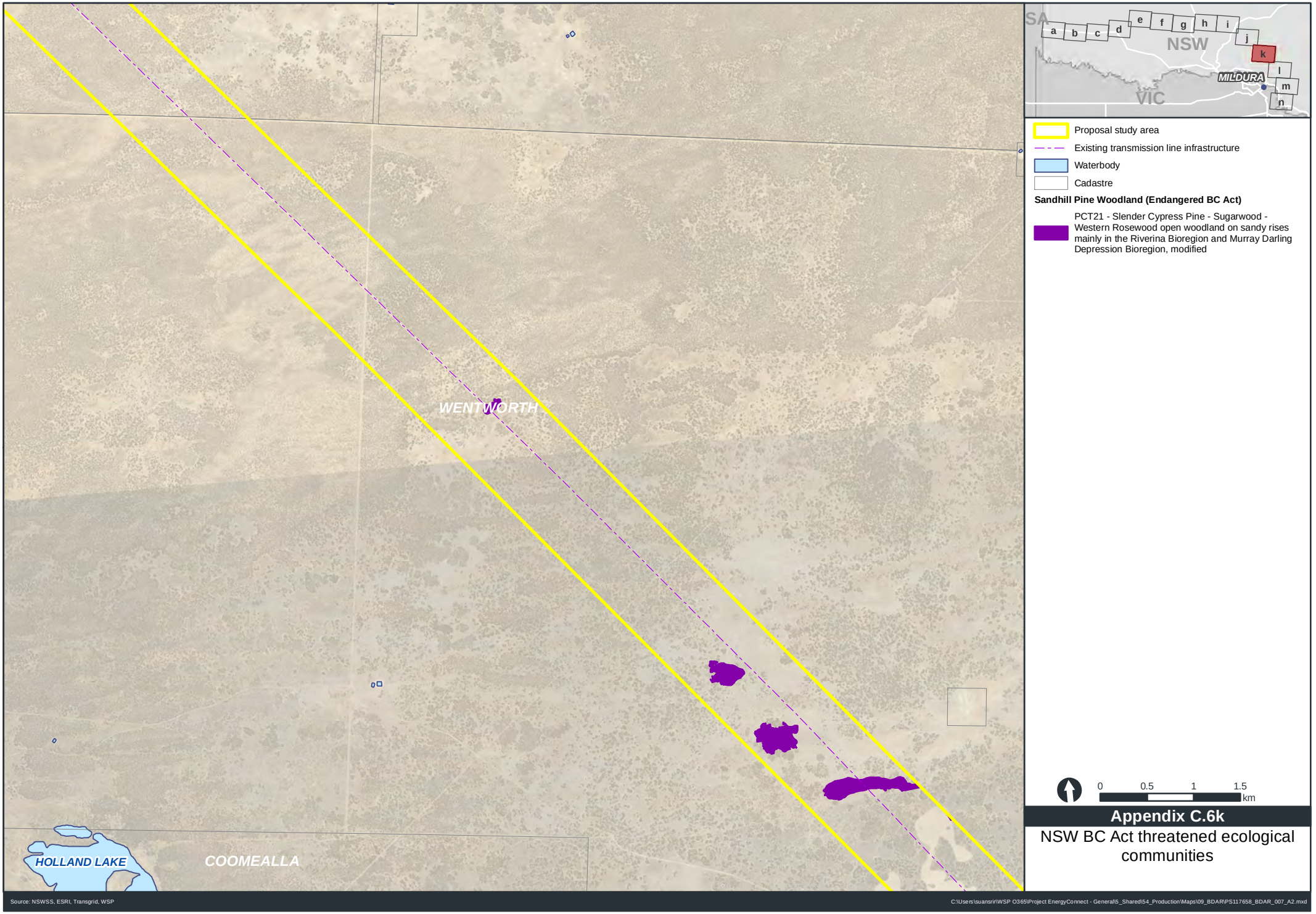
Appendix C.6i

NSW BC Act threatened ecological communities



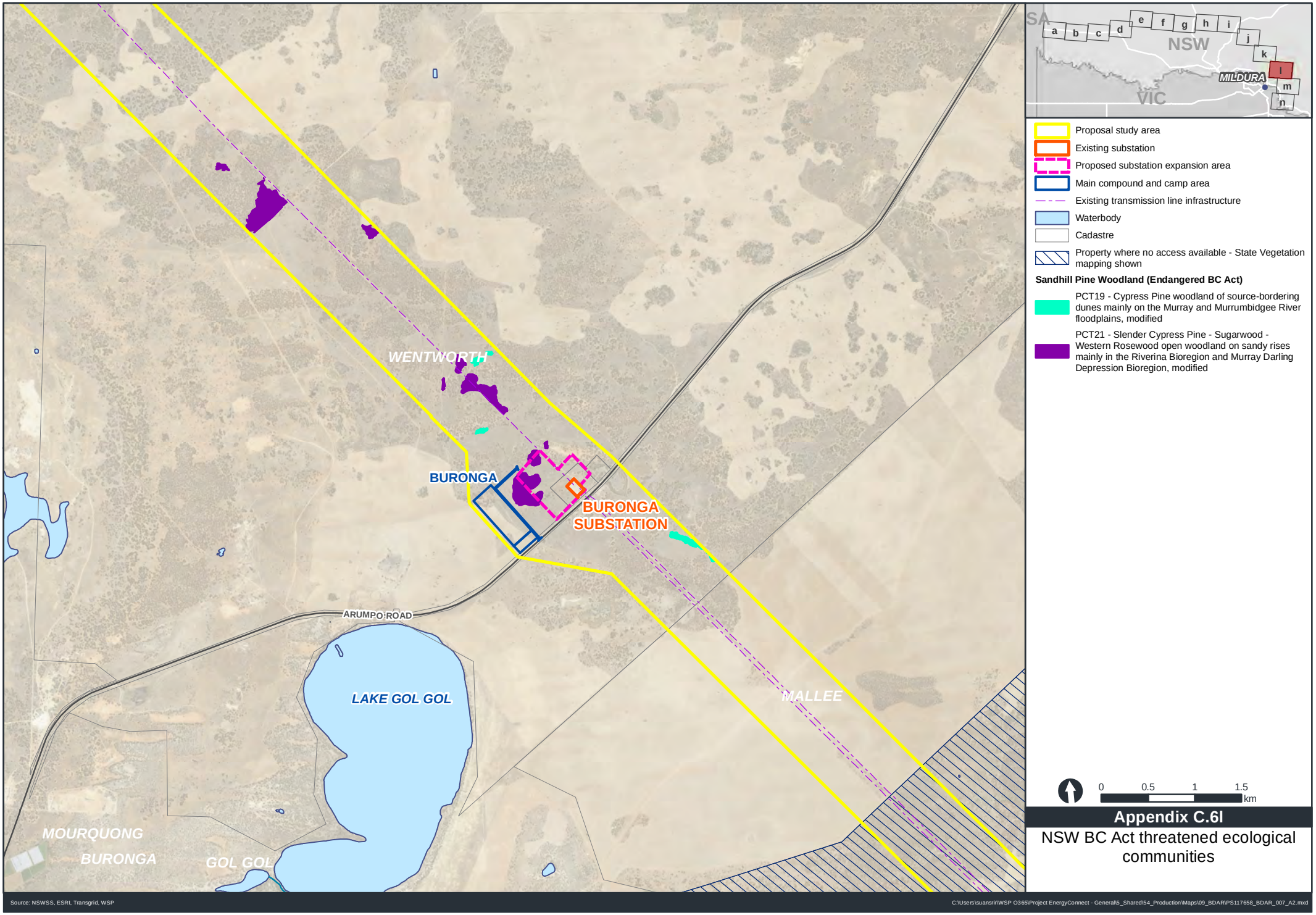
Appendix C.6j

NSW BC Act threatened ecological communities



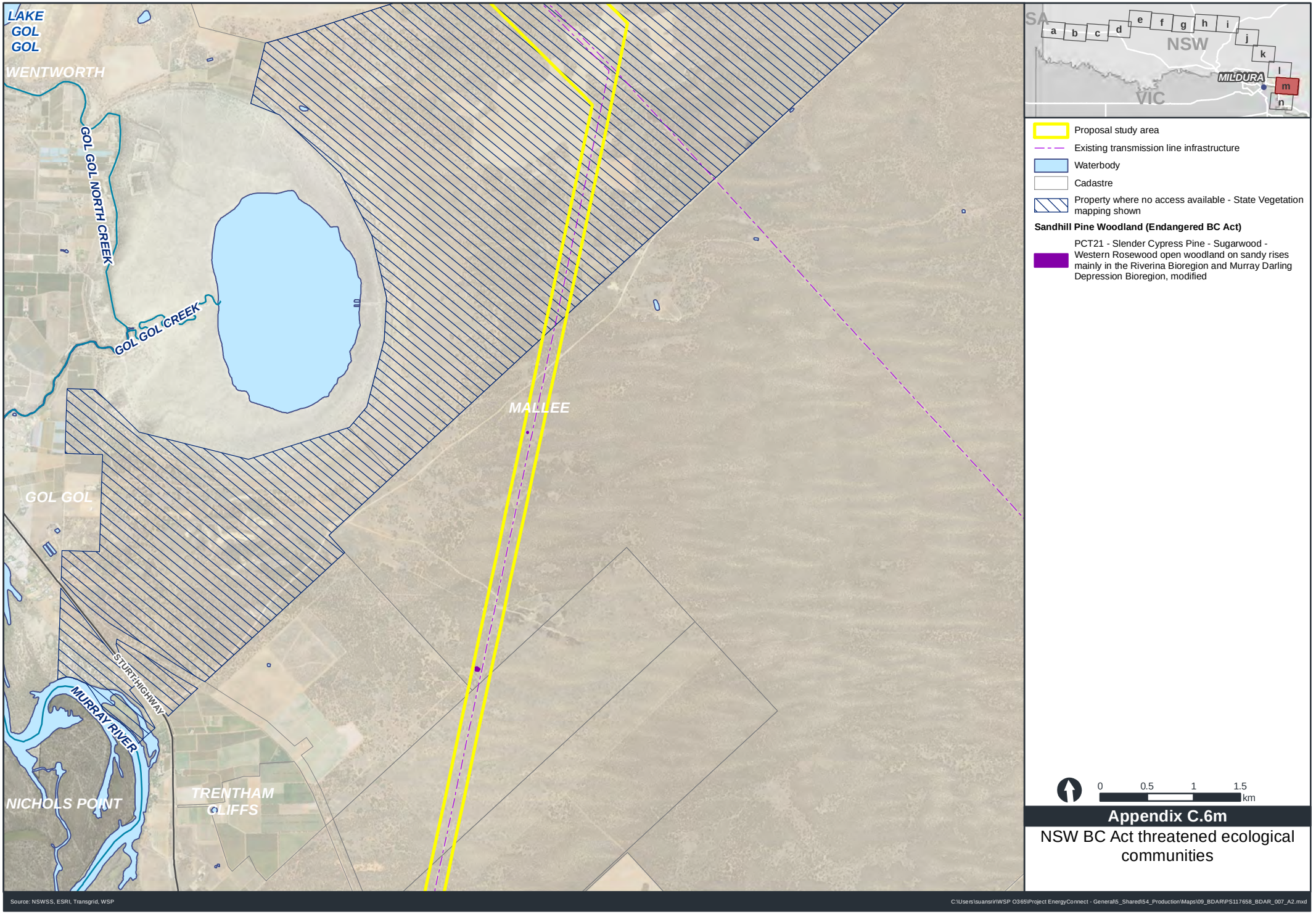
Appendix C.6k

NSW BC Act threatened ecological communities



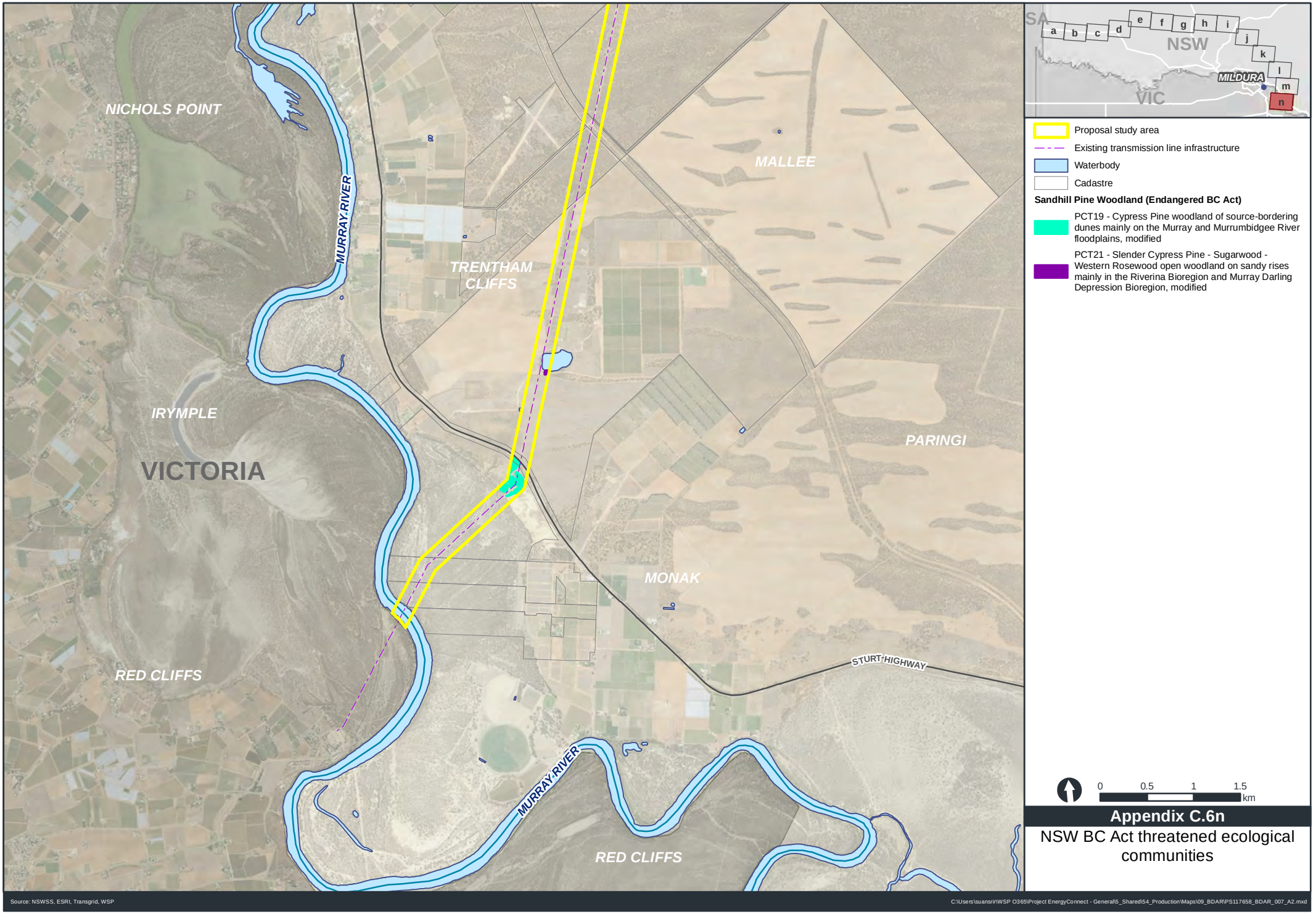
Appendix C.6l

NSW BC Act threatened ecological communities



Appendix C.6m

NSW BC Act threatened ecological communities


NICHOLS POINT
MURRAY RIVER
TRENTHAM CLIFFS
MALLEE
IRYMPLE
VICTORIA
PARINGI
MONAK
RED CLIFFS
STURT HIGHWAY
MURRAY RIVER
RED CLIFFS
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Existing transmission line infrastructure
Waterbody
Cadastre
Sandhill Pine Woodland (Endangered BC Act)
PCT19 - Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains, modified
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
0
0.5
1
1.5
km
Appendix C.6n
NSW BC Act threatened ecological communities
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_007_A2.mxd

APPENDIX C-7
RAPID DATA POINT ASSESSMENT SURVEY RESULTS

Table C-7.1 Floristics, TransGrid easement, Red Cliffs-NSW-SA border

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	1	43.47788	615153.5868	6206524.425	*Eucalyptus largiflorens*	Black Box Chenopod Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	1	43.47788	615153.5868	6206524.425	*Chenopodium nitrariaceum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	1	43.47788	615153.5868	6206524.425	*Rhagodia spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	1	43.47788	615153.5868	6206524.425	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	1	43.47788	615153.5868	6206524.425	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	1	43.47788	615153.5868	6206524.425	*Mesembryanthemum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Brachyscome lineariloba*	End Black Box Chenopod Woodland. Start open treeless floodplain	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Roepera glauca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	2	43.67124	615818.713	6207016.647	*Scleroblitum atriplicinum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	3	43.20502	615949.9899	6207111.514		End treeless floodplain. Start Black Box Chenopod Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	4	42.99884	616041.7249	6207180.584	*Acacia victoriae*	End Black Box Chenopod Woodland. Start Sandhill Pine Woodland (cleared)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	4	42.99884	616041.7249	6207180.584	*Eremophila longifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	5	59.11953	616247.8048	6207485.692		End at highway. Start cleared Mallee woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	6	62.05232	616209.117	6207343.542		End cleared Mallee Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	7	49.4166	616347.4847	6225590.248		Start cleared land with sporadic mallee Eucs.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	8	51.18155	616347.8857	6225525.585		Cleared land with sporadic mallee Eucs.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	9	49.06809	616754.0073	6225034.678		End cleared land with sporadic mallee Eucs. Start Chenopod Sandplain Mallee to W; Narrow strip of Chenopod Sandplain Mallee to E between high voltage lines	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	10	47.61265	617166.604	6224533.8		Start cleared land	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	11	48.63166	617265.2582	6224418.56		End cleared land. Start very disturbed Mallee to W; cleared to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	12	46.46768	617351.4874	6224298.371		Start very disturbed Mallee to W; thin strip of Mallee to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	13	49.50927	617528.4375	6224100.635		Start cleared Mallee to W; narrow strip of Mallee to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	14	51.43059	617876.8175	6223663.852		Start very disturbed Belah Woodland to W; cleared to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	15	52.20318	617911.1613	6223614.734		Start cleared land W and E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	16	52.40767	617977.4089	6223542.701		Start very disturbed Belah Woodland to W; cleared to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	17	53.00617	618025.4082	6223486.646		End Belah Woodland. Cleared W and E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	18	57.56072	618736.7524	6222645.891		Very disturbed Mallee to W; narrow strip of Mallee/Belah Woodland to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	19	62.78024	619172.5555	6222115.342		End at fence	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Maireana pyramidata*	Black Bluebush/Nitre-bush Shrubland on Woorinen Formation clay loam	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Austrostipa scabra ssp. falcata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
6/09/2020	20	38.20455	539155.7187	6249288.009	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Salvia verbenaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	20	38.20455	539155.7187	6249288.009	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Maireana sedifolia*	End Black Bluebush/Nitre-bush Shrubland. Start Pearl Bluebush Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Vittadinia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Elachanthus pusillus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Convolvulus clementii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Vittadinia gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
6/09/2020	21	37.27097	539367.9237	6249623.428	*Vittadinia cervicularis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Convolvulus remotus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Sida intricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	21	37.27097	539367.9237	6249623.428	*Roepera crenata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	22	34.79123	539472.868	6249844.862		Baked clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	23	36.2952	539572.7324	6249933.372	*Maireana sedifolia*	Baked clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	23	36.2952	539572.7324	6249933.372	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	23	36.2952	539572.7324	6249933.372	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
6/09/2020	23	36.2952	539572.7324	6249933.372	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	23	36.2952	539572.7324	6249933.372	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	24	36.74843	539541.3656	6249928.624	*Spergularia? sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	25	40.96211	539585.6939	6249959.374		End Pearl Bluebush Shrubland. Start Black Bluebush Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	26	41.05412	539710.6438	6250119.96	*Callitris gracilis*	End Black Bluebush/Nitre-bush Shrubland. Start mixed Pine Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	26	41.05412	539710.6438	6250119.96	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	26	41.05412	539710.6438	6250119.96	*Pycnosorus pleiocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	27	42.64264	539904.1316	6250415.419		Start mixed Pine Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Maireana pyramidata*	End Pine Woodland. Start Black Bluebush/Pearl Bluebush ecotonal Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Rhodanthe stuartiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
6/09/2020	28	42.74054	540008.7271	6250570.986	*Vittadinia sp.*	As per waypoint 21	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Vittadinia gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	28	42.74054	540008.7271	6250570.986	*Teucrium racemosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	29	42.11478	540303.2824	6251012.149	*Casuarina pauper*	Exit ecotonal Shrubland. Start very open Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	30	46.36515	540589.2439	6251470.304	*Casuarina pauper*	End very open Belah Woodland. Start Belah Woodland on sandy loam rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	31	46.60934	540701.6382	6251605.983	*Casuarina pauper*	End Belah Woodland. Start sparse Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	31	46.60934	540701.6382	6251605.983	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	31	46.60934	540701.6382	6251605.983	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	32	48.03177	541189.992	6252338.786	*Casuarina pauper*	End sparse Belah Woodland. Start Belah Woodland with Black Bluebush understorey	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	32	48.03177	541189.992	6252338.786	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	33	39.62931	541319.6081	6252538.139		End Belah Woodland with Black Bluebush understorey. Start open Grassland of Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	34	40.15574	541448.2805	6252731.949	*Casuarina pauper*	End Grassland. Start Belah/Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	34	40.15574	541448.2805	6252731.949	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
6/09/2020	35	40.59444	541560.7493	6252899.662	*Maireana sedifolia*	End Belah/Black Bluebush Shrubland. Start extremely degraded Pearl Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Maireana pyramidata*	End Pearl Bluebush Shrubland. Start highly degraded Black Bluebush/Pearl Bluebush Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	36	39.72472	541726.6754	6253149.079	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	37	41.92524	542191.4312	6253844.568	*Casuarina pauper*	End Black Bluebush/Pearl Bluebush Shrubland. Start Belah Woodland with Pearl Bluebush understorey	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	37	41.92524	542191.4312	6253844.568	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	37	41.92524	542191.4312	6253844.568	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	37	41.92524	542191.4312	6253844.568	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	37	41.92524	542191.4312	6253844.568	*Roepera crenata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	38	38.65634	542274.1312	6253989.896	*Rhagodia ulicina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	39	38.11795	542562.9731	6254409.948		End Belah Woodland. Start cleared Belah Woodland with Black Bluebush understorey	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	40	34.48782	542705.0106	6254622.753		End Belah Woodland with Black Bluebush understorey. Start Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	41	32.61919	542866.0484	6254862.304		End Black Bluebush Shrubland. Start degraded Belah Woodland with Black Bluebush understorey	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	42	34.37682	542999.5346	6255063.39		Degraded Belah Woodland with Black Bluebush understorey	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Maireana pyramidata*	End degraded Belah Woodland with Black Bluebush understorey. Start Black Bluebush/Dillon Bush/Saltbush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	43	30.63125	543186.067	6255351.718	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Atriplex vesicaria*	Bladder Saltbush Shrubland with occasional Black Bluebush and Dillon Bush emergent shrubs on gypseous light clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	44	30.65189	542589.0629	6255857.575	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Arabidella ? sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	44	30.65189	542589.0629	6255857.575	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	45	34.22335	543243.9886	6255454.129		End at Nulla/Pine Camp boundary on gypseous rise with Woorinen capping and some gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Maireana pyramidata*	Start heading W toward Nulla Rd. Black Bluebush/Dillon Bush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	46	30.43201	539108.3547	6249215.024	*Eragrostis dielsii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	46	30.43201	539108.3547	6249215.024	*Angianthus brachypappus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	47	33.80601	538750.177	6249242.548	*Maireana pyramidata*	End Black Bluebush/Dillon Bush Shrubland. Start degraded Bluebush Shrubland. <100 Black Bluebush per ha.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	47	33.80601	538750.177	6249242.548	*Austrostipa scabra ssp. falcata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	47	33.80601	538750.177	6249242.548	*Rhodanthe stuartiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	47	33.80601	538750.177	6249242.548	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	48	32.09432	538392.7316	6249200.092	*Maireana pyramidata*	End degraded Belah Woodland. Start Black Bluebush Shrubland with sparse Belah	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	48	32.09432	538392.7316	6249200.092	*Casuarina pauper*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Maireana sedifolia*	End Black Bluebush Shrubland. Start degraded Pearl Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Austrostipa scabra ssp. falcata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Roepera ovata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	49	34.73473	538219.6381	6249198.794	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	50	39.75403	537846.0543	6249212.265	*Casuarina pauper*	End Pearl Bluebush Shrubland. Start Belah/Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	50	39.75403	537846.0543	6249212.265	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	51	46.20101	537556.3789	6249190.684	*Maireana sedifolia*	End Belah/Black Bluebush Shrubland. Start Pearl Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Maireana sedifolia*	Pearl Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Brachyscome dichromosomatica var. alba*	Approx. 100 plants in 1 ha.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	52	46.92328	537396.7105	6249193.864	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	53	58.75865	536779.6255	6249170.661		End at Nulla Road.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	54	56.02255	536752.3215	6249163.448	*Casuarina pauper*	Start at Nulla Road heading W towards Renmark Road. Belah/Black Bluebush Woodland grading to very disturbed Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	54	56.02255	536752.3215	6249163.448	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	55	62.23634	535651.0114	6249038.361		End at Renmark Road	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	56	58.45505	534385.7437	6249101.016	*Maireana pyramidata*	Very degraded Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	56	58.45505	534385.7437	6249101.016	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	56	58.45505	534385.7437	6249101.016	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	57	60.41753	534317.2709	6249112.129		Baked clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Tecticornia tenuis*	Glasswort Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Rhodanthe stricta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Rhagodia spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	58	54.73786	534044.5489	6249096.257	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	59	55.02465	533971.2445	6249100.844	*Maireana pyramidata*	End Glasswort Shrubland. Start Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	60	59.80728	533840.8475	6249066.937	*Tecticornia tenuis*	End Black Bluebush Shrubland. Start Glasswort Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Maireana pyramidata*	Black Bluebush Shrubland on scald eroded of 10-20cm of topsoil.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Lepidium phlebopetalum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	61	56.55596	531913.7492	6249022.714	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	62	55.62203	531908.3978	6249026.059		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	63	58.68129	531621.0283	6249107.296	*Minuria integerrima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	63	58.68129	531621.0283	6249107.296	*Lepidium fasciculatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	63	58.68129	531621.0283	6249107.296	*Spergularia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	63	58.68129	531621.0283	6249107.296	*Rhodanthe stricta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	63	58.68129	531621.0283	6249107.296	*Centipeda thespidioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	64	57.74004	531168.4447	6248996.694		End section	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	65	59.65464	529256.9455	6248932.81	*Maireana pyramidata*	Start Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	66	59.37967	528701.2244	6248916.211		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	67WSP	58.85797	528557.4545	6248916.755	*Santalum murrayanum*	x1 DBH 7cm	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	68WSP	57.61288	526536.1679	6248658.174	*Santalum murrayanum*	x1 DBH 3cm 2.5m tall No fruit	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	69WSP	60.04671	526530.5509	6248666.284	*Santalum murrayanum*	x1 DBH 2cm 2.2m tall No fruit	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	70WSP	59.00177	525960.1554	6248583.372	*Santalum murrayanum*	x1 DBH 8cm 4.5m tall No fruit	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	71WSP	54.90351	526006.3369	6248465.493	*Santalum murrayanum*	x1 DBH 3cm 3.0m tall Fruiting	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	71WSP	54.90351	526006.3369	6248465.493	*Olearia magniflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	72WSP	60.85266	523316.6328	6248399.078	*Santalum murrayanum*	x2 DBH 2cm 2.2m tall; DBH 4cm 2.5m tall No fruit	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	73WSP	59.84396	523054.6725	6248419.01		Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	74WSP	62.43508	521034.5907	6248708.321		End Chenopod Sandplain Mallee. Start cleared land	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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5/09/2020	75WSP	59.72549	520500.3686	6248742.309		End cleared land. Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	76WSP	64.1825	518570.5562	6249025.245		Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	76WSP	64.1825	518570.5562	6249025.245	*Sida spodochroma*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	77WSP	61.22038	518232.7629	6249001.395		End Chenopod Sandplain Mallee. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	78WSP	67.40835	518100.8684	6248974.926		End Spinifex Mallee. Start mostly cleared swale	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	79WSP	59.38037	516538.2306	6249015.141		End mostly cleared swale. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	80WSP	50.34822	516068.6482	6249129.263		End Spinifex Mallee. Start cleared land	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	81WSP	61.08176	514880.6066	6249396.083		End cleared land. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	82WSP	64.5825	514401.6524	6249513.574		End Spinifex Mallee. End section at Lush boundary in Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	83WSP	58.41211	513039.8975	6249868.682	*Eucalyptus largiflorens*	Continuing on Floodplain near quarry. Black Box Chenopod Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	83WSP	58.41211	513039.8975	6249868.682	*Atriplex semibaccata/leptocarpa hybrid*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	83WSP	58.41211	513039.8975	6249868.682	*Atriplex semibaccata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	83WSP	58.41211	513039.8975	6249868.682	*Atriplex leptocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	83WSP	58.41211	513039.8975	6249868.682	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Maireana pyramidata*	End section	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	67 OGY	53.47218	618770.1891	6215693.355	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	68 OGY	54.19963	618862.3363	6215692.19		Start section	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	69 OGY	54.14065	618862.3363	6215692.19	*Vittadinia sp.*	Grinding stone with another rock.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	69 OGY	54.14065	618862.3363	6215692.19	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	69 OGY	54.14065	618862.3363	6215692.19	*Enneapogon avenaceus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	70 OGY	53.77516	618862.3363	6215692.19	*Polycalymma stuartii*	Sandy rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	70 OGY	53.77516	618862.3363	6215692.19	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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6/09/2020	70 OGY	53.77516	618862.3363	6215692.19	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
6/09/2020	71 OGY	53.84523	618863.7396	6215803.082		End at Renmark Road	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	72 OGY	52.34243	618865.1429	6215913.974	*Maireana pyramidata*	Start at Renmark Road. Black Bluebush Shrubland on clay loam. Start of survey is 500m to E of this waypoint.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	72 OGY	52.34243	618865.1429	6215913.974	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	72 OGY	52.34243	618865.1429	6215913.974	*Vittadinia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	72 OGY	52.34243	618865.1429	6215913.974	*Convolvulus remotus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	73 OGY	49.50366	618958.6965	6216023.699	*Maireana pyramidata*	End section in Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	73 OGY	49.50366	618958.6965	6216023.699	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Maireana sedifolia*	Start section. Pearl Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Elachanthus pusillus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Euphorbia dallachyana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Vittadinia gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	74 OGY	47.63018	618960.1008	6216134.591	*Rhodanthe pygmaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	75 OGY	46.53479	619053.6577	6216244.315		End section	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Casuarina pauper*	Start section in Belah/Pearl Bluebush Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Asphodelus fistulosus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	76 OGY	46.2012	619055.063	6216355.207	*Maireana trichoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Casuarina pauper*	End Belah/Pearl Bluebush Woodland. Start Belah/Black Bluebush Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Asphodelus fistulosus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Salvia verbenaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	77 OGY	46.3422	619150.0294	6216575.823	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	78 OGY	46.42485	619151.4357	6216686.715		End section	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Eucalyptus oleosa*	Start section in Euc. Oleosa/Pearl Bluebush Woodland on clay loam (Undescribed PTC for NSW?)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Roepera ovata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Rhagodia ulicina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Centipeda thespidioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Lemooria burkittii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Nicotiana goodspeedii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Crassula colorata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Triglochin sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Plagiobothrys plurisepaleus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Myriocephalus rhizocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Marsilea drummondii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Teucrium albicaule*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Wahlenbergia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	79 OGY	47.06841	619246.4073	6216907.329	*Marsilea costulifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Marsilea drummondii*	End section at Run On Depression Herbland (Undescribed PTC for NSW?)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Marsilea costulifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Spergularia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Centipeda thespidioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Myriocephalus rhizocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Peplidium foecundum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Ranunculus sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Erodium cicutarium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Isolepis sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Cyperus sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Leontodon rhagadioloides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Lemooria burkittii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Silene apetala*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	80 OGY	47.86926	619249.2219	6217129.113	*Wahlenbergia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Eucalyptus socialis*	Highly disturbed Chenopod Sandplain Mallee; understorey largely removed	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Acacia nyssophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Rhagodia ulicina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Grevillea huegelii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Stenopetalum lineare*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	81 OGY	49.03723	619342.7915	6217238.834	*Ptilotus seminudus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	82 OGY	50.49779	619345.608	6217460.618		End section at track to Regunyah Station	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana pyramidata*	Start section. Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana sedifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Roepera ovata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Roepera angustifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Roepera crenata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Myoporum platycarpum ssp. platycarpum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Eucalyptus oleosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	83 OGY	41.68771	615155.533	6206532.941	*Maireana trichoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	84	62.01798	512503.6813	6250002.011		End Chenopod Sandplain Mallee. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	85	62.45351	512485.5717	6250012.568	*Eremophila scoparia*	1 plant. Spinifex Mallee eoctonal with Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	85	62.45351	512485.5717	6250012.568	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	85	62.45351	512485.5717	6250012.568	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	86	64.03569	512024.8782	6250066.605		End section at track	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	87	55.91916	512437.7863	6249886.565		Fenceline alignment	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	88	59.17347	513936.1035	6249511.718		Fenceline alignment	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Eucalyptus largiflorens*	Start Black Box Woodland on red Woorinen formation aeolian soil	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Salvia verbenaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	89	40.08134	564500.9373	6254198.267	*Sida intricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Eucalyptus largiflorens*	End Black Box Woodland on red Woorinen formation aeolian soil. Start Black Box Woodland on Coonambidgal alluvium.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	90	36.86285	564646.3042	6254188.188	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Sclerolaena stelligera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Atriplex leptocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Scleroblitum atriplicinum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	90	36.86285	564646.3042	6254188.188	*Sclerolaena muricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Polycalymma stuartii*	End floodplain. Start Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Cenchrus ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	91	38.75115	564859.0016	6254161.459	*medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Cucumis myriocarpus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	91	38.75115	564859.0016	6254161.459	*Scleranthus misusculus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	92	39.38659	565017.7773	6254150.617		Baked clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	93	39.31368	565069.0613	6254155.035	*Swainsona phacoides*	3 plants	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	94	41.19129	565111.2709	6254185.35	*Swainsona phacoides*	1 plant	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	95	41.05734	565115.3346	6254184.324	*Swainsona phacoides*	8 plants	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	96	39.80804	565112.51	6254177.136	*Swainsona phacoides*	1 plant	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	97	40.12335	565110.8925	6254170.605	*Swainsona phacoides*	1 plant	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Polycalymma stuartii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	98	37.93768	565275.6932	6254323.272	*Pimelea simplex ssp. simplex*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Sida ammophila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Swainsona phacoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Brassica tournefortii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	98	37.93768	565275.6932	6254323.272	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	99	37.04448	565315.2828	6254322.113		Anabranch Road	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Callitris glaucophylla*	Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Acacia victoriae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Phyllanthus lacunellus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Swainsona phacoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Brassica tournefortii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	100	38.93935	565454.0259	6254317.279	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	100	38.93935	565454.0259	6254317.279	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	101	38.63827	565554.8574	6254355.726		End in Black Box on a shallow veneer of aeolian sand on Coonambidgal Formation alluvium	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	102	45.07925	568083.0488	6254127.958		1.5km E of Darling Anabranch heading E to Silver City Hwy. Degraded Belah/Black Bluebush Woodland lacking understorey shrubs.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	103	48.23849	568269.9061	6254111.428		Cereal crop on alignment with scattered remnant trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	104	51.52731	568653.8229	6254069.302		Very degraded Belah Woodland lacking shrubs	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	105	51.44004	568930.1914	6254034.149		End Belah Woodland. Start cereal crop with scattered remnant trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	106	58.2621	570171.5937	6253899.22		End cereal crop. Start cleared land with scattered remnant trees. Gate.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	107	59.84555	572185.7213	6253677.017		End cleared land. Start extremely degraded Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	108	57.83131	572165.7302	6253614.962		Belah trees to S of centreline of alignment. ****Recommendation: Shift 20m to N to avoid Belah trees.****	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	109	57.36245	572661.6675	6253623.939		Cleared with scattered Belah trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	110	56.93276	572775.8083	6253609.205		Very degraded Belah/Rosewood Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	111	56.73189	572946.3706	6253593.04		Cleared with scattered Belah trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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7/09/2020	112	53.75557	573046.2306	6253537.829		End at Duncan's fence. Start Road Reserve (Silver City Hwy) to E.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	113	50.97791	573168.6146	6253560.618		End Road Reserve. Land cleared	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	114	51.52298	573663.4666	6253513.11		End cleared land. Start cleared land with scattered woodland trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	115	53.79732	573801.7482	6253498.067		Start cleared paddock	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	116	56.42045	574315.6716	6253441.173		End cleared paddock. Start cleared paddock with scattered mallee trees	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	117	60.68433	574392.3857	6253432.146		Start cleared paddock	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	118	65.91132	574991.5247	6253365.9		End cleared paddock. Start extremely degraded Belah Woodland with low tree density and no understorey shrubs	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	119	60.17065	576016.5637	6253251.756		End degraded Belah. Start cleared paddock	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	120	66.1089	576970.3432	6253148.279		End cleared paddock. Start very degraded Belah lacking understorey shrubs	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
7/09/2020	121	60.51293	577137.2753	6253119.538		End at corner of fence	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Eucalyptus largiflorens*	Start at fence. Elevated Black Box terrace with crust of aeolian sand	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Acacia victoriae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	122	39.85762	565573.6293	6254354.377	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Sisymbrium erysimoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Salsola tragus ssp. tragus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Sclerolaena decurrens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	122	39.85762	565573.6293	6254354.377	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	123	46.05663	565748.0269	6254327.782		Bungunia limestone stone flake	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	124	38.83843	566252.9635	6254270.944	*Eucalyptus largiflorens*	End Black Box terrace. Start Black Box on alluvial clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	125	39.50209	566320.3608	6254277.349	*Lepidium africanum*	Upper bank of sub channel of Darling Anabranch	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	125	39.50209	566320.3608	6254277.349	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Sisymbrium erysimoides*	Middle of sub channel of Darling Anabranch	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Lepidium africanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Lepidium fasciculatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	126	35.95925	566366.3892	6254284.125	*Lepidium papillosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	127	35.31049	566717.9317	6254214.693	*Einadia nutans*	Main channel of Darling Anabranch	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	127	35.31049	566717.9317	6254214.693	*Lepidium fasciculatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	127	35.31049	566717.9317	6254214.693	*Malva parviflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	127	35.31049	566717.9317	6254214.693	*Acacia stenophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Eucalyptus largiflorens*	Black Box Woodland on upper terrace of floodplain. Baked clay common and widespread	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Atriplex leptocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Lepidium papillosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Calotis cuneifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Heliotropium curassavicum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Atriplex conduplicata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	128	40.98607	566826.126	6254207.502	*Rytidosperma caespitosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Osteocarpum acropterum var. deminutum*	Upper terrace on alluvial clay with thin aeolian crust. Shingleback	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	129	41.13405	567437.0859	6254139.101	*Cotula bipinnata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Atriplex conduplicata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Atriplex pseudocampanulata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Myriocephalus rhizocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Centipeda thespidioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Spergularia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Alopecurus geniculatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Lachnagrostis filiformis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	129	41.13405	567437.0859	6254139.101	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	130	43.28214	567706.7384	6254108.467	*Lepidium papillosum*	Upper terrace	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	130	43.28214	567706.7384	6254108.467	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	130	43.28214	567706.7384	6254108.467	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	131	39.93196	567953.2599	6254077.768	*Casuarina pauper*	End floodplain. Start River Cliff edge Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	132	49.59823	567998.5244	6254055.268	*Casuarina pauper*	End in mid River Cliff edge Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	133	40.99924	565573.6092	6254391.745		End of section having returned to fence. Live Echidna.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	134	51.30359	578936.7089	6253613.084	*Casuarina pauper*	Start very degraded Belah Woodland lacking understorey shrubs. Many fauna hollows. Fresh echidna scratchings.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	134	51.30359	578936.7089	6253613.084	*Myoporum platycarpum ssp. platycarpum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	134	51.30359	578936.7089	6253613.084	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	135	57.00028	578820.1941	6253586.107		End in extremely degraded vegetation	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	136	46.71294	580881.4657	6252317.761	*Swainsona microphylla*	x3 plants	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	137	58.28974	581223.6641	6254336.453		Start in highly degraded cleared Belah Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	138	57.0868	581326.4882	6254340.121	*Casuarina pauper*	Start Belah Woodland with partially intact understorey. Many hollow-bearing Belah	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	139	56.62822	581367.4063	6254353.632		Search on returning to start	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	140	58.96664	581221.3644	6254338.025		End search	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	141	52.34681	581294.0618	6255147.443		Start Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	142	52.43531	581368.8053	6255350.617		Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	143	58.41788	581402.2297	6255634.316		Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	144	63.26118	581580.0927	6256877.624		Change direction to E-W fence	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	145	53.95008	582036.3184	6256830.68		Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	146	48.55174	582157.3075	6256812.672		End Sandhill Pine Woodland. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	147	38.60992	582527.9885	6256762.672	*Eucalyptus gracilis*	End Spinifex Mallee. Start saltpan	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	147	38.60992	582527.9885	6256762.672	*Melaleuca lanceolata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	147	38.60992	582527.9885	6256762.672	*Tecticornia pergranulata ssp. pergranulata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	148	33.54955	582954.261	6256709.734	*Eucalyptus gracilis*	Eastern edge of saltpan. Start gypseous rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	148	33.54955	582954.261	6256709.734	*Eucalyptus leptophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	148	33.54955	582954.261	6256709.734	*Triodia scariosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	148	33.54955	582954.261	6256709.734	*Acacia sclerophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	148	33.54955	582954.261	6256709.734	*Roepera angustifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Austrostipa nitida*	Gypseous rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Roepera ovata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Stenopetalum lineare*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Roepera aurantiaca ssp. aurantiaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	149	41.20535	583068.8607	6256617.363	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	150	44.08926	583074.5712	6256688.503		Continuing S on gypseous rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	151	38.44605	583058.0402	6256575.763	*Austrostipa nullanulla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	151	38.44605	583058.0402	6256575.763	*Maireana erioclada*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Maireana erioclada*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	152	35.30423	582965.7526	6256031.772	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Austrostipa nullanulla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Roepera aurantiaca ssp. aurantiaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Stenopetalum lineare*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Erodium cicutarium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Cynoglossum australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Rhodanthe pygmaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Nicotiana glauca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	152	35.30423	582965.7526	6256031.772	*Marrubium vulgare*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	152	35.30423	582965.7526	6256031.772	*Euphorbia dallachyana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	153	30.35648	582375.8994	6254715.989		Turn back in Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	154	38.64026	582429.2267	6254773.079	*Triodia scariosa*	Spinifex Mallee on sandy loam	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	155	38.69811	582443.1205	6254828.181		End Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Chthonocephalus pseudevax*	Sandhill Pine Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Rhodanthe pygmaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Pimelea simplex ssp. simplex*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	156	37.82595	582447.0593	6254866.292	*Euphorbia dallachyana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	156	37.82595	582447.0593	6254866.292	*Convolvulus clementii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	157	35.91515	582915.9207	6255559.044	*Austrostipa nullanulla*	Wedge-tailed Eagle nest in Eucalyptus oleosa	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	157	35.91515	582915.9207	6255559.044	*Eucalyptus oleosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	158	43.47527	583080.0656	6256649.977		End at N end of gypseous rise lunette	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Maireana pyramidata*	Aeolian formation clay loam. To W is Black Bluebush at 30-40% of typical density. To E is Black Bluebush at 90% typical density.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	159	40.09673	585617.8237	6255697.802	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
8/09/2020	160	40.90231	585618.1693	6255715.652		End on track	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	161	34.69665	586819.0031	6256179.053		100m W of High Darling Road	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	162	43.16522	587114.004	6256166.157	*Maireana pyramidata*	End at High Darling Road in Black Bluebush Shrubland with scattered trees on Woorinen formation claly loam	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	162	43.16522	587114.004	6256166.157	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	162	43.16522	587114.004	6256166.157	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	162	43.16522	587114.004	6256166.157	*Pycnosorus pleiocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	162	43.16522	587114.004	6256166.157	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	163	46.44615	587138.2601	6256177.357	*Maireana pyramidata*	High Darling Road. Black Bluebush Shrubland with extremely weedy understorey on aeolian Woorinen formation	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	164	43.13076	587331.398	6256157.291		End Black Bluebush Shrubland. Start Black Box Woodland S of fence. On N side is a thin band of Woorinen Formation sandy loam grading to a flat of Woorinen Formation clay loam with low tree density.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Maireana pyramidata*	Black Bluebush Shrubland on Woorinen Formation red sandy loam	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Swainsona phacoides*	x6 plants	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	165	42.68579	587326.633	6256152.344	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Goodenia pinnatifida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	165	42.68579	587326.633	6256152.344	*Emex australis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Eucalyptus largiflorens*	Erosion blow out. Black Box to N side.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Sida ammophila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	166	44.96335	587544.1922	6256091.02	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	167	42.67688	587583.2953	6256116.609	*Swainsona phacoides*	Occuring along pipeline alignment	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	168	48.67995	588005.6532	6256065.919	*Eucalyptus largiflorens*	Black Box Woodland on a shallow veneer of Woorinen Formation silty clay loam over grey clay alluvium.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	168	48.67995	588005.6532	6256065.919	*Brachyscome dichromosomatica var. alba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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8/09/2020	168	48.67995	588005.6532	6256065.919	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	168	48.67995	588005.6532	6256065.919	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	168	48.67995	588005.6532	6256065.919	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	169	41.45726	588131.5513	6256050.339		Black Bluebush Shrubland continues on easement to Black Box Woodland approx. 1km to E	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	170	40.93363	588411.8579	6256010.148	*Swainsona phacoides*	x1	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
8/09/2020	171	49.10856	588654.7463	6255976.729	*Swainsona phacoides*	x25	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	172	39.75265	591488.3407	6253720.001	*Bulbine semibarbata*	Dunvegan Station at Darling River	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	172	39.75265	591488.3407	6253720.001	*Crinum flaccidum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	172	39.75265	591488.3407	6253720.001	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	172	39.75265	591488.3407	6253720.001	*Pycnosorus pleiocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	172	39.75265	591488.3407	6253720.001	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	173	47.94999	591448.533	6253823.402	*Tetragonia moorei*	Sandy rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	173	47.94999	591448.533	6253823.402	*Crinum flaccidum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	173	47.94999	591448.533	6253823.402	*Acacia victoriae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Eucalyptus largiflorens*	End sandy rise. Start very open Black Box Woodland on Coonambidgal Formation alluvium	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Lepidium papillosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Senecio glossantus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Sclerolaena intricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	174	45.12952	591366.9715	6253981.985	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Eucalyptus largiflorens*	End very open Black Box Woodland on Coonambidgal Formation alluvium. Start Black Box Woodland on heavier Coonambidgal Formation clay.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Sclerolaena intricata*	Baked clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	175	41.00205	591142.9379	6254470.948	*Atriplex conduplicata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Lepidium papillosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Eremophila maculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Rhagodia spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Sclerolaena tricuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Frankenia serpyllifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	175	41.00205	591142.9379	6254470.948	*Maireana pentagona*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Minuria cunninghamii*	End Black Box Woodland on heavier Coonambidgal Formation clay. Start very open Black Box Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Maireana pentagona*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	176	43.39263	590940.1411	6254889.841	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Frankenia serpyllifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Atriplex conduplicata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Senecio glossantus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Atriplex pseudocampanulata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Sclerolaena intricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Eragrostis australasica*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Chenopodium nitrariaceum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Sclerolaena stelligera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	176	43.39263	590940.1411	6254889.841	*Scleroblitum atriplicinum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Marsilea drummondii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	176	43.39263	590940.1411	6254889.841	*Rhodanthe stuartiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	177	39.79867	590832.7632	6255108.546	*Eucalyptus largiflorens*	Black Box Woodland on shallow alluvial clay	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	177	39.79867	590832.7632	6255108.546	*Minuria integerrima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	177	39.79867	590832.7632	6255108.546	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	177	39.79867	590832.7632	6255108.546	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Eucalyptus largiflorens*	End Black Box Woodland on shallow alluvial clay. Start Black Box Woodland with Black Bluebush understorey on aeolian soil.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Lepidium phlebopetalum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	178	42.15801	590753.2688	6255243.594	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	178	42.15801	590753.2688	6255243.594	*Sclerolaena decurrens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	179	43.29002	590739.6741	6255273.553		Dunvegan Station boundary	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	180	41.44937	590809.2775	6255091.027		End search	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	181	41.62309	590711.7685	6255268.053		Dunvegan Station fence.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	182	39.60772	590708.907	6255346.48	*Maireana pyramidata*	Black Bluebush Shrubland on clayey sand.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	182	39.60772	590708.907	6255346.48	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	182	39.60772	590708.907	6255346.48	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	182	39.60772	590708.907	6255346.48	*Lepidium phlebopetalum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	182	39.60772	590708.907	6255346.48	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	183	43.41015	590704.3141	6255388.885	*Eucalyptus largiflorens*	End Black Bluebush Shrubland. Start very open Black Box Woodland with Black Bluebush understorey on clayey sand of Bunyip Formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	183	43.41015	590704.3141	6255388.885	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
9/09/2020	183	43.41015	590704.3141	6255388.885	*Crinum flaccidum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	183	43.41015	590704.3141	6255388.885	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	183	43.41015	590704.3141	6255388.885	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	183	43.41015	590704.3141	6255388.885	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	184	40.22168	590614.6111	6255531.014	*Sclerochlamys brachyptera*	Almost treeless lower terrace on aeolian clayey sand	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	184	40.22168	590614.6111	6255531.014	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	184	40.22168	590614.6111	6255531.014	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Sclerolaena muricata*	Black Box Woodland on grey cracking clay of Coonambidgal Formation. Major Mitchell's Cockatoo	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Silene nocturna*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	185	41.48131	590589.0309	6255594.909	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
9/09/2020	185	41.48131	590589.0309	6255594.909	*Eucalyptus largiflorens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	186	41.21474	590493.1306	6255679.323	*Eucalyptus largiflorens*	Very open Black Box Woodland grey cracking clay of Coonambidgal Formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	186	41.21474	590493.1306	6255679.323	*Sclerolaena muricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	186	41.21474	590493.1306	6255679.323	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	186	41.21474	590493.1306	6255679.323	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	187	39.38149	590334.2172	6255676.84	*Eucalyptus largiflorens*	End very open Black Box Woodland grey cracking clay of Coonambidgal Formation. Start Black Box Woodland with Black Bluebush understorey on aeolian clayey sand	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	187	39.38149	590334.2172	6255676.84	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	188	39.55074	590122.5407	6255721.539	*Eucalyptus largiflorens*	Sandy rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	188	39.55074	590122.5407	6255721.539	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	189	42.50995	590074.32	6255740.292	*Maireana pyramidata*	End Black Box. Start Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	189	42.50995	590074.32	6255740.292	*Sclerolaena decurrens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	189	42.50995	590074.32	6255740.292	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	189	42.50995	590074.32	6255740.292	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	189	42.50995	590074.32	6255740.292	*Brachyscome dichromosomatica var. alba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	190	39.89153	589947.5695	6255753.134	*Eucalyptus largiflorens*	End Black Bluebush Shrubland. Start Black Box Woodland on Coonambidgal alluvium.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	190	39.89153	589947.5695	6255753.134	*Brachyscome dichromosomatica var. alba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Maireana pyramidata*	End Black Box Woodland. Start Black Bluebush Shrubland on aeolian sandy clay rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Brachyscome dichromosomatica var. alba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	191	41.2504	589662.4351	6255800.18	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	192	41.56284	589488.8765	6255805.14	*Eucalyptus largiflorens*	End Black Bluebush Shrubland on aeolian sandy clay rise. Start Black Box Woodland with Black Bluebush understorey on clayey sand.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	192	41.56284	589488.8765	6255805.14	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	192	41.56284	589488.8765	6255805.14	*Brachyscome dichromosomatica var. alba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	192	41.56284	589488.8765	6255805.14	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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9/09/2020	192	41.56284	589488.8765	6255805.14	*Mesembryanthemum granulicaule*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	193	37.95282	589222.3637	6255844.901	*Maireana pyramidata*	End Black Box Woodland. Start Black Bluebush Shrubland on clayey sand.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	194	40.99793	589110.9131	6255861.247	*Hyalosperma semisterile*	End Black Bluebush Shrubland on Woorinen Formation. Start light sandy clay loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	194	40.99793	589110.9131	6255861.247	*Rhodanthe pygmaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
9/09/2020	195	41.25975	589038.5293	6255928.681		End section at wet patch of track.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	198	42	614024	6204919	*Eucalyptus largiflorens*	Red Cliffs Sub-station heading NE. Black Box Chenopod Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	198	42	614024	6204919	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	198	42	614024	6204919	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	198	42	614024	6204919	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	199	35	614053	6204932		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	200	35	614050	6204930		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	201	34	614052	6204930		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	202	35	614188	6205059		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
17/09/2020	203	45	614238	6205173	*Eucalyptus largiflorens*	Black Box Chenopod Woodland continues	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	203	45	614238	6205173	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	203	45	614238	6205173	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	203	45	614238	6205173	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	203	45	614238	6205173	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	204	45	614262	6205195		Start crossing a billabong	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	205	44	614277	6205229	*Hakea leucoptera ssp. leucoptera*	End crossing a billabong	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	205	44	614277	6205229	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	205	44	614277	6205229	*Opuntia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	205	44	614277	6205229	*Olearia pimeleoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	206	44	614315	6205306	*Opuntia robusta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	207	43	614379	6205382	*Sida trichopoda*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	207	43	614379	6205382	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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17/09/2020	208	43	614375	6205381		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Dianella porracea*	In middle of track	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Teucrium racemosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	209	37	614416	6205422	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	210	43	614438	6205486	*Roepera angustifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	210	43	614438	6205486	*Atriplex stipitata ssp. miscella*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	210	43	614438	6205486	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	210	43	614438	6205486	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	211	43	614492	6205541	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	211	43	614492	6205541	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
17/09/2020	211	43	614492	6205541	*Hakea leucoptera ssp. leucoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	212	41	614528	6205591	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	212	41	614528	6205591	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	212	41	614528	6205591	*Hakea leucoptera ssp. leucoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	213	44	614544	6205668	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	213	44	614544	6205668	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	213	44	614544	6205668	*Hakea leucoptera ssp. leucoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	214	43	614556	6205681	*Dianella porracea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	214	43	614556	6205681	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	214	43	614556	6205681	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	215	41	614603	6205727	*Eragrostis setifolia*	Lignum Swampy Woodland (all Black Box dead)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	215	41	614603	6205727	*Eragrostis dielsii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	215	41	614603	6205727	*Atriplex leptocarpa x semibaccata hybrid*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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17/09/2020	216	40	614610	6205737		Ignore waypoint	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	217	39	614765	6205949		River Red Gum Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	218	39	614792	6205966		End section at River.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	219	41	614811	6205932		Return on opposite side of powerline.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	220	40	614759	6205879	*Calotis cuneifolia*	End River Red Gum Woodland. Start Lignum Swampy Woodland/Black Box Chenopod Woodland ecotone	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	220	40	614759	6205879	*Sporobolus mitchellii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	220	40	614759	6205879	*Paspalidium jubiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	221	41	614676	6205718	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	222	38	614644	6205689	*Sclerolaena stelligera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	222	38	614644	6205689	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	222	38	614644	6205689	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	222	38	614644	6205689	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	222	38	614644	6205689	*Sclerolaena tricuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
17/09/2020	222	38	614644	6205689	*Malacocera tricornis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	223	41	614588	6205614	*Sclerolaena muricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	224	38	614569	6205554	*Vittadinia sp.*	Black Box Chenopod Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	224	38	614569	6205554	*Cyperus sp.*	<10 plants on sandy bank	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	224	38	614569	6205554	*Lotus cruentus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	224	38	614569	6205554	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	225	37	614554	6205525	*Swainsona microphylla*	5 plants	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Dianella porracea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Goodenia glauca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Vittadinia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	226	39	614549	6205506	*Convolvulus remotus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
17/09/2020	227	42	614533	6205453	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	227	42	614533	6205453	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	228	40	614526	6205446	*Cyperus? sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	228	40	614526	6205446	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Cyperus? sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	229	41	614526	6205441	*Cynodon dactylon var. pulchellus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	230	42	614462	6205392	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	230	42	614462	6205392	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	231	42	614429	6205372	*Eragrostis setifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
17/09/2020	231	42	614429	6205372	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	231	42	614429	6205372	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	232	43	614387	6205305	*Roepera angustifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	232	43	614387	6205305	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	232	43	614387	6205305	*Eremophila divaricata ssp. divaricata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	233	42	614339	6205190		End Black Box Chenopod Woodland. Start crossing a billabong	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	234	39	614324	6205173		End crossing a billabong. Start Black Box Chenopod Woodland. Chestnut-rumped Thornbill x2	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	235	43	614220	6205022	*Atriplex rhagodioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	235	43	614220	6205022	*Sarcozona praecox*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	236	41	614092	6204872	*Acacia salicina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
17/09/2020	236	41	614092	6204872	*Juncus acutus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Maireana trichoptera*	Belah-Rosewood Woodland (B-RW)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Maireana georgei*	Crested Bellbird	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	325	65.40824	500684.389	6250637.661	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Atriplex stipitata subsp. miscella*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Callitris gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Olearia pimeleoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Lemooria burkittii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	325	65.40824	500684.389	6250637.661	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	326	66.96219	501178.0962	6250608.674	*Eremophila deserti*	Enter Sandhill Pine Woodland (SHPW)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	327	63.75872	501445.5223	6250585.243	*Roepera ovata*	Baked clay oven	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	327	63.75872	501445.5223	6250585.243	*Acacia nyssophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	328	65.33505	501462.3421	6250519.38	*Eremophila deserti*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Casuarina pauper*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	329	60.96882	501968.0809	6250582.044	*Rhagodia ulicina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Acacia nyssophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Maireana trichoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	329	60.96882	501968.0809	6250582.044	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	330	60.78925	502028.7251	6250500.205	*Lepidium leptopetalum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	330	60.78925	502028.7251	6250500.205	*Maireana radiata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	330	60.78925	502028.7251	6250500.205	*Eucalyptus socialis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	330	60.78925	502028.7251	6250500.205	*Acacia colletioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	331	61.92644	502107.2359	6250512.828	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	331	61.92644	502107.2359	6250512.828	*Eremophila deserti*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	331	61.92644	502107.2359	6250512.828	*Acacia colletioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	331	61.92644	502107.2359	6250512.828	*Reichardia tingitana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	332	59.79263	502316.8601	6250478.962	*Eucalyptus socialis*	Shrubby Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	332	59.79263	502316.8601	6250478.962	*Lomandra effusa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	333	58.87582	502710.8605	6250414.328	*Olearia muelleri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	333	58.87582	502710.8605	6250414.328	*Ptilotus exaltatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Triodia scariosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Eucalyptus oleosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	334	60.08812	502796.3821	6250368.4	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Silene nocturna*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Eremophila glabra ssp. murrayana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Marsdenia australis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	334	60.08812	502796.3821	6250368.4	*Wahlenbergia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	335	60.99701	503127.4325	6250393.355		Rufous Whistler	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	336	60.7133	503356.9332	6250364.227	*Templetonia egena*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	336	60.7133	503356.9332	6250364.227	*Eucalyptus socialis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	336	60.7133	503356.9332	6250364.227	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	336	60.7133	503356.9332	6250364.227	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	336	60.7133	503356.9332	6250364.227	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	337	60.14534	503566.0868	6250329.003	*Roepera aurantiaca ssp. aurantiaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	337	60.14534	503566.0868	6250329.003	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	337	60.14534	503566.0868	6250329.003	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Isoetopsis graminifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Marsdenia australis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Ptilotus exaltatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	338	61.53645	503613.9799	6250313.019	*Maireana trichoptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	339	62.95459	503882.5034	6250294.397	*Podolepis capillaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	339	62.95459	503882.5034	6250294.397	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	339	62.95459	503882.5034	6250294.397	*Westringia rigida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
2/09/2020	339	62.95459	503882.5034	6250294.397	*Chenopodium desertorum ssp. desertorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	339	62.95459	503882.5034	6250294.397	*Goodenia willisiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	340	63.36885	503931.9753	6250296.483	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	340	63.36885	503931.9753	6250296.483	*Thysanotus baueri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	341	61.72302	504085.3024	6250327.02	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	341	61.72302	504085.3024	6250327.02	*Scaevola spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	341	61.72302	504085.3024	6250327.02	*Acacia oswaldii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	342	60.63649	504162.4082	6250295.498	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	342	60.63649	504162.4082	6250295.498	*Exocarpos aphyllus*	Spiny-cheeked Honey-eater	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	343	57.57198	506668.0619	6250711.74	*Cryptandra magniflora*	Shingleback	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	344	60.5727	506844.2307	6250721.594	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	344	60.5727	506844.2307	6250721.594	*Eucalyptus costata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	344	60.5727	506844.2307	6250721.594	*Eucalyptus leptophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	345	57.44175	507095.2071	6250726.288	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	345	57.44175	507095.2071	6250726.288	*Acacia brachybotrya*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	345	57.44175	507095.2071	6250726.288	*Beyeria opaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	346	55.12468	507337.1229	6250732.979	*Eucalyptus gracilis*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	346	55.12468	507337.1229	6250732.979	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	346	55.12468	507337.1229	6250732.979	*Olearia muelleri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	346	55.12468	507337.1229	6250732.979	*Acacia colletioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Eucalyptus gracilis*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Acacia nyssophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	347	55.30329	507957.1362	6250596.324	*Maireana triptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	348	56.28011	508148.7189	6250573.211	*Chenopodium desertorum ssp. desertorum*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	348	56.28011	508148.7189	6250573.211	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	348	56.28011	508148.7189	6250573.211	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	348	56.28011	508148.7189	6250573.211	*Acacia oswaldii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	349	57.80789	508176.1973	6250589.707	*Hakea leucoptera*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	350	57.48418	508207.8002	6250563.624	*Templetonia egena*	Chenopod Sandplain Mallee. Fresh Echidna scratchings.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	351	61.00605	508966.0051	6250396.625	*Eutaxia microphylla*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Acacia acanthoclada*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Acacia oswaldii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Acacia nyssophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Acacia sclerophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Olearia pimeleoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	352	61.60879	509040.4367	6250389.237	*Eutaxia microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
2/09/2020	353	56.89289	509263.7058	6250436.255	*Eucalyptus dumosa*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	353	56.89289	509263.7058	6250436.255	*Eucalyptus gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	353	56.89289	509263.7058	6250436.255	*Olearia muelleri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	353	56.89289	509263.7058	6250436.255	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	353	56.89289	509263.7058	6250436.255	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	354	54.24144	509781.6326	6250344.707	*Triodia scariosa*	Chenopod Sandplain Mallee/Triodia Mallee ecotone	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	354	54.24144	509781.6326	6250344.707	*Lomandra leucocephala*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	355	61.37322	509823.7733	6250319.938	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	355	61.37322	509823.7733	6250319.938	*Chenopodium desertorum ssp. rectum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	356	59.67864	511127.99	6250183.12	*Eucalyptus dumosa*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	356	59.67864	511127.99	6250183.12	*Eucalyptus gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	356	59.67864	511127.99	6250183.12	*Olearia muelleri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	356	59.67864	511127.99	6250183.12	*Senna artemisioides ssp. coriacea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
2/09/2020	356	59.67864	511127.99	6250183.12	*Senna artemisioides ssp. petiolaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	357	56.80504	511466.7411	6250139.254	*Triodia scariosa*	Triodia Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	357	56.80504	511466.7411	6250139.254	*Eucalyptus socialis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	357	56.80504	511466.7411	6250139.254	*Eucalyptus leptophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	357	56.80504	511466.7411	6250139.254	*Beyeria opaca*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	357	56.80504	511466.7411	6250139.254	*Olearia muelleri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	358	58.14446	511579.1732	6250131.91	*Eucalyptus gracilis*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	358	58.14446	511579.1732	6250131.91	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	358	58.14446	511579.1732	6250131.91	*Senna artemisioides ssp. petiolaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	358	58.14446	511579.1732	6250131.91	*Dodonaea viscosa ssp. angustissima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	358	58.14446	511579.1732	6250131.91	*Lepidium leptopetalum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	359	58.34214	511729.4277	6250127.18	*Atriplex stipitata ssp. stipitata*	Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	359	58.34214	511729.4277	6250127.18	*Maireana pentatropis*	Shingleback	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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2/09/2020	360	63.13315	511999.5171	6250119.969	*Atriplex acutibractea ssp. karoniensis*	Cleared road side.(Pine Camp Road)	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	360	63.13315	511999.5171	6250119.969	*Roepera ovata*	Emu scats and feathers	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	360	63.13315	511999.5171	6250119.969	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	360	63.13315	511999.5171	6250119.969	*Sisymbrium erysimoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
2/09/2020	360	63.13315	511999.5171	6250119.969	*Asphodelus fistulosus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Maireana pyramidata*	Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	361	32.56469	543207.641	6255518.382	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	361	32.56469	543207.641	6255518.382	*Alyssum linifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Maireana pyramidata*	Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Malva weinmanniana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	362	33.31513	543280.1776	6255538.232	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Maireana pyramidata*	Black Bluebush/Nitre-bush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Nitraria billardierei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	363	30.04532	543378.4347	6255699.89	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	363	30.04532	543378.4347	6255699.89	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Maireana pyramidata*	Black Bluebush Shrubland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Salsola tragus ssp. tragus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	364	31.32635	543427.8765	6255788.257	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	365	30.98225	543450.1854	6255871.536	*Maireana pyramidata*	Black Bluebush Shrubland. Lower slope of aeolian dune.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	365	30.98225	543450.1854	6255871.536	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	365	30.98225	543450.1854	6255871.536	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	365	30.98225	543450.1854	6255871.536	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	365	30.98225	543450.1854	6255871.536	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	365	30.98225	543450.1854	6255871.536	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Maireana pyramidata*	Black Bluebush Shrubland. Scolded sub-saline swale of aeolian formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	366	29.63256	543485.7738	6255924.706	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	367	30.25385	543577.6336	6256021.305	*Maireana pyramidata*	Black Bluebush Shrubland. Lower dune slope of Woorinen formation aeolian rise ecotonal with Yamba formation gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	367	30.25385	543577.6336	6256021.305	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	367	30.25385	543577.6336	6256021.305	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	367	30.25385	543577.6336	6256021.305	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	367	30.25385	543577.6336	6256021.305	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	368	31.76774	543591.5203	6256022.904	*Maireana pyramidata*	Black Bluebush Shrubland. Lower dune slope of Woorinen formation aeolian rise ecotonal with Yamba formation gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	368	31.76774	543591.5203	6256022.904	*Austrostipa nullanulla*	15 plants per square metre	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	368	31.76774	543591.5203	6256022.904	*Austrostipa nitida*	1 plant per square metre	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Maireana pyramidata*	Black Bluebush Shrubland. Lower dune slope of Woorinen formation aeolian rise ecotonal with Yamba formation gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	369	32.51291	543570.4082	6256039.744	*Erodium cicutarium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	370	33.46721	543571.6089	6256059.475	*Maireana pyramidata*	Black Bluebush Shrubland on aeolian Woorinen formation rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	370	33.46721	543571.6089	6256059.475	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	370	33.46721	543571.6089	6256059.475	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	370	33.46721	543571.6089	6256059.475	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	371	31.91357	543642.3954	6256019.456	*Maireana pyramidata*	Black Bluebush Shrubland on thinly (<5cm) gypseous swale with scalded Woorinen toposoil.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	371	31.91357	543642.3954	6256019.456	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	371	31.91357	543642.3954	6256019.456	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	371	31.91357	543642.3954	6256019.456	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	371	31.91357	543642.3954	6256019.456	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Maireana pyramidata*	Black Bluebush Shrubland on lower slope of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Austrostipa scabra ssp. falcata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	372	30.81537	543668.8871	6256025.655	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	372	30.81537	543668.8871	6256025.655	*Roepera compressa*	<1 plant per square metre	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	373	31.381	543686.3941	6256029.788	*Maireana pyramidata*	Black Bluebush Shrubland on lower middle slope (W aspect) of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	373	31.381	543686.3941	6256029.788	*Austrostipa nullanulla*	Ave 27 plants per square metre with older tussocks.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	373	31.381	543686.3941	6256029.788	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	374	31.22337	543712.2356	6256035.435	*Maireana pyramidata*	Black Bluebush Shrubland on mid slope (W aspect) of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	374	31.22337	543712.2356	6256035.435	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	374	31.22337	543712.2356	6256035.435	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	374	31.22337	543712.2356	6256035.435	*Austrostipa nullanulla*	Ave 14 plants per square metre.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	375	34.97316	543726.4432	6256046.457	*Maireana pyramidata*	Black Bluebush Shrubland on upper slope (W aspect) of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	375	34.97316	543726.4432	6256046.457	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	375	34.97316	543726.4432	6256046.457	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	375	34.97316	543726.4432	6256046.457	*Austrostipa nullanulla*	Ave 22 plants per square metre. Numerous regenerants.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	376	36.70854	543750.8271	6256036.921	*Maireana pyramidata*	Black Bluebush Shrubland on dune crest of Woorinen formation capping gypsum. Numerous dead Callitris Pine.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	376	36.70854	543750.8271	6256036.921	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	376	36.70854	543750.8271	6256036.921	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	376	36.70854	543750.8271	6256036.921	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	376	36.70854	543750.8271	6256036.921	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	376	36.70854	543750.8271	6256036.921	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Maireana pyramidata*	Black Bluebush Shrubland on dune crest of Woorinen formation capping gypsum. Numerous dead Callitris Pine.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Eucalyptus oleosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	377	34.91509	543865.7596	6256059.455	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on aeolian sandplain.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	378	34.91069	543988.4343	6256075.299	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Euphorbia dallachyana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	378	34.91069	543988.4343	6256075.299	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	379	38.4019	544099.514	6256104.833	*Maireana pyramidata*	Black Bluebush Shrubland on low dune hummock with a Woorinen formation veneer with some gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	379	38.4019	544099.514	6256104.833	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	379	38.4019	544099.514	6256104.833	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	379	38.4019	544099.514	6256104.833	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	380	36.92809	544189.2564	6256122.268	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	380	36.92809	544189.2564	6256122.268	*Sclerolaena obliquicuspis*	****POSSIBLE PAD LOCATION**** approx. 1100m from Nulla Station boundary	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	380	36.92809	544189.2564	6256122.268	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	380	36.92809	544189.2564	6256122.268	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	381	33.27002	544297.7984	6256143.053	*Eucalyptus oleosa*	Middle dune slope of aeolian rise	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	381	33.27002	544297.7984	6256143.053	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	381	33.27002	544297.7984	6256143.053	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	381	33.27002	544297.7984	6256143.053	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	381	33.27002	544297.7984	6256143.053	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on E aspect of lower Woorinen formation dune slope.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Roepera ovata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	382	31.27916	544351.7868	6256152.337	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	383	32.20539	544474.6405	6256186.247	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on Woorinen formation sand plain.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	383	32.20539	544474.6405	6256186.247	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	383	32.20539	544474.6405	6256186.247	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	383	32.20539	544474.6405	6256186.247	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	384	28.22246	544274.584	6256105.573	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on middle dune slope of aeolian rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	384	28.22246	544274.584	6256105.573	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	384	28.22246	544274.584	6256105.573	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	384	28.22246	544274.584	6256105.573	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	385	34.33642	544128.1165	6256067.223	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on low duen hummock of Woorinen formation veneer over outcropping gypsum.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	385	34.33642	544128.1165	6256067.223	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	385	34.33642	544128.1165	6256067.223	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	385	34.33642	544128.1165	6256067.223	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	386	32.28295	544123.3052	6256027.329	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on aeolian rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	386	32.28295	544123.3052	6256027.329	*Sclerolaena obliquicuspis*	****SUGGESTED ALIGNMENT, BUT SEE WAYPOINT 387****	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	386	32.28295	544123.3052	6256027.329	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Maireana pyramidata*	Degraded Black Bluebush Shrubland on W facing slope of low gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Austrostipa nullanulla*	Ave 5 plants per square metre.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Erodium cicutarium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	387	33.03838	543975.8953	6255924.783	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	388	34.12235	543932.5359	6255952.703	*Austrostipa nitida*	Speargrass/Copperburr and Mallee ecotone on low Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	388	34.12235	543932.5359	6255952.703	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	388	34.12235	543932.5359	6255952.703	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	388	34.12235	543932.5359	6255952.703	*Dysphania cristata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	388	34.12235	543932.5359	6255952.703	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	389	34.76615	543886.8217	6255931.514	*Eucalyptus gracilis*	Lower dune slope of a Woorinen rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	389	34.76615	543886.8217	6255931.514	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	389	34.76615	543886.8217	6255931.514	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	389	34.76615	543886.8217	6255931.514	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on clay loam of Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	390	33.3838	543833.6143	6255890.512	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	391	35.80674	543774.1304	6255852.755	*Eucalyptus oleosa*	Very open Mallee Woodland on dune crest of Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	391	35.80674	543774.1304	6255852.755	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	391	35.80674	543774.1304	6255852.755	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	391	35.80674	543774.1304	6255852.755	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	392	30.07369	543641.6555	6255777.3	*Maireana pyramidata*	Black Bluebush Shrubland on sandy clay loam of Woorinen formation. Gypsum outcropping 30m to S. No target spp. found.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	392	30.07369	543641.6555	6255777.3	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	392	30.07369	543641.6555	6255777.3	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	392	30.07369	543641.6555	6255777.3	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	393	31.86538	543537.8455	6255717.679	*Maireana pyramidata*	Lower dune slope of a Woorinen formation ecotonal with gypseous outcrop.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	393	31.86538	543537.8455	6255717.679	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	393	31.86538	543537.8455	6255717.679	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	393	31.86538	543537.8455	6255717.679	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	393	31.86538	543537.8455	6255717.679	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	393	31.86538	543537.8455	6255717.679	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Austrostipa nitida*	Lower dune slope of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Eragrostis dielsii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	394	29.51165	543517.7369	6255711.007	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Spergularia diandra*	Swale of gypseous rises with thin Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	395	30.59902	543464.7074	6255688.076	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Pogonolepis muelleriana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	395	30.59902	543464.7074	6255688.076	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	396	30.90777	543468.9416	6255662.998		1 piece of brown ironstone.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Nitraria billardierei*	Swale of gypseous rises with thin Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	397	30.4581	543401.1785	6255655.435	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	398	34.43596	543314.2544	6255605.381	*Maireana pyramidata*	Black Bluebush Shrubland on upper slope of gypseous rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	398	34.43596	543314.2544	6255605.381	*Plantago turrifera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	398	34.43596	543314.2544	6255605.381	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	398	34.43596	543314.2544	6255605.381	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	398	34.43596	543314.2544	6255605.381	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	398	34.43596	543314.2544	6255605.381	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	399	29.41531	543386.4331	6256236.839	*Roepera compressa*	Middle dune slope of gypseous rise, W aspect.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	399	29.41531	543386.4331	6256236.839	*Frankenia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	399	29.41531	543386.4331	6256236.839	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	400	30.23822	543392.7763	6256207.428	*Elachanthus glaber*	Gypseous rise dune top.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	400	30.23822	543392.7763	6256207.428	*Roepera compressa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	400	30.23822	543392.7763	6256207.428	*Austrostipa nullanulla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	400	30.23822	543392.7763	6256207.428	*Frankenia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	400	30.23822	543392.7763	6256207.428	*Tecticornia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	400	30.23822	543392.7763	6256207.428	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Austrostipa nullanulla*	Upper slope of gypseous rise, W aspect.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Roepera compressa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Brachyscome ciliaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Elachanthus glaber*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Rostraria pumila*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	401	30.47025	543388.2864	6256196.804	*Lawrencia glomerata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Austrostipa nullanulla*	1 plant. Rosewood/Mallee Eucalyptus Woodland on gypseous rise with veneer of Woorinen formation with gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	402	33.60925	543550.0569	6255393.635	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	402	33.60925	543550.0569	6255393.635	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Austrostipa nullanulla*	8 plants. Rosewood/Mallee Eucalyptus Woodland on gypseous rise with veneer of Woorinen formation with gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	403	32.85987	543555.6895	6255391.17	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Austrostipa nullanulla*	20-30 plants. Rosewood/Mallee Eucalyptus Woodland on gypseous rise with veneer of Woorinen formation with gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	404	31.95625	543563.8659	6255398.672	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	404	31.95625	543563.8659	6255398.672	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Austrostipa nullanulla*	Rosewood/Mallee Eucalyptus Woodland on gypseous rise with veneer of Woorinen formation with gypsum outcropping.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	405	34.13758	543630.4525	6255392.158	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	405	34.13758	543630.4525	6255392.158	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Austrostipa nitida*	Speargrass/Copperburr Shrubland. ****POTENTIAL TRACK ALIGNMENT TO POTENTIAL PAD****	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Salsola tragus ssp. tragus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Carrichterra annua*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	406	32.72348	543745.4668	6255353.71	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Eucalyptus dumosa*	Rosewood/Mallee Eucalyptus Woodland. ****POTENTIAL TRACK ALIGNMENT TO POTENTIAL PAD****	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	407	32.33876	543652.0393	6255297.59	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	407	32.33876	543652.0393	6255297.59	*Roepera crenata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	408	31.18014	543507.0747	6255260.888	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland. ****PROPOSED TRACK ALIGNMENT TO PROPOSED PAD****	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	408	31.18014	543507.0747	6255260.888	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	408	31.18014	543507.0747	6255260.888	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	408	31.18014	543507.0747	6255260.888	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	409	38.05738	544738.3812	6256192.219	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on clay loam of Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	409	38.05738	544738.3812	6256192.219	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	409	38.05738	544738.3812	6256192.219	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	409	38.05738	544738.3812	6256192.219	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	409	38.05738	544738.3812	6256192.219	*Onopordum acaulon*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	410	39.85852	544908.9365	6256235.878	*Austrostipa nitida*	Derived Speargrass/Copperburr Shrubland on clay loam of Woorinen formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	410	39.85852	544908.9365	6256235.878	*Eriochiton sclerolaenoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	410	39.85852	544908.9365	6256235.878	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	410	39.85852	544908.9365	6256235.878	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	410	39.85852	544908.9365	6256235.878	*Onopordum acaulon*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Casuarina pauper*	Belah/Black Bluebush/Rosewood Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Maireana georgei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	411	49.21794	545881.9661	6256363.962	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Myoporum platycarpum ssp. platycarpum*	Sugarwood Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	412	49.40421	545943.4455	6256390.942	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Pimelea simplex ssp. simplex*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	412	49.40421	545943.4455	6256390.942	*Goodenia pusilliflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	413	52.53634	546160.908	6256431.137		End Sugarwood Woodland. Start degraded Chenopod Sandplain Mallee Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	414	53.72825	546193.0341	6256434.64	*Eucalyptus dumosa*	DBHs of 20-50cm	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	414	53.72825	546193.0341	6256434.64	*Eucalyptus socialis*	DBHs of 20-50cm	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	415	47.13173	546686.5462	6256422.032	*Myoporum platycarpum ssp. platycarpum*	Sugarwood/Pine Woodland. Trees mostly dead	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	415	47.13173	546686.5462	6256422.032	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	415	47.13173	546686.5462	6256422.032	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	415	47.13173	546686.5462	6256422.032	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	415	47.13173	546686.5462	6256422.032	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	415	47.13173	546686.5462	6256422.032	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Eucalyptus gracilis*	Mallee Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Eucalyptus dumosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Maireana pentatropis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	416	46.72845	546790.074	6256437.38	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	417	41.85211	547040.8408	6256474.952	*Alectryon oleifolius*	End Mallee Woodland. Start Derived Speargrass/Copperburr Shrubland on Open Sandplain with sparse Rosewood.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	417	41.85211	547040.8408	6256474.952	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	417	41.85211	547040.8408	6256474.952	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	417	41.85211	547040.8408	6256474.952	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	417	41.85211	547040.8408	6256474.952	*Onopordum acaulon*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	418	42.81184	547526.5258	6256562.353	*Alectryon oleifolius*	Derived Speargrass/Copperburr Shrubland on Open Sandplain with sparse Rosewood.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	418	42.81184	547526.5258	6256562.353	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	418	42.81184	547526.5258	6256562.353	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	418	42.81184	547526.5258	6256562.353	*Onopordum acaulon*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	419	48.10061	548548.3246	6256730.836	*Eucalyptus gracilis*	End Derived Speargrass/Copperburr Shrubland. Start Mallee Open Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	419	48.10061	548548.3246	6256730.836	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	419	48.10061	548548.3246	6256730.836	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	419	48.10061	548548.3246	6256730.836	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	420	48.81608	549183.448	6256810.736	*Myoporum platycarpum ssp. platycarpum*	Sugarwood Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	420	48.81608	549183.448	6256810.736	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	420	48.81608	549183.448	6256810.736	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	420	48.81608	549183.448	6256810.736	*Onopordum acaulon*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	420	48.81608	549183.448	6256810.736	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	421	66.03493	551178.5031	6256247.93	*Myoporum platycarpum ssp. platycarpum*	Sugarwood Woodland	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	421	66.03493	551178.5031	6256247.93	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	421	66.03493	551178.5031	6256247.93	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	421	66.03493	551178.5031	6256247.93	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	421	66.03493	551178.5031	6256247.93	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	422	65.52918	550925.3105	6256312.822	*Casuarina pauper*	End Sugarwood Woodland. Start Belah Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	423	65.49435	550926.2445	6256452.859	*Dodonaea viscosa ssp. angustissima*	End Belah Woodland. Start large Hopbush Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	424	50.72397	553437.0353	6255553.274	*Austrostipa nitida*	End Hopbush Shrubland. Start very open Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	424	50.72397	553437.0353	6255553.274	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	424	50.72397	553437.0353	6255553.274	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	425	62.88171	554195.04	6255460.505	*Eucalyptus oleosa*	End very open Mallee Woodland. Start Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	425	62.88171	554195.04	6255460.505	*Grevillea huegelii*	50-60 Euc trees per ha. Ave 5 stems per tree. DBHs 30-50cm. Much Mallee fauna habitat.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	425	62.88171	554195.04	6255460.505	*Myoporum platycarpum ssp. platycarpum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	426	60.95789	555950.6413	6255242.446	*Casuarina pauper*	End Chenopod Sandplain Mallee. Start Belah Woodland with sparse understorey.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	426	60.95789	555950.6413	6255242.446	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	426	60.95789	555950.6413	6255242.446	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	427	61.17099	557091.3542	6255100.618	*Eucalyptus gracilis*	End Belah Woodland. Start Euc. Mallee Woodland with derived understorey. Very old. DBHs 25-50cm. Multiple hollows. Much Mallee fauna habitat.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	427	61.17099	557091.3542	6255100.618	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	427	61.17099	557091.3542	6255100.618	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	427	61.17099	557091.3542	6255100.618	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	428	59.58524	558258.0238	6254956.942		End Euc. Mallee Woodland. Start very old, very open Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	429	55.04594	558473.252	6254930.452		End Spinifex Mallee. Start very old Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	430	45.31104	559135.9477	6254849.96	*Austrostipa nitida*	End Chenopod Sandplain Mallee. Start very open large old Euc. Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	430	45.31104	559135.9477	6254849.96	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	430	45.31104	559135.9477	6254849.96	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	430	45.31104	559135.9477	6254849.96	*Eremophila sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	431	40.35225	559802.3245	6254753.209	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Lycium australe*	Waypoints 432-437 defining an Australian Box-thorn stand.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	432	36.65156	560094.4186	6254725.09	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	433	39.43752	560097.3687	6254708.772	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	434	40.25559	560137.026	6254674.148	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	435	38.83373	560172.2739	6254688.451	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	436	37.52555	560159.5599	6254726.231	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	437	40.16716	560096.2962	6254729.403	*Lycium australe*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	438	38.42879	560207.7784	6254714.062	*Eucalyptus dumosa*	Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	438	38.42879	560207.7784	6254714.062	*Eucalyptus socialis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	439	40.27031	560326.7661	6254700.557		End Chenopod Sandplain Mallee. Start Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Triodia scariosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Convolvulus clementii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Pimelea simplex ssp. simplex*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Lotus cruentus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	440	45.24745	560406.8822	6254670.443	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Emex australis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Brassica tournefortii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Dissocarpus paradoxus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Chenopodium desertorum ssp. desertorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Rhyncharrhena linearis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Oxalis perennans*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Ptilotus exaltatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Limonium lobatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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3/09/2020	440	45.24745	560406.8822	6254670.443	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Amphipogon caricinus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Podolepis capillaris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Erodium cicutarium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Harmsiodoxa blennodioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Actinobole uliginosum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Thysanotus baueri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	440	45.24745	560406.8822	6254670.443	*Calotis erinacea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	441	47.88454	560944.3156	6254624.992	*Eucalyptus gracilis*	End Spinifex Mallee. Start very old Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	441	47.88454	560944.3156	6254624.992	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	441	47.88454	560944.3156	6254624.992	*Roepera apiculata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	441	47.88454	560944.3156	6254624.992	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
3/09/2020	442	43.36585	561057.9926	6254476.235	*Lycium australe*	Approimately 1 ha.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	443	46.37412	561769.3627	6254518.88		End very old Chenopod Sandplain Mallee. Start cleared land apart from sparse Mallees on south side of fence.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
3/09/2020	444	42.65762	564388.5486	6254214.662		End cleared paddock.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Eucalyptus camaldulensis*	River Red Gum Woodland at Darling River bank.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Medicago polymorpha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Rhagodia spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Stemodia florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Sonchus oleraceus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Cyperus gymnocaulos*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Senecio glossanthus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	445	31.62869	592450.9899	6253240.955	*Lepidium africanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Eucalyptus largiflorens*	Very open Black Box Woodland on grey alluvial clay of upper riverine terrace.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
4/09/2020	446	45.46118	592556.9033	6253267.648	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Acacia stenophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Sisymbrium erysimoides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Roepera iodocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Malva parviflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	446	45.46118	592556.9033	6253267.648	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	447	42.12997	592638.2573	6253204.424		Black Box Scar tree.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	448	43.61943	592694.7862	6253214.075	*Eucalyptus largiflorens*	Black Box Woodland on Bunyip Formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	448	43.61943	592694.7862	6253214.075	*Echium plantagineum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	448	43.61943	592694.7862	6253214.075	*Opuntia elata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	448	43.61943	592694.7862	6253214.075	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	448	43.61943	592694.7862	6253214.075	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	448	43.61943	592694.7862	6253214.075	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	449	46.14936	592772.3274	6253205.889	*Acacia victoriae*	Acacia victoriae Woodland, mostly dead. Soil now Woorinen Formation sandy loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	449	46.14936	592772.3274	6253205.889	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	449	46.14936	592772.3274	6253205.889	*Echium plantagineum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	449	46.14936	592772.3274	6253205.889	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	449	46.14936	592772.3274	6253205.889	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	450	44.35547	592877.2284	6253185.681	*Eucalyptus largiflorens*	End A.victoriae Woodland. Start Black Box Woodland on Bunyip Formation clayey sand.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	450	44.35547	592877.2284	6253185.681	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	450	44.35547	592877.2284	6253185.681	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	451	42.23391	593004.8821	6253145.954	*Eucalyptus largiflorens*	Change of soil to silty clay.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	451	42.23391	593004.8821	6253145.954	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	451	42.23391	593004.8821	6253145.954	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	451	42.23391	593004.8821	6253145.954	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	452	43.91471	593048.351	6253097.291	*Lepidium papillosum*	Silty clay.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	452	43.91471	593048.351	6253097.291	*Lepidium fasciculatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	452	43.91471	593048.351	6253097.291	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	452	43.91471	593048.351	6253097.291	*Atriplex holocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	452	43.91471	593048.351	6253097.291	*Sclerolaena obliquicuspis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	453	43.02573	593094.5252	6253117.132	*Maireana pyramidata*	End silty clay. Start Woorinen Formation sandy clay loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	453	43.02573	593094.5252	6253117.132	*Echium plantagineum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	453	43.02573	593094.5252	6253117.132	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Acacia victoriae*	End Black Box Woodland. Start very open Acacia victoriae Shrubland on Woorinen Formation sandy loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Maireana pyramidata*	M.pyramidata mostly eaten out.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Echium plantagineum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	454	42.72233	593158.6849	6253093.55	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Brassica tournefortii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	454	42.72233	593158.6849	6253093.55	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Eucalyptus largiflorens*	End A.victoriae Shrubland. Start Black Box Woodland with Black Bluebush shrubby understorey on Woorinen Formation clay loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Maireana turbinata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Atriplex stipitata ssp. miscella*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	455	43.14538	593420.9221	6252815.964	*Convolvulus clementii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	456	44.02045	593504.5284	6252709.905	*Acacia victoriae*	End Black Box Woodland. Start Acacia victoriae Shrubland on Woorinen Formation sandy loam dunes.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	456	44.02045	593504.5284	6252709.905	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	456	44.02045	593504.5284	6252709.905	*Polycalymma sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	456	44.02045	593504.5284	6252709.905	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	456	44.02045	593504.5284	6252709.905	*Schismus barbatus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Callitris gracilis*	End A.victoriae Shrubland. Start Sandhill Pine Woodland EEC.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Polycalymma sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Medicago minima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	457	42.66432	593567.9583	6252631.323	*Pycnosorus pleiocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	458	39.69065	593883.1677	6252343.333		End of Sandhill Pine Woodland. Start vineyard.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	459	42.09654	594116.315	6251981.512	*Callitris gracilis*	End vineyard. Start weedy Sandhill Pine Woodland EEC/Black Box Woodland ecotone on sandy loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	459	42.09654	594116.315	6251981.512	*Eucalyptus largiflorens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	459	42.09654	594116.315	6251981.512	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Eucalyptus largiflorens*	End weedy Sandhill Pine Woodland/Black Box Woodland ecotone. Start Black Box Woodland on light sandy clay loam.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Tetragonia moorei*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Thysanotus baueri*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Polycalymma sturtii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Harmsiodoxa blennodioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Atriplex stipitata ssp. miscella*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	460	41.18057	594202.993	6251897.595	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	461	44.88245	594289.3688	6251829.981		End Black Box Woodland at fence. Start unvegetated road reserve.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	462	41.88012	594328.2874	6251771.487	*Eucalyptus largiflorens*	End road reserve. Start Black Box Woodland with Black Bluebush understorey on Woorinen Formation sandy clay loam to sandy loam on rises.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	462	41.88012	594328.2874	6251771.487	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	462	41.88012	594328.2874	6251771.487	*Callitris gracilis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	463	45.07016	594419.9771	6251643.049	*Callitris gracilis*	End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	463	45.07016	594419.9771	6251643.049	*Rhodanthe moschata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	463	45.07016	594419.9771	6251643.049	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	463	45.07016	594419.9771	6251643.049	*Harmsiodoxa blennodioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	464	45.6985	594434.4268	6251607.753	*Eucalyptus largiflorens*	End Sandhill Pine Woodland. Start Black Box Woodland with Black Bluebush understorey.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	464	45.6985	594434.4268	6251607.753	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	465	44.46778	594539.3094	6251513.338	*Callitris gracilis*	End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	466	45.45221	594621.2891	6251394.975	*Eucalyptus largiflorens*	End Sandhill Pine Woodland. Start Black Box Woodland with Acacia oswaldii.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	466	45.45221	594621.2891	6251394.975	*Acacia oswaldii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	467	44.12974	594670.1427	6251322.076	*Callitris gracilis*	End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
4/09/2020	468	42.93795	594743.3012	6251274.882	*Eucalyptus largiflorens*	End Sandhill Pine Woodland. Start Black Box Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	468	42.93795	594743.3012	6251274.882	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	468	42.93795	594743.3012	6251274.882	*Rhodanthe corymbiflora*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	468	42.93795	594743.3012	6251274.882	*Hyalosperma semisterile*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	468	42.93795	594743.3012	6251274.882	*Harmsiodoxa blennodioides*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	469	41.32077	594973.3932	6250992.802	*Callitris gracilis*	End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	469	41.32077	594973.3932	6250992.802	*Sclerolaena decurrens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	470	41.80823	595148.4302	6250774.587	*Eucalyptus largiflorens*	End Sandhill Pine Woodland. Start Black Box Woodland with Black Bluebush understorey.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	470	41.80823	595148.4302	6250774.587	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	471	38.72161	595198.955	6250721.517		End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	472	40.72165	595245.8226	6250654.289		End Sandhill Pine Woodland. Start Woorinen veneer over Coonambidgal Formation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	473	37.12755	595313.5206	6250579.866		Baked clay.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	474	40.83513	595519.1773	6250336.163		Fenceline in very low sandy rise.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
4/09/2020	475	39.11979	596472.378	6249261.726	*Rhodanthe moschata*	End Black Box Woodland. Start Sandhill Pine Woodland EEC	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Bulbine semibarbata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Calotis hispidula*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Austrostipa nitida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Nicotiana velutina*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Swainsona microphylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Roepera similis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	475	39.11979	596472.378	6249261.726	*Solanum esuriale*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	476	42.46492	596451.0073	6249197.181	*Eucalyptus largiflorens*	End Sandhill Pine Woodland. Start Black Box Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Tetragonia moorei*	Start low floodplain depression.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	477	37.98889	597146.6251	6248391.76	*Chenopodium nitrariaceum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Maireana pyramidata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Sclerolaena diacantha*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Brachyscome lineariloba*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Atriplex eardleyae*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Pycnosorus pleiocephalus*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Rorippa palustris*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	477	37.98889	597146.6251	6248391.76	*Osteocarpum acropterum var. deminutum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	478	37.42784	597227.7269	6248319.958		End depression.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	479	44.50157	597501.5075	6248110.442		Start tall clayey lunette. No target species found.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	480	45.05576	598269.9731	6247204.156		Start cleared Sandhill Pine Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020						No waypoint. Gate. Start very old very open Mallee Euc. Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	481	46.71245	599077.4443	6246258.027		End very old Mallee Euc. Woodland. Start Sandhill Pine Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	482	50.28491	599465.2319	6245795.082	*Maireana pyramidata*	End Sandhill Pine Woodland. Start very old Chenopod Mallee Woodland with M.pyramidata understorey.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	483	50.97135	599639.3912	6245600.406		End Chenopod Mallee Woodland. Start Belah, Black Bluebush Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	484	55.41555	599866.1489	6245327.213		End Belah Woodland. Start Sandhill Pine Woodland EEC.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	485	54.2579	600043.9464	6245110.976	*Maireana pyramidata*	End Sandhill Pine Woodland. Start M.pyramidata Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	486	58.90361	601033.929	6243934.29	*Acacia ligulata*	End M.pyramidata Shrubland. Start Sandy rise with Mallee Euc. Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	487	56.42553	601144.4499	6243819.331	*Triodia scariosa*	End Mallee Euc. Woodland. Start Spinifex Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	487	56.42553	601144.4499	6243819.331	*Eucalyptus socialis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	487	56.42553	601144.4499	6243819.331	*Pittosporum angustifolium*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	487	56.42553	601144.4499	6243819.331	*Dodonaea viscosa ssp. angustissima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	487	56.42553	601144.4499	6243819.331	*Chenopodium desertorum ssp. desertorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	488	46.52957	601344.3388	6243444.36		End Spinifex Mallee Woodland. Start Chenopod Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	489	48.84582	601506.4109	6243397.38		End Chenopod Mallee Woodland. Start Spinifex Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	490	46.77505	601664.235	6243221.58	*Daviesia arenaria*	5 plants.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	491	49.86058	601685.9917	6243181.978		End Spinifex Mallee Woodland. Start Chenopod Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	492	47.8826	601759.1815	6243103.675	*Maireana pyramidata*	End Chenopod Mallee Woodland. Start M.pyramidata Shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	493	50.10031	601843.8583	6243002.182		End M.pyramidata Shrubland. Start Chenopod Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	494	55.63974	601902.0381	6242937.79		End Chenopod Mallee Woodland. Start Spinifex Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	495	54.41767	602013.6435	6242796.859		End Spinifex Mallee Woodland. Start very open Chenopod Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	496	50.91778	603371.4418	6241193.75		End very open Chenopod Mallee Woodland. Start Spinifex Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	497	57.52426	603648.2994	6240840.507	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	498	57.98163	603561.3114	6240794.659	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	498	57.98163	603561.3114	6240794.659	*Triodia scariosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	498	57.98163	603561.3114	6240794.659	*Maireana radiata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	498	57.98163	603561.3114	6240794.659	*Acacia wilhelmiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	499	59.95224	603757.9556	6240585.348	*Santalum murrayanum*	Fresh Echidna scratchings.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	500	57.58138	603770.1522	6240543.183	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	501	60.47012	603827.4476	6240535.569	*Santalum murrayanum*	Dead. Marginal Triodia Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	502	62.46195	604753.9802	6239572.187		Start Chenopod Sandplain Mallee, burnt within last 10 years.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	503	58.35992	604828.5309	6239371.299		Start very old Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Triodia scariosa*	End Chenopod Sandplain Mallee. Start Spinifex Mallee, burnt within last 10 years.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Halgania cyanea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Eremophila glabra*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Myoporum platycarpum ssp. perbellum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Codonocarpus cotinifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Acacia wilhelmiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Maireana radiata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Lomandra leucocephala ssp. robusta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	504	56.46825	605099.4676	6239168.565	*Waitzia acuminata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	504	56.46825	605099.4676	6239168.565	*Goodenia willisiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	505	58.67931	605424.3191	6238714.7	*Goodenia willisiana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	506	59.72033	605551.6778	6238637.093		End Spinifex Mallee. Start Chenopod Sandplain Mallee, burnt within last 10 years.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	507	59.36563	605670.6449	6238494.811		End Chenopod Sandplain Mallee. Enter burnt Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Waitzia acuminata*	Dune crest in Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Millotia myosotidifolia*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Eremophila glabra ssp. murrayana*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Stenopetalum lineare*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Stenopetalum sphaerocarpum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Codonocarpus cotinifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Pimelea simplex ssp. simplex*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Goodenia pinnatifida*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	508	65.38291	605938.5007	6238169.209	*Calandrinia eremaea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	508	65.38291	605938.5007	6238169.209	*Erodium crinitum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	509	65.3868	605939.5043	6238168.088		Ignore Waypoint.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	510	67.82703	606298.8416	6237748.405	*Acacia rigens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	511	64.06372	606456.9187	6237570.407	*Wahlenbergia sp.*	White flowered. Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	512	65.09879	606998.7853	6236927.392		End Chenopod Sandplain Mallee. Start Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	513	67.1747	607211.323	6236683.665	*Alectryon oleifolius*	Mallee/Rosewood/Hopbush on large dune. No Spinifex.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	513	67.1747	607211.323	6236683.665	*Dodonaea viscosa ssp. angustissima*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	514	68.72825	607361.127	6236504.081		Start thick Spinifex Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	515	65.33343	607507.5953	6236332.184	*Casuarina pauper*	End Spinifex Mallee. Start mixed Belah/Rosewood/Mallee Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	515	65.33343	607507.5953	6236332.184	*Alectryon oleifolius*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	516	65.40685	607736.987	6236038.014		End mixed Woodland. Start Belah Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	517	70.9561	607986.3074	6235767.677		End Belah Woodland. Start Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

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4/09/2020	518	73.75603	608207.1346	6235510.411		End Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	519	68.30584	609316.7519	6234202.754	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	520	69.9279	609468.4932	6233990.062		End Chenopod Sandplain Mallee. Start Chenopod Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	521	70.35255	610513.94	6232720.255	*Alectryon oleifolius*	Very open Rosewood/Mallee Woodland, mostly cleared.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	522	71.77533	611191.3323	6231858.239		End Rosewood/Mallee Woodland. Start Sandhill Pine Woodland EEC.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	523	69.5965	611252.0509	6231785.548	*Casuarina pauper*	End Sandhill Pine Woodland. Start Belah Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	524	65.60497	611781.2388	6231102.231		End Belah Woodland. Start crop.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	525	65.98042	611919.4552	6230948.988	*Casuarina pauper*	Small patch of Belah in crop.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	526	57.98437	612054.8632	6230769.492		End Belah in crop.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	527	47.50609	612985.1319	6229582.594		Start Chenopod Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	528	46.4614	613173.3903	6229365.183		End Chenopod Mallee. Start cleared land.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	529	48.40509	613415.6816	6229067.599		Cleared land.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	530	47.52577	614881.904	6227287.457		Cleared land.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
4/09/2020	531	52.62416	615063.315	6227075.854		End cleared land. Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	532	48.91941	615112.582	6227022.462		End Chenopod Sandplain Mallee. Start Belah Woodland/Chenopod Sandplain Mallee mosaic.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	533	51.65188	615553.8349	6226489.039		End mosaic. Start mostly cleared land.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	534	50.70473	615642.5749	6226374.605		End cleared land. Start disturbed and partially cleared Belah Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	535	59.69694	615848.794	6226134.954		Disturbed and partially cleared Belah Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
4/09/2020	536	51.54407	616092.4628	6225768.182		End at Power Substation.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	537	17.83664	614905.163	6206095.263	*Eucalyptus camaldulensis*	River Red Gum Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	537	17.83664	614905.163	6206095.263	*Acacia stenophylla*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	537	17.83664	614905.163	6206095.263	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	537	17.83664	614905.163	6206095.263	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	538	37.78327	614916.6542	6206108.875	*Eucalyptus largiflorens*	Black Box Chenopod Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	538	37.78327	614916.6542	6206108.875	*Rhagodia spinescens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	538	37.78327	614916.6542	6206108.875	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	538	37.78327	614916.6542	6206108.875	*Opuntia sp.*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	539	43.21511	614991.5438	6206269.55	*Eucalyptus largiflorens*	End Black Box Chenopod Woodland. Start Black Box with Lignum Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	539	43.21511	614991.5438	6206269.55	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	539	43.21511	614991.5438	6206269.55	*Enchylaena tomentosa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	539	43.21511	614991.5438	6206269.55	*Mesembryantheum nodiflorum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Eucalyptus largiflorens*	Black Box with Lignum Woodland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Duma florulenta*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Atriplex semibaccata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Sclerochlamys brachyptera*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Atriplex leptocarpa*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Atriplex lindleyi ssp. inflata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Disphyma crassifolium ssp. clavelatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	540	40.87804	615029.1361	6206294.376	*Maireana pentagona*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	541	43.1582	615141.3904	6206520.915		End section.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	542	66.51331	616561.9897	6208455.798		Water storage with disturbed regrowth shrubland.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	543	70.37804	616658.4651	6208808.067		End disturbed shrubland. Start Chenopod Sandplain Mallee. Rabbit infested.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	544	73.20825	616722.8404	6209000.471		End Chenopod Sandplain Mallee. Start Spinifex Mallee. Disturbed with high rabbit numbers.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	545	73.86477	616756.5736	6209106.08		End Spinifex Mallee. Start cleared paddock.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	546	64.66663	616806.7268	6209265.498		Cleared paddock to E. Chenopod Sandplain Mallee in narrow (20m) corridor to W.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	547	62.80296	616842.5416	6209375.407		Cleared paddock to E. Chenopod Sandplain Mallee in narrow (20m) corridor to W.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	548	65.16279	616868.4393	6209465.476		Cleared paddock to E. Spinifex Mallee in narrow (20m) corridor to W.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	549	65.1711	616925.4656	6209643.995		Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	550	61.81895	617026.6565	6210003.189	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	551	61.98354	617019.2954	6210011.155	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	552	62.24002	617014.6417	6210014.652	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	553	63.60336	617029.2198	6210016.688	*Santalum murrayanum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	554	63.21273	617032.1722	6210017.095	*Santalum murrayanum*	Sucker	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	555	66.64844	617082.2373	6210124.496		End Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	556	67.90871	617110.829	6210216.083		Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	557	61.26097	617130.8926	6210295.909	*Goodenia arguta*	Start recently cleared Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	558	57.58316	617217.9053	6210558.787		End cleared Mallee. Start Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	559	63.23304	617234.9585	6210611.367		Chenopod Sandplain Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	560	58.79265	617365.3908	6211031.081		End Chenopod Sandplain Mallee. Start cleared paddock.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	561	71.52989	617813.1884	6212441.231		End cleared paddock. Start vineyards to W. Cleared paddock (vineyard in development) to E.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	562	71.37463	617964.4121	6212920.679		Cleared paddocks	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	563	61.77891	618382.1137	6214232.806		Start Chenopod Sandplain Mallee.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	564	69.06407	618406.92	6214358.487		End Chenoopod Sandplain Mallee. Start Spinifex Mallee with very dense Triodia scariosa.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	565	59.92066	618520.5336	6214715.735		End Spinifex Mallee. Spinifex Mallee to W. Cleared paddock to E.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	566	55.88706	618564.1412	6214863.249		Start Chenopod Sandplain Mallee to W. Cleared paddock to E.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

DATE	WAYPOINT	ELEVATION	EAST (X)	NORTH (Y)	PLANT TAXON PRESENT	COMMENTS	OBSERVERS AND CONTACT
5/09/2020	567	59.34151	618698.209	6215219.239	*Atriplex acutibractea ssp. karoniensis*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	567	59.34151	618698.209	6215219.239	*Chenopodium curvispicatum*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	567	59.34151	618698.209	6215219.239	*Senna artemisioides ssp. coriacea*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	567	59.34151	618698.209	6215219.239	*Atriplex stipitata ssp. stipitata*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	568	55.92616	618740.9133	6215382.402		Spinifex Mallee	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	569	59.22541	618722.8626	6215405.256	*Acacia brachybotrya*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	570	53.30094	618754.6343	6215432.582	*Grevillea huegelii*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	571	56.00333	618843.0561	6215596.053	*Santalum murrayanum*	x1, fruiting. DBH 5cm.	Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au
5/09/2020	571	56.00333	618843.0561	6215596.053	*Acacia rigens*		Ian Sluiter ian@ogyris.com.au; Geoffrey Allen geoffrey@ogyris.com.au

APPENDIX D

THREATENED SPECIES

APPENDIX D-1
THREATENED FLORA LIKELIHOOD OF OCCURRENCE ASSESSMENT

Table D-1.1 Threatened flora likelihood of occurrence assessment

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Acacia acanthoclada	Harrow Wattle	E	–	–	BioNet; BAM-C	✓	–	–	–	**Habitat Requirements** Grows in mallee communities on ridges and dunes and very occasionally on rocky outcrops; generally, grows in deep, loose, sandy soil. Targeted seasonal surveys are required to be undertaken between August and November. **South Olary Plain** Habitat constraints – Deep silicious sands. Deep silicious sands occur within the proposal study area. Potentially suitable habitat in the form of PCTs 170, PCT 171 and PCT 172 occurs within the proposal study area.	**Candidate Species** South Olary Plain
Acacia carneorum	Purple-wood Wattle	V	V	Yes	PlantNet; BAM-C	✓	–	–	–	**Habitat Requirements** Grows in grassland and woodland in red, sandy soil; also found in Mulga communities on sand dunes, level sandy sites and alluvial accumulations along watercourses Detailed targeted surveys are required, and this species can be surveyed for all year. **South Olary Plain** Potentially suitable habitat in the form of PCT 21 and PCT 58 occurs in the SOP IBRA subregion.	**Candidate Species** South Olary Plain **EPBC Act Assessment** Although associated habitat occurs within the proposal study area, there no records within 100 km of the proposal with all known occurrences located with mulga vegetation communities to the north of the proposal study area. Therefore, the species is considered unlikely to occur.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Atriplex acutiloba	–	EX	–	N/A	PlantNet; PMST	–	–	–	–	Little known. Found in arid areas in western NSW (west of Broken Hill) and South Australia. In NSW, it is considered likely to occur in similar habitat to *Atriplex velutinella* which grows in sandy or saline areas. No associated PCT's are listed for this species.	Not candidate species. Not considered further.
Atriplex infrequens	A Saltbush	V	V	–	PlantNet; PMST; BAM-C SEARs	✓	✓	✓	✓	**Habitat Description** *Atriplex infrequens* is associated with broad drainage tracts, clay flats and possibly occasionally inundated habitats. Very little ecological information is available for this species so it's critical habitat components can only be speculated as relatively undisturbed and ungrazed drainage lines and flats. Detailed targeted seasonal surveys are required between Nov - Feb, 4 to 6 weeks after above average rainfall. **South Olary Plain** Potentially suitable habitat in the form of PCT 170. **Great Darling Anabranch** Potentially suitable habitat in the form of PCT 166. **Pooncarie – Darling** Potentially suitable habitat in the form of PCT 166. **Robinvale Plains** Potentially suitable habitat in the form of PCT 17 and PCT 216.	**Candidate Species** South Olary Plain Great Darling Anabranch Robinvale Plains **EPBC Assessment** Listed under Appendix A of the SEARs – associated vegetation types occur within the proposal study area. Further assessment required.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Austrostipa metatoris	A spear-grass	V	V	–	BioNet; BAM-C SEARs	✓	–	–	✓	**Habitat Description** Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils. Detailed targeted surveys required in Oct – Nov. **South Olary Plain** Potentially suitable habitat in the form of PCT 170. **Robinvale Plains** Potentially suitable habitat in the form of PCT 19.	**Candidate Species** South Olary Plain Robinvale Plains **EPBC Assessment** Listed under Appendix A of the SEARs – associated vegetation types occur within the proposal study area. Further assessment required.
Austrostipa nullanulla	A spear-grass	E	–	Yes	BioNet; PlantNet; BAM-C	✓	–	–	–	**Habitat Requirements** A perennial spear-grass that grows in tussocks to one metre tall. It grows on the margins of relict lakes, on the crests and sides of lunettes above old lake floors. Targeted seasonal surveys are required to be undertaken between Sept – Dec. General surveys notes for this species indicted optimal survey conditions are 4 to 6 weeks after significant rain. **South Olary Plain** Habitat constraints – land containing gypseous lunettes and copi rises. Geographic limitations – within 50 km of the Murray River. Habitat constraints and geographical limitations occur within the proposal study area. Potentially suitable habitat in the form of PCT 253 occurs within the proposal study area.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Brachyscome papillosa	Mossgiel Daisy	V	V	–	PMST; BAM-C	✓	✓	✓	✓	**Habitat Requirements** Recorded primarily in clay soils on Bladder Saltbush (*Atriplex vesicaria*) and Leafless Bluebush (*Maireana aphylla*) plains, but also in grassland and in Inland Grey Box (*Eucalyptus microcarpa*) – Cypress Pine (*Callitris* spp.) woodland. Whilst associated habitat within the proposal study area occurs in the form of PCT 15, PCT 154, & PCT 216 the species is mostly known from areas east of Balranald (~150 km east) and Willandra Lakes (~100 km northeast). The proposal study area does not support large plains of Bladder Saltbush, Leafless Bluebush, grasslands or Grey Box – Cypress Pine woodland complex. Given the lack of records in the locality and lack of optimal habitat this species is not considered a candidate and as such not considered further.	Given the lack of records in the locality and lack of optimal habitat *Brachyscome papillosa* is not considered a candidate species. **EPBC Assessment** Listed under Appendix A of the SEARs – considered unlikely to occur although further assessment is provided.
Caladenia tensa	Greencomb Spider-orchid	–	E	–	PMST	–	–	–	–	**Habitat Requirements** The rigid spider-orchid occurs in *Callitris* spp. (cypress pine), *Eucalyptus leucoxylon* (yellow gum) woodland and *Melaleuca uncinata* (broombush) mallee on Tertiary and Quaternary aeolian sandy loams in the Murray-Darling Depression bioregion. PCT association unknown.	Not listed under BC Act. **EPBC Assessment** Considered unlikely to occur. Not considered further.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Calotis moorei	A Burr-daisy	E	E	Yes	BAM-C	✓	–	✓	–	**Habitat Requirements** The species grows in sandy soil and appears to be associated with Acacia woodlands and chenopod shrublands. At Mt Mulyah, *Calotis moorei* grows in an area cleared of original *Acacia cambagei* woodland and subsequently invaded by *Dodonaea viscosa* subsp. *angustissima* which repressed the growth of herbaceous species. Targeted seasonal surveys are required from Sept to Nov. **South Olary Plain** Potentially suitable habitat in the form of PCT 154 and PCT 170. **Pooncarie – Darling** Potentially suitable habitat in the form of PCT 139 and PCT 154.	**Candidate species** South Olary Plain Pooncarie – Darling. **EPBC Assessment** This species will be subject to targeted surveys and further assessment.
Casuarina obesa	Swamp She-oak	E	–	Yes	BioNet; BAM-C	✓	–	–	–	**Habitat Description** Requires moist, slightly saline soils. Potential habitats include shorelines of permanent, ephemeral or relict lakes. These systems may be freshwater or saline-influenced judging by the present distribution of the species. **Habitat Constraints** Geographic constraints Brackish or saline areas within 100 m from rivers or lakes. Within NSW this species is only known from a single population at Lake Benanee that occurs to the east of the proposal study area. The proposal disturbance area does not impact shorelines of permanent, ephemeral or relict lakes with associated habitats for this species. Given the lack of records in the locality and lack of optimal habitat this species is not considered a candidate and as such not considered further.	Not candidate species. **EPBC Assessment** Considered unlikely to occur. Not considered further.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Cratystylis conocephala	Bluebush Daisy	E	–	–	PlantNet; BioNet; BAM-C	✓	✓	–	✓	**Habitat Description** Bluebush Daisy grows in mallee with areas of Belah (*Casuarina pauper*) on calcareous red soil. NSW populations are invariably found in Belah-Rosewood woodland or on the edge of sandplain mallee in calcareous soils. Targeted surveys are required; however these can be conducted all year round. **South Olary Plain** Potentially suitable habitat in the form of PCT 58, PCT 170, PCT 172, PCT 221 and PCT 253. **Great Darling Anabranch** Potentially suitable habitat in the form of PCT 58. **Robinvale Plains** Potentially suitable habitat in the form of PCT 221.	**Candidate Species** South Olary Plain Greater Darling Anabranch Robinvale Plains.
Dodonaea stenozyga	Desert Hopbush	CE	–	Yes	BioNet; PlantNet	✓	–	–	–	**Habitat Description** A shrub of semi-arid mallee scrub or open eucalypt woodland, usually on sandy soil. Presumed extinct in NSW (with the only record from the Darling River prior to 1859) until recorded in 1998 from Nanya Station, north west of Wentworth in far south western NSW. Targeted surveys are required, and can be conducted all year. **South Olary Plain** Potentially suitable habitat in the form of PCT 170, PCT 171, and PCT 172.	**Candidate species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Eucalyptus leucoxylon subsp. *pruinosa*	Yellow Gum	V	–	–	BioNet; BAM-C	–	–	–	✓	**Habitat Description** *Eucalyptus leucoxylon* subsp. *pruinosa* is a tree species which, in New South Wales, occurs at the bases of sandy rises and on loamy clay flats on the floodplains of the Murray River and its tributaries in the Riverina Bioregion. Targeted surveys are required but this species can be surveyed for all year. **Robinvale Plains** Potentially suitable habitat in the form of PCT 11, PCT 13 and PCT 19.	**Candidate Species** South Olary Plain Greater Darling Anabranch Pooncarie – Darling Robinvale Plains
Kippistia suaedifolia	Fleshy Minuria	E	–	–	BAM-C	✓	-	–	–	**Habitat Description** Grows around saline lakes and depressions, often in association with gypsum. Rare in NSW, recorded only from a restricted area on a loamy and highly gypseous soil. Targeted surveys are required but can be surveyed all year. **Habitat Constraints** Saline lakes, depressions and claypans with Gypseous or calcareous soils, gypseous dunes, or within 50 m. **South Olary Plain** Potentially suitable habitat in the form of PCT 154 and PCT 253.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Lasiopetalum behrii	Pink Velvet Bush	CE	–	Yes	PlantNet; BAM-C	✓	–	–	–	**Habitat Description** Grows in mallee and red dune and swale country. Pink Velvet Bush is known in NSW from a single record made in 1997 on leasehold land to the south east of Pooncarie in the far south western plains. The species is common in mallee areas of north western Victoria, with an outlier in the whipstick mallee near Bendigo. It is also widespread in south eastern South Australia. Habitat Constraint – Shallow, sandy soils. Targeted surveys are required but can be surveyed all year. **South Olary Plain** Potentially suitable habitat in the form of PCT 170, PCT 171 and PCT 172.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Lepidium monoplocoides	Winged Peppercress	E	E	–	BioNet, PMST; PlantNet; BAM-C SEARs	✓	–	✓	✓	**Habitat Description** Occurs on seasonally moist to waterlogged sites, on heavy fertile soils, with a mean annual rainfall of around 300–500 mm. Predominant vegetation is usually an open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *Eucalyptus populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses. Targeted Seasonal surveys required Nov to Feb. Survey about 1 month after significant rain. **South Olary Plain** Potentially suitable habitat in the form of PCT 15 and PCT 170. **Pooncarie – Darling** Potentially suitable habitat in the form of PCT 15. **Robinvale Plains** Potentially suitable habitat in the form of PCT 13 and PCT 216.	**Candidate Species** South Olary Plain Pooncarie – Darling Robinvale Plains **EPBC Assessment** Listed under Appendix A of the SEARs – considered unlikely to occur although further assessment is provided.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Leptorhynchos waitzia	Button Immortelle	E	–	Yes	BAM-C	✓	✓	✓	–	**Habitat Description** Grows on sandy or loamy soils, often in intermittently flooded areas and salt flats. Found in Kinchega NP on an open Bluebush plain with scattered chenopods. Only known in NSW from early records in the Darling River region and a more recent collection from Kinchega National Park. Targeted surveys required between Sept and Nov. **South Olary Plain** Potentially suitable habitat in the form of PCT 170. **Great Darling Anabranch** Potentially suitable habitat in the form of PCT 166. **Pooncarie – Darling** Potentially suitable habitat in the form of PCT 63 and PCT 166.	**Candidate Species** South Olary Plain Greater Darling Anabranch Pooncarie – Darling
Maireana lanosa	Woolly Bluebush	EX	–	–	PlantNet	–	–	–	–	**Habitat Description** *Maireana lanosa* is found in red sand or loam on saline flats or floodplains. This species is presumed extinct in NSW. This species is presumed extinct.	Not a candidate species

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Pimelea serpyllifolia subsp. *serpyllifolia*	Thyme Rice-Flower	E	–	Yes	BioNet; PlantNet; BAM-C	✓	–	–	–	**Habitat Description** Grows in scrub and woodland on calcareous soils. Often found in sandy red soils supporting mallee scrub. Targeted seasonal surveys required July to Nov. **South Olary Plain** Potentially suitable habitat in the form of PCT 170, PCT 171 and PCT 172	**Candidate Species** South Olary Plain
Pterostylis cheraphila	Floodplain Rustyhood	–	V	–	PMST	–	–	–	–	**Habitat Description** *Pterostylis cheraphila* is endemic to western Victoria, centred around Dimboola and Murtoa. It grows in open *Eucalyptus largiflorens/Eucalyptus leucoxylon* woodland with a sparse grassy understorey, on seasonally inundated, heavy, grey-black clay soils.	Not a Candidate Species Not BC Act Listed **EPBC Assessment** Not considered further
Pterostylis cobarensis	Cobar Rustyhood	V	–	–	BAM-C	–	–	–	–	**Habitat Description** Habitats are eucalypt woodlands, open mallee or Callitris shrublands on low stony ridges and slopes in skeletal sandy-loam soils. Targeted seasonal surveys October. Survey after soaking rains in autumn and winter as rosette growth and flowering dependent on these rains. The proposal study area does not contain preferred habitat in the form of low stony ridges or slopes. Further this species has not been recorded within the locality with the nearest known record being >100 km to the northeast.	Not a candidate species

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Santalum murrayanum	Bitter Quandong	E	–	–	BioNet; PlantNet; BAM-C	✓	–	–	–	**Habitat Description** Usually grows in mallee communities. Generally, grows in gravely and sandy loam soils on dunes, in open woodland and tall shrubland. Recorded in sand in spinifex-shrub steppe. NSW populations found in mallee habitats on soft linear dune-crests, with deep and well-drained calcareous earths or red and brown sands, loamy sands or clay-loams. Habitat constraints – Sandy loam or loamy sand. Survey all year **South Olary Plain** Potentially suitable habitat in the form PCT 170, PCT 171 and PCT 172.	**Candidate Species** South Olary Plain
Senecio behrianus	Stiff Groundsel	X	E	–	BioNet; PlantNet	–	–	–	–	**Habitat Description** Endemic to south-eastern Australia, where it once occurred in South Australia, New South Wales and Victoria. It is presumed extinct in South Australia and New South Wales, and is now only known only from 5 wild and 2 reintroduced populations in Victoria. Remaining populations grow on poorly-drained sedimentary grey clays or sandy clays on or close to floodplains, and on basalt-derived grey cracking clays in periodically flooded depressions. This species is presumed Extinct.	Not a candidate species **EPBC Assessment** Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Solanum karsense	Menindee Nightshade	V	V	–	BioNet, PMST; PlantNet; BAM-C SEARs	✓	✓	✓	✓	**Habitat Description** Grows in occasionally flooded depressions with heavy soil, including level river floodplains of grey clay with Black Box and Old Man Saltbush, and open treeless plains with solonized brown soils. Habitats are generally lake beds or floodplains of heavy grey clays with a highly self-mulching surface. Also found on sandy floodplains and ridges and in calcareous soils, red sands, red-brown earths and loamy soils. **Habitat constraints** – Semi-permanent/ephemeral wet areas. Targeted seasonal surveys are required between Sept to Nov. Survey after flood recession if possible as flowering is driven by flood disturbance. Species does not flower every year. **South Olary Plain** Potentially suitable habitat in the form of PCT 15. **Great Darling Anabranch** Potentially suitable habitat in the form of PCT 15. **Pooncarie – Darling** Potentially suitable habitat in the form of PCT 15, PCT 63 and PCT 166. **Robinvale Plains** Potentially suitable habitat in the form of PCT 13 and PCT 17.	**Candidate Species** South Olary Plain Greater Darling Anabranch Pooncarie – Darling Robinvale Plains. **EPBC Assessment** Listed under Appendix A of the SEARs – considered unlikely to occur although further assessment is provided.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Swainsona colutoides	Bladder Vetch	E	–	No	PlantNet; BAM-C	✓	–	–	–	**Habitat Description** Grows on sandy flats or skeletal hillside soils in mallee woodland. Plants are usually found in large numbers in areas of previous controlled burns and wildfires. Occurs in the south western corner of NSW, with several populations all located within Tarawi Nature Reserve. Targeted surveys are required and can be conducted all year round. However, survey is required after soaking rain and when night-time temperatures are above frost temperatures. Survey up to 2 years after fire. Strongly recommend expert report to discount presence or absence. **South Olary Plain** Potentially suitable habitat in the form of PCT 170, PCT 171 and PCT 172.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Swainsona murrayana	Slender Darling Pea	V	V	No	PMST	✓	–	–	–	**Habitat Description** The species has been collected from clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated. Targeted surveys required in September. **South Olary Plain** Potential habitat in the form of PCT 253. This species has not been recorded within the locality with most records occurring to the east associated with the broader Hay Plain. A single record from 2010 occurs from Nanya Station (~80 km north of the proposal study area). At Nanya Station, *Swainsona murrayana* was recorded from a gypseous rise approximately 2 m above a saline clay playa, occurring on gypseous clay of Yamba Formation. The plant was ascending through a Bladder Saltbush in a very sparse Bladder Saltbush Shrubland. Gypseous rises have been recorded within the proposal study area within the South Olary Plain IBRA subregion. Targeted surveys of PCT 253 – modified lunette variant will be undertaken based on the occurrence of this species within similar habitat at Nanya Station.	**Candidate Species** South Olary Plain **EPBC Assessment** Considered unlikely to occur although further assessment is provided.

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Swainsona pyrophila	Yellow Swainson-pea	V	V	–	BioNet, PMST, PlantNet, BAM-C SEARs	✓	–	-	–	**Habitat Description** Grows in mallee scrub on sandy or loamy soil, usually found only after fire. Sites include cleared and burnt mallee scrub on red loam to sand, previously burnt *Eucalyptus dumosa* mallee, disturbed woodland in sheltered aspects, a bulldozed firebreak adjacent to wheat paddocks, roadsides, claypans and at the edge of fire ash. Targeted Surveys required Sept to Nov. **South Olary Plain** Potentially suitable habitat in the form of PCT 170, PCT 171 and PCT 172.	**Candidate Species** South Olary Plain **EPBC Assessment** Listed under Appendix A of the SEARs – considered unlikely to occur although further assessment is provided.
Swainsona sericea	Silky Swainson-pea	V	–	–	PlantNet	–	–	–	✓	**Habitat Description** Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Found in a wide variety of vegetation types in the Southern Tablelands and South West Slopes and Northern Tableland. Targeted seasonal surveys Sep – Oct. Although no associated vegetation types occur within the proposal study area, this species has been recorded frequently near Red Cliffs mostly within Kings Billabong Park. Field validation of vegetation types within this area indicate Black Box Woodland is the most likely habitat and as such targeted surveys are required for PCT13 within the Robinvale Plains IBRA subregion.	**Candidate** Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SAII	SOURCE[3]	SOP	GDA	PD	RP	HABITAT SUITABILITY	OUTCOME
Tecticornia flabelliformis	Bead Glasswort	–	V	–	PMST	–	–	–	–	**Habitat Description** The Bead Glasswort *Tecticornia flabelliformis* is a poorly-known, small perennial shrub that is widely distributed across southern Australia, where it occurs in low-lying seasonally inundated clay and salt pans.	Not a candidate species Not listed under BC Act **EPBC Assessment** Not considered further
Tetratheca pilosa subsp. *pilosa*	–	EX	–	–	BioNet	–	–	–	–	**Habitat Description** *Tetratheca pilosa* subsp. *pilosa* is currently found in Victoria, Tasmania and South Australia. It is presumed extinct in NSW. Grows in heath or sclerophyll forest. The species flowers in spring. This species is presumed Extinct in NSW. A single historic record occurs within the locality form Lake Victoria area dated from 1884.	Not a candidate species Not considered further

APPENDIX D-2
THREATENED FAUNA LIKELIHOOD OF OCCURRENCE ASSESSMENT

Table D-2.1 Threatened fauna likelihood of occurrence assessment

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Amphibians (3)											
Crinia sloanei	Sloane's Froglet	V	-	Professional opinion, as a possibility	✓	✓	✓	✓	**Habitat requirements** It is typically associated with periodically inundated areas in grassland, woodland and disturbed habitats. Sloane's Froglet has been recorded from widely scattered sites in the floodplains of the Murray-Darling Basin, with most records in the Darling Riverine Plains, NSW South Western Slopes and Riverina bioregions in New South Wales.	**Low.** Associated habitat in the form of water bodies recorded, though generally in poor condition.	Not a candidate species Not considered further
Litoria raniformis	Southern Bell Frog	E	V	BAM-C, Bionet, PMST, SEARS	–	–	–	✓	**Habitat requirements** In NSW the species was once distributed along the Murray and Murrumbidgee Rivers and their tributaries, the southern slopes of the Monaro district and the central southern tablelands as far north as Tarana, near Bathurst. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Murrumbidgee floodplain and around Lake Victoria. Usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat. **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17 Detailed targeted surveys are required to be undertaken between October to January.	**Moderate**. Scattered records within locality. Associated habitat in the form of PCT's 11, 13, and 17, lakes, swamps and rivers.	**Candidate Species** Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Neobatrachus pictus	Mallee Spadefoot Toad / Painted Burrowing Frog	E	-	BAM-C	✓	✓	✓	–	**Habitat requirements** Found at only two locations in NSW. These are Scotia Sanctuary, adjacent to the South Australian border and in an area to the west of Pooncarie. Animals can occur in open grassland, mallee, woodland, farmland and cleared areas and are usually found in or around flooded areas after periods of heavy rainfall, including grassy marshes, lagoons, flooded claypans, temporary roadside pools, ditches, mallee swales and farm dams. Animals burrow beneath the soil surface during periods of water shortage and emerge only after heavy rains to breed. They most likely use leaf litter, fallen logs and ground cover vegetation as shelter whilst above ground. Breeding can occur in summer, autumn or winter and males call whilst floating in still water. **South Olary Plain** Predicted habitat occurs within PCT 58, 153, 154, 170, 171, 221, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 153, 154 Detailed targeted surveys are required to be undertaken, these can be done any time of year, preferably post rainfall events.	**Moderate**. Associated habitat recorded in the form of PCT's 11, 15, 58, 153, 154, 170, 171, 221, 252. Floodplain – grasslands and swamps.	**Candidate Species** South Olary Plain Great Darling Anabranch Pooncarie Darling

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Birds (87)											
Actitis hypoleucos	Common Sandpiper	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Frequents a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity. It is mostly encountered along muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow and may be steep. The species is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Amytornis striatus	Striated Grasswren	V	-	BAM-C	✓	–	–	–	**Habitat requirements** This species is widely distributed through the arid and semi-arid regions of mainland Australia, with three subspecies currently recognised. Confined to areas with mature spinifex (*Triodia irritans*), usually in association with mallee eucalypts and sandy soils. Is known to reoccupy burnt vegetation 6 to 8 years following fire and prefers areas with large hummocks of spinifex which is greatest 25 to 40 years post-fire. **South Olary Plain** Predicted habitat occurs within PCT 171, 172 Detailed targeted surveys are required to be undertake, these can be done any time of year.	**Moderate.** Recorded within locality. Associated habitat recorded.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Anseranas semipalmata	Magpie Goose	V	-	Bionet	✓	✓	✓	✓	**Habitat requirements** A vagrant to NSW, normally following food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. **South Olary Plain** Predicted habitat occurs within PCT 15 **Great Darling Anabranch** Predicted habitat occurs within PCT 15 **Pooncarie-Darling** Predicted habitat occurs within PCT 15 **Robinvale Plains** Predicted habitat occurs within PCT 13	**Moderate.** Potential habitat occurs within PCT 13 and PCT 15.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Apus pacificus	Fork-tailed Swift	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Breeds in the northern hemisphere, wintering south to Australia. It is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground. It mostly occurs over inland plains but sometimes above foothills or in coastal areas over cliffs, beaches, islands and well out to sea. It also occurs over towns and cities. It mostly occurs over dry and/or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, grassland, spinifex sandplains, farmland and sand-dunes. It sometimes occurs above forests. It probably roosts aerially but has occasionally been observed to land.	**Moderate.** May occur in aerial habitats over the proposal study area on a seasonal basis.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Ardea (Bulbulcus) ibis	Cattle Egret	-	Ma	Bionet, PMST	–	–	–	–	**Habitat requirements** Widespread and common according to migration movements and breeding localities surveys. Breeds in colonies, either mono-specific or with other Egrets/Herons. Occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It has occasionally been seen in arid and semi-arid regions however this is extremely rare. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. It has been recorded on earthen dam walls and ploughed fields. It is commonly associated with the habitats of farm animals, particularly cattle, but also pigs, sheep, horses and deer. It uses predominately shallow, open and fresh wetlands including meadows and swamps with low emergent vegetation and abundant aquatic flora. They have sometimes been observed in swamps with tall emergent vegetation.	**Moderate.** May occur intermittently in wetland habitats.	**Considered further in MNES section**
Ardea alba (syn. Ardea modesta)	Eastern Great Egret	-	Ma	PMST	–	–	–	–	**Habitat requirements** Colonies are known in the Darling Riverine Plains region of NSW and the Riverina region of NSW and Victoria. Non-breeding birds have been recorded across much of Australia but avoid the driest regions of the western and central deserts. Inhabits a wide range of wetland habitats which include swamps and marshes; margins of rivers and lakes; damp or flooded grasslands, pastures or agricultural lands; reservoirs; sewage treatment ponds; drainage channels; salt pans and salt lakes; salt marshes; estuarine mudflats, tidal streams; mangrove swamps; coastal lagoons; and offshore reefs.	**Recorded**. Occur in wetland and riparian habitats.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Ardeotis australis	Australian Bustard	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat requirements** Occurs in inland Australia and is now scarce or absent from southern and south-eastern Australia. In NSW, they are mainly found in the north-west corner and less often recorded in the lower western and central west plains regions. Occasional vagrants are still seen as far east as the western slopes and Riverine plain. Breeding now only occurs in the north-west region of NSW. Mainly inhabits tussock and hummock grasslands, though prefers tussock grasses to hummock grasses; also occurs in low shrublands and low open grassy woodlands; occasionally seen in pastoral and cropping country, golf courses and near dams. Breeds on bare ground on low sandy ridges or stony rises in ecotones between grassland and protective shrubland cover; roosts on ground among shrubs and long grasses or under trees. **South Olary Plain** Predicted habitat occurs within PCT 15, 58, 221, 252 Detailed targeted surveys are required to be undertaken, these can be done any time of year.	**Moderate**. Associated habitat recorded.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Arenaria interpres	Ruddy Turnstone	-	M	Bionet	–	–	–	–	**Habitat requirements** During non-breeding movements, it is found in most coastal regions, with occasional records of inland populations. Mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In north Australia it is known to occur in a wide variety of habitats and may prefer wide mudflats. In southern Australia the Ruddy Turnstone prefers rockier coastlines and is less numerous on large embayments with extensive mudflats.	**Low.** Mainly restricted to coastal environments. Rare occurrences cannot be discounted but unlikely. The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19, 216	**Recorded.** Known to occur within locality.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Botaurus poiciloptilus	Australasian Bittern	E	E	BAM-C, Bionet, PMST, SEARS	–	–	✓	✓	**Habitat requirements** In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.). Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds. **Pooncarie-Darling** Predicted habitat occurs within PCT 11 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17	**Moderate**. Records occur within locality.	**Predicted ecosystem credit species** Pooncarie Darling Robinvale Plains **Considered further in MNES section**
Burhinus grallarius	Bush Stone-curlew	E	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east, it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Moderate.** A small number of records in riparian habitats associated with the Murray and Darling River. Associated habitat recorded in riparian areas.	**Candidate Species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Calamanthus campestris	Rufous Fieldwren	V	–	Birdata and eBird records	–	✓	✓	–	**Habitat requirements** Forages by working through the undergrowth and over the ground, cock-tailed and hopping, feeding on insects and seeds. Inhabits low shrublands, particularly saltbush and bluebush communities, and also areas around inland saline lakes. **Great Darling Anabranch** Predicted habitat occurs within PCT 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 166	**Low.** Surveys and call playback conducted in most likely habitats with only Redthroat responding to Fieldwren calls. Associated habitats including Saltbush and Bluebush communities, recorded.	Not considered further.
Calidris acuminata	Sharp-tailed Sandpiper	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Occurs in a variety of habitats: tidal mudflat, mangrove swamps, saltmarshes, shallow fresh, brackish, salt inland swamps and lakes; flooded and irrigated paddocks, sewage farms and commercial saltfields.	**Low.** Recorded within Chowilla regional reserve but the proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Calidris canutus	Red Knot	-	E, M	Bionet	–	–	–	–	**Habitat requirements** In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Calidris ferruginea	Curlew Sandpiper	E	M	Bionet, PMST, SEARS	–	–	–	–	**Habitat requirements** Occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes, and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further under BC Act. **Considered further in MNES section as in SEARS**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Calidris melanotos	Pectoral Sandpiper	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species frequents coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. It is usually found in coastal or near coastal habitat but occasionally further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. It has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands.	**Low.** Recorded within Chowilla regional reserve but the proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Calidris minuta	Little Stint	-	Ma	Professional opinion	–	–	–	–	**Habitat requirements** It breeds in arctic Europe and Asia, and is a long-distance migrant, wintering south to Africa and south Asia. It occasionally is a vagrant to North America and to Australia. Habitat associated with coastal mudflats or the edges of inland pools.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Calidris ruficollis	Red-necked Stint	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Been recorded in all coastal regions and found inland in all states when conditions are suitable. Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in salt flats.	**Low.** Recorded within Chowilla regional reserve. However, the proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Calidris subminuta	Long-toed Stint	-	M	Bionet	–	–	–	–	**Habitat requirements** Is a regular summer visitor to Australia, but uncommon in the east. Occurs in a variety of terrestrial wetlands. They prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds. The species is also fond of areas of muddy shoreline, growths of short grass, weeds, sedges, low or floating aquatic vegetation, reeds, rushes and occasionally stunted samphire. It has also been observed at open, less vegetated shores of larger lakes and ponds and is common on muddy fringes of drying ephemeral lakes and swamps. The Long-toed Stint also frequents permanent wetlands such as reservoirs and artificial lakes. They are uncommon, but not unknown, at tidal estuaries, saline lakes, saltponds and bore swamps.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Certhionyx variegatus	Pied Honeyeater	V		BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Widespread throughout acacia, mallee and spinifex scrubs of arid and semi-arid Australia. Inhabits wattle shrub, primarily Mulga (*Acacia aneura*), mallee, spinifex and eucalypt woodlands, usually when shrubs are flowering; feeds on nectar, predominantly from various species of emu-bushes (*Eremophila* spp.); also, from mistletoes and various other shrubs (e.g. *Grevillea* spp.); also eats saltbush fruit, berries, seed, flowers and insects. Highly nomadic, following the erratic flowering of shrubs; can be locally common at times. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 139, 154 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Moderate.** Associated habitats, including Mallee and River Red Gum woodlands recorded.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Charadrius bicinctus	Double-banded Plover	-	M	PMST	–	–	–	–	**Habitat requirements** The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. It is sometimes associated with coastal lagoons, inland saltlakes, exposed seagrass beds, exposed reefs and rock platforms and coastal sand dunes.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further
Charadrius leschenaultii	Greater Sand Plover	V	V, M, Ma	Direct observation	–	–	–	–	**Habitat requirements** Generally considered entirely coastal in NSW foraging on intertidal sand and mudflats in estuaries and roosting during high tide on sand beaches or rocky shores. Has been observed to occur in inland habitats when suitable intermittent conditions occur. A migratory species it is found in New South Wales generally during the summer months.	**Low.** Recorded within Chowilla regional reserve October 2019. However, the proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further under BC Act. **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Charadrius ruficapillus	Red-capped Plover	-	Ma	PMST	–	–	–	–	**Habitat requirements** Inhabit wide, bare sandflats or mudflats at the margins of saline, brackish or freshwater wetlands where they forage by using their characteristic 'stop-run-peck' method, taking small invertebrates from the surface. Their speckled eggs are laid in a shallow depression in the ground, often beneath a low shrub, or out in the open if near water.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Chlidonias leucopterus	White-winged Black Tern	-	M	Bionet	–	–	–	–	**Habitat requirements** The species is a non-breeding migrant to Australia, where it is widespread and common along south-western, northern and central-eastern coasts, with only scattered records of small numbers along the coasts elsewhere in southern Australia. mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. White-winged Black Terns frequent tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats. Terrestrial wetlands, including swamps, lakes, billabongs, rivers, floodplains, reservoirs, saltworks, sewage ponds and outfalls are also inhabited. Wetlands may be open, or with floating emergent or marginal vegetation. They rarely occur on inland wetlands in Australia. The species is usually only recorded offshore when on passage.	**Moderate.** May occur intermittently in wetland habitats particularly rivers.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Chrysococcyx osculans	Black-eared Cuckoo	-	Ma	PMST	–	–	–	–	**Habitat requirements** The Black-eared Cuckoo is widespread on mainland Australia, but avoids the wet, heavily forested areas on the east coast and the south-west corner of Western Australia. It is an occasional vagrant to offshore islands and Tasmania. Found in drier country where species such as mulga and mallee form open woodlands and shrublands. It is often found in vegetation along creek beds.	**Moderate.** Recorded within locality. Associated habitats recorded.	**Considered further in MNES section**
Chthonicola sagittata (syn. Pyrrholaemus sagittatus)	Speckled Warbler	V	-	Bionet	–	–	–	–	**Habitat requirements** Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	**Low**. Distribution does not extend to habitats associated with the project.	Not considered further.
Cinclosoma castanotum	Chestnut Quail-thrush	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat requirements** Throughout its distribution it occurs in a wide range of arid and semi-arid habitats; mainly in the low shrubs and undergrowth of mallee scrub, but also in Acacia scrubs, dry sclerophyll woodland, heath, and native pine. However, in NSW it seems to occur almost exclusively in mallee habitats, with understorey dominated by spinifex, chenopods or other shrubs including Acacia species. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Recorded.** Associated habitat in the form of semi-arid woodlands (Mallee) recorded.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Circus assimilis	Spotted Harrier	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Preys on terrestrial mammals (e.g. bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 216	**Moderate.** Local records and the proposal study area traverses suitable habitat.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Bionet	–	–	–	–	**Habitat requirements** Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	**Low.** Outside the known distribution for this threatened sub-species. The nominate race *Climacteris picumnus picumnus* was recorded widely within the proposal study area.	Not considered further.
Daphoenositta chrysoptera	Varied Sittella	V	-	BAM-C, Bionet	✓	–	–	✓	**Habitat requirements** Sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 170, 171, 172, 221, 252 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Moderate.** Frequently recorded within locality, associated habitats recorded.	**Predicted ecosystem credit species** South Olary Plain Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Drymodes brunneopygia	Southern Scrub-robin	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat requirements** This species is restricted to mallee and shrublands across southern Australia and in NSW is confined to two main areas. The first is in central NSW and is centred on Round Hill and Nombinnie Nature Reserves. The other population occurs in the far south west of NSW, mainly within the Scotia mallee centred on Tarawi NR and Scotia Sanctuary. Inhabits mallee and acacia scrub, particularly with dense sub-shrubs in the understorey, including Broombush and other dry shrubs. Occupies vegetation with a post fire age of 4-80 years but is most abundant in areas with a post fire age of 26-40 years as dependent on a well-developed shrub layer. **South Olary Plain** Predicted habitat occurs within PCT 171	**Moderate**. Although it is considered unlikely that this species persists in the locality its presence cannot be entirely discounted. Mallee woodland communities generally considered to be of insufficient quality to support this species.	**Predicted ecosystem credit species** South Olary Plain
Epthianura albifrons	White-fronted Chat	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. **South Olary Plain** Predicted habitat occurs within PCT 154, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 63, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 17, 216	**Recorded.** The proposal study area traverses suitable habitat.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Falco hypoleucos	Grey Falcon	E	V	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19, 216	**Moderate.** Associated habitat recorded within the proposal study area.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Falco subniger	Black Falcon	V	-	Bionet	✓	✓	✓	✓	**Habitat requirements** Widely, but sparsely, distributed in New South Wales, mostly occurring woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. It is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition, although in agricultural landscapes it tends to nest in healthy, riparian woodland remnants with a diverse avi-fauna. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19, 216	**Moderate.** Species is known to occur locally.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains
Gallinago hardwickii	Latham's Snipe	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Occurs in freshwater or brackish wetlands generally near protective vegetation cover. This species feeds on small invertebrates, seeds and vegetation. It migrates to the northern hemisphere to breed.	**Moderate.** May occur intermittently in wetland habitats.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Geophaps scripta scripta	Squatter Pigeon (Southern Subspecies)	CE	V	BAM-C	✓	-	-	-	**Habitat requirements** Found from north Queensland to the North West Slopes of NSW and extending down to the Liverpool Plains and Dubbo. Today they are very rare in the southern parts of their range. Found in grassy woodlands and plains, preferring sandy areas and usually close to water. **South Olary Plain** Predicted habitat occurs within PCT 15	**Low.** Species distribution does not extend to the proposal study area regions.	Not considered further
Glossopsitta porphyrocephala	Purple-crowned Lorikeet	V	-	BAM-C, Bionet	✓	–	–	✓	**Habitat requirements** It is uncommon in NSW, with records scattered across the box-ironbark woodlands of the Riverina and south west slopes, the River Red Gum forests and mallee of the Murray Valley as far west as the South Australian border, and, more rarely, the forests of the South Coast. The species is nomadic and most, if not all, records from NSW are associated with flowering events. Found in open forests and woodlands, particularly where there are large flowering eucalypts. Also recorded from mallee habitats. Feed primarily on nectar and pollen of flowering Eucalypts, including planted trees in urban areas. Breeds away from feeding areas, utilising hollow branches or holes in trees. Also roosts in dense vegetation up to several kilometres away from feeding areas. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172 **Robinvale Plains** Predicted habitat occurs within PCT 11	**Moderate**. The proposal study area occurs on the fringe of distribution. Rare occurrences during favourable conditions cannot be discounted.	**Predicted ecosystem credit species** South Olary Plain Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Grantiella picta	Painted Honeyeater	V	V	BAM-C, Bionet, PMST	✓	–	–	–	**Habitat requirements** The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ 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. Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143	**Moderate.** Habitat occurs with proposal study area and similar habitat is associated with records in SA although there are no records locally.	**Predicted ecosystem credit species** South Olary Plain **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Grus rubicunda	Brolga	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range. Often feed in dry grassland or ploughed paddocks or even desert claypans, they are dependent on wetlands too, especially shallow swamps, where they will forage with their head entirely submerged. **South Olary Plain** Predicted habitat occurs within PCT 15 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 63, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17	**Moderate.** Low number of records locally but may occasionally fly through the region.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Ma	BAM-C, Bionet, PMST	✓	✓	✓	✓	**Habitat requirements** In NSW it is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs in vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts. Feed mainly on fish and freshwater turtles, but also waterbirds, reptiles, mammals and carrion. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 170, 171 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 139, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19, 216	**Recorded.** Recorded at the Red Cliffs section in the east and on the Rufus plains and Rufus weir in the west of the project locality.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
									Targeted surveys to be undertaken during July to December for breeding activity. Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines AND the presence of a large stick nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period.		
Hamirostra melanosternon	Black-breasted Buzzard	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Found sparsely in areas of less than 500 mm rainfall. Lives in a range of inland habitats, especially along timbered watercourses which is the preferred breeding habitat. Also hunts over grasslands and sparsely timbered woodlands. Breeds from August to October near water in a tall tree. The stick nest is large and flat and lined with green leaves. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143, 154, 170, 171, 172, 221, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 216 Targeted surveys undertaken to identify breeding habitat during September to November. Breeding habitat normally associated with land within 40 m of riparian woodland on inland watercourses/waterholes containing dead or dying eucalypts.	**Recorded.** Associated habitat recorded within proposal study area. Recorded near the Low Darling Road, High Darling Road and Chowilla Regional Reserve.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Hieraaetus morphnoides	Little Eagle	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19, 216 Targeted surveys to be undertaken between August to October to identify breeding habitat. Nest trees – live (occasionally dead) large old trees within vegetation.	**Recorded.** Associated habitat recorded within proposal study area.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Himantopus himantopus	Black-winged Stilt	-	Ma	PMST	–	–	–	–	**Habitat requirements** Widely distributed throughout the Australian mainland, although absent or very few records in central Kimberley and central to western Northern Territory. It prefers shallow, open freshwater wetlands, especially those with dense growth of short grass or similar emergent vegetation. Occur on most types of wetlands: swamps, marshy ponds, billabongs, lakes, lagoons, saltmarsh, closed tidal wetlands, sewage farms and flooded paddocks.	**Low.** Recorded within Chowilla regional reserve. However, the proposal study area does not contain any mapped important areas that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Hirundapus caudacutus	White-throated Needletail	-	V, M	Bionet	–	–	–	–	**Habitat requirements** Widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. It is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks.	**Moderate.** Although local records are sparse, due to wide ranging habitats may occur in aerial habitats over the proposal study area on a seasonal basis.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Hydroprogne caspia (syn. Sternia caspia)	Caspian Tern	-	M	Bionet	–	–	–	–	**Habitat requirements** Found in sheltered coastal embayments preferring sandy or muddy margins. Also found in near-coastal or inland terrestrial wetlands. It forages in open wetlands, preferring sheltered shallow water near the margins. It usually breeds in low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks and occasionally among beach-cast debris above the high-water mark or at artificial sites, including islands in reservoirs, or on dredge-spoil. Generally roosting occurs on bare exposed sand or shell spits, banks or shores.	**Recorded.** Recorded in local riparian and wetland habitats.	**Considered further in MNES section**
Hylacola cauta	Shy Heathwren	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat requirements** Inhabits mallee woodlands with a relatively dense understorey of shrubs and heath plants. The central NSW population (for example in Cocoparra NP) also occurs at low densities in rocky hilltop vegetation with a thick shrub layer such as Broombush or Tea-tree. Appears to occur in all age classes of vegetation, though believed to prefer either one to five years following fire when the resprouting eucalypts provide dense vegetation cover or in long unburnt (greater than 40 years) areas which have a well-developed shrub layer. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate**. A small number of records within locality of the site, mallee habitats assessed to be of insufficient quality to support this species.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Lathamus discolor	Swift Parrot	E	CE	BAM-C, SEARS	–	–	–	✓	**Habitat requirements** Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there is abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany (*Eucalyptus robusta)*, Spotted Gum (*Corymbia maculata*), Red Bloodwood (*C. gummifera*), Mugga Ironbark (*E. sideroxylon*), and White Box (*E. albens*). Commonly used lerp infested trees include Inland Grey Box (*E. macrocarpa*), Grey Box (*E. moluccana*) and Blackbutt (*E. pilularis*). **Robinvale Plains** Predicted habitat occurs within PCT 11	**Moderate.** No records locally, but associated habitats, including River Red Gum riparian communities, recorded.	**Considered further as both a predicted ecosystem credit and candidate species credit.** Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Leipoa ocellata	Malleefowl	E	V, M	BAM-C, Bionet, PMST, SEARS	✓	–	–	–	**Habitat requirements** The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary and is part of a larger population north of the Murray River in South Australia. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 – 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy and dense and diverse shrub and herb layers. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate.** Associated Mallee communities recorded.	**Predicted ecosystem credit species** South Olary Plain **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Lichenostomus cratitius	Purple-gaped Honeyeater	V	-	BAM-C, Bionet	✓	–	–	✓	**Habitat requirements** Occurs in disjunct populations across southern Australia east from southern Western Australia, with the eastern population largely occurring south of the Murray River. NSW forms the extreme north-east of its range, with occasional sightings in the far south west. Inhabits mallee heathlands and less commonly in associated mallee with a more open understorey (such as Spinifex associations). Is also occasionally recorded in River Red Gums bordering waterways. Generally thought to be sedentary, moving only locally in response to flowering. They may gather in large numbers where flowering is prolific. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Moderate.** A record in mallee habitat in South Australian associated habitats, Mallee, and River Red Gum Woodland communities, recorded.	**Predicted ecosystem credit species** South Olary Plain Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Limicola falcinellus	Broad-billed Sandpiper	V	M	Bionet	–	–	–	–	**Habitat requirements** The eastern form of this species breeds in northern Siberia before migrating southwards in winter to Australia. In Australia, Broad-billed Sandpipers overwinter on the northern coast, particularly in the north-west, with birds located occasionally on the southern coast. In NSW, the main site for the species is the Hunter River estuary, with birds occasionally reaching the Shoalhaven estuary. There are few records for inland NSW. Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches. Candidate species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Limosa lapponica	Bar-tailed Godwit	-	M	Bionet, PMST, SEARS	–	–	–	–	**Habitat requirements** Recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria, including the offshore islands. Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, salt-lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks and airstrips, although it is commonly recorded in paddocks at some locations overseas.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Limosa lapponica baueri	Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit	-	V, M	PMST	–	–	–	–	**Habitat requirements** The Bar-tailed Godwit (both subspecies combined) has been recorded in the coastal areas of all Australian states. The migratory Bar-tailed Godwit (western Alaskan) does not breed in Australia. Occurs mainly in coastal habitats in coastal habitats which include large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It also has been recorded in coastal sewage farms and saltworks, salt-lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms and coral reef-flats.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Limosa lapponica menzbieri	Northern Siberian Bar-tailed Godwit, Bar-tailed Godwit (menzbieri)	-	CE, M	PMST	–	–	–	–	**Habitat requirements** The Bar-tailed Godwit (both subspecies combined) has been recorded in the coastal areas of all Australian states. The migratory Bar-tailed Godwit (western Alaskan) does not breed in Australia. Occurs mainly in coastal habitats in coastal habitats which include large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It also has been recorded in coastal sewage farms and saltworks, salt-lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms and coral reef-flats.	**Low.** Not likely to occur in the proposal study area. Records restricted to the Northwest of Australia.	Not considered further.
Limosa limosa	Black-tailed Godwit	V	M	Bionet, PMST	–	–	–	–	**Habitat requirements** The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. Primarily a coastal species and usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further under BC Act. **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
									Candidate species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present.		
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** In NSW it is found regularly as far east as about Bourke and Griffith, and sporadically further east than that. Inhabits a wide range of treed and treeless inland habitats, always within easy reach of water. Feeds mostly on the ground, especially on the seeds of native and exotic melons and on the seeds of species of saltbush, wattles and cypress pines. Nesting, in tree hollows, occurs throughout the second half of the year; nests are at least 1 km apart, with no more than one pair every 30 square kilometres. Breeding habitat occurs in the form of living or dead tree with hollows greater than 10cm diameter. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58, 166 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 154, 166 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 19 Detailed targeted surveys are required to be undertaken during breeding season from Aug to November, foraging may be present all year.	**Recorded.** Associated habitat including Saltbush, Arid Shrubland and Cypress Pine communities recorded.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Lophoictinia isura	Square-tailed Kite	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 221, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Recorded.** Associated habitats recorded.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
									Targeted surveys to be undertaken during September to January for breeding activity. Breeding habitat normally occurs as live large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy.		
Manorina melanotis	Black-eared Miner	CE	EM	BAM-C, Bionet, PMST, SEARS	✓	–	–	–	**Habitat requirements** In NSW, it is restricted to old growth mallee in the Scotia region. Prior to European settlement, the species may have been present in suitable mallee habitat throughout south-west NSW. Birds are restricted to large tracts (30,000 ha or greater) of mature, unregimented mallee on the more fertile soils. Occupies vegetation with a post fire age of greater than 25 years but is most abundant in areas with a post fire age of 50 years or more. Their diet consists of arthropods (including grasshoppers, bugs, lerps, beetles, weevils, flies, caterpillars, bees, wasps, ants, and spiders) obtained by gleaning and probing loose and hanging bark of mallee trunks. The diet also includes nectar, pollen, plant material, seeds and fruit. They breed communally and use a cup-shaped nest constructed from grasses and sticks within mallee eucalypts located in a fork or mistletoe clump. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172 Targeted surveys to be undertaken during August to January.	**Moderate.** Associated habitat recorded within the proposal study area.	**Candidate Species** South Olary Plain **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Melanodryas cucullata cucullata	Hooded Robin (South-Eastern)	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** The south-eastern form (subspecies *cucullata*) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 170, 171, 172, 221, 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 139 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 19	**Recorded.** Associated habitats including Mallee and Arid Shrublands recorded within the proposal study area.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	BAM-C, Bionet	–	–	✓	✓	**Habitat requirements** In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*), White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees. **Pooncarie-Darling** Predicted habitat occurs within PCT 11 **Robinvale Plains** Predicted habitat occurs within PCT 11	**Moderate** Suitable habitat types recorded, although records are sparse regionally, its presence cannot be entirely discounted.	**Predicted ecosystem credit species** Pooncarie Darling Robinvale Plains
Merops ornatus	Rainbow Bee-eater	-	Ma	Bionet, PMST	–	–	–	–	**Habitat requirements** Usually occur in open or lightly timbered areas, often near water. Breed in open areas with friable, often sandy soil, good visibility, convenient perches and often near wetlands. Nests in embankments including creeks, rivers and sand dunes. Insectivorous, most foraging is aerial, in clearings.	**Recorded.** Frequently recorded within locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Motacilla cinerea	Grey Wagtail	-	M	PMST	–	–	–	–	**Habitat requirements** The Grey Wagtail is a scarce but regular visitor to northern Australia, generally arriving in October and departing around March. The species has a strong association with water. In their normal breeding range, Grey Wagtails are found across a variety of wetlands, especially water courses, but also on the banks of lakes and marshes, as well as artificial wetlands such as sewage farms, reservoirs and fishponds. This association with water extends into non-breeding habitats with all confirmed Australian records being associated with water; especially creeks, rivers and waterfalls. On migration they may forage on rocky tidal flats.	**Low.** Migratory species, no records in locality. Rare occurrences during seasonal movements in wetland habitats cannot be discounted.	Not considered further
Motacilla flava	Yellow Wagtail	-	M	PMST	–	–	–	–	**Habitat requirements** This species occurs in a range of habitats including estuarine habitats such as sand dunes, mangrove forests and coastal saltmarshes. This species also occurs in open grassy areas including disturbed sites such as sports grounds and has been recorded on the edges of wetlands, swamps, lakes and farm dams. This species migrates from Asia to Australia in spring-summer. It has been recorded in the estuarine areas of the Hunter River in Newcastle NSW and in QLD and the north of NT and WA.	**Low.** Migratory species, no records in locality. Rare occurrences during seasonal movements in wetland habitats cannot be discounted.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Myiagra cyanoleuca	Satin Flycatcher	-	M	PMST	–	–	–	–	**Habitat requirements** In NSW, they are widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Mainly recorded in eucalypt forests, often near wetlands or watercourses. Also occur in moister, taller forests, often occurring in gullies. In addition, can occur in eucalypt woodlands with open understorey and grass ground cover, and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1400 m above sea level, and in the ACT, they occur mainly between 800 m above sea level and the tree line.	**Low.** No preferred habitat associated with proposal study area.	Not considered further
Neophema splendida	Scarlet-chested Parrot	V	-	BAM-C	✓	–	–	–	**Habitat requirements** Rarely recorded in NSW, with historical records from Menindee Lakes (1849), the 'Darling River' (1863), Bourke (1892) and near Broken Hill (1952). More recently, this species has been recorded occasionally in Danggali Conservation Park (SA) and in the adjoining Scotia Mallee (Tarawi NR, Scotia Sanctuary) in NSW. Inhabits semi-arid areas with mallee and mulga scrublands/open woodlands with spinifex and saltbush ground covers. Occurs in both recently burnt and older growth mallee. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate.** Associated habitat recorded within the proposal study area. Records in adjacent areas of South Australia, and rare occurrences cannot be entirely discounted.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Ninox connivens	Barking Owl	V	-	BAM-C	✓	✓	✓	✓	**Habitat requirements** Found throughout continental Australia except for the central arid regions. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile riparian soils. Preferentially hunts small arboreal mammals such as Squirrel Gliders and Common Ringtail Possums, but when loss of tree hollows decreases these prey populations the owl becomes more reliant on birds, invertebrates and terrestrial mammals such as rodents and rabbits. Requires very large permanent territories in most habitats due to sparse prey densities. Monogamous pairs hunt over as much as 6000 hectares, with 2000 hectares being more typical in NSW habitats. **South Olary Plain** Predicted habitat occurs within PCT 15 **Great Darling Anabranch** Predicted habitat occurs within PCT 15 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13	**Moderate.** Associated foraging habitat recorded within the proposal study area.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
									Targeted surveys to be undertaken during May to December to identify breeding habitat. Breeding can be identified by suitable habitat AND 1. Presence of male and female OR 2. Calling to each other (duetting) OR 3. Find nest OR 4. Existing breeding habitat identified. Uses paddock trees to extend foraging area from intact woodland.		
Numenius madagascariensis	Eastern Curlew	-	CE, M	PMST	–	–	–	–	**Habitat requirements** Inhabits coastal estuaries, mangroves, mud flats and sand pits. It is a migratory shorebird which generally inhabits sea and lake shore mud flats, deltas and similar areas, where it forages for crabs and other crustaceans, clam worms and other annelids, molluscs, insects and other invertebrates. Its migration route ranges from its wintering grounds in Australia to its breeding grounds in northern China, Korea and Russia.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Numenius minutus	Little Curlew	-	M	Bionet	–	–	–	–	**Habitat requirements** On passage the species shows a preference for foraging and resting in swampy meadows near lakes and along river valleys. It overwinters on dry inland grassland, bare cultivation, dry mudflats and coastal plains of black soil with scattered shallow pools of freshwater, swamps, lakes or flooded ground. It shows a preference for short grass swards of less than 20 cm tall, and occasionally occurs in dry saltmarshes, coastal swamps, mudflats or sandflats in estuaries, or on the beaches of sheltered coasts.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Oxyura australis	Blue-billed Duck	V	-	BAM-C, Bionet	–	–	–	✓	**Habitat requirements** Endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. **Robinvale Plains** Predicted habitat occurs within PCT 17	**Moderate.** Though limited associated habitat recorded within the proposal study area, species may occur during migration movements and dispersal during the breeding season. Associated habitat includes PCT 17.	**Predicted ecosystem credit species** Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pachycephala inornata	Gilbert's Whistler	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat requirements** Occurs in ranges, plains and foothills in arid and semi-arid timbered habitats. In NSW it occurs mostly in mallee shrubland, but also in box-ironbark woodlands, Cypress Pine and Belah woodlands and River Red Gum forests. Within the mallee the species is often found in association with an understorey of spinifex and low shrubs including acacia, hakea, senna and grevillea. In woodland habitats, the understorey comprises dense patches of shrubs. **South Olary Plain** Predicted habitat occurs within PCT 19, 21, 58, 170, 171, 172 **Great Darling Anabranch** Predicted habitat occurs within PCT 19, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 21 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19	**Moderate.** Known to occur within locality.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pachycephala rufogularis	Red-lored Whistler	CE	V	BAM-C, Bionet, PMST, SEARS	✓	–	–	–	**Habitat requirements** Found in mallee woodland with a shrub layer, usually of Broombush and native pine such as Mallee Pine (*Callitris verrucosa*), with occasional patches of spinifex and emergent mallee, forming a relatively dispersed canopy. Occupies vegetation with a post fire age of 4-40 years but is most abundant in areas with a post fire age of 21-40 years. Feeds mainly on the ground, eating invertebrates (airborne and ground-dwelling, including caterpillars, weevils, grasshoppers, beetles, larvae), and some berries and seeds. A substantial cup nest is constructed by these birds, mainly of coarse bark and mallee leaves, neatly woven around the rim, located within low shrubs (e.g. Broombush). **South Olary Plain** Predicted habitat occurs within PCT 171, 172 Targeted surveys can be undertaken at any time of year.	**Moderate**. Lack of associated habitat with sufficient quality. Although it is considered unlikely that this species persists in the locality its presence cannot be entirely discounted.	**Candidate Species** South Olary Plain **Considered further in MNES section**
Pandion cristatus (syn. P. haliaetus)	Eastern Osprey	V	M	PMST	–	–	–	–	**Habitat requirements** Found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	**Low.** Lack of suitable associated habitat.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pedionomus torquatus	Plains-wanderer	E	V	Bionet, PMST, SEARS	–	–	–	–	**Habitat requirements** The vast majority (>99%) of records of Plains-wanderers in NSW over the past 30 years come from an area of the western Riverina bounded by Hay and Narrandera on the Murrumbidgee River in the north, the Cobb Highway in the west, the Billabong Creek in the south, and Urana in the east. Even within its western Riverina stronghold, the Plains-wanderer has a very patchy distribution. It is effectively extinct in eastern NSW, south-western Victoria, and south-eastern South Australia. Its current stronghold is the western Riverina of southern NSW. Plains-wanderers live in semi-arid, lowland native grasslands that typically occur on hard red-brown soils. Habitat structure appears to play a more important role than plant species composition. Preferred habitat of the Plains-wanderer typically comprises 50% bare ground, 10% fallen litter, and 40% herbs, forbs and grasses. Most of the grassland habitat of the Plains-wanderer is <5 cm high, but some vegetation up to a maximum of 30 cm is important for concealment, as long as grass tussocks are spaced 10–20 cm apart. The species is a dual credit species, with the species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present.	**Low.** Associated vegetation and old occurrences recorded within the area.	Not considered further under BC Act. **Considered further in MNES section as in SEARS**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Petroica phoenicea	Flame Robin	V	-	Bionet	–	–	–	–	**Habitat requirements** In NSW the Flame Robin breeds in upland moist eucalypt forests and woodlands, often on ridges and slopes, in areas of open understorey. It migrates in winter to more open lowland habitats. In winter lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes.	**Low.** Lack of suitable associated habitat.	Not considered further
Pezoporus occidentalis	Night Parrot	EX	E	PMST	–	–	–	–	**Habitat requirements** The distribution of the Night Parrot has not been well documented, but it is known to be restricted to arid and semi-arid Australia. Is known to occur within Spinifex grasslands in stony or sandy areas and samphire and chenopod associations on floodplains, salt lakes and clay pans. Suitable habitat is characterized by the presence of large and dense clumps of Spinifex, and it may prefer mature spinifex that is long and unburnt. The Night Parrot is a nocturnal bird that forages on the ground, becoming active during dusk and, generally flies to water to drink prior to foraging. During the day it rests within clumps of spinifex. Appears to be highly nomadic, moving in response to availability of food and water. After periods of heavy rain with abundant seeding of spinifex, the species was often locally common.	**Low.** Not previously recorded within locality. Confirmed records from central western Queensland and central-eastern Western Australia.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Plegadis falcinellus	Glossy Ibis	-	M	Bionet	–	–	–	–	**Habitat requirements** It feeds in very shallow water and nests in freshwater or brackish wetlands with tall dense stands of emergent vegetation (e.g. reeds or rushes) and low trees or bushes. It shows a preference for marshes at the edges of lakes and rivers, as well as lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and irrigated cultivation. It less often occurs in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons. Roosting sites are often large trees that may be far from water. The nest is a platform of twigs and vegetation usually positioned less than 1 m above water in tall dense stands of emergent vegetation (e.g. reeds or rushes), low trees or bushes over water.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Pluvialis fulva	Pacific Golden Plover	-	M	Bionet	–	–	–	–	**Habitat requirements** Prefers sandy, muddy or rocky shores, estuaries and lagoons, reefs, saltmarsh, and or short grass in paddocks and crops. The species is usually coastal, including offshore islands; rarely far inland. Often observed on beaches and mudflats, sandflats and occasionally rock shelves, or where these substrates intermingle; harbours, estuaries and lagoons.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	E	V	Bionet, BAM-C, PMST, SEARS	✓	✓	✓	✓	**Habitat requirements** In NSW it occurs along the Murray River downstream of Tooleybuc (though there are few records between Mildura and the South Australian border), the Wakool River downstream of Kyalite, and the Murrumbidgee River immediately upstream from the junction with the Murray River and adjoining areas of mallee. There are scattered records along the Darling River as far north as Menindee, but at this stage the species has not been confirmed to breed along this river. The species nests within River Red Gum forests along the Murray, Wakool and lower Murrumbidgee Rivers, and possibly the Darling River downstream of Pooncarie. Typical nest trees are large, mature healthy trees with many spouts (though dead trees are used) and are usually located close to a watercourse. Principal foraging habitat is mallee woodlands, though foraging also occurs in riverine forests and woodlands. Mallee woodland within 20 kilometres of nesting sites is critical foraging habitat for breeding birds. **South Olary Plain** Predicted habitat occurs within PCT 15, 58, 170, 171 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15	**Recorded**. Frequently recorded within locality. Associated habitat recorded.	**Considered further as both a predicted ecosystem credit and candidate species credit.** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
									Robinvale Plains Predicted habitat occurs within PCT 11, 13 Targeted surveys to be undertaken during August to November to identify breeding habitat. Breeding habitat can be identified by the presence of habitat features and observed nest OR two or more birds seen on site. Paddock trees can be important for this species as they can link remnant foraging habitat		
Pomatostomus temporalis temporalis	Grey-Crowned Babbler (eastern subspecies)	V	-	BAM-C	✓	–	–	–	**Habitat requirements** In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands. Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 58, 143	**Low.** Paucity of records locally are likely mistaken identification for Chestnut-crowned Babbler	**Predicted ecosystem credit species** South Olary Plain Not considered further for B2B

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pyrrholaemus brunneus	Redthroat	V	-	BAM-C, Bionet	✓	–	✓	–	**Habitat requirements** In NSW, the species is confined to the far west of the state. These include; east of Tibooburra; west of Sturt NP; Broken Hill and to the north towards Mutawintji NP. The two areas in the south west of NSW are in chenopod shrublands to the north of Penarie, north of Balranald and around the Great Darling Anabranch (particularly around Nearie Lake NR) to the north of Wentworth. Scattered records are known from other locations, such as around Lake Victoria and near Oxley. Recorded mainly in chenopod shrublands including Old Man Saltbush, Black Bluebush and Dillon Bush shrublands. Around Broken Hill it appears to be associated with the denser vegetation, particularly Acacias, found in drainage lines that run from the rocky hills. In other locations it is known from Canegrass and Lignum swamps and depressions, particularly on floodplains. **South Olary Plain** Predicted habitat occurs within PCT 154 **Pooncarie-Darling** Predicted habitat occurs within PCT 154	**Recorded.** Associated habitats including Saltbush and Chenopod communities, recorded.	**Predicted ecosystem credit species** South Olary Plain Pooncarie Darling

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Recurvirostra novaehollandiae	Red-necked Avocet	-	Ma	PMST	–	–	–	–	**Habitat requirements** Found throughout mainland Australia but breeds mainly in the south-western interior. Out of breeding season, it visits most of the rest of Australia, but is only an accidental visitor to Tasmania or the Cape York Peninsula. Frequents estuarine, saline and freshwater wetlands including coastal and interior ephemeral habitats, preferring saline environments. Makes long dispersive movements for breeding purposes to inland salt lakes and inundated claypans.	**Low**. Recorded in Chowilla Regional Reserve. However, the proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Rostratula australis (syn. R. benghalensis)	Australian Painted Snipe (Painted Snipe)	E	E	BAM-C, Bionet, PMST	–	–	–	✓	**Habitat requirements** Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds. **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17	**Moderate.** Associated habitat recorded in the locality. Potential habitat occurs in PCT 11, 13 & 17.	**Predicted ecosystem credit species** Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Stagonopleura guttata	Diamond Firetail	V	-	BAM-C	✓	–	–	✓	**Habitat requirements** Endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (*Eucalyptus pauciflora*) Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities. **South Olary Plain** Predicted habitat occurs within 19, 58, 170 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 19	**Moderate.** Known to occur within locality.	**Predicted ecosystem credit species** South Olary Plain Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Stictonetta naevosa	Freckled Duck	V	-	BAM-C, Bionet	–	–	✓	✓	**Habitat requirements** Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times. Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. **Pooncarie-Darling** Predicted habitat occurs within PCT 11 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17	**Moderate.** Known to occur within locality and likely to intermittently utilise local wetland habitats.	**Predicted ecosystem credit species** Pooncarie Darling Robinvale Plains
Stiltia isabella	Australian Pratincole	-	Ma	PMST	–	–	–	–	**Habitat requirements** Mainly found in the north and eastern inland of Australia. Inhabits open plains; also sparsely wooded plains and tussock grasslands; usually in arid and semi-arid rainfall zones, though also in zones of higher rainfall. Mainly in lowlands, but also higher areas, such as Atherton Tablelands, QLD. Usually nest within 2 km of water.	**Moderate.** Known to occur within locality and may utilise habitats in proposal study area.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Stipiturus mallee	Mallee Emu-wren	-	E	SEARS	–	–	–	–	**Habitat requirements** The mallee emu-wren is found in the mallee country on the South Australian and Victorian border. It occurs in areas of spinifex sometimes with an overstorey of mallee woodland. It prefers dense stands (hummocks) of long unburnt spinifex.	**Low.** Associated habitat within Mallee woodland communities is not of sufficient quality to support this species.	**Considered further in MNES section as in SEARS**
Tringa glareola	Wood Sandpiper	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Found in well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees and often with fallen timber. They also inhabit inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains and occasionally found in stony wetlands. The species forages on mud at the edges of wetlands, either along shores, among open scattered aquatic vegetation, or in clear shallow water.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Tringa nebularia	Common Greenshank	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Occurs in a range of inland and coastal environments. Inland, it occurs in both permanent and temporary wetlands, billabongs, swamps, lakes floodplains, sewage farms, saltworks ponds, flooded irrigated crops. On the coast, it occurs in sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. It generally prefers wet and flooded mud and clay rather than sand.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**
Tringa stagnatilis	Marsh Sandpiper	-	M	Bionet, PMST	–	–	–	–	**Habitat requirements** Occurs in coastal and inland wetlands (salt or fresh water), estuarine and mangrove mudflats, beaches, shallow or swamps, lakes, billabongs, temporary floodwaters, sewage farms and saltworks ponds.	**Low.** The proposal study area does not contain any mapped important areas or PCTs that are known to be used by this species. It may occur intermittently around salt-lakes and wetlands in the locality.	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Fish (6)											
Bidyanus bidyanus	Silver Perch	V*	CE	DPI, PMST	–	✓	✓	✓	**Habitat requirements** The most abundant remaining natural population occurs in the central Murray River downstream of Yarrawonga Weir as well as several of its anabranches and tributaries. The central Murray population is considered secure and self-sustaining. There have also been reports of self-sustaining populations in other rivers, including the MacIntyre and Macquarie Rivers in northern NSW and the Warrego River in Queensland, mostly from recreational anglers. It prefers fast-flowing waters but is also known from rivers, lakes and reservoirs.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped key fish habitats (Strahler 4/5 Order streams).	**Considered further in threatened aquatic species section** **Considered further in MNES section**
Craterocephalus fluviatilis	Murray Hardyhead	CE*	E	PMST	–	✓	✓	✓	**Habitat requirements** Murray hardyhead live along the edges of slow-flowing lowland rivers, as well as in lakes, billabongs and backwaters. They are often found amongst aquatic weeds, in both fresh and quite saline waters. They were once widespread and abundant in the Murray and Murrumbidgee river systems in southern NSW and northern Victoria; however, they have suffered a serious population decline, and now seem to be limited to a few sites, mainly in northern Victoria. Since 2000, only one individual has been collected in extensive surveys in NSW.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped key fish habitats (Strahler 4/5 Order streams).	**Considered further in threatened aquatic species section** **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Galaxias rostratus	Flat-headed Galaxias	CE*	CE	DPI, PMST	–	–	–	✓	**Habitat requirements** This species is endemic to the southern tributaries of the Murray-Darling River System; the Murray, Murrumbidgee and Lachlan Rivers and their tributaries. It has also previously been reported from the upper Macquarie River. mall shoaling fish that grows to 150 mm and 22.5 g, but is seldom over 100 mm. It is often seen mid-water and is found in still and gently flowing waters in small streams, lakes, lagoons, billabongs and backwaters. Its habitats consist of rock or sand bottoms, and aquatic vegetation.	**Low.** Current known distributions do not include habitats within the locality.	Not considered further
Maccullochella peelii	Murray Cod		V	PMST	–	✓	✓	✓	**Habitat requirements** The Murray Cod was historically distributed throughout the Murray-Darling Basin (the Basin), which extends from southern Queensland, through New South Wales (NSW), the Australian Capital Territory (ACT) and Victoria to South Australia, with the exception of the upper reaches of some tributaries. The species still occurs in most parts of this natural distribution, up to approximately 1000 m above sea level. It utilises a diverse range of habitats from clear rocky streams, such as those found in the upper western slopes of NSW (including the ACT), to slow-flowing, turbid lowland rivers and billabongs. 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.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped key fish habitats (Strahler 4/5 Order streams).	**Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Macquaria australasica	Macquarie Perch	E*	E	PMST	–	–	–	–	**Habitat requirements** Macquarie Perch are found in the Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers, and parts of south-eastern coastal NSW, including the Hawkesbury/Nepean and Shoalhaven catchments. Macquarie Perch are found in both river and lake habitats; especially the upper reaches of rivers and their tributaries. It prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks. Spawning occurs just above riffles (shallow running water).	**Low.** Current known distributions do not include habitats within the locality.	Not considered further
Tandanus tandanus	Eel-tailed Catfish	E2*	-	DPI	–	–	–	✓	**Habitat requirements** Eel Tailed Catfish are naturally distributed throughout the Murray-Darling Basin and in the Eastern drainages NSW north of Newcastle. Occupies a wide range of habitats including rivers, creeks, lakes, billabongs and lagoons. It inhabits flowing streams but prefers slow and still waters and can be found in clear or turbid water over substrates including mud, gravel and rock.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped key fish habitats	**Considered further in threatened aquatic species section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Invertebrates (3)											
Euastacus armatus	Murray Crayfish	V*	-	DPI	–	–	–	✓	**Habitat requirements** Murray Crayfish can be found in the Murray River upstream of Mildura, in the Murrumbidgee River and in some dams, and are the only species in the Euastacus genus that live in both cold and warm water habitats. They are opportunistic feeders, feeding on decaying animals and plants. Murray Crayfish become more active during the winter months. Mating activity usually occurs during May, most likely cued to a decline in water temperatures.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped habitats	**Considered further in threatened aquatic species section**
Notopala hanleyi	Hanley's River Snail	CE*	-	DPI	–	–	–	✓	**Habitat requirements** The species once occurred in flowing, well oxygenated waters throughout the Murray River catchment. Artificially introduced hard surfaces now provide habitat for the species with populations being recorded as surviving in irrigation pipelines. The pipeline environment is thought to promote microbial production and organic accumulation, which is a highly nutritious food source for the species. Hanley's River Snail feeds on the bacteria and microflora associated with detritus.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped habitats	**Considered further in threatened aquatic species section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Notopala sublineata	Darling River Snail	CE*	-	DPI	–	✓	✓	-	**Habitat requirements** The Darling River Snail is restricted to the Darling River and its tributaries. Collections and sightings of the species in NSW declined in the 1960s and 1970s and by the 1980s, populations were thought to only occur in a small number of locations. The species once occurred in flowing rivers throughout the Murray-Darling system, along the banks attached to logs and rocks or crawling in the mud. Artificially introduced hard surfaces now provide habitat for the species with populations being recorded as surviving in irrigation pipelines. The pipeline environment is thought to promote microbial production and organic accumulation, which is a highly nutritious food source for the species. The Darling River Snail feeds on the bacteria and microflora associated with detritus.	**Moderate.** The proposal study area traverses Local Government Areas that contain mapped habitats	**Considered further in threatened aquatic species section**
Mammals (24)											
Antechinomys laniger	Kultarr	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** A terrestrial insectivore that inhabits open country, especially claypans among Acacia woodlands. Nocturnal, sheltering by day in hollow logs or tree-stumps, beneath saltbush and spinifex tussocks, in deep cracks in the soil and in the burrows of other animals. **South Olary Plain** Predicted habitat occurs within PCT 21, 58, 143, 154, 170, 171, 221, 252	**Moderate**. Although it is considered unlikely that this species persists in the locality its presence in low numbers cannot be entirely discounted.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Bettongia lesueur graii	Burrowing Bettong	EX	X	Bionet	–	–	–	–	**Habitat Requirements** The subspecies (*Bettongia lesueur lesueur*) has been used to establish a population in feral-free enclosures at the Australian Wildlife Conservancy in Scotia Sanctuary in south western New South Wales. Lived in a range of dry subtropical and tropical habitats, from open Eucalyptus and Acacia woodlands to arid spinifex grasslands. In its current range on the islands, it seems to prefer open spinifex and dune habitats, but will burrow anywhere except places with rocky substrate.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct.	Not considered further
Cercartetus concinnus	Western Pygmy-possum	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** In NSW, has been found in mallee shrubland either dominated by spinifex (*Triodia* spp.) or with an understorey of tea-tree (*Leptospermum* spp.) and also in Belah (*Casuarina pauper*) in a mixed woodland with a well-developed understorey of saltbush. In other states is also frequently found in woodlands with dense heath understorey (particularly Proteaceae species such as Banksia and Hakea species). Shelters during the day in a leaf-lined nest in tree-hollows or in disused birds' nests, leaf clumps on the ground, under stumps or in mallee lignotubers at the base of live trees; shelters also include spinifex hummocks, shrubs, piles of dead branches and bark strips, ground depressions and in the tree canopy. Frequently enters torpor, particularly when temperatures are lower. **South Olary Plain** Predicted habitat occurs within PCT 58, 170, 171, 172, 221	**Moderate.** Numerous records within locality and the proposal study area traverses suitable habitat.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Chaeropus ecaudatus	Pig-footed Bandicoot	EX	X	Bionet	–	–	–	–	**Habitat Requirements** Native to western New South Wales and Victoria, the southern part of the Northern Territory as well as South Australia and Western Australia. It inhabited a wide range of habitat types: from grassy woodland and grassland plains to the spinifex country and arid flats of central Australia. Despite its wide range, the species had a sparse distribution and was never abundant.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct.	Not considered further
Chalinolobus picatus	Little Pied Bat	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat Requirements** Recorded in dry open forest, open woodland, Mulga woodlands, chenopod shrublands, Callitris forest and mallee. The species roosts and breeds in tree hollows, fissures or cracks, buildings, power poles, fenceposts, caves, cliff crevices, mine shafts and tunnels. Roost sites in caves are usually warm and dry but the species can tolerate roost temperatures of more than 40°C. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143, 154, 170, 171, 172, 221, 252, 253 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 216 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 63, 139, 153, 154, 166 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 58, 166	**Recorded.** Recorded in open woodland, River Red Gum Woodland and Mallee/Black Oak woodland.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Dasyurus maculatus maculatus	Spotted-Tailed Quoll (Southern Subspecies)	V	E	Bionet	–	–	–	–	**Habitat Requirements** Found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges up to about 750 hectares and males up to 3500 hectares. Are known to traverse their home ranges along densely vegetated creeklines.	**Low.** Unlikely to occur. No records within the locality.	Not considered further
Lagorchestes leporides	Eastern Hare-wallaby	EX	X	Bionet	–	–	–	–	**Habitat Requirements** This species once inhabited the interior of New South Wales, Victoria and the Murray River region of South Australia. It was common in the level country between the Murray and Darling rivers, as well as the Liverpool Plains. Prefers habitat that consisted of open plains and grasslands.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Lasiorhinus latifrons	Southern Hairy-nosed Wombat	E	-	BAM-C, Bionet	✓	✓	–	–	**Habitat Requirements** Distribution has become fragmented and contracted in the last 200 years. Once regarded as common in south-western NSW but the current size of this population is unknown. Warrens, used by 5 to 10 individuals, are confined to soils with sufficient structural strength. The burrows provide a humid resting place during the day. Forages close to the warren. Diet almost entirely restricted to grasses. Habitat is semi-arid grasslands and open woodlands. **South Olary Plain** Predicted habitat occurs within PCT 58, 153, 154, 170, 171, 172 **Great Darling Anabranch** Predicted habitat occurs within PCT 58	**Moderate**. Although it is considered unlikely that this species persists in the locality its presence in low numbers cannot be entirely discounted.	**Candidate Species** South Olary Plain Great Darling Anabranch
Leporillus conditor	Greater Stick-nest Rat	EX	V	Bionet	–	–	–	–	**Habitat Requirements** Inhabits semi-arid to arid perennial shrublands where there is little or no fresh water, particularly with succulent and semi-succulent plant species. Is presumed to be extinct in NSW.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct in NSW.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Macrotis lagotis	Greater Bilby	EX	V	Bionet	–	–	–	–	**Habitat Requirements** Is presumed extinct in NSW. They now occur in fragmented populations in mulga shrublands and spinifex grasslands in the Tanami Desert of the Northern Territory; in the Gibson and Great Sandy Deserts and the Pilbara and Kimberley regions of Western Australia; and the Mitchell Grasslands of southwest Queensland. Once widespread in arid, semi-arid and relatively fertile areas. The Bilby prefers arid habitats because of the spinifex grass and acacia shrub.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct in NSW.	Not considered further
Myotis macropus	Southern Myotis	V	-	Professional opinion, as a possibility	–	–	–	–	**Habitat Requirements** The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. They generally roost in groups of 10–15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, road culverts, buildings, under bridges and in dense foliage.	**Low.** This species is rarely found more than 100 km inland (except along major rivers) and was not recorded during the surveys.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Myrmecobius fasciatus	Numbat	EX	V	Bionet	–	–	–	–	**Habitat Requirements** Formerly distributed across southern Australia from Western Australia across as far as northwestern New South Wales. However, their range has declined significantly since European settlement, and is presumed extinct in the wild in NSW. In recent years, it has, however, been successfully reintroduced into a few fenced reserves, including some in South Australia (Yookamurra Sanctuary) and New South Wales (Scotia Sanctuary). The remaining populations of the Numbat are found in Eucalypt forests and woodlands dominated by *Eucalyptus marginata*, *Eucalyptus calophylla* and *Eucalyptus wandoo*.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct in NSW.	Not considered further
Ningaui yvonneae	Southern Ningaui	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** In NSW most records are from the far south west, including the Scotia mallee (Tarawi Nature Reserve, Scotia Sanctuary and surrounding properties) and east of the Darling River (Mungo and Mallee Cliffs National Parks and many surrounding properties). An apparently isolated population occurs in central NSW mallee with most records from Nombinnie, Round Hill and western Yathong Nature Reserves and one single record from remnant mallee near Taleeban (south west of West Wyalong). Shelters in spinifex clumps, beneath logs, and in dense vegetation, but may also dig its own burrows. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Recorded.** Recorded between Rufus River Rd and SA border during the surveys.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Notomys mitchelli	Mitchell's Hopping-mouse	EX	-	Bionet	–	–	–	–	**Habitat Requirements** Species inhabits areas of mallee vegetation which lack a significant understorey. Mallee shrubland associations are the typical habitat, especially areas with sandy soils and slight sand dune formations. It has been reported that it is no longer found in the semi-arid region of New South Wales where the species was first identified.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct.	Not considered further
Nyctophilus corbeni (syn. N. timoriensis)	South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)	V	V	BAM-C, Bionet, PMST, SEARS	✓	✓	✓	✓	**Habitat Requirements** Overall, the distribution of the south eastern form coincides approximately with the Murray Darling Basin with the Pilliga Scrub region being the distinct stronghold for this species. Inhabits a variety of vegetation types, including mallee, bulloke (*Allocasuarina leuhmannii*) and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation that occurs in a north-south belt along the western slopes and plains of NSW and southern Queensland. Roosts in tree hollows, crevices, and under loose bark. **South Olary Plain** Predicted habitat occurs within PCT 21, 58, 170, 171, 221 **Robinvale Plains** Predicted habitat occurs within PCT 13 **Pooncarie-Darling** Predicted habitat occurs within PCT 21, 139 **Great Darling Anabranch** Predicted habitat occurs within PCT 58	**Recorded.** Recorded within Mallee woodland including PCT170 - Chenopod sandplain mallee woodland/ shrubland.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains **Considered further in MNES section**

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Onychogalea lunata	Crescent Nailtail Wallaby	EX	X	Bionet	–	–	–	–	**Habitat Requirements** The biology of the Crescent Nailtail Wallaby is poorly known. It occupied woodland and shrublands, especially those dominated by Mulga, and ate grass. During the day, it sheltered below trees and shrubs.	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct.	Not considered further
Phascogale calura	Red-tailed Phascogale	EX	E	Bionet	–	–	–	–	**Habitat Requirements** It was previously found in most arid and semi-arid regions of Australia. Preferred habitats are *Allocasuarina* woodlands with hollow-containing eucalypts. Is now known to occur only in the central and southern wheatbelt areas of Western Australia	**Low.** Considered unlikely that this species persists within the locality. Thought to be extinct in NSW.	Not considered further
Phascolarctos cinereus	Koala	V	V	Bionet, PMST	–	–	–	–	**Habitat Requirements** Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Some preferred species include Forest Red Gum, Grey Gum. In coastal areas, Tallowwood and Swamp Mahogany are important food species, while in inland areas White Box, Bimble Box and River Red Gum are favoured. Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size.	**Low.** Outside known distribution, no records within the area.	Not considered further

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pseudomys bolami	Bolam's Mouse	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** Prefers mallee shrubland where there is a developed understorey of *Acacia*, *Dodonaea* or *Eremophila* sp. and succulent chenopod (bluebush and saltbush) shrubs, hummock grass or spinifex, especially in plains areas, spillways and along valley bottoms where soils are loams or clays. It has been recorded in four broad vegetation types in Tarawi Nature Reserve: Mallee-spinifex, Mallee shrubland, Belah woodland and Mixed open shrubland/woodland. **South Olary Plain** Predicted habitat occurs within PCT 21, 58, 170, 171, 172, 221	**Recorded.** Recorded in Red Cliffs section near Murray River during the survey.	**Predicted ecosystem credit species** South Olary Plain
Pseudomys desertor	Desert Mouse	CE	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** Most records of the Desert Mouse come from sand dune or sand plain habitats dominated by Spinifex (*Triodia* spp.). Depends on a dense groundcover of grasses, sedges or shrubs; survives in small pockets of habitat and expands into other areas following rains and subsequent vegetation growth. Has been found in open eucalypt woodlands, riparian habitats, acacia, samphire and nitre bush shrublands, and sedge, spinifex and cane-grass habitats, on alluvial plains, sandplains, dunes, stony hills, scree slopes, and wetlands. **South Olary Plain** Predicted habitat occurs within PCT 171, 172	**Moderate**. Although it is considered unlikely that this species persists in the locality its presence in low numbers cannot be entirely discounted.	**Candidate Species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Pseudomys hermannsburgensis	Sandy Inland Mouse	V	-	BAM-C	✓	–	–	–	**Habitat Requirements** Occurs in a very wide range of open vegetation types including coolibah or Acacia woodlands, tall open shrublands (especially Mulga scrub) and hummock grasslands. Mostly on sands (plains and dunes) and sandy loams, but also in areas of cracking earth soils and gibber plains. **South Olary Plain** Predicted habitat occurs within PCT 58, 143, 154, 171	**Moderate**. Although it is considered unlikely that this species persists in the locality its presence in low numbers cannot be entirely discounted.	**Predicted ecosystem credit species** South Olary Plain
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	BAM-C, Bionet	✓	✓	✓	✓	**Habitat Requirements** Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. **South Olary Plain** Predicted habitat occurs within PCT 15, 19, 21, 58, 143, 170 **Robinvale Plains** Predicted habitat occurs within PCT 11, 13, 17, 19 **Pooncarie-Darling** Predicted habitat occurs within PCT 11, 15, 21, 139 **Great Darling Anabranch** Predicted habitat occurs within PCT 15, 19, 58	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Sminthopsis macroura	Stripe-faced Dunnart	V	-	BAM-C	✓	–	–	–	**Habitat Requirements** Occurs in native dry grasslands and low dry shrublands, often along drainage lines where food and shelter resources tend to be better. They shelter in cracks in the soil, in grass tussocks or under rocks and logs. Prefers relatively ungrazed habitats with greater diversity and healthier understorey vegetation. **South Olary Plain** Predicted habitat occurs within PCT 58, 143, 154, 171, 172, 221	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain
Vespadelus baverstocki	Inland Forest Bat	V	-	BAM-C, Bionet	✓	–	✓	✓	**Habitat Requirements** Roosts in tree hollows and abandoned buildings. Known to roost in very small hollows in stunted trees only a few metres high. Recorded from a variety of woodland formations, including Mallee, Mulga and River Red Gum. Most records are from drier woodland habitats with riparian areas. However, other habitats may be used for foraging and/or drinking. **South Olary Plain** Predicted habitat occurs within PCT 15, 21, 58, 143, 170, 171, 172, 221 **Robinvale Plains** Predicted habitat occurs within PCT 13 **Pooncarie-Darling** Predicted habitat occurs within PCT 15, 21	**Recorded.** Recorded during the surveys.	**Predicted ecosystem credit species** South Olary Plain Pooncarie Darling Robinvale Plains

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Reptiles (12)											
Aprasia inaurita	Mallee Worm Lizard	E	-	BAM-C	✓	–	–	–	**Habitat Requirements** Inhabits semi-arid, mallee woodlands on red sands. Often shelters in sand, beneath mallee stumps, in leaf litter or in the nests of ants and other insects; thought to be dependent on Spinifex (*Triodia scariosa*). **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain
Aprasia parapulchella	Pink-tailed Worm Lizard (syn. Pink-tailed Legless Lizard)	V	V	Bionet, PMST	–	–	–	–	**Habitat Requirements** Occurs in open grassland habitats that have a substantial cover of small rocks. Lizards also show a preference for sunny aspects, avoiding S facing slopes. Some specimens have been collected from grassland sites that appear not to support any native grasses and several animals have been found on the edge of *Callitris endlicheri* woodland and *Eucalyptus macrorhyncha* woodland. A burrowing species, it is usually found under rocks on well-drained soil and in ant nests, occasionally with several individuals found under the same rock.	**Low.** Outside the known distribution for this species.	Not considered further
Ctenotus brooksi	Wedgesnout Ctenotus	V	-	BAM-C	✓	–	–	–	**Habitat Requirements** Occurs in arid and semi-arid habitats and may be highly specialised, as it has only been recorded from large unconsolidated sand dunes and not from the low consolidated red sand ridges. Prefers areas of loose sand interspersed with vegetation on and near the crests of dunes and in NSW it is probably restricted to habitats containing spinifex or other clumping grassland communities. **South Olary Plain** Predicted habitat occurs within PCT 143, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Cyclodomorphus melanops elongatus	Mallee Slender Blue-tongue Lizard	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** In NSW, animals inhabit mallee/spinifex communities on a sandy or mixed sand/gravel substrate (plains, ridges or hillslopes). It is assumed that the species seeks refuge in vegetation clumps such as spinifex and in fallen timber and leaf litter. **South Olary Plain** Predicted habitat occurs within PCT 171, 172	**Recorded.** Recorded west of Great Darling Anabranch.	**Predicted ecosystem credit species** South Olary Plain
Delma australis	Marble-faced Delma	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** Typically found in temperate mallee woodlands or spinifex grasslands but also in chenopod shrublands, heathlands and buloke associated with mallee habitats or from eucalypt lined watercourses. The species occupies areas with a sandy substrate but may also utilise cracking red loam soils. Found in deep leaf litter, under rocks, logs, fallen timber or in grass clumps such as spinifex. They are considered to be terrestrial although they may climb into hummock grass and even sleep in the branches of small shrubs. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Echiopsis curta	Bardick	E	-	BAM-C	✓	–	–	–	**Habitat requirements** Known only in the Balranald and Mildura areas of NSW. Inhabits hummock grasslands and mallee areas on sandy or loamy soils and is usually associated with run-off slopes and drainage from local rises. The species is particularly common in areas of *Triodia* (spinifex). A terrestrial and partly nocturnal species which shelters under fallen timber and rocks, in leaf litter and dense, matted vegetation and in spinifex hummocks and sometimes basks near clumps of spinifex. **South Olary Plain** Predicted habitat occurs within PCT 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain
Lerista xanthura	Yellow-tailed plain slider	V	-	BAM-C	✓	✓	✓	–	**Habitat requirements** Occurs in a variety of semi-arid and arid habitats. Occurs on grassed alluvial sands and sand dunes, including dry open woodlands and spinifex-dominated red sand plains. The species is fossorial and usually found in loose soil or sand beneath stones, logs and other surface debris. **South Olary Plain** Predicted habitat occurs within PCT 58, 143, 170, 171, 221 & 252 **Great Darling Anabranch** Predicted habitat occurs within PCT 58 **Pooncarie Darling** Predicted habitat occurs within PCT 139	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain Great Darling Anabranch Pooncarie Darling

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Lucasium stenodactylum	Crowned Gecko	V	-	BAM-C	✓	–	–	–	**Habitat requirements** Habitat preferences largely unknown. In NSW, the species has been reported from red sand habitats and elsewhere from savannah woodland and stony areas with shrubs. **South Olary Plain** Predicted foraging and breeding habitat occurs within PCT 170, 143, 153, 154, 221. Detailed targeted surveys are required to be undertaken between October to March.	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Candidate Species** South Olary Plain
Pseudonaja modesta	Ringed Brown Snake	E	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** A terrestrial species that inhabits drier areas including rocky outcrops and dry watercourses. Occurs in a variety of vegetation types including woodlands, shrublands, mallee and grasslands. By night it shelters in ground debris or abandoned animal burrows. **South Olary Plain** Predicted habitat occurs within PCT 58, 143, 170, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain
Ramphotyphlops endoterus	Interior Blind Snake	E	-	BAM-C	✓	–	–	–	**Habitat Requirements** Nocturnal in activity and feeds principally on ants and termites. Shelters in the ground, termite nests or under rocks and logs. Found in red sandy soils in spinifex, Mitchell grassland or shrubland. **South Olary Plain** Predicted habitat occurs within PCT 143, 154	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped	**Predicted ecosystem credit species** South Olary Plain

SCIENTIFIC NAME	COMMON NAME	BC ACT[1]	EPBC ACT[2]	SOURCE[3]	IBRA SUBREGIONS				HABITAT REQUIREMENTS / SUITABILITY	LIKELIHOOD OF OCCURRENCE	OUTCOME
					SOP	GDA	PD	RP			
Strophurus elderi	Jewelled Gecko	V	-	Bionet, BAM-C	✓	–	–	–	**Habitat Requirements** Restricted to habitats containing spinifex on red sandy plains or dunes and to a lesser extent stony hills. Spinifex may occur as a dominant groundcover with little to no overstorey vegetation or in association with mallee, cypress pine or acacia woodlands. Animals are nocturnal, foraging at night within or on the exterior portion of a clump of spinifex. They are also observed in the matrix between spinifex clumps, especially during stormy conditions, presumably seeking new refuge. **South Olary Plain** Predicted habitat occurs within PCT 170, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain
Tiliqua occipitalis	Western Blue-tongued Lizard	V	-	BAM-C, Bionet	✓	–	–	–	**Habitat Requirements** Scattered records across central western and western NSW. Inhabits plains, swales, ranges and sometimes dunes of loamy or clayey/sandy soils vegetated by woodlands, especially mallee, shrublands (including chenopods), heaths or hummock grasslands. Preferred vegetation type appears to be mixed mallee/*Triodia* communities. Diurnally forages for insects, snails, native vegetation and carrion. **South Olary Plain** Predicted habitat occurs within PCT 21, 154, 170, 171, 172	**Moderate.** The proposal study area occurs in habitats where this species known distribution is mapped.	**Predicted ecosystem credit species** South Olary Plain

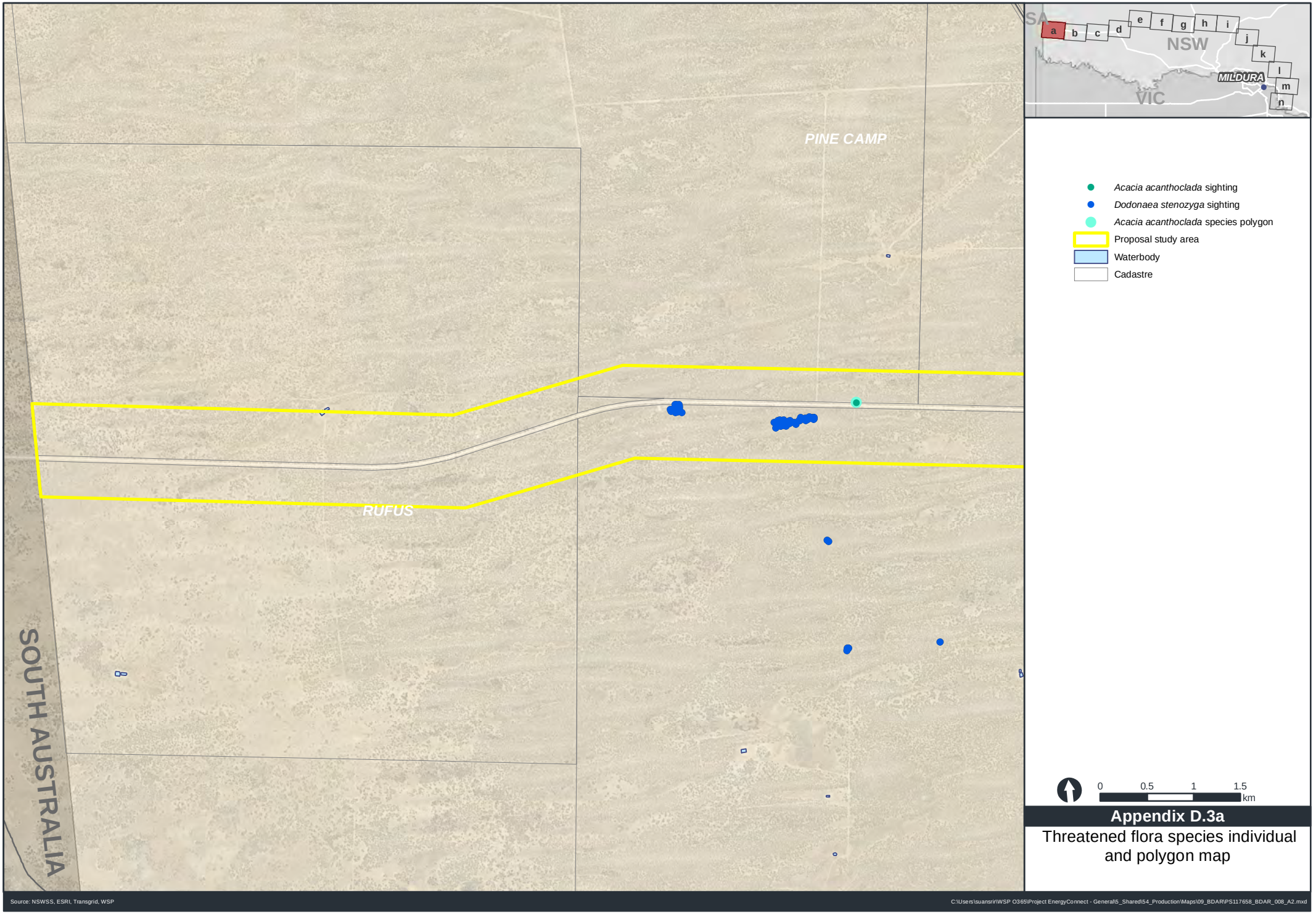
**Note – listed under the Fisheries Management Act 1994 (FM Act)*

(1) V = Vulnerable, E = Endangered, CE = Critically Endangered, EX = Presumed Extinct under the BC Act

(2) V = Vulnerable, E = Endangered, M = Migratory, Ma = Marine under the Commonwealth EPBC Act, X = Extinct.

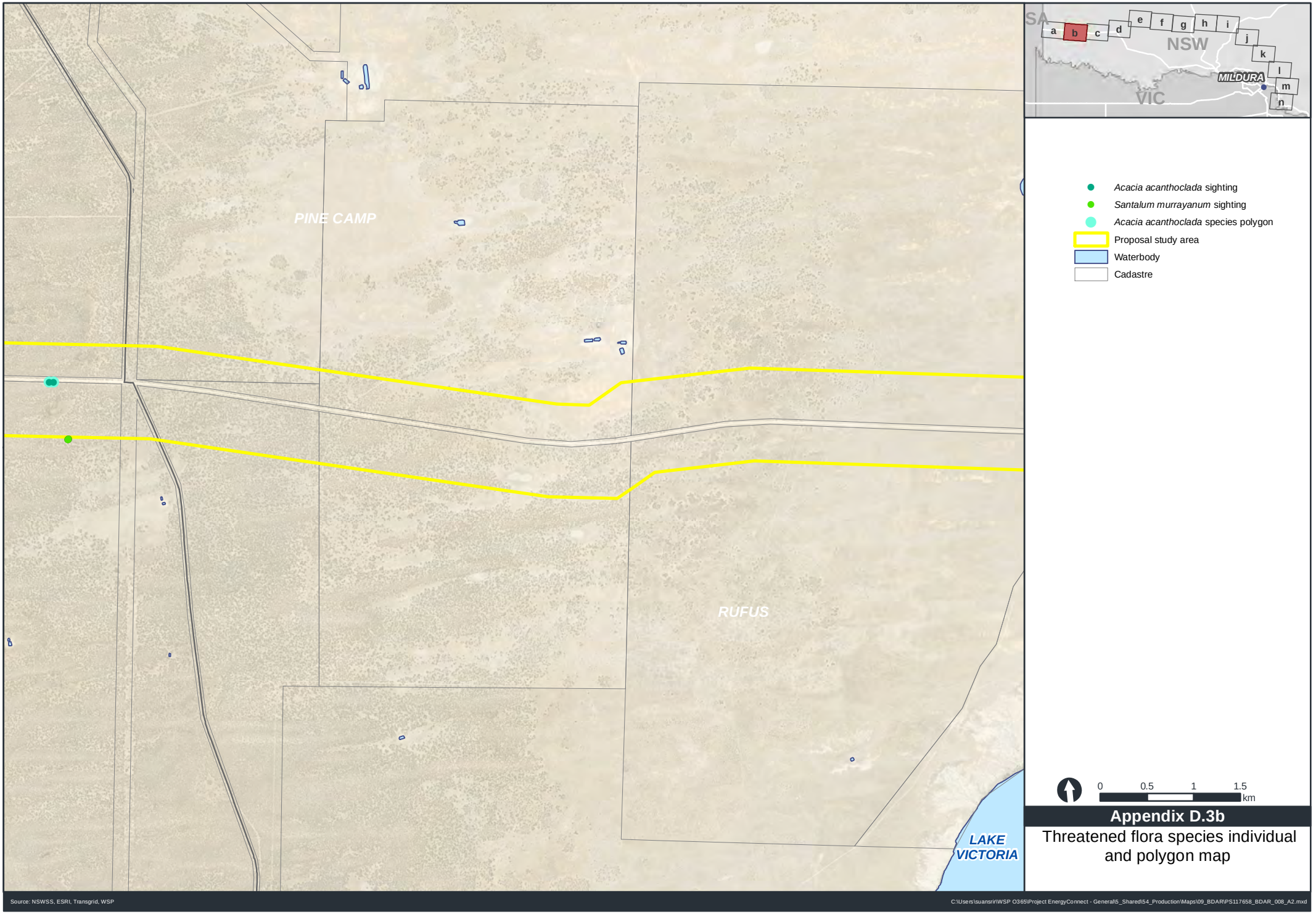
(3) Source; Professional opinion = ESS expert advice of predicted threatened species areas provided as spatial data, PMST = The Department of the Environment and Energy's EPBC Protected Matters Search Tool, BioNet = ESS's Bionet Atlas of NSW Wildlife, BAM-C = BAM calculator predictor

APPENDIX D-3
THREATENED FLORA SPECIES INDIVIDUAL AND POLYGON MAPS



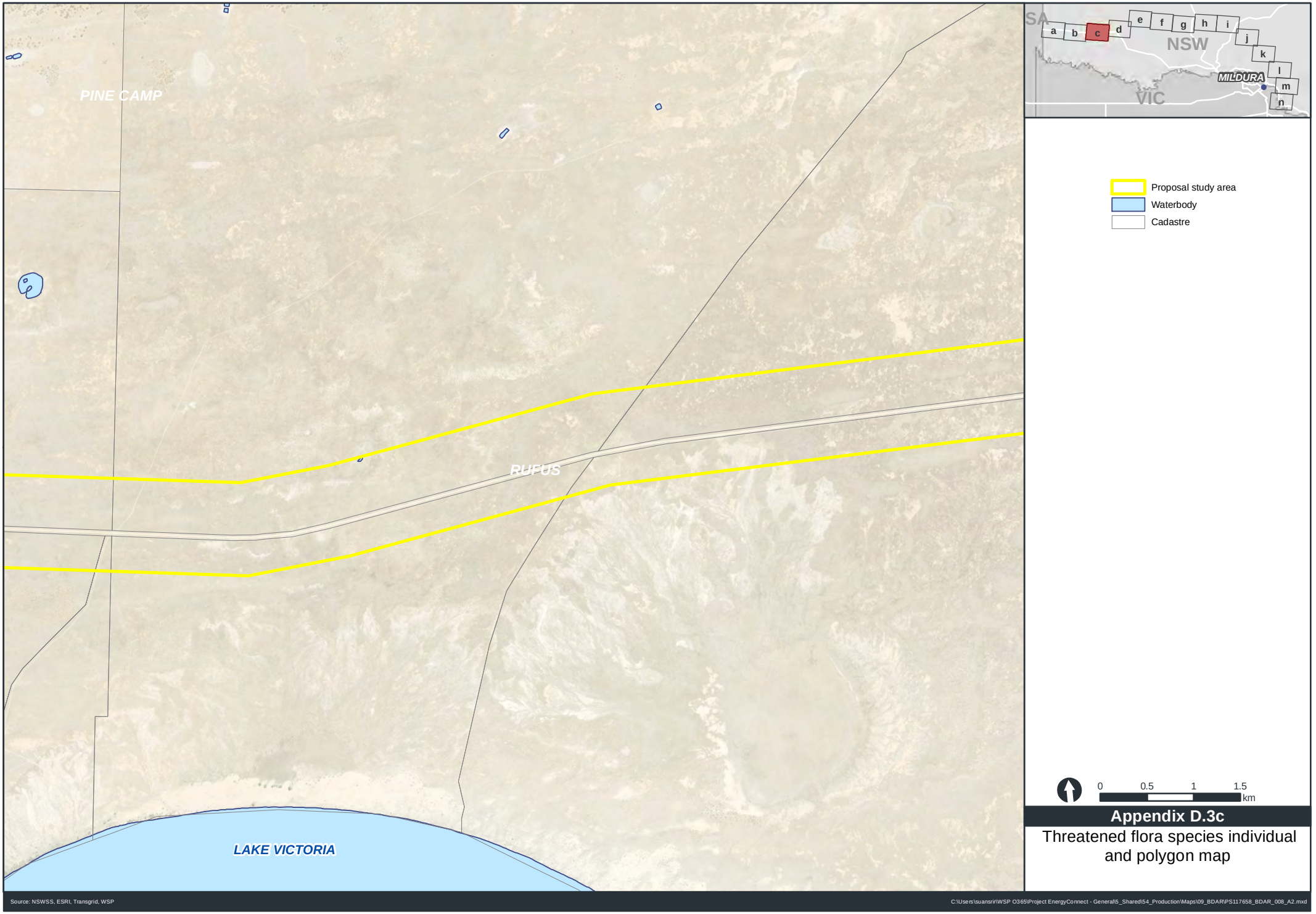
Appendix D.3a

Threatened flora species individual and polygon map



Appendix D.3b

Threatened flora species individual and polygon map



Appendix D.3c

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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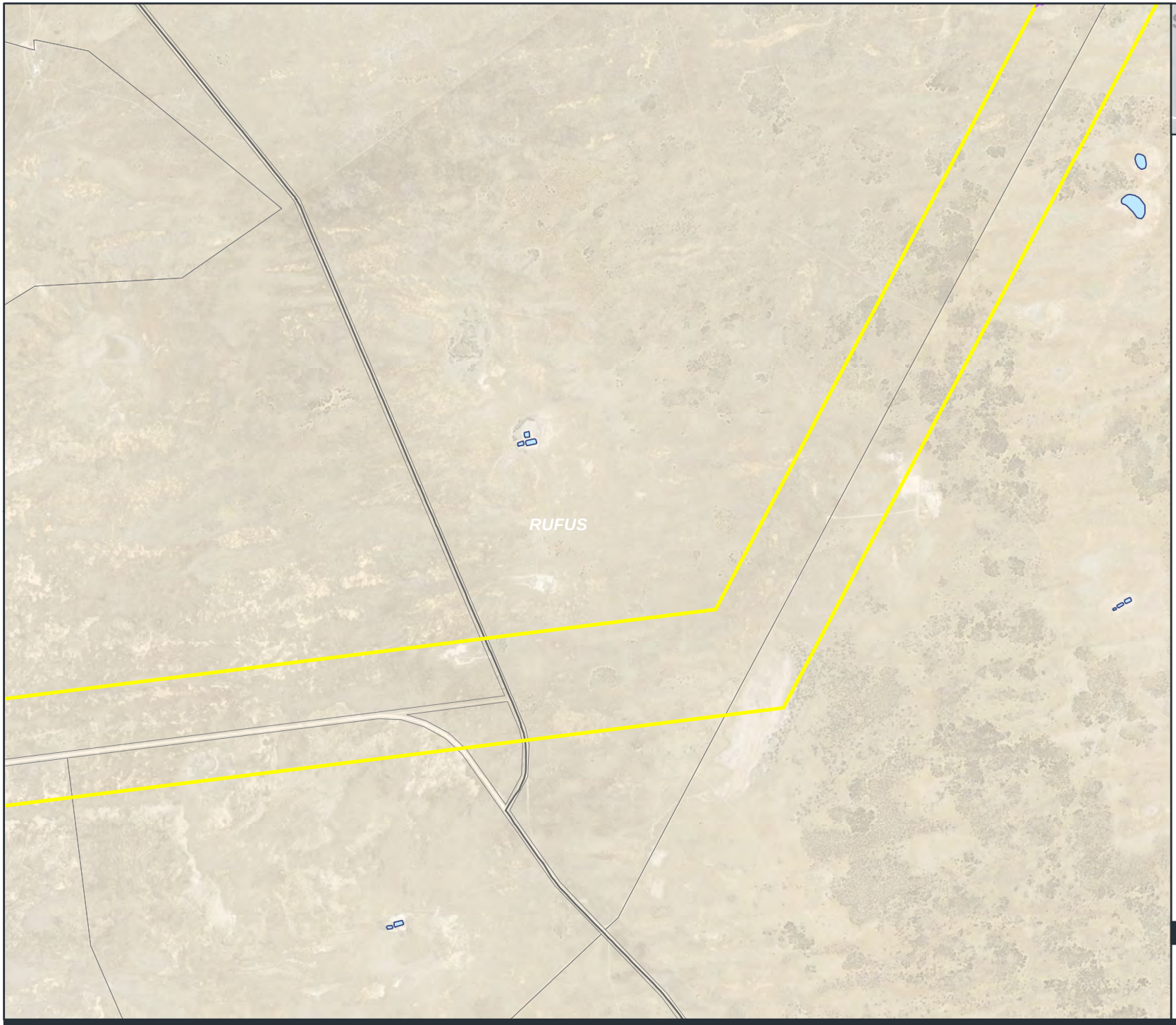
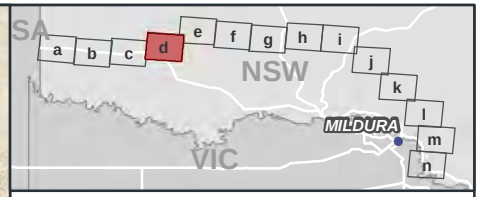




Proposal study area
Waterbody
Cadastre

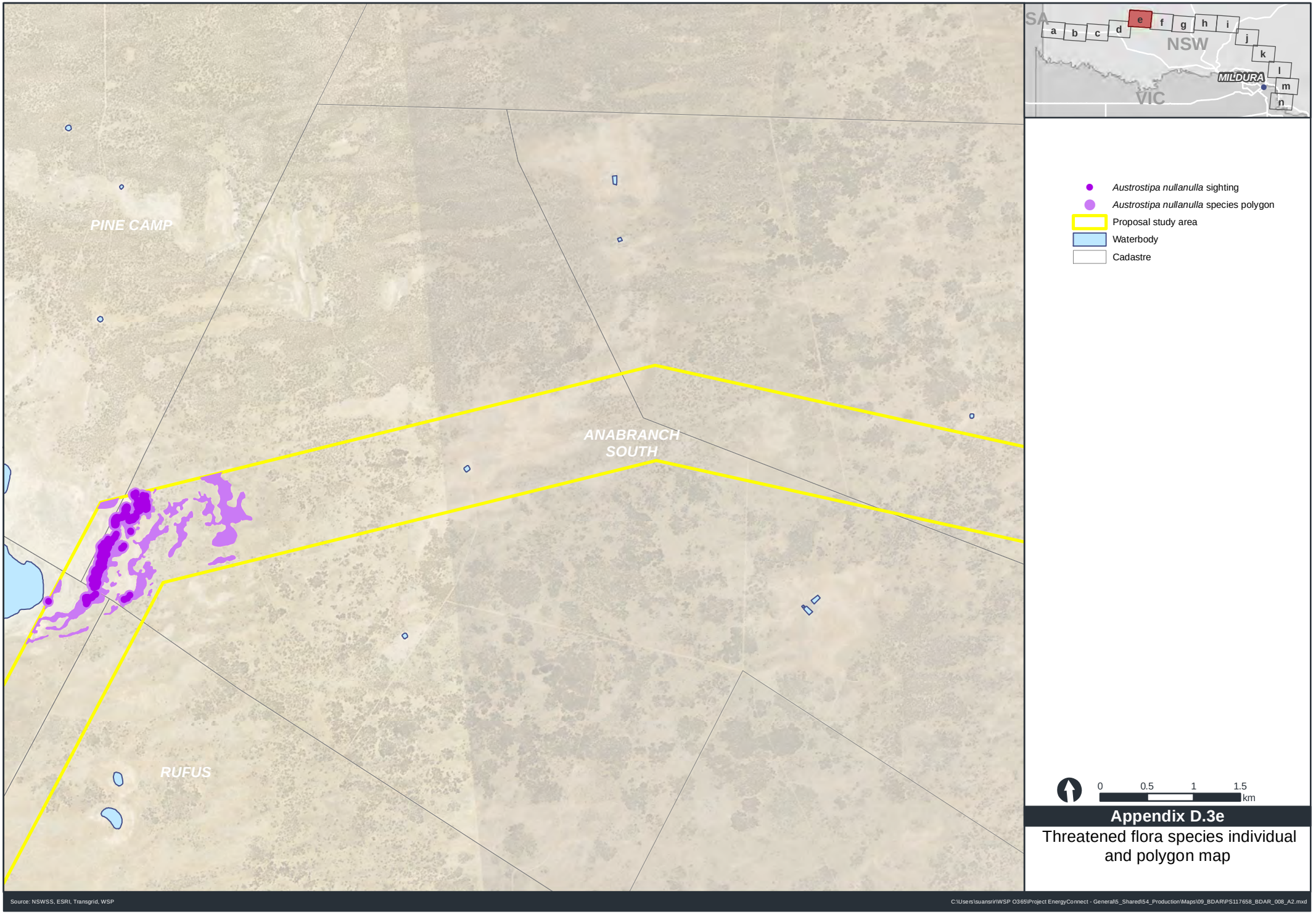
0 0.5 1 1.5
km

Appendix D.3d

Threatened flora species individual and polygon map

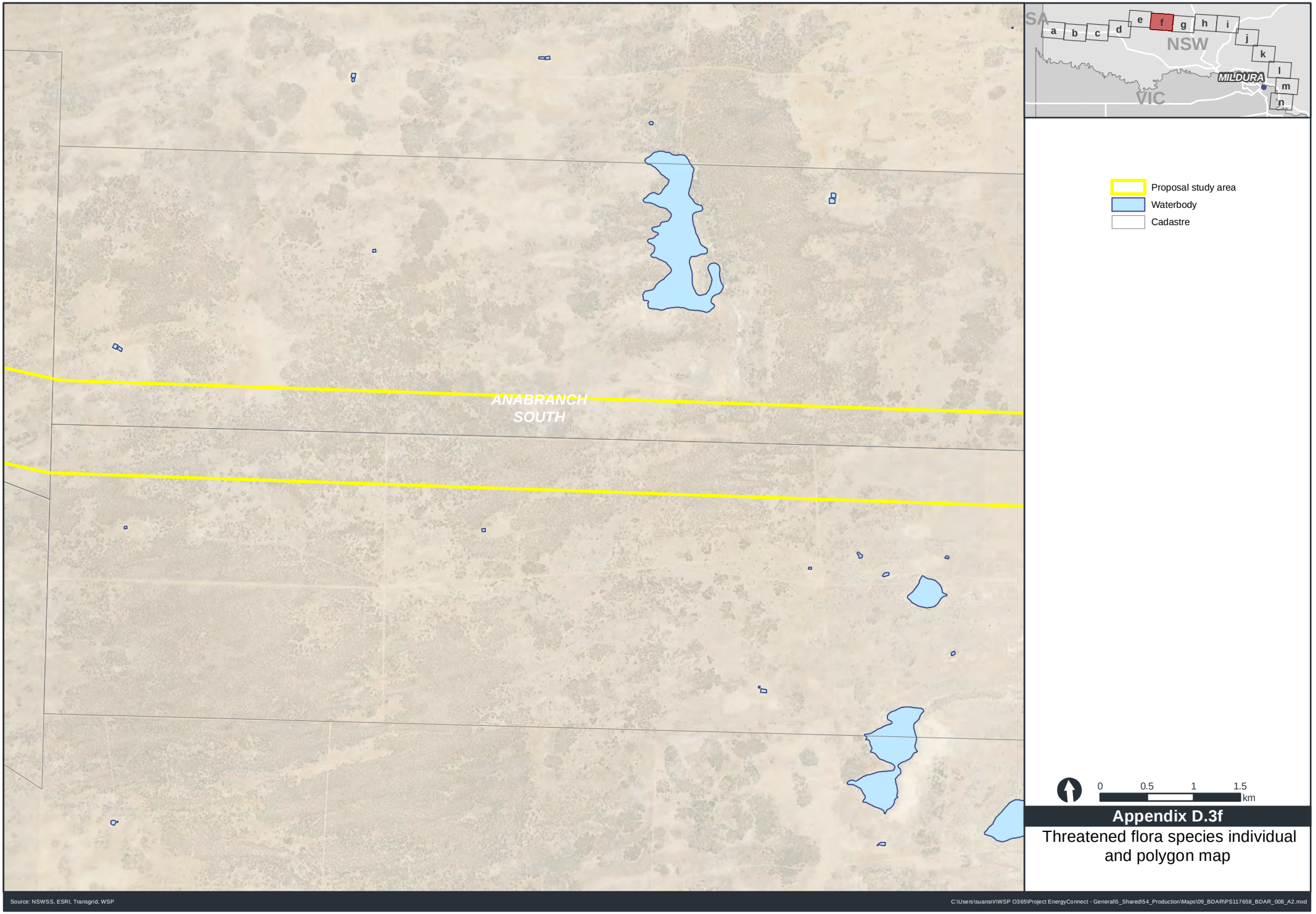
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A2.mxd



Appendix D.3e

Threatened flora species individual and polygon map



Appendix D.3f

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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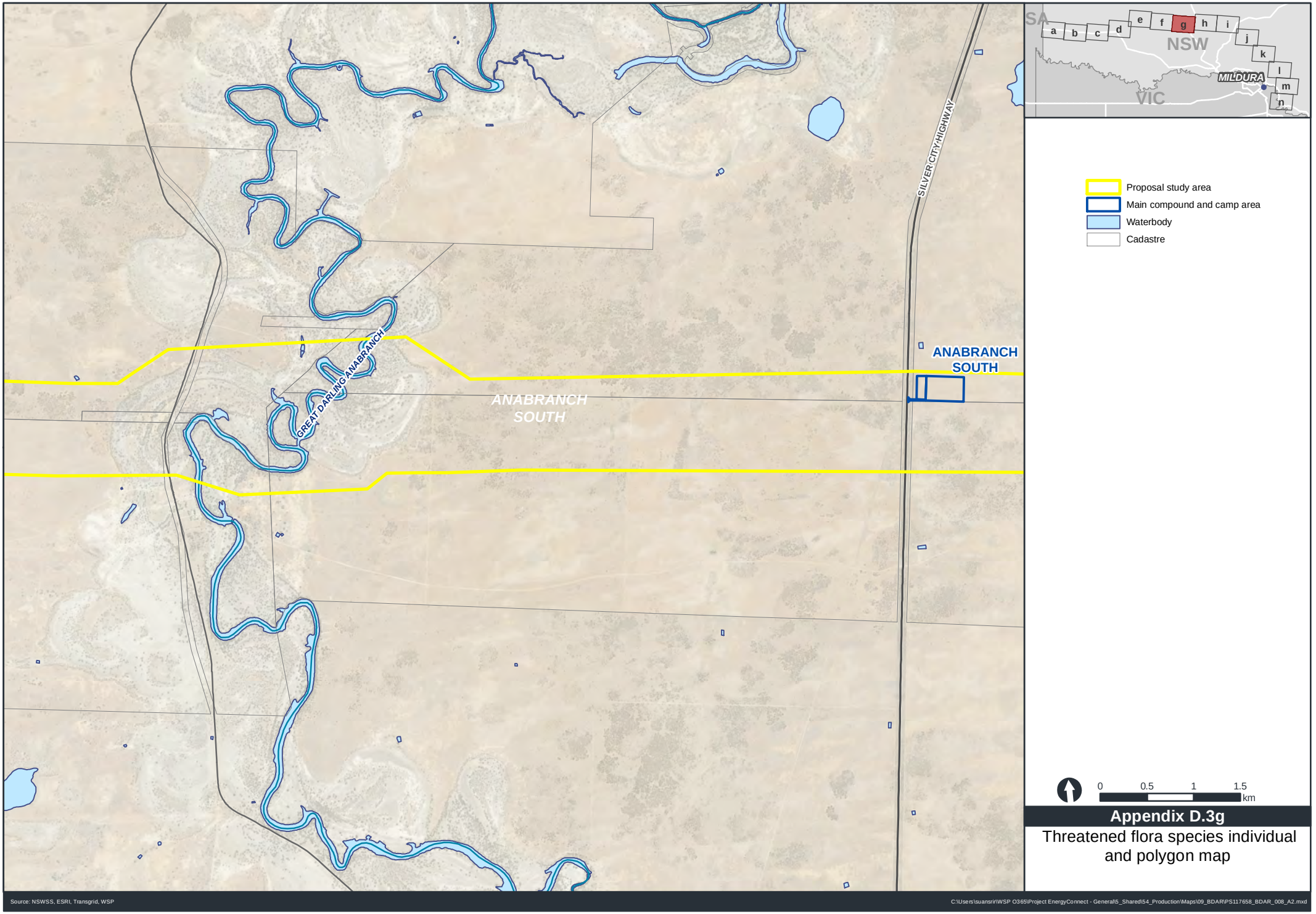
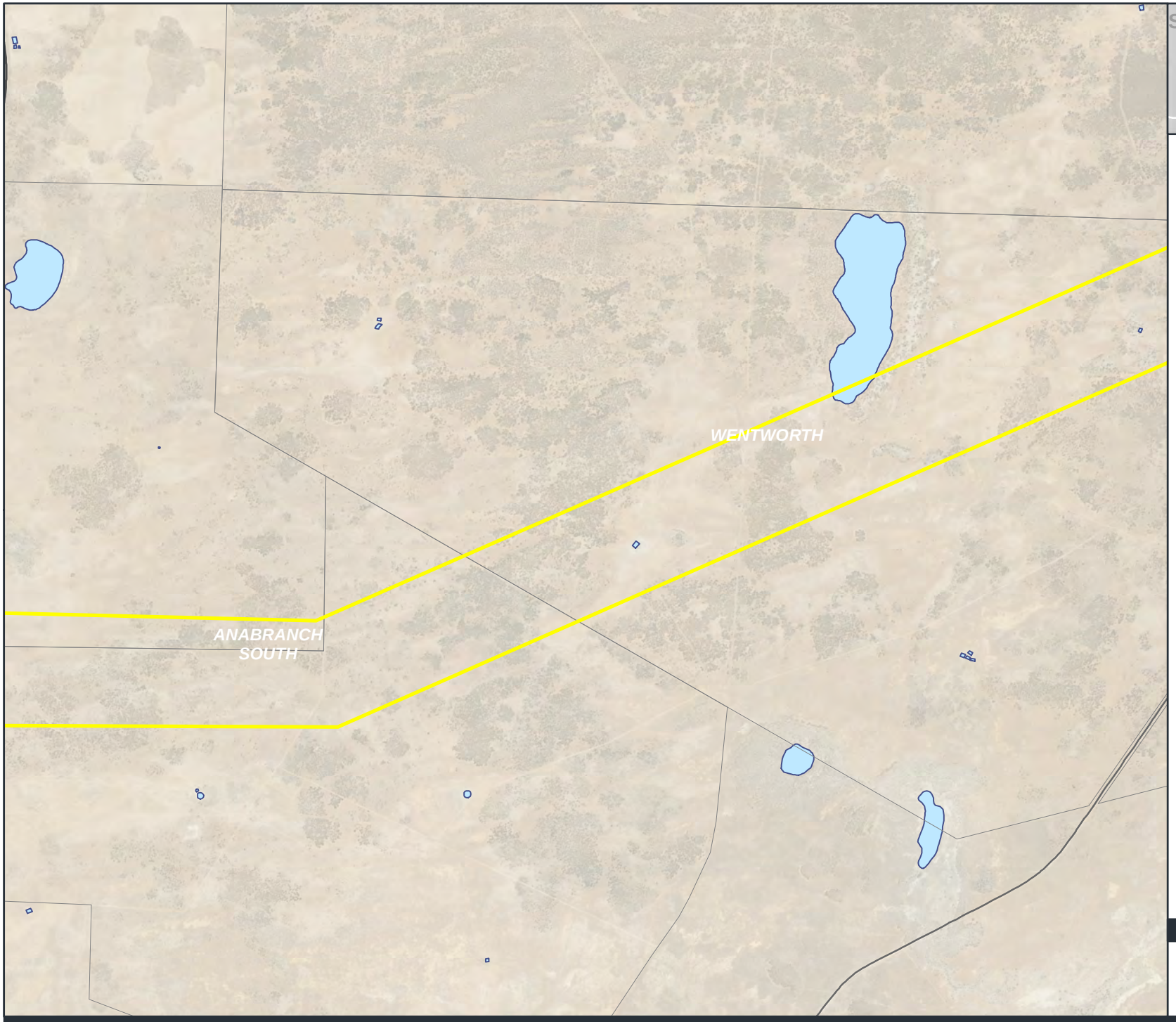
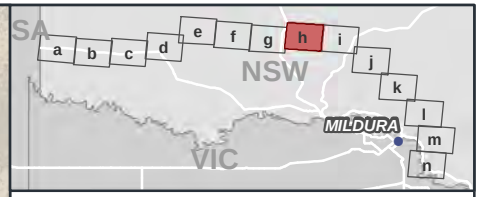


Appendix D.3g

Threatened flora species individual and polygon map





Proposal study area
Waterbody
Cadastre

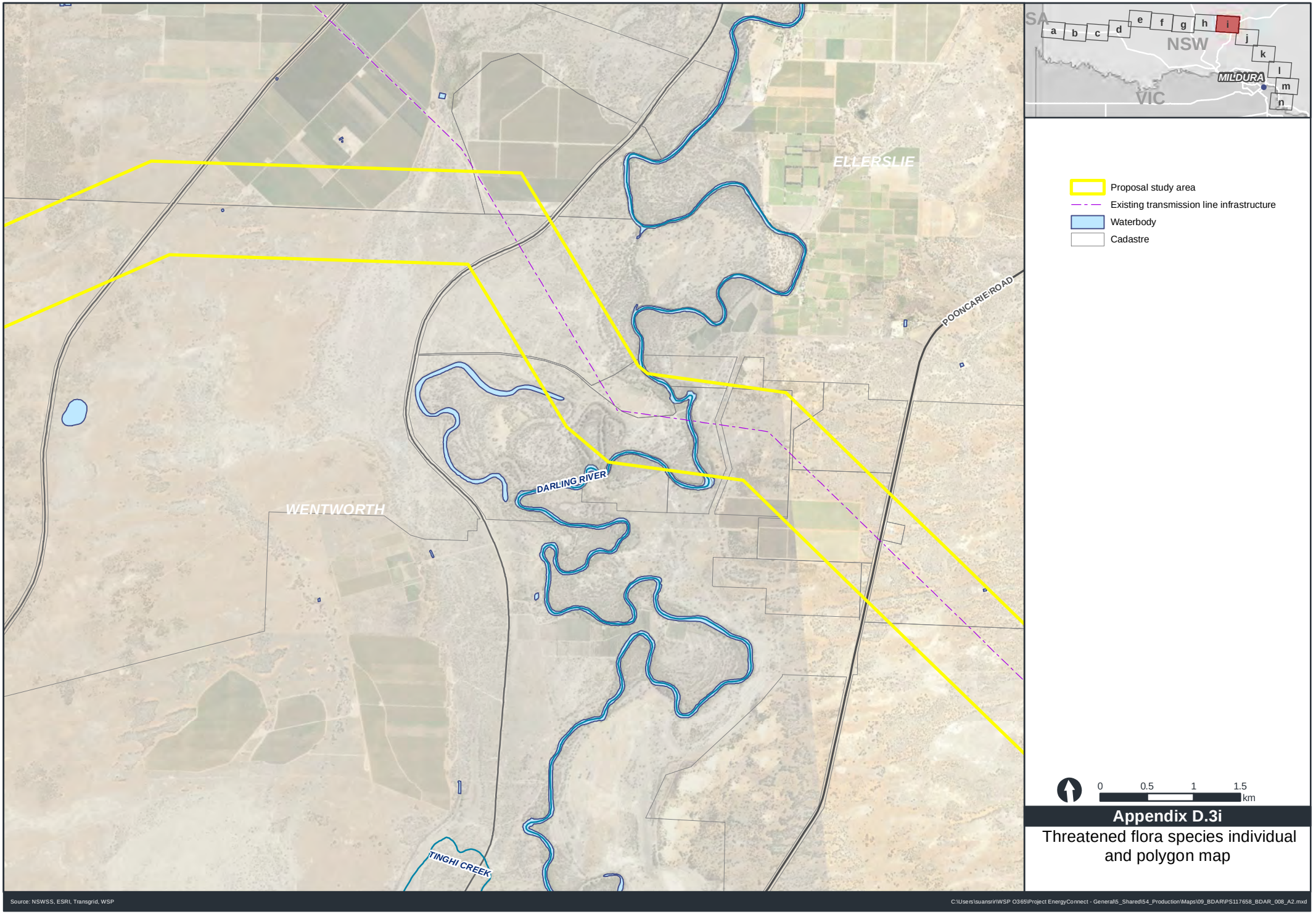
0 0.5 1 1.5 km

Appendix D.3h

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A2.mxd



Appendix D.3i

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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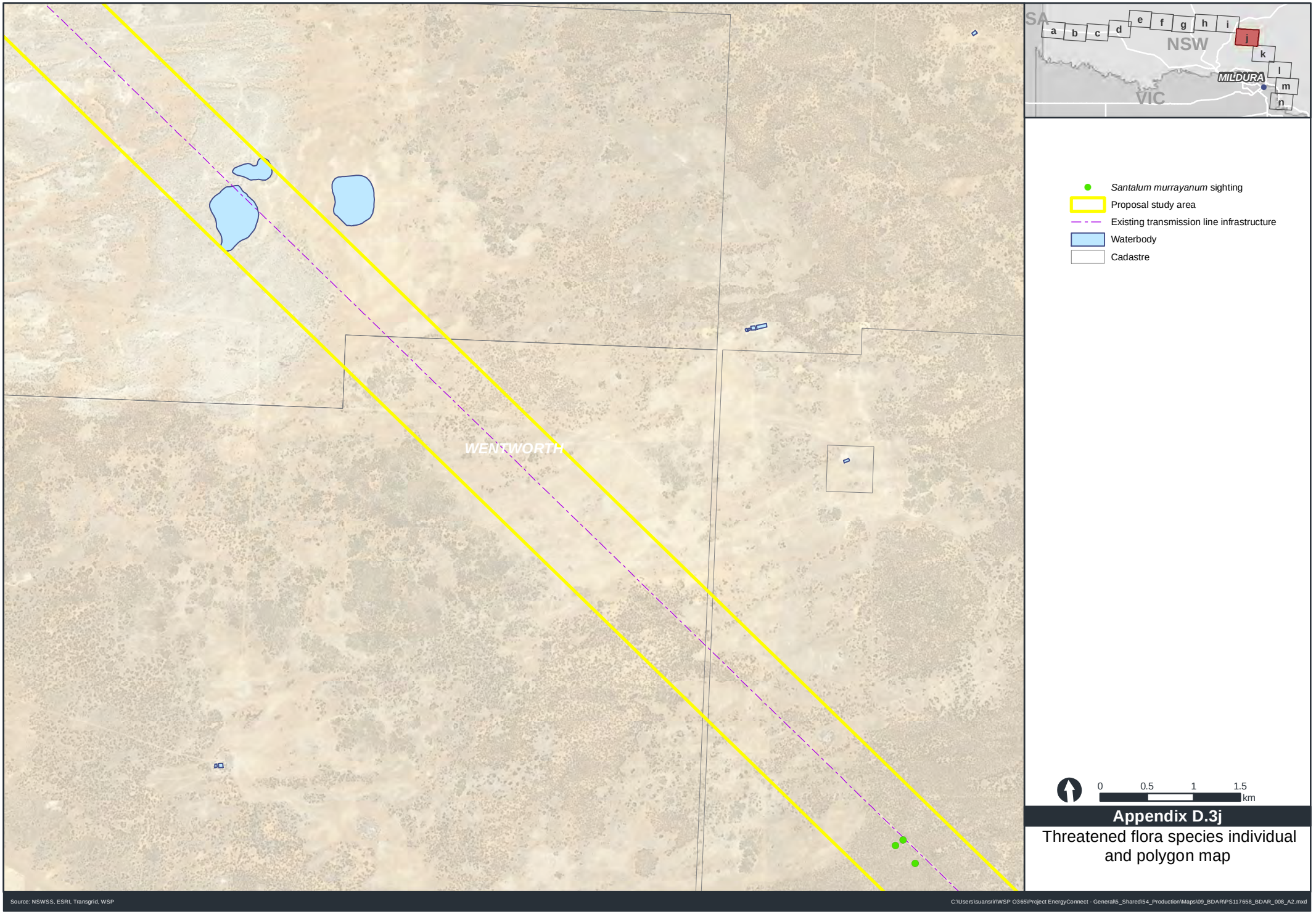
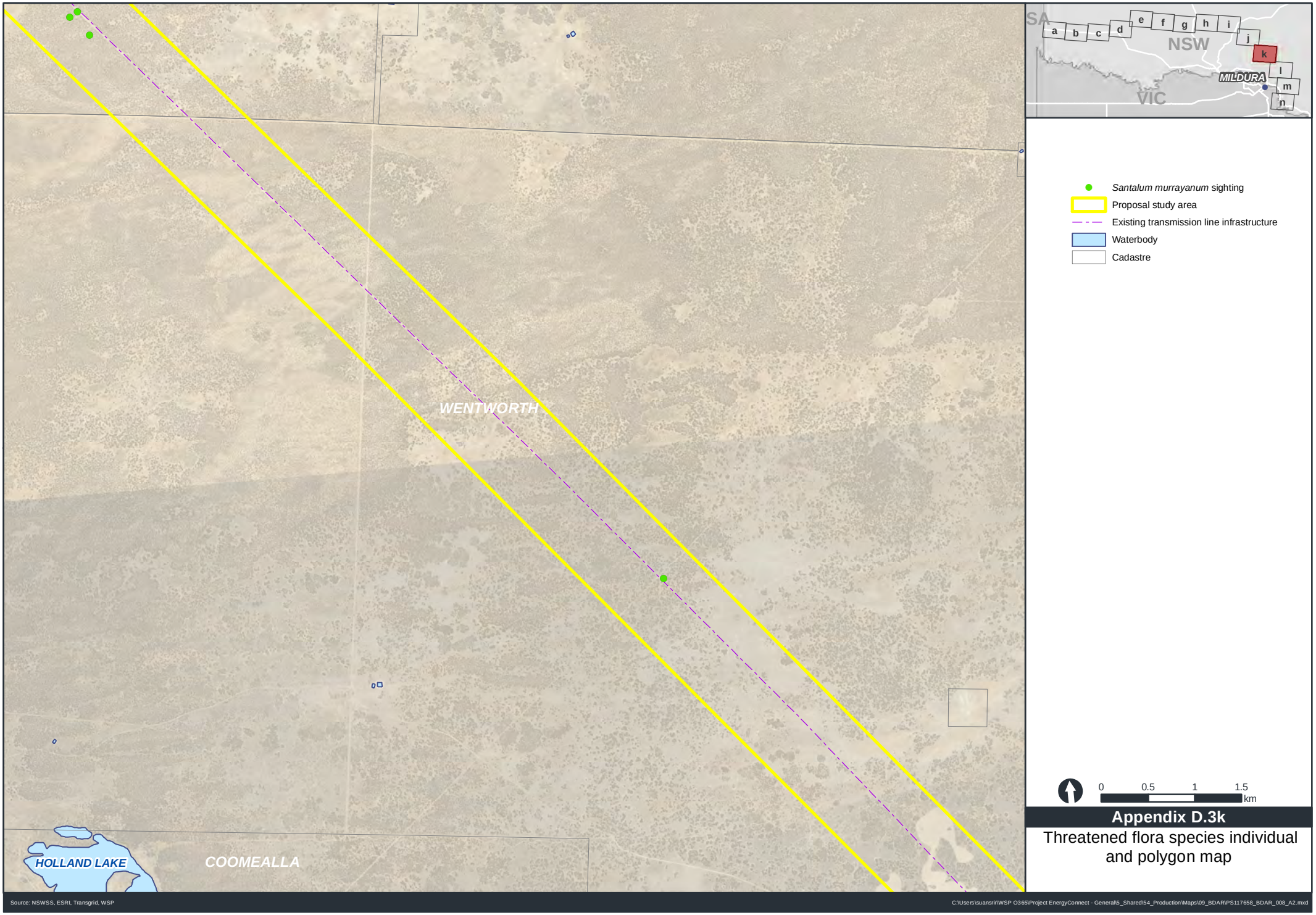


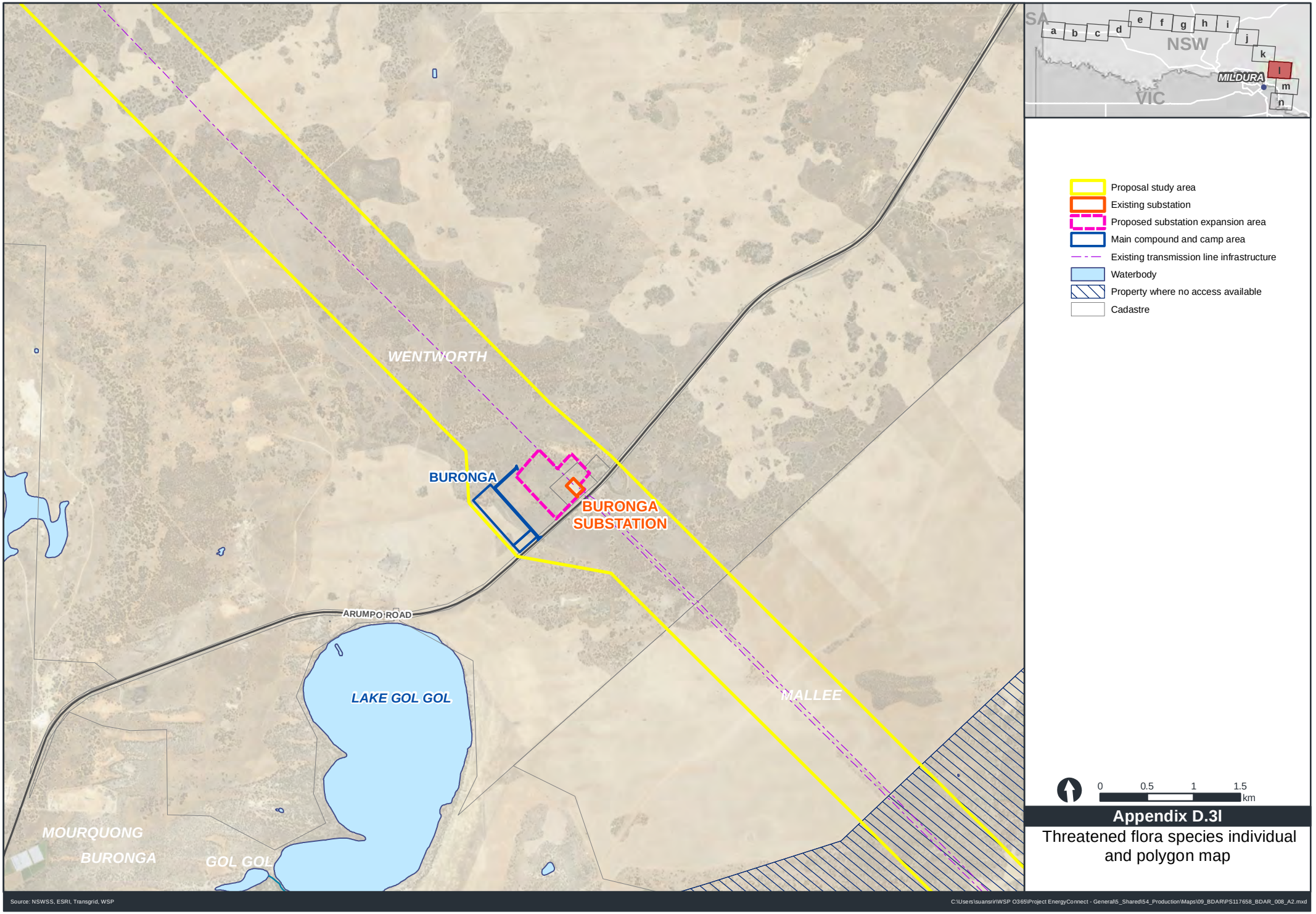
Appendix D.3j

Threatened flora species individual and polygon map



Appendix D.3k

Threatened flora species individual and polygon map



Appendix D.3l

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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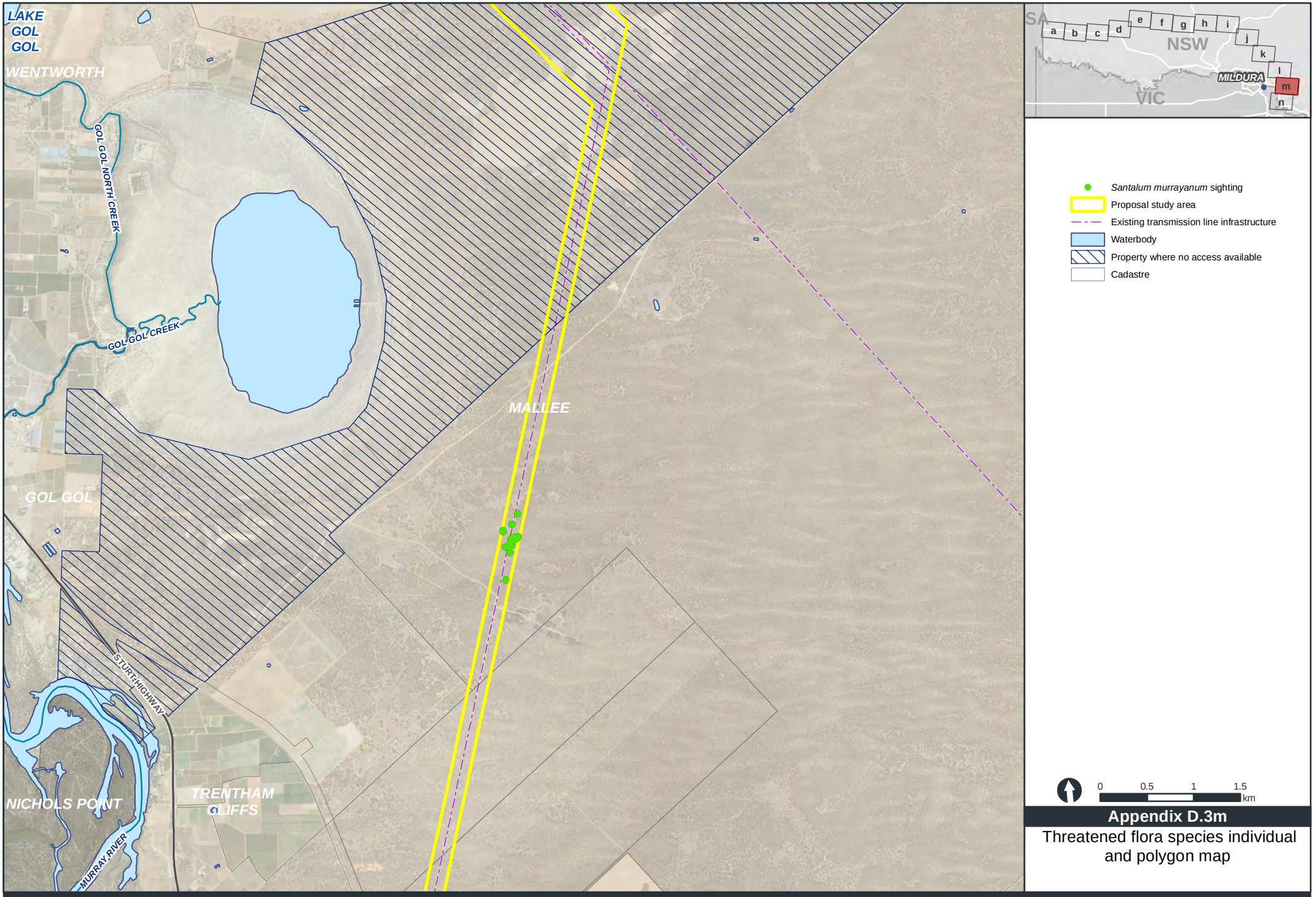

Appendix D.3m

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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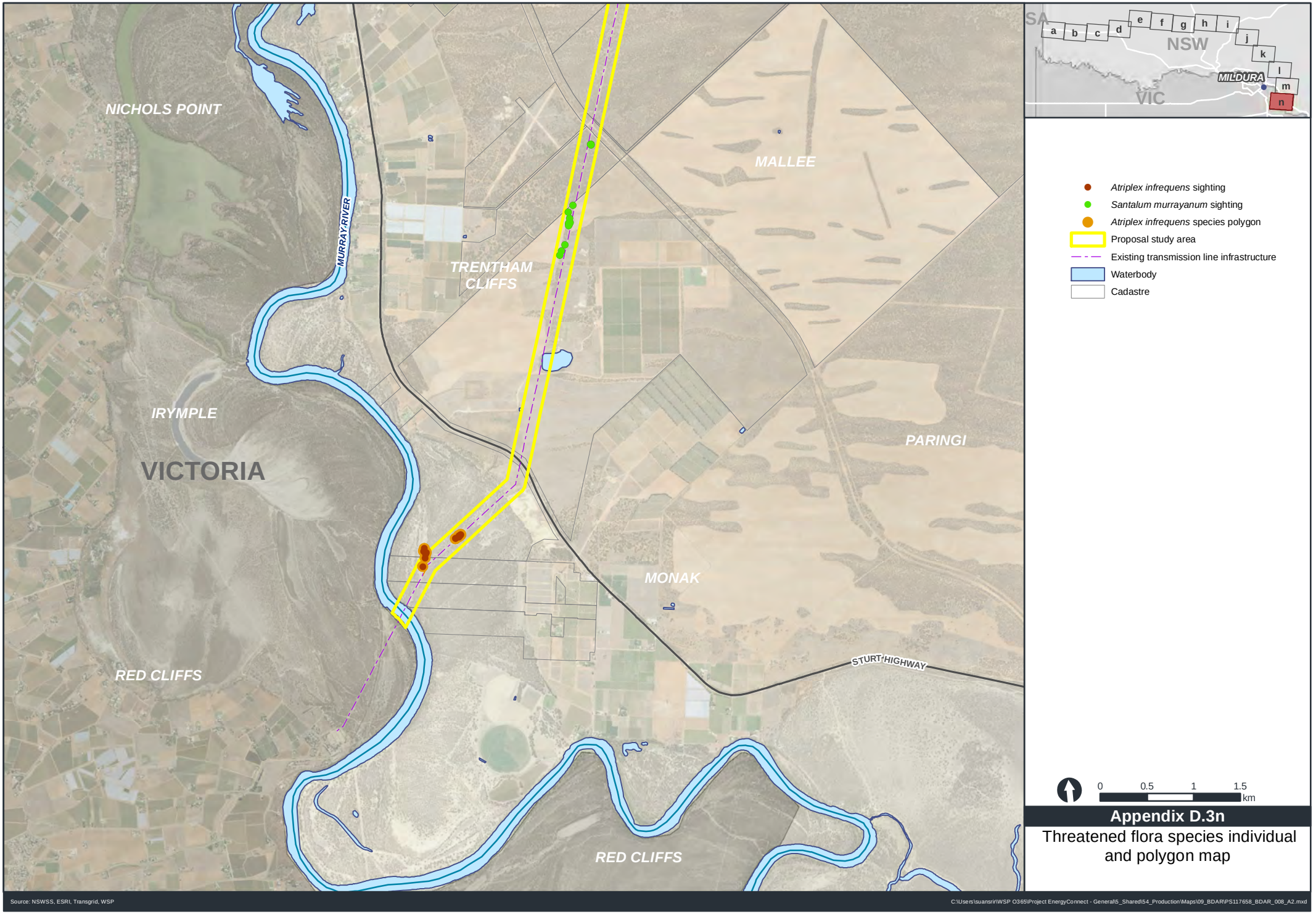


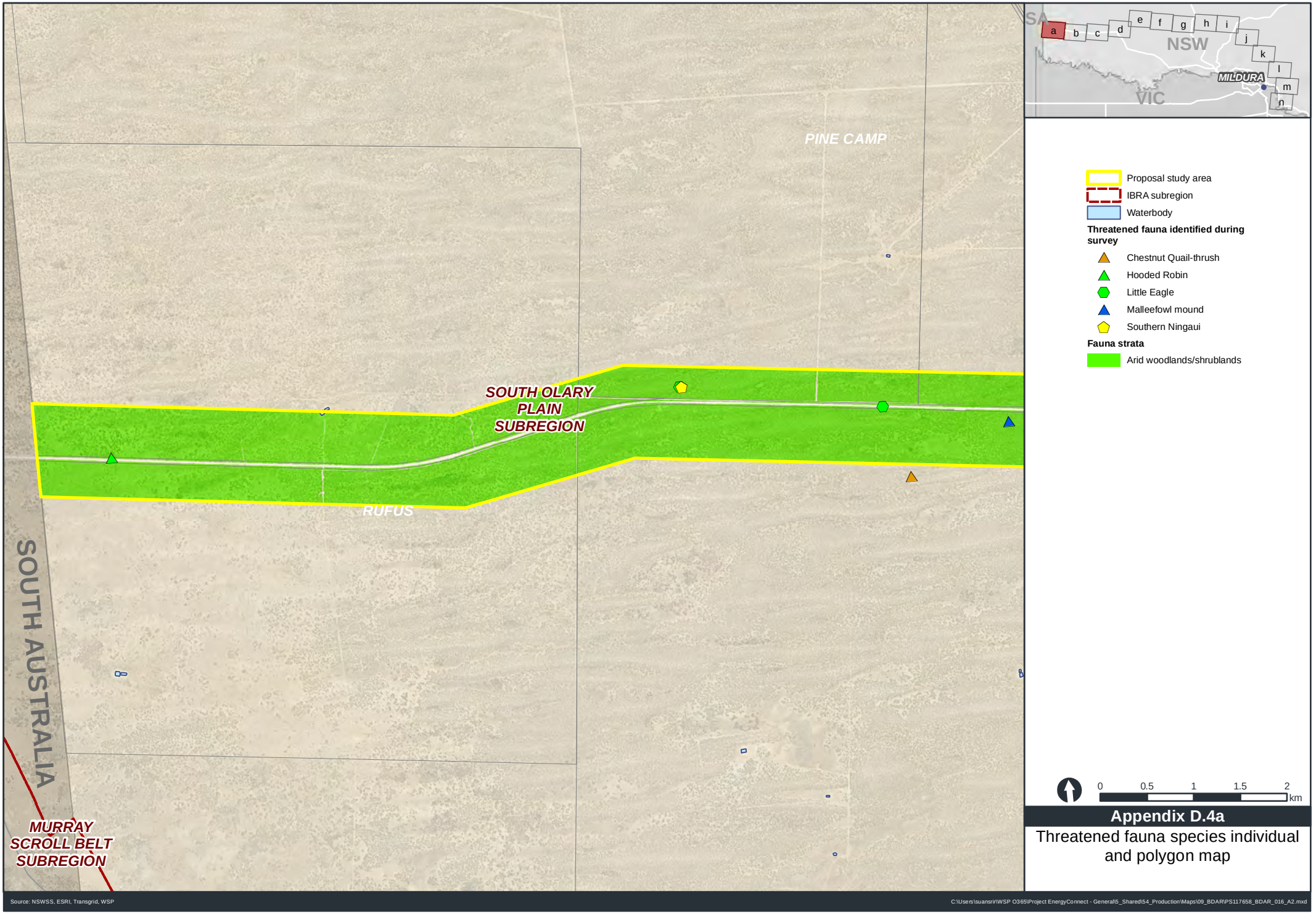
Appendix D.3n

Threatened flora species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

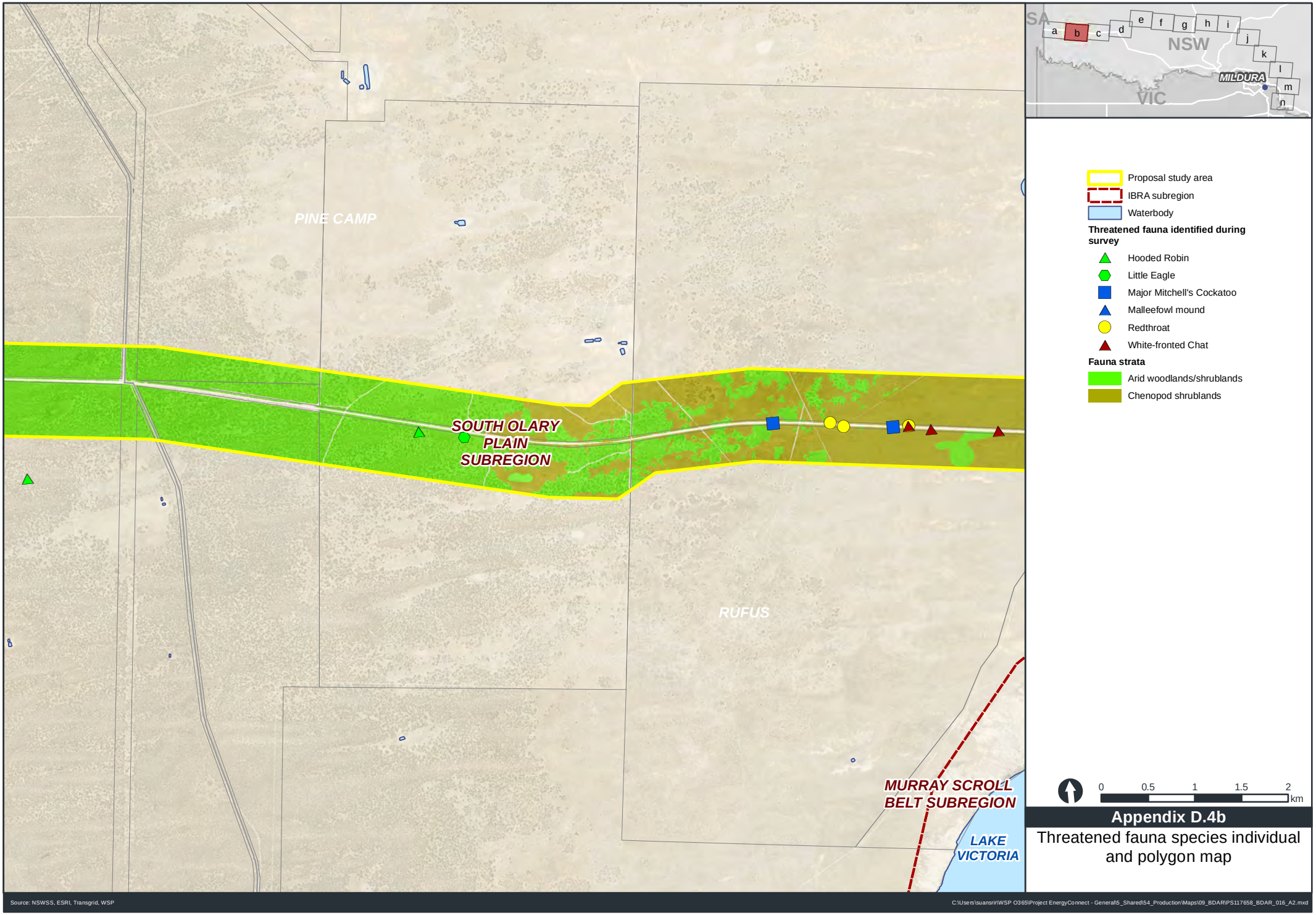
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_008_A2.mxd

APPENDIX D-4
THREATENED FAUNA SPECIES INDIVIDUAL AND POLYGON MAPS



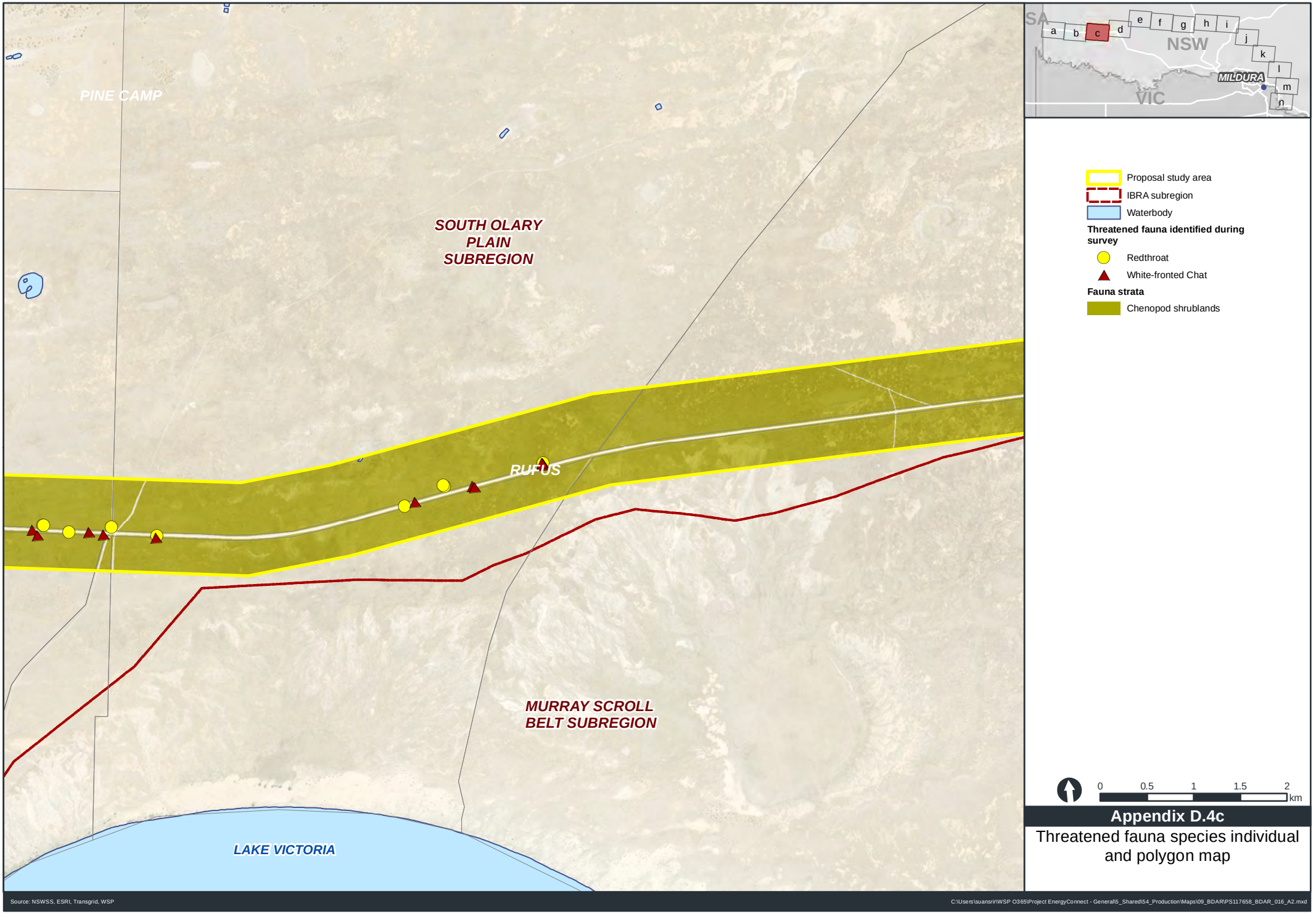
Appendix D.4a

Threatened fauna species individual and polygon map



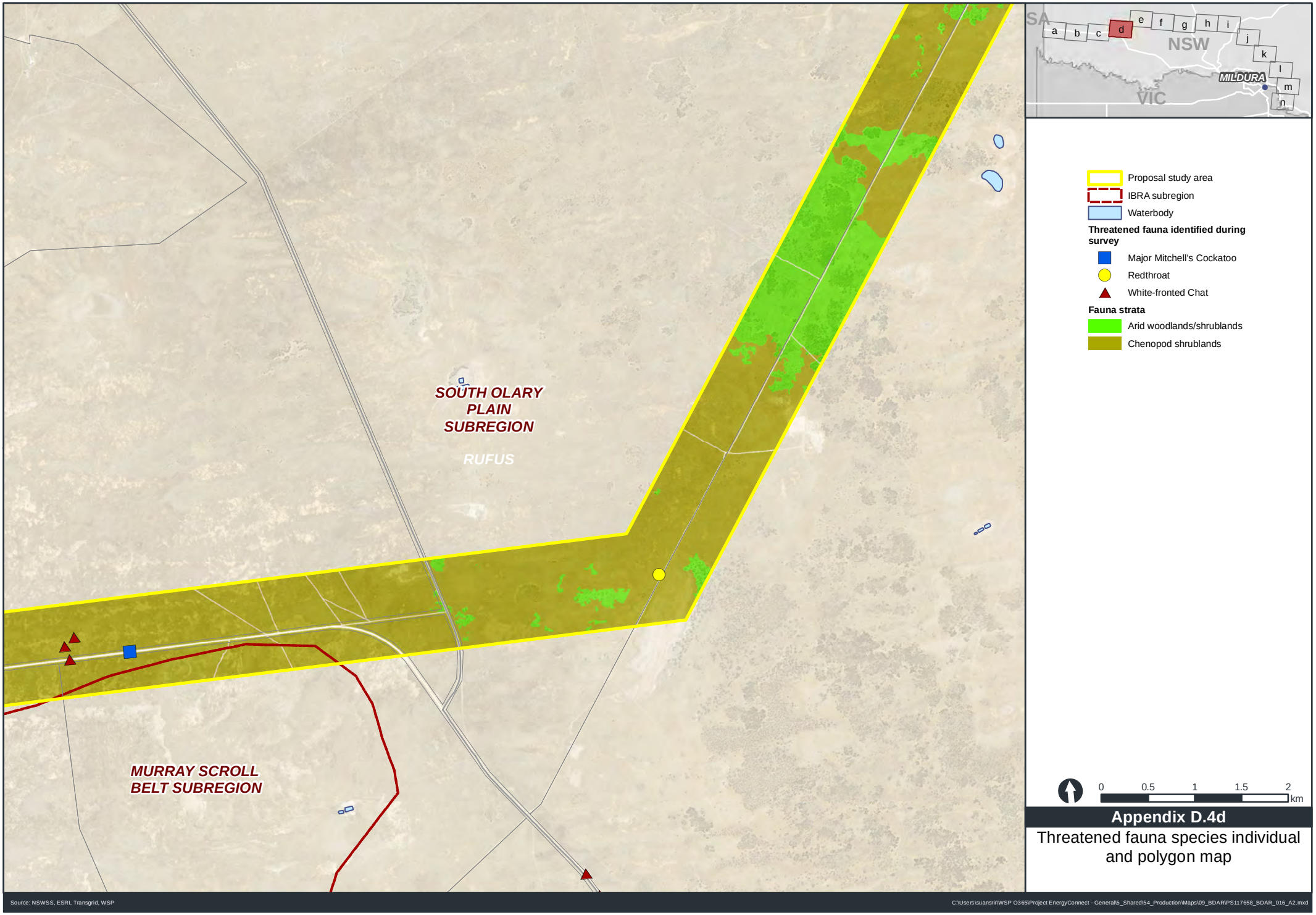
Appendix D.4b

Threatened fauna species individual and polygon map



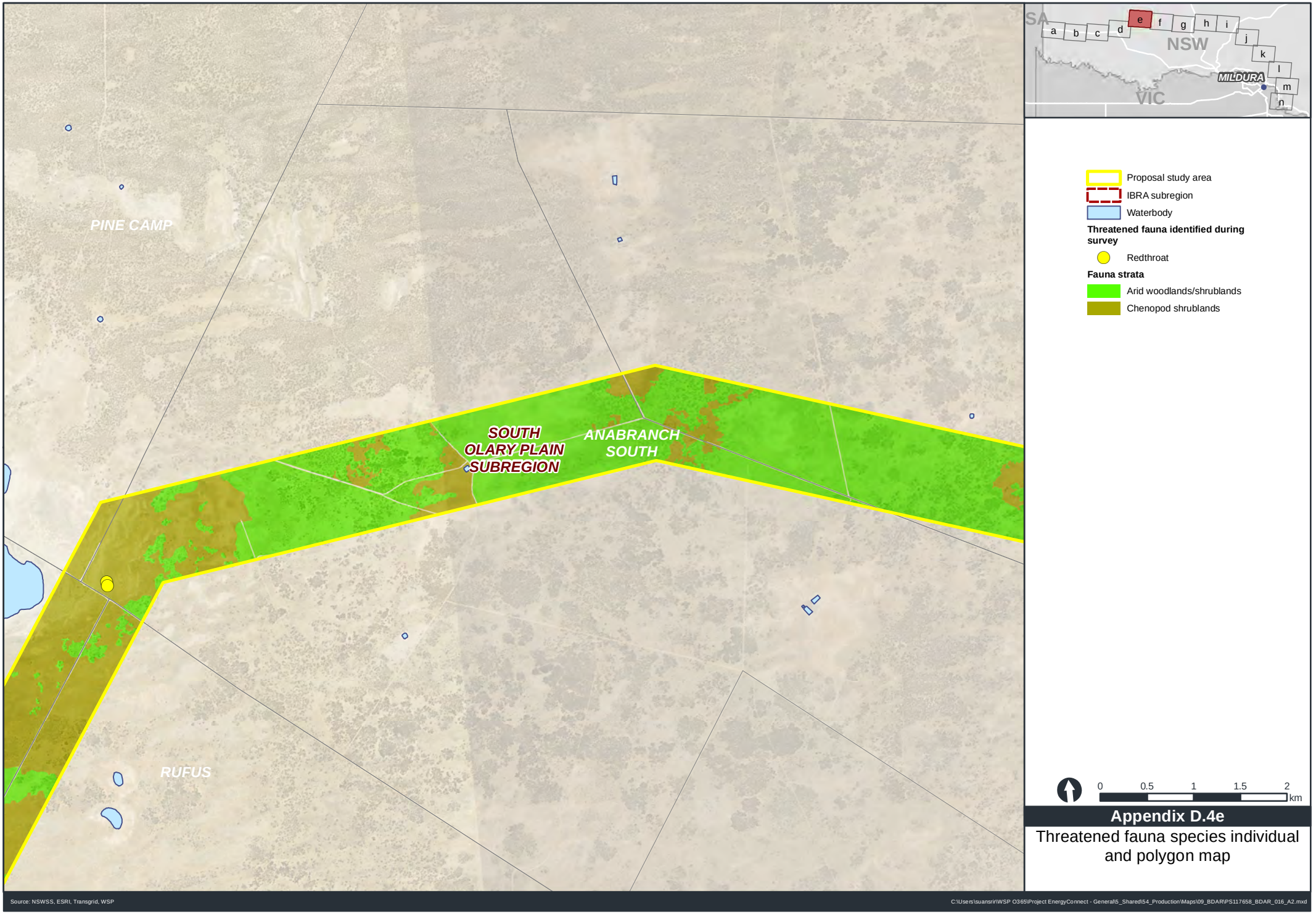
Appendix D.4c

Threatened fauna species individual and polygon map



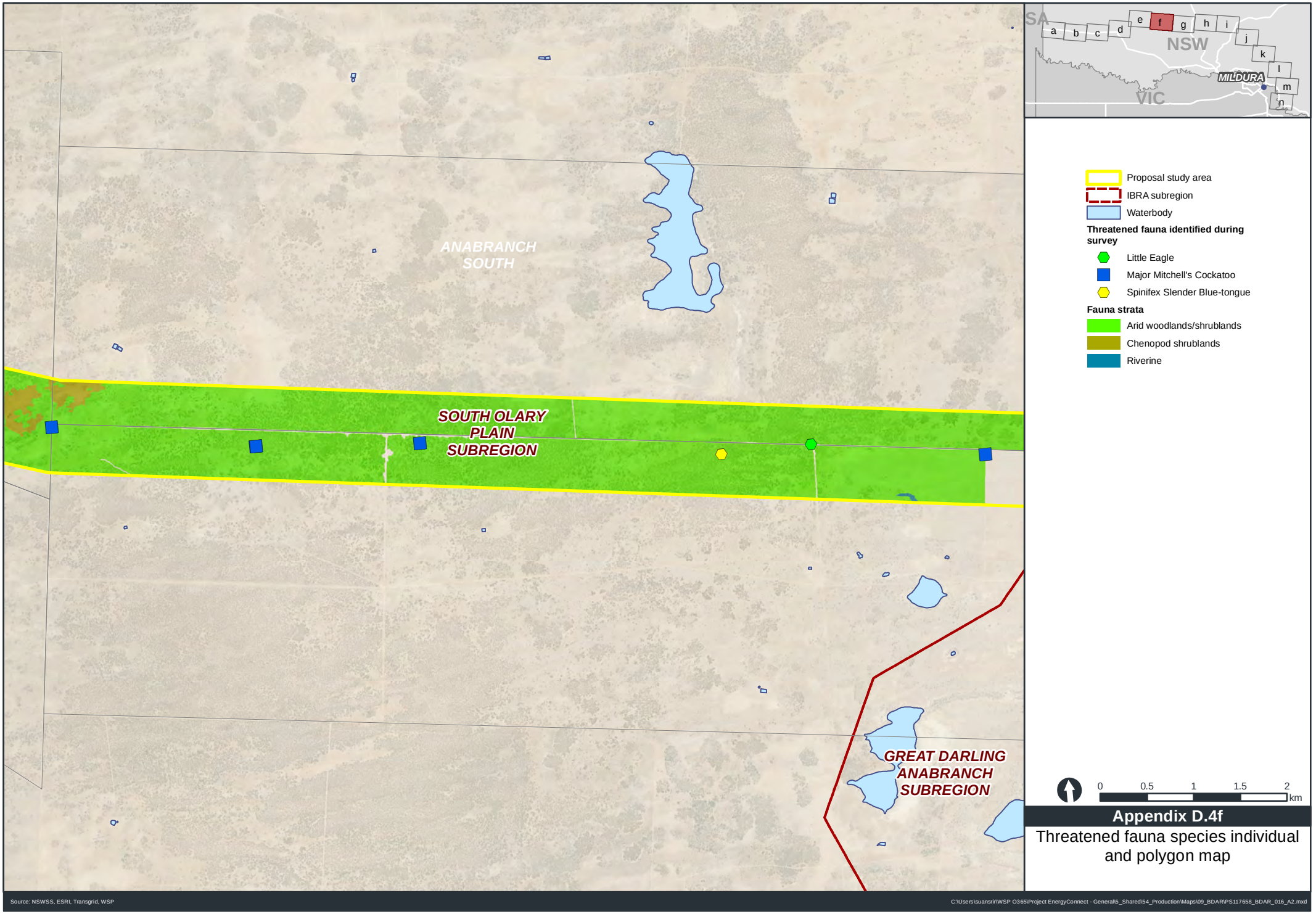
Appendix D.4d

Threatened fauna species individual and polygon map



Appendix D.4e

Threatened fauna species individual and polygon map



Appendix D.4f

Threatened fauna species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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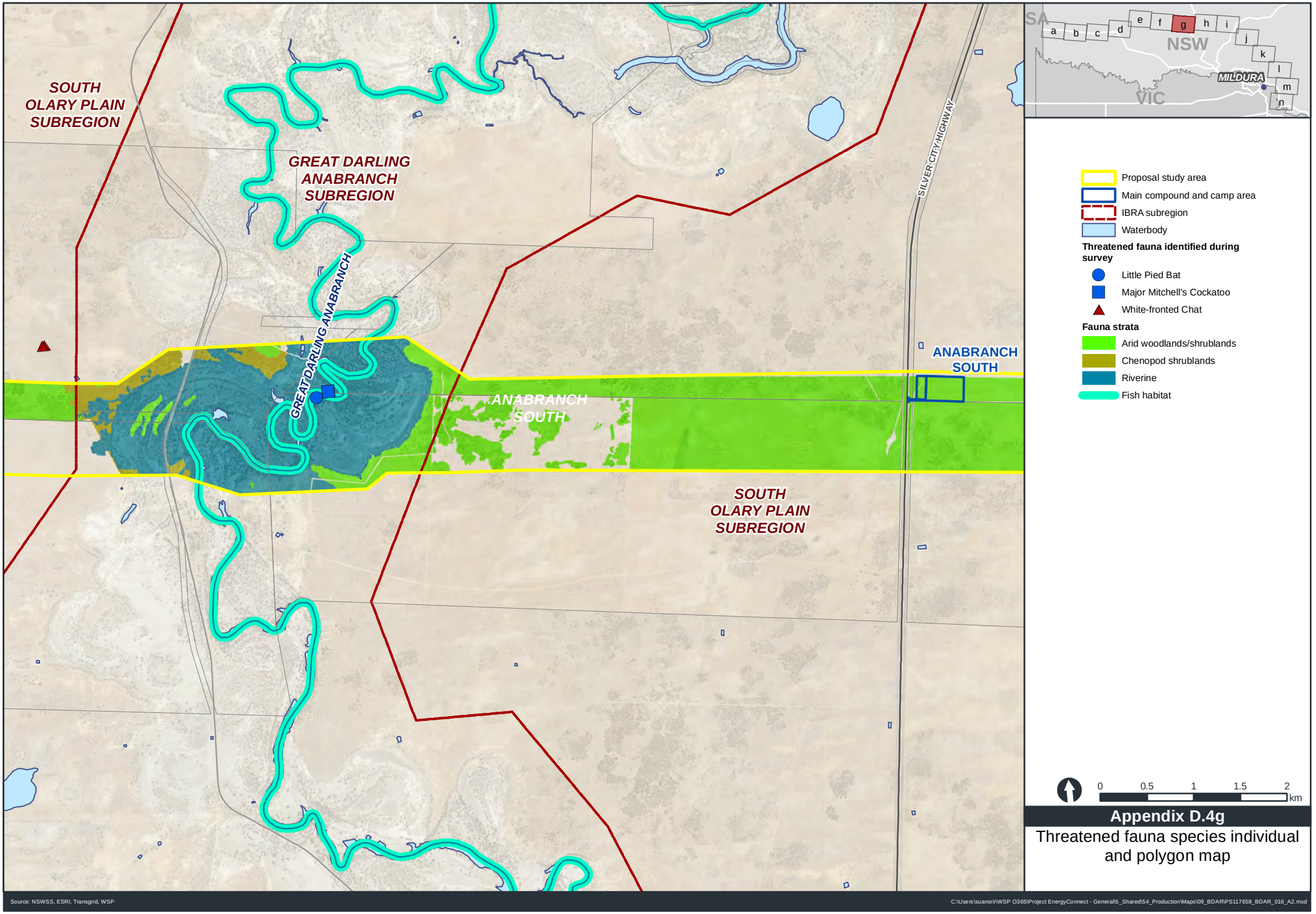
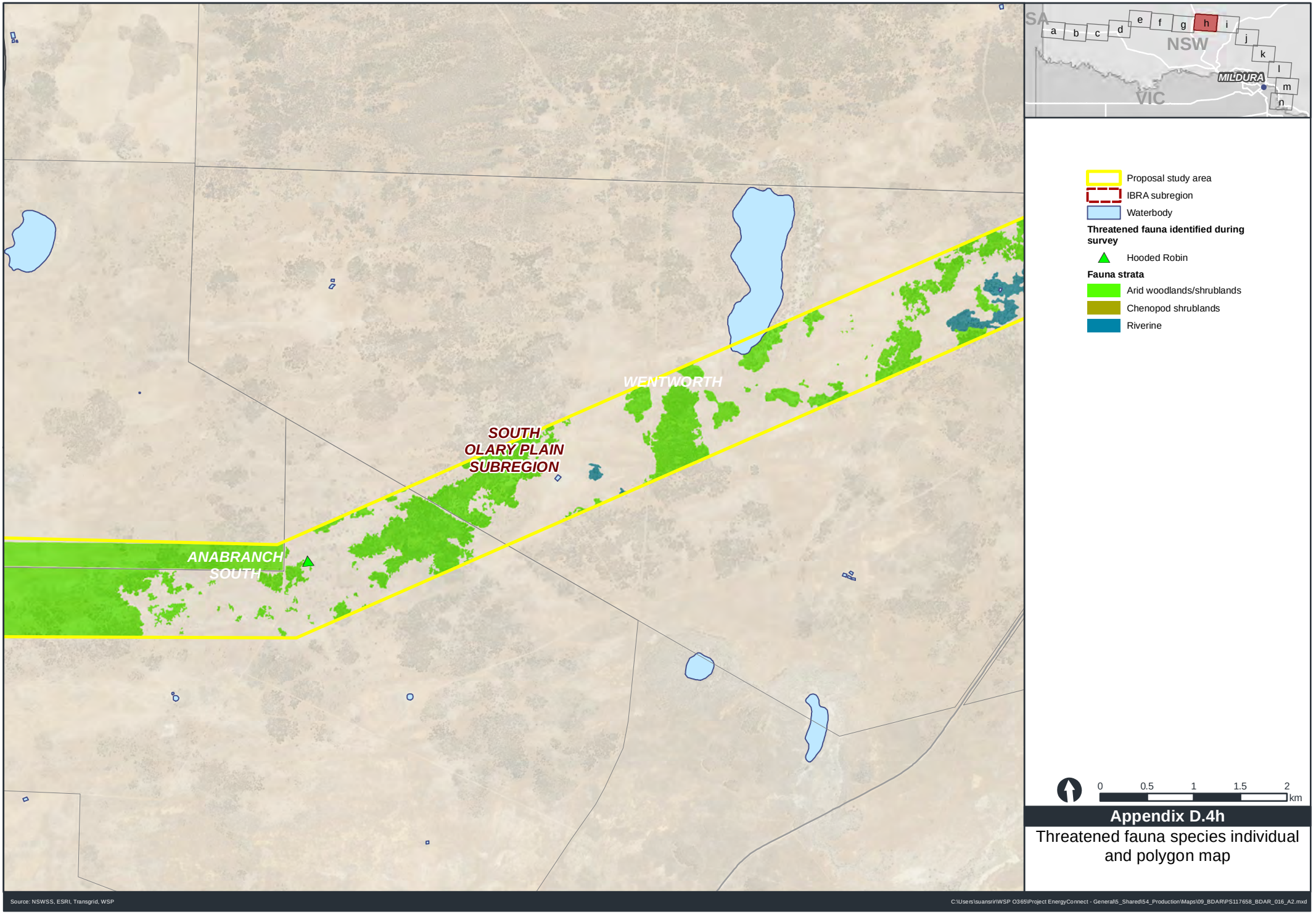
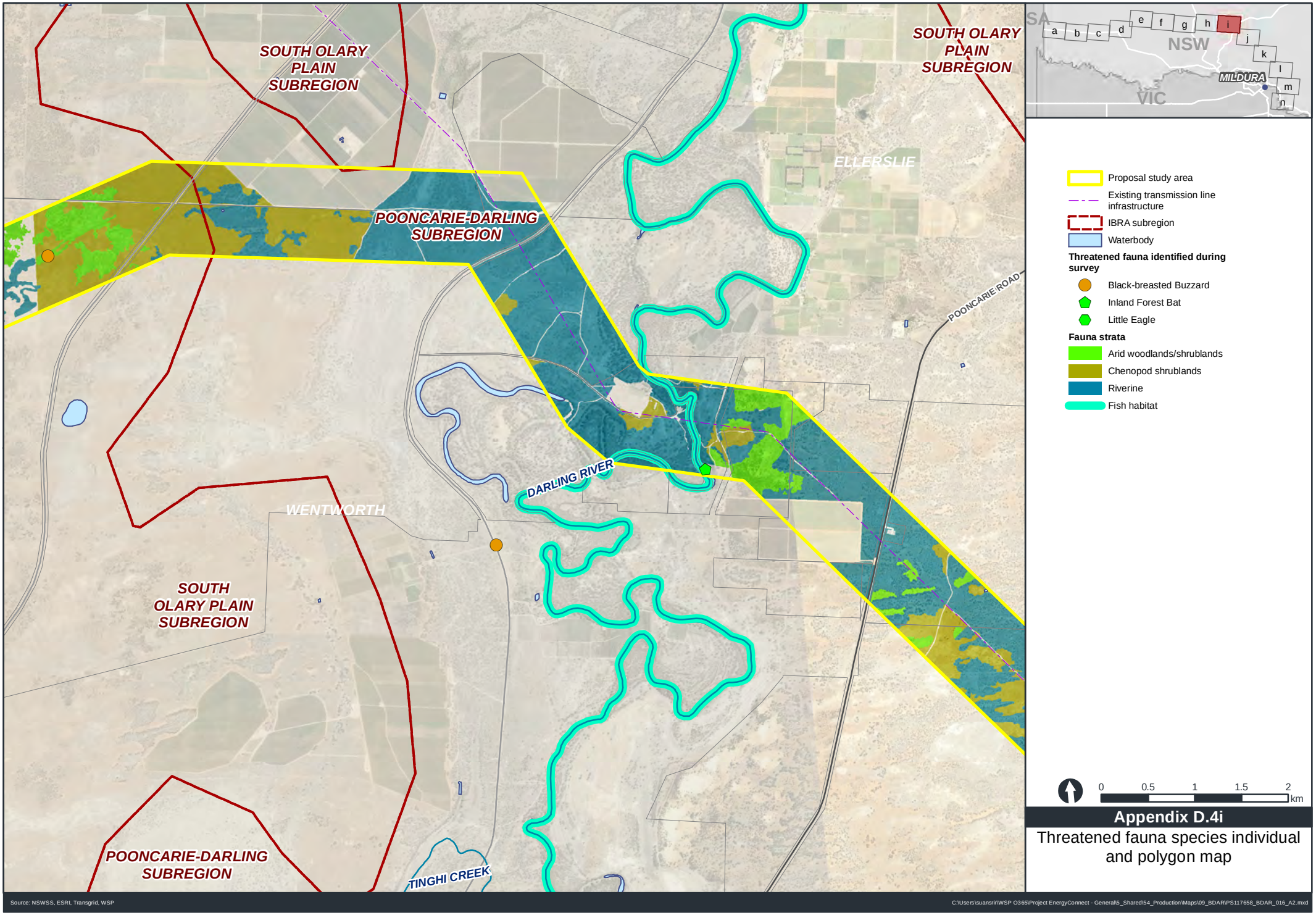

SOUTH OLARY PLAIN SUBREGION
GREAT DARLING ANABRANCH SUBREGION
GREAT DARLING ANABRANCH
SILVER CITY HIGHWAY
ANABRANCH SOUTH
ANABRANCH SOUTH
SOUTH OLARY PLAIN SUBREGION
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Main compound and camp area
IBRA subregion
Waterbody
Threatened fauna identified during survey
Little Pied Bat
Major Mitchell's Cockatoo
White-fronted Chat
Fauna strata
Arid woodlands/shrublands
Chenopod shrublands
Riverine
Fish habitat
0
0.5
1
1.5
2
km
Appendix D.4g
Threatened fauna species individual and polygon map
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_016_A2.mxd



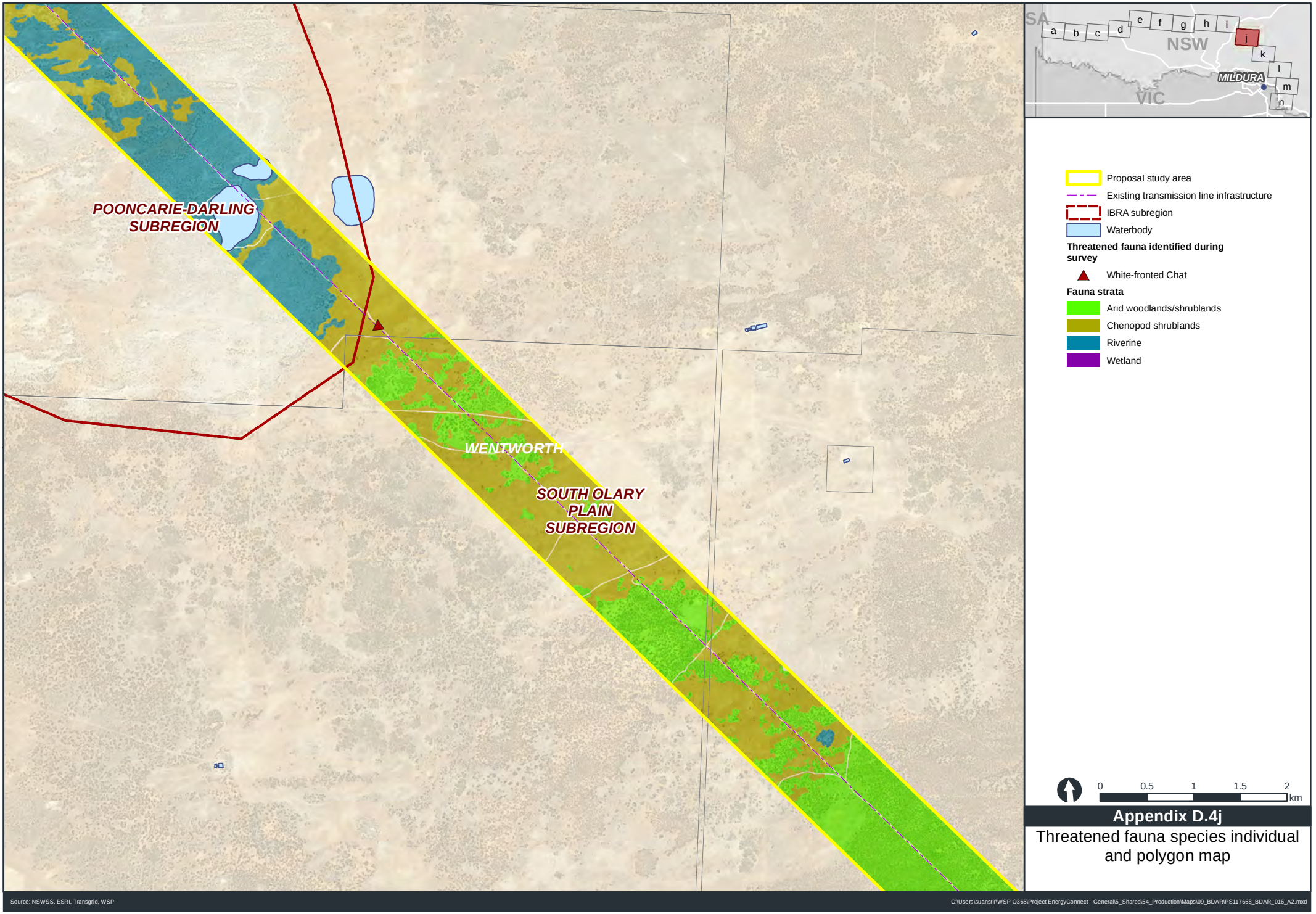
Appendix D.4h

Threatened fauna species individual and polygon map



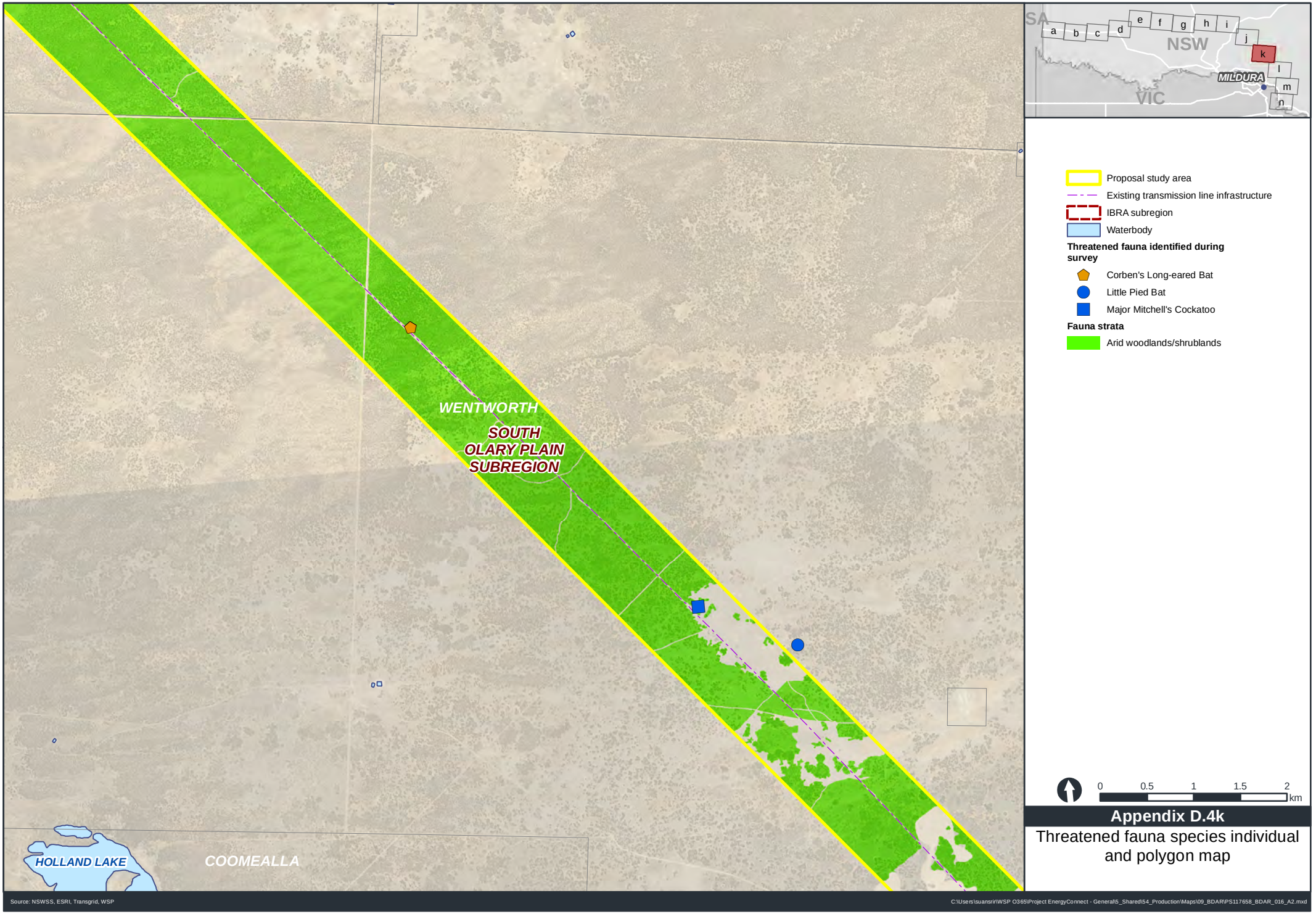
Appendix D.4i

Threatened fauna species individual and polygon map



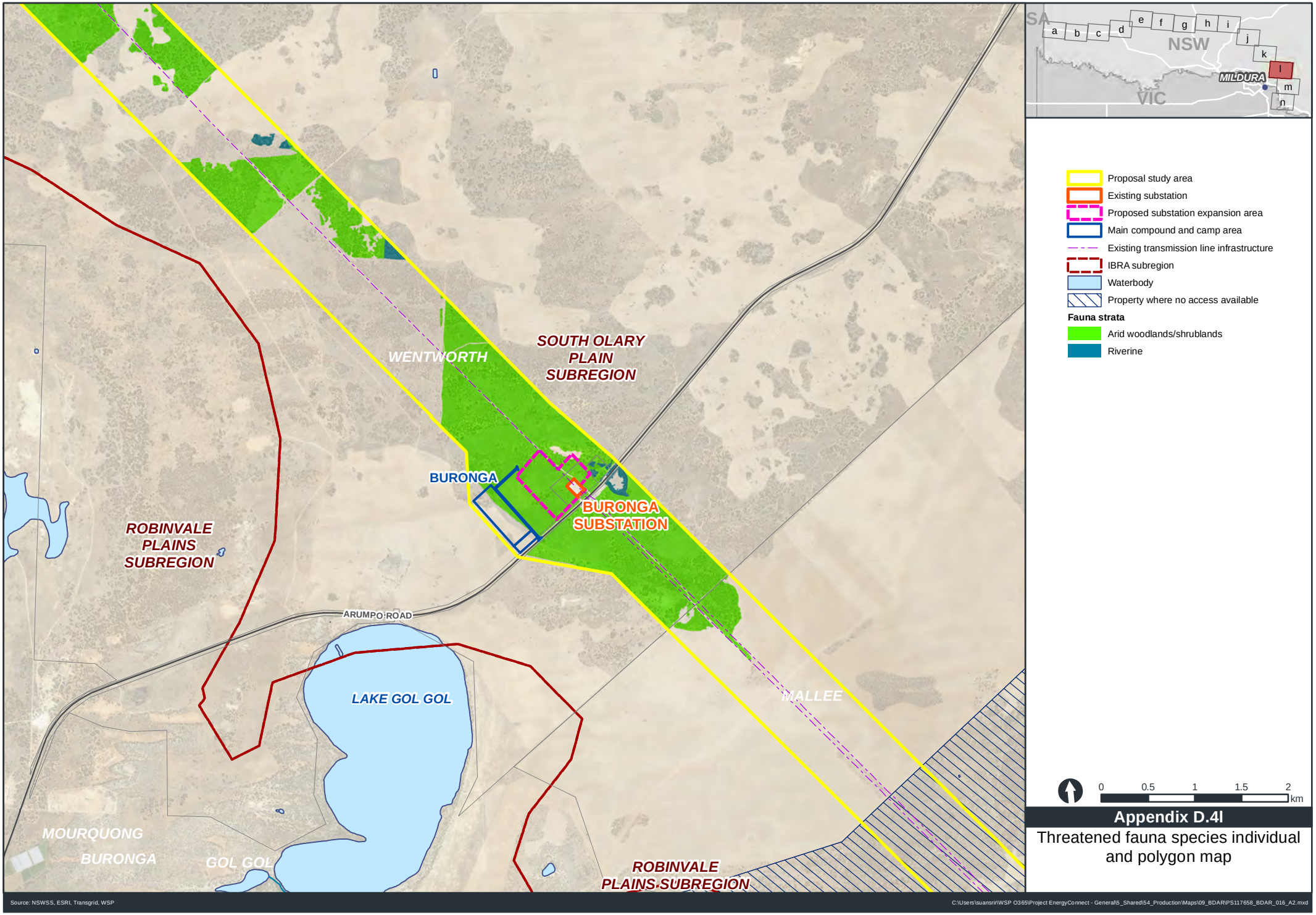
Appendix D.4j

Threatened fauna species individual and polygon map



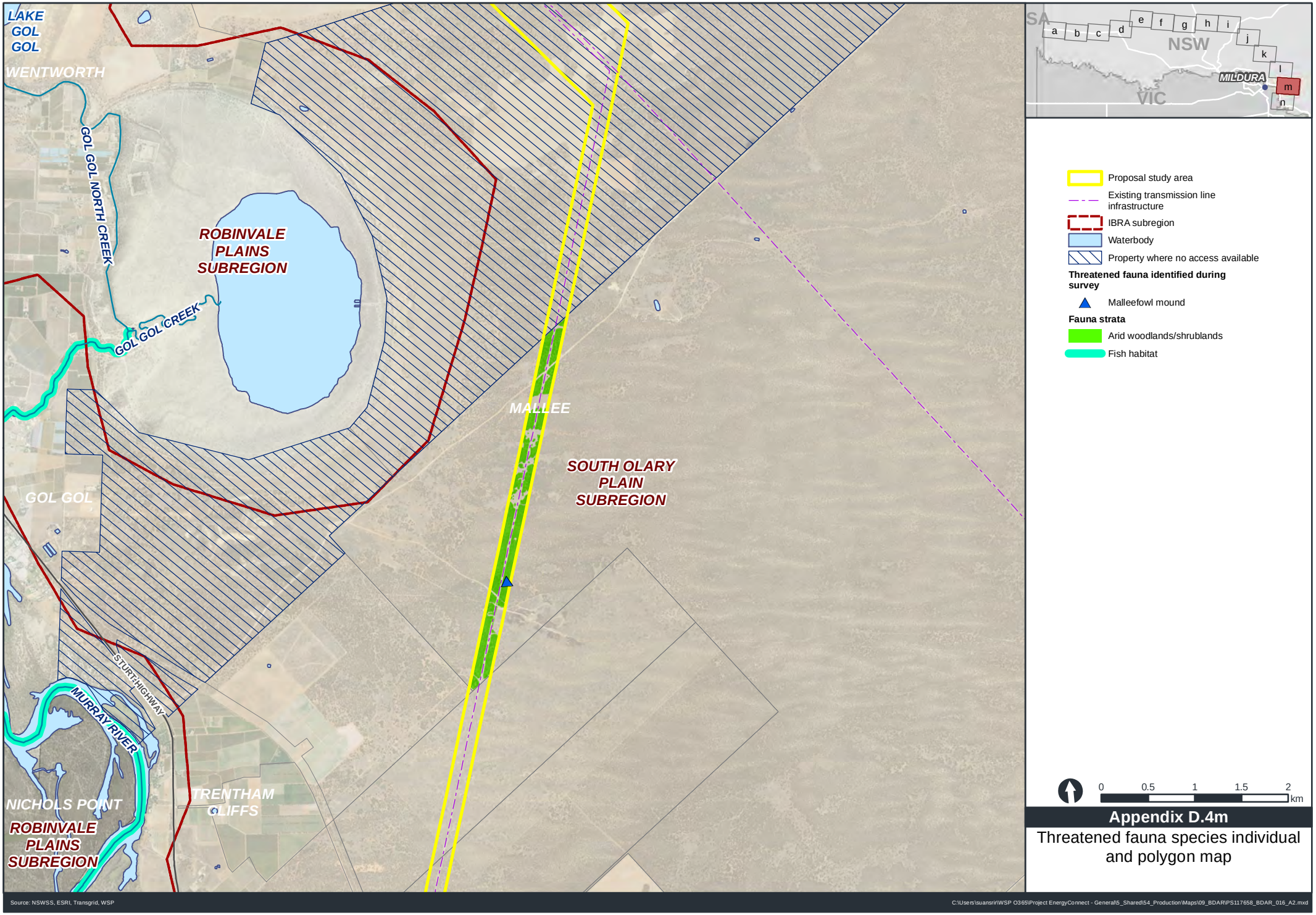
Appendix D.4k

Threatened fauna species individual and polygon map



Appendix D.4l

Threatened fauna species individual and polygon map



Appendix D.4m

Threatened fauna species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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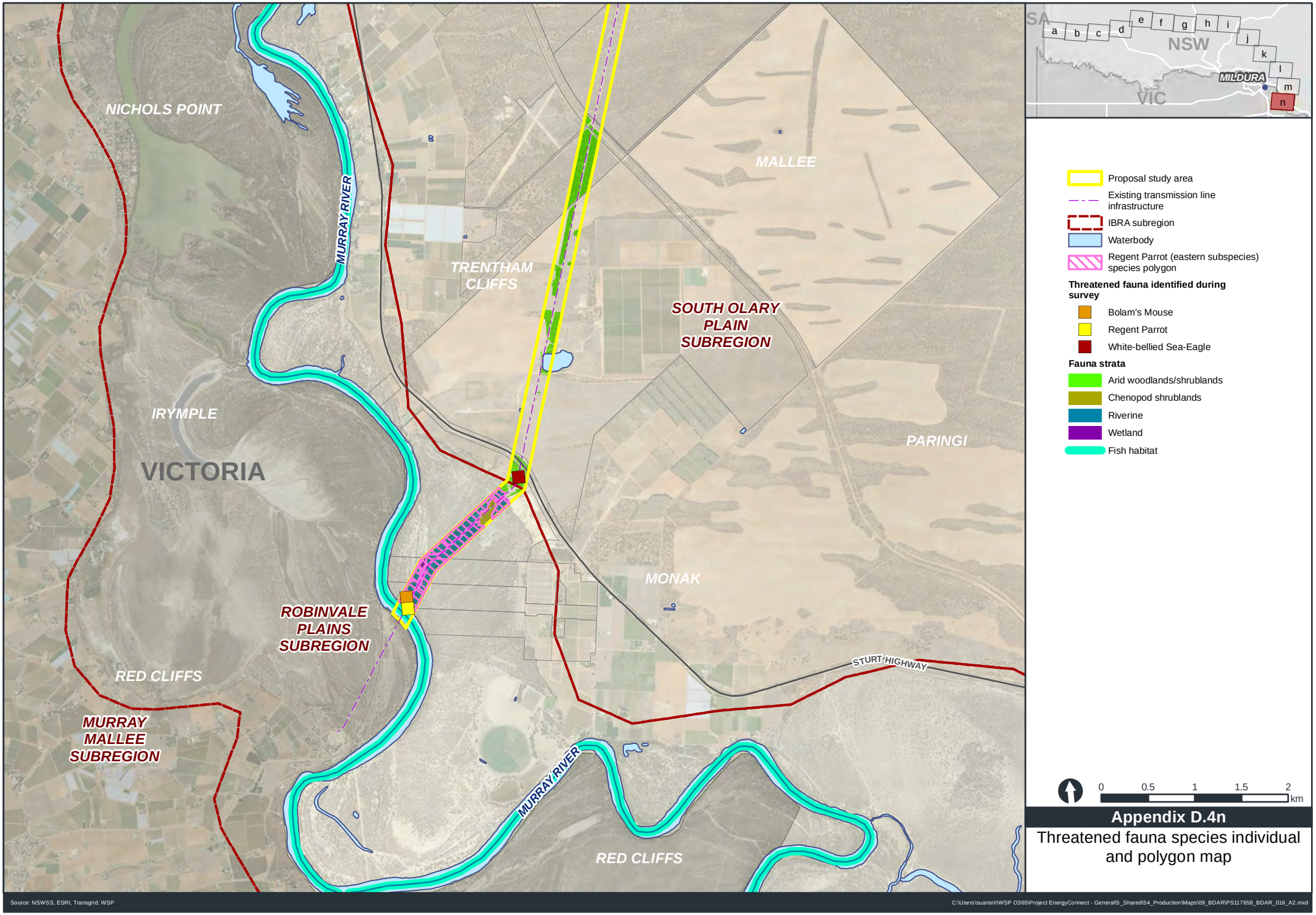

Appendix D.4n

Threatened fauna species individual and polygon map

Source: NSWSS, ESRI, Transgrid, WSP

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APPENDIX D-5
RECORDED FAUNA SPECIES

Table D-5.1 Fauna species recorded in the study area or its vicinity

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Amphibians (5)					
Crinia parinsignifera	Eastern Sign-bearing Froglet	W	N		
Limnodynastes interioris	Giant Banjo Frog	T	N		
Limnodynastes tasmaniensis	Spotted Marsh Frog	W	N		
Litoria peronii	Peron's Tree Frog	W	N		
Neobatrachus sudellae	Sudell's Frog	T	N		
Reptiles (23)					
Cryptoblepharus australis	Inland Snake-eyed Skink	O	N		
Cryptoblepharus pannosus	Ragged Snake-eyed Skink	OT	N		
Ctenophorus fordi	Mallee Military Dragon	O	N		
Ctenotus atlas	Southern Spinifex Ctenotus	T	N		
Ctenotus regius	Royal Ctenotus	O	N		
Ctenotus brachyonyx	Short-clawed Ctenotus	T	N		
Ctenotus schomburgkii	Barred Wedge-snouted Ctenotus	OT	N		
Cyclodomorphus melanops	Spinifex Slender Blue-tongue	O	N	E1	
Delma butleri	Spinifex Delma	T	N		
Demansia psammophis	Yellow-faced Whipsnake	T	N		
Emydura macquarii	Macquarie Turtle	O	N		
Gehyra versicolor	Variable Dtella	O	N		
Heteronotia binoei	Bynoe's Gecko	O	N		
Lerista punctatovittata	Eastern Robust Slider	T	N		
Licasium damaeum	Beaded Gecko	OT	N		
Menetia greyii	Common Dwarf Skink	T	N		
Morethia boulengeri	South-eastern Morethia Skink	OT	N		
Notechis scutatus	Mainland Tiger Snake	O	N		
Pogona vitticeps	Central Bearded Dragon	O	N		
Pseudonaja aspidoryncha	Strap-snouted Brown Snake	O	N		
Pseudonaja textilis	Eastern Brown Snake	O	N		
Tiliqua rugosa	Shingleback Skink	O	N		
Varanus gouldii	Sand Goanna	O	N		
Varanus varius	Lace Monitor	O	N		

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Birds (113)					
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	OW	N		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	OW	N		
Acanthiza uropygialis	Chestnut-rumped Thornbill	OW	N		
Accipiter cirrocephalus	Collared Sparrowhawk	O	N		
Accipiter fasciatus	Brown Goshawk	O	N		
Acrocephalus australis	Australian Reed-Warbler	W	N		
Aegotheles cristatus	Australian Owlet-nightjar	W	N		
Anas superciliosa	Pacific Black Duck	O	N		
Anas rhynchotis	Australasian Shoveler	O	N		
Anhinga novaehollandiae	Australasian Darter	OW	N		
Anthochaera carunculata	Red Wattlebird	OW	N		
Anthus novaeseelandiae	Australian Pipit	O	N		
Aphelocephala leucopsis	Southern Whiteface	OW	N		
Aquila audax	Wedge-tailed Eagle	O	N		
Artamus cinereus	Black-faced Woodswallow	O	N		
Artamus cyanopterus	Dusky Woodswallow	O	N	V	
Artamus personatus	Masked Woodswallow	O	N		
Artamus superciliosus	White-browed Woodswallow	O	N		
Barnardius zonarius	Australian Ringneck	OW	N		
Cacatua galerita	Sulphur-crested Cockatoo	OW	N		
Cacatua sanguinea	Little Corella	OW	N		
Cacomantis flabelliformis	Fan-tailed Cuckoo	OW	N		
Cacomantis pallidus	Pallid Cuckoo	O	N		
Chenonetta jubata	Australian Wood Duck	OW	N		
Chrysococcyx basalis	Horsfield's Bronze-Cuckoo	OW	N		
Cincloramphus cruralis	Brown Songlark	OW	N		
Cinclosoma castanotum	Chestnut Quail-thrush	O	N	V	
Climacteris affinis	White-browed Treecreeper	OW	N		
Climacteris picumnus	Brown Treecreeper	OW	N		
Colluricincla harmonica	Grey Shrike-thrush	OW	N		
Columba livia	Rock Dove*	O	I		

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Coracina novaehollandiae	Black-faced Cuckoo-shrike	OW	N		
Corcorax melanorhamphos	White-winged Chough	OW	N		
Corvus coronoides	Australian Raven	OW	N		
Corvus mellori	Little Raven	OW	N		
Cracticus nigrogularis	Pied Butcherbird	OW	N		
Cracticus tibicen	Australian Magpie	OW	N		
Cracticus torquatus	Grey Butcherbird	OW	N		
Cygnus atratus	Black Swan	O	N		
Dicaeum hirundinaceum	Mistletoebird	OW	N		
Dromaius novaehollandiae	Emu	O	N		
Entomyzon cyanotis	Blue-faced Honeyeater	O	N		
Eolophus roseicapilla	Galah	OW	N		
Epthianura albifrons	White-fronted Chat	O	N	V	
Epthianura aurifrons	Orange Chat	O	N		
Epthianura tricolor	Crimson Chat	O	N		
Eurostopodus argus	Spotted Nightjar	OW	N		
Falco berigora	Brown Falcon	OW	N		
Falco cenchroides	Nankeen Kestrel	OW	N		
Falco longipennis	Australian Hobby	O	N		
Falco peregrinus	Peregrine Falcon	O	N		
Grallina cyanoleuca	Magpie-lark	OW	N		
Haliaeetus leucogaster	White-bellied Sea-Eagle	O	N	V	Ma
Haliastur sphenurus	Whistling Kite	OW	N		
Hamirostra melanosternon	Black-breasted Buzzard	O	N	V	
Hieraaetus morphnoides	Little Eagle	O	N	V	
Hirundo neoxena	Welcome Swallow	OW	N		
Lalage sueurii	White-winged Triller	OW	N		
Leipoa ocellata	Malleefowl	E	N	E1	V
Lichenostomus leucotis	White-eared Honeyeater	OW	N		
Lichenostomus ornatus	Yellow-plumed Honeyeater	OW	N		
Lichenostomus penicillatus	White-plumed Honeyeater	OW	N		
Lichenostomus plumulus	Grey-fronted Honeyeater	OW	N		

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Lichenostomus virescens	Singing Honeyeater	OW	N		
Lophochroa leadbeateri	Major Mitchell's Cockatoo	OW	N	V	
Lophoictinia isura	Square-tailed Kite	OW	N	V	
Malurus assimilis	Purple-backed Fairy-wren	OW	N		
Malurus leucopterus	White-winged Fairy-wren	OW	N		
Malurus splendens	Splendid Fairy-wren	OW	N		
Manorina flavigula	Yellow-throated Miner	OW	N		
Manorina melanocephala	Noisy Miner	OW	N		
Melanodryas cucullata	Hooded Robin	O	N	V	
Melithreptus brevirostris	Brown-headed Honeyeater	OW	N		
Merops ornatus	Rainbow Bee-eater	OW	N		Ma
Microeca fascinans	Jacky Winter	OW	N		
Milvus migrans	Black Kite	OW	N		
Myiagra inquieta	Restless Flycatcher	OW	N		
Northiella haematogaster	Blue Bonnet	OW	N		
Nymphicus hollandicus	Cockatiel	OW	N		
Ocyphaps lophotes	Crested Pigeon	OW	N		
Oreoica gutturalis	Crested Bellbird	OW	N		
Pachycephala rufiventris	Rufous Whistler	OW	N		
Pardalotus punctatus	Spotted Pardalote	OW	N		
Pardalotus striatus	Striated Pardalote	OW	N		
Passer domesticus	House Sparrow*	OW	N		
Pelecanus conspicillatus	Australian Pelican	OW	N		
Peltohyas australis	Inland Dotterel	O	N		
Petrochelidon ariel	Fairy Martin	OW	N		
Petrochelidon nigricans	Tree Martin	OW	N		
Petroica goodenovii	Red-capped Robin	OW	N		
Phalacrocorax carbo	Great Cormorant	OW	N		
Phalacrocorax melanoleucos	Little Pied Cormorant	OW	N		
Phalacrocorax varius	Pied Cormorant	OW	N		
Phaps chalcoptera	Common Bronzewing	OW	N		
Philemon citreogularis	Little Friarbird	OW	N		

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Platycercus elegans	Crimson Rosella	OW	N		
Plectorhyncha lanceolata	Striped Honeyeater	OW	N		
Podargus strigoides	Tawny Frogmouth	OW	N		
Polytelis anthopeplus	Regent Parrot	OW	N	E1	V
Pomatostomus ruficeps	Chestnut-crowned Babbler	OW	N		
Pomatostomus superciliosus	White-browed Babbler	OW	N		
Psephotus haematonotus	Red-rumped Parrot	OW	N		
Psephotus varius	Mulga Parrot	OW	N		
Purnella albifrons	White-fronted Honeyeater	OW	N		
Pyrrholaemus brunneus	Redthroat	OW	N	V	
Rhipidura leucophrys	Willie Wagtail	OW	N		
Smicrornis brevirostris	Weebill	OW	N		
Strepera versicolor	Grey Currawong	OW	N		
Struthidea cinerea	Apostlebird	OW	N		
Sturnus vulgaris	Common Starling*	OW	I		
Tadorna tadornoides	Australian Shelduck	OW	N		
Taeniopygia guttata	Zebra Finch	OW	N		
Todiramphus pyrrhopygius	Red-backed Kingfisher	OW	N		
Vanellus tricolor	Banded Lapwing	OW	N		
Mammals (26)					
Austronomus australis	White-striped Free-tailed Bat	W	N		
Bos taurus	Cattle*	O	I		
Capra hircus	Goat*	OW	I		
Chalinolobus gouldii	Gould's Wattled Bat	T	N		
Chalinolobus picatus	Little Pied Bat	T	N	**V**	
Equus caballus	Horse*	O	I		
Lepus europaeus	Brown Hare*	O	I		
Macropus fuliginosus	Western Grey Kangaroo	O	N		
Macropus robustus	Common Wallaroo	O	N		
Macropus rufus	Red Kangaroo	O	N		
Mus musculus	House Mouse	T	I		
Ningaui yvonneae	Southern Ningaui	T	N	**V**	

SCIENTIFIC NAME	COMMON NAME	OBSERVATION TYPE[1]	NATIVE (N) OR INTRODUCED (I)	BC ACT[2]	EPBC ACT[3]
Nyctophilus corbeni	Corben's Long-eared Bat	T	N	**V**	**V**
Nyctophilus geoffroyi	Lesser Long-eared Bat	T	N		
Oryctolagus cuniculus	Rabbit*	O	I		
Ovis aries	Sheep*	OW	I		
Ozimops petersi	Inland Free-tailed Bat	T	N		
Pseudomys bolami	Bolams Mouse	T	N	**E**	
Scotorepens greyii	Little Broad-nosed Bat	T	N		
Sminthopsis murina	Common Dunnart	T	N		
Tachyglossus aculeatus	Short-beaked Echidna	O	N		
Tadorna tadornoides	Australian Shelduck	O	N		
Trichosurus vulpecula	Common Brushtail Possum	O	N		
Vespadelus baverstocki	Inland Forest Bat	T	N	**V**	
Vespadelus vulturnus	Little Forest Bat	T	N		
Vulpes vulpes	Fox*	O	I		

(1) Observation Type, OW = Seen and Heard, O = Observed, T = Trapped, W = Heard, K = Dead, P = scat, FB = Burrow, E = Nest

(2) V= Vulnerable, E1 = Endangered under the *Biodiversity Conservation Act 2016* (BC Act)

(3) V = Vulnerable, Ma = Marine, M = Migratory under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)

* = introduced

APPENDIX E

MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE ASSESSMENT

APPENDIX E-1
COMMONWEALTH EPBC ACT ASSESSMENT OF SIGNIFICANCE

E-1.1 INTRODUCTION

The *Matters of National Environmental Significance Significant Impact Guidelines 1.1 EPBC Act* (Significant Impact Guidelines) is designed to inform proponents who propose to undertake an action (development), to decide whether they should submit a referral to DoAWE. The purpose of the significant impact assessments is to inform an EPBC Referral to the Commonwealth Minister of Environment to assess the Project's eligibility as a controlled action under the EPBC Act. Under the EPBC Act an action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on an MNES.

Tests of significance have been conducted for threatened species, populations and communities that were recorded in the proposal study area during field surveys or were identified as having a moderate or higher potential to occur in the proposal study area based on the presence of habitat. Those EPBC Act listed species specifically noted in the SEARs have also been assessed. For threatened biodiversity listed under the EPBC Act, significance assessments have been completed following the Significant Impact Guidelines. The Significant Impact Guidelines state that a 'significant impact' is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts. Importantly, for a significant impact to be likely, it is not necessary for a significant impact to have a greater than 50 per cent chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility. If there is scientific uncertainty about the impacts of an action and potential impacts are serious or irreversible, the precautionary principle is applicable.

The Significant Impact Guidelines provide definitions for specific terms used throughout the significant impact assessment criteria contained in the Significant Impact Guidelines as follows:

- population of a species
- important population
- habitat critical to the survival of a species or ecological community
- important habitat for migratory species
- ecologically significant proportion (migratory species)
- population of a migratory species
- invasive species.

These definitions are key considerations when conducting a significant impact assessment for threatened and migratory species listed under the EPBC Act. The definition for each is presented below.

E-1.1.1 POPULATION OF A SPECIES

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

E-1.1.2 IMPORTANT POPULATION

An '*important population*' is defined by the Significant Impact Guidelines as "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."

E-1.1.3 HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES OR ECOLOGICAL COMMUNITY

'*Habitat critical to the survival of a species*' is defined by the Significant Impact Guidelines as habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long-term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to:

- habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or
- habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

Critical habitat can be further explained as an identified area of viable habitat that contains habitat attributes that are essential for the conservation of a threatened species. These areas are typically under a regime of special protection and management to ensure the critical habitat remains a stronghold for the species to ensure its long-term survival and viability in the wild. Critical habitat may also include an area of land not currently occupied by the species but can act as a sanctuary by possessing the necessary whole of life cycle habitat attributes to facilitate the recovery of a declining population of the species.

E-1.1.4 IMPORTANT HABITAT FOR MIGRATORY SPECIES

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

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- habitat that is of critical importance to the species at particular life-cycle stages, and/or
- habitat utilised by a migratory species which is at the limit of the species range, and/or
- habitat within an area where the species is declining.

E-1.1.5 ECOLOGICALLY SIGNIFICANT PROPORTION (MIGRATORY SPECIES)

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).

E-1.1.6 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.

E-1.1.7 INVASIVE SPECIES

An *'invasive species'* is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

E-1.1.8 THREATENED FLORA SPECIES SUBJECT TO ASSESSMENT

Appendix A of the SEARs outlines an initial list of EPBC Act listed threatened flora species likely to be impacted by the action. Combined with database searches (BioNet, BAM-C and PMST), there is predicted habitat or identified known habitat within the proposal study area for 12 threatened flora species listed under the EPBC Act (refer to Appendix D-1). Of these, five have been identified to have a moderate likelihood of occurrence and were the subject of targeted surveys. Appendix D-1 provides a description of the habitat requirements for each EPBC Act listed species, and the reasoning for inclusion and exclusion of EPBC Act listed species in this assessment.

Details of the scope, timing and methodology of the targeted surveys used for EPBC Act listed threatened flora species and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements is provided in Section 5.2.1).

Of the five EPBC Act listed threatened flora species that were identified to have a moderate likelihood of occurrence and were the subject of targeted surveys, only one species: *Atriplex infrequens* (Vulnerable), was recorded during the targeted surveys that were completed for the project in May, July, and September 2020. This species was recorded from PCT 17 (refer to Section 6.2.1). *Atriplex infrequens* is therefore considered to be affected by the proposal. A significance assessment for this species has been completed following the Significant Impact Guidelines.

E-1.1.9 THREATENED FAUNA SPECIES SUBJECT TO ASSESSMENT

Appendix A of the SEARs outlines the original list of EPBC Act listed threatened fauna species likely to be impacted by the action. Combined with database searches (BioNet, BAM-C and PMST), there is predicted habitat or identified known habitat within the proposal study area for 37 threatened fauna species listed under the EPBC Act (refer to Appendix D-2). This includes four extinct mammal species. Of these, 13 terrestrial fauna have been identified to have a moderate likelihood of occurrence or higher and were the subject of targeted surveys. Appendix D-2 provides a description of the habitat requirements for each EPBC Act listed species, and the reasoning for inclusion and exclusion of EPBC Act listed species in this assessment.

Details of the scope, timing and methodology of the targeted surveys used for EPBC Act listed threatened fauna species and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements is provided in Section 5.2.2.

The 13 EPBC Act listed threatened fauna species that were identified to have a moderate likelihood of occurrence and were the subject of targeted surveys are outlined in Table E-1.1. Significance assessments for these species have been completed following the Significant Impact Guidelines.

Table E-1.1 Listed EPBC Act threatened fauna species considered for assessment

SCIENTIFIC NAME	COMMON NAME	EPBC ACT[1]	DETAILS	ASSESSMENT
Amphibians				
Litoria raniformis	Southern Bell Frog	V	Identified in the SEARs as a matter requiring further consideration.	Candidate species credit species. Predicted habitat occurs within PCT 11, PCT 13, and PCT 17 in the Robinvale Plains IBRA Subregion.
Birds				
Botaurus poiciloptilus	Australasian Bittern	E	Identified in the SEARs as a matter requiring further consideration.	Predicted ecosystem credit species. Habitat is present within PCT 11 in the Pooncarie-Darling IBRA Subregion. Habitat is present in PCT 11, PCT 13 and PCT 17 in the Robinvale Plains IBRA Subregion.
Calidris canutus	Red Knot	E	Identified in the BioNet search.	Mainly restricted to coastal environments. Rare occurrences cannot be discounted.
Falco hypoleucos	Grey Falcon	V	Identified by the BAM-C.	Predicted ecosystem credit species. Rare occurrences cannot be discounted. Habitat is present within PCT 11 in the Pooncarie-Darling IBRA Subregion. Habitat is present in PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 in the South Olary Plain IBRA Subregion, PCT 15, 19, 58, 166 in the Great Darling Anabranch IBRA Subregion, PCT 11, 15, 21, 63, 139, 154, 166 in the Pooncarie-Darling IBRA Subregion, and PCT 11, 13, 17, 19 and 216 in the Robinvale Plains IBRA Subregion.
Grantiella picta	Painted Honeyeater	V	Identified in the PMST, BioNet and BAM-C searches. Habitat occurs with proposal study area and similar habitat is associated with records in SA although there are no records locally.	Predicted ecosystem credit species. Habitat is present within PCT 15, 21, 58, 143 in the South Olary Plain IBRA Subregion.
Hirundapus caudacutus	White-throated Needletail	V	Identified in the BioNet search. Although local records are sparse, due to wide ranging habitats may occur in aerial habitats over the proposal study area on a seasonal basis.	Mainly restricted to coastal environments. Rare occurrences in the air cannot be discounted.

SCIENTIFIC NAME	COMMON NAME	EPBC ACT[1]	DETAILS	ASSESSMENT
Lathamus discolor	Swift Parrot	CE	Identified in the SEARs as a matter requiring further consideration.	Predicted ecosystem credit species. Suitable habitat occurs within PCT 11 in the Robinvale Plains IBRA Subregion. This species was recorded during the surveys.
Leipoa ocellata	Malleefowl	V	Identified in the SEARs as a matter requiring further consideration.	Predicted ecosystem credit species. Suitable habitat occurs within PCT 170, PCT 171, and PCT 172 in the South Olary Plain IBRA Subregion. This species was recorded during the surveys.
Limosa lapponica baueri	Bar-tailed Godwit (baueri), Western Alaskan Bar-tailed Godwit	V	Identified in the PMST search. May occur intermittently around salt-lakes and wetlands.	Predicted ecosystem credit species. Mainly restricted to coastal environments. Rare occurrences cannot be discounted.
Manorina melanotis	Black-eared Miner	E	Identified in the SEARs as a matter requiring further consideration.	Candidate species credit species. Potential habitat occurs within PCT 170, PCT 171, and PCT 172 in the South Olary Plain IBRA Subregion.
Pachycephala rufogularis	Red-lored Whistler	V	Identified in the SEARs as a matter requiring further consideration.	Predicted ecosystem credit species. Predicted habitat occurs within PCT 171 and PCT 172 in the South Olary Plain IBRA Subregion.
Polytelis anthopeplus monarchoides	Regent Parrot (eastern subspecies)	V	Identified in the SEARs as a matter requiring further consideration.	Candidate species credit species (breeding habitat) and Predicted ecosystem credit species. Predicted habitat occurs within PCT 15, PCT 58, PCT 170, and PCT 171 in the South Olary Plain IBRA Subregion. Predicted habitat occurs within PCT 15 and PCT 58 in the Great Darling Anabranch IBRA Subregion. Predicted habitat occurs within PCT 11 and PCT 15 in the Pooncarie Darling IBRA Subregion. Predicted habitat occurs within PCT 11 and PCT 13 in the Robinvale Plains IBRA Subregion.
Rostratula australis (syn. R. benghalensis)	Australian Painted Snipe (Painted Snipe)	E	Identified in the PMST, BioNet and BAM-C searches.	Predicted ecosystem credit species. Robinvale Plains. Predicted habitat occurs within PCT 11, 13, 17

SCIENTIFIC NAME	COMMON NAME	EPBC ACT[1]	DETAILS	ASSESSMENT
Mammals				
Nyctophilus corbeni (syn. N. timoriensis)	South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)	V	Identified in the SEARs as a matter requiring further consideration	Predicted ecosystem credit species. Recorded within PCT170 during the surveys. Predicted habitat occurs within PCT 21, PCT 58, PCT 170, PCT 171 and PCT 221 in the South Olary Plain IBRA Subregion. Predicted habitat occurs within PCT 58 in the Great Darling Anabranch IBRA Subregion. Predicted habitat occurs within PCT 21 and PCT 139 in the Pooncarie Darling IBRA Subregion. Predicted habitat occurs within PCT 11 in the Robinvale Plains IBRA Subregion.

(1) Threat status under the EPBC Act: V = vulnerable, E = endangered, CE = critically endangered

E-1.1.10 THREATENED AQUATIC SPECIES SUBJECT TO ASSESSMENT

The following three EPBC Act listed threatened aquatic species have been considered to have moderate likelihood of occurrence:

- Murray Hardyhead (*Craterocephalus fluviatilis*) – listed as Endangered under EPBC Act
- Murray Cod (*Maccullochella peelii*) – listed as vulnerable under EPBC Act
- Silver Perch (*Bidyanus bidyanus*) – listed as Critically Endangered under EPBC Act.

The proposal study area traverses Local Government Areas that contain mapped key fish habitats (Strahler 4/5 Order streams) and DPI mapped habitat for the Silver Perch. However, impacts to aquatic habitats are likely to be minimal (see Section 9.8). Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts will would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions. Nevertheless, significance assessments for these three threatened aquatic species have been completed following the Significant Impact Guidelines.

E-1.1.11 MIGRATORY SPECIES SUBJECT TO ASSESSMENT

Based on the results of the database searches, 26 listed migratory species may occur in the broader locality (refer to Appendix D-2). The following EPBC Act listed Migratory species are considered moderately likely to occur in, or adjacent to, the proposal study area based on the presence of suitable habitats:

- Migratory marine birds – Fork-tailed Swift
- Migratory terrestrial species – White-throated Needletail
- Migratory wetland species – Common Sandpiper, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Pectoral Sandpiper, Little Stint, Red-necked Stint, Long-toed Stint, Greater Sand Plover, White-winged Black Tern, Latham's Snipe, Caspian Tern, Broad-billed Sandpiper, Bar-tailed Godwit, Bar-tailed Godwit (baueri), Black-tailed Godwit, Little Curlew, Glossy Ibis, Pacific Golden Plover, Wood Sandpiper, Common Greenshank and Marsh Sandpiper.

Listed Migratory species that were recorded outside of the proposal study area in Chowilla regional reserve in SA included the Migratory wetland species Sharp-tailed Sandpiper, Pectoral Sandpiper, Red-necked Stint, and Greater Sand Plover. The Caspian Tern was recorded in local riparian and wetland habitats near the proposal study area.

Significance assessments for these listed Migratory species have been completed following the Significant Impact Guidelines.

E-1.2 SIGNIFICANCE ASSESSMENTS

E-1.2.1 *ATRIPLEX INFREQUENS* (A SALTBUSH)

Atriplex infrequens is listed as Vulnerable under the EPBC Act and the BC Act.

E-1.2.1.1 DESCRIPTION

Atriplex infrequens is a small spreading to erect perennial saltbush that is distinguished by its small rhombic shaped fruiting bracteoles that are generally less than two millimetres (PlantNET 2020). The species is currently only known from NSW where it is confined to the far north and south western plains regions. Records of *Atriplex infrequens* occur east of Tibooburra, southeast of Brewarrina, near Wilcannia and isolated collections in the Pooncarie region. The southern limit of known distribution of *Atriplex infrequens* is a population that occurs on the southern side of Lake Victoria.

In 2018–2019 a Saving Our Species research action was undertaken to better understand the distribution of *Atriplex infrequens.* The action involved undertaking targeted surveys at known populations across the known distribution of the species. A report card issued on the research outcomes concluded that in the northern area bounded by the locality of Bourke, Wanaaring, and Tilpa no plants were recorded. Surveys conducted at the southern limit of distribution at Lake Victoria recorded about 1,900 individuals (Saving Our Species 2019).

Within the proposal study area, a new population of *Atriplex infrequens* was recorded on the Murray River Floodplain from the Trentham Cliff area south of the Sturt Highway. The species was growing in a Lignum Swamp (PCT 17) on grey clays associated with prior flood channels of the Murray River. A population of more than 100 individuals was recorded, all of which were restricted to an area of PCT 17 apart from eight individuals that where recorded growing along the edge of an existing access track. *Atriplex infrequens* was observed growing with *Duma florulenta* (Lignum) along with other saltbush species such as *Atriplex lindleyi* (Eastern Flat-top Saltbush), *Atriplex pseudocampanulata* (Mealy Saltbush), and *Atriplex holocarpa* (Pop Saltbush). *Atriplex infrequens* was initially recorded on 3 May 2020 when undertaking a BAM plot survey of PCT 17 (refer to Q33 in Appendix C-3). Specimens recorded at the time exhibited fruiting bracteoles and were retained in a field plant press for herbarium verification. *Atriplex infrequens* was confirmed by the National Herbarium of NSW under BIS 21400 on 28 July 2020.

E-1.2.1.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Approved Conservation Advice for Atriplex infrequens* (Department of the Environment, Water, Heritage and the Arts, 2008) was reviewed as part of this assessment.
- The SPRAT database indicates that listing assessment information may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for competition and land degradation by rabbits (Department of the Environment and Energy, 2016a).
- There are no specific Commonwealth survey guidelines for *Atriplex infrequens.*

E-1.2.1.3 SPECIFIC IMPACTS

The proposed action will consist of a maximum cleared area for a single tower footprint or laydown area of <0.5 ha, and the easement width of the transmission line would be a maximum of approximately 80 meters (with full clearing not always being required). The transmission line will be utilising existing cleared transmission tracks and micro-siting towers will be placed in areas to avoid impacting known plants, and where possible, placed in already disturbed areas.

The direct impacts of the proposal on *Atriplex infrequens* may include removal of approximately 0.26 ha of habitat (see Section 9.1.3). The area of potential impact for *Atriplex infrequens* is mapped in Appendix D-3 and Appendix E-2. Table E-1.2 outlines the specific impacts to habitat for this species.

Table E-1.2 Specific impacts to Atriplex infrequens from the proposal

VEGETATION TYPE	PROPOSAL STUDY AREA	INDICATIVE DISTURBANCE AREA	PROPORTIONAL IMPACT TO KNOWN HABITAT
PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (derived)	0.04 ha	0.04 ha	100%
PCT13 – Black Box – Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	0.87 ha	0.18 ha	21%
PCT17 – Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion) (modified)	0.65 ha	0.04 ha	6%
Total	**1.55 ha**	**0.26 ha**	**17%**

E-1.2.1.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The population of *Atriplex infrequens* within the proposal study area is at the south-eastern extent of the known distribution of the species. This is a new previously unknown population of *Atriplex infrequens* from the Trentham Cliff area and a relatively large population of more than 100 individuals was recorded. As such, this is likely to be an important population.

E-1.2.1.5 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**

The risk of extinction of the local *Atriplex infrequens* population will increase if anything reduces its population size or reproductive success. The lifecycle of the local *Atriplex infrequens* population within the proposal study area is dependent on the habitat that is present within the proposal study area. It is however unlikely that the population would become extinct due to the proposal. Approximately 0.26 ha of *Atriplex infrequens* habitat would be removed within the proposal area which represents approximately 17% of the mapped local habitat. As such, there will be a decrease in the size of the population. It is likely however that the population is not restricted to the proposal study area and is likely to be larger than currently known given the extent of similar adjacent habitat on the Murray River floodplain.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

The project is likely to reduce the area of occupancy for this population by approximately 0.26 ha. This would be a 17% decrease in area. It is likely however that the population is not restricted to the proposal study area and is likely to be larger than currently known given the extent of similar adjacent habitat on the Murray River floodplain.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

The proposal study area is located within a landscape that has been, and continues to be, severely fragmented by agriculture and existing infrastructure. However, given the nature of the proposal some level of further habitat fragmentation will occur along the proposal study area. The habitat for the *Atriplex infrequens* population on the Murray River floodplain at Trentham Cliffs is currently fragmented at a local scale by the existing powerline easement and the various vehicle tracks that are present. At a landscape scale the habitat for the *Atriplex infrequens* population in this area is part of a relatively large tract of vegetation that occupies several hundred hectares on the eastern bank of the Murray River.

Any further fragmentation caused by the proposal is not likely to be of a scale large enough to break the existing population into two or more populations. The level of fragmentation caused by the proposal would not be great enough to prevent wind pollination within the remaining plants in the *Atriplex infrequens* population or dispersal of seed by wind and/or water.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Habitat critical to the survival of *Atriplex infrequens* has not been identified and listed on the Register of Critical Habitat maintained by the minister under the EPBC Act. There is no adopted or made Recovery Plan for this species so critical habitat has not been identified in this manner. The *Approved Conservation Advice for Atriplex infrequens* (Department of the Environment, Water, Heritage and the Arts, 2008) indicates that very little ecological information is available for this species, so its critical habitat components can only be speculated as relatively undisturbed and ungrazed drainage lines and flats.

The impacted population of *Atriplex infrequens* is at the south-eastern extent of the known distribution of the species. This is a new previously unknown population of *Atriplex infrequens* from the Trentham Cliff area and is relatively large population of more than 100 individuals. As *Atriplex infrequens* is a data-deficient species in NSW and is little known, the population to be impacted by the proposal may occur in habitat that is critical to the survival of the species. However, the habitat is not undisturbed and is heavily grazed.

Approximately 0.26 ha of *Atriplex infrequens* habitat would be removed within the proposal area which represents approximately 17% of the mapped local habitat. However, full clearing of the easement is not always being required and existing cleared access tracks will be utilized. Micro-siting of towers will be undertaken so that they are placed in areas to avoid impacting known plants.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

The level of impact caused by the proposal would not be great enough to prevent wind pollination within the remaining plants in the *Atriplex infrequens* population or dispersal of seed by wind and/or water. As such, the breeding cycle will not be disrupted and the remaining plants will be able to breed.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

Approximately 0.26 ha of *Atriplex infrequens* habitat would be removed within the proposal area which represents approximately 17% of the mapped local habitat. It is likely however that the population is not restricted to the proposal study area and is likely to be larger than currently known given the extent of similar adjacent habitat on the Murray River floodplain.

The transmission line will be utilising existing cleared access tracks and towers will be placed in areas to avoid impacting known plants, and where possible, placed in already disturbed areas. The small extent of habitat removal is not considered likely to be of a sufficient magnitude to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline. A significant proportion of the known habitat, and *Atriplex infrequens* population, will remain in the proposal study area and there are likely to be areas of unsurveyed suitable habitat in the surrounding area on the Murray River floodplain that may contain this species. Overall, the proposal would not result in the extinction of this population given the small extent of direct impact and the implementation of mitigation measures to avoid any indirect impacts or accidental removal or damage to plants and habitat.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

Invasive species including weeds and pests are already established in the habitat. The mitigation measures for the proposal include the implementation of a weed and pest management measures and installation of vehicle wash stations to limit the importation and spread of weeds, pathogens and disease. Sediment and control measures will be implemented to minimise sedimentation and hydrological impacts. It is therefore unlikely that the proposal would result in any invasive species becoming established in the habitat.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no known diseases causing potential species decline to *Atriplex infrequens*. The mitigation measures for the proposal include the installation of vehicle wash stations to limit the importation and spread of pathogens and disease.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

There is no adopted or made Recovery Plan for this species. *Atriplex infrequens* is a data-deficient species in NSW as little is known about its distribution, general ecology or the management techniques required to secure it in the wild. The Species Action Statement for *Atriplex infrequens* under the NSW Saving Our Species program aims to address key knowledge gaps for this species, which once resolved, can inform effective management of this species. *Atriplex infrequens* is managed in NSW through:

- undertaking targeted surveys across entire predicted range to locate new populations and re-confirm status of known populations. Collect data on area of occupancy, population status, habitat and undertake threat assessment
- investigating life history dynamics; including seed set, seed viability, germination and seedling survival.
- conducting experimental research into the relative impacts of grazing and fire on the species survival and recruitment.

The proposed action would not interfere with the Saving Our Species program.

- **CONCLUSION**

The proposal will have an impact will occur to *Atriplex infrequens* and its habitat. Approximately 0.26 ha of *Atriplex infrequens* habitat would be removed within the proposal area which represents approximately 17% of the mapped local habitat. It is likely however that the *Atriplex infrequens* population is not restricted to the proposal study area and is likely to be larger than currently known given the extent of similar adjacent habitat on the Murray River floodplain. The context and intensity of the predicted impact to *Atriplex infrequens* would not be important, notable, or of consequence as the predicted impact is small in magnitude. Importantly, the *Atriplex infrequens* population will remain in the habitat. The ground layer vegetation will remain within the easement and the transmission line will be utilising existing cleared access tracks. The towers will be placed in areas to avoid impacting known plants, and where possible, placed in already disturbed areas. Micro siting of various proposal elements should be successful in avoiding and minimising impacts to *Atriplex infrequens*. Mitigation measures to prevent weed invasion, particularly along access tracks, and targeted pre-clearing surveys to identify and avoid plants and install exclusion zones will occur before construction commences.

E-1.2.1.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

For each of the EPBC Act listed threatened species and communities and migratory species likely to be impacted by the action the EIS must provide a separate*:*

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no adopted or made Recovery Plan for this species. *Atriplex infrequens* is a data-deficient species in NSW as little is known about its distribution, general ecology or the management techniques required to secure it in the wild. There are no specific Commonwealth guidelines or policy statements for *Atriplex infrequens*. The *Approved Conservation Advice for Atriplex infrequens* (Department of the Environment, Water, Heritage and the Arts, 2008) outlines habitat for this species as follows:

- Atriplex infrequens occurs in western NSW, within the northern and southern far western plains regions. It is not known to occur within a conservation reserve (Briggs & Leigh, 1996) and has been recorded from the drier regions of the Bourke District, such as Lake Parnamaroo in 1860; Delalah Downs, undated; and Tarcoola in 1920; and from the Murray-Darling Depression (Wilson, 1984; Morton et al., 1995; Ayers et al., 1996). This species occurs within the Lower Murray Darling and Western (NSW) Natural Resource Management Regions.

  The known habitat of *A. infrequens* is associated with broad drainage tracts, clay flats and possibly occasionally inundated habitats. Very little ecological information is available for this species, so its critical habitat components can only be speculated as relatively undisturbed and ungrazed drainage lines and flats (DECC, 2008).

  The distribution of this species overlaps with the following EPBC Act-listed threatened ecological communities:

  - the community of native species dependent on natural discharge of groundwater from the Great Artesian Basin, and
  - Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions.

Within the proposal study area, a new population of *Atriplex infrequens* was recorded on the Murray River Floodplain from the Trentham Cliff area south of the Sturt Highway. The species was growing in a Lignum Swamp (PCT 17) on grey clays associated with prior flood channels of the Murray River. A population of more than 100 individuals was recorded, all of which were restricted to an area of PCT 17 apart from eight individuals that where recorded growing along the edge of an existing access track. *Atriplex infrequens* was observed growing with *Duma florulenta* (Lignum) along with other saltbush species such as *Atriplex lindleyi* (Eastern Flat-top Saltbush), *Atriplex pseudocampanulata* (Mealy Saltbush), and *Atriplex holocarpa* (Pop Saltbush).

The habitat map showing the location of *Atriplex infrequens* and its habitat is provided in Appendix D-3 and Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

There are no specific Commonwealth survey guidelines for *Atriplex infrequens*. The field survey techniques used to undertake targeted seasonal surveys were in general accordance with the *NSW Guide to Surveying Threatened Plants* (Office of Environment and Heritage, 2016) and *Surveying threatened plants and their habitats; NSW guide for the BAM* (Department of Planning, Industry and Environment, 2020). It should be noted that the later field survey guidelines published by the Department of Planning, Industry and Environment were released during and following most of the survey period for this proposal. The methods utilised to survey for *Atriplex infrequens* are outlined in Section 3.7 of the BDAR. Surveys involved using a two-phase approach:

- Firstly, the survey was designed to maximise the likelihood of detection of targeted threatened plant species by:
  - identifying drought and non-drought affected species
  - grouping those species considered likely to be reliably detected through survey according to optimal months of survey and associated habitat.
- Secondly, field survey techniques were assigned to areas of associated habitat based on number of associated candidate species, likelihood to support candidate species, condition and presence of associated microhabitats. Techniques included:
  - parallel field traverses
  - representative parallel field traverses (one-kilometre sections)
  - representative parallel field traverses (500 metre sections)
  - parallel field traverses of microhabitats.

A summary of the field survey effort completed for *Atriplex infrequens* is as follows:

- Representative parallel field traverses (PCT 153, PCT 166, PCT 170 & PCT 216):
  - 26–30 Nov 2019: Species not recorded during traverses.
  - 20–22 Dec 2019: Species not recorded during traverses.
  - 18–21 Feb 2020: Species not recorded during traverses.
  - 29–31 Apr 2020 (Following above average rainfall): Species not recorded during traverses.
  - 2–9 Sept 2020 (Following above average rainfall): Species not recorded during traverses (apart from relocating known plants in PCT 17).
- Active searches during BAM plot surveys:
  - 1–6 May 2020: Recorded species from Q33.
  - 15–22 July 2020. Species recorded from PCT 17.
- Microhabitat searches of PCT 17:
  - 2 May 2020: Recorded species from Q33 and surrounding associated habitat. Plant material collected including fruiting bracteoles for positive identification. 4 May 2020 plant material forwarded to the National Herbarium of NSW.
  - 22 July 2020: Recorded species from PCT 17. Additional plant material collected including fruiting bracteoles. 31 Jul 2020 additional plant material forwarded to the National Herbarium of NSW.
  - 5 Sept 2020: Relocated previously recorded plants in PCT 17 and additional plant material collected for identification.
- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The direct impacts of the proposal on *Atriplex infrequens* may include removal of approximately 0.26 ha of habitat (see Section 9.1.3). The area of potential impact for *Atriplex infrequens* is mapped in Appendix D-3. Table E-1.2 outlines the specific impacts to habitat for this species.

Figure E-1.1 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The population of *Atriplex infrequens* within the proposal study area is at the south-eastern extent of the known distribution of the species. This is a new previously unknown population of *Atriplex infrequens* from the Trentham Cliff area (east of Mildura). Potential habitat is widespread but known occurrences of the species are rare.

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Regarding specific measures for *Atriplex infrequens*, the following relevant mitigation measures are recommended for any related residual impacts to the species:

- positioning of the indicative disturbance area to co-locate with the existing Broken Hill to Buronga 220 kV electrical infrastructure to avoid impacts on individuals of the Vulnerable flora species *Atriplex infrequens*
- establishment of no-go zones to protect threatened flora populations that have a high susceptibility to trampling and compaction.

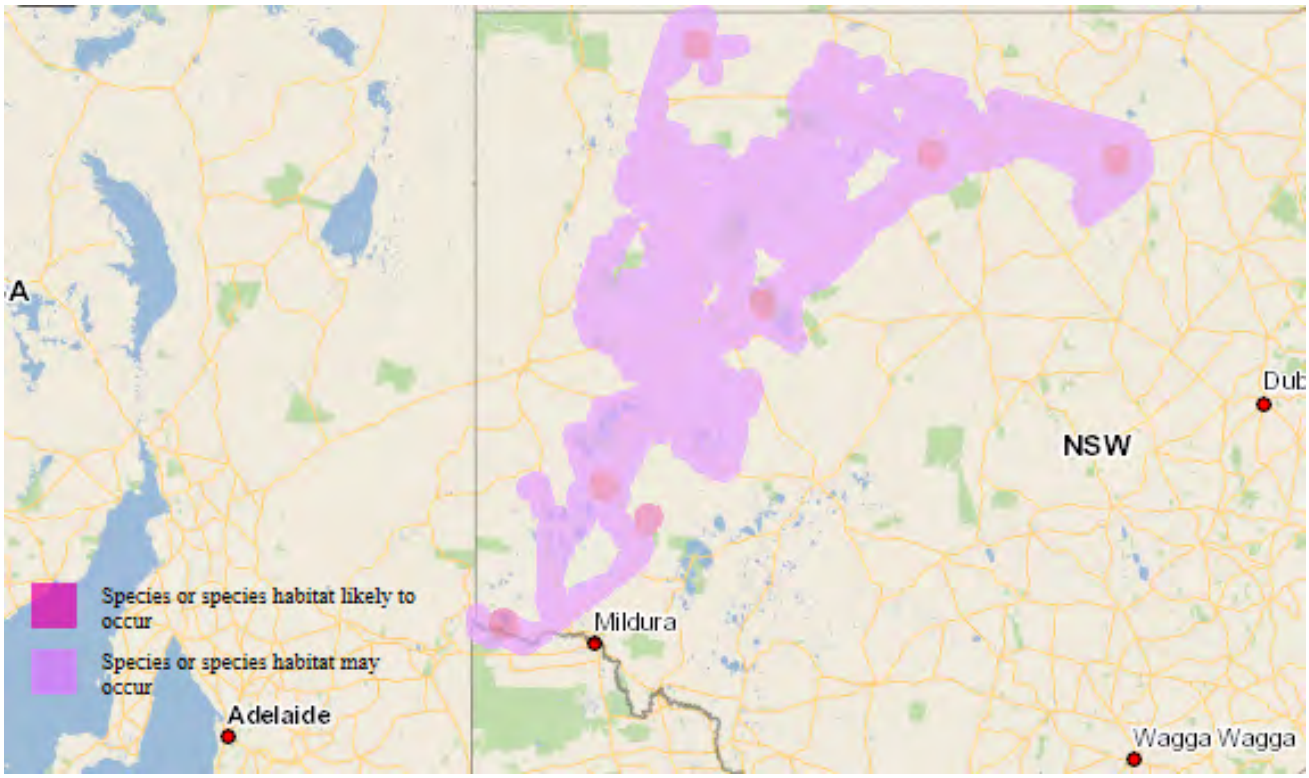

Figure E-1.1 Current distribution map for Atriplex infrequens taken from the SPRAT

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to *Atriplex infrequens* is estimated at 0.26 ha of habitat removal.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR. Nine species credits are required to offset the residual impacts to *Atriplex infrequens*.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.2 SOUTHERN BELL FROG (*LITORIA RANIFORMIS*)

The Southern Bell Frog is listed as Vulnerable under the EPBC Act and Endangered under the BC Act.

E-1.2.2.1 DESCRIPTION

Southern Bell Frog is one of the largest frog species in Australia. Currently, the species is known to exist only in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. This species is usually found in or around permanent or ephemeral Black Box/Lignum/Nitre Goosefoot swamps, Lignum/Typha swamps and River Red Gum swamps or billabongs along floodplains and river valleys. They are also found in irrigated rice crops, particularly where there is no available natural habitat.

Breeding occurs during the warmer months and is triggered by flooding or a significant rise in water levels. The species has been known to breed anytime from early spring through to late summer/early autumn (Sept to April) following a rise in water levels.

E-1.2.2.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- There is no approved Conservation Advice for this species.
- There is no Listing Advice for this species.
- The *National Recovery Plan for the Southern Bell Frog Litoria raniformis* (Clemann & Gillespie, 2012) was reviewed as part of this assessment.
- The Background Paper to the EPBC Act Policy Statement 3.14: Significant Impact Guidelines for the vulnerable growling grass frog (Litoria raniformis) (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009a) was reviewed as part of this assessment.
- The *EPBC Act Policy Statement 3.14: Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009b) was reviewed as part of this assessment.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for infection of amphibians with chytrid fungus resulting in chytridiomycosis (Department of the Environment and Energy, 2016b).

Relevant survey guidelines for this species include:

- Survey Guidelines for Australia's Threatened Frogs. EPBC Act survey guidelines 6.3 (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.2.3 SPECIFIC IMPACTS

Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River.

Importantly, the proposal will not exceed any of the identified significant impact thresholds as outlined in the *EPBC Act Policy Statement 3.14: Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009b) as follows:

- The proposal will not result in the permanent removal or degradation of terrestrial habitat that would result in the loss of dispersal or overwintering opportunities for an important population. The current dispersal or overwintering opportunities will still exist adjacent to the Murray River once the proposal has been built.
- There would be no alteration of aquatic vegetation diversity or structure.
- There would be no alteration to wetland hydrology, diversity and structure.
- There would be no introduction of predatory fish and/or disease agents due to implementation of mitigation measures.
- There would be no net reduction in the number and/or diversity of water bodies available to an important population.
- There would be no removal or alteration of available terrestrial or aquatic habitat corridors (including alteration of connectivity during flood events).
- There would be no construction of physical barriers to movement between water bodies, such as roads or buildings. Existing access tracks will be used.

E-1.2.2.4 IS THIS PART OF AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the Significant Impact Guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

There are species records within proposal study area and locality (EES, 2020). Currently, this species is known only to exist in isolated populations in the Coleambally Irrigation Area, the Lowbidgee floodplain and around Lake Victoria. There are five priority Saving our Species management sites that have been identified in NSW for this species. If recorded within the proposal study area, this species would not be at the limit of its known range. However, any breeding population in NSW would be likely be considered important for breeding and maintaining genetic diversity. Therefore, the population subject to this assessment is part of an important population given the limited range and the fragility of the species.

As such, if a population is recorded using the habitat within the proposal study area, it should be assumed to be an important population.

E-1.2.2.5 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**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to significantly decrease the size of any important population. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. There will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species. As such, the proposal is considered unlikely to reduce the area of the occupancy of any important population.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. No fragmentation of water bodies or adjacent terrestrial habitats would occur, and the population would not be fragmented into two or more populations.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat has been listed for this species under the EPBC Act. Habitat critical to the survival of the Southern Bell Frog differs throughout its range. In disturbed areas it commonly occurs in artificial waterbodies such as farm dams, irrigation channels, irrigated rice crops and disused quarries; particularly where natural habitat is no longer available. The proposal study area does not include any suitable waterbodies so the habitat to be impacted Is not considered critical to the survival of this species.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Southern Bell Frogs generally breed between November and March, following local flooding and a marked rise in water levels from rain, which triggers calling in breeding males. Breeding usually occurs in still or slow-moving water. Most breeding sites located in recent surveys in NSW were overflow areas, for example, billabongs or levee swamps.

No overflow areas will be directly impacted so it is considered unlikely that the action would adversely disrupt the breeding cycle of any important population of the species. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

This species is susceptible to predation from Plague Minnow (*Gambusia holbrooki*), mitigation measures will aim at controlling and preventing the introduced fish species into in Southern Bell Frog habitat.

It is recommended that mitigation measures include the implementation of a weed and pest management plans, installation of vehicle wash stations to limit the spread of weeds, pathogens and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occur within or near this species habitat, to minimise sedimentation and hydrological impacts.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

This species is susceptible to Amphibian Chytrid Fungus (*Batrachochytrium dendrobatidis*), which has been identified as the cause of population decline for this species and many others along the eastern ranges. Mitigation measures such as wash down areas and hygiene protocols to prevent contamination and minimising the spread of disease would be adhered too.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The *National Recovery Plan for the Southern Bell Frog Litoria raniformis* (Clemann & Gillespie, 2012) outlines the following specific objectives for recovery of the Southern Bell Frog:

1. Secure extant populations of Southern Bell Frogs, particularly those occurring in known breeding habitats, and improve their viability through increases in size and/or area of occurrence.
2. Determine distribution, biology and ecology of the Southern Bell Frog, and identify causes of the decline of the species across its geographic range.
3. Address known or predicted threatening processes and implement appropriate management practices where possible to ensure that land use activities do not threaten the survival of the Southern Bell Frog.
4. Increase community awareness of and support for Southern Bell Frog conservation.

The proposal will not interfere with any of the recovery actions that have been identified to meet the specific objectives outlined above.

- **CONCLUSION**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

Given that there would be no direct impact to waterbodies and mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River it is unlikely that the proposed action would have significant impact on the species. Importantly, the proposal will not exceed any of the identified significant impact thresholds as outlined in the *EPBC Act Policy Statement 3.14: Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009b).

E-1.2.2.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no approved Conservation Advice for this species. There is no Listing Advice for this species. The *National Recovery Plan for the Southern Bell Frog Litoria raniformis* (Clemann & Gillespie, 2012) indicates that habitat critical to the survival of the Southern Bell Frog differs throughout its range. Populations from the north and west occur in swamps dominated by River Red Gums *Eucalyptus camaldulensis*, Lignum and Typha, and Black Box (*Eucalyptus largiflorens*)/ Lignum/Nitre Goosefoot (*Chenopodium nitrari*aceum) and will also occur in irrigated rice crops (Clemann & Gillespie, 2012). Critical features of these latter habitat types appear to be that they are large, continuous areas containing both permanent and ephemeral waterbodies that undergo regular flooding and are surrounded by areas containing suitable refugia in the form of ground debris, vegetation cover and cracking soils (Clemann & Gillespie, 2012). The key ecological requirements of the species are outlined in the *Background Paper to the EPBC Act Policy Statement 3.14: Significant Impact Guidelines for the vulnerable growling grass frog (Litoria raniformis)* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009a) and the *EPBC Act Policy Statement 3.14: Significant impact guidelines for the vulnerable growling grass frog (Litoria raniformis)* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2009b).

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened frog surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Frogs. EPBC Act survey guidelines* 6.3 (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. Opportunistic surveys of wetlands were undertaken, and call playback was also undertaken when conditions were suitable. The survey effort for Southern Bell Frog is outlined in Table E-1.3.

Comprehensive survey for this species during appropriate conditions could not be undertaken. As such, using a precautionary approach, this species is assumed to be present in PCT 11, PCT 13 and PCT 17) in the Robinvale Plains IBRA Subregion.

Table E-1.3 Summary of survey effort for Southern Bell Frog

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Amphibians	Assessment of wetland habitats.	12-person hours of opportunistic surveys	Oct – Feb	Oct – Nov 2019
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Amphibians	Targeted surveys and call playback during suitable conditions	Habitat assessments & 12-person hours of opportunistic surveys	Oct – Feb or during significant rainfall events	Oct – Nov 2019

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

Figure E-1.2 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. Any population of Southern Bell Frog within the proposal study area would be near the north-western extent of the known distribution of the species. Potential habitat is widespread but known occurrences of the species are rare.

Figure E-1.2 Current distribution map for Southern Bell Frog taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for Southern Bell Frog are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

No residual impact to the Southern Bell Frog is expected.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.3 AUSTRALASIAN BITTERN (*BOTAURUS POICILOPTILUS*)

The Australasian Bittern is listed as Endangered under the EPBC Act and the BC Act.

E-1.2.3.1 DESCRIPTION

The Australasian Bittern occurs in Australia, New Zealand and New Caledonia. In Australia, they occur from south-east Queensland to south-east Australia, Tasmania and the south-west of Western Australia. The Australian population size is estimated at between 250 and 800 individuals (2010 data) (Threatened Species Scientific Committee, 2011b).

The preferred habitat includes wetlands with tall vegetation, including permanent and seasonal freshwater habitats dominated by sedges, rushes, reeds, or cutting grass are preferred, with species such as *Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus, and Gahnia* growing over a muddy or peaty substrate (Threatened Species Scientific Committee, 2011b).

The Australasian Bittern forages in still, shallow water up to 0.3 metres deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water (Threatened Species Scientific Committee, 2011b). Solitary pairs breed in deep, densely vegetated swamps, building a next just above the water level typically in shrubs standing in water within screening reeds (Morcombe *et al.*, 2011).

Threats to the Australasian Bittern include:

- reduction in extent and quality of habitat due to the diversion of water away from wetlands, and drainage of swamps
- land clearing for urban and agricultural development causing loss or alteration of wetland habitats
- peat mining
- predation by foxes and cats
- reduced water quality as a result of increasing salinity, siltation and pollution
- overgrazing by livestock and detrimental fire regimes (Threatened Species Scientific Committee, 2011b).

Atlas of Living Australia and BioNet species records indicate some scattered species records near the Murray River between Wentworth, Mildura and Buronga. This species is cryptic and primarily solitary and sedentary, occasionally dispersing nocturnally.

E-1.2.3.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Botaurus poiciloptilus Australasian Bittern* (Threatened Species Scientific Committee, 2019a) was reviewed as part of this assessment.
- The *Commonwealth Listing Advice on Botaurus poiciloptilus (Australasian Bittern)* (Threatened Species Scientific Committee, 2011) provides a similar habitat description was reviewed as part of this assessment.
- There is no adopted or made Recovery Plan for this species.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for predation by feral cats (Department of the Environment, 2015a).
- Threat abatement plan for predation by the European red fox (Department of the Environment, Water, Heritage and the Arts, 2008b).

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.3.3 SPECIFIC IMPACTS

Habitat is present within PCT 11 in the Pooncarie-Darling IBRA Subregion. Habitat is present in PCT 11, PCT 13 and PCT 17 in the Robinvale Plains IBRA Subregion. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River.

E-1.2.3.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to significantly decrease the size of any important population. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. There will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species. As such, the proposal is considered unlikely to reduce the area of the occupancy of any important population.

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. No fragmentation of water bodies or adjacent terrestrial habitats would occur, and the population would not be fragmented into two or more populations. Given the ability of this species to disperse over these cleared areas, is it considered unlikely that the action would fragment an existing population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat has been listed for this species under the EPBC Act. The proposal study area does not include any suitable waterbodies so the habitat to be impacted Is not considered critical to the survival of this species.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

No waterbodies will be directly impacted so it is considered unlikely that the action would adversely disrupt the breeding cycle of any important population of the species. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A CRITICALLY ENDANGERED OR ENDANGERED SPECIES BECOMING ESTABLISHED IN THE ENDANGERED OR CRITICALLY ENDANGERED SPECIES' HABITAT**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no known diseases causing potential species decline to the Australasian Bittern.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

There is no adopted or made Recovery Plan for this species. The proposed action would not interfere with the NSW Saving Our Species recovery strategy, and the proposal study area does not occur within a priority management area for the species. As such, the proposed action is unlikely to interfere with the recovery of the species.

- **CONCLUSION**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

Given that there would be no direct impact to waterbodies and mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River it is unlikely that the proposed action would have significant impact on the species.

E-1.2.3.5 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

The *Conservation Advice Botaurus poiciloptilus Australasian Bittern* (Threatened Species Scientific Committee, 2019a) states that given that the Australasian Bittern is presumed to have undergone a severe reduction in numbers, based on historic habitat loss and degradation across the core part of its range, all natural habitat (including constructed wetlands with suitable habitat) in which the Australasian Bittern is known or likely to occur should be considered critical to the survival of the species. The Australasian Bittern occurs mainly in freshwater wetlands and, rarely, in estuaries or tidal wetlands and favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water (Threatened Species Scientific Committee, 2019). It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds (e.g. *Phragmites, Cyperus, Eleocharis, Juncus, Typha, Baumea, Bolboschoenus*) or cutting grass (*Gahnia*) growing over a muddy or peaty substrate (Threatened Species Scientific Committee, 2019). The *Commonwealth Listing Advice on Botaurus poiciloptilus (Australasian Bittern)* (Threatened Species Scientific Committee, 2011) provides a similar habitat description.

Owing to the small total number of Australasian Bitterns and the significant observed declines in both total numbers and the species' extent of occurrence all populations should be considered important (Threatened Species Scientific Committee, 2019).

There is no adopted or made Recovery Plan for this species.

Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Australasian Bittern is outlined in Table E-1.4.

Table E-1.4 Summary of survey effort for Australasian Bittern

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Wetland Birds	Targeted wetland surveys and habitat assessments	8 x 20 min/2 ha formal bird surveys 39.5-person hours of opportunistic surveys	All year – where suitable conditions occur	Oct – Nov 2019; July 2020
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Wetland Birds	Targeted wetland surveys and habitat assessments	39.5-person hours of opportunistic surveys 8 x 20 min/2 ha formal bird surveys	All year	Oct – Nov 2019; July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

Figure E-1.3 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. Any population of Australasian Bittern within the proposal study area would be near the western extent of the known distribution of the species in NSW. Potential habitat is widespread but known occurrences of the species are rare.

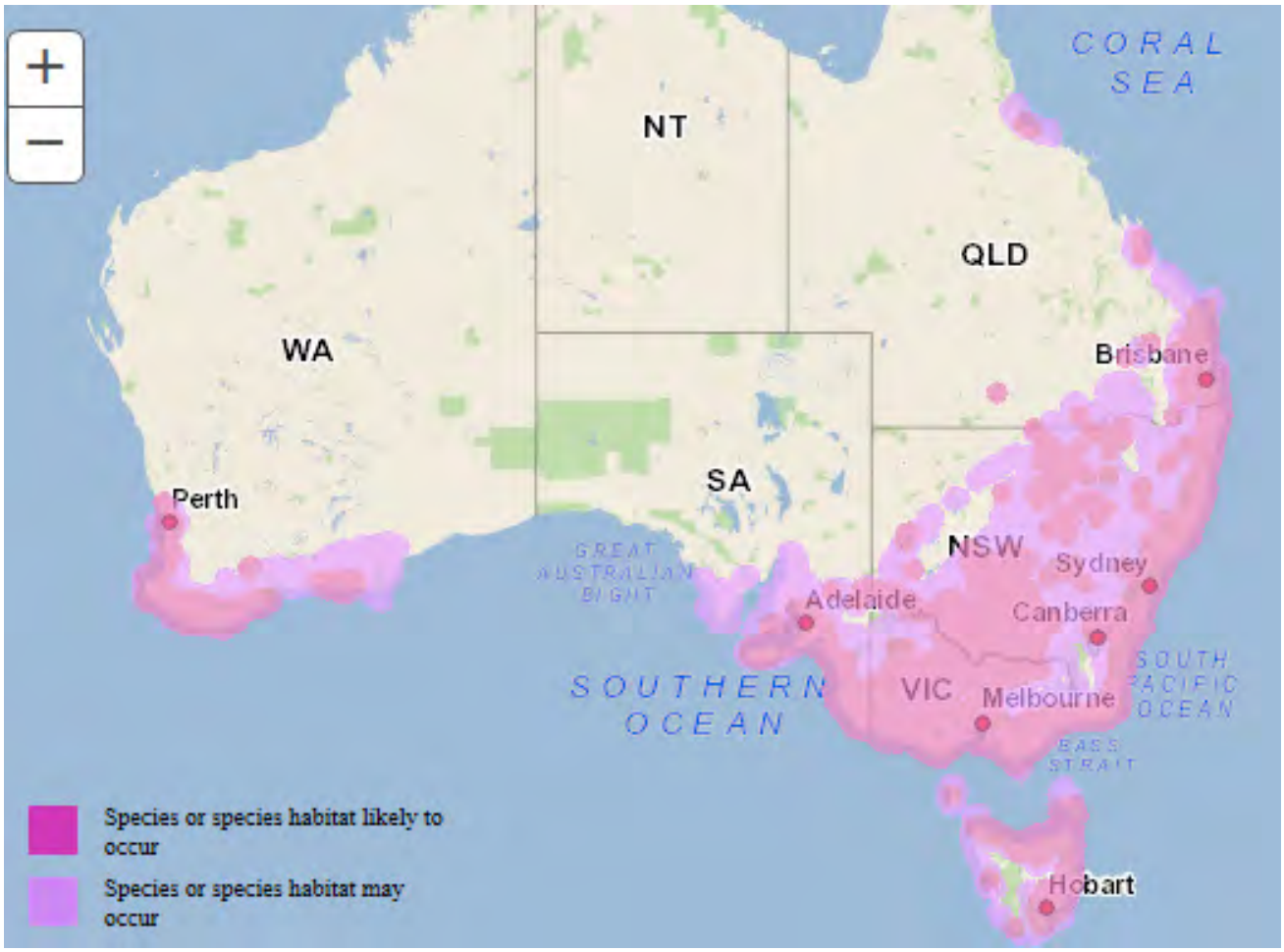

Figure E-1.3 Current distribution map for Australasian Bittern taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for Australasian Bittern are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

There are no residual impacts to the Australasian Bittern expected.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.4 RED KNOT (*CALIDRIS CANUTUS*)

The Red Knot is listed as Endangered under the EPBC Act.

E-1.2.4.1 DESCRIPTION

The Red Knot is a non-breeding migratory visitor from Arctic regions of Siberia. It can fly non-stop between north-eastern China and northern Australia. Birds arrive between September and October and leave between March and April, with a small number of individuals overwintering. In NSW it is recorded in small numbers along some of the major river estuaries and sheltered embayments of the coastline. This environment is used as a staging area for birds to rest and replenish fat resources; large numbers arrive in September then most move south to Victoria by October. The Red Knot is a rare visitor to wetlands away from the coast with a few records as far west as Lake Menindee and the Riverina. The Red knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts and sometimes on sandy ocean beaches or shallow pools on exposed rock platforms. They are occasionally seen on terrestrial saline wetlands.

Core coastal habitat does not occur within the proposal study area, but the species may be an occasional visitor to inland water habitats such as Lake Gol Gol which is listed as an internationally important shorebird location by Birdlife Australia. Few ALA records occur within locality and are primarily in riverine and wetland habitat locations.

E-1.2.4.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Calidris canutus Red knot* (Threatened Species Scientific Committee, 2016a) was reviewed as part of this assessment.
- Listing assessment information for this species may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.
- The *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) applies to this species.
- The EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (Department of the Environment, 2015b) applies to this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.4.3 SPECIFIC IMPACTS

This species may potentially collide with transmission lines and conductors causing injury or mortality, but the risk is low. The potential impacts to Migratory and wetland birds was considered during the proposal design development, including the strategic options assessment and identification and refinement of the proposal process. Details about the proposal design development are summarised in Chapter 3 of the EIS and Section 8.1 of the BDAR. A biodiversity constraints assessment was undertaken through the proposal design development phase to identify biodiversity values to be avoided. Ramsar wetlands and other important wetlands and water sources for migratory birds were avoided as a priority.

The proposal study area does not contain and mapped important areas or PCTs that are known to be used by this species.

E-1.2.4.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

The action is unlikely to cause a long term decrease in the size of a population. Atlas of living Australia and OEH records show few scattered species records in the wider locality, indicating that this species is not known in large numbers within the proposal study area. Therefore, risk of a high number of individuals colliding with the transmission lines is low.

Risk of decrease in population size due to clearing of habitat is also considered low, as vegetation clearing within the proposal study area within preferred wetland and riverine habitat is likely to be minimised or avoided.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

The extent of occurrence in Australia is estimated to be 36,000 km^2 and area occupied 2,400 km^2 (Threatened Species Scientific Committee, 2016a). This species is only considered likely to occur intermittently within the proposal study area between periods of migration as the wetland habitat within the proposal study area is not the preferred or internationally important coastal habitat for these species. As the project will not impact important wetland habitats the area of occupancy for this species is unlikely to be reduced.

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

No important wetland habitat will be impacted and given the ability of this species to disperse over these cleared areas it is considered unlikely that the action would fragment an existing population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Conservation advice and listing advice does not list any habitat critical to the survival of this species. No mapped important areas will be impacted. Areas surrounding the proposal study area also provide habitat for foraging, breeding, and roosting, and mitigation measures including erosion and sediment control plans are proposed to avoid water quality degradation in wetland habitats. Therefore, the action is not likely to affect habitat critical to the survival of the species.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

The red knot does not breed in Australia. Red knots breed in north Siberia and Alaska during the austral winter. Therefore, the proposed action would not disrupt the breeding cycle of 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**

As vegetation clearing in wetland habitat is likely to be minimal or avoided, and species records are low for the proposal study area, the action is unlikely to result in the modification, removal, isolation, or decreased 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**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no knows diseases causing potential species decline to the Red Knot.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

There is no recovery plan for this species, as the approved conservation advice provides sufficient direction to implement priority actions and mitigate against key threats.

The proposed action is unlikely to interfere with the broad scale recovery of the species, as the impact of potential collision with the transmission line is considered minimal and habitat loss due to clearing would be minimal or avoided.

- **CONCLUSION**

The proposed action is **unlikely to significantly impact** upon the Red Knot as:

- the proposal study area does not show evidence of containing a sizable population of Red Knot
- vegetation clearing to preferred wetland habitat would likely be minimal or avoided
- collision with transmission lines causing injury or death is considered likely to be minimal due to the relatively low abundance of the species in the proposal study area.

E-1.2.4.5 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Calidris canutus Red knot* (Threatened Species Scientific Committee, 2016a) outlines habitat during the non-breeding season in Australasia as intertidal mudflats, sandflats and sandy beaches of sheltered coasts and sometimes on sandy ocean beaches or shallow pools on exposed rock platforms. They are occasionally seen on terrestrial saline wetlands near the coast and on sewage ponds and saltworks (Threatened Species Scientific Committee, 2016a). There is no adopted or made Recovery Plan for this species.

The *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) and *EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment, 2015b) state that important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. According to this approach, wetland habitat should be considered internationally important if it regularly supports:

- 1 per cent of the individuals in a population of one species or subspecies of waterbird or
- a total abundance of at least 20,000 waterbirds.

Nationally important habitat for migratory shorebirds can be defined using a similar approach to these international criteria, i.e. if it regularly supports:

- 0.1 per cent of the flyway population of a single species of migratory shorebird or
- 2000 migratory shorebirds or
- 15 migratory shorebird species.

The habitats within the proposal study area would not meet any of the criteria for nationally or internationally important habitat as listed in the *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015). Habitat descriptions are provided in Section 5.6 of the BDAR. Core coastal habitat does not occur within the proposal study area, but the species may be an occasional visitor to inland water habitats such as Lake Gol Gol which is listed as an internationally important shorebird location by Birdlife Australia. Few ALA records occur within locality and are primarily in riverine and wetland habitat locations.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for wetland birds is outlined in Table E-1.5.

Table E-1.5 Summary of survey effort for Migratory Birds

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Migratory Birds	Targeted wetland surveys during the Spring and Summer	29-person hours	Sep – Mar	Oct – Nov 2019

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action could potentially result in individuals colliding with transmission lines during nocturnal dispersal. These impacts are captured in Section 12 of the BDAR.

Figure E-1.4 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is not within known habitat distributions, but the species may be an occasional visitor to inland water habitats.

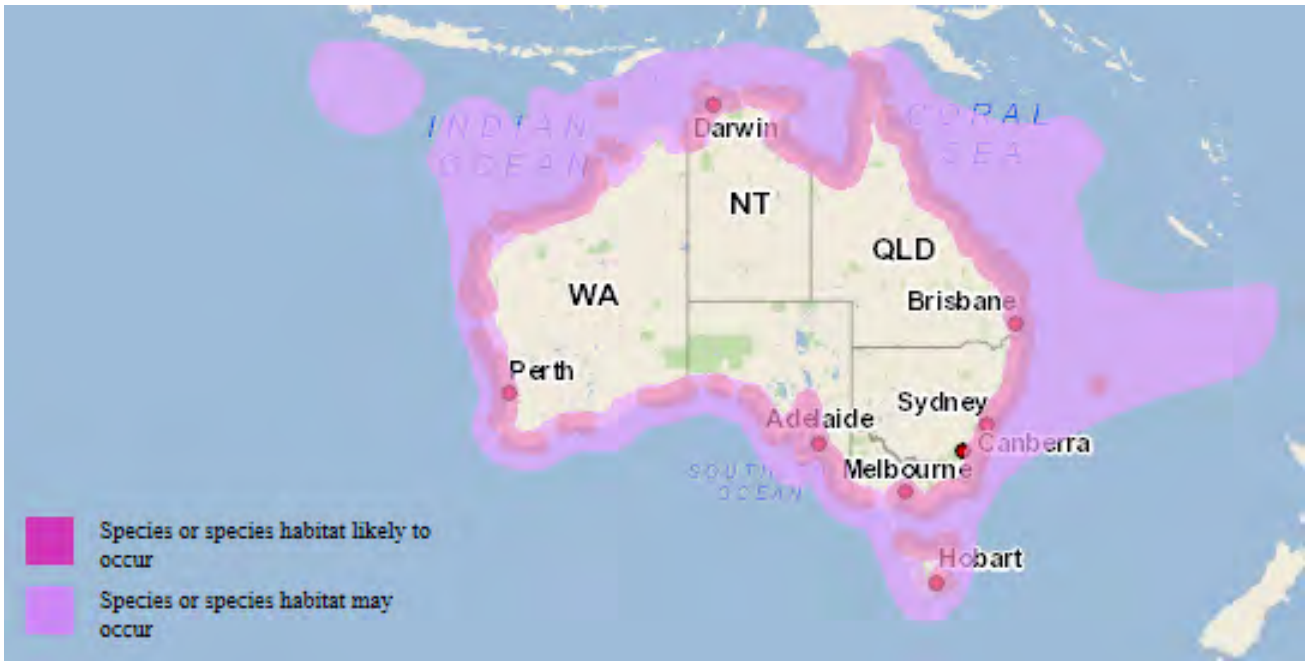

Figure E-1.4 Current distribution map for Red Knot taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for the Red Knot are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Red Knot is likely to be minimal. The proposed action would potentially clear vegetation within suitable wetland habitat. The proposed action could potentially result in individuals colliding with transmission lines during nocturnal dispersal.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.5 GREY FALCON (*FALCO HYPOLEUCOS*)

Grey Falcon is listed as Vulnerable under the EPBC Act.

E-1.2.5.1 DESCRIPTION

The species occurs in arid and semi-arid Australia, including the Murray-Darling Basin, Eyre Basin, central Australia and Western Australia (Marchant and Higgins 1993). The species is mainly found where annual rainfall is less than 500 mm, except when wet years are followed by drought, when the species might become marginally more widespread, although it is essentially confined to the arid and semi-arid zones at all times (Schoenjahn 2018). In regard to NSW, Grey Falcon is sparsely distributed, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500 mm rainfall in NSW. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey. Preys primarily on birds, especially parrots and pigeons, using high-speed chases and stoops; reptiles and mammals are also taken. Like other falcons it utilises old nests of other birds of prey and ravens, usually high in a living eucalypt near water or a watercourse; peak laying season is in late winter and early spring; two or three eggs are laid.

E-1.2.5.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Falco hypoleucos Grey Falcon* (Threatened Species Scientific Committee, 2020) was reviewed as part of this assessment.
- Listing assessment information may be available in the approved Conservation Advice for this species.
- There is no adopted or made Recovery Plan for this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.5.3 SPECIFIC IMPACTS

Targeted bird surveys within the proposal study area did not record Grey Falcon. Impacts would consist of clearing of habitat in the form of PCT 11, 13, 15, 17, 19, 21, 58, 63, 139, 143, 154, 166, 170, 171, 172, 216, 221, 252 & 253. Also, potential disturbance of nesting by construction activities.

E-1.2.5.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This location is not at the limit of this species known range, which extend into all mainland states. Nor would any population present be important for maintaining genetic diversity or breeding. Therefore, any occurrences of this species within the proposal study area are not likely to form part of an important population or is the available habitat considered necessary for a species' long-term survival and recovery within the area.

E-1.2.5.5 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**

Not applicable, if present are not considered to be part of an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

Not applicable, if present are not considered to be part of an important population.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Not applicable, if present are not considered to be part of an important population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

There is no habitat listed as critical to the survival of these species within the proposal study area. Although preferred habitat is present in the proposal study area, clearing works would be linear and considered marginal compared to the amount of potential foraging habitat surrounding the proposal study area, and is therefore not considered significant enough to adversely affect this habitat.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Not applicable, if present are not considered to be part of an important population. No significant impacts are anticipated for the species from the proposed action, mitigation measures recommended include pre-clearing surveys to identify any trees containing breeding pairs or nests prior to clearing, and if possible, avoid clearing such trees. It is recommended to avoid clearing during the main breeding period. Therefore, the proposed action is unlikely to disrupt the breeding cycle of a population.

- **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 action would reduce the availability of suitable foraging habitat on a relatively small scale. However, given the surrounding landscape, it is unlikely that the proposed action would modify the existing environment 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**

The proposed action is considered unlikely to cause the establishment of any invasive species that would be harmful to the species or its habitat.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no known diseases causing potential species decline to the Grey Falcon.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

Recovery actions would not be affected by the proposed action. No key management sites are known to occur within the proposal study area.

- **CONCLUSION**

There are no important populations of Grey Falcon within the proposal study area, and with recommended mitigation measures, and the small scale of clearing relative to the availability of surrounding habitat, **the proposed action is considered unlikely to significantly impact** the Grey Falcon.

E-1.2.5.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Falco hypoleucos Grey Falcon* (Threatened Species Scientific Committee, 2020) provides a broad habitat description that states that the species frequents timbered lowland plains, particularly acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter (Threatened Species Scientific Committee, 2020). There is no adopted or made Recovery Plan for this species.

Rare occurrences of this species within the proposal study area cannot be discounted. Habitat is present within PCT 11 in the Pooncarie-Darling IBRA Subregion. Habitat may be present in PCT 15, 19, 21, 58, 143, 153, 154, 170, 171, 172, 221, 252, 253 in the South Olary Plain IBRA Subregion, PCT 15, 19, 58, 166 in the Great Darling Anabranch IBRA Subregion, PCT 11, 15, 21, 63, 139, 154, 166 in the Pooncarie-Darling IBRA Subregion, and PCT 11, 13, 17, 19 and 216 in the Robinvale Plains IBRA Subregion.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Grey Falcon is outlined in Table E-1.6.

Table E-1.6 Summary of survey effort for Grey Falcon

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Aerial bird species	Targeted opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020
Birds of prey	Targeted Opportunistic and Targeted formal surveys in suitable habitat	8 x 20 min/2 ha formal bird surveys 39.5-person hours of opportunistic surveys	All year	Oct – Nov 2019; July 2020
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Aerial Species	Opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020
Birds of Prey	Targeted Opportunistic and Targeted formal surveys in suitable habitat	8 x 20 min/2 ha formal bird surveys 357-person hours of opportunistic surveys	All year	Oct – Dec 2019; Mar 2020; Apr – May 2020; July 2020
Chenopod Shrublands – PCT13, PCT153, PCT154, PCT166, PCT216, PCT221, PCT253				
Aerial Species	Seasonal opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020
Birds of Prey	Targeted Opportunistic and Targeted formal surveys in suitable habitat	7 – 20 min/2 ha Formal Bird surveys 348-person hours of opportunistic surveys	All year	Nov – Dec 2019; Feb 2020; Mar 2020; Apr – May 2020
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Aerial Species	Opportunistic surveys	44 x 20 min/2 ha formal bird surveys 337-person hours of opportunistic surveys	Nov – Mar	Oct – Dec 2019; Feb 2020; Mar 2020; Apr – May 2020
Birds of Prey	Targeted Opportunistic and Targeted formal surveys in suitable habitat	44 x 20 min/2 ha Formal Bird surveys 337-person hours of opportunistic surveys	All year	

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would potentially clear vegetation within suitable habitat. The proposed action could potentially result in individuals colliding with transmission lines. These impacts are captured in Section 12 of the BDAR.

Figure E-1.5 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is not at the limit of the known distribution of this species.

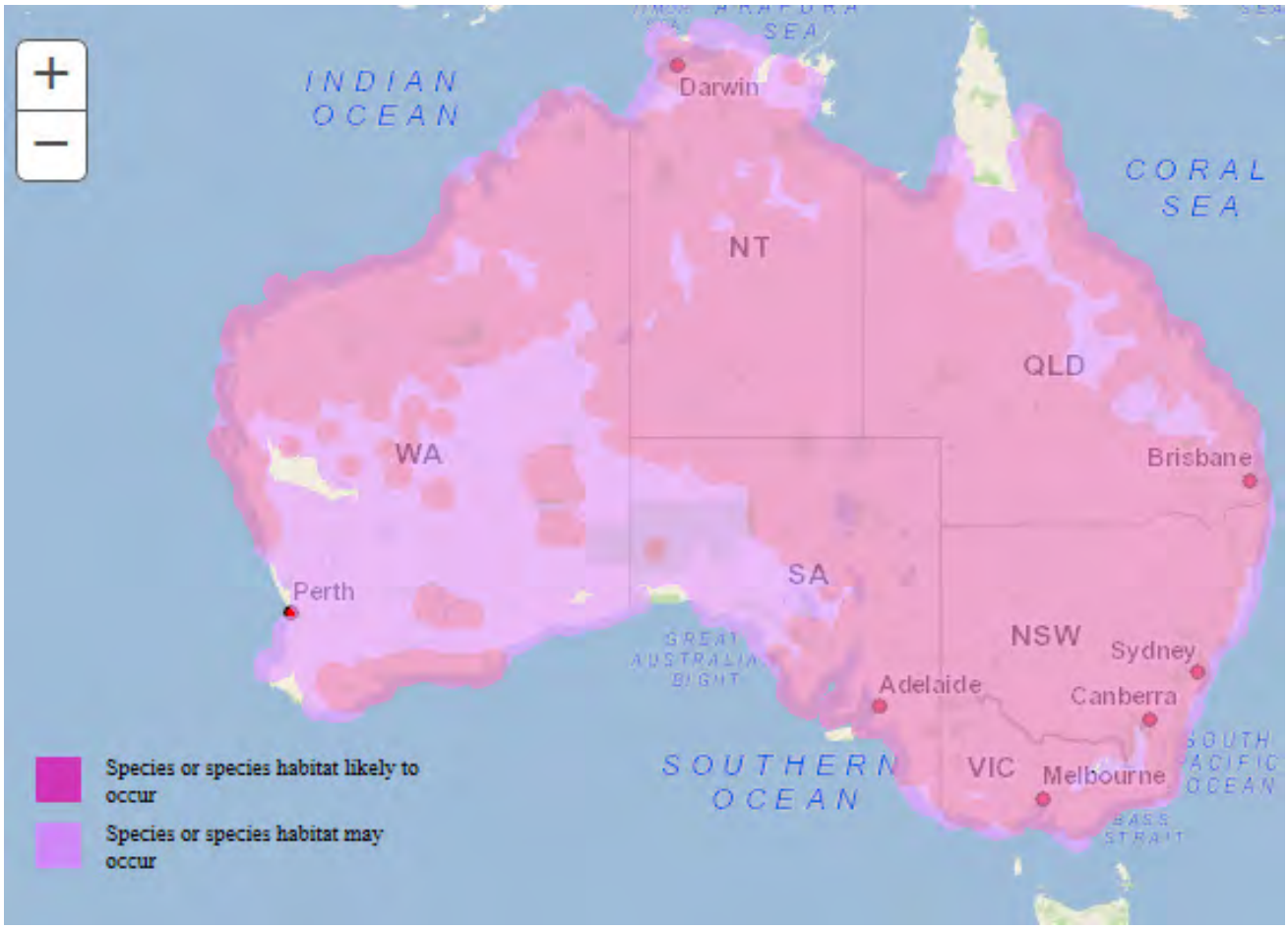

Figure E-1.5 Current distribution map for Grey Falcon taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for the Grey Falcon are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Grey Falcon is likely to be minimal. The proposed action would potentially clear vegetation within suitable habitat. The proposed action could potentially result in individuals colliding with transmission lines during dispersal.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.6 PAINTED HONEYEATER (*GRANTIELLA PICTA*)

The Painted Honeyeater is listed as Vulnerable under the EPBC Act and the BC Act.

E-1.2.6.1 DISTRIBUTION

The Painted Honeyeater 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. Fruiting mistletoe primarily influences the Painted Honeyeater's seasonal north-south movements, with its breeding season closely matched. After breeding, many birds move in to semi-arid regions such as north-eastern South Australia, central and western Queensland, and central Northern Territory. Breeding occurs from October to March when mistletoe fruits are most available (Threatened Species Scientific Committee, 2015).

The species is a mistletoe specialist, and inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of Black Box and River Red Gum, Box-ironbark-yellow Gum woodlands, Acacia-dominated woodlands, Paperbarks, Casuarinas, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes, and is more common in wider blocks of remnant woodland than in narrower strips (Threatened Species Scientific Committee, 2015).

Threats for this species include:

- habitat loss due to clearing
- grazing by livestock, macropods and rabbits, limiting new tree recruitment
- competition with the aggressive Noisy Miner (*Manorina melanocephala*), predation by invasive species such as Black Rats (*Rattus rattus*), ad nest predation by over abundant Pied Currawongs (*Strepera graculina*), pied and grey butcherbirds (*Cracticus nigrogularis* and *Cracticus torquatus*), and crows and ravens (Corvidae). (Threatened Species Scientific Committee, 2015).

Strongholds for the species and breeding areas occur on the inland slopes of the Great Dividing Range in NSW, Vic and Southern Queensland (OEH, 2019).

There are records of this species within the locality of proposal study area including records at Buronga.

E-1.2.6.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Grantiella picta painted honeyeater* (Department of the Environment, 2015c) was reviewed as part of this assessment.
- Listing assessment information for this species may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.6.3 SPECIFIC IMPACTS

Vegetation clearing in PCT 15, 21, 58 & 143 and associated suitable habitats.

E-1.2.6.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

There are records of this species within the locality of proposal study area including records at Buronga.

As the core range for Painted Honeyeaters is inland south-eastern Australia where its natural habitat is subtropical or tropical dry forests, and species population strongholds and breeding areas occur on the inland slopes of the Great Dividing Range (outside of the proposal study area). If any population is present, they are unlikely to be key source populations for dispersal or for maintaining genetic diversity. Also, this location is not at the limit of this species known range. As such any individual or population recorded within the proposal study area would not be considered part of an important population.

E-1.2.6.5 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**

Not applicable. Not considered an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

Not applicable. Not considered an important population.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Not applicable. Not considered an important population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Conservation advice does not list any habitat critical to the survival of this species. Therefore, the proposed action is not considered likely to adversely affect habitat critical to the survival of the species.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Not applicable. Not considered 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**

Although vegetation clearing at the project level may contribute to the decline of the population within the proposal study area, it is not considered likely that the action would result in disturbance to the extent that the species would decline. There is adjacent habitat located in contiguous areas such as National Parks and reserves, where the species is known to occur

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes establishing in wetland habitat areas

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no knows diseases causing potential species decline to the Painted Honeyeater, or diseases to its preferred food source, mistletoe.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The proposed action the proposed action is contrary to the recovery objectives and actions outlined in the Saving Our Species program and the National Recovery Program for the Painted Honeyeater. Contributing to the degradation and removal of habitat (i.e. mature trees containing mistletoe). Vegetation clearing will occur in potential habitat associated with PCT 15, 21, 58 & 143. Although sections of potential habitat are likely to be cleared, the maximum cleared area for a single tower footprint or laydown area would not exceed 0.5 ha, and the easement width of the transmission line would be a maximum of approximately 80 meters (with full clearing not always being required). The proposal study area is within an already fragmented landscape from agriculture and existing linear infrastructure, thereby limiting the potential for any substantial patches of habitat removal to occur. It is considered unlikely that the amount of potential clearing would interfere substantially with the recovery of the species.

- **CONCLUSION**

Although potentially suitable woodland habitat has been mapped within the proposal study area, mitigation measures would ensure that clearing of large tracts of suitable woodland are minimised or avoided to prevent significant loss of habitat. As core populations, breeding areas, and the species stronghold do not occur within the locality of this proposed action, it is considered unlikely that the proposed action would have a significant impact on the Painted Honeyeater.

E-1.2.6.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Grantiella picta painted honeyeater* (Department of the Environment, 2015c) indicates that the species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips, although it breeds in quite narrow roadside strips if ample mistletoe fruit is available. There is no adopted or made Recovery Plan for this species.

Habitat is present within PCT 15, 21, 58 and 143.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Painted Honeyeater is outlined in Table E-1.7.

Table E-1.7 Summary of survey effort for Painted Honeyeater

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Blossom Nomads	Favoured habitat surveys and assessment	8 x 20 min/2 ha Formal Bird surveys 412-person hours of opportunistic surveys	Nov – Feb – Mistletoe fruiting Associated with strong winter blossoming events Apr – Sep	Oct – Dec 2019; Mar 2020; Apr – May 2020; July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would potentially clear vegetation within suitable habitat. These impacts are captured in Section 12 of the BDAR.

Figure E-1.6 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is not at the limit of the known distribution of this species.

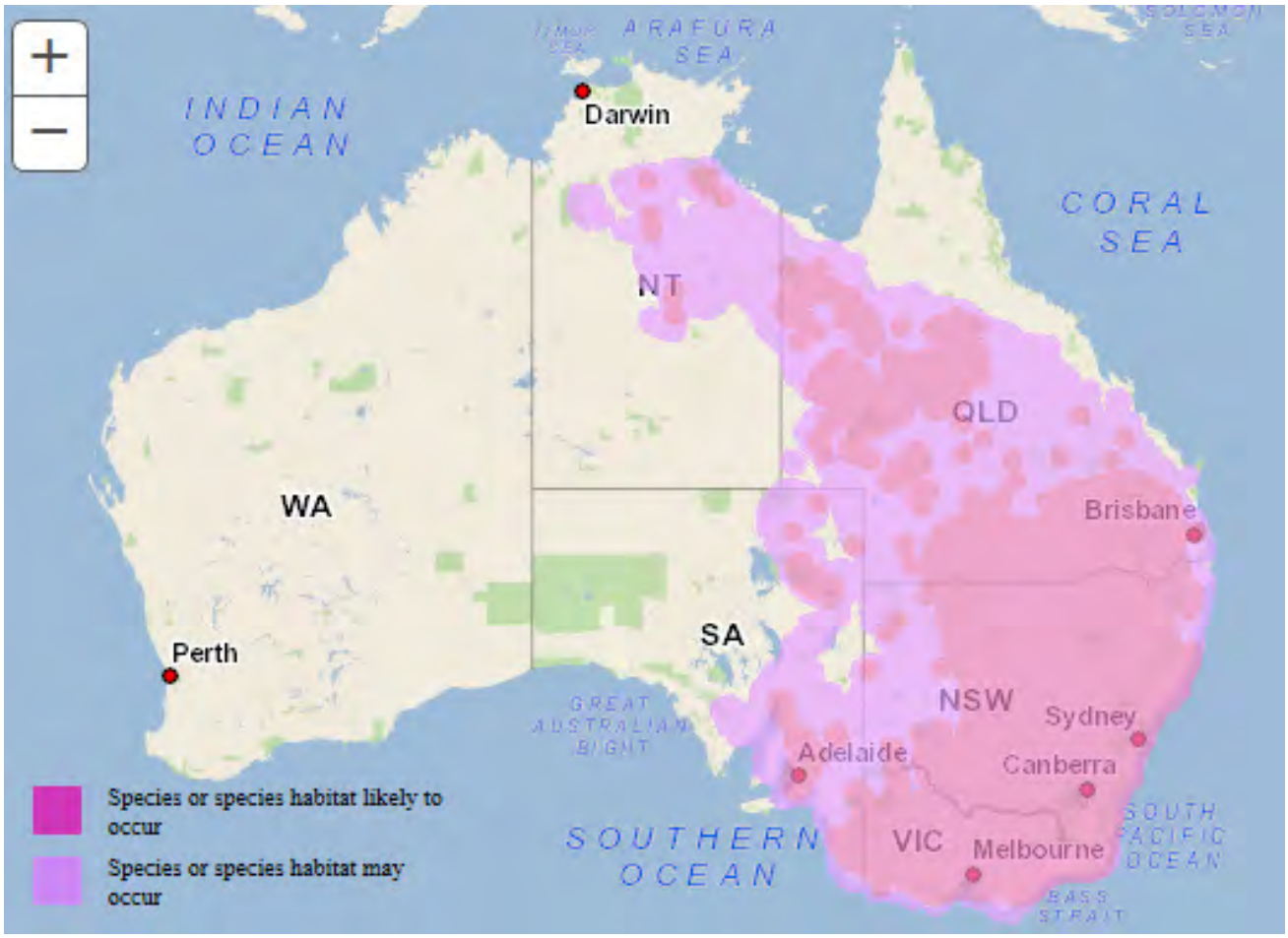

Figure E-1.6 Current distribution map for Painted Honeyeater taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for the Painted Honeyeater are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Painted Honeyeater is likely to be minimal. The proposed action would potentially clear vegetation within suitable habitat.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.7 WHITE-THROATED NEEDLETAIL (*HIRUNDAPUS CAUDACUTUS*)

The White-throated Needletail is listed as Vulnerable under the EPBC Act.

E-1.2.7.1 DESCRIPTION

White-throated Needletails occur in Australia only between late spring and early autumn, but mostly in summer, when they sometimes form large flocks, appearing as a swirling cloud of birds. White-throated Needletails often occur in large numbers over eastern and northern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. The White-throated Needletail feeds on flying insects, such as termites, ants, beetles and flies. They catch the insects in flight in their wide gaping beaks. Birds usually feed in rising thermal currents associated with storm fronts and bushfires.

E-1.2.7.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Hirundapus caudacutus White-throated Needletail* (Threatened Species Scientific Committee, 2019b) was reviewed as part of this assessment.
- Listing assessment information for this species may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.
- The *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015d) was reviewed as part of this assessment.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.7.3 SPECIFIC IMPACTS

Vegetation clearing of habitat in areas which the species may be foraging above in aerial spaces on a seasonal basis.

E-1.2.7.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The proposal study area does not contain suitable habitat for breeding, as breeding takes place in Northern Asia. The proposal study area does not contain key resources for breeding or dispersal, does not occur at the limit of the species distribution range and is unlikely to be necessary for maintaining genetic diversity. The population that may occur in the proposal study area is not considered to form part of an 'important population'.

E-1.2.7.5 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**

Not applicable.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

Not applicable.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Not applicable.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat is listed for this species under the EPBC Act.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Not applicable.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

Although vegetation clearing at the project level may contribute to the decline of available habitat within proposal study area, it is not considered likely that the action would result in disturbance to the extent that the species would decline.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

It is not likely that invasive species (such as introduced predators) that are harmful to the White-throated Needletail would become further established because of the Project.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

No. There are no known diseases that are likely to increase in the area because of the Project.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

Due to the limited foraging habitat likely to be affect by the Project (0.15 ha) and as no breeding habitat is near the proposal study area, the Project is not likely to interfere with the recovery of this species.

- **CONCLUSION**

The White-throated Needletail is almost exclusively aerial, breeding in Northern Asia, and occur from Queensland to Victoria. Any individuals or population observed within the proposal study area are unlikely to be an important population or is the habitat important to the species long-term survival. The extent of native vegetation clearing and habitat removal associated with the proposed action is small in terms of the available habitat for this species within the surrounding landscape. Although the loss of foraging habitat for the White-throated Needletail is an incremental loss of suitable habitat regionally, the proposal is **not likely to have a significant impact** on the long-term survival of the White-throated Needletail within the area.

E-1.2.7.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Hirundapus caudacutus White-throated Needletail* (Threatened Species Scientific Committee, 2019b) indicates that in Australia, the White-throated Needletail is mostly aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings (Threatened Species Scientific Committee, 2019). When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Threatened Species Scientific Committee, 2019). There is no adopted or made Recovery Plan for this species.

This species may occur in aerial habitats over the proposal study area on a seasonal basis. Specific PCT associations cannot be made.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for White-throated Needletail is outlined in Table E-1.8.

Table E-1.8 Summary of survey effort for White-throated Needletail

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Aerial bird species	Targeted opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Aerial Species	Opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Chenopod Shrublands – PCT13, PCT153, PCT154, PCT166, PCT216, PCT221, PCT253				
Aerial Species	Seasonal opportunistic surveys	102-person hours of opportunistic surveys	Nov – Mar	Nov – Dec 2019; Mar 2020
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Aerial Species	Opportunistic surveys	44 x 20 min/2 ha formal bird surveys 337-person hours of opportunistic surveys	Nov – Mar	Oct – Dec 2019; Feb 2020; Mar 2020; Apr – May 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would potentially clear vegetation within suitable habitat. These impacts are captured in Section 12 of the BDAR.

Figure E-1.7 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is outside of the known distribution of this species.

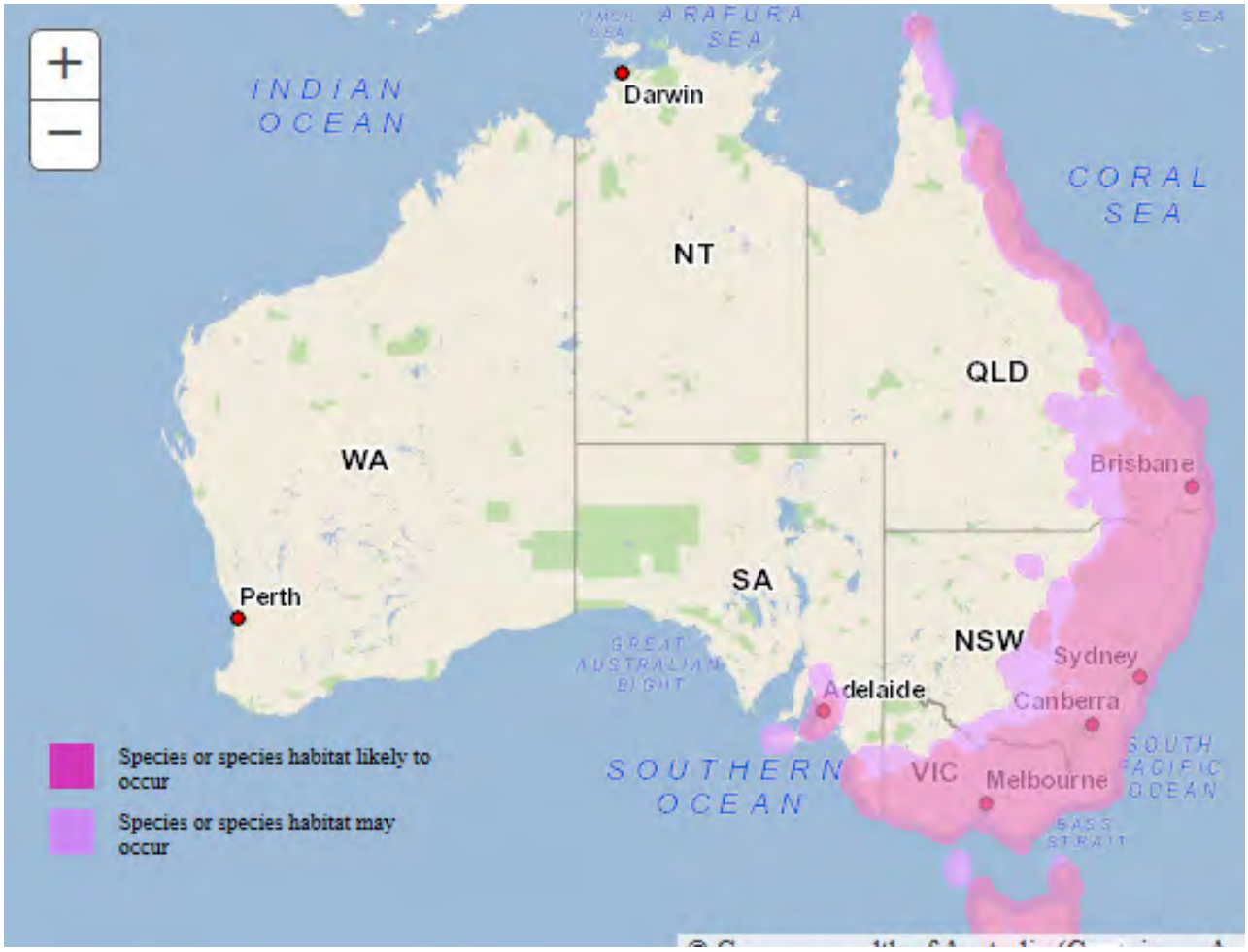

Figure E-1.7 Current distribution map for White-throated Needletail taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for the White-throated Needletail are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the White-throated Needletail is likely to be minimal. The proposed action would potentially clear vegetation within suitable habitat.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.8 SWIFT PARROT (*LATHAMUS DISCOLOR*)

Listed as Critically Endangered under the EPBC Act and BC Act.

E-1.2.8.1 DESCRIPTION

Breeding occurs in Tasmania, majority migrates to mainland Australia in autumn, over-wintering, particularly in Victoria and central and eastern NSW, but also south-eastern Queensland as far north as Duaringa. Until recently it was believed that in New South Wales, Swift Parrots forage mostly in the western slopes region along the inland slopes of the Great Dividing Range but are patchily distributed along the north and south coasts including the Sydney region, but new evidence indicates that the forests on the coastal plains from southern to northern NSW are also extremely important. In mainland Australia is semi-nomadic, foraging in flowering eucalypts in eucalypt associations, particularly box-ironbark forests and woodlands. Preference for sites with highly fertile soils where large trees have high nectar production,

including along drainage lines and isolated rural or urban remnants, and for sites with flowering *Acacia pycnantha*, is indicated. Sites used vary from year to year. (Garnett and Crowley, 2000a) (Swift Parrot Recovery Team, 2001)

Threats for this species include:

- loss of habitat through clearing for agriculture, and urban and industrial development
- collisions with wire netting fences, windows and cars, during the breeding season and winter migration.

E-1.2.8.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Lathamus discolor swift parrot* (Threatened Species Scientific Committee, 2016b) was reviewed as part of this assessment.
- Listing assessment information may be available in the approved Conservation Advice.
- The *National Recovery Plan for the Swift Parrot (Lathamus discolor)* (Saunders & Tzaros, 2011) was reviewed as part of this assessment.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for predation by feral cats (Department of the Environment, 2015a).
- Relevant survey guidelines for this species include:
- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.8.3 SPECIFIC IMPACTS

Suitable habitat occurs within PCT 11 in the Robinvale Plains IBRA Subregion. An impact of approximately 0.1 ha is predicted.

E-1.2.8.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

Any identified population Swift Parrot in the area would not be restricted to habitat within the proposal study area. An impact of approximately 0.1 ha is predicted. Due to the species' large home range, nomadic nature and higher quality foraging habitat elsewhere in the locality and region, the proposed action is not considered likely to significantly contribute to a long-term decline in the size of a population of these species. The Swift Parrot does not breed in the proposal study area and the extent of habitat remaining in the proposal study area would provide sufficient resources to sustain future visitation, such that the action is unlikely to lead to a long-term decrease in the size of the Australian population.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

The project would contribute to the loss of potential foraging habitat by approximately 0.1 ha which would reduce the area of habitat available. However, the action will not reduce the area of occupancy of this species which is estimated at 4,000 km².

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

Importantly, the action will not result in fragmentation of habitat for the Swift Parrot. This species is highly mobile and as a regular behaviour flies long distances over open areas to move between suitable foraging habitats. The action will not affect the movement of the Swift Parrot between habitat patches or fragment the population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat has been listed for the Swift Parrot to date. Habitat critical to the survival of the Swift Parrot includes; those areas of priority habitat for which the Swift Parrot has a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot or are otherwise identified by the recovery team (Saunders, 2011). The Swift Parrot is not known to regularly visit the proposal study area and the proposal study area is not known as an area of important habitat, so it is unlikely to be critical habitat for this species.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

Swift Parrots breed in Tasmania during spring and summer, migrating to south-eastern Australia during autumn and winter (Department of Environment and Conservation, 2006b) While Swift Parrots are dependent on flowering resources across a wide range of habitats (woodlands and forests) within their NSW wintering grounds, the removal of a small amount of potential foraging habitat is unlikely to disrupt their movements to Tasmanian breeding grounds. As such the proposed action is unlikely to affect their breeding cycle.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

Potential foraging habitat for this species will be reduced by about 0.1 ha. As a large-scale migrant, it has the ability to cover vast areas of its winter range, seeking suitable flowering eucalypt habitat. The species is an occasional visitor to the region and may utilise trees in the proposal study area for foraging intermittently when no other suitable resources are available. The action is unlikely to 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**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as rabbits, cats and foxes establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

It is unlikely that disease would be increased by the proposed action. Mitigation measures would be prepared to minimise the likelihood of spread of pathogens into the habitat of these species

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

A National Recovery Plan for the Swift Parrot *Lathamus discolor* was prepared in 2011 (Saunders, 2011). Recovery actions outlined in this plan include:

- identify the extent and quality of habitat
- manage and protect swift parrot habitat at the landscape scale
- monitor and manage the impact of collisions, competition and disease
- monitor population and habitat.

Based on the potential ecological impacts of the proposed action on the Swift Parrot it is unlikely the proposed action would be in conflict with the recovery actions outlined above.

- **CONCLUSION**

Although potentially suitable woodland habitat has been mapped within the proposal study area, records within the area are rare and intermittent. Additionally, clearing of large tracts of suitable woodland habitat would be minimised or avoided to prevent significant loss of habitat in the case that the species is found in the proposal study area during future targeted surveys. The predicted impact is small in magnitude. Therefore, the proposed action is considered unlikely to have a significant impact on the Swift Parrot.

E-1.2.8.5 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Lathamus discolor swift parrot* (Threatened Species Scientific Committee, 2016b) indicates that the species exhibits high site fidelity, returning to locations on an irregular cyclic basis. They disperse across eastern Tasmania after breeding and migrate to overwinter on the mainland in flowering woodlands and forests (Threatened Species Scientific Committee, 2016b). They feed preferentially in the largest trees available (Threatened Species Scientific Committee, 2016b). Their distribution fluctuates with food availability as they feed on psyllid lerps, seeds and fruit (Threatened Species Scientific Committee, 2016b). Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, and coastal swamp mahogany (E. robusta) and spotted gum (Corymbia maculata) woodland when in flower; otherwise often in coastal forests from eastern Victorian to the central coast of New South Wales (Threatened Species Scientific Committee, 2016b).

The *National Recovery Plan for the Swift Parrot* (Lathamus discolor) (Saunders & Tzaros, 2011) indicates that priority sites for the management of Swift Parrot foraging habitat to be identified within the following CMAs: Hawkesbury – Nepean, Hunter – Central Rivers, Lachlan, Murray, Murrumbidgee, Northern Rivers, Southern Rivers, Sydney Metro.

This species may occur in PCT 11 in the Robinvale Plains region on a seasonal basis.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Swift Parrot is outlined in Table E-1.9.

Table E-1.9 Summary of survey effort for Swift Parrot

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Blossom Nomads	Favoured habitat surveys and assessment	8 x 20 min/2 ha Formal Bird surveys 412-person hours of opportunistic surveys	Associated with strong winter blossoming events Apr – Sep	Mar 2020; Apr – May 2020; July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would potentially clear vegetation within suitable habitat. These impacts are captured in Section 12 of the BDAR.

Figure E-1.8 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is outside of the known limit of the species distribution, but birds may occur on occasion.

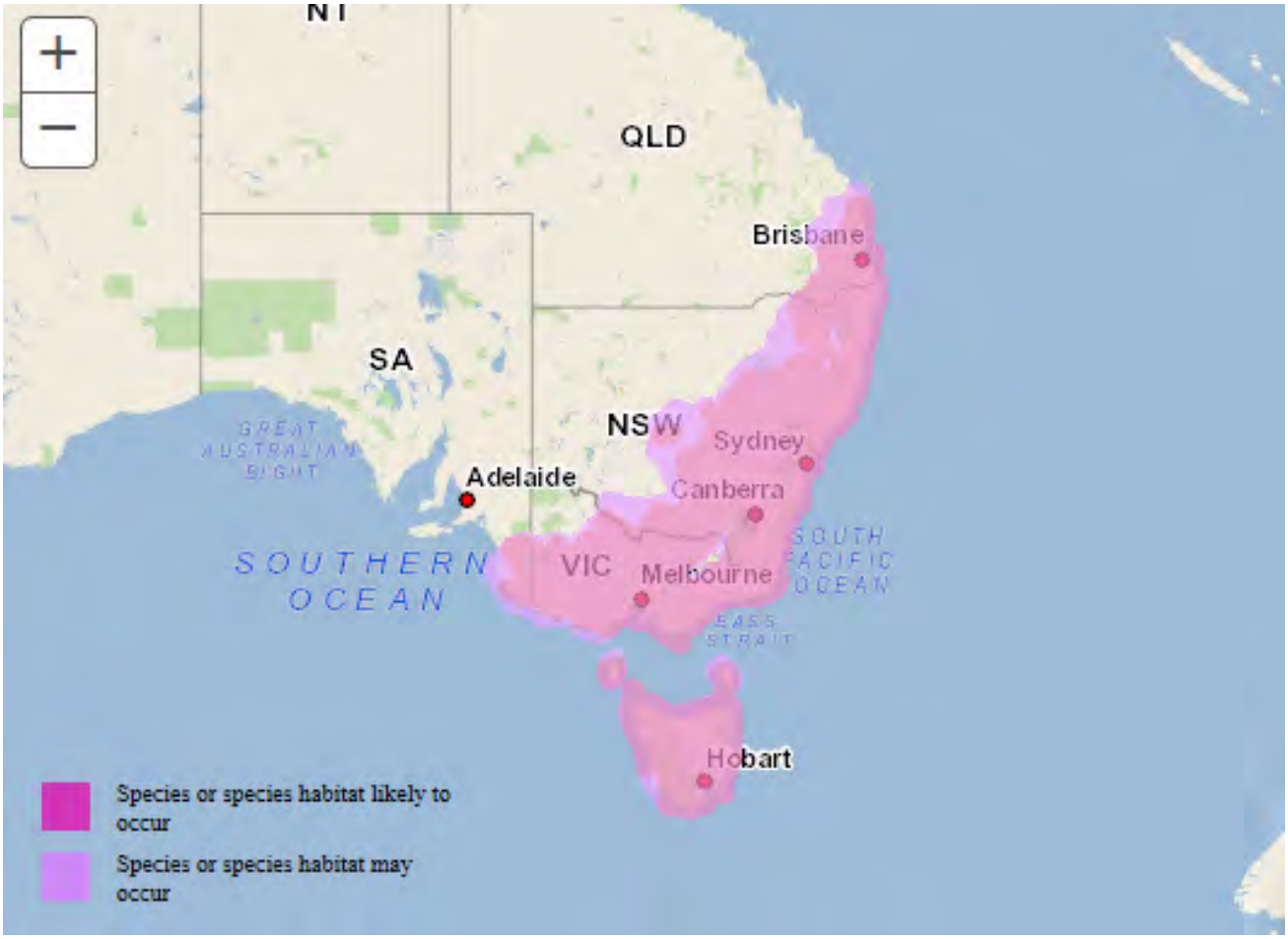

Figure E-1.8 Current distribution map for Swift Parrot taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for the Swift Parrot are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Swift Parrot is likely to be minimal at approximately 0.1 ha.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.9 MALLEEFOWL (*LEIPOA OCELLATA*)

Listed as Vulnerable under the EPBC Act and Endangered under the BC Act.

E-1.2.9.1 DESCRIPTION

The Malleefowl occupies semi-arid mallee scrub on the fringes of the relatively fertile areas of southern Australia, where it is now reduced to three separate populations: the Murray-Murrumbidgee basin, west of Spencer Gulf along the fringes of the Simpson Desert, and the semiarid fringe of Western Australia's fertile southwest corner (ALA, 2019). They occur in the semi-arid to arid zone in shrublands and low woodlands dominated by mallee and associated habitats such as Broombush (*Melaleuca uncinata*) and Scrub Pine (*Callitris verrucosa*). Malleefowl also occur in Red Ironbark (*Eucalyptus sideroxylon*) woodland at the eastern limit of their distribution. They require a sandy substrate and abundance of leaf litter for next construction, which are built in the form of large incubating mounds (Benshemesh, 2007).

Threats for the Malleefowl include:

- loss of habitat and habitat fragmentation due to clearing and habitat degradation
- habitat degradation due to inappropriate grazing or fire regimes
- fire causing removal of leaf litter for mound constructions, shelter from predators, and food sources such as seeds
- predation by foxes and cats and disturbance to mounds by feral goats and pigs
- vehicle strike while birds are feeding along the roadside or crossing roads (OEH, 2019).

The stronghold for this species in NSW is located in the mallee in the south west centred on Mallee Cliffs National Park and extending east to near Balranald and scattered records as far north as Mungo National Park (OEH, 2019).

There are OEH and ALA records within proposal study area and within the locality, specifically between Buronga and Balranald, centred around Mallee Cliffs National Park. Preferred Malleefowl habitat occurs within the proposal study area. Two older Malleefowl mounds were recorded, one located at the western end of the proposal study area and one north of the Sturt Highway on the section heading towards the Murray River.

E-1.2.9.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- There is no approved Conservation Advice for this species.
- There is no Listing Advice for this species
- The *National Recovery Plan for Malleefowl* (Benshemesh, 2007) was reviewed as part of this assessment.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for predation by feral cats (Department of the Environment, 2015a).
- Threat abatement plan for competition and land degradation by rabbits (Department of the Environment and Energy, 2016a).
- Threat abatement plan for predation, habitat degradation, competition and disease transmission by feral pigs (Sus scrofa) (Department of the Environment and Energy, 2017).
- Threat abatement plan for competition and land degradation by unmanaged goats (Department of the Environment, Water, Heritage and the Arts, 2008c).
- Threat abatement plan for predation by the European red fox (Department of the Environment, Water, Heritage and the Arts, 2008b).

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.9.3 SPECIFIC IMPACTS

Clearing of habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region would occur. The proposal would impact on approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region, although not all of this habitat would be suitable for this species. Most of this habitat is not in good condition as it has been intensely grazed by sheep and goats. No individuals were recorded during targeted surveys. However, two older Malleefowl mounds were recorded, one located at the western end of the proposal study area and one north of the Sturt Highway on the section heading towards the Murray River.

The proposal is linear infrastructure which will result in a level of fragmentation at the landscape scale. However, the habitats within this landscape have been severely fragmented by agriculture and existing infrastructure. The proposal would adjoin existing fragments and existing easements minimising new fragmentation. The proposal will result in a level of fragmentation but functional connectivity between habitats is likely to be retained as the alignment will not be completely cleared.

The potential for this species to receive injury or mortality from colliding with the future transmission lines is considered to be negligible. This species rarely flies and when it does so would only fly into the mallee canopy and not to the height of the powerlines themselves.

E-1.2.9.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Malleefowl occur in a wide range of habitat types and habitat critical to the survival of the species is known only in broad terms and no particular populations or general areas can be described as being of greater importance for the long-term survival of Malleefowl than any other (Benshemesh, 2007). As such, in the absence of other information the population subject to this assessment is considered to be important. No individuals were recorded during targeted surveys. However, two older Malleefowl mounds were recorded, one located at the western end of the proposal study area and one north of the Sturt Highway on the section heading towards the Murray River.

E-1.2.9.5 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**

The proposal would impact on approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region, although not all of this habitat would be suitable for this species. Most of this habitat is not in good condition as it has been intensely grazed by sheep and goats. This species was not observed during the targeted seasonal surveys, but two old unused mounds were recorded (see Section 5.7 of the BDAR). This suggests at the minimum that the Malleefowl is present at low density in the habitats that would be impacted. Any birds that use the habitat would have a large home range and the habitat to be impacted by the proposal is not limiting for this species. Any Malleefowl mounds would be avoided during detailed design. The clearing associated with the proposal would not result in the extinction of this species from the locality and as such, the proposal is considered unlikely to lead to a long-term decrease in the size of an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

The area of occupancy for this species is not provided in any documents. The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. West of the Darling River a population also occurs in the Scotia mallee including Tarawi NR and Scotia Sanctuary and is part of a larger population north of the Murray River in South Australia. Approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region. While there will be an impact to suitable habitat, the overall Australian area of occupancy will not be affected.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

The proposal is linear infrastructure which will result in a level of fragmentation at the landscape scale. However, the habitats within this landscape have been severely fragmented by agriculture and existing infrastructure. The proposal would adjoin existing fragments and existing easements minimising new fragmentation. The proposal will result in a level of fragmentation but functional connectivity between habitats is likely to be retained as the alignment will not be completely cleared. The proposal would not result in the fragmentation of an existing population into two or more populations.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Malleefowl occur in a wide range of habitat types and habitat critical to the survival of the species is known only in broad terms and no particular populations or general areas can be described as being of greater importance for the long-term survival of Malleefowl than any other (Benshemesh, 2007). Although habitat such as mallee woodland is present within the proposal study area and would be impacted by the proposal, clearing works would be relatively small or in narrow patches and fragmented woodland, and the clearance of this habitat is very limited compared to the amount of potential foraging habitat surrounding the proposal study area. Although removal of Malleefowl habitat for transmission towers and associated infrastructure is likely to be required, the availability of surrounding suitable Mallee woodland habitat provides extensive habitat. Any identified mounds within the study proposal area would be avoided. Therefore, the impact is not considered significant enough to adversely affect this habitat.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Although removal of Malleefowl habitat for transmission towers and associated infrastructure is likely to be required, the availability of surrounding suitable Mallee woodland habitat provides extensive habitat. Any identified mounds within the study proposal area would be avoided so that the breeding cycle is not disrupted.

- **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 action would decrease the availability of potential habitat by approximately 279 ha in the form of PCT 170, 171 & 172 in the South Olary Plain region. Although removal of Malleefowl habitat for transmission towers and associated infrastructure is likely to be required, the availability of surrounding suitable Mallee woodland habitat provides extensive habitat. Therefore, the proposed action is considered 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.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

Vertebrate pests and weeds are already established in the habitat. Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent further invasive weeds and vertebrate pests such as cats and foxes establishing in the proposal study area.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no diseases known to the Malleefowl that may cause the species to decline.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The *National Recovery Plan for Malleefowl* (Benshemesh, 2007) states that the overall objective is to de-list Malleefowl as a threatened species under the EPBC Act. To achieve this the following specific objectives have been identified:

1. reduce permanent habitat loss
2. reduce the threat of grazing pressure on Malleefowl populations
3. reduce fire threats
4. reduce predation
5. reduce isolation of fragmented populations
6. promote Malleefowl-friendly agricultural practices
7. reduce mortality on roads
8. provide information for regional planning
9. monitor Malleefowl and develop an adaptive management framework
10. determine the current distribution of Malleefowl
11. examine population dynamics: longevity, recruitment and parentage
12. describe habitat requirements that determine Malleefowl abundance
13. define appropriate genetic units for management of Malleefowl
14. assess captive breeding and re-introduction of Malleefowl

15 investigate infertility and agrochemicals
16 facilitate communication between groups
17 raise public awareness through education and publicity
18 manage the recovery process.

The proposal would result in habitat loss and therefore is not consistent with the objectives of the *National Recovery Plan for Malleefowl* (Benshemesh, 2007).

– CONCLUSION

This species is known to utilise the proposal study area. Malleefowl occur in a wide range of habitat types and habitat critical to the survival of the species is known only in broad terms and no particular populations or general areas can be described as being of greater importance for the long-term survival of Malleefowl than any other (Benshemesh, 2007). As such, in the absence of other in formation the population subject to this assessment is considered to be important.

The proposal would impact on approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region. While this is a relatively large area of habitat removal it is a conservative overestimate as not all of this habitat would be suitable for this species. Most of this habitat is not in good condition as it has been intensely grazed by sheep and goats. The carrying capacity of the habitat is likely to be low due to past clearing for agriculture, heavy grazing that has damaged vegetation integrity, and predation pressure from vertebrate pests. At a minimum the Malleefowl is present at low density in the habitats that would be impacted. Any birds that use the habitat would have a large home range and the habitat to be impacted by the proposal is not likely to be limiting for this species.

Any Malleefowl mounds that are identified would be avoided during detailed design. Much of the clearing would take place adjacent to existing power lines or access tracks. The clearing associated with the proposal would not result in the extinction of this species from the locality and as such, the proposal is considered unlikely to lead to a long-term decrease in the size of an important population. Some fragmentation would occur, but as lower level vegetation will be retained within the easement any fragmentation is likely to be localised and functional connectivity for this species would remain. No appreciable increase to landscape scale fragmentation such as what has recently occurred with the breaking apart of large blocks of habitat for agriculture north of the Sturt Highway in the locality of Mallee would occur.

The area of occupancy would not be reduced by the proposal. While all habitats are considered critical for this species the habitat in the proposal study area is not high quality when compared to more intact areas of Mallee. Any identified mounds within the study proposal area would be avoided so that the breeding cycle is not disrupted.

The impact on approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region appears to be relatively large in terms of intensity. However, the context of the clearing in terms of relatively low habitat quality and low carrying capacity of the habitat indicate that a significant impact to the Malleefowl is unlikely. Habitat would be reduced but the habitat to be removed likely forms a small part of the home range of a small number of birds. The habitat to be impacted represents a small proportion of the better-quality habitat that is present in the region including that in the secure reserve of Mallee Cliffs. As such, the impact is unlikely to result in the habitat being unusable for this species in the future and the birds are likely to persist in the habitat once construction is completed.

E-1.2.9.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no Listing Advice for this species. The *National Recovery Plan for Malleefowl* (Benshemesh, 2007) states that Malleefowl occur in a wide range of habitat types and habitat critical to the survival of the species is known only in broad terms and no particular populations or general areas can be described as being of greater importance for the long-term survival of Malleefowl than any other. The *National Recovery Plan for Malleefowl* (Benshemesh, 2007) outlines habitat requirements and limiting factors for the species as follows:

- The Malleefowl is found in semi-arid to arid shrublands and low woodlands, especially those dominated by mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding. Densities of the birds are generally greatest in areas of higher rainfall and on more fertile soils where habitats tend to be thicker and there is an abundance of food plants. Much of the best habitat for Malleefowl has already been cleared or has been modified by grazing by sheep, cattle, rabbits and goats. The species has been shown to be highly sensitive to grazing by sheep and is probably similarly sensitive to grazing by other introduced herbivores. The effect of fire on Malleefowl is severe and breeding in burnt areas is usually reduced for at least 30 years. However, the deleterious effect of fire appears to be mitigated if fires burn patchily. Predation by the introduced fox is also thought to be limiting the abundance of Malleefowl and in many areas may be a major cause of decline. The degree of fragmentation of the remaining Malleefowl habitat is of particular concern and presents a major limiting factor to halting and reversing the decline of the species.

Potential habitat in the form of PCT 170, 171 & 172 is present in the South Olary Plain region. However, most of this habitat is not in good condition as it has been intensely grazed by sheep and goats.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Malleefowl is outlined in Table E-1.10.

Table E-1.10 Summary of survey effort for Malleefowl

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Mallee Spinifex birds	Targeted habitat searches and assessments	11 x 20 min/2 ha formal bird surveys 135-person hours of opportunistic surveys	All year	Oct 2019 & Apr 2020
Mallee, Woodlands and Shrubland birds	Formal 20 min/2 ha surveys, opportunistic surveys and habitat assessments	44 x 20 min/2 ha Formal Bird surveys 232-person hours of opportunistic surveys	All year & during breeding seasons for certain species (Aug-Jan)	Oct 2019; Mar-April 2020 & July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposal would impact on approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region. While this is a relatively large area of habitat removal it is a conservative overestimate as not all of this habitat would be suitable for this species. Most of this habitat is not in good condition as it has been intensely grazed by sheep and goats. The carrying capacity of the habitat is likely to be low due to past clearing for agriculture, heavy grazing that has damaged vegetation integrity, and predation pressure from vertebrate pests. At a minimum the Malleefowl is present at low density in the habitats that would be impacted. Any birds that use the habitat would have a large home range and the habitat to be impacted by the proposal is not likely to be limiting for this species. The impacts to habitat for the Malleefowl are captured in Section 12 of the BDAR.

Figure E-1.9 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is at the south-western edge of the NSW distribution. The species is more widely spread across WA and SA.

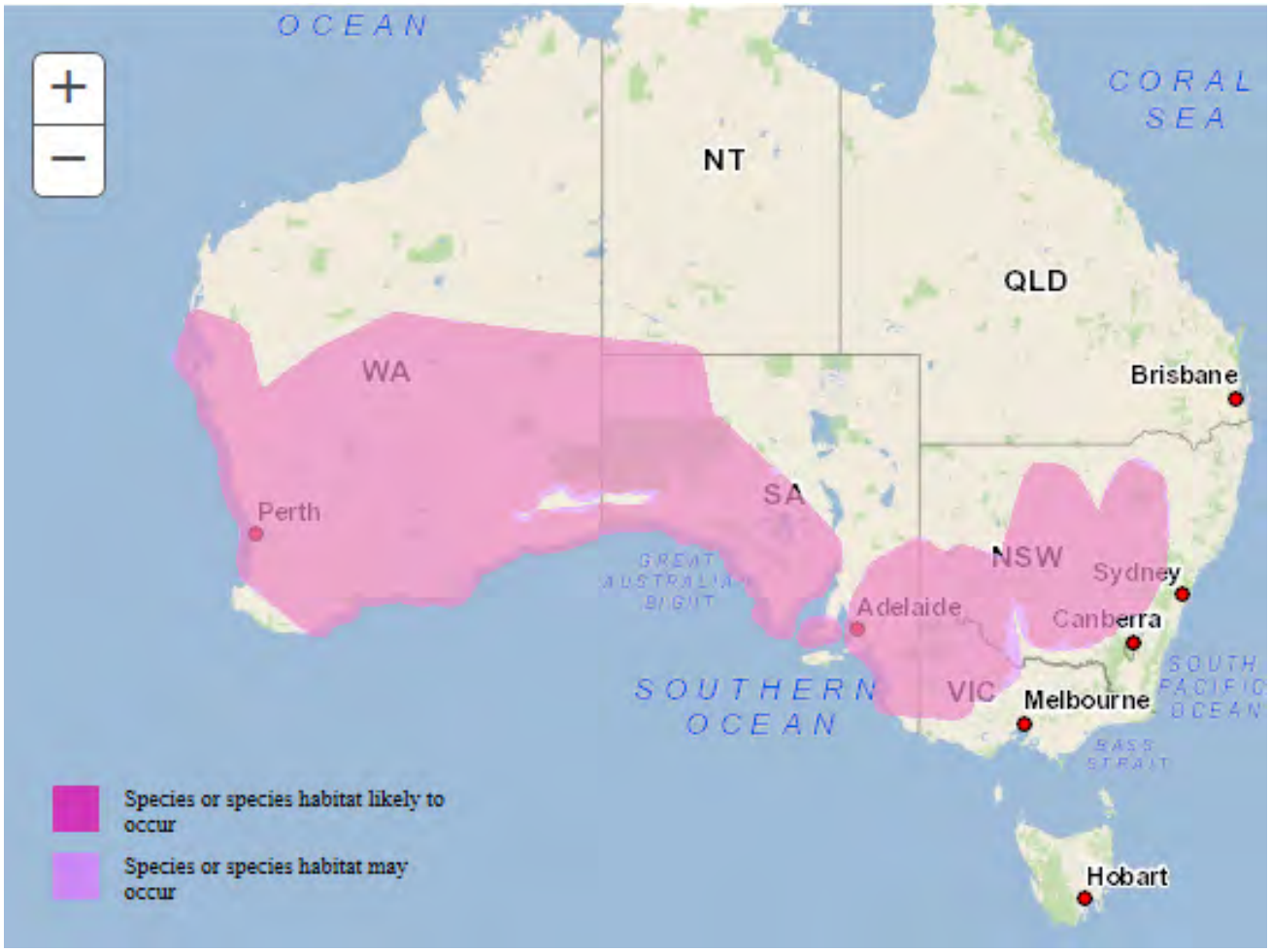

Figure E-1.9 Current distribution map for Malleefowl taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. Two old disused mounds were recorded during the field survey. Specific mitigation for this species will involve avoidance of any mounds that are discovered to limit impacts to breeding habitat.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Malleefowl is approximately 279 ha of potential habitat in the form of PCT 170, 171 & 172 in the South Olary Plain region. The residual impacts to this habitat will be offset as outlined in Section 12 of the BDAR.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlines the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.10 WESTERN ALASKAN BAR-TAILED GODWIT (*LIMOSA LAPPONICA BAUERI*)

The Bar-tailed Godwit (Baueri) is listed as Vulnerable and Migratory under the EPBC Act.

E-1.2.10.1 DESCRIPTION

The Bar-tailed Godwit (*Limosa lapponica*) contains one nominate species and three subspecies, one of which has the potential to occur within the proposal study area on rare occasion: the Bar-tailed Godwit (Western Alaskan) (*Limosa lapponica baueri*)

The Bar-tailed Godwit (Western Alaskan) is migratory shorebird species and are found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. They less frequently occur in salt lakes and brackish wetlands, sandy ocean beaches and rock platforms. They are widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria. During the non-breeding period, their distribution is predominately New Zealand, northern and eastern Australia, and adults are thought to have high site fidelity in the non-breeding season (DoE, 2020c).

The Bar-tailed Godwit (Western Alaskan) forages near the edge of water or in shallow water, mainly in tidal estuaries and harbours, with a mainly carnivorous diet of worms, molluscs, crustaceans, insects and some plant material. They prefer exposed sandy or soft mud substrates on intertidal flats, banks and beaches, and usually roosts on sandy beaches, sandbars, spits and in near-coastal saltmarsh (Threatened Species Scientific Committee, 2016c).

The Bar-tailed Godwit (Western Alaskan) leaves Australia to breed in north-east Siberia from around the Kolyma River to east of the Chukotski Peninsula. They also breed in west Alaska, from Wales to Barrow.

There are several internationally important locations listed for this species within Australia, the closest of which occurs at Hunter Estuary, NSW, over 1,000 km north east of the proposal study area. The PMST indicated that species or species habitat is likely to occur around Lake Hawthorn and Lake Ranfurly, Mildura. Atlas of Living Australia records indicate nine records of the nominate species (*Limosa lapponica*) within the locality, mainly located around Lake Hawthorn and Lake Ranfurly. Additionally, Lake Gol Gol, listed as an internationally important shorebird location by BirdLife Australia, may provide potentially suitable (although not preferred) habitat for these species.

E-1.2.10.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Limosa lapponica baueri Bar-tailed godwit (western Alaskan)* (Threatened Species Scientific Committee, 2016c) was reviewed as part of this assessment.
- Listing assessment information for this species may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.
- The *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) applies to this species.
- The EPBC Act Policy Statement 3.21 – Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species (Department of the Environment, 2015b) applies to this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.10.3 SPECIFIC IMPACTS

This species may potentially collide with transmission lines and conductors causing injury or mortality but the risk is low. The potential impacts to Migratory and wetland birds was considered during the proposal design development, including the strategic options assessment and identification and refinement of the proposal process. Details about the proposal design development are summarised in Chapter 3 of the EIS and Section 8.1 of the BDAR. A biodiversity constraints assessment was undertaken through the proposal design development phase to identify biodiversity values to be avoided. Ramsar wetlands and other important wetlands and water sources for migratory birds were avoided as a priority.

The proposal study area does not contain and mapped important areas or PCTs that are known to be used by this species.

E-1.2.10.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

Any birds that may fly through or utilise the habitats within the proposal study area would be part of the same population that is present in Australia during the non-breeding season. In the absence of other evidence this population is assumed to be important for the purpose of this assessment.

E-1.2.10.5 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**

The Bar-tailed Godwit (Baueri) is a migratory shorebird species with a global population, and is widespread throughout Australia, preferring coastal habitats. Locations where species records for the nominate species (*Limosa lapponica*) occur including Lake Hawthorn and Lake Ranfurly, as well as potential habitat around Lake Gol Gol will not be impacted by the current proposal. The proposal study area does not contain and mapped important areas or PCTs that are known to be used by this species. However, this species may potentially collide with transmission lines and conductors causing injury or mortality.

Due to the low number of occurrence records within the proposal study area, as well as generally lower occurrences of this species this far inland in contrast with coastal areas, collision with the transmission line is not considered likely to significantly affect or decrease the size of a population as few birds would be affected. The transmission line will not be built over a congregation or migration staging area. Therefore, the proposed action is considered unlikely to lead to a long-term decrease in the size of a population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

The extent of occurrence in Australia is estimated to be 7,500,000 km^2 and area occupied 8,100 km^2 (Threatened Species Scientific Committee, 2016c). This species is only considered likely to occur intermittently within the proposal study area between periods of migration as the wetland habitat within the proposal study area is not the preferred or internationally important coastal habitat for these species. As the project will not impact important wetland habitats the area of occupancy for this species is unlikely to be reduced.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

No important wetland habitat will be impacted and given the ability of this species to disperse over these cleared areas it is considered unlikely that the action would fragment an existing population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

There is no habitat listed as critical to the survival of these species within the proposal study area.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

These species do not breed in Australia, and migration to the proposal study area is not considered important in the breeding cycle. Therefore, the proposed action is unlikely to disrupt the breeding cycle of a population.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

The proposal study area does not contain wetland habitat preferred for these species, as they prefer coastal intertidal areas. Additionally, vegetation clearing in wetland habitat for the project in general is likely to be minimal or avoided, therefore, the proposed action is unlikely to result in the modification, removal, isolation, or decreased 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**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

The action is not considered likely to introduce or cause the spread of disease that may affect this species.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

There is no adopted or made Recovery Plan for this species. No key management sites are known to occur within the proposal study area.

- **CONCLUSION**

The action is considered **unlikely to significantly impact** upon The Bar-tailed Godwit (Baueri). No mapped important habitats or PCTs known to be used by this species would be impacted. This species is migratory, widely distributed, and does not breed in Australia. No important habitats (such as Lake Gol Gol) would be impacted by the proposed action. Additionally, collision with transmission lines causing injury or death is considered minimal due to the relatively low abundance of the species in the locality.

E-1.2.10.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. The *Conservation Advice Limosa lapponica baueri Bar-tailed godwit (western Alaskan).* (Threatened Species Scientific Committee, 2016c) outlines habitat during the non-breeding season in Australasia as coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. It has also been recorded in coastal sewage farms and saltworks, saltlakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. Feeding habitat includes the edge of water or in shallow water, mainly in tidal estuaries and harbours. They prefer exposed sandy or soft mud substrates on intertidal flats, banks and beaches (Threatened Species Scientific Committee, 2016c). Roosting habitat includes sandy beaches, sandbars, spits and also in near-coastal saltmarsh (Threatened Species Scientific Committee, 2016c).

There is no adopted or made Recovery Plan for this species.

The *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) and *EPBC Act Policy Statement 3.21 - Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment, 2015b) state that important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. According to this approach, wetland habitat should be considered internationally important if it regularly supports:

- 1 per cent of the individuals in a population of one species or subspecies of waterbird or
- a total abundance of at least 20,000 waterbirds.

Nationally important habitat for migratory shorebirds can be defined using a similar approach to these international criteria, i.e. if it regularly supports:

- 0.1 per cent of the flyway population of a single species of migratory shorebird or
- 2000 migratory shorebirds or
- 15 migratory shorebird species.

The habitats within the proposal study area would not meet any of the criteria for nationally or internationally important habitat as listed in the *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015). Habitat descriptions are provided in Section 5.6 of the BDAR. Core coastal habitat does not occur within the proposal study area, but the species may be an occasional visitor to inland water habitats such as Lake Gol Gol which is listed as an internationally important shorebird location by Birdlife Australia. Few ALA records occur within locality and are primarily in riverine and wetland habitat locations.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for wetland birds is outlined in Table E-1.11.

Table E-1.11 Summary of survey effort for Migratory Birds

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation				
Migratory Birds	Targeted wetland surveys during the Spring and Summer	29-person hours	Sep – Mar	Oct – Nov 2019

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would potentially clear vegetation within suitable wetland habitat. The proposed action could potentially result in individuals colliding with transmission lines during nocturnal dispersal. These impacts are captured in Section 12 of the BDAR.

Figure E-1.10 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is not within the known habitat distributions, but the species is only likely to be an occasional visitor to inland habitats.

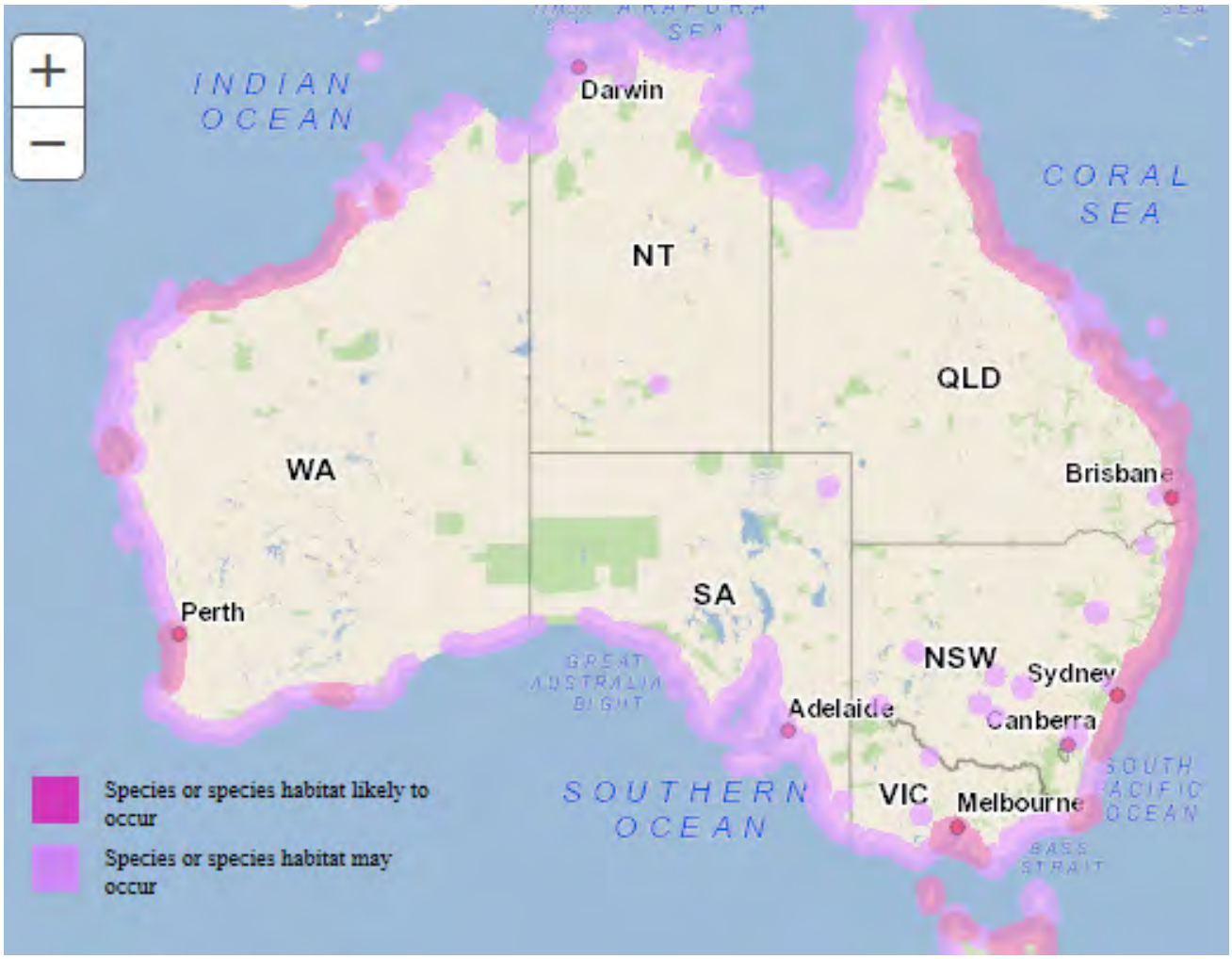

Figure E-1.10 Current distribution map for Bar-tailed Godwit (Baueri) taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for this species are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to this species is likely to be minimal. The proposed action would potentially clear vegetation within suitable wetland habitat. The proposed action could potentially result in individuals colliding with transmission lines during nocturnal dispersal.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.11 BLACK-EARED MINER (*MANORINA MELANOTIS*)

The Black-eared Miner is listed as Endangered under the EPBC Act and listed as Critically Endangered under the BC Act.

E-1.2.11.1 DESCRIPTION

The Black-eared Miner occurs in the Murray Mallee region of Victoria, SA and the far-south west of NSW. The majority of occurrence records are from the Riverland Biosphere Reserve in SA, the Murray-Sunset National Park in Victoria, and the Scotia sanctuary in NSW (Threatened Species Scientific Committee, 2016d). They are restricted to mature, unfragmented mallee eucalypt woodland, preferring shallow sand mallee and chenopod mallee where vegetation is dominated by multi-stemmed mallee eucalypts, including *Eucalyptus dumosa, Eucalyptus gracilis, Eucalyptus oleosa and Eucalyptus socialis*, usually in association with a ground layer dominated by either Spinifex (*Triodia scariosa*), or shrubs of the families Chenopodiaceae and Zygophyllaceae. They also prefer old growth mallee that has not been burnt of at least 50 years (Threatened Species Scientific Committee, 2016d). These mallee habitats are required for breeding and foraging.

Associated PCTs in NSW, which are also present in the proposal study area in the South Olary Plain region, include:

- PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
- PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion.

The primary reason for the decline of the Black-eared Miner is that the majority of its preferred habitat has been cleared. This has allowed the closely related Yellow-throated Miner (*Manorina flavigula*) to colonise habitat remnants and interbreed with Black-eared Miners, causing genetic swamping (i.e. the genes of the rare Black-eared Miner to be dominated by genes of the Yellow-throated Miner over time in individuals) to be the species greatest threat (DoE, 2020h).

Within the proposal study area, there are no records of this species, all recent records are further to the west, near the SA/NSW border.

E-1.2.11.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Manorina melanotis black-eared miner* (Threatened Species Scientific Committee, 2016d) was reviewed as part of this assessment.
- Listing assessment information for this species may be available in the approved Conservation Advice.
- The Recovery Plan for the Black-eared Miner Manorina melanotis 2002-2006: Conservation of old-growth dependant mallee fauna (Baker-Gabb, 2003) was reviewed as part of this assessment.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.11.3 SPECIFIC IMPACTS

Vegetation clearing for transmission line towers and access tracks in potentially suitable mallee habitat will occur. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7 of the BDAR the habitats within the proposal study area are not optimal for the Black-eared Miner.

All mallee habitats associated with the Proposal alignment (i.e. PCT 170 and PCT 171) are compromised as potential Black-eared Miner habitat by habitat attributes, which favour the persistence of Yellow-throated Miners (*M. flavigula*). The most suitable habitats in the alignment are those occurring in the west, however, the habitat has low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners from the dark rumped Black-eared Miners (Higgins et al., 2001). If Black-eared Miners persist in habitats associated with the Proposal alignment, they may only occur as a genetic influence within the more dominant Yellow-throated Miner gene pool.

E-1.2.11.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an endangered or critically 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**

Within the proposal study area, there are no records of this species, all recent records are further to the west, near the SA/NSW border. All mallee habitats associated with the Proposal alignment (i.e. PCT 17p and PCT 171) are compromised as potential Black-eared Miner habitat by habitat attributes, which favour the persistence of Yellow-throated Miners (*M. flavigula*). The most suitable habitats in the alignment are those occurring in the west, however, the habitat has low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners. It is likely that genetically pure Black-eared Miners no longer persist in the habitat to be impacted by the proposal.

As the species is unlikely to be present in a pure form, the impact from the proposal is unlikely to lead to a long-term decrease in the size of a Black-eared Miner population.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

The Black-eared Miner formerly occurred in the 'Murray Mallee' region of South Australia, Victoria and New South Wales, but is now absent from much of its range. Few birds remain in Victoria and New South Wales, with most colonies now confined to a limited area of mallee to the north-west of Renmark in South Australia (Baker-Gabb, 2003) (see Figure E-1.11). The proposal will not impact on any of these known areas, so the current known area of occupancy would not be reduced.

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

Although sections of marginal Black-throated Miner habitat are likely to be cleared, the maximum cleared area for a single tower footprint or laydown area would not exceed 0.5 ha, and the easement width of the transmission line would be a maximum of approximately 80 meters (with full clearing not always being required). The proposal study area is within an already fragmented landscape from agriculture and existing linear infrastructure, thereby limiting the potential for any substantial additional fragmentation to occur. Given the ability for the Black-throated Miner to disperse over and around cleared areas, is it considered unlikely that the action would fragment an existing population.

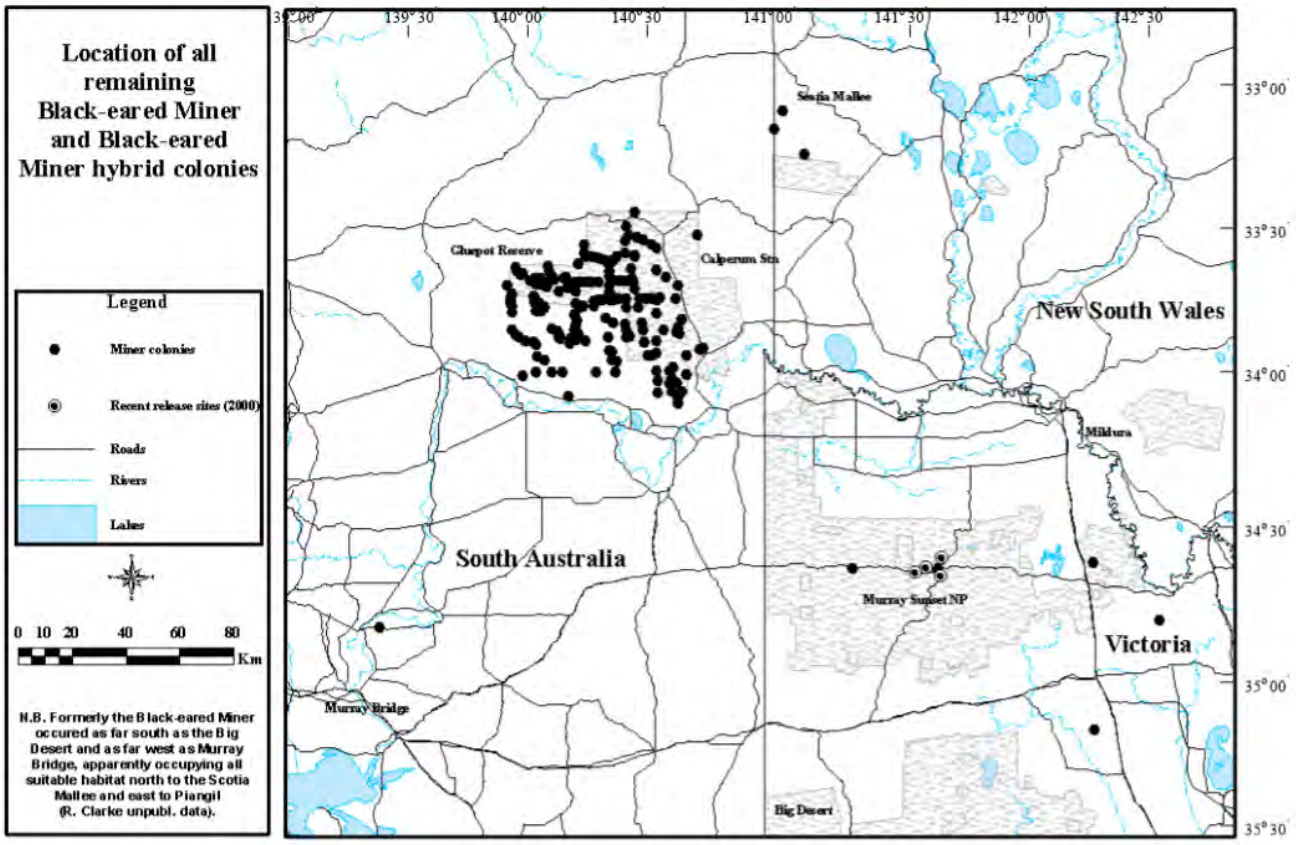

Figure E-1.11 Location of all remaining Black-eared Miner and hybrid colonies (taken from the Recovery Plan)

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

The *Recovery Plan for the Black-eared Miner Manorina melanotis 2002-2006: Conservation of old-growth dependant mallee fauna* (Baker-Gabb, 2003) outlines the habitat that is critical for the survival of the Black-eared Miner as follows:

- The Black-eared Miner inhabits Shallow-sand Mallee and Chenopod Mallee in both the Sunset Country of Victoria and the Bookmark Biosphere Reserve in South Australia (McLaughlin 1992; Muir et al 1999). In both States the vegetation is dominated by multi-stemmed mallee eucalypts, including *Eucalyptus dumosa*, *E gracilis*, *E oleosa* and *E socialis*, usually in association with a ground layer dominated by either Porcupine Grass *Triodia scariosa*, or shrubs of the families Chenopodiaceae and Zygophyllaceae (Starks 1987; McLaughlin 1992; Muir et al 1999).

Black-eared Miners occur predominantly in old-growth habitats that have not been burnt for at least 40 years, although post-fire regenerating mallee of 5-10 years or older may provide occasional foraging habitat (Starks 1987; C Silveira and J McLaughlin unpubl). In the Bookmark Biosphere Reserve and Tarawi Nature Reserve in NSW >80% of the mallee is older than 40 years and hence suitable for breeding birds. In Victoria where there is much less old-growth mallee, the age and distribution of cohorts of mallee regenerating from fires have been mapped and digitised so that the amount of critical habitat and potential critical habitat can be calculated.

Within large areas of contiguous mallee in Bookmark Biosphere Reserve, sites with highest quality colonies of Black-eared Miners are more than 5 km from dams and man-made clearings (Clarke and Clarke 1999b, Muir et al 1999). In contrast, all known Yellow-throated Miner colonies in the Bookmark region have been located within 2 km of permanent water and man-made clearings. The extensive areas of mallee that have remained unburnt for over 40 years that Black-eared Miners need are also important for other nationally threatened birds such as the Malleefowl and hollow- nesting Major Mitchell's Cockatoo (Benshemesh 1999, Garnett and Crowley 2000).

In Victoria, colonies known to have contained Black-eared Miners were in blocks of contiguous mallee vegetation larger than 12,000 ha (McLaughlin 1994). In South Australia and New South Wales all but one known colony occurs in areas of contiguous mallee larger than 100,000 ha. Black-eared Miners were once known to occur in small remnant patches of mallee (McGilp and Parsons 1937; Rix 1937; McGilp 1943) which were probably occupied immediately following large-scale clearing, but prior to the expansion into and subsequent habitation of these areas by Yellow-throated Miners (Starks 1987). Even larger isolated blocks of suitable mallee such as the reserves at Bronzewing (20,000 ha) and Annuello (35,000 ha) have proved unable to retain viable populations of Black-eared Miners and protect them from genetic swamping in the medium term (Boulton and Clarke 2000b).

There are areas of mallee habitat within the proposal study area, which are considered to be potential habitat for the Black-eared Miner. The most suitable habitats in the alignment are those occurring in the west, however, the habitat has low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners. It is likely that genetically pure Black-eared Miners no longer persist in the habitat to be impacted by the proposal.

None of the areas identified as critical habitat in the *Recovery Plan for the Black-eared Miner Manorina melanotis 2002-2006: Conservation of old-growth dependant mallee fauna* (Baker-Gabb, 2003) would be impacted.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

Within the proposal study area, there are no records of this species, or known breeding populations. The proposal area does not contain critical habitat required for breeding and therefore unlikely to disrupt breeding cycle of a potential local population.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

The Black-eared Miner formerly occurred in the ‘Murray Mallee’ region of South Australia, Victoria and New South Wales, but is now absent from much of its range. Few birds remain in Victoria and New South Wales, with most colonies now confined to a limited area of mallee to the north-west of Renmark in South Australia (Baker-Gabb, 2003) (see Figure F.11). The proposal will not impact on any of these known areas. The habitats that would be impacted have low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners. It is likely that genetically pure Black-eared Miners no longer persist in the habitat to be impacted by the proposal. As such, as no known Black-eared Miner population would be impacted the proposal is not considered likely to 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 CRITICALLY ENDANGERED OR ENDANGERED SPECIES BECOMING ESTABLISHED IN THE ENDANGERED OR CRITICALLY ENDANGERED SPECIES' HABITAT**

Long term effects of the action may cause minor increases in the establishment, density or diversity of weed species due to edge effects along cleared land surrounding the transmission line, towers and access tracks. Adherence to a long term weed and pest management plan as a mitigation measure would reduce the risk of weed invasion.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no known diseases causing potential species decline to the Black-eared Miner.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The proposed action would not interfere substantially with the *Recovery Plan for the Black-eared Miner Manorina melanotis 2002-2006: Conservation of old-growth dependant mallee fauna* (Baker-Gabb, 2003). This plan focuses on the remaining known areas of habitat which will not be impacted by the proposal.

- **CONCLUSION**

The proposed action is **considered unlikely to have a significant impact** on the Black-eared Miner. The habitats within the proposal study area are not optimal for this species and all birds observed within the proposal study area during surveys approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners. It is likely that genetically pure Black-eared Miners no longer persist in the habitat to be impacted by the proposal.

E-1.2.11.5 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no Listing Advice for this species. The *Conservation Advice Manorina melanotis black-eared miner* (Threatened Species Scientific Committee, 2016d) broadly outlines habitat as mallee that has not been burnt for at least 45 years, although the species will forage in much younger mallee. The *Recovery Plan for the Black-eared Miner Manorina melanotis 2002-2006: Conservation of old-growth dependant mallee fauna* (Baker-Gabb, 2003) outlines the preferred habitat in greater detail including habitat that is critical for the survival of the Black-eared Miner which is outlined in the assessment above.

Associated PCTs in NSW, which are also present in the proposal study area in the South Olary Plain region, include:

- PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
- PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion.

However, the habitats within the proposal study area are considered marginal (see discussion above).

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Black-eared Miner is outlined in Table E-1.12.

Table E-1.12 Summary of survey effort for Black-eared Miner

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Mallee Spinifex birds	Targeted habitat searches and assessments	11 x 20 min/2 ha formal bird surveys 135-person hours of opportunistic surveys	All year	Oct 2019 & Apr 2020
Mallee, Woodlands and Shrubland birds	Formal 20 min/2 ha surveys, opportunistic surveys and habitat assessments	44 x 20 min/2 ha Formal Bird surveys 232-person hours of opportunistic surveys	All year & during breeding seasons for certain species (Aug-Jan)	Oct 2019; Mar-April 2020 & July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

Vegetation clearing for transmission line towers and access tracks in potentially suitable mallee habitat will occur. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.1 of the BDAR the habitats within the proposal study area are not optimal for the Black-eared Miner.

All mallee habitats associated with the Proposal alignment (i.e. PCT 17p and PCT 171) are compromised as potential Black-eared Miner habitat by habitat attributes, which favour the persistence of Yellow-throated Miners (*M. flavigula*). The most suitable habitats in the alignment are those occurring in the west, however, the habitat has low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners from the dark rumped Black-eared Miners (Higgins et al., 2001). If Black-eared Miners persist in habitats associated with the Proposal alignment, they may only occur as a genetic influence within the more dominant Yellow-throated Miner gene pool.

The Black-eared Miner formerly occurred in the 'Murray Mallee' region of South Australia, Victoria and New South Wales, but is now absent from much of its range. Few birds remain in Victoria and New South Wales, with most colonies now confined to a limited area of mallee to the north-west of Renmark in South Australia (Baker-Gabb, 2003) (see Figure E-1.11). The proposal will not impact on any of these known areas.

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

There are unlikely to be any significant residual impacts to this species from the proposal.

All mallee habitats associated with the Proposal alignment (i.e. PCT 170 and PCT 171) are compromised as potential Black-eared Miner habitat by habitat attributes, which favour the persistence of Yellow-throated Miners (*M. flavigula*). The most suitable habitats in the alignment are those occurring in the west, however, the habitat has low incidences of old-growth components, there are permanent dams, and all observed miners approaching Black-eared Miner markings had white rumps, which is a key character for identifying Yellow-throated Miners from the dark rumped Black-eared Miners (Higgins et al., 2001). If Black-eared Miners persist in habitats associated with the Proposal alignment, they may only occur as a genetic influence within the more dominant Yellow-throated Miner gene pool.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

There are unlikely to be any significant residual impacts to this species from the proposal.

Details of offset requirements and obligations for PCT 170 and PCT 171 are addressed in Section 12 of the BDAR.

DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlines the biodiversity offset strategy for the proposal. The offset obligations for PCT 170 and PCT 171 will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.12 RED-LORED WHISTLER (*PACHYCEPHALA RUFOGULARIS*)

The Red-lored Whistler is listed as Vulnerable under the EPBC Act and Critically Endangered under the BC Act.

E-1.2.12.1 DESCRIPTION

The Red-lored Whistler is found in semi-arid regions of New South Wales, Victoria and South Australia. The core of the population is centred on the South Australia-Victoria border, where it occurs in the Murray-Mallee region and Upper South-East region (including Riverland Biosphere Reserve) of South Australia, and in the Big Desert and Sunset Country areas of Victoria (DoEE, 2019).

The Red-lored Whistler inhabits low mallee shrublands, heathlands and woodlands that have an open canopy and a moderately dense but patchy understorey. In tree mallee environments in the Murray Mallee region they prefer habitats that support a mosaic of mallee and *Triodia* vegetation. In the more heath-dominated mallee environments located further south, they display a preference for taller mallee heath. In tree mallee habitats, they appear to prefer habitats that have remained unburnt for at least 20 years. They predominantly occur in mallee vegetation that has a sparse or open canopy comprised of 2–5 m tall eucalypts such as *Eucalyptus incrassata*, *Eucalyptus dumosa*, *Eucalyptus foecunda*, *Eucalyptus socialis* and *Eucalyptus leptophylla*; a low (usually less than 1.5 m tall), moderately dense understorey that may be comprised of various species, including *Melaleuca uncinata*, *Callitris verrucosa*, *Leptospermum coriaceum*, *Phebalium bullatum*, *Baeckea behrii*, *B. crassifolia*, *Hakea muelleriana*, *Leucopogon cordifolius*, *Allocasuarina muelleriana*, *Calytrix tetragona*, *Banksia ornata* and species of *Acacia*; and a sparse ground layer usually comprised of tussocks of *Triodia*, and sometimes species of *Maireana*, *Sclerolaena*, *Chenopodium*, *Westringia*, *Zygophyllum*, *Ptilotus* and *Stipa*, with extensive areas of bare ground.

The Red-lored Whistler breeds from August to November and builds a cup-shaped nest of bark, sticks, leaves and other plant material that is mainly taken from mallee eucalypts. The nest is generally placed amongst *Triodia* and sheltered by a shrub or tree, or in the fork of a mallee *Eucalyptus*, *Casuarina*, *Banksia*, *Melaleuca* or *Acacia*. The total breeding population of the Red-lored Whistler has been estimated, with low reliability, to consist of 10,000 birds (DoEE, 2019).

Important sites include Round Hill and Nombinnie Nature Reserves in central NSW, which are over 500 km east of the proposal study area. There are records within proposal study area and within locality.

E-1.2.12.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- There is no approved Conservation Advice for this species.
- There is no Listing Advice for this species.
- The National Recovery Plan for the Mallee Emu-Wren Stipiturus mallee, Red-lored Whistler Pachycephala rufogularis and Western Whipbird Psophodes nigrogularis leucogaster (Department of Environment, Land, Water and Planning, 2016) was reviewed as part of this assessment.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for predation by feral cats (Department of the Environment, 2015a).

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.12.3 SPECIFIC IMPACTS

Targeted bird surveys within the proposal study area did not record any Red-lored Whistler. Impacts would consist of clearing of potential mallee habitat in the form of PCT 170 and PCT 171. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.3 of the BDAR the habitats within the proposal study area are not optimal for the Red-lored Whistler.

The potential for this species to receive injury or mortality from colliding with the future transmission lines is considered to be negligible. This species inhabits mallee and the associated shrub and ground layer and feeds mainly on the ground, eating invertebrates and seed and fruit. When flying, it is most likely fly into the mallee canopy and not to the height of the powerlines themselves. Striking powerlines is not known to be a regular impact to this species.

E-1.2.12.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Matters of National Environmental Significance, Significant Impact Guidelines 1.1, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

The western portion of the proposal study area near the SA border is within the mapped area of potential occurrence for this species. If a Red-lored Whistler population did occur within the proposal study area, then it would likely be considered an important population. Taking a precautionary approach, the population subject to this assessment is assumed to be important.

E-1.2.12.5 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**

Targeted bird surveys within the proposal study area did not record any Red-lored Whistler. Impacts would consist of clearing of potential mallee habitat in the form of PCT 170 and PCT 171. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.3 of the BDAR the habitats within the proposal study area are not optimal for the Red-lored Whistler.

The species requires high quality habitat and is absent from large areas of mallee habitat, particularly where grazing is present, with habitat noted as unsuitable within six kilometres of cattle drinking bores (Department of Environment, 2016a). Grazing pressure within the mallee habitats in the proposal study area is very high. The Red-lored Whistler is considered very unlikely to occur within habitats impacted by the proposal, due to the lack of records from the surrounding regions and the degraded condition of associated mallee habitats as a consequence of clearing, burning and a long history of grazing. This species was not recorded during the 2019/2020 survey program, despite targeted surveys for this species and habitat assessments concluded that habitat was not of sufficient quality to support its presence. As such, it is unlikely that the proposal would lead to a long-term decrease in the size of an important population of the Red-lored Whistler.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

The extent of occurrence for the Red-lord Whistler is estimated to be 400,000 km² and this estimate, which is based on published maps, is considered to be of medium reliability (Garnett & Crowley 2000). The Red-lored Whistler has disappeared from some areas of its former range but based on available records, these disappearances do not seem to have had a major effect on the extent of occurrence which is estimated at 5,000 km² (Garnett & Crowley 2000).

The mallee habitats that would be impacted by the proposal are considered to be marginal habitat for the Red-lored Whistler and impact to these habitats would not reduce the known area of occupancy for this species.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Although sections of marginal Red-lored Whistler habitat are likely to be cleared, the maximum cleared area for a single tower footprint or laydown area would not exceed 0.5 ha, and the easement width of the transmission line would be a maximum of approximately 80 meters (with full clearing not always being required). The proposal study area is within an already fragmented landscape from agriculture and existing linear infrastructure, thereby limiting the potential for any substantial additional fragmentation to occur. It is unlikely that a Red-lored Whistler population occurs within the habitats to be impacted by the proposal. However, if a population does occur, functional connectivity of habitats would remain.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Nombinnie Nature Reserves to the north of the proposal study area and Tarawi Nature Reserve to the west of the proposal study area are considered key management sites (critical habitat) for this species in NSW. The proposed action would not impact on these sites. The mallee habitat within the proposal study area is considered to be marginal for the Red-lored Whistler and would not be critical to the survival of this species.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

The species requires high quality habitat and is absent from large areas of mallee habitat, particularly where grazing is present, with habitat noted as unsuitable within six kilometres of cattle drinking bores (Department of Environment, 2016a). Grazing pressure within the mallee habitats in the proposal study area is very high and the Red-lored Whistler is considered unlikely to occur within habitats impacted by the proposal. Breeding habitat is unlikely to be present.

- **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 action is considered 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. Grazing pressure within the mallee habitats in the proposal study area is very high and the Red-lored Whistler is considered unlikely to occur within habitats impacted by the proposal. Habitat quality is already poor. Any impact from the proposal is considered likely to be negligible for this species as the habitat is already marginal.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as goats, cats and foxes establishing in the proposal study area.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no diseases known to the Red-lored Whistler that may cause the species to decline.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The *National Recovery Plan for the Mallee Emu-Wren Stipiturus mallee, Red-lored Whistler Pachycephala rufogularis and Western Whipbird Psophodes nigrogularis leucogaster* (Department of Environment, Land, Water and Planning, 2016) outlines the following strategies to achieve the recovery objectives:

- establishing a recovery team to coordinate implementation of the recovery plan
- incorporating threatened mallee bird fire scale and frequency requirements into all fire management plans and annual works plans
- enhancing habitat connectivity and quality
- managing total grazing pressure from all herbivores by decommissioning artificial water points and controlling introduced herbivores

- undertaking introduced predator control programs
- monitoring trends in subpopulations in response to management actions, particularly rates of recovery from fire
- investigating the need for translocations, including the degree of genetic isolation of geographically separate subpopulations, and develop translocation programs where necessary
- enhancing community involvement and awareness.

The proposed action would not interfere with these identified strategies.

- **CONCLUSION**

The proposed action is considered unlikely to significantly impact the Red-lored Whistler. Targeted bird surveys within the proposal study area did not record any Red-lored Whistler. Impacts would consist of clearing of potential mallee habitat in the form of PCT 170 and PCT 171. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.3 of the BDAR the habitats within the proposal study area are not optimal for the Red-lored Whistler. The species requires high quality habitat and is absent from large areas of mallee habitat, particularly where grazing is present. Grazing pressure within the mallee habitats in the proposal study area is very high. The Red-lored Whistler is considered very unlikely to occur within habitats impacted by the proposal, due to the lack of records from the surrounding regions and the degraded condition of associated mallee habitats as a consequence of clearing, burning and a long history of grazing.

E-1.2.12.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no Listing Advice for this species. There is no approved Conservation Advice for this species. The *National Recovery Plan for the Mallee Emu-Wren Stipiturus mallee, Red-lored Whistler Pachycephala rufogularis and Western Whipbird Psophodes nigrogularis leucogaster* (Department of Environment, Land, Water and Planning, 2016) outlines the habitat for the Red-lored Whistler as follows:

- In New South Wales, Red-lored Whistlers chiefly occur in the central-western NSW mallee centred on Round Hill and Nombinnie Nature Reserves. It is thought to have become locally extinct at Pulletop Nature Reserve in central New South Wales where it was last seen in 1982. There were also records during the 1980s from the Scotia Mallee west of the Darling River, at Scotia Sanctuary, Tarawi Nature Reserve and Springwood Station north of Wentworth, but targeted searches have failed to find Red-lored Whistlers in this region since 1996.

- The Red-lored Whistler occurs in Spinifex Grass (*Triodia*) mallee, shrubland or mallee heath, mostly 2–5 m tall and usually where the canopy is sparse, and with a sparse to moderately dense but patchy shrub layer (Carpenter & Matthew 1986; Woinarski 1987; Matthew et al. 1996; Sluiter & O'Neill 1996). Like the Mallee Emu-wren, the Red-lored Whistler prefers the Woorinen Sands Mallee ecological vegetation class in Victoria (Clarke 2007a). Moise (2008) showed that the Red-lored Whistler has strict habitat requirements with its distribution in both mallee and mallee heath limited by the presence of Spinifex Grass (Triodia scariosa). Red-lored Whistlers often nest on Spinifex Grass hummocks (Higgins and Peter 2002, Moise 2008). Dominant Eucalypt species include Eucalyptus incrassata, E. dumosa and E. socialis, with understorey shrubs including Acacia species, Callitris verrucosa, Leptospermum coriaceum, Calytrix tetragona, Hakea muelleriana, Baeckea behrii, B. crassifolia, Phebalium bullatum, Leucopogon cordifolius, Banksia ornata and Broombush (Melaleuca uncinata), and a ground cover of Triodia scariosa and species such as Westringia rigida, Ptilotus species and Stipa species (Matthew et al. 1995; 1996; Sluiter & O'Neill 1996). Birds are very occasionally recorded in tall mallee, eucalypt woodland and Banksia species scrub (Hackett & Hackett 1986; Cooper & McAllan 1995). The Red-lored Whistler appears to have one of the most specialised habitat requirements of all of the threatened mallee birds, and because their habitat is patchily distributed, and the birds have

very large home ranges, this specialisation results in low population densities (Clarke 2005b, Moise 2008). Much of the remaining habitat is in conservation reserves.

- Red-lored Whistlers apparently do not recolonise areas until at least five years after a fire (Matthew et al. 1996). In the Big Desert mallee-heath, 63% of Red-lored Whistler records were in vegetation 21–40 years post-fire, with other records in long-unburnt habitat (Cheal et al. 1979), while studies in heath habitat indicated a preference for Broombush 3–30 years of age (Woinarski 1987, 1989). In the Sunset Country, the Red-lored Whistler was recorded from a range of early post-fire to long-unburnt vegetation (Cheal et al. 1979; Silveira 1993; Sluiter & O'Neill 1996), with areas that have remained unburnt for 21–44 years most important (Clarke 2005b; Connell et al. in press). In the Riverland Biosphere Reserve, the Red-lored Whistler has been recorded predominantly in long-unburnt mallee (Moise 2008), with habitats that have remained unburnt for 46–52 years most important, with some ability to utilise habitats last burnt 20–23 years ago. In heath-dominated mallee the species appears to occupy more recently burnt habitats, with a preference for areas burnt 10–24 years ago (Clarke 2005b, Moise 2008).
- In the Riverland Biosphere Reserve Red-lored Whistlers occur >6 km from water points and their associated grazing impacts (Harrington 2002). Moise (2008) also recorded this species only in areas that had experienced low grazing impacts.

Associated PCTs in NSW, which are also present in the proposal study area in the South Olary Plain region, include:

- PCT 170 – Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
- PCT 171 – Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion.

However, the habitats within the proposal study area are considered marginal (see discussion above).

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Red-lored Whistler is outlined in Table E-1.13.

Table E-1.13 Summary of survey effort for Red-lored Whistler

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Mallee Spinifex birds	Targeted habitat searches and assessments	11 x 20 min/2 ha formal bird surveys 135-person hours of opportunistic surveys	All year	Oct 2019 & Apr 2020
Mallee, Woodlands and Shrubland birds	Formal 20 min/2 ha surveys, opportunistic surveys and habitat assessments	44 x 20 min/2 ha Formal Bird surveys 232-person hours of opportunistic surveys	All year & during breeding seasons for certain species (Aug-Jan)	Oct 2019; Mar-April 2020 & July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

Vegetation clearing for transmission line towers and access tracks in potentially suitable mallee habitat will occur. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.3 of the BDAR the habitats within the proposal study area are not optimal for the Red-lored Whistler.)

The extent of occurrence for the Red-lord Whistler is estimated to be 400,000 km² and this estimate, which is based on published maps, is considered to be of medium reliability (Garnett & Crowley 2000). The Red-lored Whistler has disappeared from some areas of its former range but based on available records, these disappearances do not seem to have had a major effect on the extent of occurrence which is estimated at 5,000 km² (Garnett & Crowley 2000). The mallee habitats that would be impacted by the proposal are considered to be marginal habitat for the Red-lored Whistler and impact to these habitats would not reduce the known area of occupancy for this species. The current distribution of the Red-lored Whistler is shown in Figure E-1.12). The proposal will impact on an area of potential occurrence near the SA / NSW border.

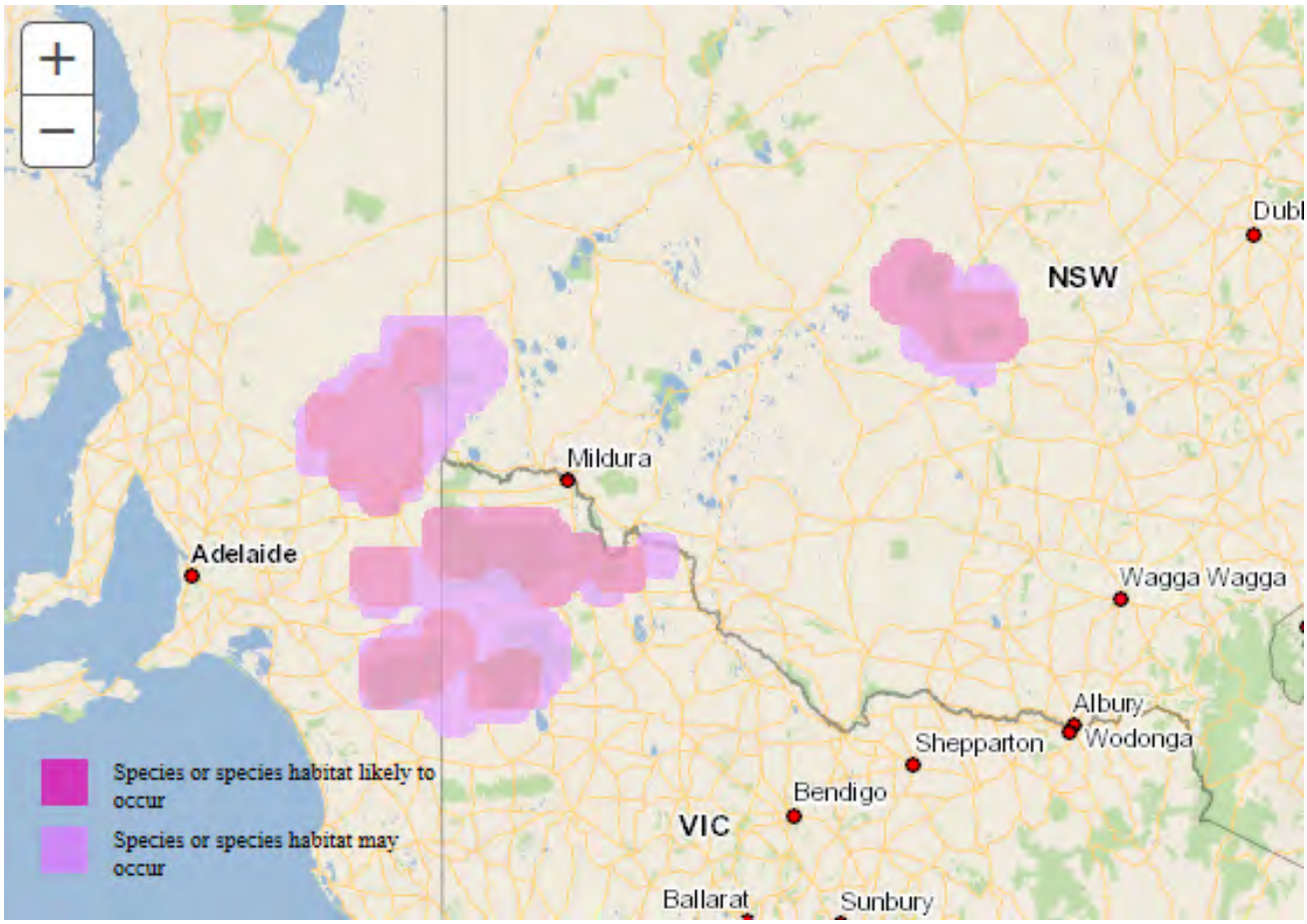

Figure E-1.12 Current distribution map for Red-lored Whistler taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

There are unlikely to be any significant residual impacts to this species from the proposal.

Impacts would consist of clearing of potential mallee habitat in the form of PCT 170 and PCT 171. The impacts to PCT 170 and PCT 171 in the South Olary Plain region include clearing of 196 ha and 55 ha of each PCT respectively. However, as described in Section 5.7.3 of the BDAR the habitats within the proposal study area are not optimal for the Red-lored Whistler. The species requires high quality habitat and is absent from large areas of mallee habitat, particularly where grazing is present. Grazing pressure within the mallee habitats in the proposal study area is very high. The Red-lored Whistler is considered very unlikely to occur within habitats impacted by the proposal, due to the lack of records from the surrounding regions and the degraded condition of associated mallee habitats as a consequence of clearing, burning and a long history of grazing.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

There are unlikely to be any significant residual impacts to this species from the proposal.

Details of offset requirements and obligations for PCT 170 and PCT 171 are addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlines the biodiversity offset strategy for the proposal. The offset obligations for PCT 170 and PCT 171 will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.13 REGENT PARROT (EASTERN) (*POLYTELIS ANTHOPEPLUS MONARCHOIDES*)

The Regent Parrot (eastern) is listed as Vulnerable under the EPBC Act and Endangered under the BC Act.

E-1.2.13.1 DESCRIPTION

The eastern subspecies of the Regent Parrot is confined to the semi-arid interior of south eastern mainland Australia. In NSW, it is confined to the southern Lower Western Region, mainly along the Murray River, from Kyalite, north west to Mallee Cliffs State Forest, and is also recorded near Wentworth and the Rufous River. Away from the Murray River, the subspecies is recorded at isolated localities including west of Moonlight Lake, Arumpo Station, and near Pooncarie. The current population size is estimated at 1500 breeding pairs (Baker-Gabb *et al.*, 2011).

Within this range, the eastern Regent Parrot occurs in riverine and mallee woodlands and forests, including River Red Gum (*Eucalyptus camaldulensis*) forests or woodlands and adjacent Black Box (*Eucalyptus largiflorens*) woodlands, and open mallee woodland or shrubland usually with a ground cover of spinifex (*Triodia*) or other grasses, supporting various eucalypts, especially Christmas Mallee (*Eucalyptus socialis*) and Yellow Mallee (*Eucalyptus costata*) Mallee, as well as Belah (*Allocasuarina cristata*), Buloke (*A. leuhmannii*) or Slender Cypress Pine (*Callitris preissii*). As mallee habitats provide important foraging grounds, this species is dependent on mallee woodlands for survival (Baker-Gabb *et al.*, 2011).

Regent Parrot breeding is colonial, with up to 27 nests recorded in one colony. Nests are usually within 150 meters of each other with up to five nests recorded in a single tree. Nests are primarily located in hollow limbs, and sometimes located in a hollow entrance in the trunk. Large (mean 160 cm DBH), tall (mean 28 m), mature, healthy River Red Gums with many hollows, usually close to water are generally preferred (Baker-Gabb *et al.*, 2011).

E-1.2.13.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- There is no approved Conservation Advice for this species.
- There is no Listing Advice for this species.
- The National Recovery Plan for the Regent Parrot (eastern subspecies) Polytelis anthopeplus monarchoides (Baker-Gabb & Hurley, 2011) was reviewed as part of this assessment.

Relevant adopted/made threat abatement plans include:

- Threat abatement plan for competition and land degradation by rabbits (Department of the Environment and Energy, 2016a).

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts, 2010).

E-1.2.13.3 SPECIFIC IMPACTS

A pair of Regent Parrots was observed within the proposal study area flying through riverine woodland on the Robinvale Plain IBRA subregion. Clearance of Black Box and River Red Gum habitat in the form of PCT 11 & 13 in the Robinvale Plains region is the predicted impact to this species. Potential habitat is suitable for foraging and nesting. The potential impacts to PCT 11 include approximately 0.1 ha of clearing. The potential impacts to PCT 13 include approximately 6.81 ha of clearing.

The potential for this species to receive injury or mortality from colliding with the future transmission lines is considered to be negligible. When flying, it is most likely fly into the mallee canopy and not to the height of the powerlines themselves, particularly when this species is known to move through intact areas of woodland and forest along intact wildlife corridors. Striking powerlines is not known to be a regular impact to this species.

This species primarily inhabits and breeds within River Red Gum areas such as those along the Murray River, which is located approximately to the south of the proposal study area. Principal foraging habitat is Mallee Woodlands, though foraging also occurs in riverine forests and woodlands. Mallee Woodland within 20 kilometres of nesting sites is critical foraging habitat for breeding birds. Birds move between the riverine nesting habitat and foraging sites along corridors of natural vegetation. Outside the breeding season birds may move away from the riverine plain, with birds observed in mallee over 60 kilometres from the river. However, there are very few records in NSW away from the Murray River during the non-breeding season and it has been speculated that most birds may join non-breeding flocks in Victoria.

E-1.2.13.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Matters of National Environmental Significance, Significant Impact Guidelines 1.1, the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

A pair of birds were observed flying through open riparian woodland near the alignment's Murray River crossing to Red Cliffs, but no birds were observed throughout the more westerly areas of the PEC alignment, which is likely due to the movement/foraging-habitat issues associated with the very open landscapes surrounding Lake Victoria and the Murray floodplain throughout those areas of the region. The Regent Parrot (eastern) is restricted to a single population occurring in inland south-eastern Australia in the lower Murray-Darling basin region of South Australia, New South Wales and Victoria. Due to the restriction of this subspecies geographic range and fact that the entire subspecies is considered to be a single population (Baker-Gabb *et al.*, 2011), this population, including individuals occurring within the proposal study area, can be considered as an important population under the criteria outlined in the Significant Impact Guidelines.

E-1.2.13.5 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**

Impacts to this species from the proposal are limited to clearance of Black Box and River Red Gum habitat in the form of PCT 11 & 13 in the Robinvale Plains region. The habitat is suitable for foraging and nesting. The potential impacts to PCT 11 include approximately 0.1 ha of clearing. The potential impacts to PCT 13 include approximately 6.81 ha of clearing.

The majority of the habitat to be impacted is already impacted by existing powerlines and access tracks and the habitat to be cleared is unlikely to be limiting for the Australian population. The species is not entirely reliant on the habitat to be impacted and the proportional impact to suitable habitats along the Murray River is small. Therefore the proposed action is unlikely to lead to a long-term decrease in the size of an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

The area of occupancy for the Regent Parrot is estimated to be 50,000 ha (DoEE, 2019). The proposed action has potential to incrementally reduce the area of occupancy for this species in this location, but the overall national area of occupancy is unlikely to be altered. The proposed action would potentially impact foraging habitat close to the Murray River. The proposed action is unlikely to significantly reduce an area of known occupancy of this species.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

The proposal study area is located within an already fragmented and disturbed landscape, thereby limiting the potential for any substantial additional fragmentation to occur. Given the ability for the Regent Parrot to disperse over and around these cleared areas, and the cleared areas do not occur as large broad acre areas, it is considered unlikely that the proposed action would fragment an existing important population of this species.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

Critical habitat for this species has not been listed under the EPBC Act. The *National Recovery Plan for the Regent Parrot (eastern subspecies) Polytelis anthopeplus monarchoides* (Baker-Gabb & Hurley, 2011) identifies critical habitat for the eastern Regent Parrot as all known sites for nesting, food resources, water, shelter, essential travel routes, dispersal, and buffer areas, and is defined in this Recovery Plan as all potential eastern Regent Parrot habitat within its

'current normal range'. As such, all habitat is considered critical to the survival of the species and therefore the proposal would adversely affect habitat critical to the survival of the species.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

The proposed action may impact upon the breeding cycle of locally present individuals by reducing the amount of foraging habitat for breeding birds in the area close to the Murray River and by removing roosting and breeding habitat; particularly near watercourses. Therefore, the proposed action may disrupt the breeding cycle of an important population.

Mitigation measures recommended include pre-clearing surveys to identify any hollows containing breeding pairs prior to clearing, and if possible, avoid clearing such trees. It is recommended to avoid clearing during the main breeding period of August to December.

- **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 action would reduce the availability of suitable foraging habitat on a relatively small scale. However, given the surrounding landscape, it is unlikely that the proposed action would modify the existing environment 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**

The proposed action is considered unlikely to cause the establishment of competitive feral birds such as the Common Starling and Rock Dove.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

The proposal is unlikely to introduce diseases causing potential species decline to the Regent Parrot.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

The *National Recovery Plan for the Regent Parrot (eastern subspecies) Polytelis anthopeplus monarchoides* (Baker-Gabb & Hurley, 2011) identifies the following objectives for recovery of the species:

19 determine population trends in the eastern Regent Parrot
20 reduce environmental impacts and restore habitat
21 identify strategic flyways and their features and protect and enhance these
22 reduce human-induced mortality of eastern Regent Parrots
23 investigate key aspects of the biology and ecology of the eastern Regent Parrot
24 increase community involvement in the eastern Regent Parrot recovery program.

The proposed action is considered likely to interfere with the *National Recovery Plan for the Regent Parrot (eastern subspecies) Polytelis anthopeplus monarchoides* (Baker-Gabb & Hurley, 2011) as the proposed action would impact on potential nesting habitat and, flight paths to foraging areas, and foraging habitat within 20 km of nest sites.

- **CONCLUSION**

The Regent Parrot was recorded during surveys and is known to utilise the proposal study area and habitat within the locality. The proposed action would impact on Riverine Woodland habitat and foraging habitat including Mallee Woodland that is considered important to locally breeding birds. The Riverine Woodland along the Murray River and the Mallee woodland within 20 kilometres of nesting sites (Murray River) is identified as critical habitat for this species. However, in the context of available habitat along the Murray River and the adjacent Mallee foraging grounds the impacts from the proposal are low in magnitude. The proposal is unlikely to result in the long-term decrease in the size of an important population or reduce the area of occupancy for this species. As such, given the impacts are relatively small in comparison to the available habitat the proposal is considered unlikely to significantly impact the Regent Parrot.

E-1.2.13.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

There is no listing advice for this species. There is no approved Conservation Advice for this species. Critical habitat for this species has not been listed under the EPBC Act. The *National Recovery Plan for the Regent Parrot (eastern subspecies) Polytelis anthopeplus monarchoides* (Baker-Gabb & Hurley, 2011) identifies critical habitat for the eastern Regent Parrot as all known sites for nesting, food resources, water, shelter, essential travel routes, dispersal, and buffer areas, and is defined in this Recovery Plan as all potential eastern Regent Parrot habitat within its 'current normal range'. As such, all habitat is considered critical to the survival of the species and therefore the proposal would adversely affect habitat critical to the survival of the species.

A pair of Regent Parrots was observed within the proposal study area flying through riverine woodland on the Robinvale Plain IBRA subregion. Clearance of Black Box and River Red Gum habitat in the form of PCT 11 & 13 in the Robinvale Plains region is the predicted impact to this species. Potential habitat is suitable for foraging and nesting. The potential impacts to PCT 11 include approximately 0.1 ha of clearing. The potential impacts to PCT 13 include approximately 6.81 ha of clearing.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Regent Parrot is outlined in Table E-1.14.

Table E-1.14 Summary of survey effort for Regent Parrot

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Woodland Birds	Nocturnal call playback and habitat searches, formal 20 min/2 ha surveys, opportunistic surveys and habitat assessments	8 x 20 min/2 ha formal bird surveys 357-person hours of opportunistic surveys	All year & during breeding Sep – Jan	Oct – Dec 2019; Mar 2020; Apr – May 2020; July 2020
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Mallee Spinifex birds	Targeted habitat searches and assessments	11 x 20 min/2 ha formal bird surveys 135-person hours of opportunistic surveys	All year	Oct 2019 & Apr 2020

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Mallee, Woodlands and Shrubland birds	Formal 20 min/2 ha surveys, opportunistic surveys and habitat assessments	44 x 20 min/2 ha Formal Bird surveys 232-person hours of opportunistic surveys	All year & during breeding seasons for certain species (Aug-Jan)	Oct 2019; Mar-April 2020 & July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would clear vegetation within suitable habitat. These impacts are captured in Section 12 of the BDAR.

Figure E-1.13 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is inside the known limit of the species distribution.

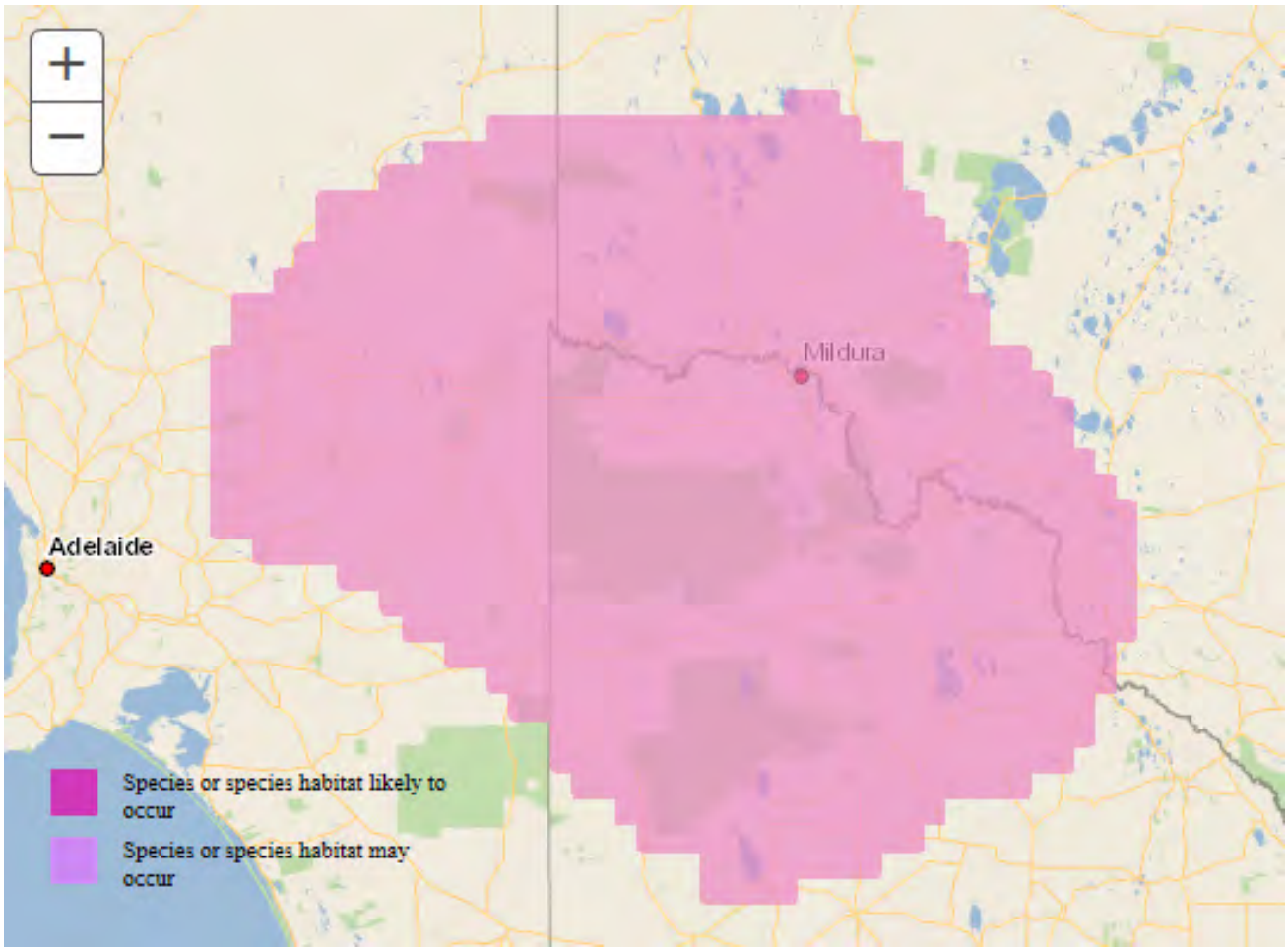

Figure E-1.13 Current distribution map for Regent Parrot taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11.

A Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna in accordance with the Biodiversity Management Plan and would include the following requirements:

- hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey.
- about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The residual impact to the Regent Parrot is estimated at approximately 6.91 ha.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

Any offsets proposed for impacts to EPBC Act listed threatened species will be done in accordance with the NSW BOS, the NSW Assessment Bilateral Agreement – Amending Agreement No. 1, and NSW BC Regulation. Further details on required offsets is provided in Chapter 12. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

The offset requirement for the Regent Parrot is 154 species credits.

E-1.2.14 AUSTRALIAN PAINTED SNIPE (*ROSTRATULA AUSTRALIS*)

The Australasian Painted Snipe is listed as Endangered under the EPBC Act and the BC Act.

E-1.2.14.1 DESCRIPTION

The Australian painted snipe occurs in shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drains, generally with a good cover of grasses, rushes and reeds, low scrub, Muehlenbeckia spp. (lignum), open timber or samphire (Department of Sustainability, Environment, Water, Population and Communities, 2013). It has been recorded at wetlands in all states and territories and is most common in eastern Australia (Department of Sustainability, Environment, Water, Population and Communities, 2013).

Important areas for this species in the past have included the Murray-Darling Basin (particularly the Riverina of Victoria and New South Wales), Queensland Channel Country, Fitzroy Basin of Central Queensland, south-eastern South Australia and adjacent parts of Victoria (Department of Sustainability, Environment, Water, Population and Communities, 2013). Records published over the past twenty years provide evidence for Australian painted snipe occurring more widely and frequently in the remote arid and tropical regions of Australia than was previously thought (Department of Sustainability, Environment, Water, Population and Communities, 2013).

Atlas of Living Australia and BioNet species records indicate that this species has been recorded from near the Murray River and western NSW.

E-1.2.14.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Approved Conservation Advice for Rostratula australis (Australian painted snipe)* (Department of Sustainability, Environment, Water, Population and Communities, 2013) was reviewed as part of this assessment.
- The *Commonwealth Listing Advice on Rostratula australis (Australian Painted Snipe)* (Threatened Species Scientific Committee, 2013) was reviewed as part of this assessment.
- There is no adopted or made Recovery Plan for this species.

No Threat Abatement Plan has been identified as being relevant for this species

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Birds* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010).

E-1.2.14.3 SPECIFIC IMPACTS

Habitat is present in PCT 11, PCT 13 and PCT 17 in the Robinvale Plains IBRA Subregion. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River.

E-1.2.14.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to significantly decrease the size of any important population. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. There will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species. As such, the proposal is considered unlikely to reduce the area of the occupancy for this species.

The species is widespread and is not considered to have a limited geographic distribution. Its current extent of occurrence estimated to be 7,100,000 km^2 and stable and the species' area of occupancy was estimated to be 2,000 km^2 (Department of Sustainability, Environment, Water, Population and Communities, 2013).

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. No fragmentation of water bodies or adjacent terrestrial habitats would occur, and the population would not be fragmented into two or more populations. Given the ability of this species to disperse over these cleared areas, is it considered unlikely that the action would fragment an existing population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat has been listed for this species under the EPBC Act. The proposal study area does not include any suitable waterbodies so the habitat to be impacted Is not considered critical to the survival of this species.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

No waterbodies will be directly impacted so it is considered unlikely that the action would adversely disrupt the breeding cycle of any important population of the species. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **MODIFY, DESTROY, REMOVE OR ISOLATE OR DECREASE THE AVAILABILITY OR QUALITY OF HABITAT TO THE EXTENT THAT THE SPECIES IS LIKELY TO DECLINE**

No suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. As there will be no direct impacts to permanent water bodies that are likely to provide suitable habitat for this species the proposal is considered unlikely to result in the modification, removal, isolation, or decreased availability or quality of habitat to the extent that the species is likely to decline. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A CRITICALLY ENDANGERED OR ENDANGERED SPECIES BECOMING ESTABLISHED IN THE ENDANGERED OR CRITICALLY ENDANGERED SPECIES' HABITAT**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no known diseases causing potential species decline to the Australasian Bittern.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

There is no adopted or made Recovery Plan for this species. The proposed action would not interfere with the NSW Saving Our Species recovery strategy, and the proposal study area does not occur within a priority management area for the species. As such, the proposed action is unlikely to interfere with the recovery of the species.

- **CONCLUSION**

This species has not been recorded within the proposal study area. Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected. However, this assessment has been completed as a precautionary measure as records do occur along the Murray River. Mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River.

Given that there would be no direct impact to waterbodies and mitigation measures will be implemented to prevent indirect impacts to habitat on the Murray River it is unlikely that the proposed action would have significant impact on the species.

E-1.2.14.5 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

The *Approved Conservation Advice for Rostratula australis (Australian painted snipe)* (Department of Sustainability, Environment, Water, Population and Communities, 2013) states that the Australian painted snipe occurs in shallow freshwater (occasionally brackish) wetlands, both ephemeral and permanent, such as lakes, swamps, claypans, inundated or waterlogged grassland/saltmarsh, dams, rice crops, sewage farms and bore drains, generally with a good cover of grasses, rushes and reeds, low scrub, Muehlenbeckia spp. (lignum), open timber or samphire (Department of Sustainability, Environment, Water, Population and Communities, 2013). It has been recorded at wetlands in all states and territories and is most common in eastern Australia (Department of Sustainability, Environment, Water, Population and Communities, 2013). Important areas for this species in the past have included the Murray-Darling Basin (particularly the Riverina of Victoria and New South Wales), Queensland Channel Country, Fitzroy Basin of Central Queensland, south-eastern South Australia and adjacent parts of Victoria (Department of Sustainability, Environment, Water, Population and Communities, 2013). Records published over the past twenty years provide evidence for Australian painted snipe occurring more widely and frequently in the remote arid and tropical regions of Australia than was previously thought (Department of Sustainability, Environment, Water, Population and Communities, 2013). The *Commonwealth Listing Advice on Rostratula australis (Australian Painted Snipe)* (Threatened Species Scientific Committee, 2013) provides a similar description.

There is no adopted or made Recovery Plan for this species. No Threat Abatement Plan has been identified as being relevant for this species.

Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Threatened bird surveys completed within the proposal study area were carried out in accordance with the *Survey Guidelines for Australia's Threatened Birds* (Department of Environment Water Heritage and the Arts, 2010). Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches. The survey effort for Australasian Bittern is outlined in Table E-1.15.

Table E-1.15 Summary of survey effort for Australasian Bittern

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Wetlands – Miscellaneous ecosystem may include PCT11 during times of inundation.				
Wetland Birds	Targeted wetland surveys and habitat assessments	8 x 20 min/2 ha formal bird surveys 39.5-person hours of opportunistic surveys	All year – where suitable conditions occur	Oct – Nov 2019; July 2020
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Wetland Birds	Targeted wetland surveys and habitat assessments	39.5-person hours of opportunistic surveys 8 x 20 min/2 ha formal bird surveys	All year	Oct – Nov 2019; July 2020

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

Associated PCTs including PCT 11, PCT 13, and PCT 17 are present within the proposal study area and therefore broad potential habitat for this species is present. However, no suitable waterbodies were present with the indicative disturbance area and therefore the presence of this species is considered unlikely and no direct impact is expected.

Figure E-1.14 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. Any population of Australian Painted Snipe within the proposal study area would not be near the edge of the extent of the known distribution of the species.

Figure E-1.14 Current distribution map for Australian Painted Snipe taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. No specific measures for Australasian Bittern are identified.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

There are no residual impacts to the Australasian Bittern expected.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Section 12.6 of the BDAR outlined the biodiversity offset strategy for the proposal. The offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establishing a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.15 CORBEN'S LONG-EARED BAT (*NYCTOPHILUS CORBENI*)

Corben's long-eared Bat is listed as Vulnerable under the EPBC Act and the BC Act.

E-1.2.15.1 DESCRIPTION

Corben's long-eared Bat is patchily distributed across southern central Queensland, central western New South Wales, north-western Victoria and eastern South Australia, with most of its range within the Murray Darling Basin. This microbat species is uncommon and has been mainly recorded within the Nandewar area and Brigalow Belt South bioregion. They are found in a wide range of inland woodlands, including box/ironbark/cypress pine woodlands, Buloke woodlands, Brigalow woodland, Belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee, and prefers old growth, dense vegetation. The core population is located in Pilliga Scrub, over 700 km north east of the proposal study area (Threatened Species Scientific Committee, 2015b).

Corben's Long-eared Bat is an insectivorous microbat, foraging on beetles, bugs, moths, grasshoppers and crickets. They roost solitary or in groups up to 20 individuals, predominantly in hollows of dead trees or dead sprouts of live trees. Studies show that most roost sites are used just for a single day and large distances are travelled at night, with consecutive roost sites generally within 4 kilometres (Threatened Species Scientific Committee, 2015b).

E-1.2.15.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat* (Threatened Species Scientific Committee, 2015) was reviewed as part of this assessment.
- The *Commonwealth Listing Advice on ten species of Bats* (Threatened Species Scientific Committee, 2001) was reviewed as part of this assessment.
- There is no adopted or made Recovery Plan for this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey Guidelines for Australia's Threatened Bats* (Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010) [Admin Guideline].

E-1.2.15.3 SPECIFIC IMPACTS

Vegetation clearing for transmission line towers and associated infrastructure such as access roads and laydown areas, in habitat including PCT 21, 58, 139, 170, 171, 172 & 221. The species was recorded within Mallee woodland – PCT170 – Chenopod sandplain mallee woodland/shrubland.

Vegetation clearing may reduce the availability of foraging habitat and hollow bearing trees as roosting habitat (possibly breeding habitat). Potential direct impacts may include injury or death during clearing works.

E-1.2.15.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This species was recorded in the proposal study area during targeted harp trapping surveys. Additionally, there are records within the locality of the proposal study area, as well as to the north in Willandra Lakes region and to the south in Huttah Kulkyne National Park. There are no important populations outlined in the SPRAT profile or OEH profile for Corben's Long-eared Bat. One core population exists in Pilliga Scrub, NSW, over 700 km north east of the proposal study area. The proposal study area occurs towards the south-western extent of the species range, but records extend beyond this. This location is not at the limit of the known range of this species, nor would any population here be key source population for breeding and genetic maintenance given the species ability to disperse for foraging and breeding. Therefore, any population utilising the proposal study area it is not considered to be an important population.

E-1.2.15.5 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**

The proposed action has potential to cause injury or death to individuals during clearing works, but is it considered unlikely that the proposed action would lead to a long-term decrease in the size of an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

Not considered to be part of an important population. The proposed action is unlikely to significantly reduce the area of occupancy for this species in this location considering the available habitat in the surrounding landscape.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Not considered to be part of an important population. The maximum cleared area for a single tower footprint or laydown area would not exceed 0.5 ha, and the easement width of the transmission line would be a maximum of approximately 80 meters (with full clearing not always being required). The proposal study area is within an already fragmented and disturbed landscape, thereby limiting the potential for any substantial additional fragmentation to occur. Given this species ability to disperse over and around these cleared areas, it is considered unlikely that the proposed action would fragment an existing important population of this species.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

No critical habitat is listed for this species under the EPBC Act. While habitat within the proposal study area is suitable for foraging, roosting and breeding, further survey is recommended to ascertain microhabitats in use. Due to the availability of surrounding habitat and its movement between roost hollows, this habitat is unlikely to be considered critical for the survival of the species.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Breeding usually takes place in autumn, if the proposed action could avoid impacting predicted breeding habitat this time of the year, potential impacts could be minimised. As far as practicable, avoiding and minimising the removal of hollow-bearing trees within the proposal study area is recommended. The proposed action is unlikely to disrupt the breeding cycle of 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 action is likely to impact suitable foraging and roosting habitat for Corben's Long-eared Bat. However, given the availability of surrounding habitat and dispersive nature of this species, it is unlikely that the action would cause the species to decline.

- **RESULT IN INVASIVE SPECIES THAT ARE HARMFUL TO A VULNERABLE SPECIES BECOMING ESTABLISHED IN THE VULNERABLE SPECIES' HABITAT**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests such as cats and foxes further establishing within the proposal study area.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

There are no knows diseases causing potential species decline to Corben's Long-eared Bat.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

No recovery plan has been prepared for this species under the EPBC Act. Nevertheless, the proposed action may interfere with the NSW Saving Our Species recovery strategy, as the proposal study area is likely to occur within priority management areas for the species; particularly between Balranald and Buronga.

- **CONCLUSION**

This species was recorded in the proposal study area during targeted harp trapping surveys, with additional records in the locality of the proposal. The proposal study area is not at the limit of the known range of these species, nor would any population here be key source population for breeding and genetic maintenance given the species ability to disperse for foraging and breeding. Although potentially suitable foraging, roosting, and possibly breeding habitat for Corben's Long-eared Bat woodland in woodland areas may be impacted by the proposed action, it is not considered essential to survival of this species within the area. Although clearing of potential habitat may occur, the detailed design would avoid where possible clearing higher quality habitat to prevent significant loss of habitat. It is considered unlikely that the proposed action would have a significant impact on this species.

E-1.2.15.6 NSW ASSESSMENT BILATERAL REQUIREMENTS

- **DESCRIPTION OF THE HABITAT (INCLUDING IDENTIFICATION AND MAPPING OF SUITABLE BREEDING HABITAT, SUITABLE FORAGING HABITAT, IMPORTANT POPULATIONS AND HABITAT CRITICAL FOR SURVIVAL), WITH CONSIDERATION OF, AND REFERENCE TO, ANY RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN**

The *Conservation Advice Nyctophilus corbeni south-eastern long-eared bat* (Threatened Species Scientific Committee, 2015) provides broad habitat descriptions for the species indicating that the species is found in a wide range of inland woodland vegetation types. These include box/ironbark/cypress pine woodlands, Buloke woodlands, Brigalow woodland, Belah woodland, smooth-barked apple woodland, river red gum forest, black box woodland, and various types of tree mallee. The *Commonwealth Listing Advice on ten species of Bats* (Threatened Species Scientific Committee, 2001) does not provide habitat information. There is no adopted or made Recovery Plan for this species.

This species was recorded within PCT170 during the surveys. Predicted habitat occurs within PCT 21, PCT 58, PCT 170, PCT 171 and PCT 221 in the South Olary Plain IBRA Subregion. Predicted habitat occurs within PCT 58 in the Great Darling Anabranch IBRA Subregion. Predicted habitat occurs within PCT 21 and PCT 139 in the Pooncarie Darling IBRA Subregion. Predicted habitat occurs within PCT 11 in the Robinvale Plains IBRA Subregion.

A map of suitable habitat for this species is provided in Appendix E-2.

- **DETAILS OF THE SCOPE, TIMING AND METHODOLOGY FOR STUDIES OR SURVEYS USED AND HOW THEY ARE CONSISTENT WITH (OR JUSTIFICATION FOR DIVERGENCE FROM) PUBLISHED AUSTRALIAN GOVERNMENT GUIDELINES AND POLICY STATEMENTS**

Habitat assessments were undertaken to assess the likelihood of threatened species of animal (those species known or predicted to occur within the locality from the literature and database review) occurring within the proposal study area. Fauna habitat assessments were the primary assessment tool in assessing whether threatened species were likely to occur within the proposal study area. The primary technique used for surveying birds were 20-minute diurnal bird searches.

Although many microchiropteran bat species are detectable through use of Anabat call detection methodologies, the vocal differences between *Nyctophilus* spp. are too subtle to reliably differentiate between the various species. Therefore, surveys for Corben's Long-eared Bat needed to be conducted with a methodology that enabled bats to be identified in the hand.

Harp traps are excellent for capture and release of microchiropteran bats and they are well suited to the capture of *Nyctophilus* spp. due to their propensity to use lower forest strata for their foraging habits. Site selection for the setting of harp traps included a number of rationales, such as targeting of those woodland habitats in areas where hollow-bearing trees provide potential roosting sites and where suitable flyways were detected. Harp traps were set at each location over a single night period during November and December 2019, and February and March 2020 (surveys best conducted between October and April). Captured bats were identified to species level, sexed, measured and weighed. Bats were released immediately after processing during dark conditions.

The survey effort for Corben's Long-eared Bat is outlined in Table E-1.16.

Table E-1.16 Summary of survey effort for Corben's Long-eared Bat

FAUNA GROUP	SURVEY TECHNIQUE	SURVEY EFFORT	OPTIMUM SURVEY PERIOD	DATES SURVEYED
Riverine Woodlands/wetlands –PCT11, PCT13, PCT15, PCT17, PCT63				
Microchiropteran bats	Harp trap and Anabat surveys	5 x Harp site locations 6 x Anabat locations	All year	Nov 2019
Arid Woodlands/Shrublands – PCT 58, PCT139, PCT143, PCT170, PCT171, PCT172, PCT19, PCT21, PCT252				
Microchiropteran bats	Harp trap and Anabat surveys	6 x Anabat trap nights	All year	Dec 2019

- **DESCRIPTION OF THE SPECIFIC IMPACTS AND ITS REGARD TO THE FULL NATIONAL EXTENT OF THE SPECIES OR COMMUNITY'S RANGE**

The proposed action would clear vegetation within suitable habitat. These impacts are captured in Section 12 of the BDAR.

Figure E-1.15 shows the current known generalised distribution from the Departments Species of National Environmental Significance dataset which is an indicative distribution map of the present distribution of the species based on best available knowledge. The proposal study area is inside the known limit of the species distribution.

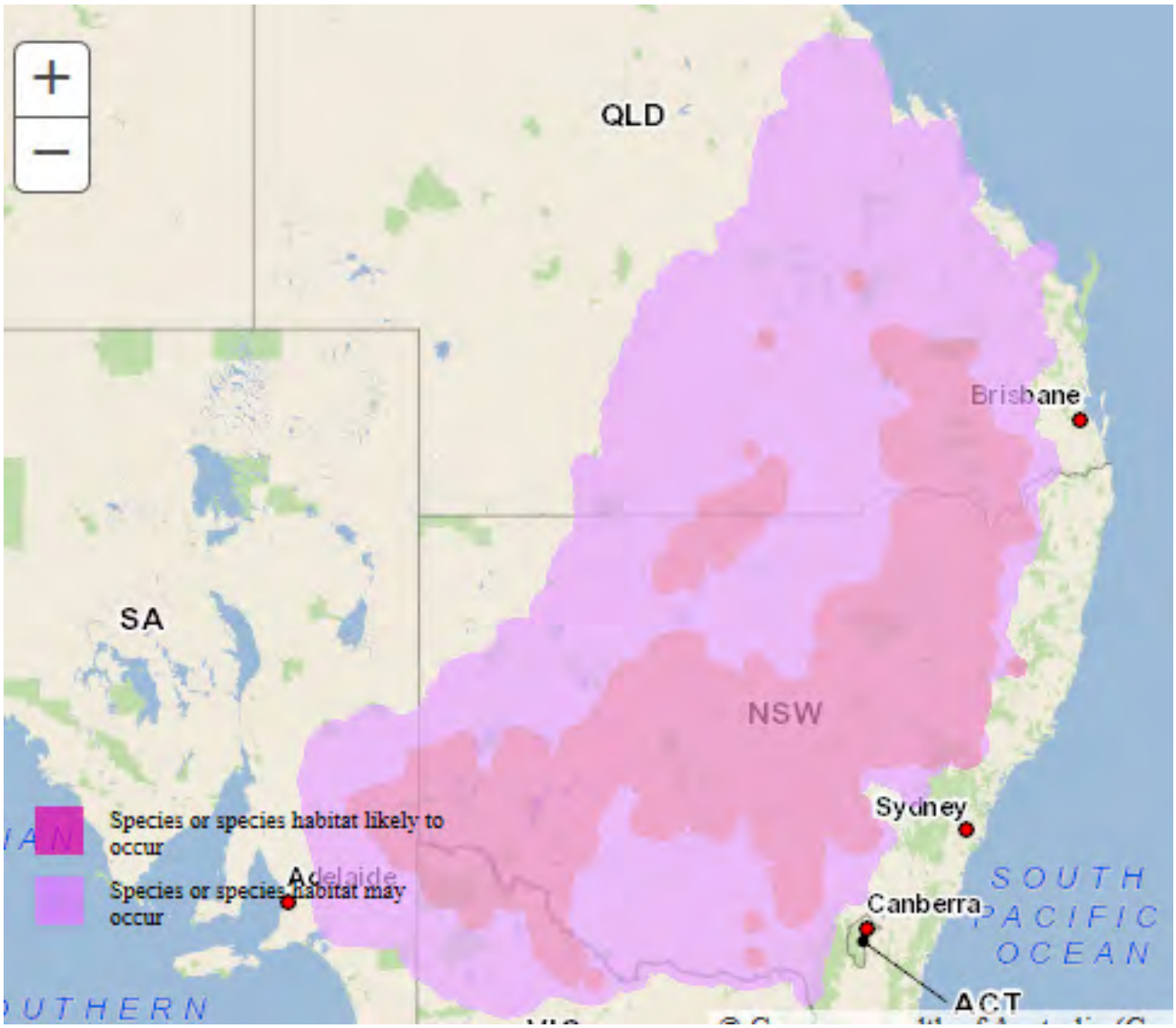

Figure E-1.15 Current distribution map for Corben's Long-eared Bat taken from the SPRAT

- **DESCRIPTION OF THE SPECIFIC PROPOSED AVOIDANCE AND MITIGATION MEASURES TO DEAL WITH RELEVANT IMPACTS OF THE ACTION**

The proposed avoidance and mitigation measures are outlined in Section 8 & 10 of the BDAR. Detailed avoidance description for impacts relating to biodiversity values (including threatened species) are outlined in Section 8. Mitigation measures to be implemented are outlined in Section 11. Specifically, the following relevant mitigation measures are recommended for any related residual impacts to the species:

- Development and implementation of a Biodiversity Management Plan (BMP) to minimise and manage the clearing of native vegetation and habitat and implement measures in avoiding, protecting and mitigating works associated threatened species habitat.
- A Nest Box Strategy would be prepared to minimise habitat loss to hollow-dependent fauna in accordance with the Biodiversity Management Plan and would include the following requirements:
  - hollow-bearing trees would be marked/tagged and mapped prior to their removal. The size, type, number and location of nest boxes required would be based on the results of the pre-clearing survey
  - about 70 per cent of nest boxes would be installed about one month prior to any vegetation removal to provide alternate habitat for hollow-dependent fauna displaced during clearing.

- **IDENTIFICATION OF SIGNIFICANT RESIDUAL ADVERSE IMPACTS LIKELY TO OCCUR AFTER THE PROPOSED ACTIVITIES TO AVOID AND MITIGATE ALL IMPACTS ARE TAKEN INTO ACCOUNT**

The species was recorded within Mallee woodland associated with PCT170 - Chenopod sandplain mallee woodland/ shrubland. Residual impacts would involve the removal of other associated habitat in the form of PCT 21, 58, 139, 170, 171, 172 & 221. Mitigation measures in regard to threatened species and their habitats are outlined in Section 10 of the BDAR. Relevant mitigation measures for the mentioned species are stated above.

- **A DESCRIPTION OF ANY OFFSETS PROPOSED TO ADDRESS RESIDUAL ADVERSE SIGNIFICANT IMPACTS AND HOW THESE OFFSETS WILL BE ESTABLISHED**

Details of offset requirements and obligations for this species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR.

- **DETAILS OF HOW THE CURRENT PUBLISHED NSW BIODIVERSITY ASSESSMENT METHOD (BAM) HAS BEEN APPLIED IN ACCORDANCE WITH THE OBJECTS OF THE EPBC ACT TO OFFSET SIGNIFICANT RESIDUAL ADVERSE IMPACTS**

Any offsets proposed for impacts to EPBC Act listed threatened species will be done in accordance with the NSW BOS, the NSW Assessment Bilateral Agreement – Amending Agreement No. 1, and NSW BC Regulation. Further details on required offsets is provided in Chapter 12. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

- **DETAILS OF THE OFFSET PACKAGE TO COMPENSATE FOR SIGNIFICANT RESIDUAL IMPACTS INCLUDING DETAILS OF THE CREDIT PROFILES REQUIRED TO OFFSET THE ACTION IN ACCORDANCE WITH THE BAM AND/OR MAPPING AND DESCRIPTIONS OF THE EXTENT AND CONDITION OF THE RELEVANT HABITAT AND/OR THREATENED COMMUNITIES OCCURRING ON PROPOSED OFFSET SITES**

Details of offset requirements and obligations for the species as a result of residual impacts due the proposed action is addressed in Section 12 of the BDAR. The BDAR specifically addresses Section 11 of the BAM and provides information on the application of the no net loss standard and the project biodiversity offset obligations. Credit calculations were quantified using the BAM-C Version 1.2.7.2.

Corben's Long-eared Bat is classified as a predicted ecosystem credit species under the BC Act. Under the BC Act and the Biodiversity Offsets Scheme, the impacts associated with vegetation impacts (including removal of predicted threatened species habitat) will be offset. Credit calculations were quantified using the BAM-C Version 1.2.7.2. The following PCTs which align to Corben's Long-eared Bat will be offset under the scheme, including: PCT 21, 58, 139, 170, 171, 172 & 221.

The proposal offset obligations will be met through implementing a combination of the following offset delivery options, being:

- the purchase and retirement of existing biodiversity credits currently available on the biodiversity credit register
- establish a biodiversity stewardship site(s) on lands with like for like biodiversity values to those impacted by the proposal
- through making a payment into the Biodiversity Conservation Fund.

E-1.2.16 SILVER PERCH (*BIDYANUS BIDYANUS*)

The Silver Perch is listed as Critically Endangered the EPBC Act.

E-1.2.16.1 DESCRIPTION

The Silver Perch most abundant remaining natural population occurs in the central Murray River downstream of Yarrawonga Weir as well as several of its anabranches and tributaries. The central Murray population is considered secure and self-sustaining. There have also been reports of self-sustaining populations in other rivers, including the MacIntyre and Macquarie Rivers in northern NSW and the Warrego River in Queensland, mostly from recreational anglers. It prefers fast-flowing waters but is also known from rivers, lakes and reservoirs.

E-1.2.16.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Conservation Advice Bidyanus bidyanus (silver perch)* (Department of the Environment, 2013) was reviewed as part of this assessment.
- Listing assessment information may be available in the approved Conservation Advice.
- There is no adopted or made Recovery Plan for this species.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4* (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011).

E-1.2.16.3 SPECIFIC IMPACTS

The maximum aquatic impact likely to occur to any of the potential aquatic habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey will would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area will would continue to function as it currently functions.

E-1.2.16.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

No significant impacts are anticipated for the species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for the species. Therefore, the proposed action is considered unlikely to lead to a long-term decrease in the size of a population.

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

No significant impacts are anticipated for the species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for the species. Therefore, the proposed action is considered unlikely to reduce the area of occupancy of a species.

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

No significant impacts are anticipated for the species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for the species. Therefore, the proposed action is considered unlikely to fragment an existing population into two or more population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

There is no habitat listed as critical to the survival of the species within the proposal study area.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

No significant impacts are anticipated for the species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for the species. Therefore, the proposed action is unlikely to disrupt the breeding cycle of a population.

- **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 action is likely to have minimal impact to wetlands, riverine, and waterways habitats suitable for the species. Therefore, the proposed action is unlikely to result in the modification, removal, isolation, or decreased 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**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

It is recommended that mitigation measures include the implementation of a weed and pest management plans, installation of vehicle wash stations to limit the spread of pathogens and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occur within or in close proximity to these species habitat to minimise sedimentation and hydrological impacts.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

Recovery actions would not be affected by the proposed action. No key management sites are known to occur within the proposal study area.

- **CONCLUSION**

The species has the potential to occur within the proposal study area, however only within waterways which would be avoided. Where waterway crossings of the transmission line occur, the alignment would span these habitats only, and no towers or structures would be placed in waterways. Mitigation measures including weed and pest management plans, hygiene protocols and sediment control measures in close proximity to potential habitat would minimise indirect impacts to the species. Therefore, no significant impacts are anticipated for these species, due to the avoidance of clearing and construction works within waterways containing potentially suitable habitat and implementation of mitigation measures.

E-1.2.17 MURRAY HARDYHEAD (*CRATEROCEPHALUS FLUVIATILIS*)

Murray Hardyhead is listed as Endangered under the EPBC Act.

E-1.2.17.1 DESCRIPTION

Murray Hardyhead live along the edges of slow-flowing lowland rivers, as well as in lakes, billabongs and backwaters. They are often found amongst aquatic weeds, in both fresh and quite saline waters. They were once widespread and abundant in the Murray and Murrumbidgee river systems in southern NSW and northern Victoria; however, they have suffered a serious population decline, and now seem to be limited to a few sites, mainly in northern Victoria. Since 2000, only one individual has been collected in extensive surveys in NSW.

E-1.2.17.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- The *Approved Conservation Advice for Craterocephalus fluviatilis (Murray hardyhead)* (Department of Sustainability, Environment, Water, Population and Communities, 2012) was reviewed as part of this assessment.
- The *Commonwealth Listing Advice on Craterocephalus fluviatilis (Murray Hardyhead)* (Threatened Species Scientific Committee, 2012) was reviewed as part of this assessment.
- The *National Recovery Plan for the Murray Hardyhead, Craterocephalus fluviatilis* (Backhouse, G., J. Lyon and B. Cant (2008) was reviewed as part of this assessment.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4* (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011).

E-1.2.17.3 SPECIFIC IMPACTS

The maximum aquatic impact likely to occur to any of the potential aquatic habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey will would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area will would continue to function as it currently functions.

E-1.2.17.4 SIGNIFICANT IMPACT CRITERIA

An action is likely to have a significant impact on an Endangered or Critically 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**

No significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species. Therefore, the proposed action is considered unlikely to lead to a long-term decrease in the size of a population

- **REDUCE THE AREA OF OCCUPANCY OF THE SPECIES**

No significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species. Therefore, the proposed action is considered unlikely to reduce the area of occupancy of a species.

- **FRAGMENT AN EXISTING POPULATION INTO TWO OR MORE POPULATIONS**

No significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species. Therefore, the proposed action is considered unlikely to fragment an existing population into two or more population

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

There is no habitat listed as critical to the survival of these species within the proposal study area.

- **DISRUPT THE BREEDING CYCLE OF A POPULATION**

No significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species. Therefore, the proposed action is unlikely to disrupt the breeding cycle of a population.

- **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 action is likely to have minimal impact to wetlands, riverine, and waterways habitats suitable for these species. Therefore, the proposed action is unlikely to result in the modification, removal, isolation, or decreased 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**

Adhering to mitigation measures such as weed and pest management plans, and vehicle weed hygiene, would prevent invasive weeds and vertebrate pests establishing in wetland habitat areas.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

It is recommended that mitigation measures include the implementation of a weed and pest management plans, installation of vehicle wash stations to limit the spread of pathogens and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occur within or in close proximity to these species habitat to minimise sedimentation and hydrological impacts.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

Recovery actions would not be affected by the project. No key management sites are known to occur within the proposal study area.

- **CONCLUSION**

These species have the potential to occur within the proposal study area, however only within waterways which would be avoided and protected by the project. Where waterway crossings of the transmission line occur, the alignment would span these habitats only, and no towers or structures would be placed in waterways. Mitigation measures like weed and pest management plans, hygiene protocols and sediment control measures, in close proximity to potential habitat would minimise indirect impacts to these species. Therefore, no significant impacts are anticipated for these species, due to the avoidance of clearing and construction works within waterways containing potentially suitable habitat and implementation of mitigation measures.

E-1.2.18 MURRAY COD (*MACCULLOCHELLA PEELII*)

Murray Cod is listed as Vulnerable under the EPBC Act.

E-1.2.18.1 DESCRIPTION

Murray Cod, also referred to as cod or codfish, were once abundant throughout the Murray-Darling river system, but overfishing and environmental changes have drastically reduced its numbers. The species has been selectively stocked in other river systems in NSW, Victoria and Western Australia, but has generally failed to establish itself in those areas. Murray Cod generally prefer slow flowing, turbid water in streams and rivers, favouring deeper water around boulders, undercut banks, overhanging vegetation and logs. Small numbers are still present in the Nepean River and Yarra River.

E-1.2.18.2 RELEVANT COMMONWEALTH GUIDELINES AND POLICY STATEMENTS INCLUDING LISTING ADVICE, CONSERVATION ADVICE AND RECOVERY PLAN

A summary of the relevant Commonwealth guidelines and policy statements available for this species is as follows:

- There is no approved Conservation Advice for this species.
- The *Commonwealth Listing Advice on Maccullochella peelii peelii (Murray Cod, Cod, Goodoo* (Threatened Species Scientific Committee (2003) was reviewed as part of this assessment.
- The *National Recovery Plan for the Murray Cod Maccullochella peelii peelii* (National Murray Cod Recovery Team, 2010) was reviewed as part of this assessment.

No threat abatement plan has been identified as being relevant for this species.

Relevant survey guidelines for this species include:

- *Survey guidelines for Australia's threatened fish. EPBC Act survey guidelines 6.4* (Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011).

E-1.2.18.3 SPECIFIC IMPACTS

The maximum aquatic impact likely to occur to any of the potential aquatic habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey will would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area will would continue to function as it currently functions.

E-1.2.18.4 IS THIS AN IMPORTANT POPULATION?

In accordance with the Significant Impact Guidelines the presence of an important population must be identified prior to addressing the significance impact criteria. An important population is defined in the guidelines as a population that is necessary for a species' long-term survival and recovery (Department of the Environment, 2013). Under the EPBC Act, important populations are:

- likely to be key source populations either for breeding or dispersal
- likely to be necessary for maintaining genetic diversity
- at or near the limit of the species range.

This location is not at the limit of this species known range, which extends into Queensland and to Victoria. Nor would any population present be important for maintaining genetic diversity or breeding. Therefore, any occurrences of this species within the proposal study area are not likely to form part of an important population. Additionally, no significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species.

E-1.2.18.5 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**

Not applicable, if present are not considered to be part of an important population.

- **REDUCE THE AREA OF OCCUPANCY OF AN IMPORTANT POPULATION**

Not applicable, if present are not considered to be part of an important population.

- **FRAGMENT AN EXISTING IMPORTANT POPULATION INTO TWO OR MORE POPULATIONS**

Not applicable, if present are not considered to be part of an important population.

- **ADVERSELY AFFECT HABITAT CRITICAL TO THE SURVIVAL OF A SPECIES**

There is no habitat listed as critical to the survival of these species within the proposal study area.

- **DISRUPT THE BREEDING CYCLE OF AN IMPORTANT POPULATION**

Not applicable, if present are not considered to be part of an important population. No significant impacts are anticipated for these species from the proposed action due to the avoidance of clearing and construction works within waterways, especially those containing potentially suitable habitat for these species. Therefore, the proposed action is unlikely to disrupt the breeding cycle of a population.

- **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 action is likely to have minimal impact to wetlands, riverine, and waterways habitats suitable for these species. Therefore, the proposed action is unlikely to result in the modification, removal, isolation, or decreased 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**

It is recommended that mitigation measures include the implementation of a weed and pest management plans, installation of vehicle wash stations to limit the spread of weeds, pathogens and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occur within or in close proximity to these species' habitat to minimise sedimentation and hydrological impacts.

- **INTRODUCE DISEASE THAT MAY CAUSE THE SPECIES TO DECLINE**

Mitigation measures such as wash down areas and hygiene protocols to prevent contamination and minimising the spread of disease should be adhered too.

- **INTERFERE SUBSTANTIALLY WITH THE RECOVERY OF THE SPECIES**

Recovery actions would not be affected by the proposed action. No key management sites are known to occur within the proposal study area.

- **CONCLUSION**

This species has the potential to occur within the proposal study area, however only within waterways which would be avoided and protected by the proposed action. Where waterway crossings of the transmission line occur, the alignment would span these habitats only, and no towers or structures would be placed in waterways. Mitigation measures like weed and pest management plans, hygiene protocols and sediment control measures, in close proximity to these potential habitats would minimise indirect impacts to this species. Therefore, no significant impacts are anticipated for this species, due to the avoidance of clearing and construction works within waterways containing potentially suitable habitat, and implementation of mitigation measures.

E-1.2.19 LISTED MIGRATORY SPECIES

Based on the results of the database searches, 26 listed migratory species may occur in the broader locality (refer to Appendix D-2). The following EPBC Act listed Migratory species are considered moderately likely to occur in, or adjacent to, the proposal study area based on the presence of suitable habitats:

- Migratory marine birds – Fork-tailed Swift
- Migratory terrestrial species – White-throated Needletail
- Migratory wetland species – Common Sandpiper, Sharp-tailed Sandpiper, Red Knot, Curlew Sandpiper, Pectoral Sandpiper, Little Stint, Red-necked Stint, Long-toed Stint, Greater Sand Plover, White-winged Black Tern, Latham's Snipe, Caspian Tern, Broad-billed Sandpiper, Bar-tailed Godwit, Bar-tailed Godwit (baueri), Black-tailed Godwit, Little Curlew, Glossy Ibis, Pacific Golden Plover, Wood Sandpiper, Common Greenshank and Marsh Sandpiper.

EPBC Act listed Marine species including the Great Egret, Cattle Egret, Red-capped Plover, White-bellied Sea-Eagle, Black-winged Stilt, Swift Parrot, Rainbow Bee-eater, Red-necked Avocet and Australian Pratincole may occur in the habitats on occasion.

Of the above species, those that were recorded within the proposal study area were:

- White-bellied Sea-Eagle
- Rainbow Bee-eater
- Great Egret.

And those that were recorded outside of the proposal study area in local or regional wetlands were:

- Sharp-tailed Sandpiper (Chowilla regional reserve in SA)
- Pectoral Sandpiper (Chowilla regional reserve in SA)
- Red-necked Stint (Chowilla regional reserve in SA)
- Greater Sand Plover (Chowilla regional reserve in SA)
- Black-winged Stilt (Chowilla regional reserve in SA)
- Caspian Tern (Recorded in local riparian and wetland habitats)
- Red-necked Avocet (Chowilla regional reserve in SA).

E-1.2.19.1 SPECIFIC IMPACTS

There is a low risk that listed Migratory species may potentially collide with transmission lines and conductors causing injury or mortality. The potential impacts to Migratory and wetland birds was considered during the proposal design development, including the strategic options assessment and identification and refinement of the proposal process. Details about the proposal design development are summarised in Chapter 3 of the EIS and Section 8.1 of the BDAR. A biodiversity constraints assessment was undertaken through the proposal design development phase to identify biodiversity values to be avoided. Ramsar wetlands and other important wetlands and water sources for migratory birds were avoided as a priority.

E-1.2.19.2 IS THE HABITAT TO BE IMPACTED IMPORTANT?

Important habitat for EPBC Act listed Migratory species is defined as (Department of Environment, 2013):

- habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species
- habitat that is of critical importance to the species at particular life-cycle stages
- habitat utilised by a migratory species which is at the limit of the species range
- habitat within an area where the species is declining.

While some migratory species of bird are likely to use the proposal study area and locality, it would not be classed as an 'important habitat' for the following reasons:

- No nationally or internationally important habitats for migratory wetlands species are present in the proposal study area according to the definition provided in the *EPBC Act Policy Statement 3.21—Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment, 2015b).
- There are no important habitats for the Fork-tailed Swift or the White-throated Needletail in the development site as outlined in the *Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015d).
- A nationally significant proportion of a listed Migratory bird population would not be supported by the habitats in the proposal study area.
- The proposal area does not contain any known important foraging grounds for listed Migratory species and the proposal would not impact on any significant foraging habitats.
- The proposal area does not contain any known important staging grounds for migration.
- The proposal area does not contain habitat that is at the limit of a listed Migratory species' range.
- The proposal area is not located within an area where a listed Migratory species is known to be declining.

E-1.2.19.3 SIGNIFICANT IMPACT CRITERIA

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

- **SUBSTANTIALLY MODIFY (INCLUDING BY FRAGMENTING, ALTERING FIRE REGIMES, ALTERING NUTRIENT CYCLES OR ALTERING HYDROLOGICAL CYCLES), DESTROY OR ISOLATE AN AREA OF IMPORTANT HABITAT FOR A MIGRATORY SPECIES**

The habitat within the proposal area would not be considered important habitat for a listed Migratory species.

The potential impacts to Migratory and other wetland birds was considered during the proposal design development, including the strategic options assessment and identification and refinement of the proposal process. Details about the proposal design development are summarised in Chapter 3 of the EIS and Section 8.1 of the BDAR. A biodiversity constraints assessment was undertaken through the proposal design development phase to identify biodiversity values to be avoided. Ramsar wetlands and other important wetlands and water sources for migratory birds were avoided as a priority therefore avoiding impacts to important habitats.

- **RESULT IN AN INVASIVE SPECIES THAT IS HARMFUL TO THE MIGRATORY SPECIES BECOMING ESTABLISHED IN AN AREA OF IMPORTANT HABITAT FOR THE MIGRATORY SPECIES, OR**

The habitat within the proposal area would not be considered important habitat for a listed Migratory species. Nevertheless, the planned mitigation measures would prevent any invasive species becoming established.

- **SERIOUSLY DISRUPT THE LIFECYCLE (BREEDING, FEEDING, MIGRATION OR RESTING BEHAVIOUR) OF AN ECOLOGICALLY SIGNIFICANT PROPORTION OF THE POPULATION OF A MIGRATORY SPECIES.**

An ecologically significant proportion of a listed Migratory species population would not occur in the proposal study area.

The *Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act* (Department of the Environment, 2015d) defines an ecologically significant proportion of the population of the Fork-Tailed Swift and White-throated Needletail as described in Table E-1.17. For species such as the Fork-Tailed Swift and White-throated Needletail that aggregate in flocks, 1% of the population is considered internationally important, 0.1% as nationally important and therefor ecologically significant. The proposal would not impact on an internationally or nationally important proportion of the Fork-Tailed Swift and White-throated Needletail population as the habitat to be impacted does not have the capacity to support this number of birds of either species.

Table E-1.17 Definitions for an ecologically significant proportion of the population of Fork-Tailed Swift and White-throated Needletail

SPECIES	ECOLOGICALLY SIGNIFICANT PROPORTION OF A POPULATION (NO. INDIVIDUALS)	
	1%	0.1%
White-throated Needletail	100	10
Fork-tailed Swift	1,000	100

The *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) and *EPBC Act Policy Statement 3.21 – Industry Guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species* (Department of the Environment, 2015b) state that important habitats in Australia for migratory shorebirds under the EPBC Act include those recognised as nationally or internationally important. According to this approach, wetland habitat should be considered internationally important if it regularly supports:

- 1 per cent of the individuals in a population of one species or subspecies of waterbird or
- a total abundance of at least 20,000 waterbirds.

Nationally important habitat for migratory shorebirds can be defined using a similar approach to these international criteria, i.e. if it regularly supports:

- 0.1 per cent of the flyway population of a single species of migratory shorebird or
- 2,000 migratory shorebirds or
- 15 migratory shorebird species.

The habitats within the proposal study area would not meet any of the criteria for nationally or internationally important habitat as listed in the *Wildlife Conservation Plan for Migratory Shorebirds* (Commonwealth of Australia, 2015) as the habitats do not support a high diversity of different wetland species or a high number of wetland bird individuals.

- **CONCLUSION**

The proposal would not substantially modify, destroy or isolate an area of important habitat for any EPBC Act listed Migratory species and it would not seriously disrupt the lifecycle of an ecologically significant proportion of a population of migratory birds.

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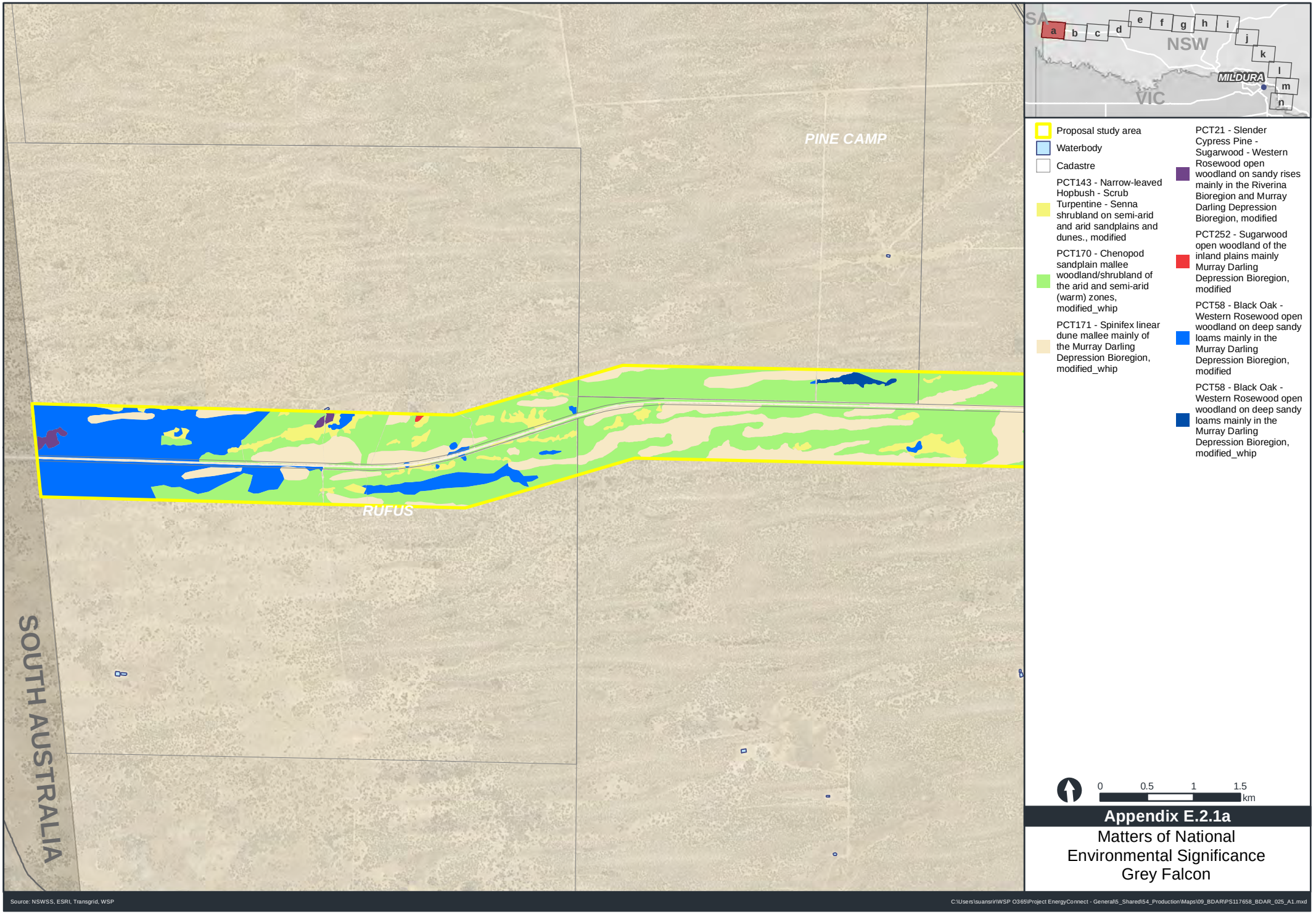
APPENDIX E-2
MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE MAPS



Appendix E.2.1a

Matters of National Environmental Significance
Grey Falcon

Source: NSWSS, ESRI, Transgrid, WSP

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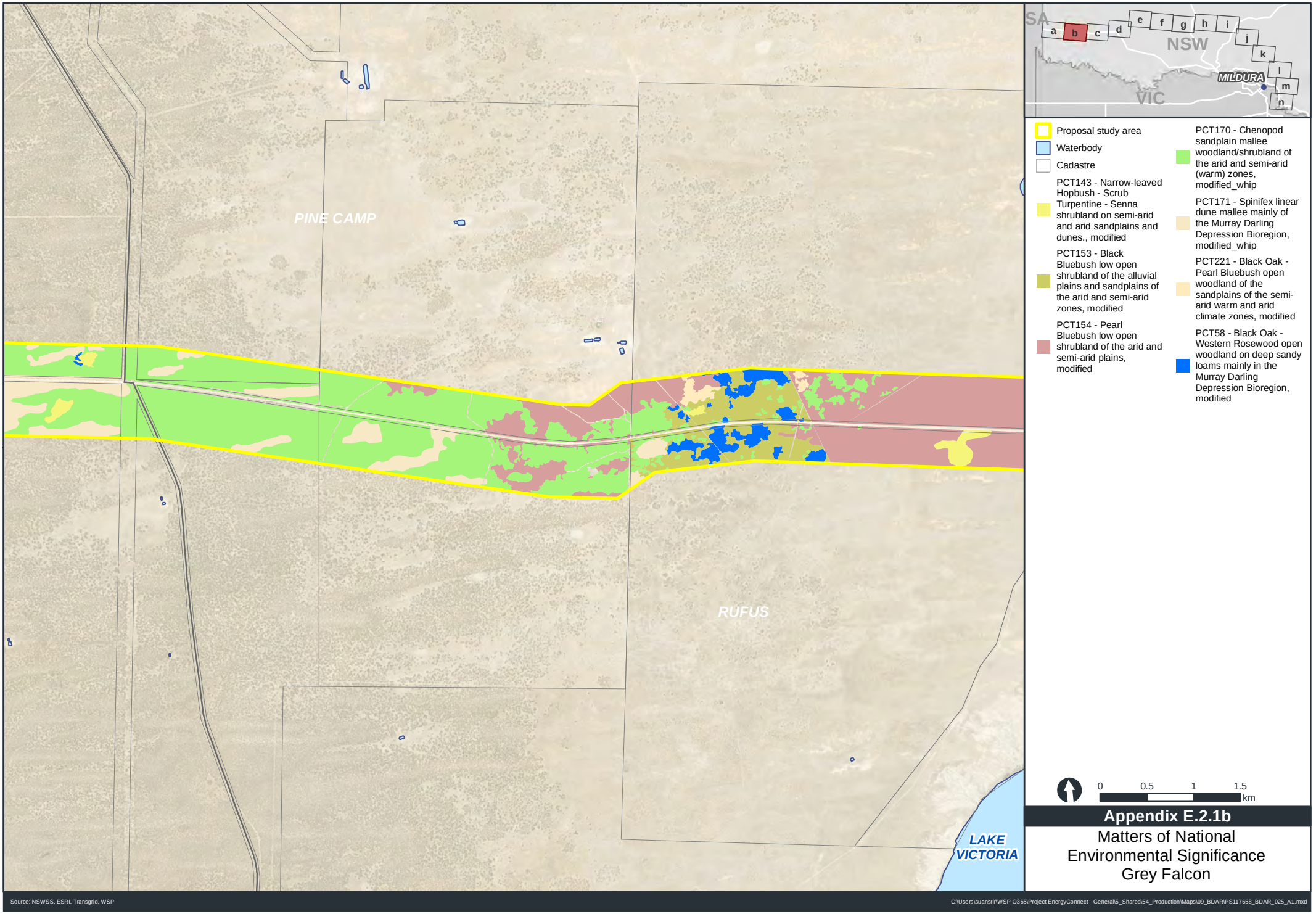
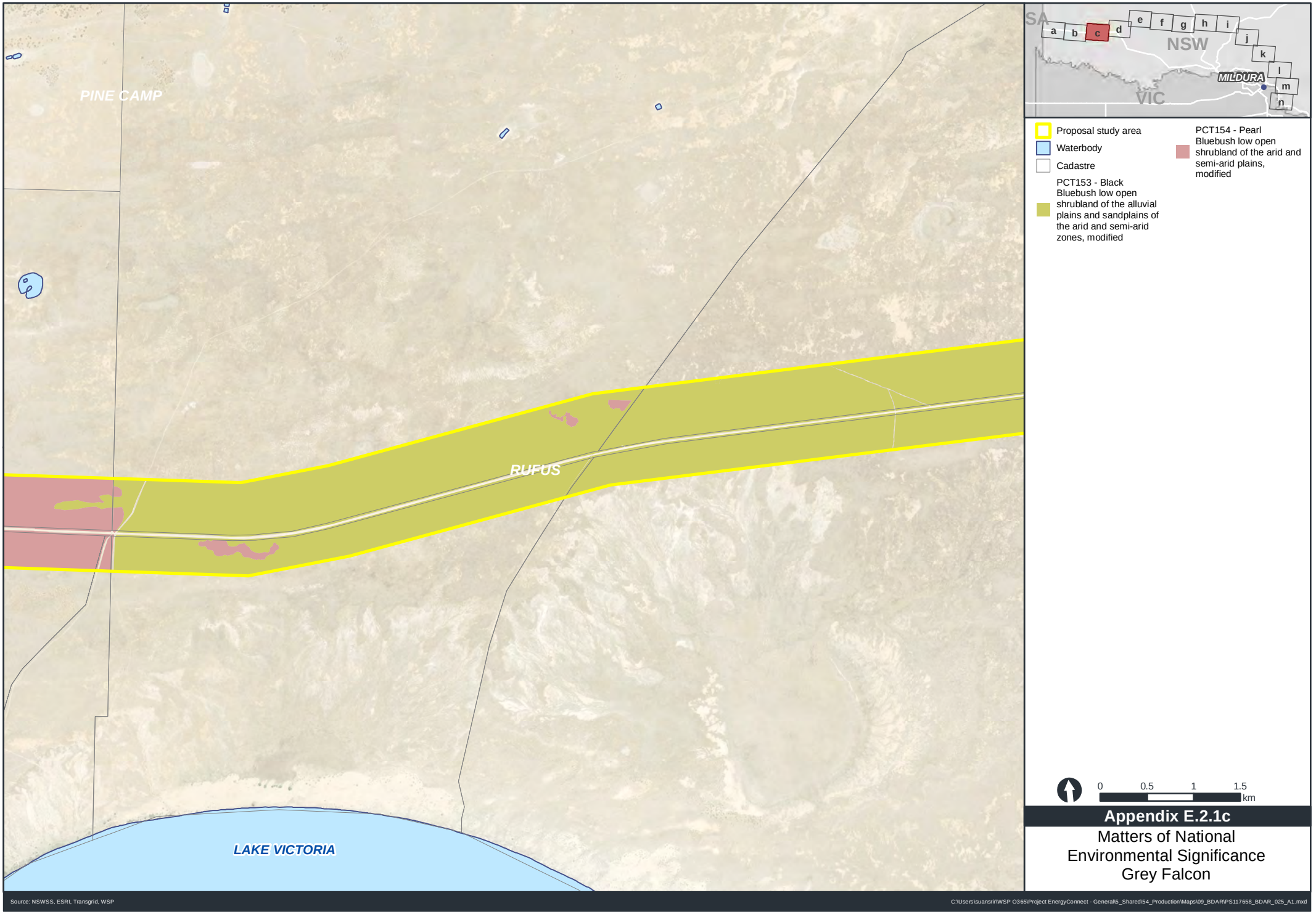


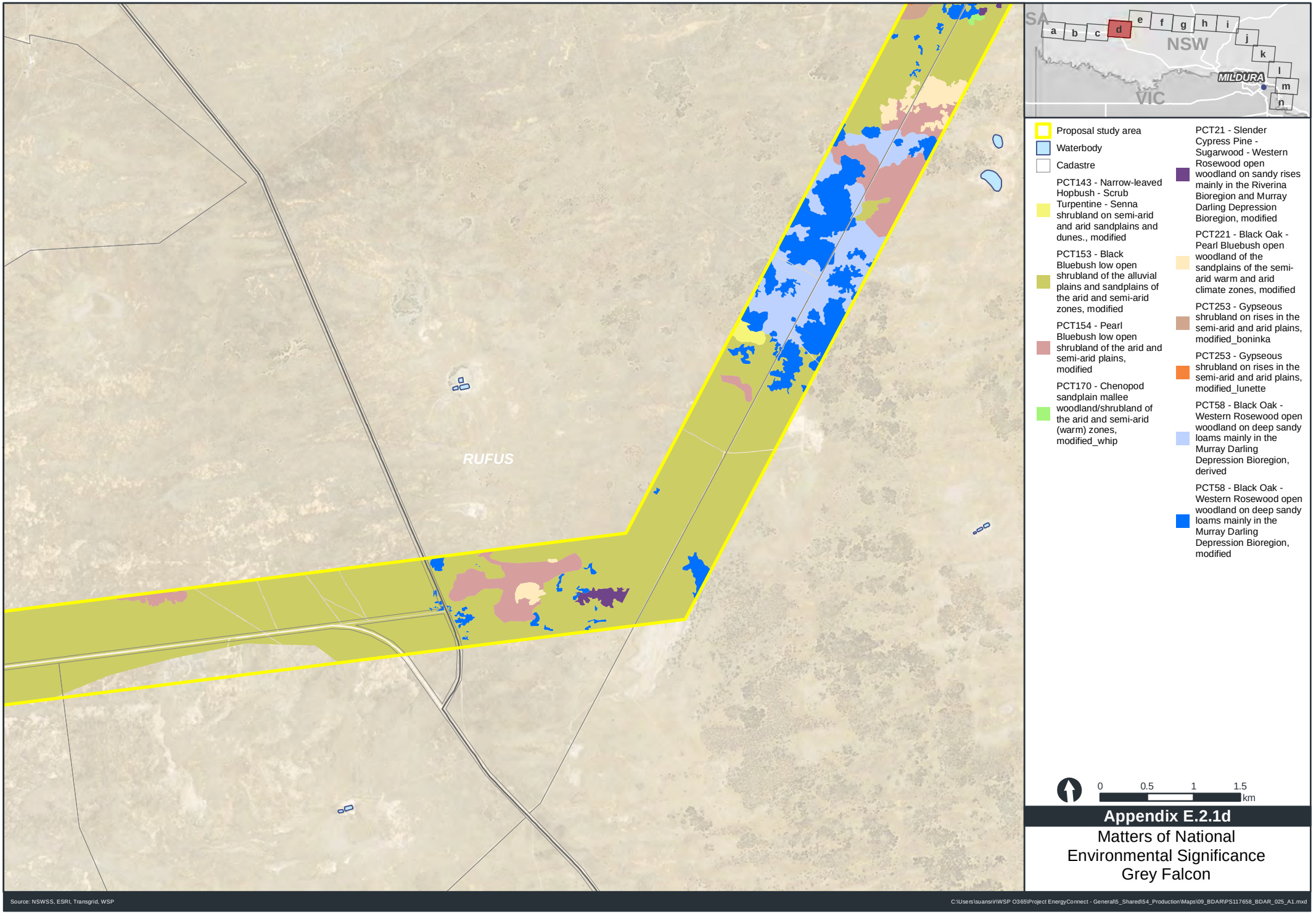
Appendix E.2.1b

Matters of National Environmental Significance
Grey Falcon



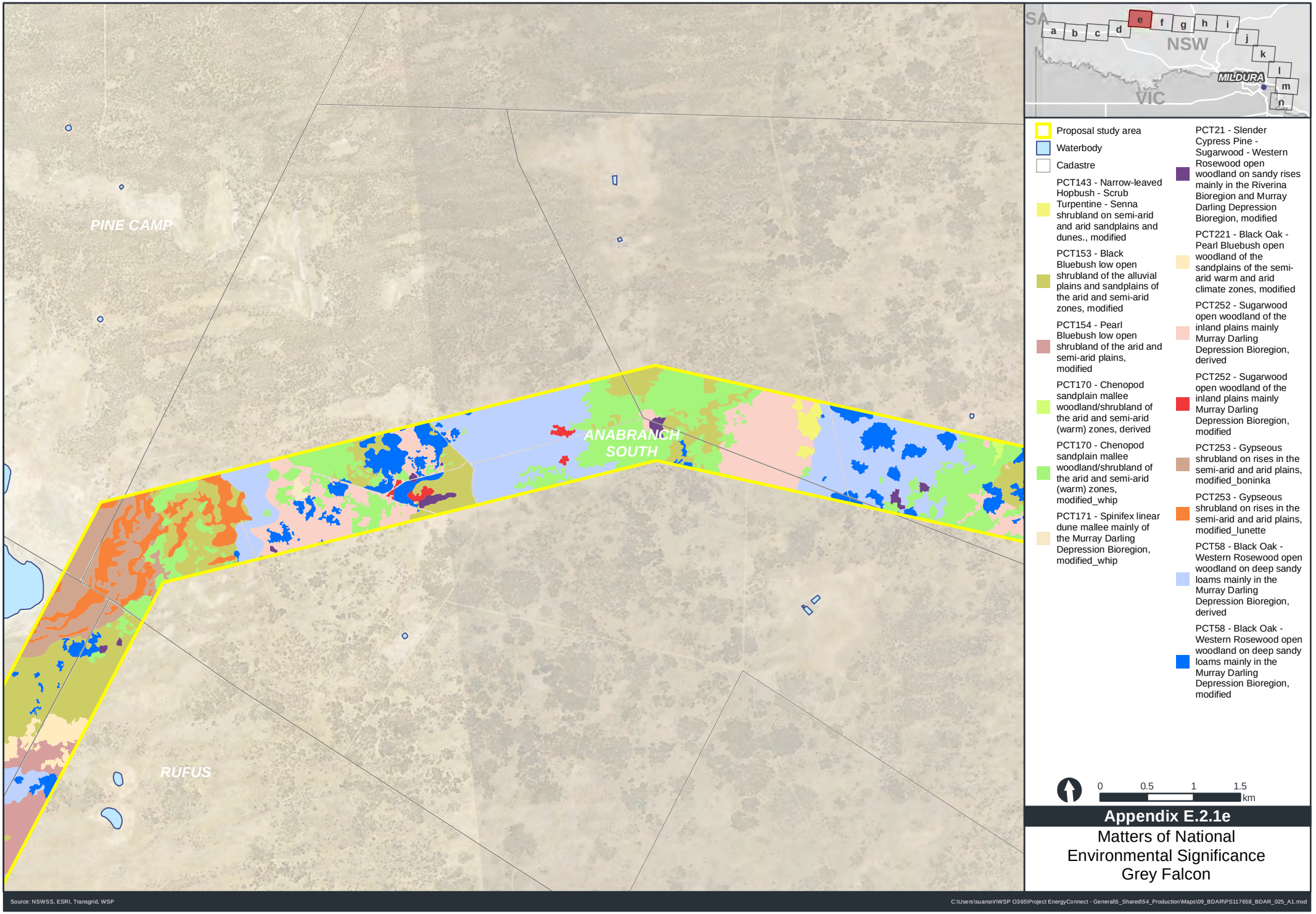
Appendix E.2.1c

Matters of National Environmental Significance
Grey Falcon



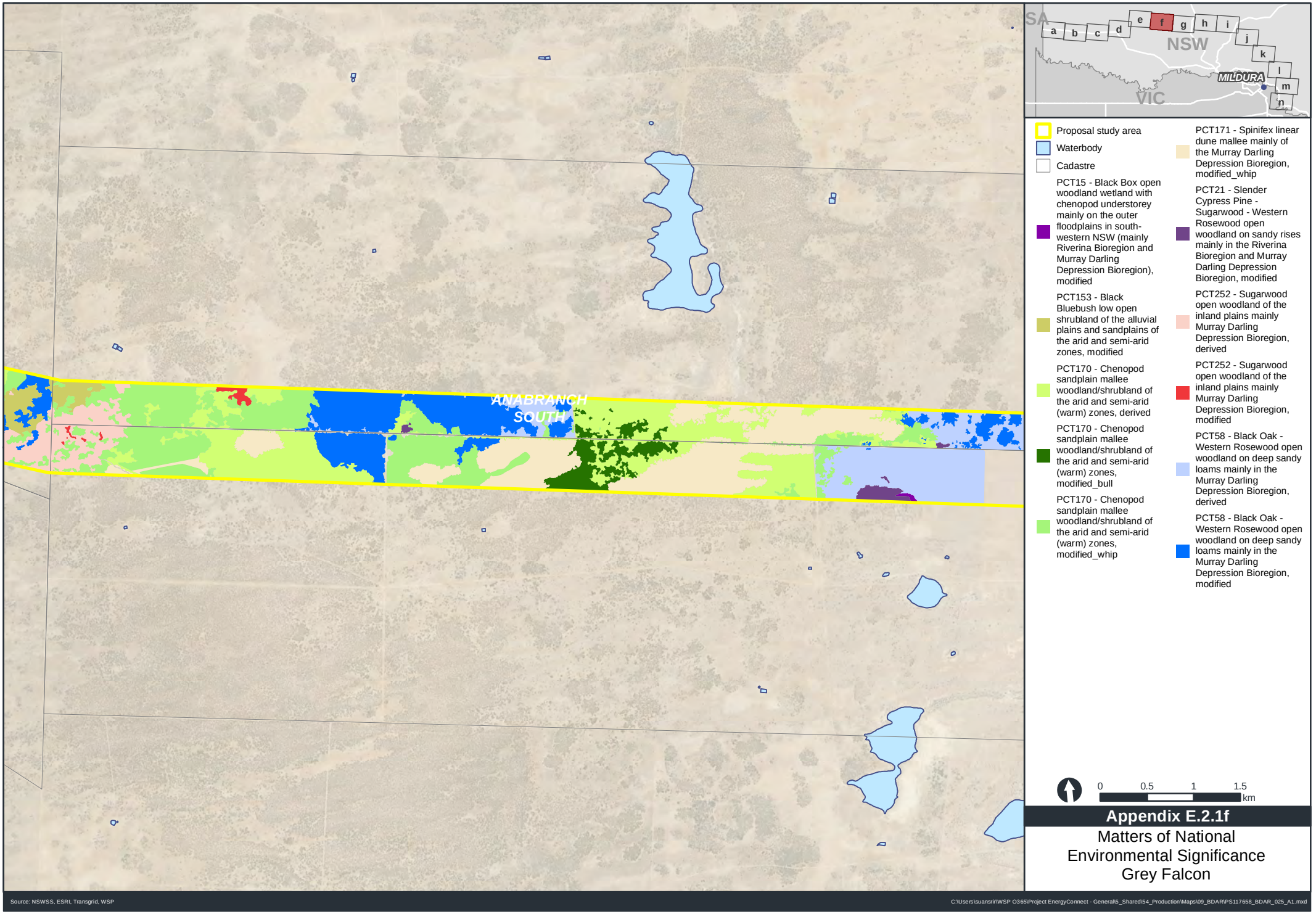
Appendix E.2.1d

Matters of National Environmental Significance
Grey Falcon



Appendix E.2.1e

Matters of National Environmental Significance
Grey Falcon


ANABRANCH SOUTH
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Waterbody
Cadastre
PCT15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion), modified
PCT153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones, modified
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, derived
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_bull
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_whip
PCT171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion, modified_whip
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, derived
PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, modified
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified
0
0.5
1
1.5
km
Appendix E.2.1f
Matters of National Environmental Significance
Grey Falcon
Source: NSWSS, ESRI, Transgrid, WSP
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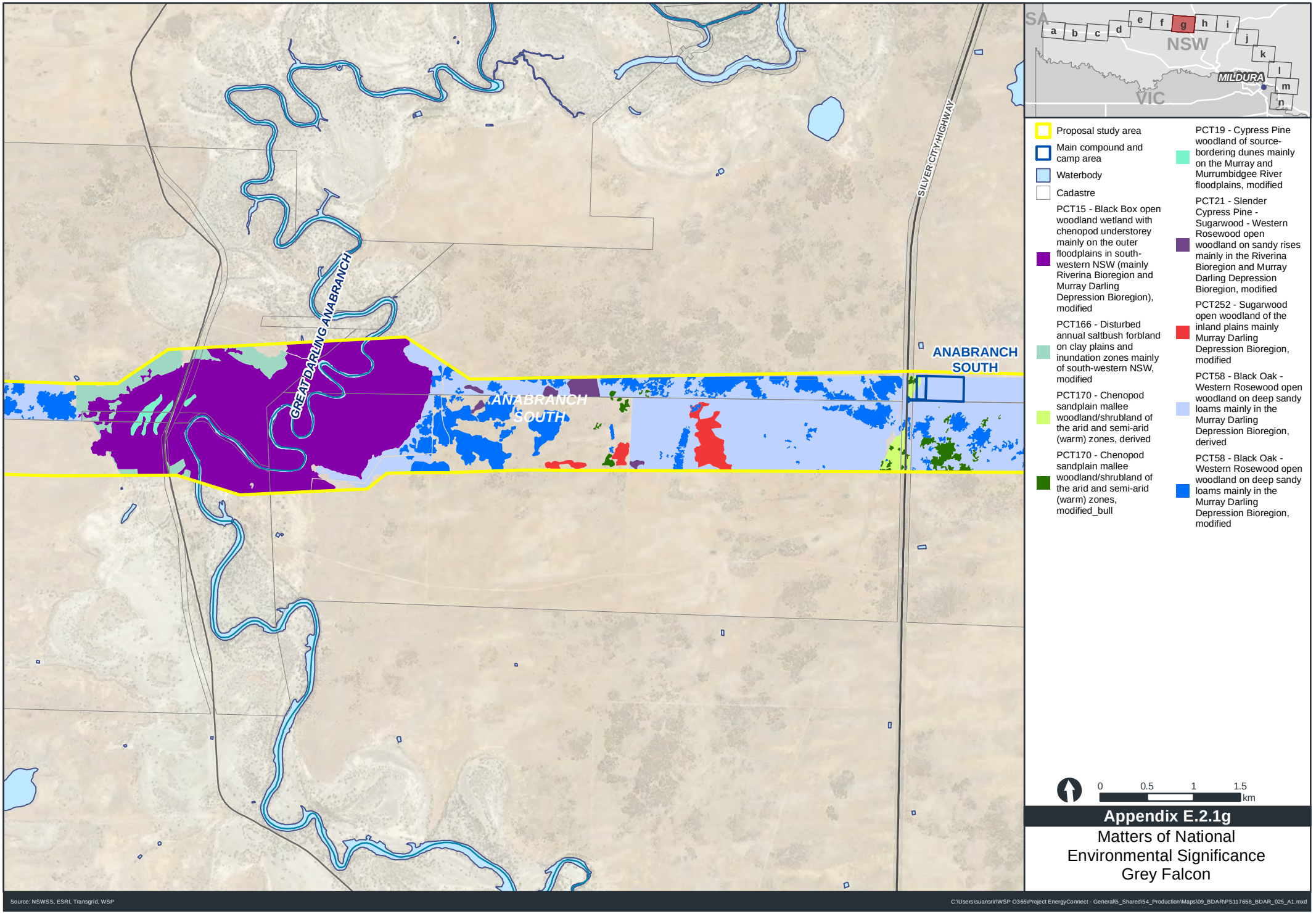
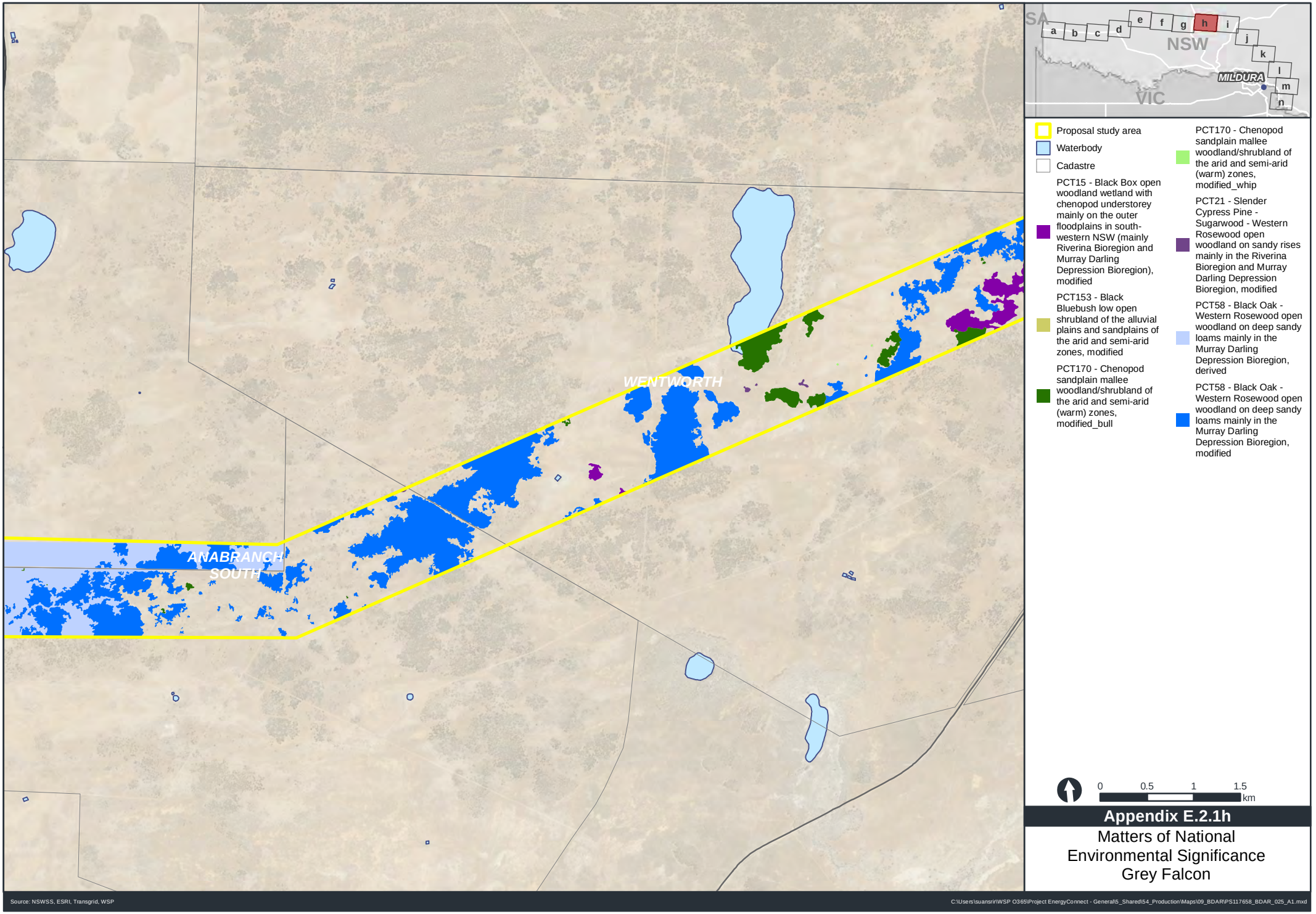


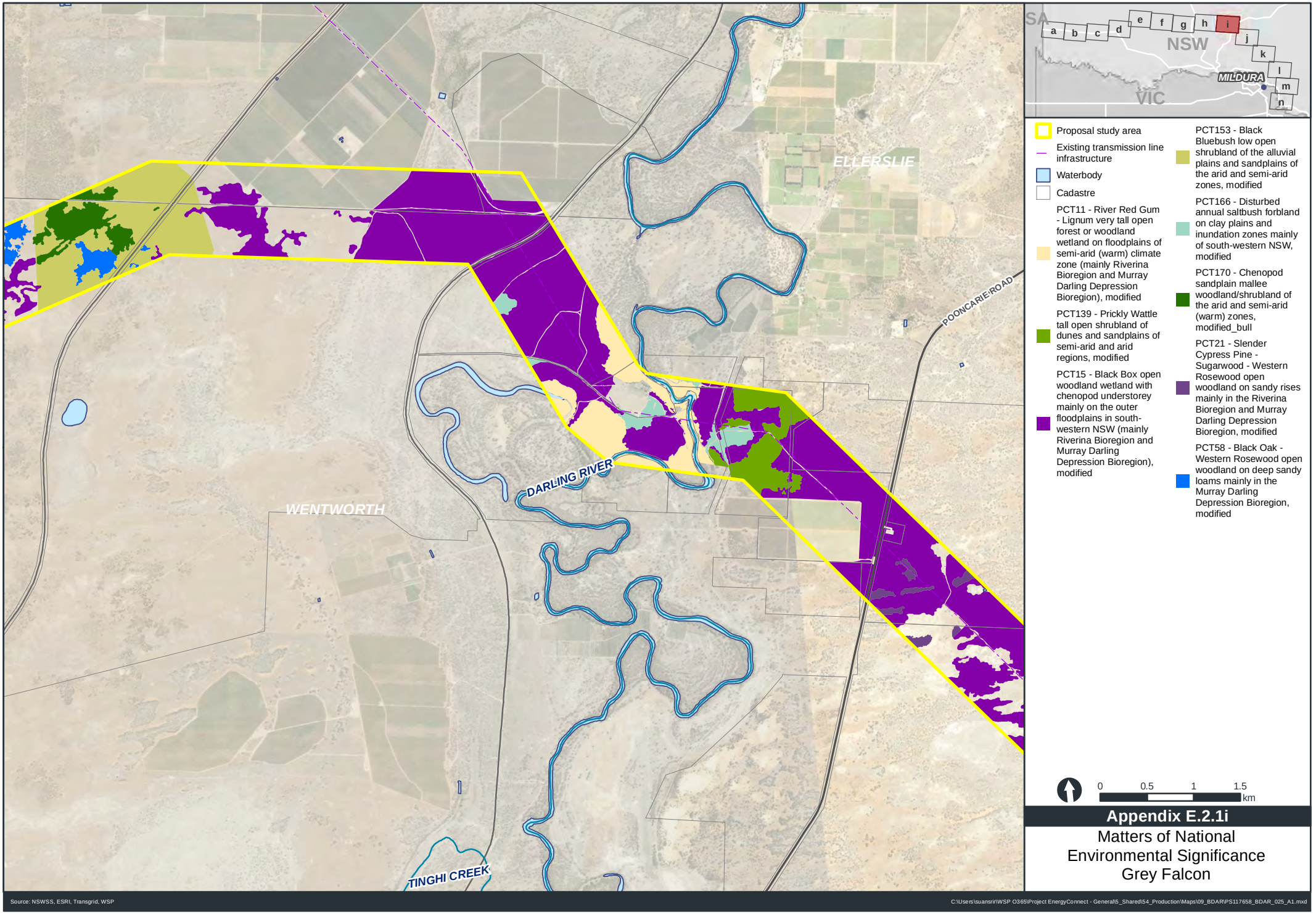
Appendix E.2.1g

Matters of National Environmental Significance
Grey Falcon



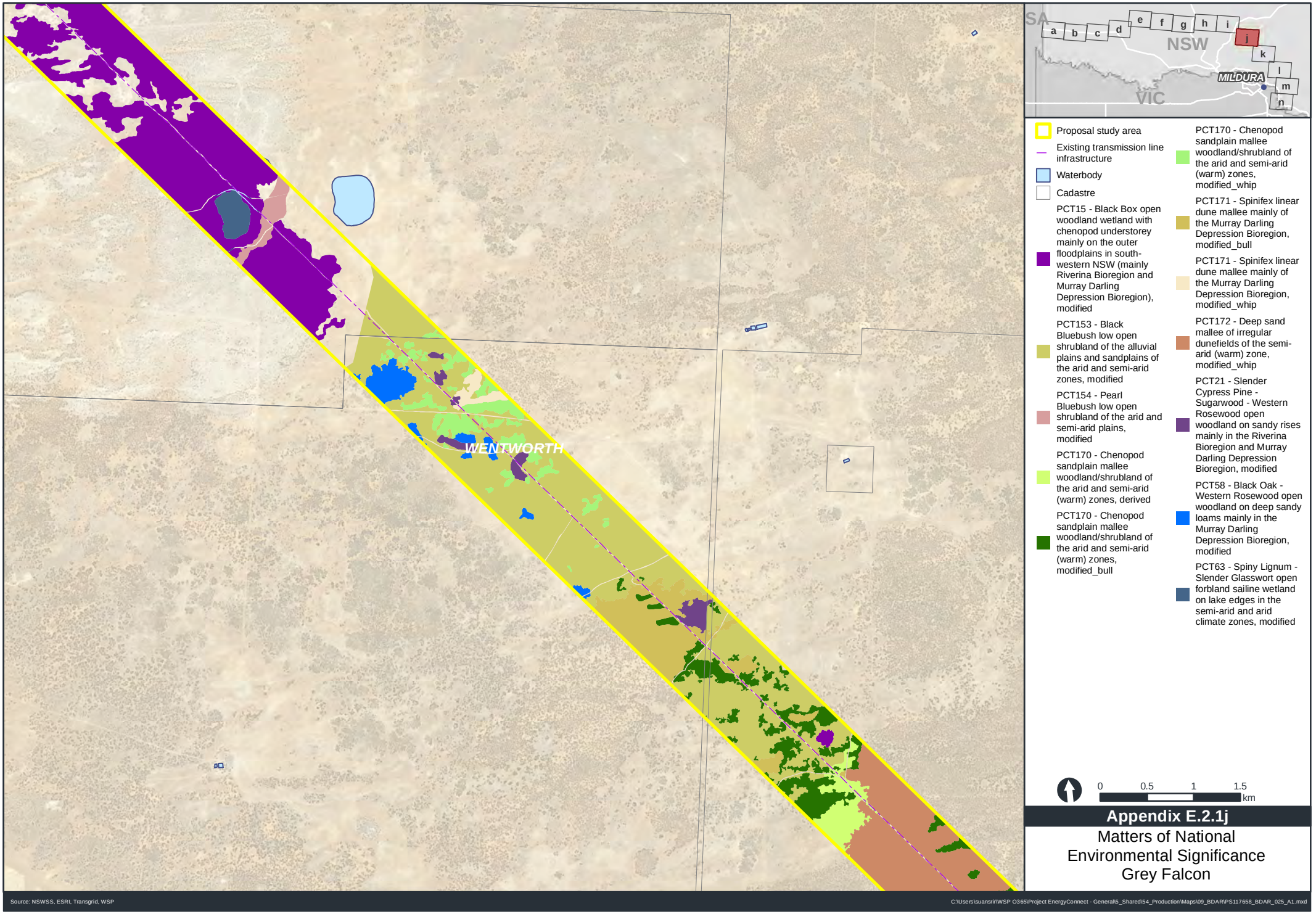
Appendix E.2.1h

Matters of National Environmental Significance
Grey Falcon



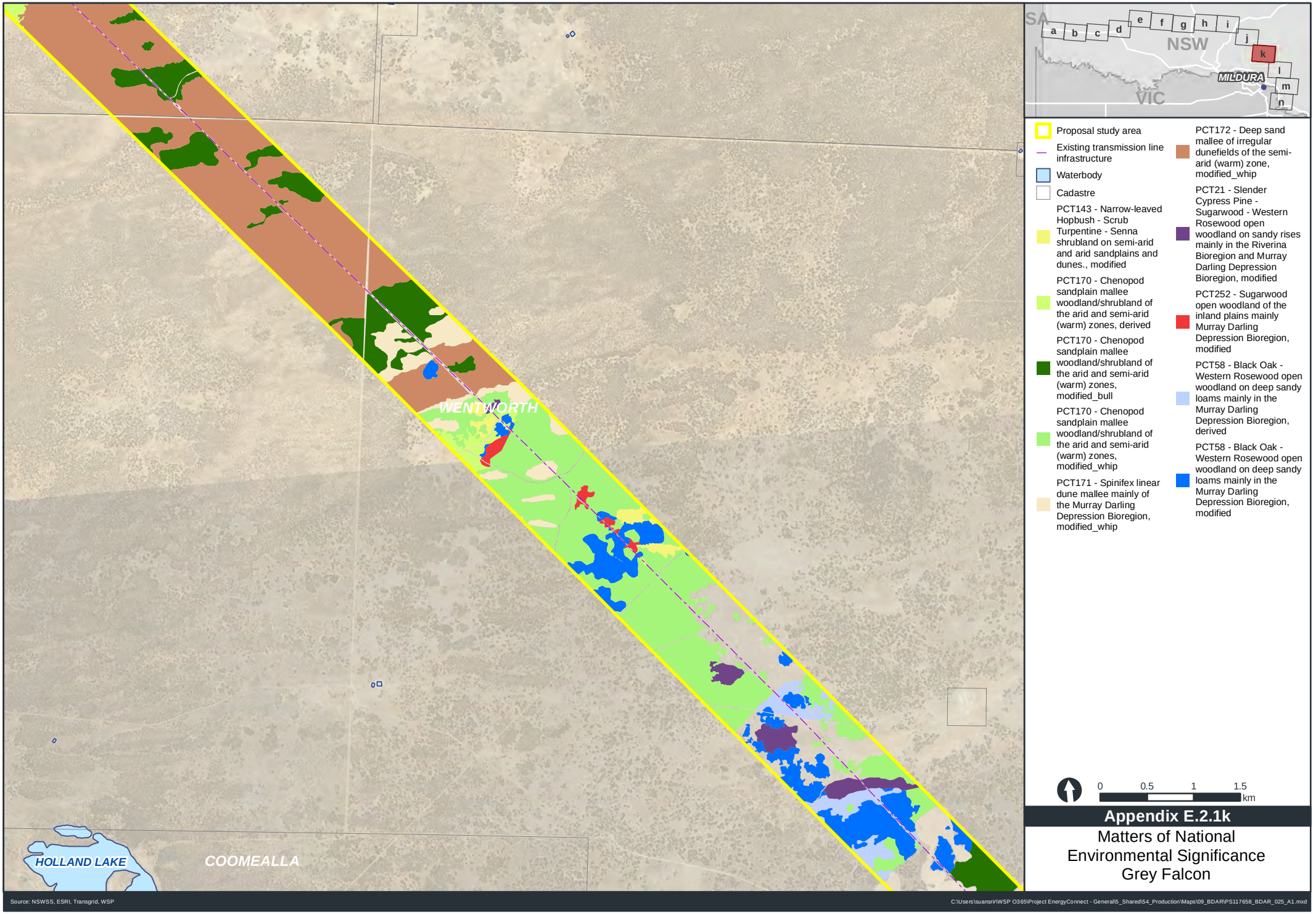
Appendix E.2.1i

Matters of National Environmental Significance
Grey Falcon



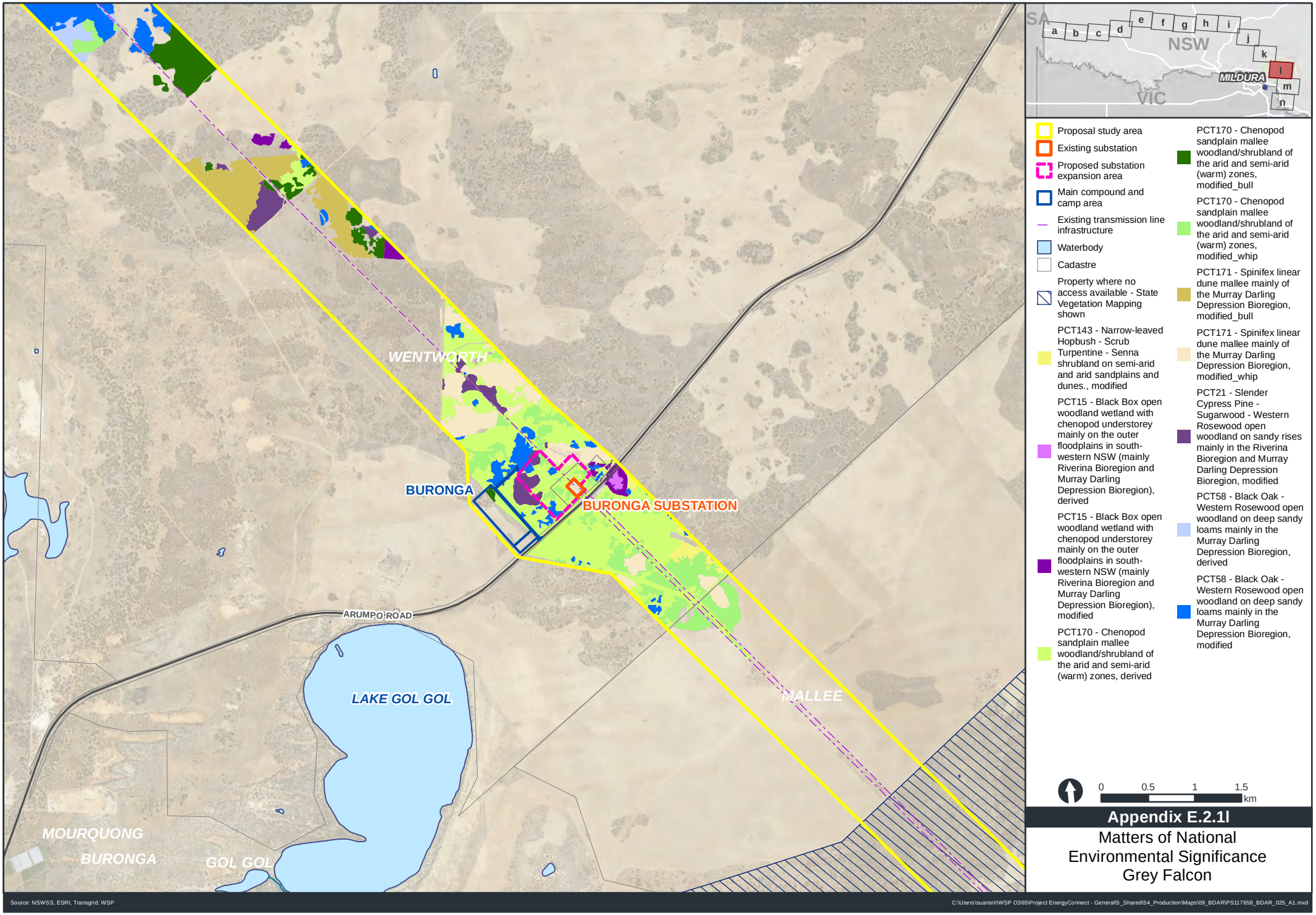
Appendix E.2.1j

Matters of National Environmental Significance
Grey Falcon



Appendix E.2.1k

Matters of National Environmental Significance
Grey Falcon



Appendix E.2.1l

Matters of National Environmental Significance
Grey Falcon

Source: NSWSS, ESRI, Transgrid, WSP

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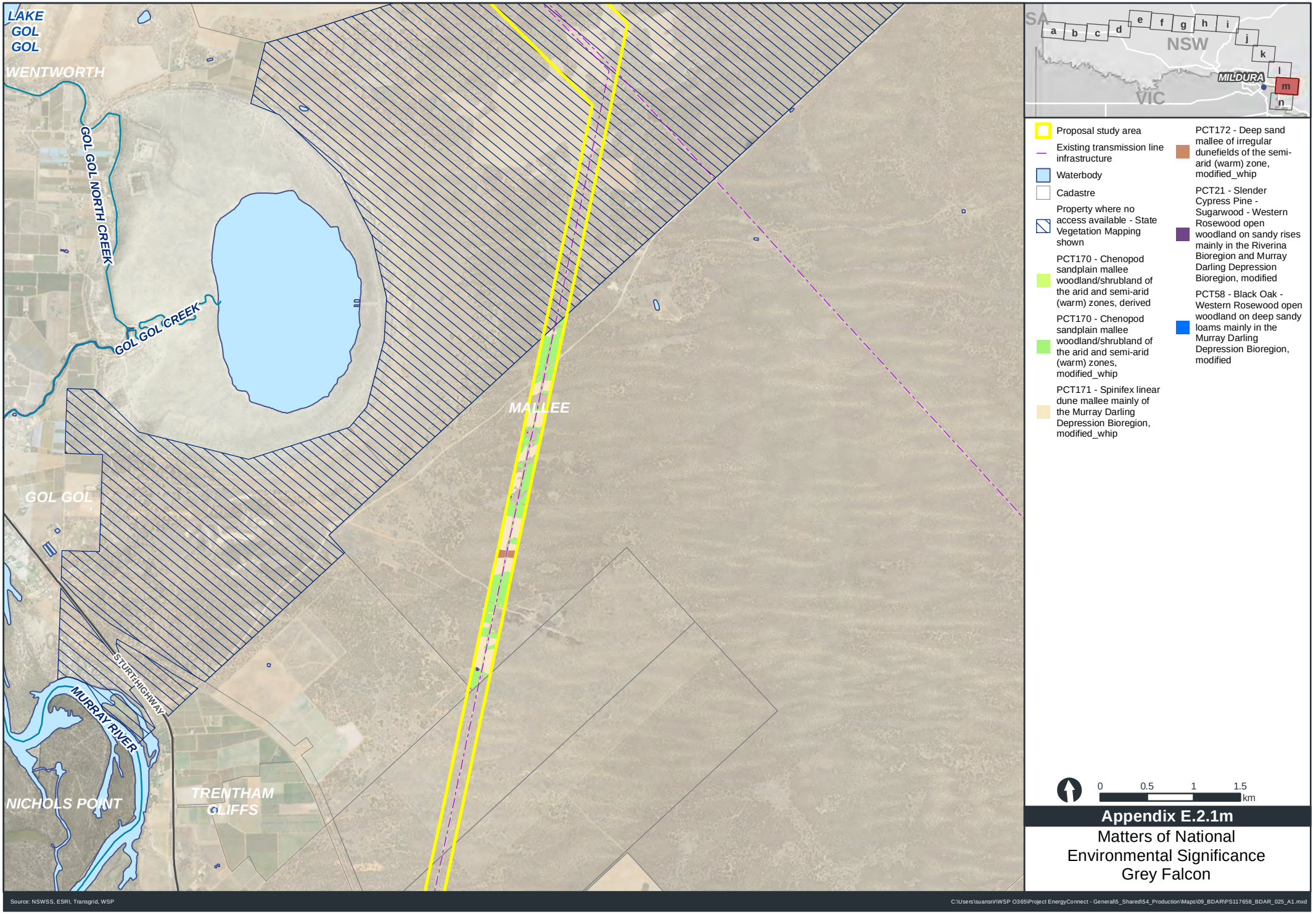
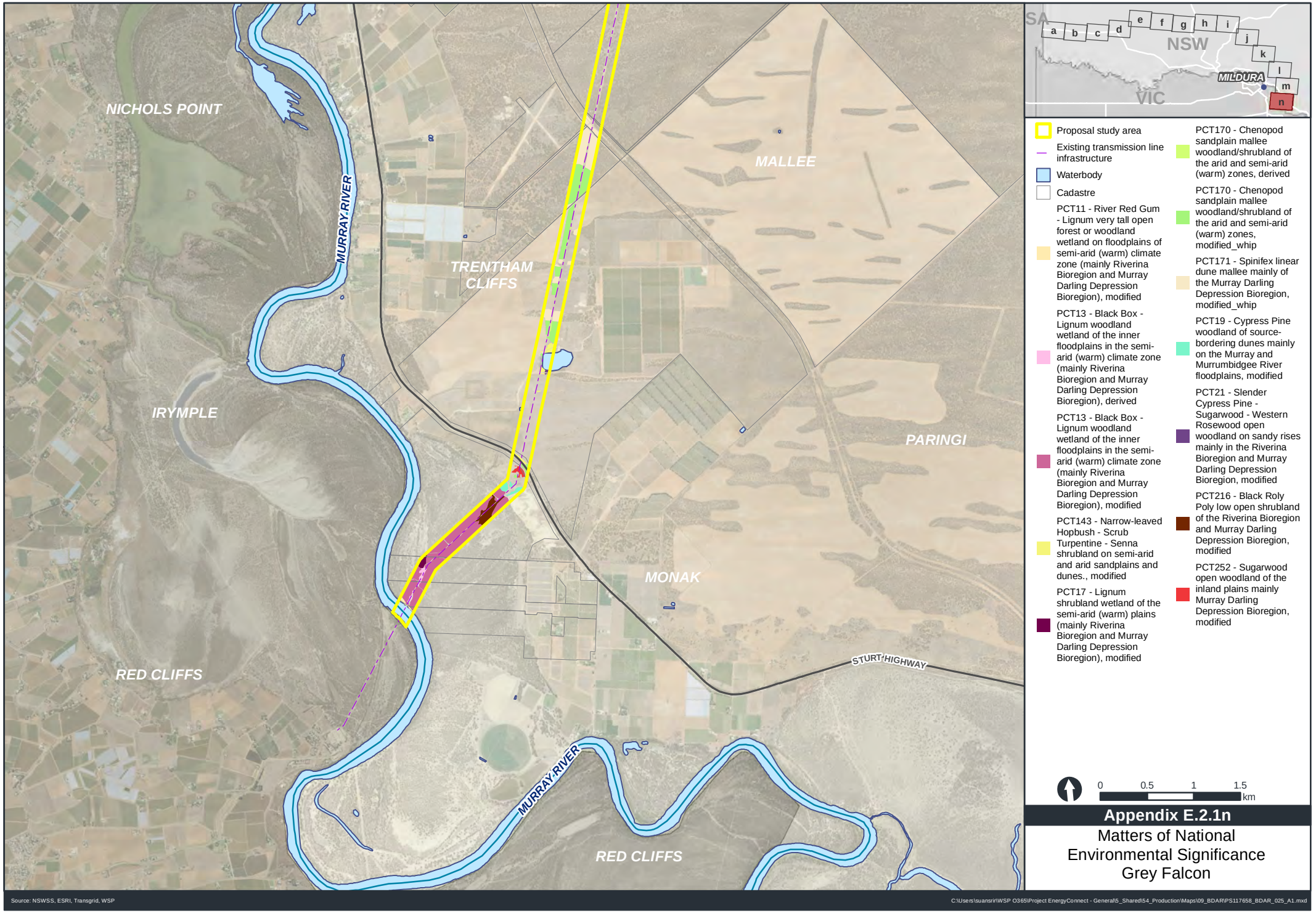


Appendix E.2.1m

Matters of National Environmental Significance
Grey Falcon



Appendix E.2.1n

Matters of National Environmental Significance
Grey Falcon

Source: NSWSS, ESRI, Transgrid, WSP

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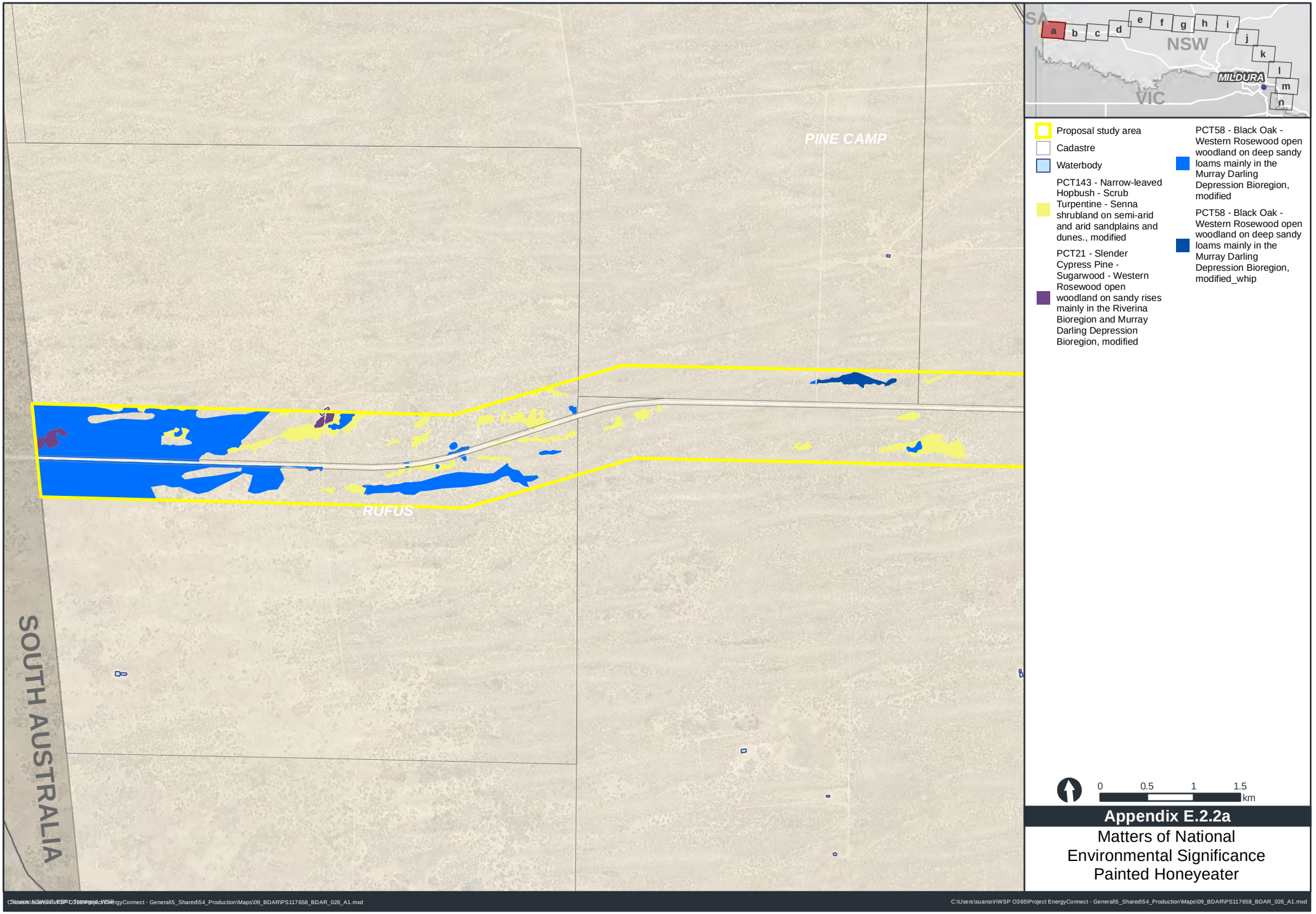

Appendix E.2.2a

Matters of National Environmental Significance
Painted Honeyeater

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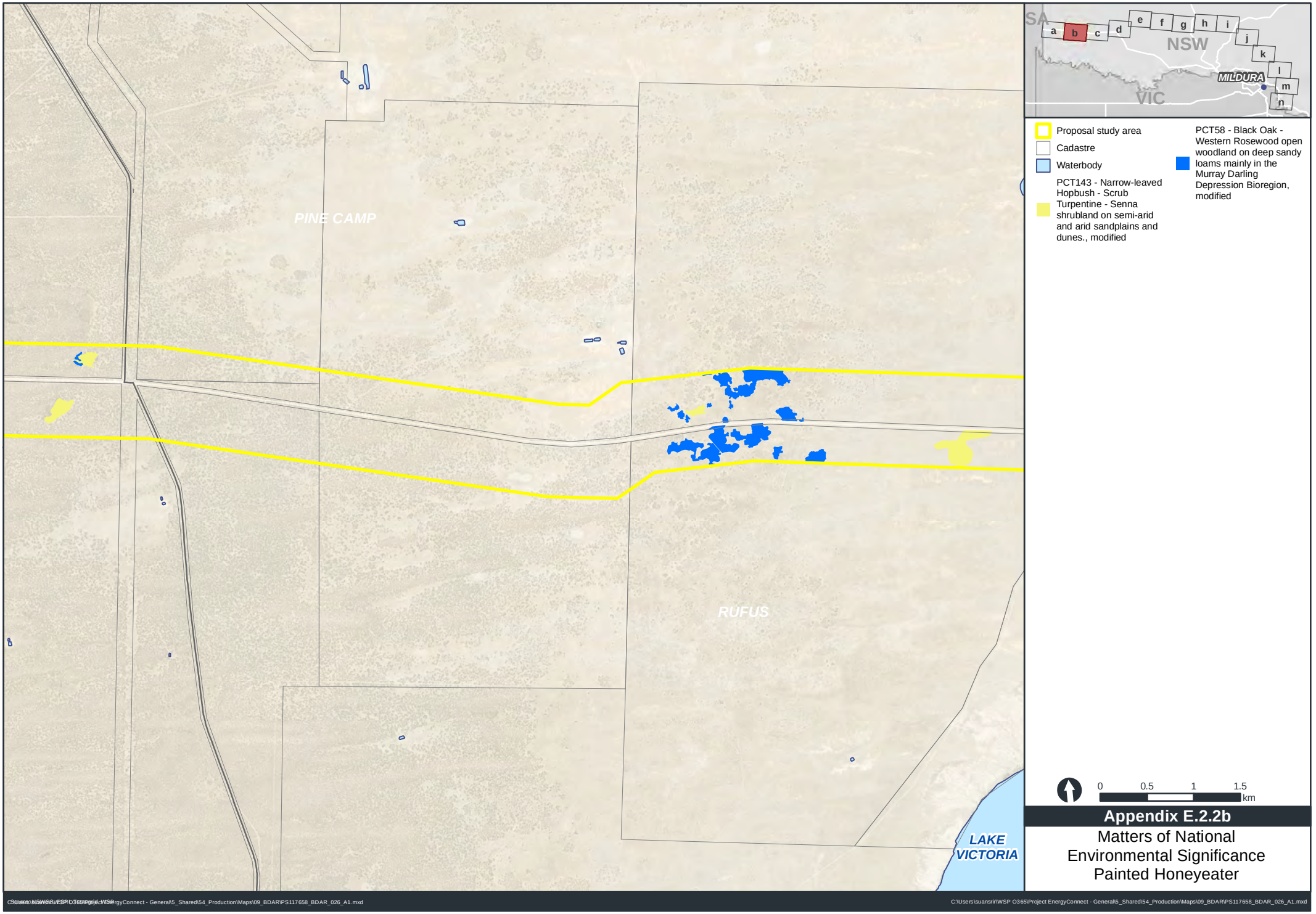

Appendix E.2.2b

Matters of National Environmental Significance
Painted Honeyeater

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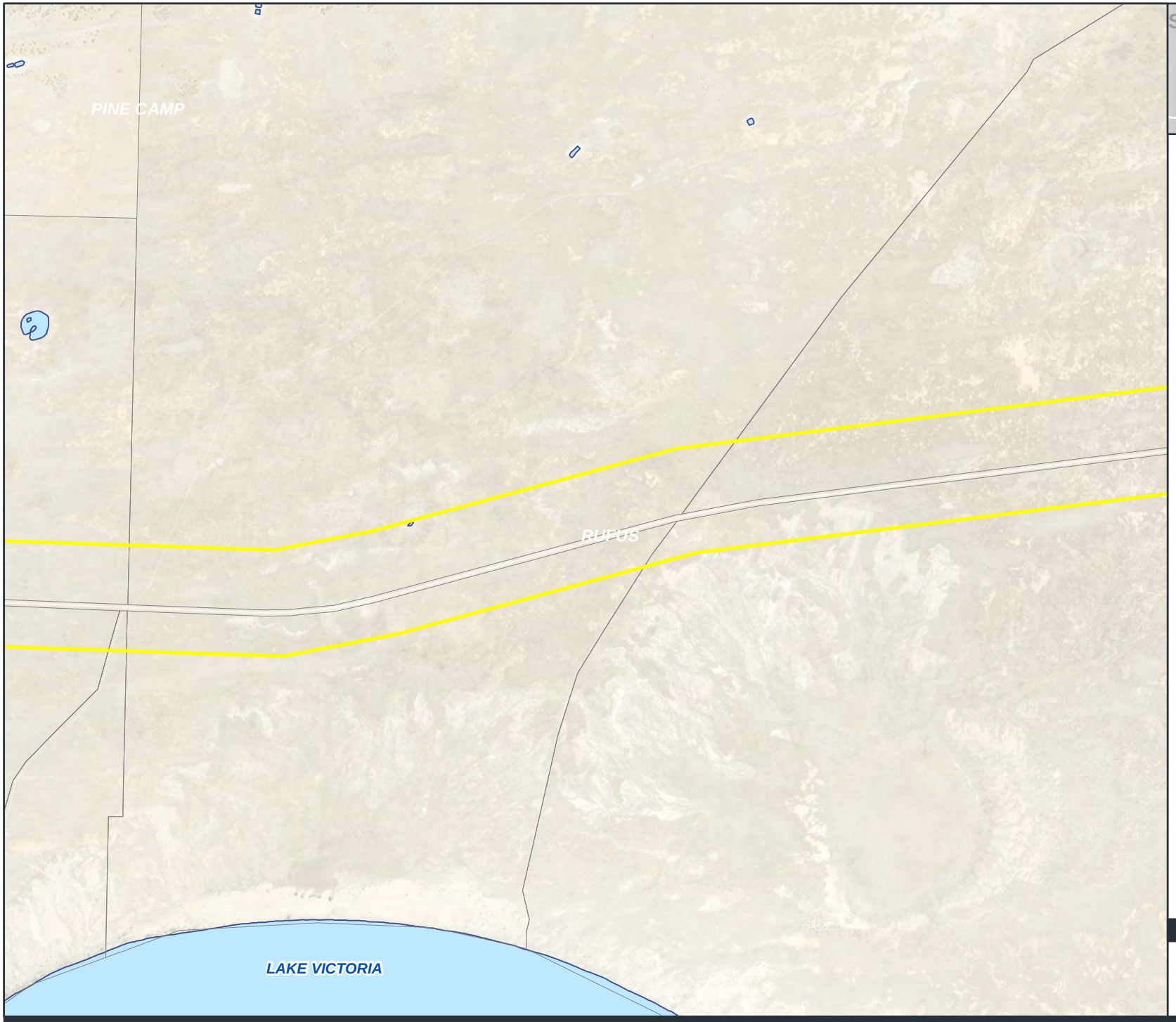

Proposal study area
Cadastre
Waterbody

0 0.5 1 1.5
km

Appendix E.2.2c

Matters of National Environmental Significance
Painted Honeyeater

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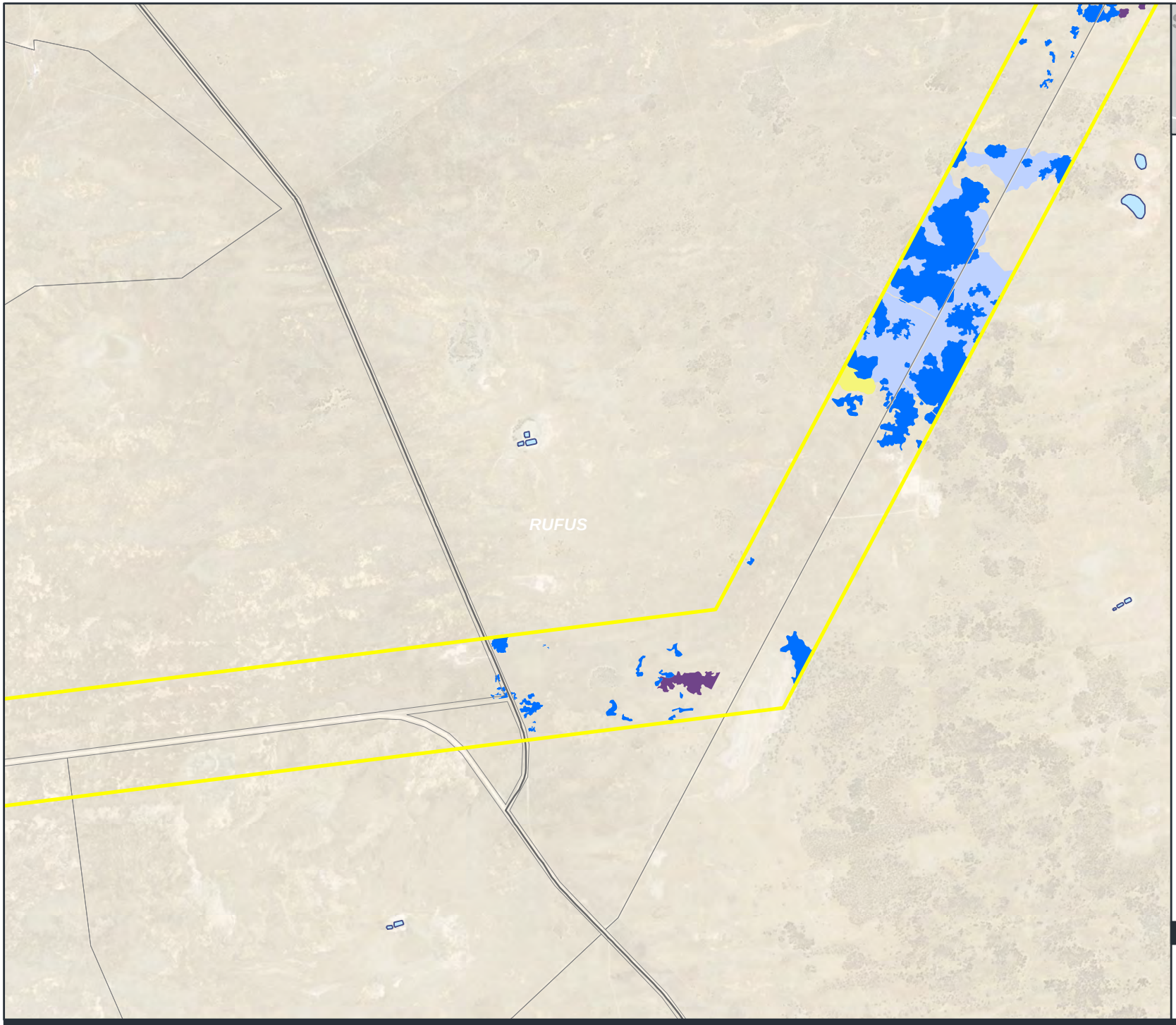
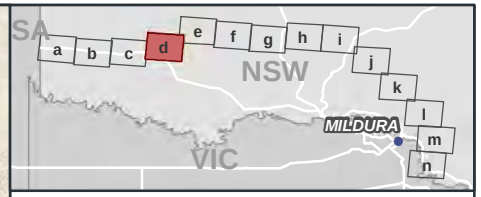




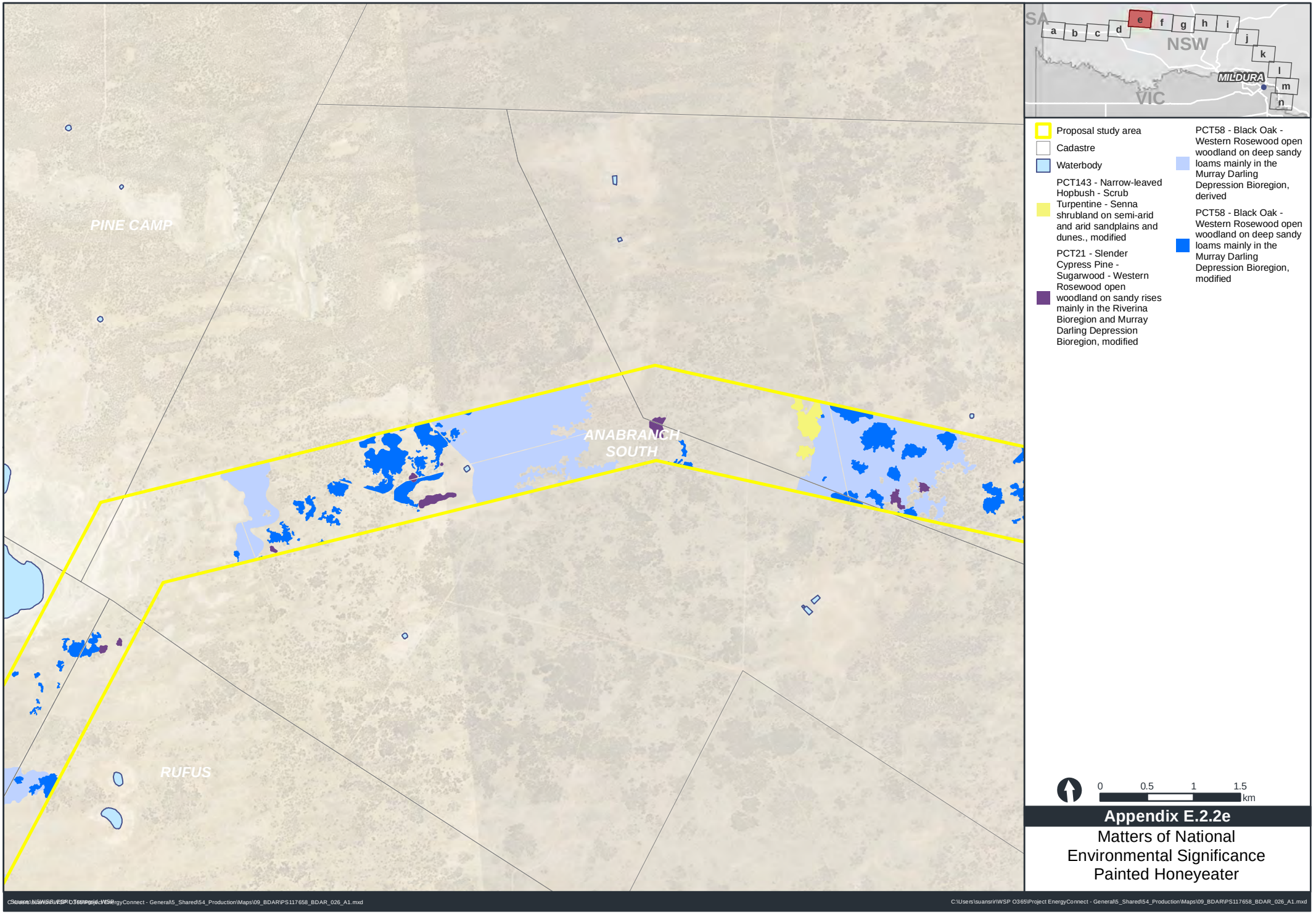
- Proposal study area
- Cadastre
- Waterbody
- PCT143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes., modified
- PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
- PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived
- PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified

0 0.5 1 1.5 km

Appendix E.2.2d

Matters of National Environmental Significance
Painted Honeyeater

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_026_A1.mxd



Appendix E.2.2e

Matters of National Environmental Significance
Painted Honeyeater

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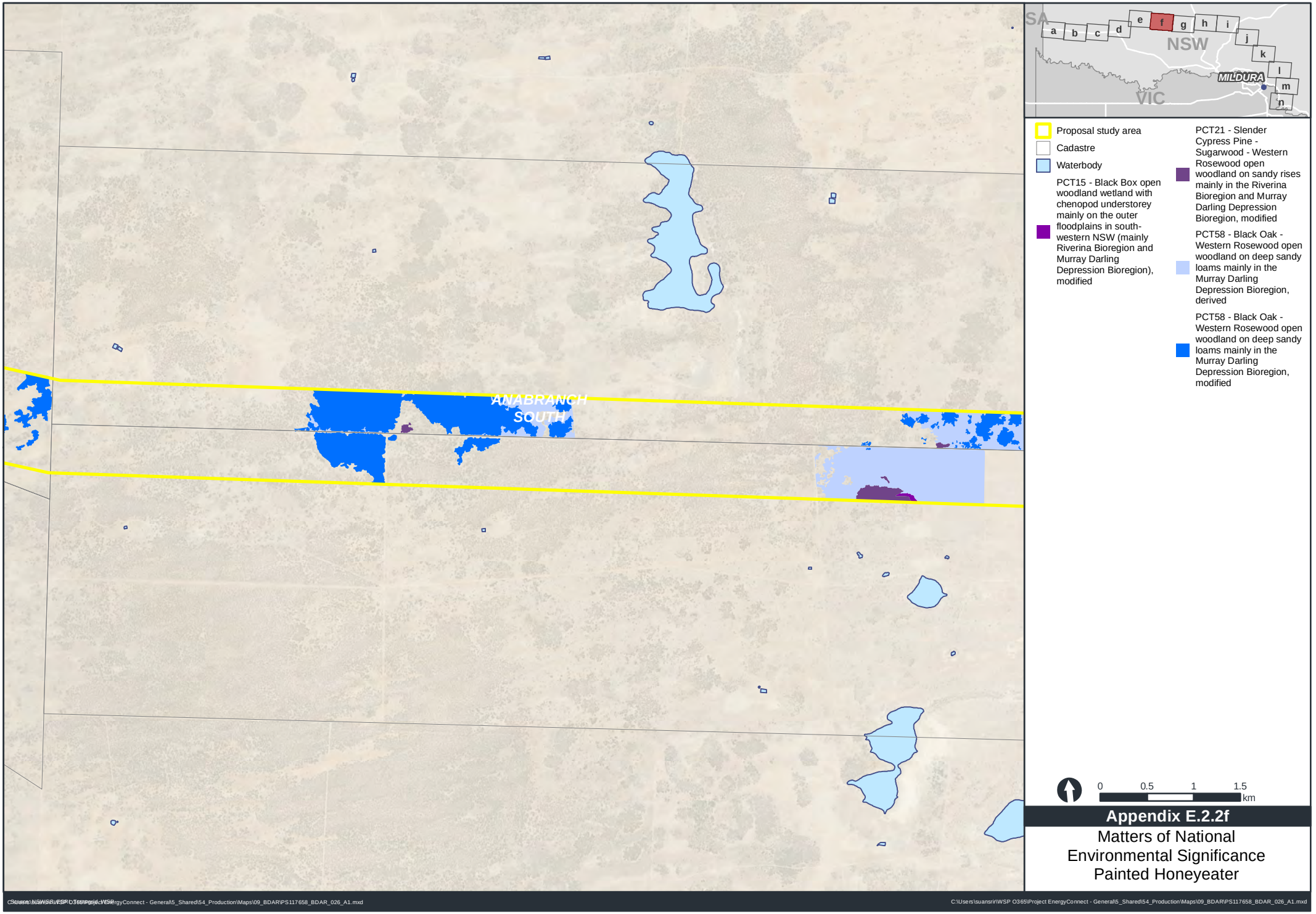

Appendix E.2.2f

Matters of National Environmental Significance
Painted Honeyeater

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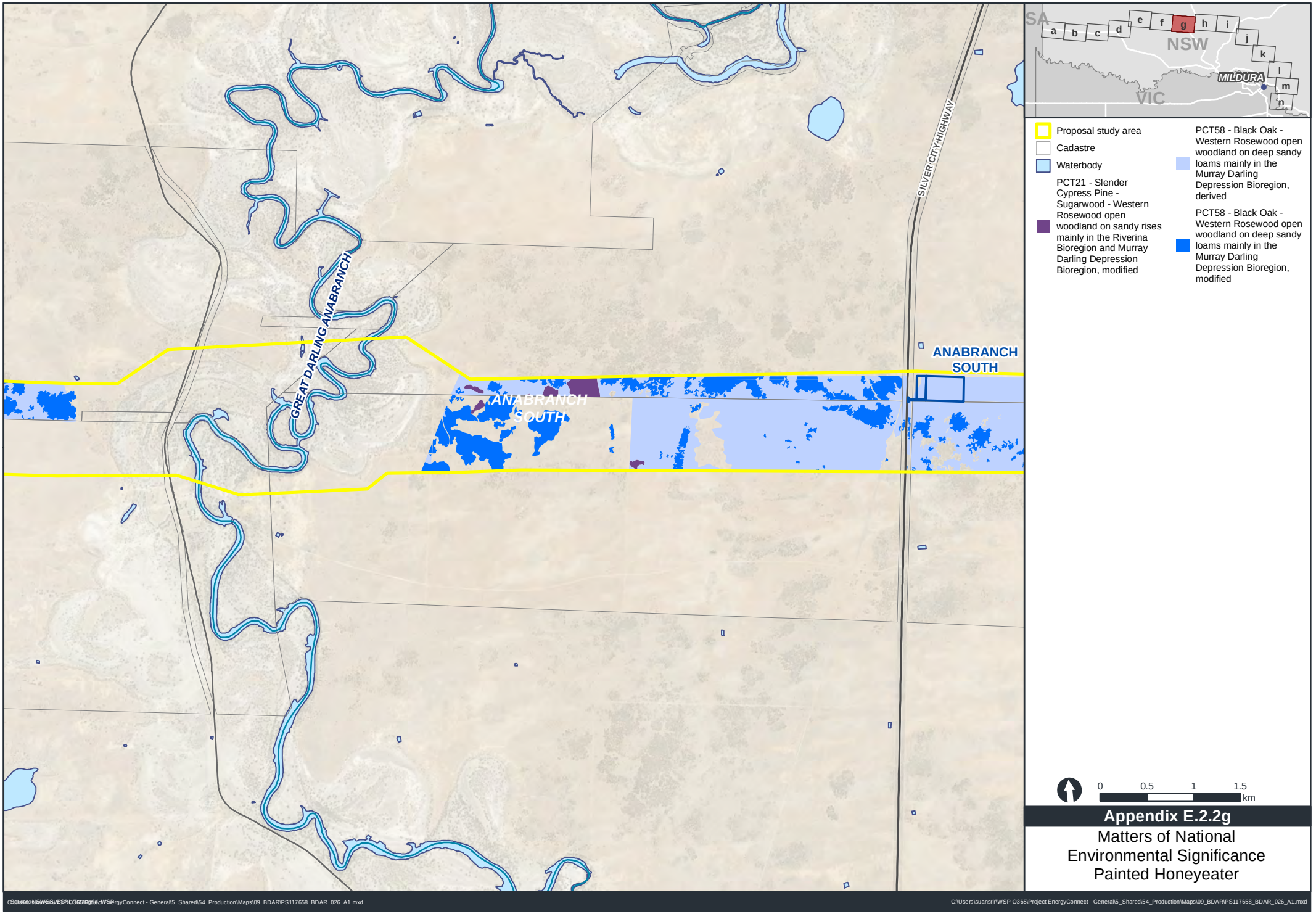
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Cadastre
Waterbody
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified
SILVER CITY HIGHWAY
GREAT DARLING ANABRANCH
ANABRANCH SOUTH
ANABRANCH SOUTH
0
0.5
1
1.5
km
Appendix E.2.2g
Matters of National Environmental Significance
Painted Honeyeater
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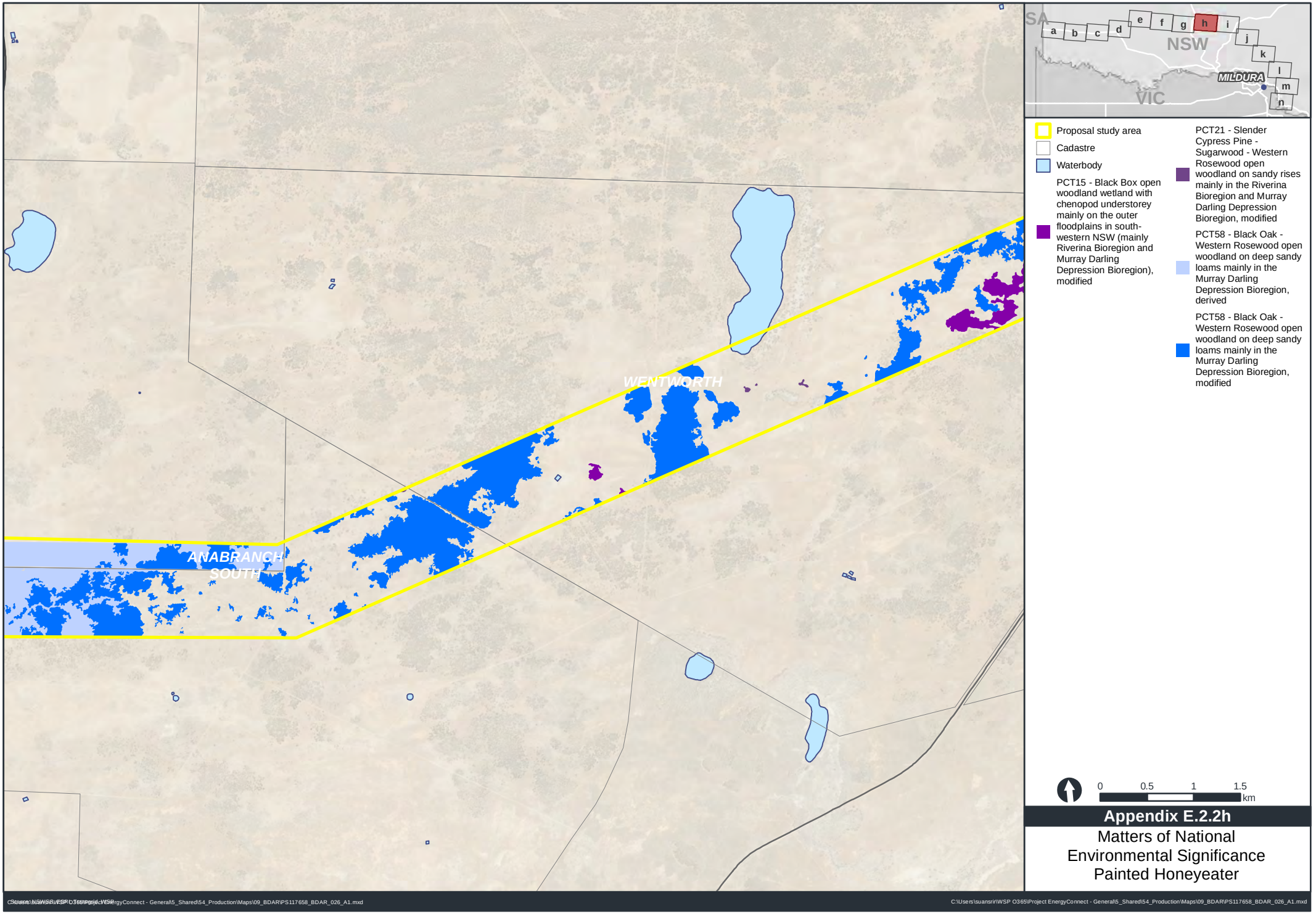

Appendix E.2.2h

Matters of National Environmental Significance
Painted Honeyeater

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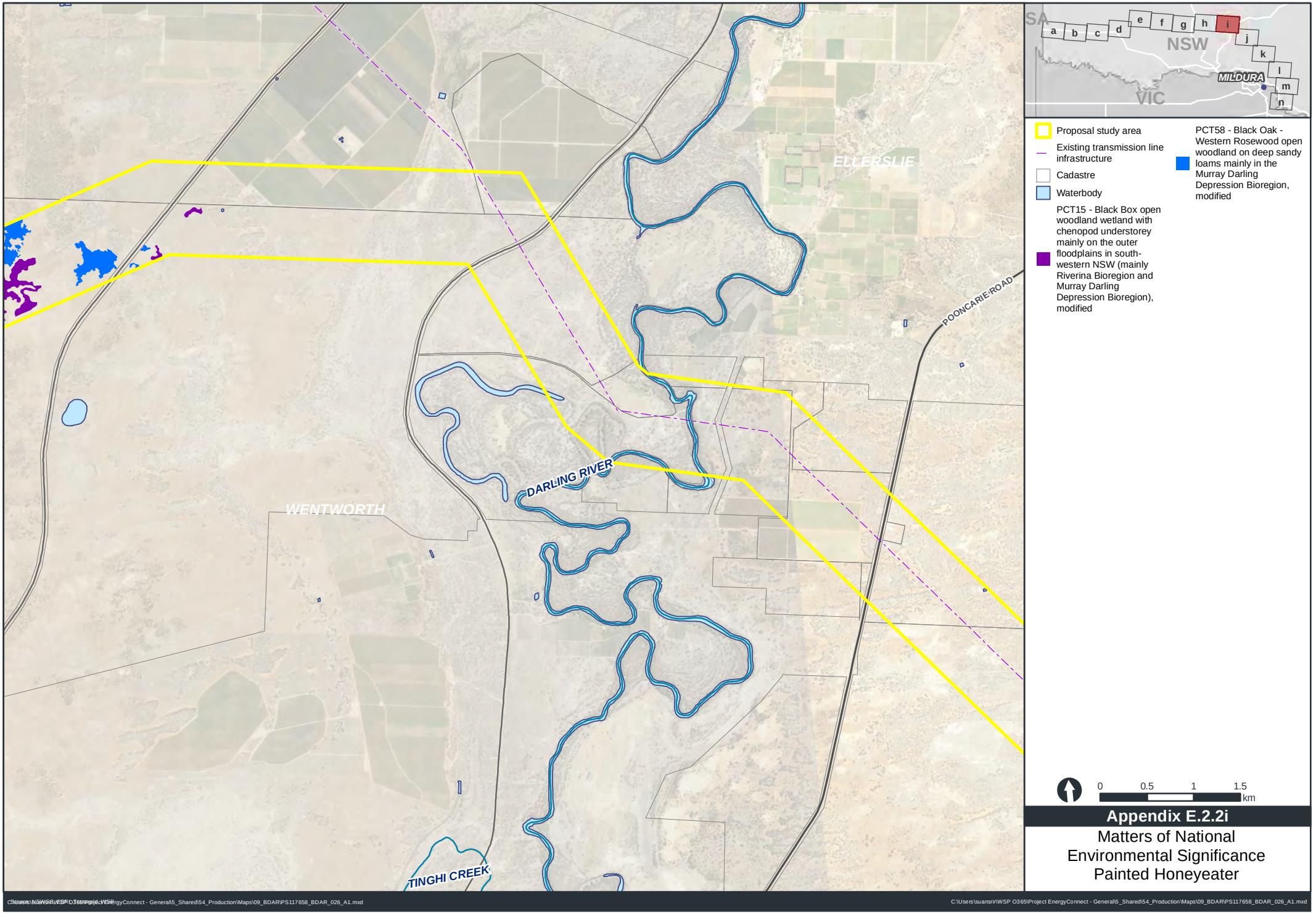

Appendix E.2.2i

Matters of National Environmental Significance
Painted Honeyeater

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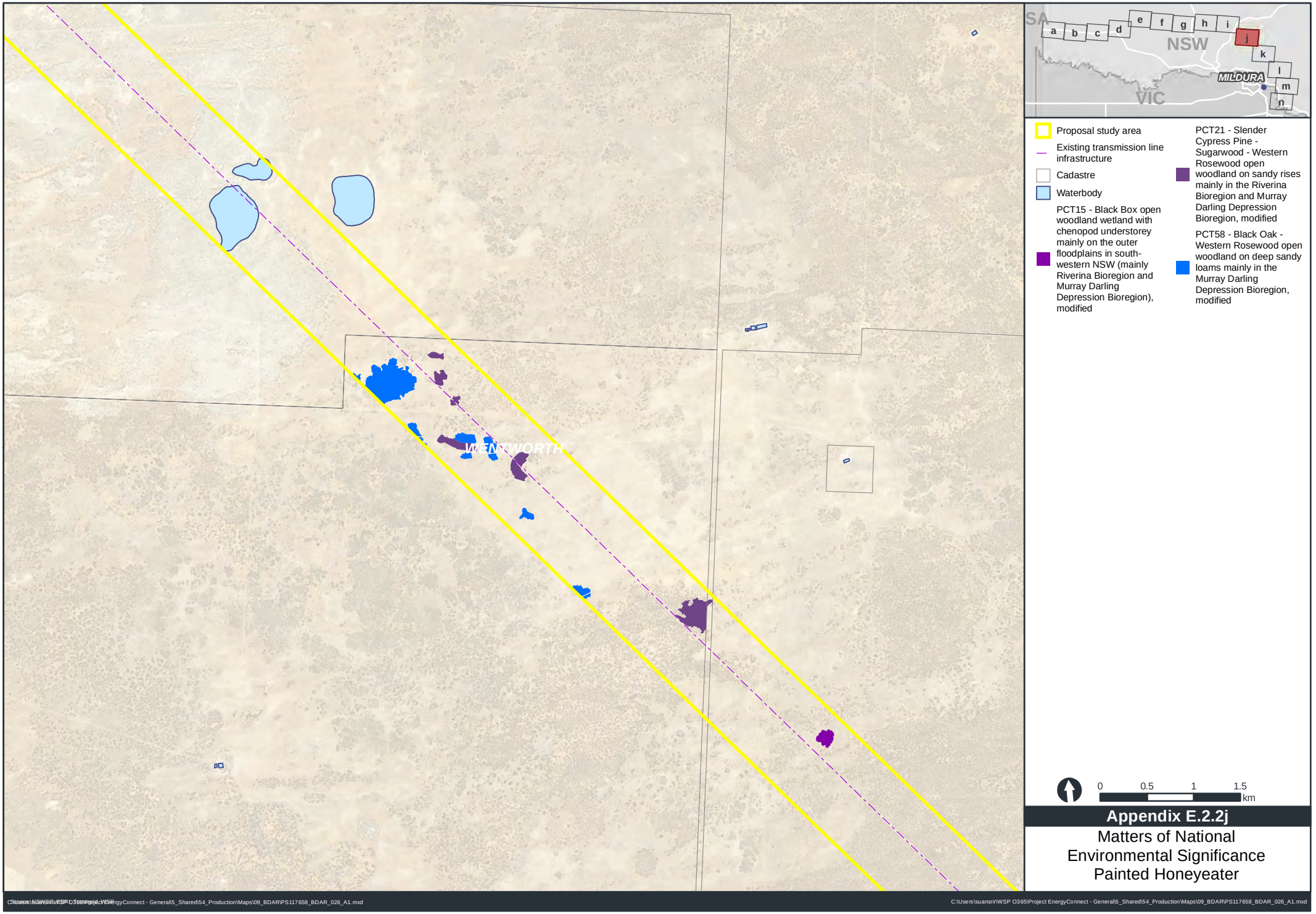

Appendix E.2.2j

Matters of National Environmental Significance
Painted Honeyeater

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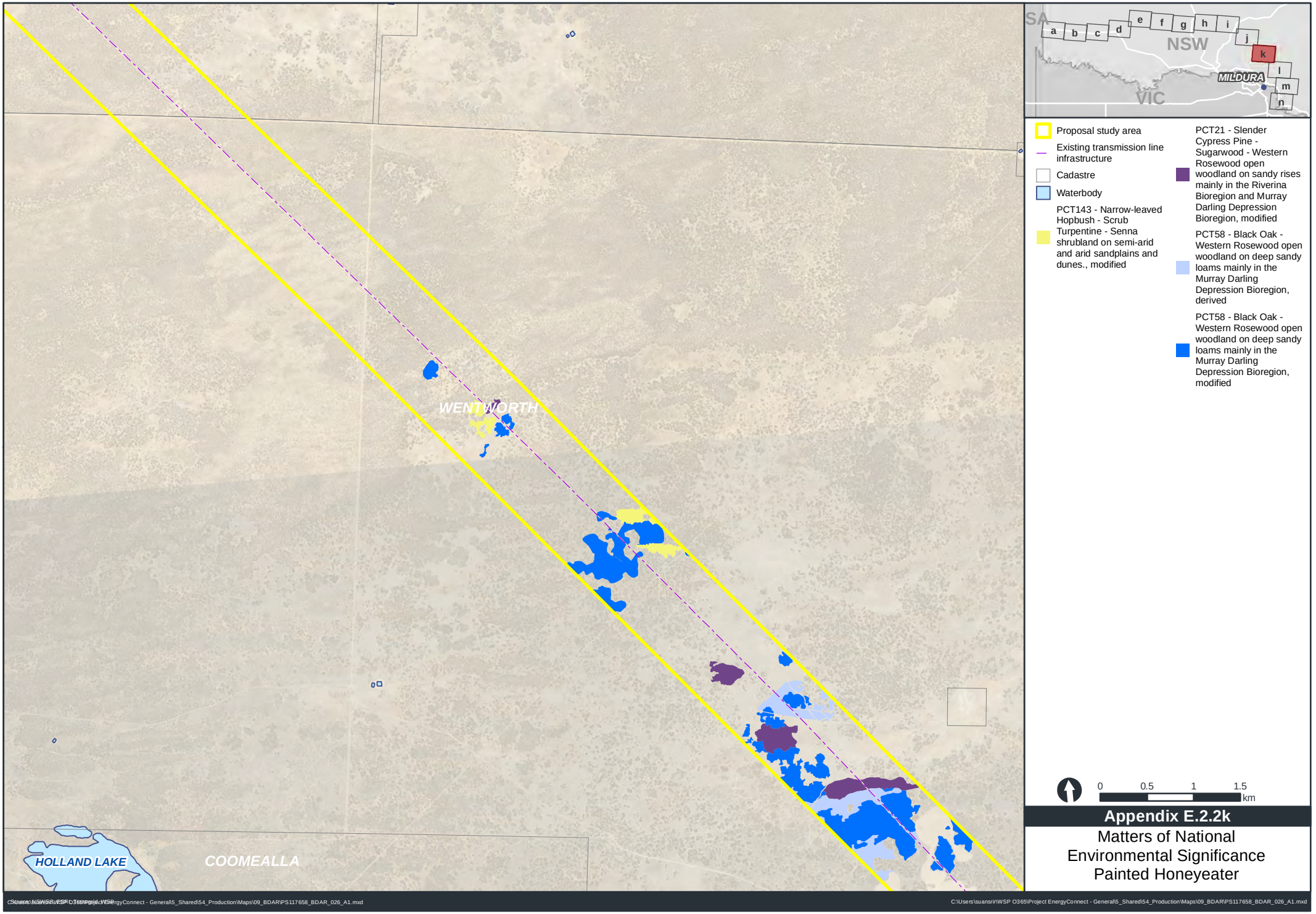

Appendix E.2.2k

Matters of National Environmental Significance
Painted Honeyeater

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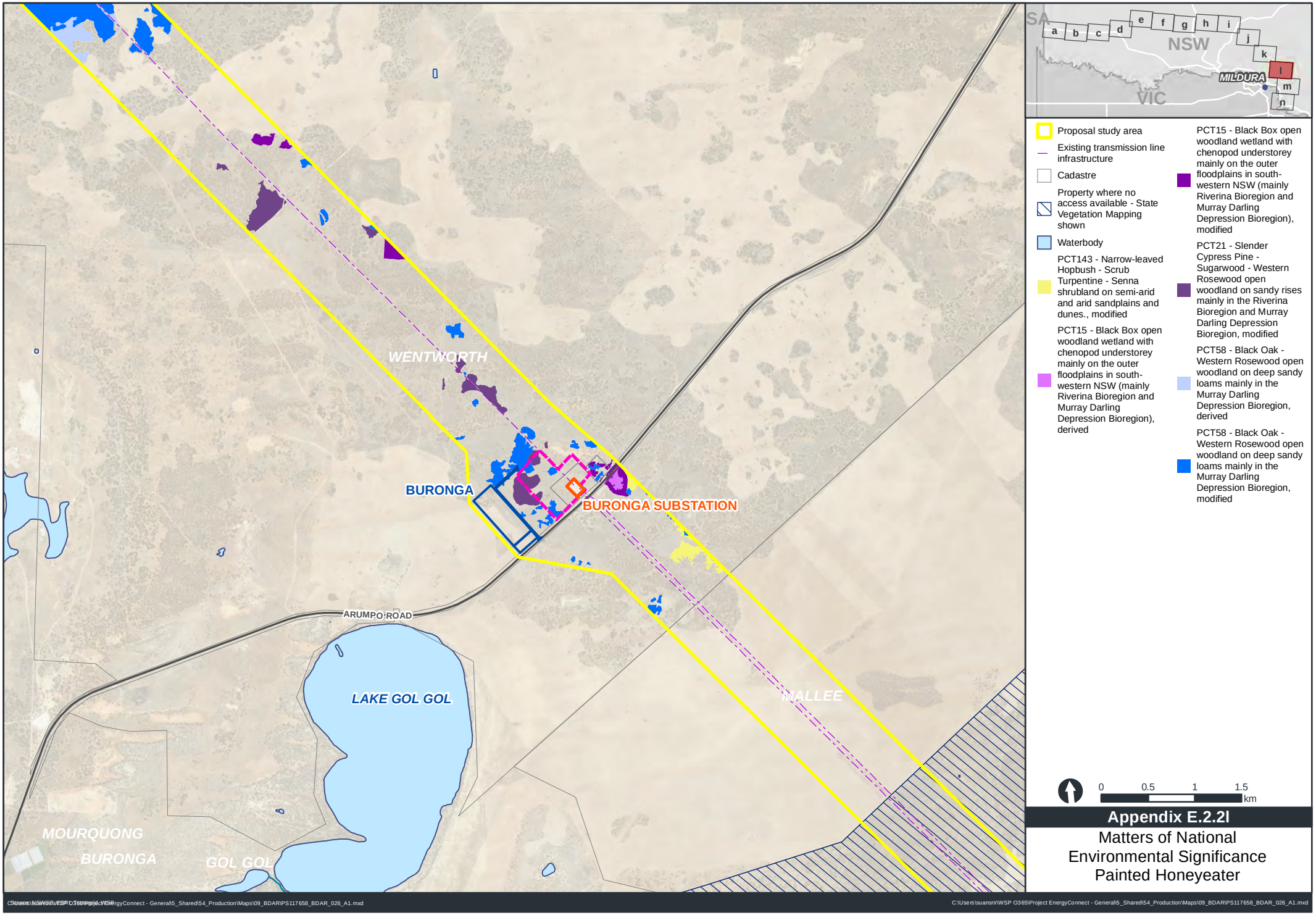

Appendix E.2.2I

Matters of National Environmental Significance
Painted Honeyeater

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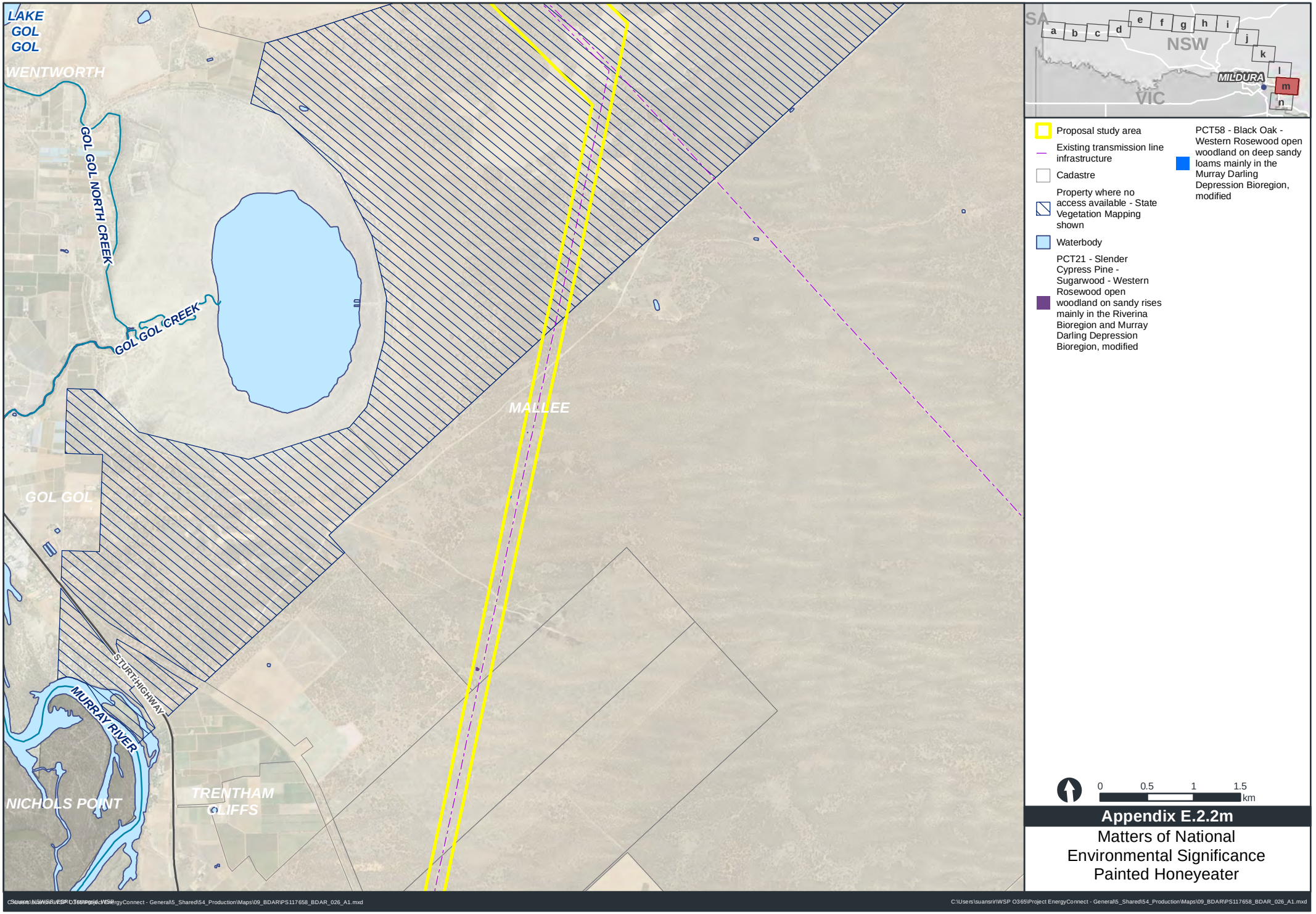

Appendix E.2.2m

Matters of National Environmental Significance
Painted Honeyeater

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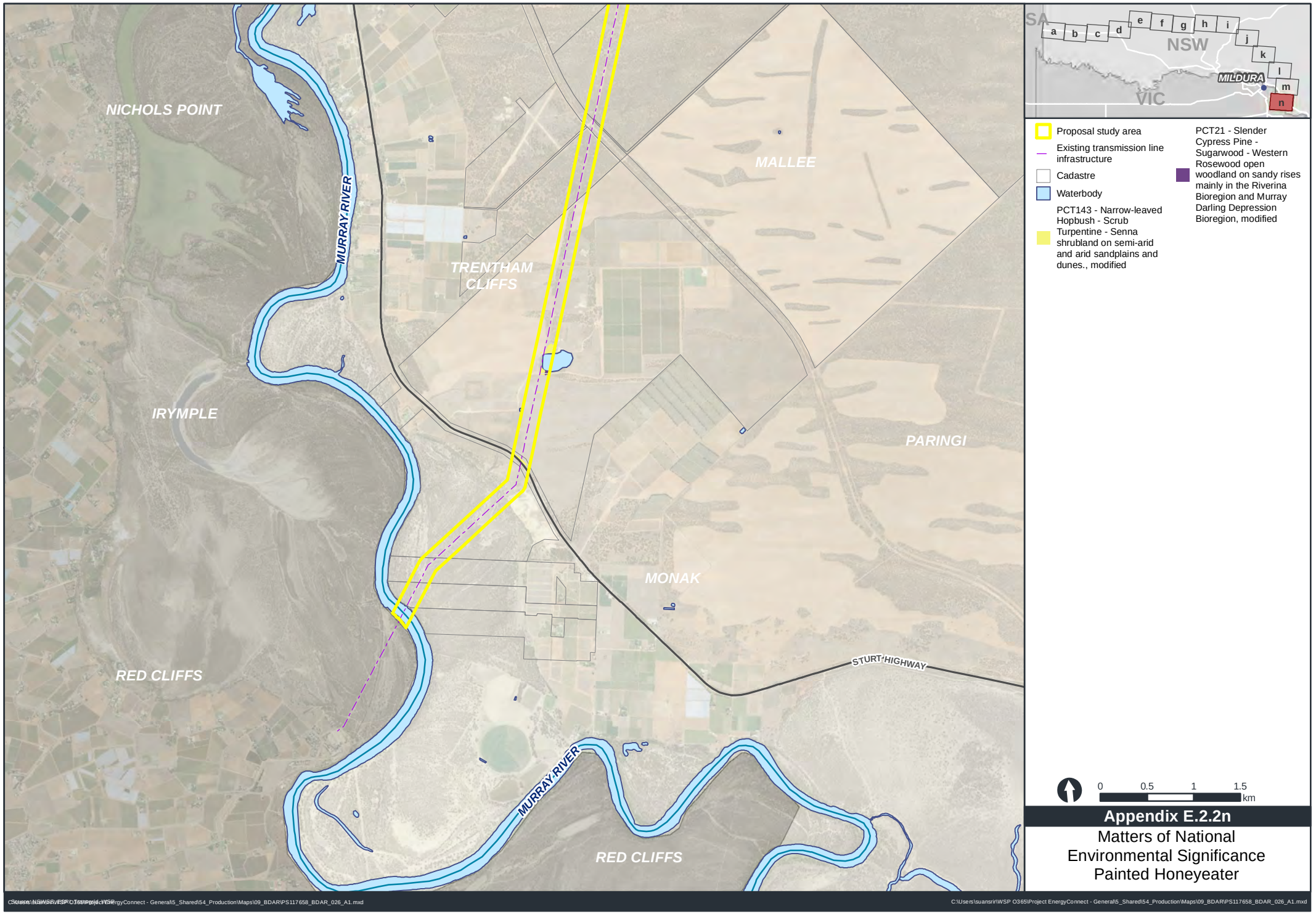

Appendix E.2.2n

Matters of National Environmental Significance
Painted Honeyeater

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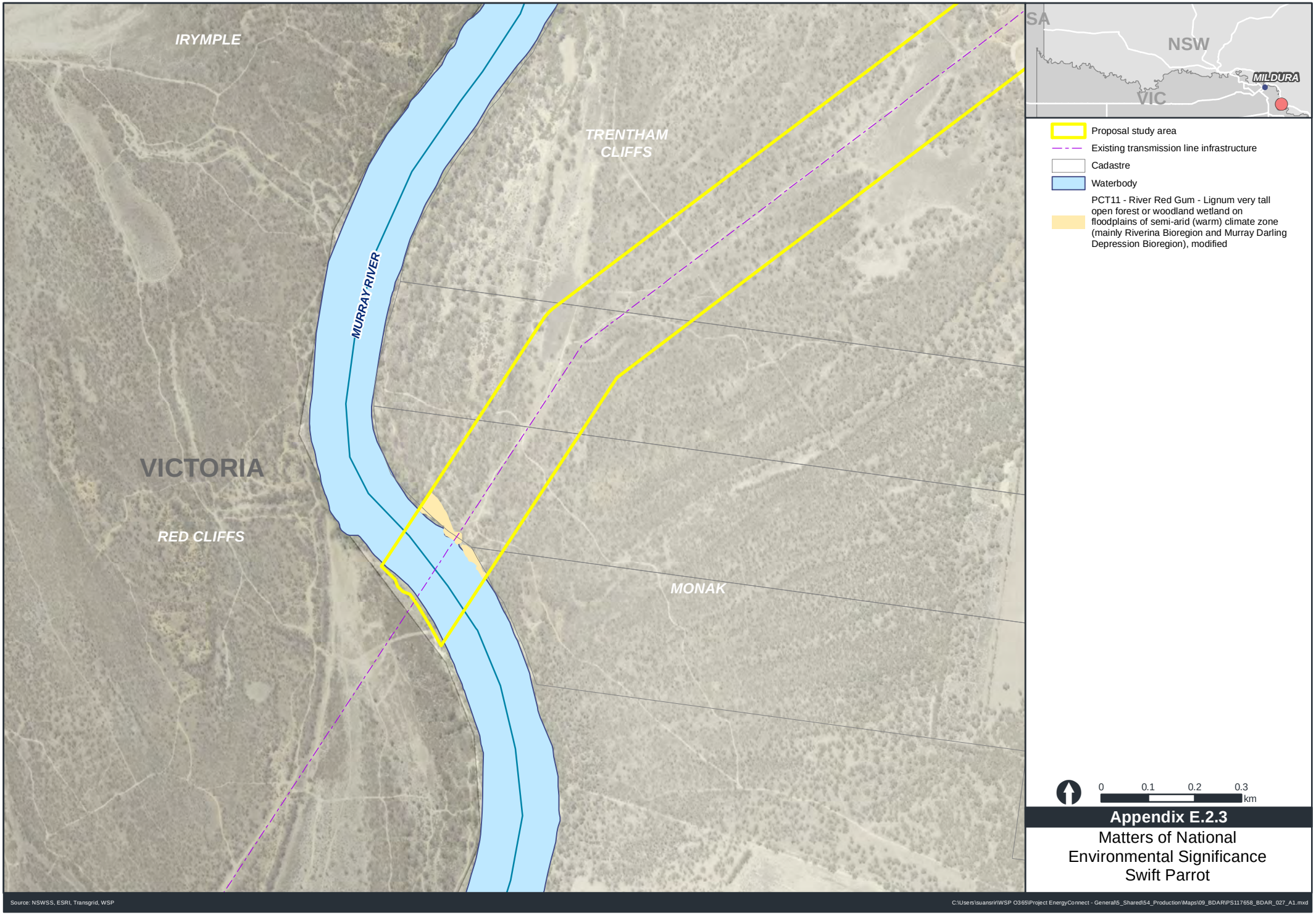
IRYMPLE
TRENTHAM CLIFFS
MURRAY RIVER
VICTORIA
RED CLIFFS
MONAK
SA
NSW
VIC
MILDURA
Proposal study area
Existing transmission line infrastructure
Cadastre
Waterbody
PCT11 - River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion), modified
0
0.1
0.2
0.3
km
Appendix E.2.3
Matters of National Environmental Significance
Swift Parrot
Source: NSWSS, ESRI, Transgrid, WSP
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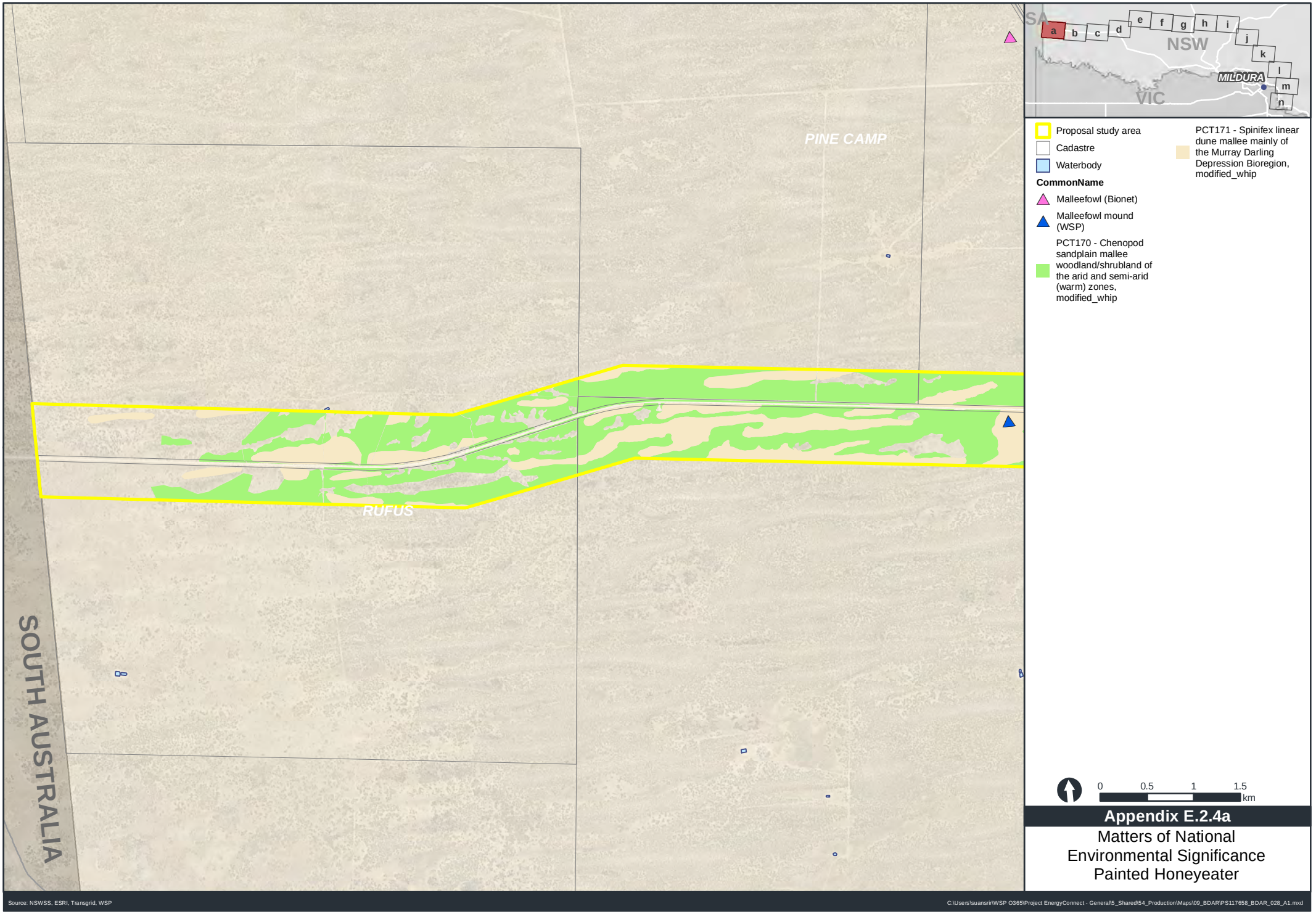

Appendix E.2.4a

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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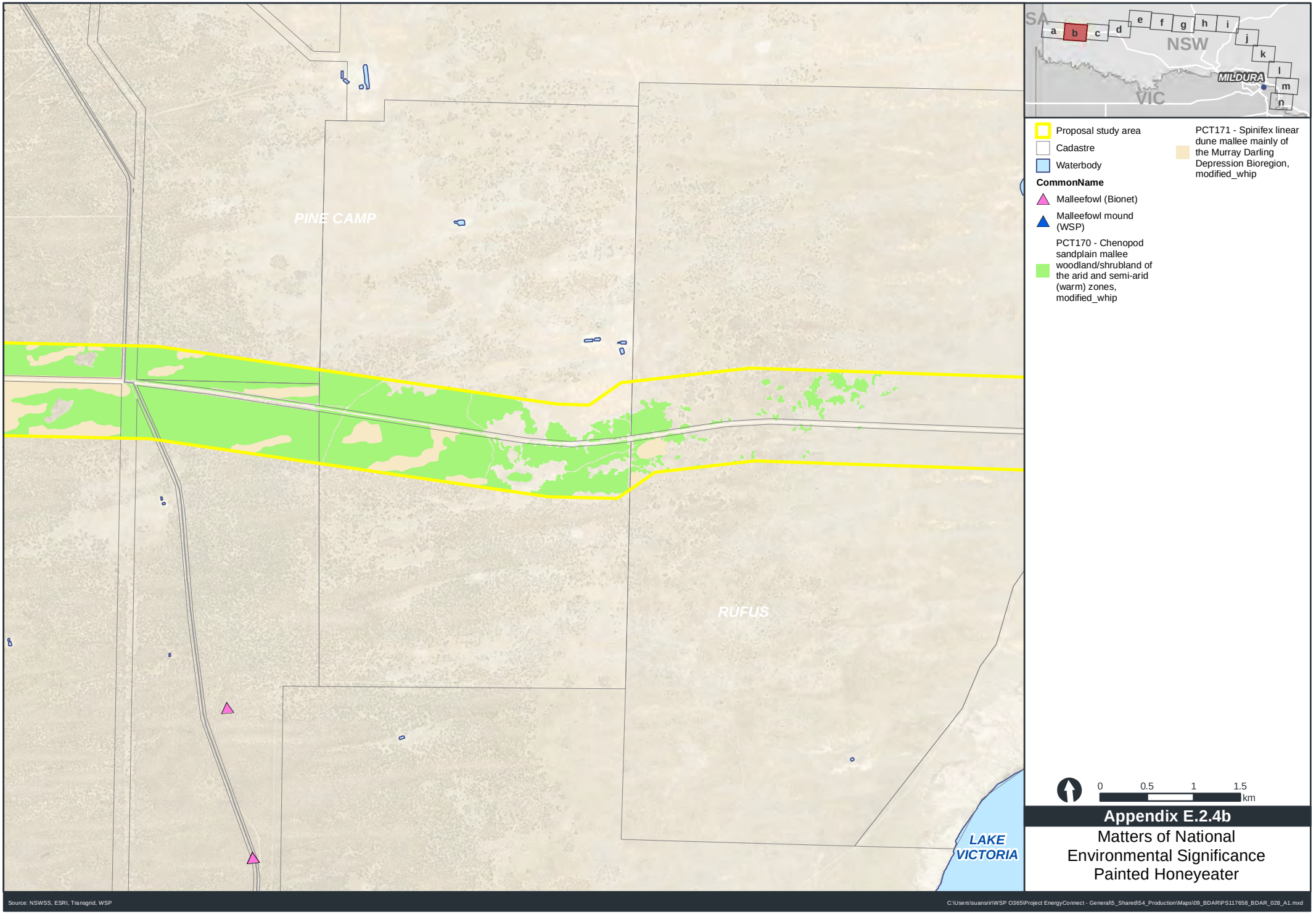

Appendix E.2.4b

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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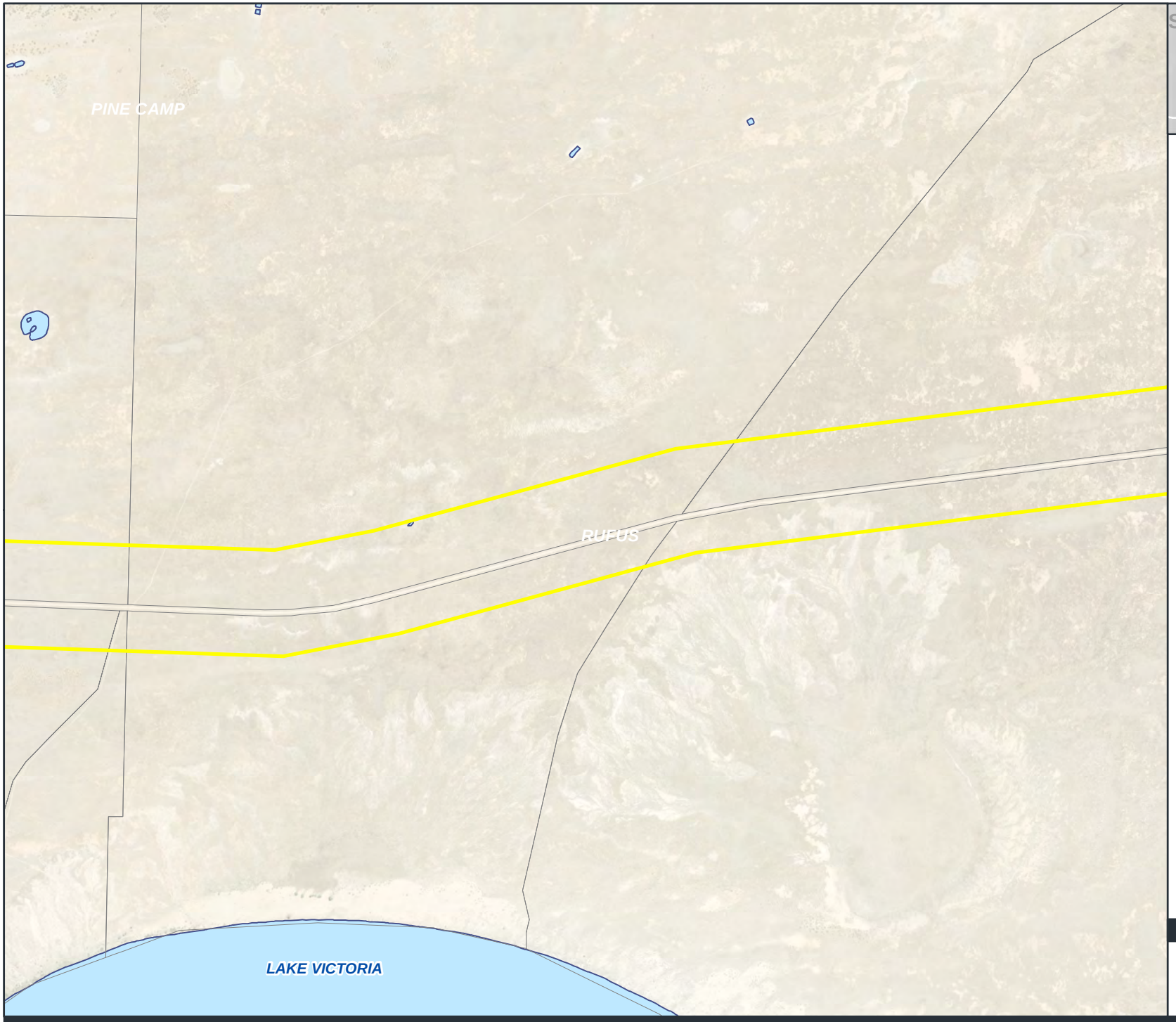

Proposal study area
Cadastre
Waterbody

0 0.5 1 1.5
km

Appendix E.2.4c

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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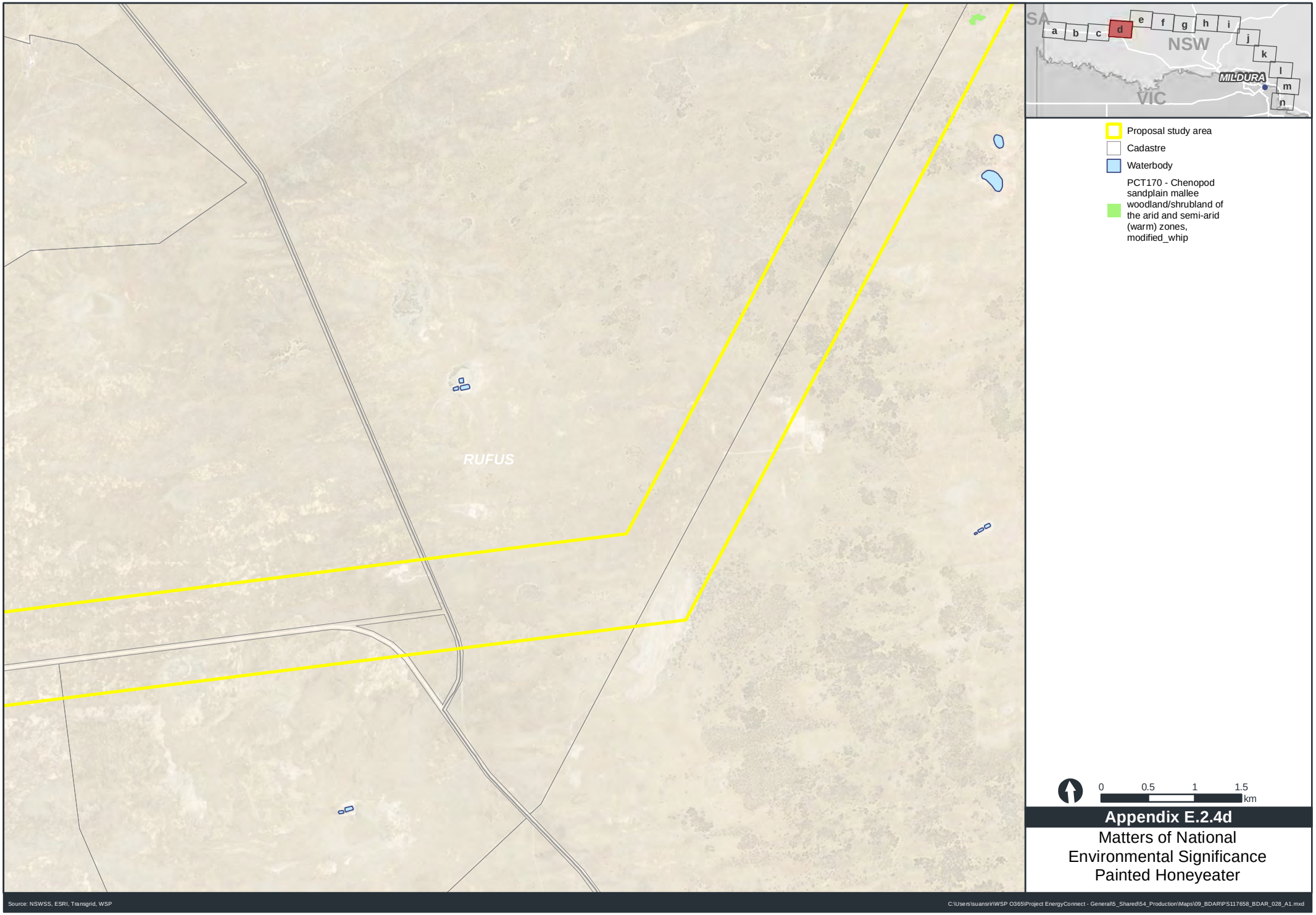

Appendix E.2.4d

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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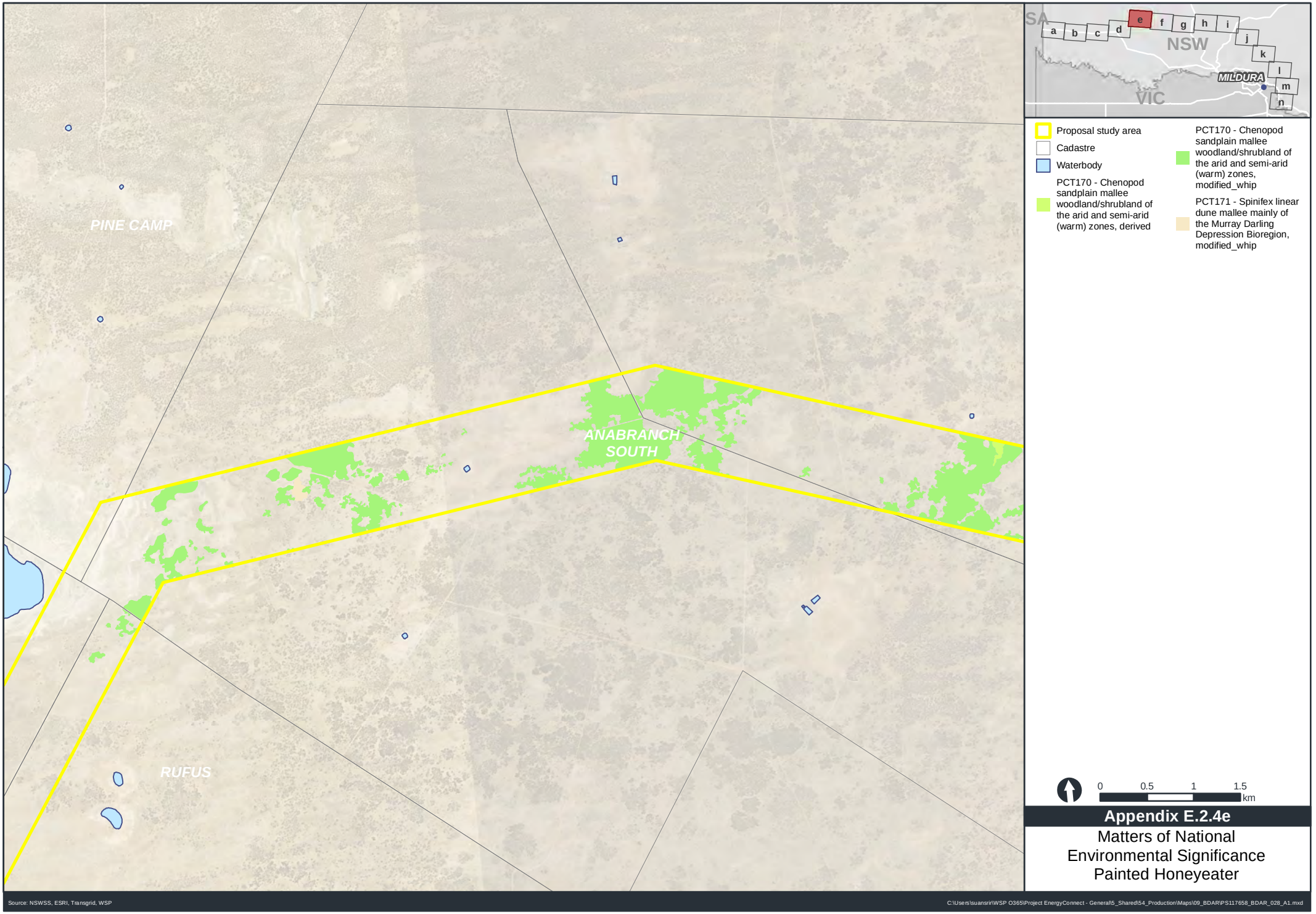

Appendix E.2.4e

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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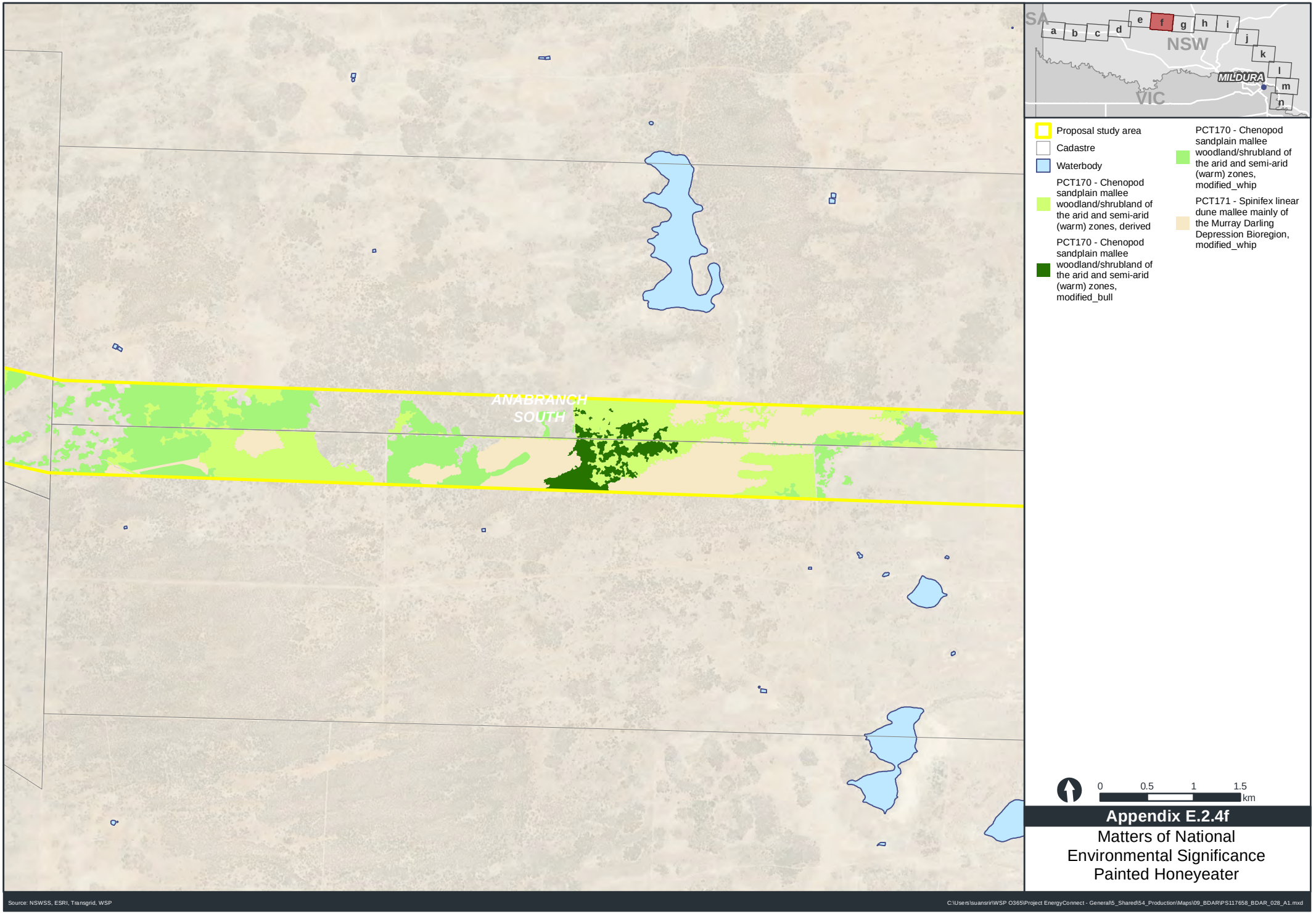
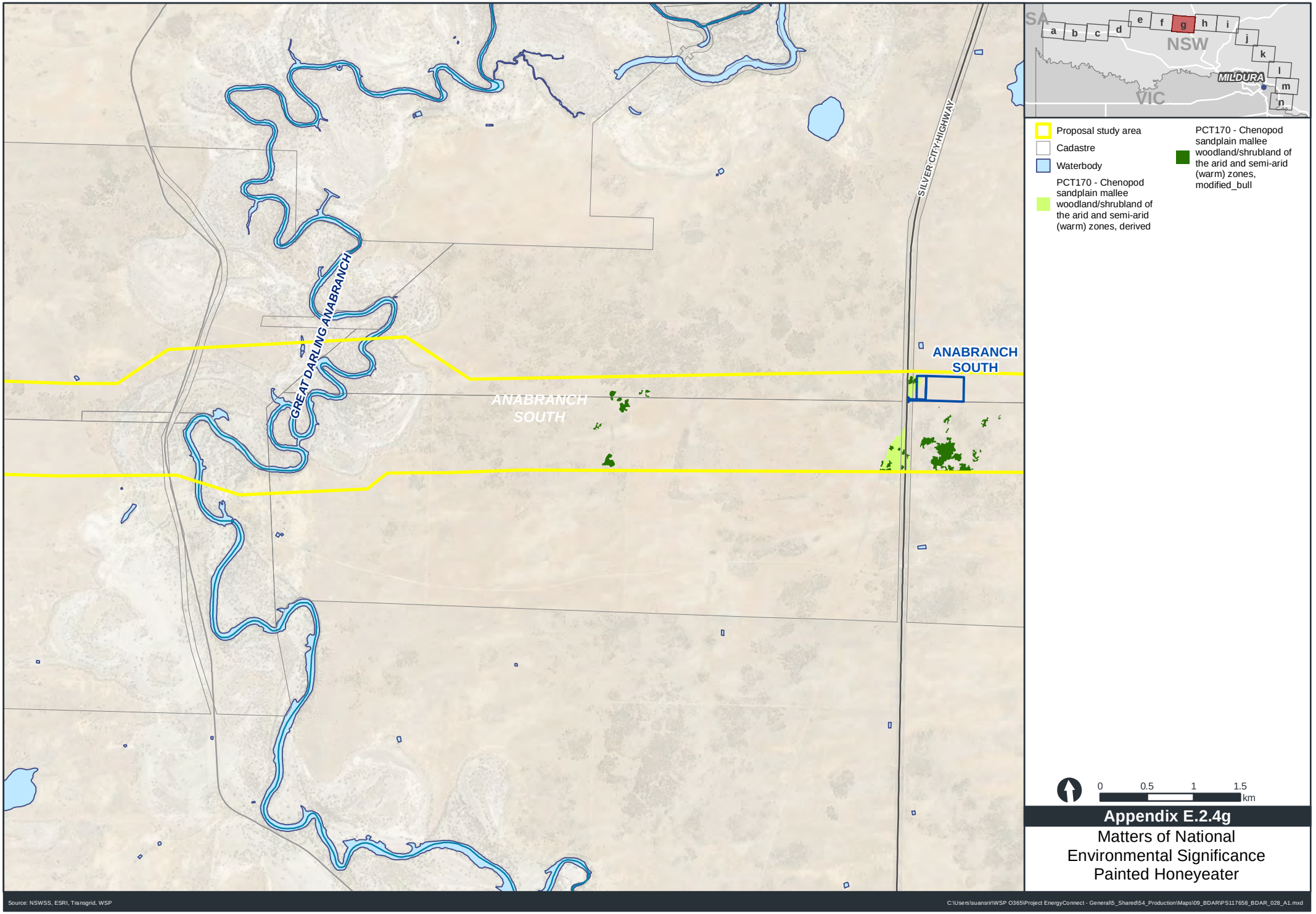


Appendix E.2.4f

Matters of National Environmental Significance
Painted Honeyeater



Appendix E.2.4g

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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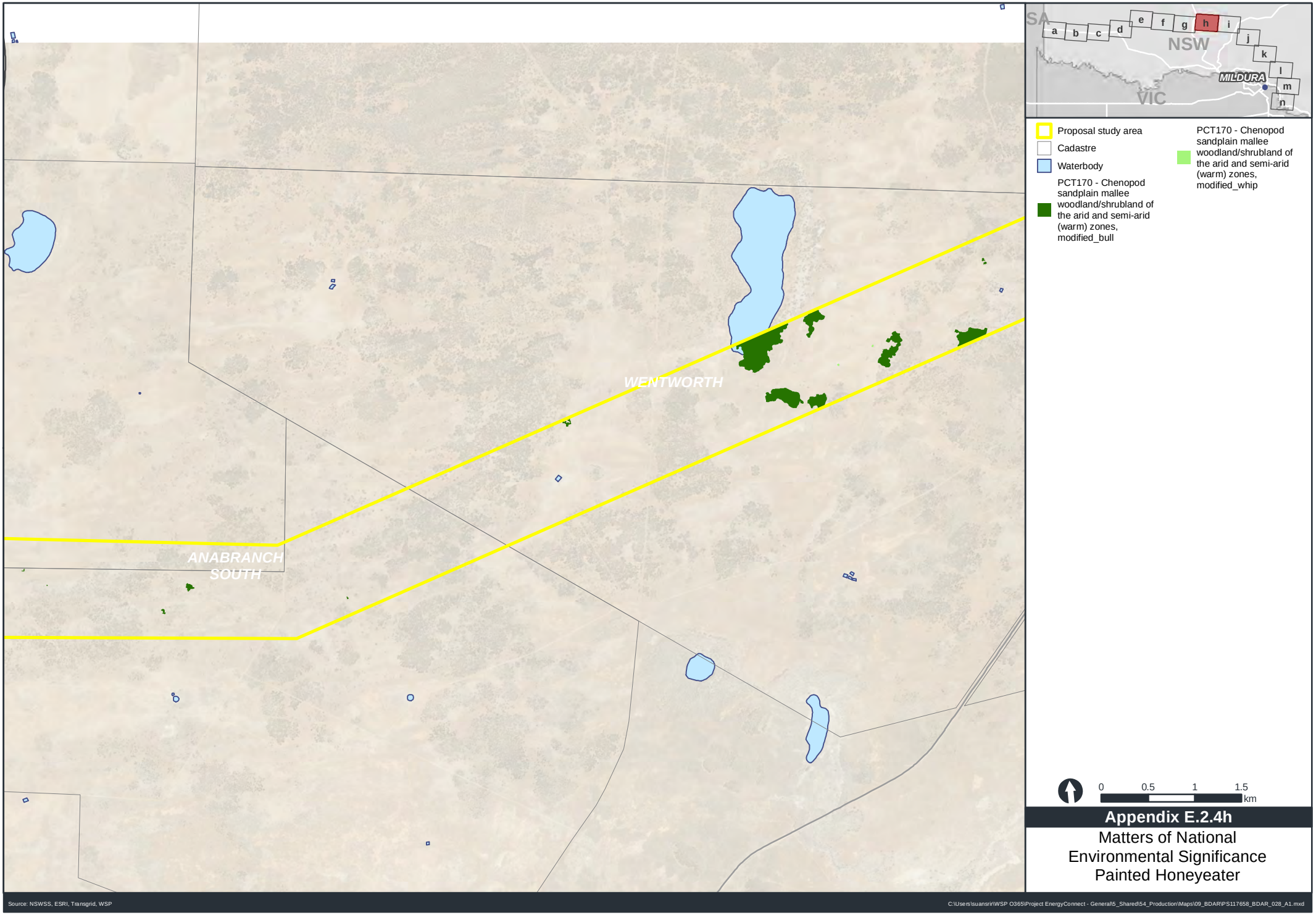
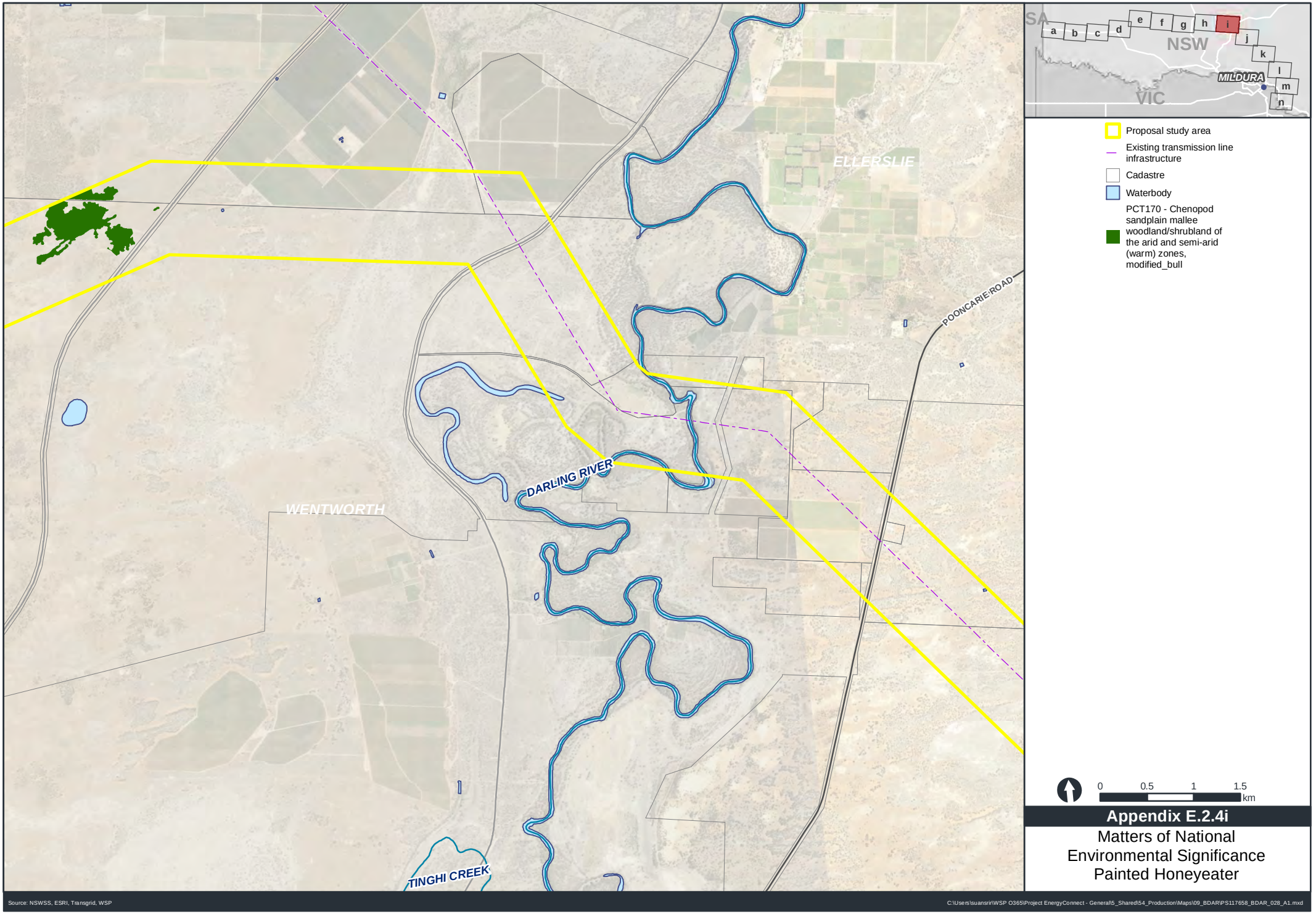


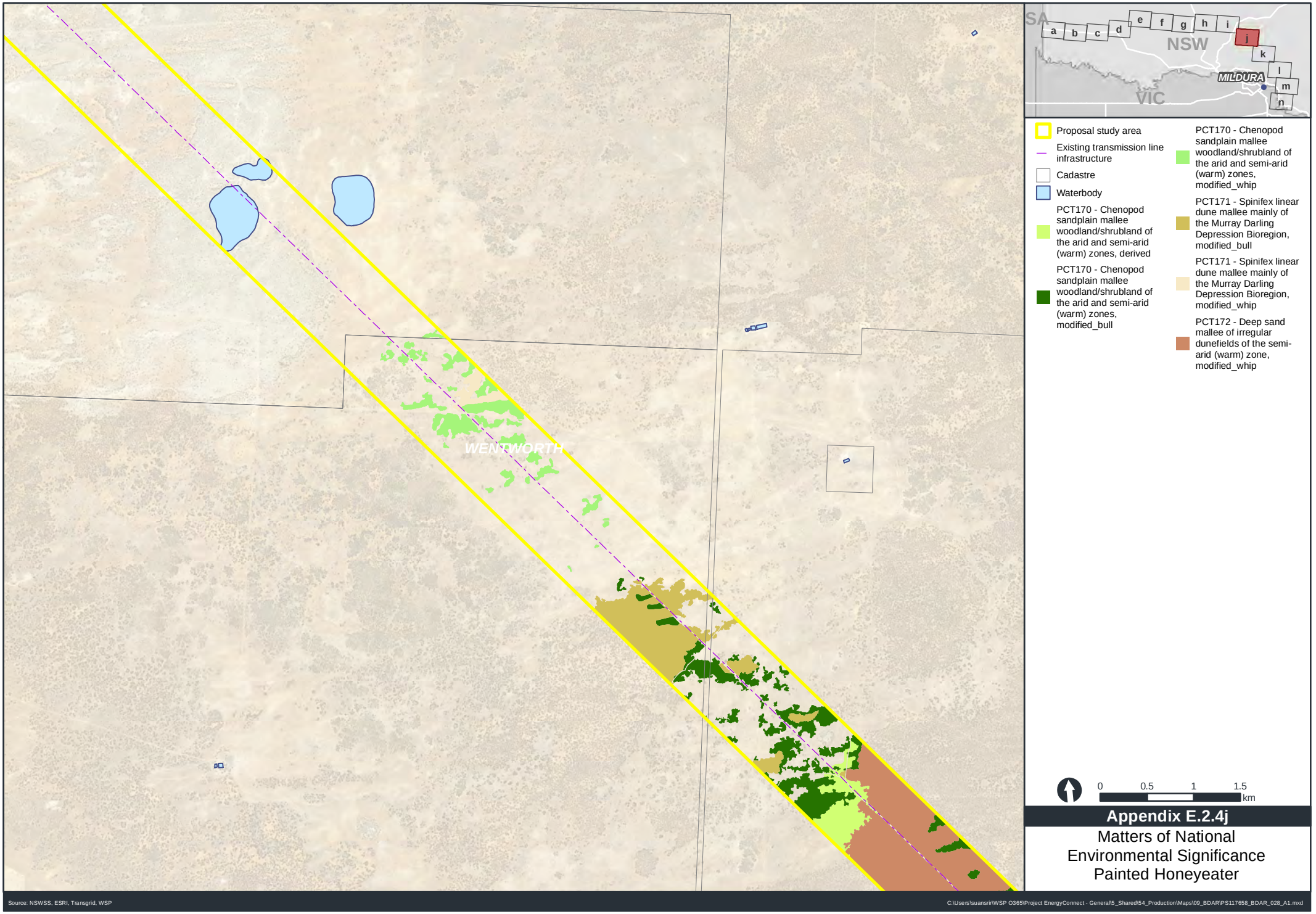
Appendix E.2.4h

Matters of National Environmental Significance
Painted Honeyeater



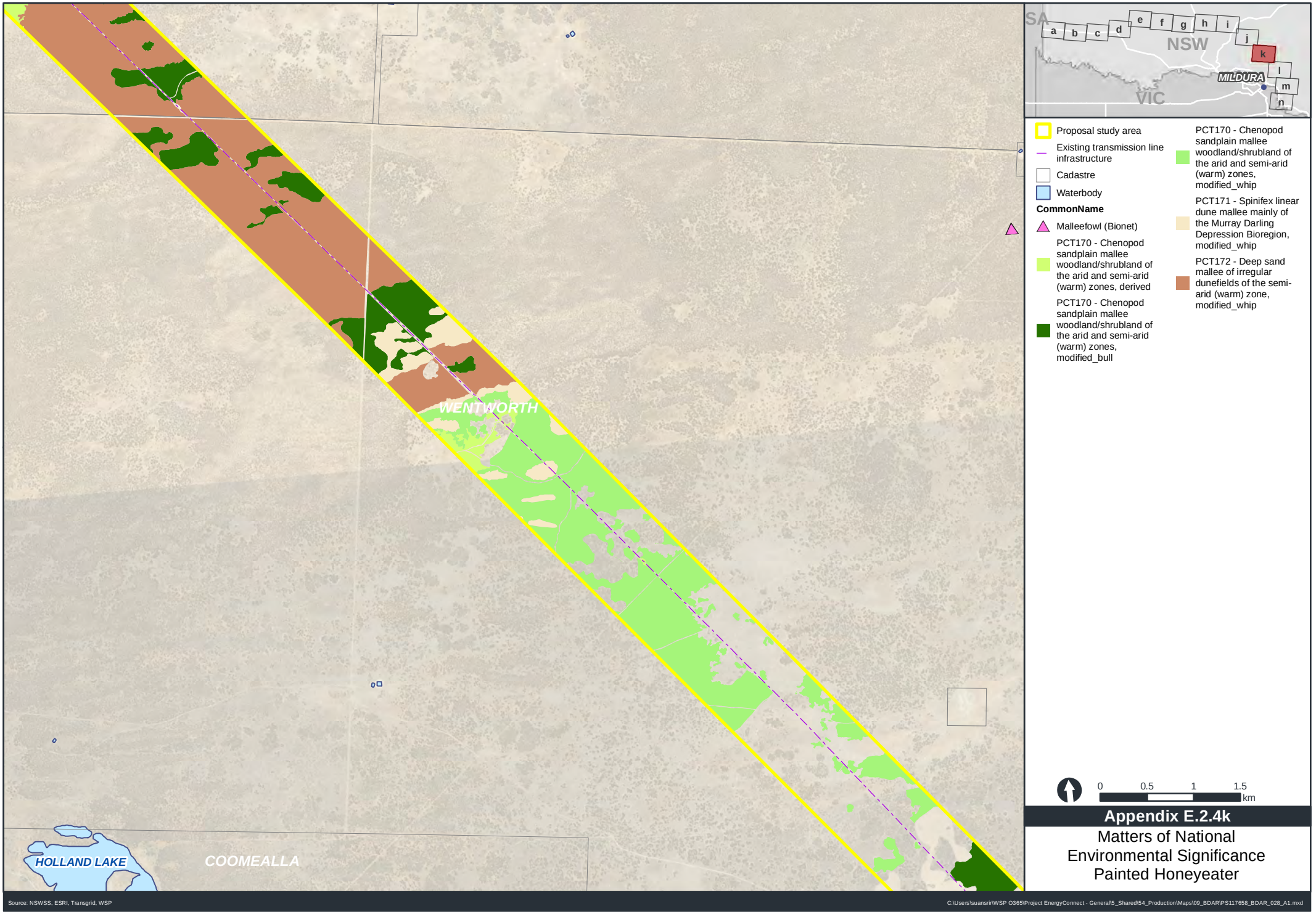
Appendix E.2.4i

Matters of National Environmental Significance
Painted Honeyeater



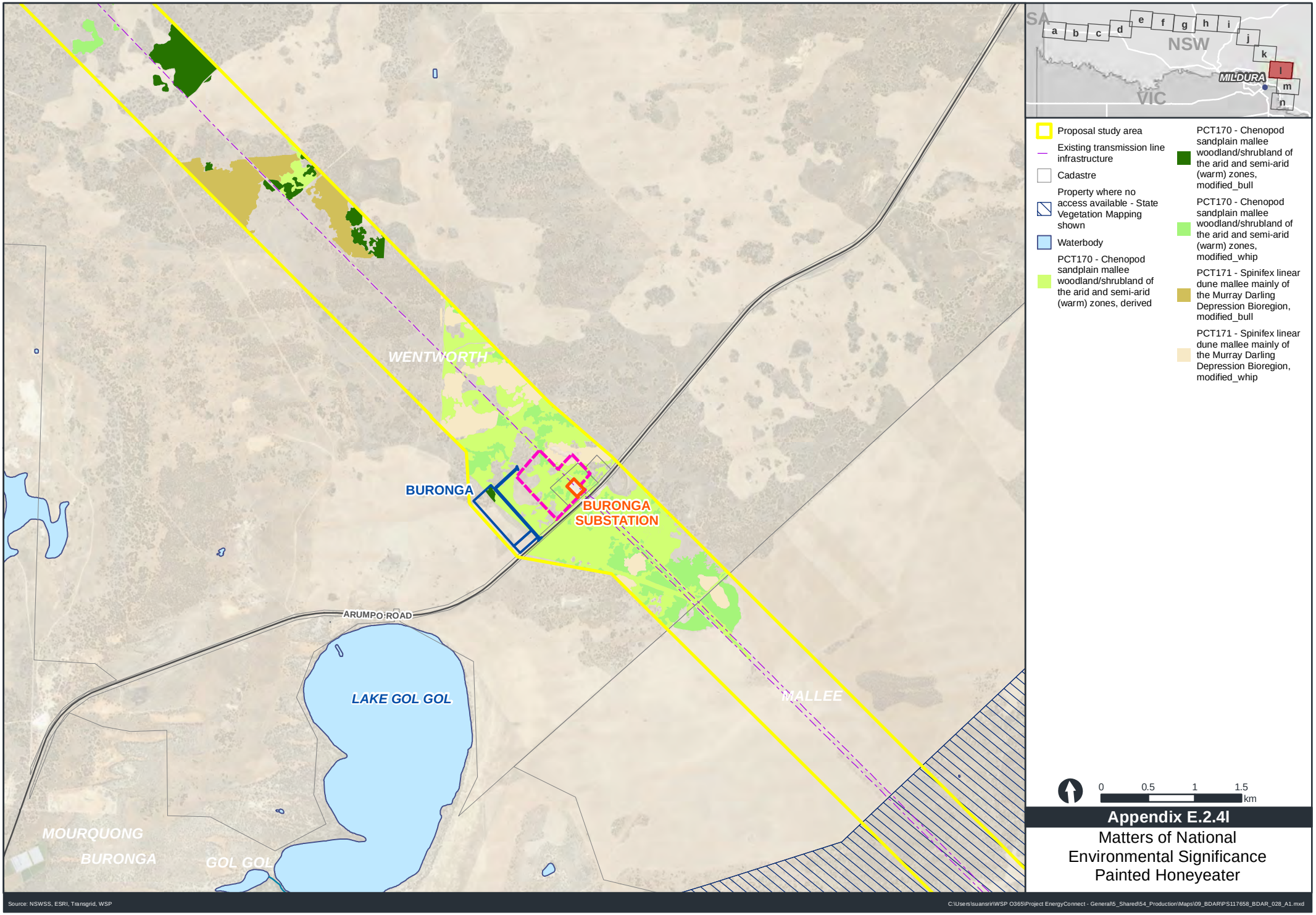
Appendix E.2.4j

Matters of National Environmental Significance
Painted Honeyeater



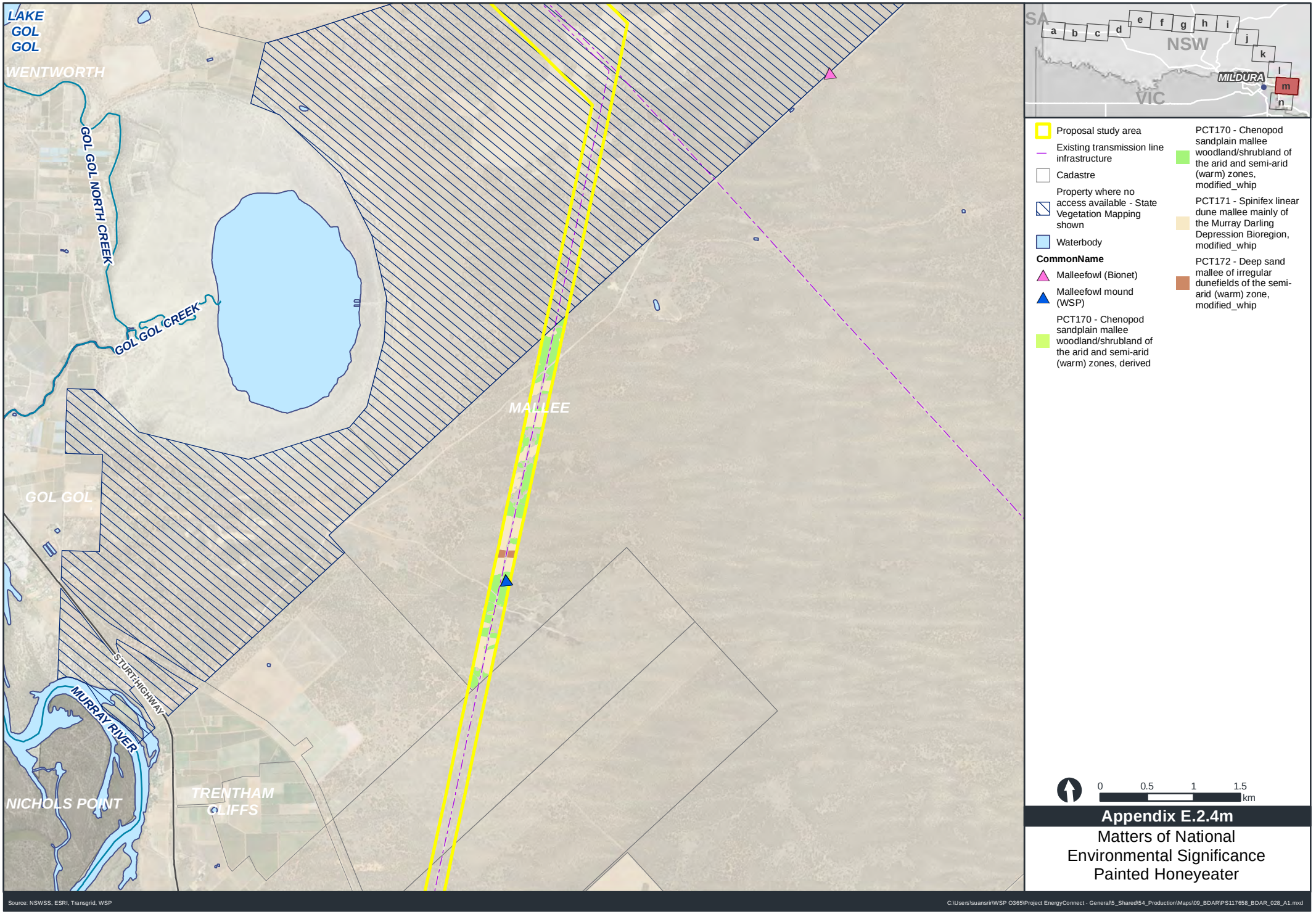
Appendix E.2.4k

Matters of National Environmental Significance
Painted Honeyeater



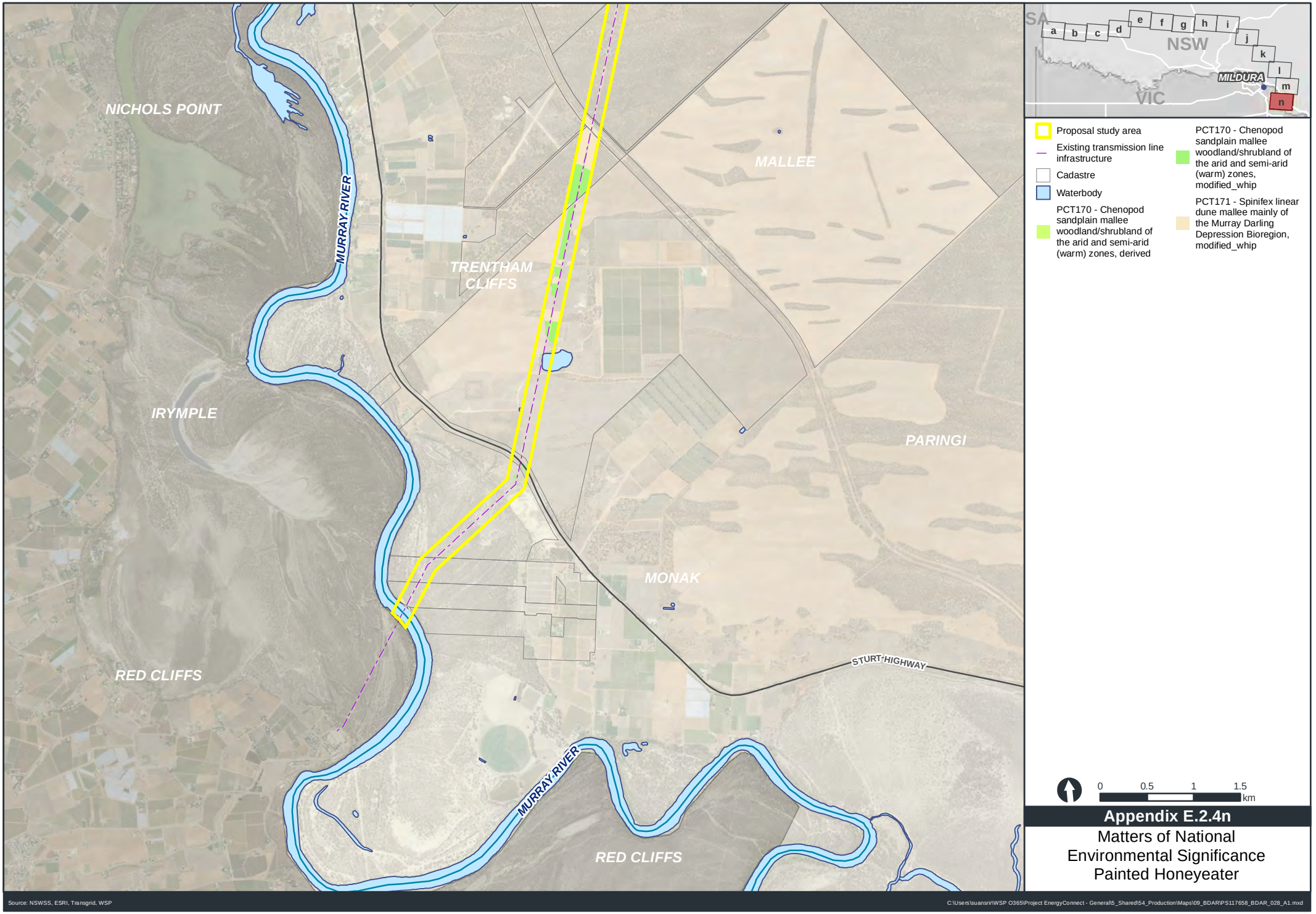
Appendix E.2.4l

Matters of National Environmental Significance
Painted Honeyeater



Appendix E.2.4m

Matters of National Environmental Significance
Painted Honeyeater



Appendix E.2.4n

Matters of National Environmental Significance
Painted Honeyeater

Source: NSWSS, ESRI, Transgrid, WSP

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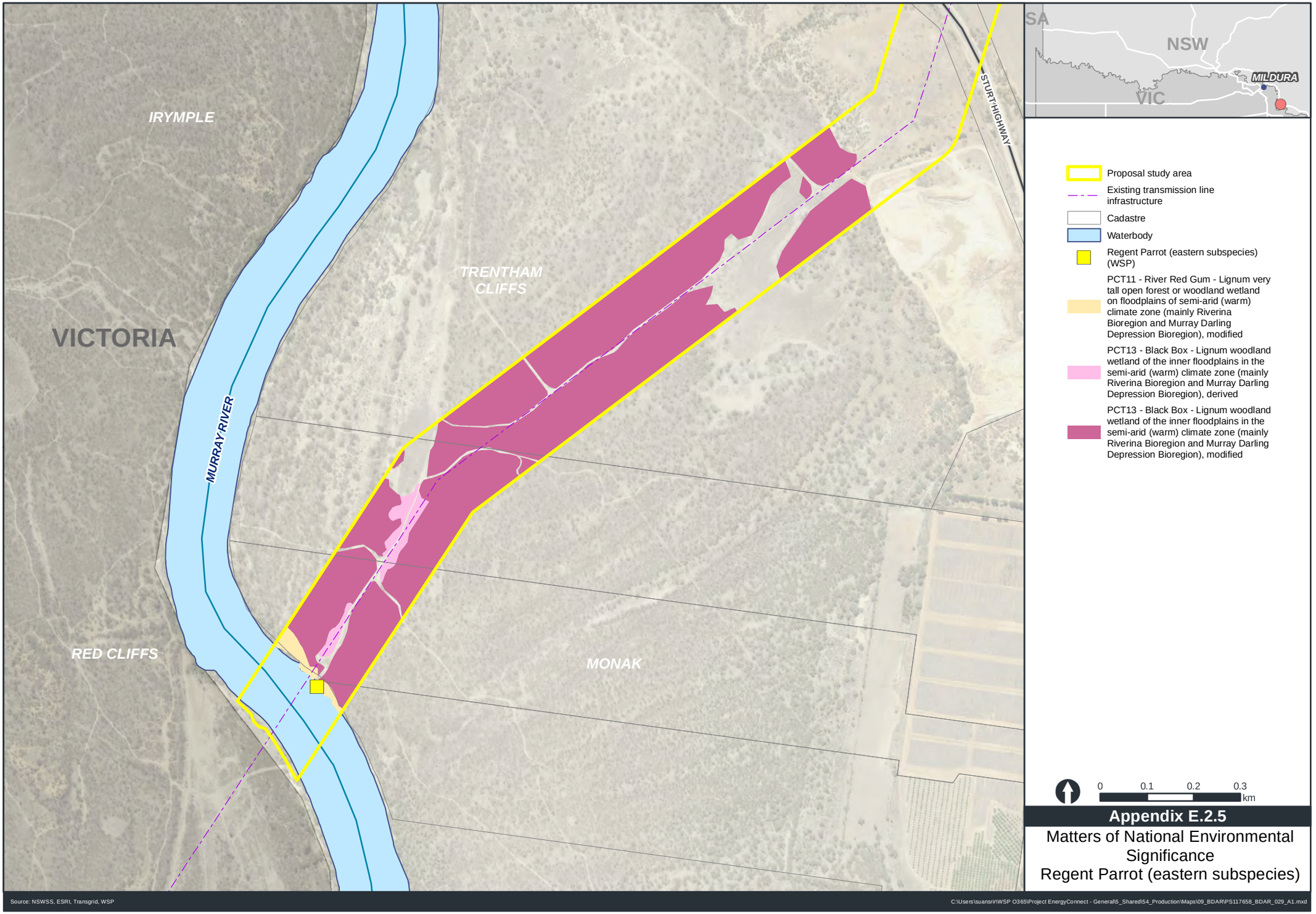
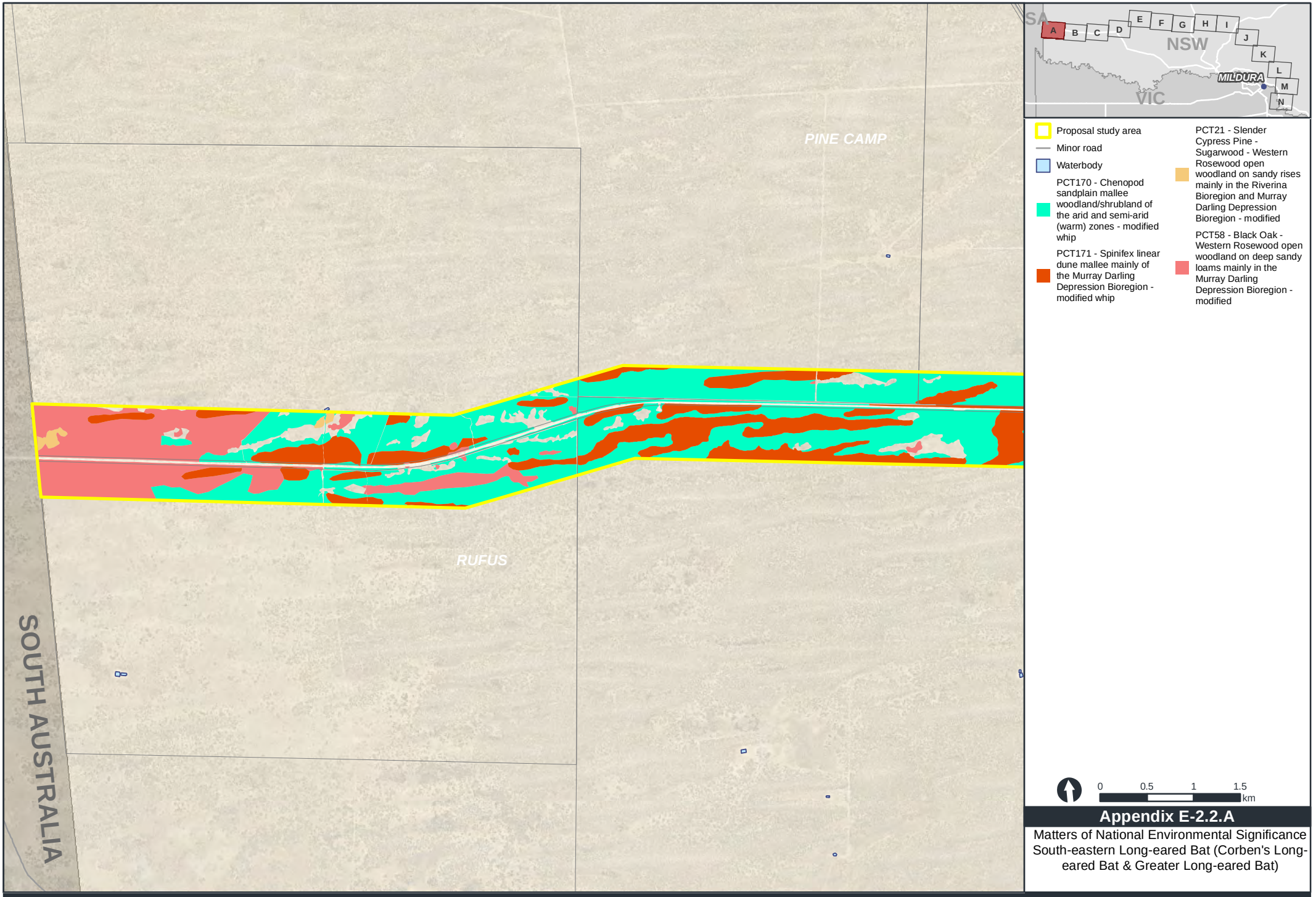


Appendix E.2.5

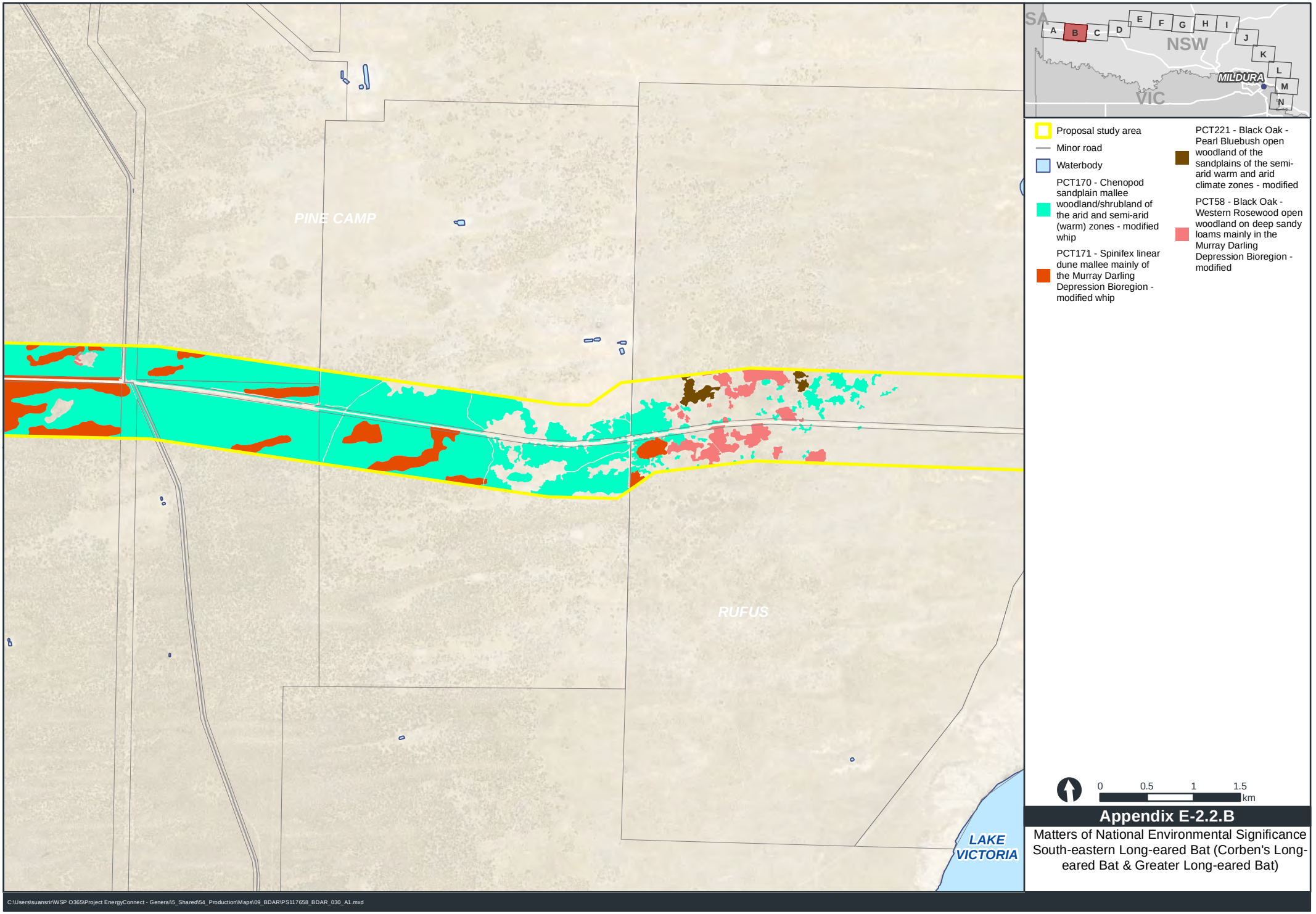
Matters of National Environmental Significance
Regent Parrot (eastern subspecies)



Appendix E-2.2.A

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_030_A1.mxd



Appendix E-2.2.B

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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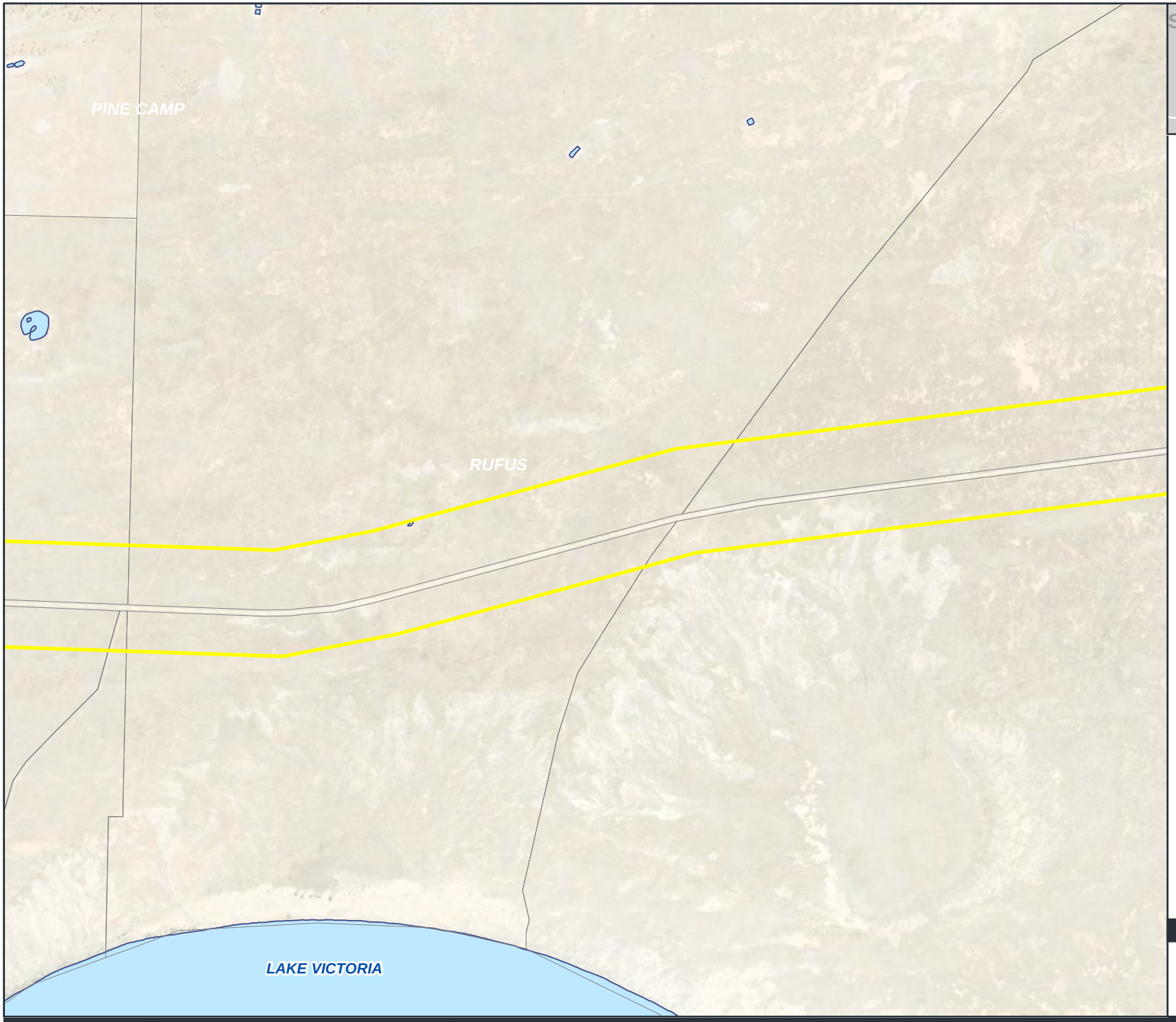


Proposal study area

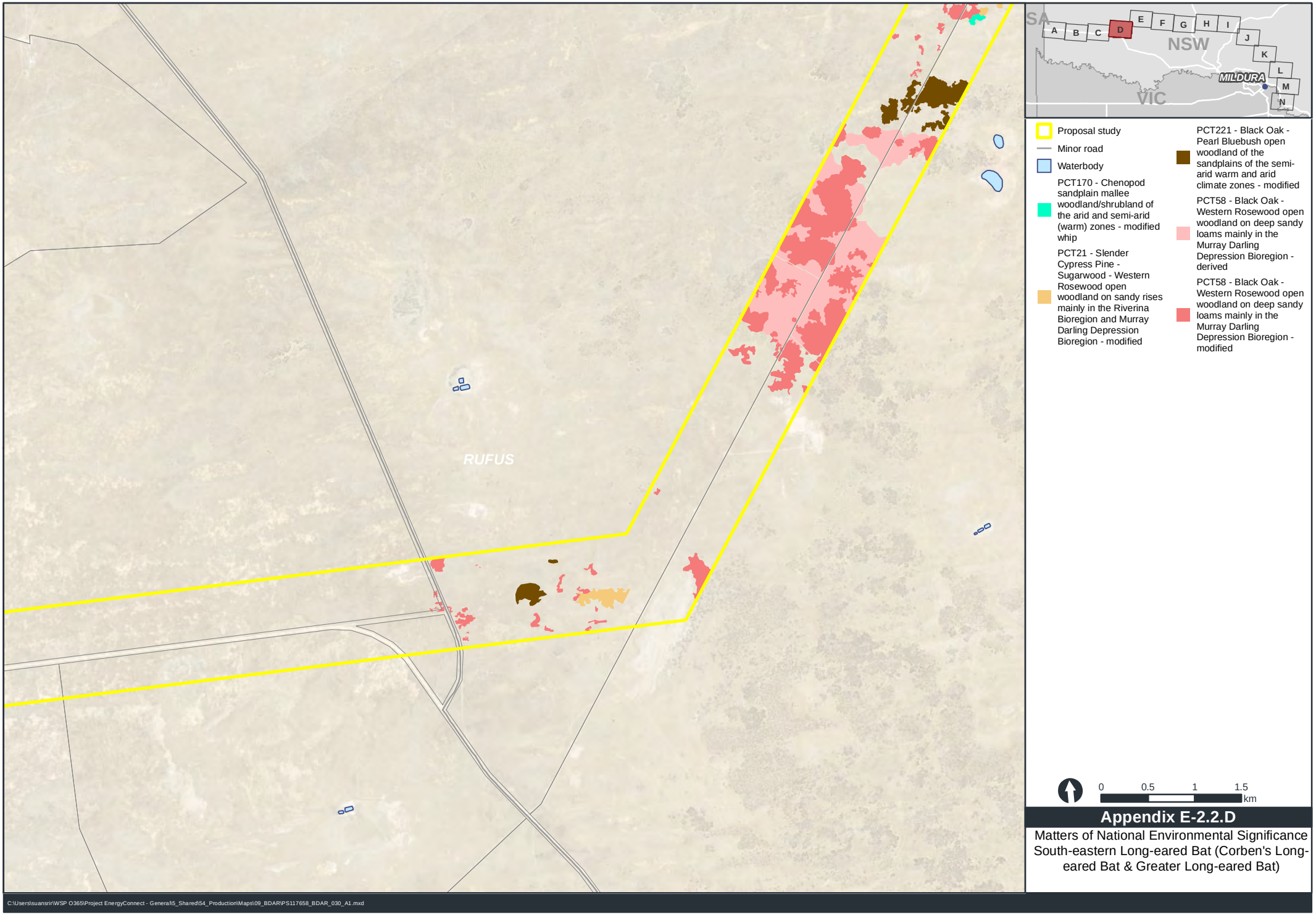
Waterbody

0 0.5 1 1.5 km

Appendix E-2.2.C

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_030_A1.mxd



Appendix E-2.2.D

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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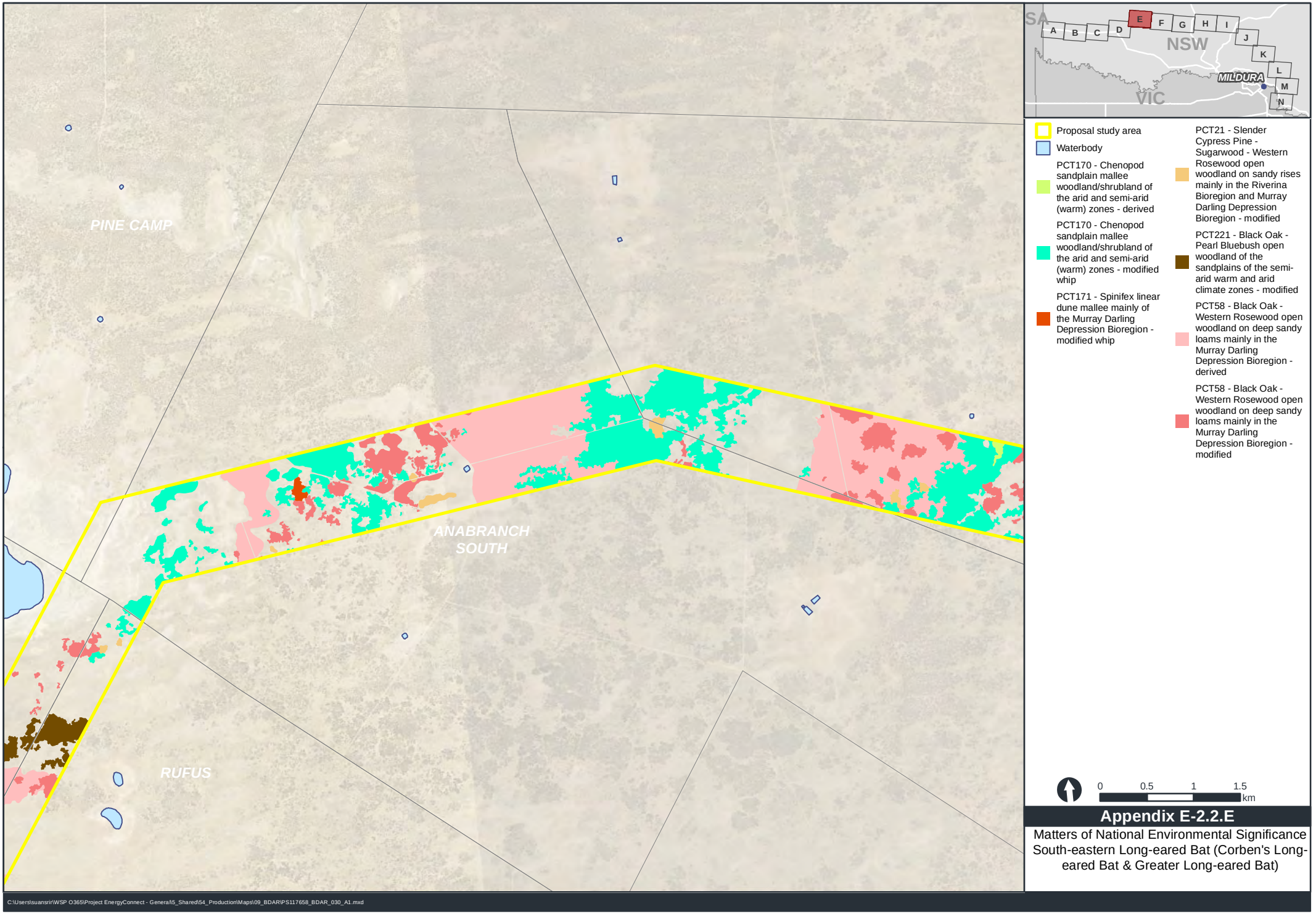

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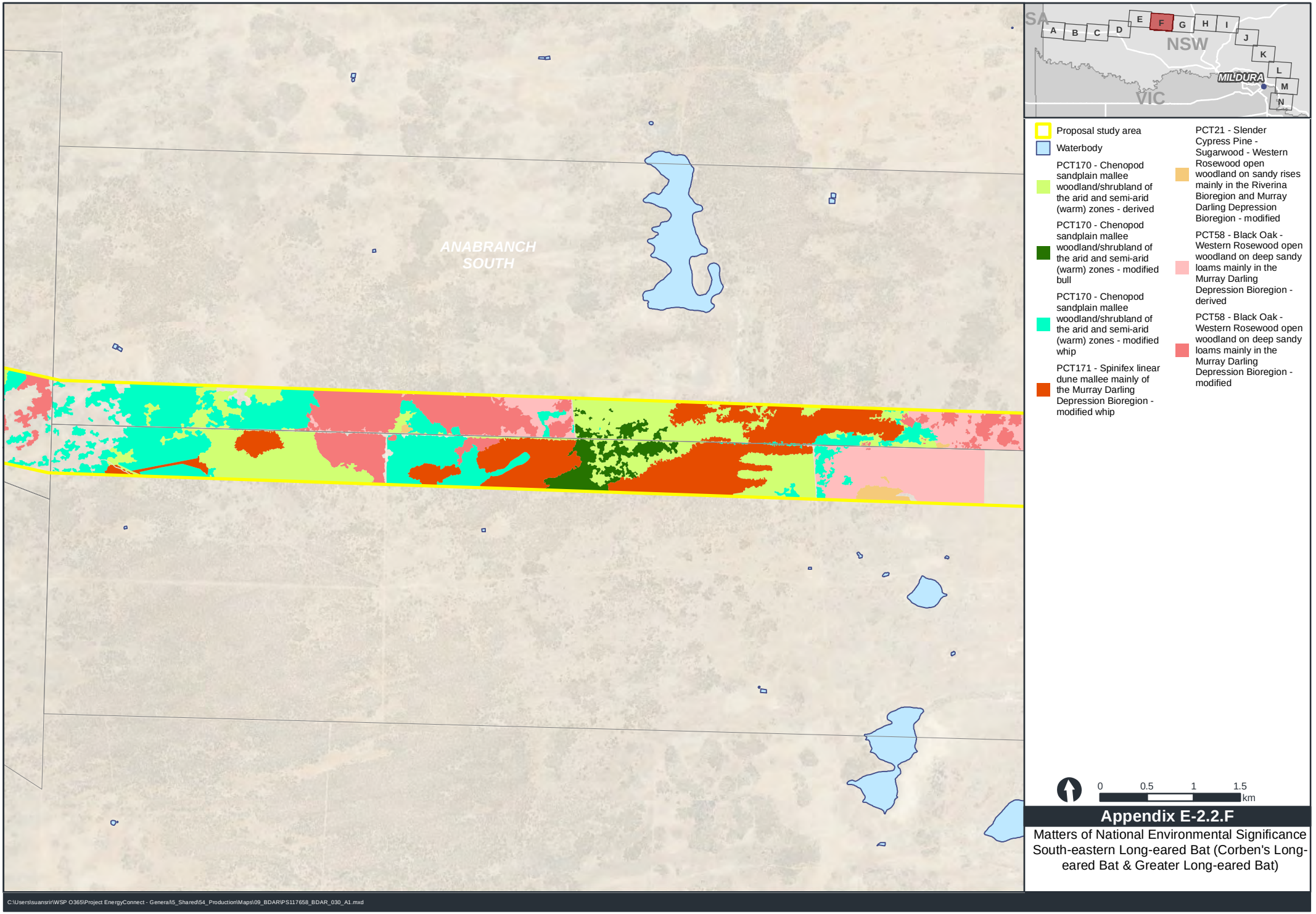
Appendix E-2.2.E

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)



Appendix E-2.2.F

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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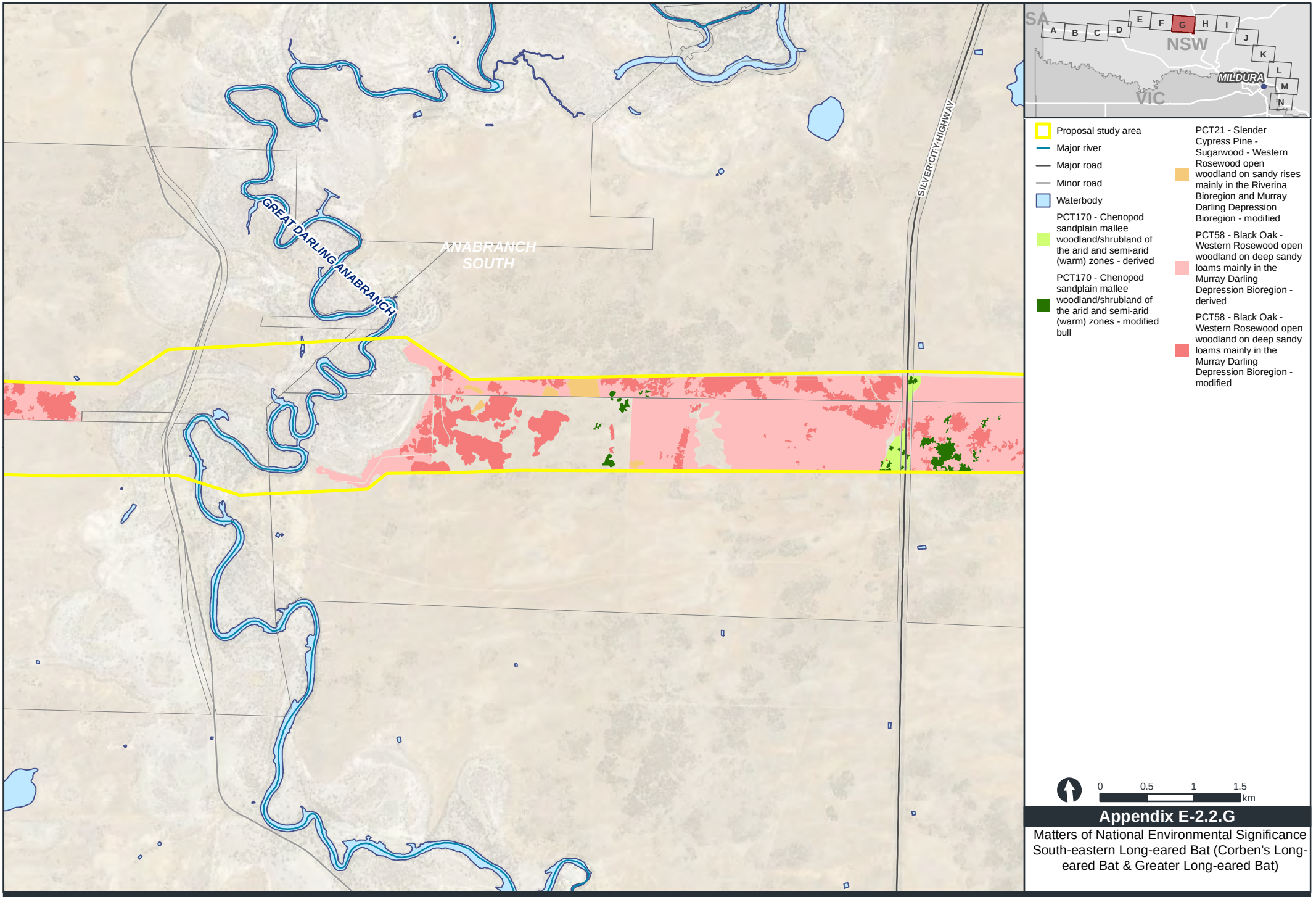

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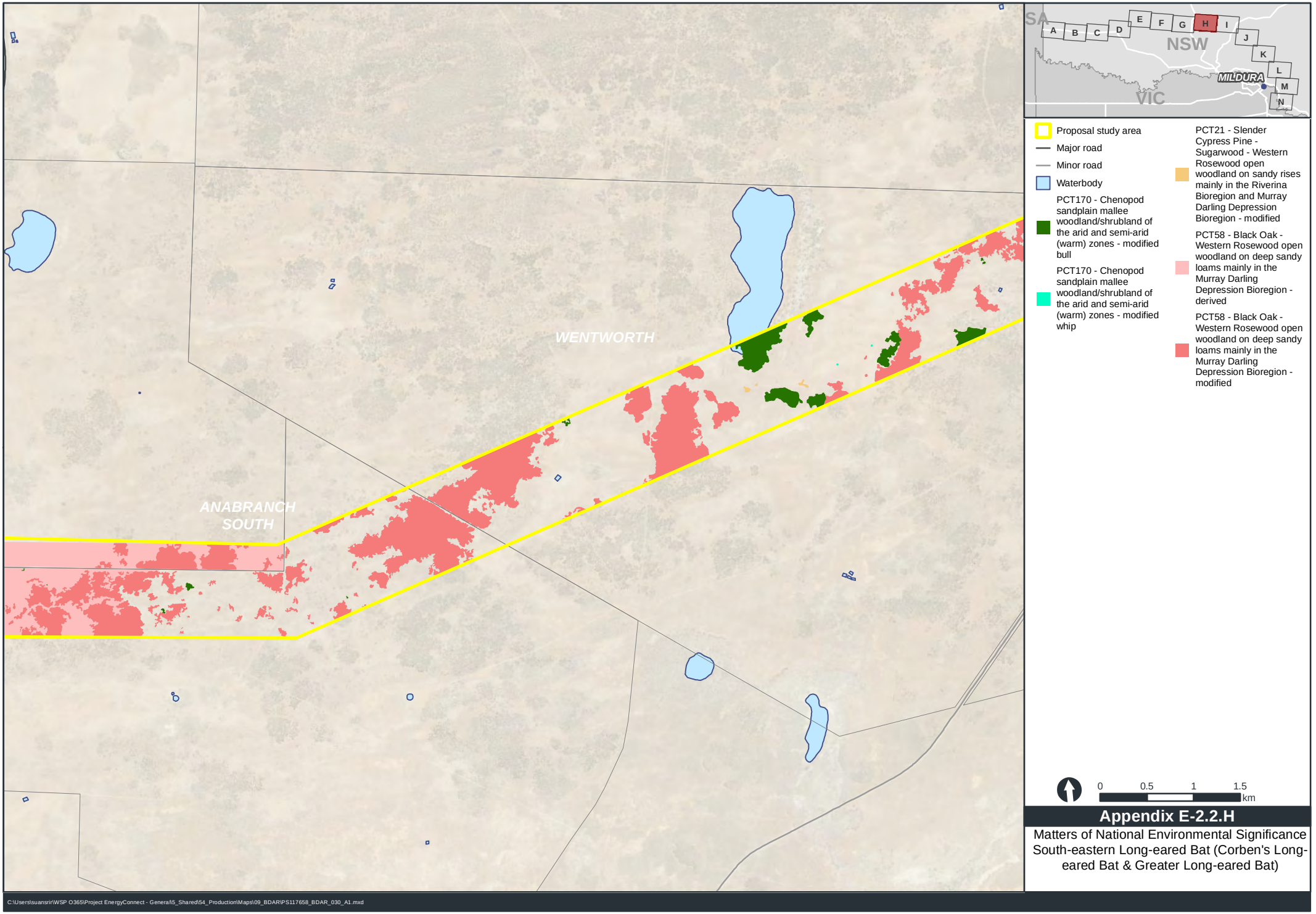
Appendix E-2.2.G

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)



Appendix E-2.2.H

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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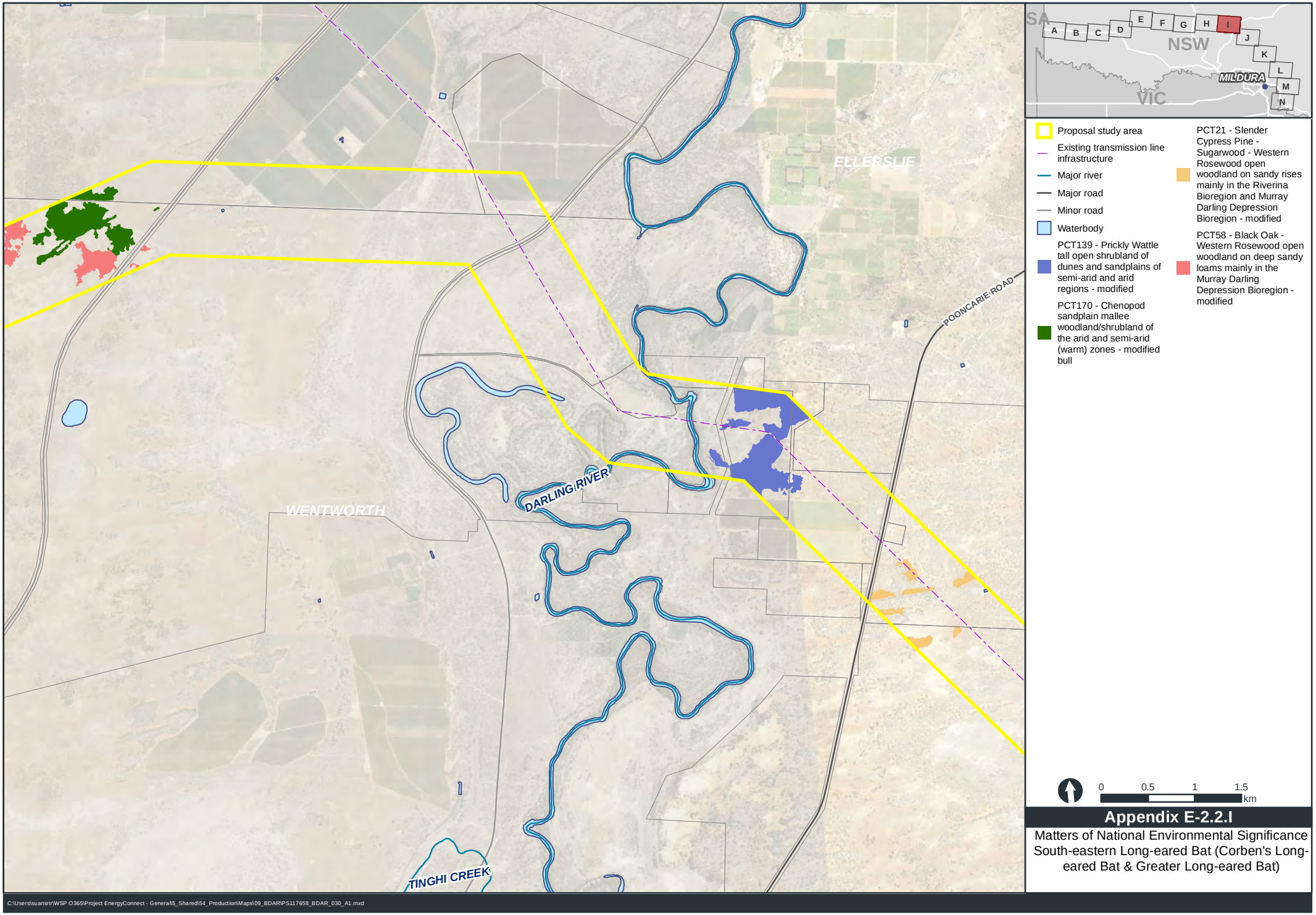
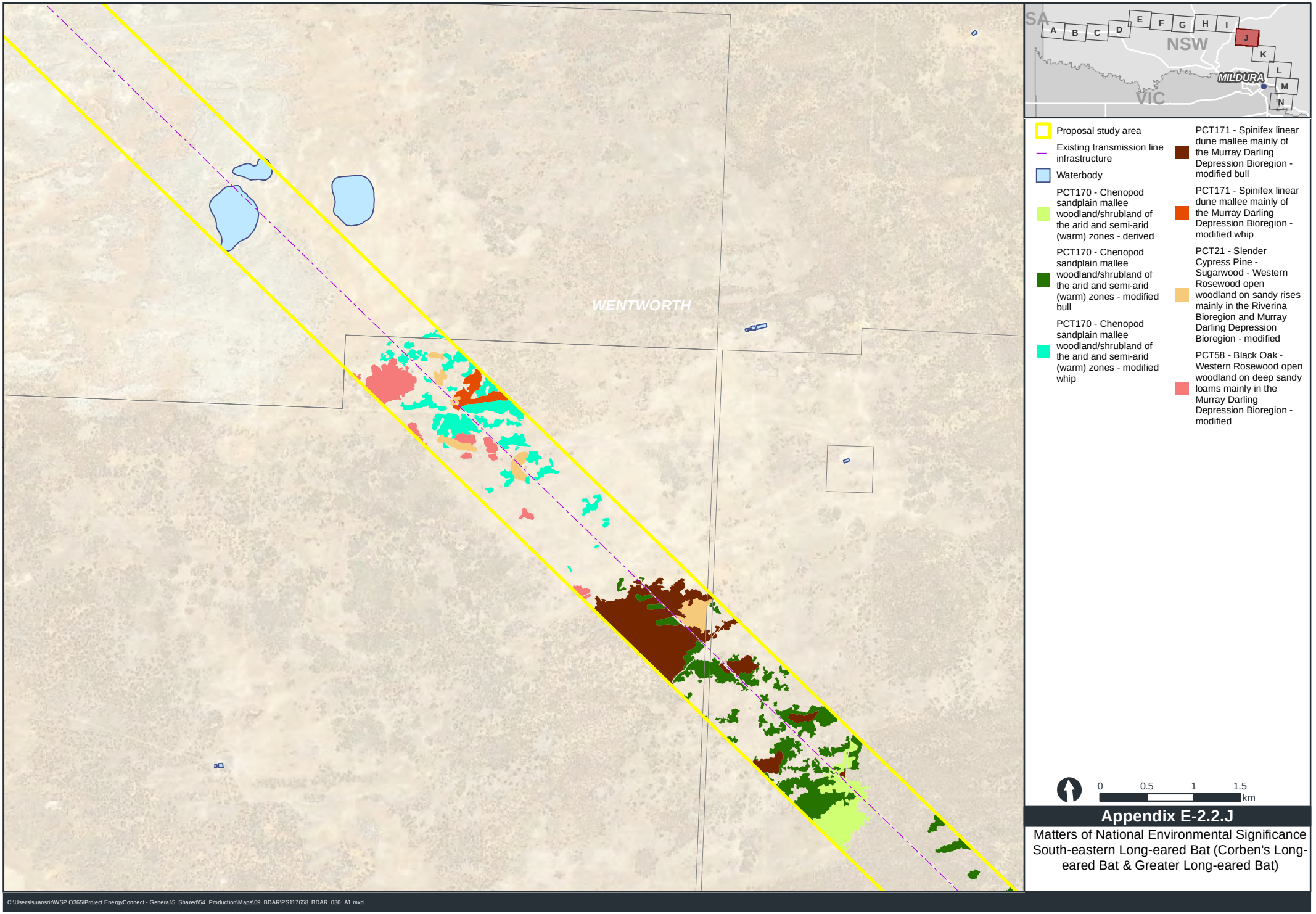


Appendix E-2.2.I

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

C:\Users\suansrir\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_030_A1.mxd



Appendix E-2.2.J

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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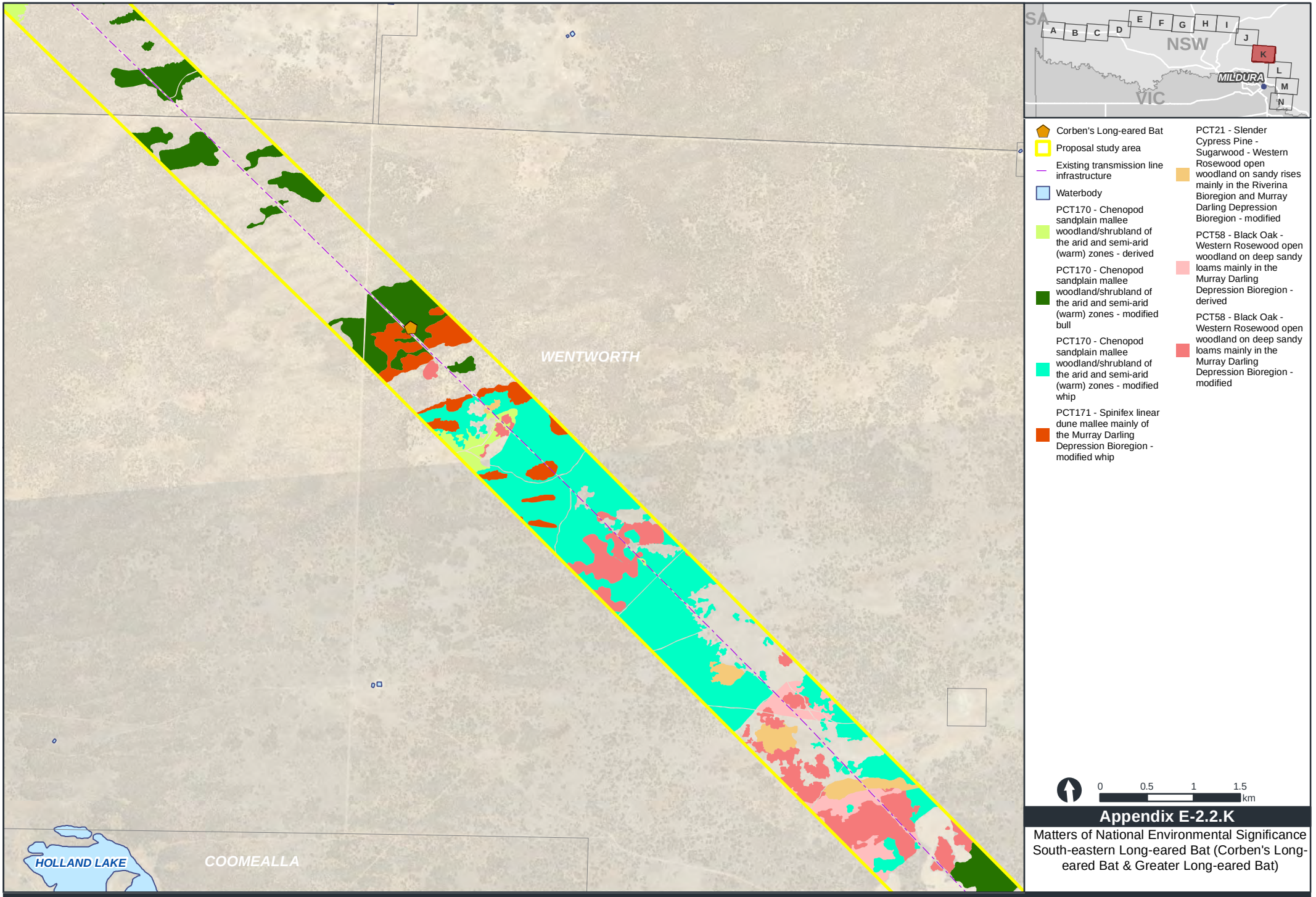

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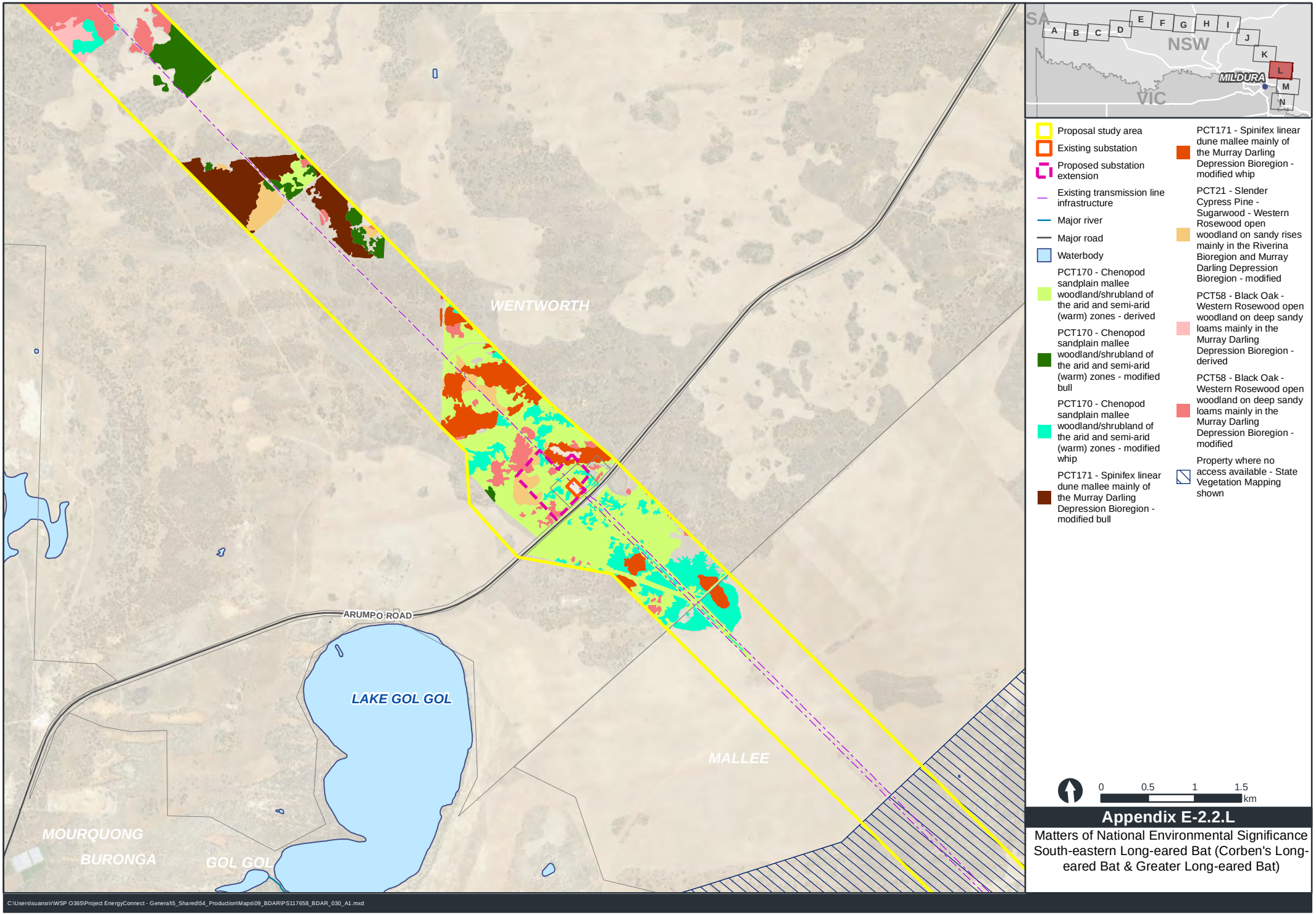
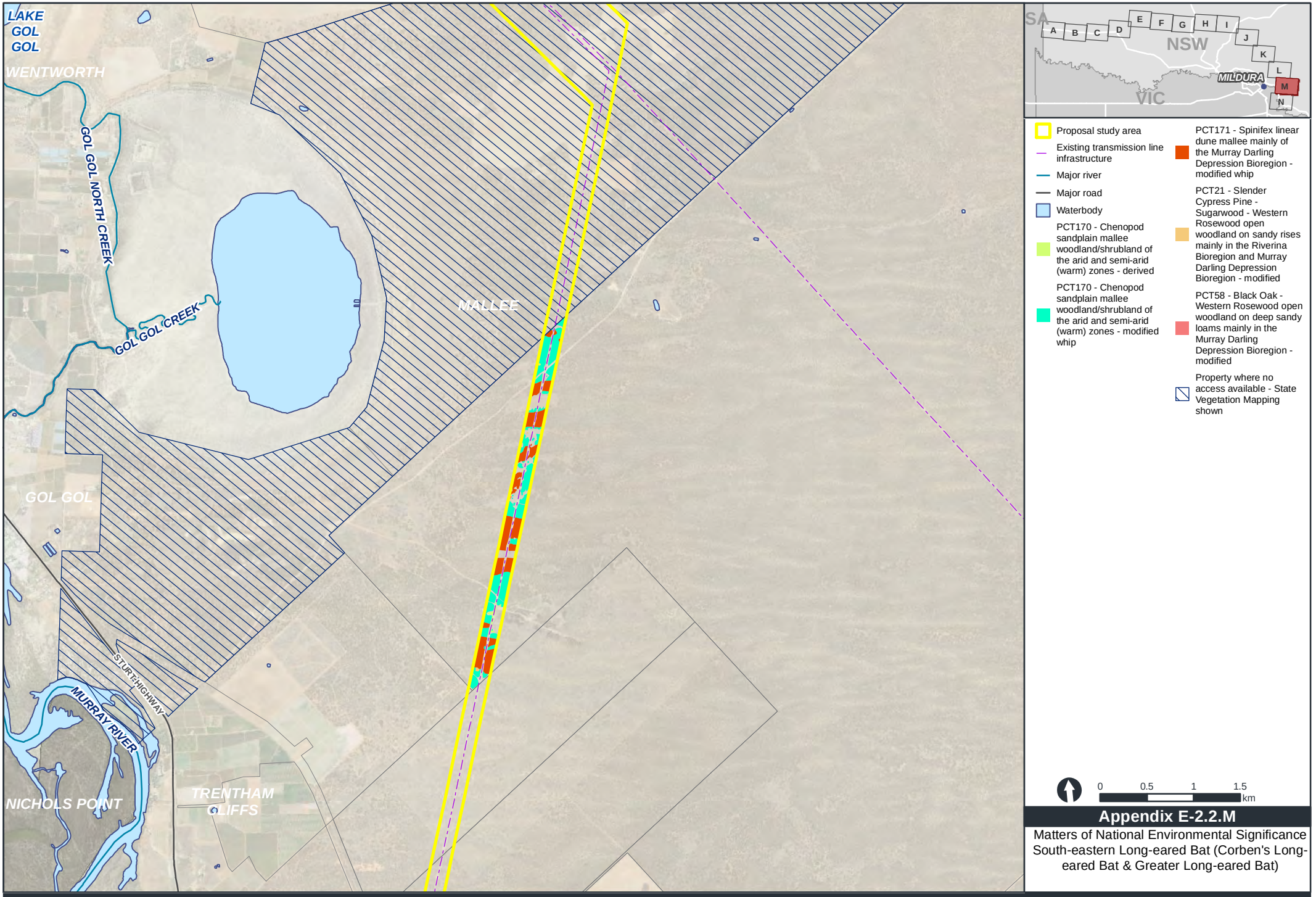
Appendix E-2.2.K

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)



Appendix E-2.2.L

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)



Appendix E-2.2.M

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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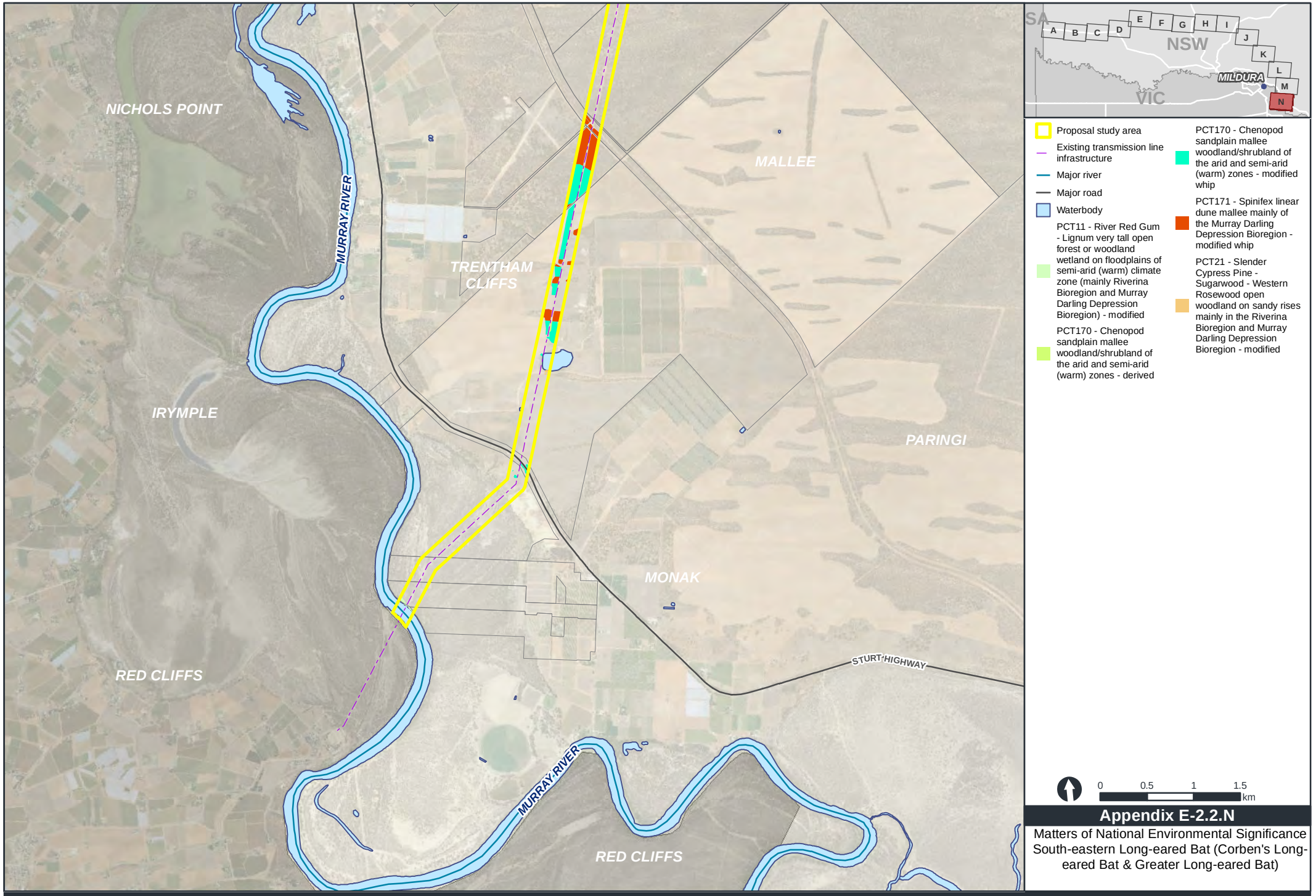

Appendix E-2.2.N

Matters of National Environmental Significance
South-eastern Long-eared Bat (Corben's Long-eared Bat & Greater Long-eared Bat)

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APPENDIX E-3
APPENDIX A OF THE SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS CROSS-REFERENCE

E-3.1 APPENDIX A OF THE SECRETARY'S ENVIRONMENTAL ASSESSMENT REQUIREMENTS

Guidelines for preparing assessment documentation relevant to the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) for proposals being assessed under the NSW Assessment Bilateral.

Project EnergyConnect (NSW – Western Section) (EPBC 2020/8673)

The following table details the response to requirements detailed in Appendix A of the SEARs, which commences from Paragraph 5 onwards. Paragraphs 1 to 4 outlines an introduction to the controlled action.

Table E-3.1 Appendix A of the Secretary's Environmental Assessment Requirements cross-reference

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
Relevant regulations	**5** The Environmental Impact Statement (EIS) must address all matters outlined in Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) and all matters outlined below in relation to the controlling provisions.	The below provides a checklist against the matters outlined in Appendix A of the SEARs. Appendix A of the SEARs duplicates, in part, some provisions of Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth) (the EPBC Regulations). This checklist identifies the provisions of that Regulation not covered by the matters specifically identified in Appendix A of the SEARs.
Project description *(Clause 1 and Clause 2 of Schedule 4 of the EPBC Regulations)*	**6** The title of the action, background to the action and current status <u>Additional provisions of Schedule 4 of the EPBC Regulations</u> — Clause 1, Schedule 4 of the EPBC Regulations also requires the following: — the full name and postal address of the designated proponent — a clear outline of the objective of the action — the consequences of not proceeding with the action.	The title of the action (being EnergyConnect (NSW – Western Section)) and details of the proponent are available in the Certification page of the EIS. This EIS seeks approval for the action. The objectives of the proposal are outlined in Section 1.2.2 of the EIS. The consequences of not proceeding with the proposal is outlined in Section 2.6 of the EIS.
	7 the precise location and description of all works to be undertaken (including associated offsite works and infrastructure), structures to be built or elements of the action that may have impacts on MNES	A description of the proposal is provided in Chapter 5 and Chapter 6 of the EIS. The assessment considers an indicative disturbance area as described in Chapter 8 of the EIS. Further description is provided in sections 1.6, 7, 9.9 and Appendix E of Technical paper 1.

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
	8 how the action relates to any other actions that have been, or are being taken in the region affected by the action	The proposal is part of EnergyConnect, which would be constructed in progressive sections. A description of the South Australian Section, the Victorian Section and the NSW – Eastern Section is provided in Chapter 1 of the EIS. The South Australian Section (referral reference no 2019/6468) and the NSW – Eastern Section (referral reference no 2020/8766) were determined to be separate controlled actions. This action (being the proposal) is a standalone action which would have distinct potential impacts that would not change due to development of any subsequent sections of EnergyConnect. Further: — EnergyConnect has been divided by its different jurisdictions, except in NSW. The proposal is able to operate independently of the NSW – Eastern Section, and subsequent sections of EnergyConnect would be geographically distinct to the proposal (the action) — the other components of EnergyConnect would be subject to separate assessments and approvals once the details of the other sections are more developed. Assessing both sections of EnergyConnect in NSW or any other sections as a combined project would not change the assessment on relevant Matters of National Environmental Significance (MNES) compared to assessing as separate projects. Relevant MNES for subsequent sections of EnergyConnect are expected to be different and not of a cumulative nature to the MNES relevant to the currently proposed action.
	9 How the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts on MNES	A description of the proposal is provided in Chapter 5 and Chapter 6 of the EIS. The assessment considers an indicative disturbance area as described in Chapter 8 of the EIS. Further description is provided in Sections 1.6, 7, 9.9 and Appendix E of Technical paper 1.

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
Impacts *(Clause 3 of Schedule 4 of the EPBC Regulations)*	**10** The EIS must include an assessment of the relevant impacts of the action on the matters protected by the controlling provisions, including: — a description and detailed assessment of the nature and extent of the likely direct, indirect and consequential impacts, including short term and long term relevant impacts — a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible — analysis of the significance of the relevant impacts — any technical data and other information used or needed to make a detailed assessment of the relevant impacts. For this requirement, Appendix A defines relevant impacts as those impacts likely to significantly impact on any matter protected under the EPBC Act.	The BDAR concludes that based on full and comprehensive seasonal targeted survey data, that no MNES are likely to be significantly impacted, so this factor does not strictly apply. However, for consideration, further description is provided in Sections 1.6, 7, 9, 10 and Appendix E of Technical paper 1 in relation to these factors.
Avoidance, mitigation and offsetting *(Clause 4 of Schedule 4 of the EPBC Regulations)*	**11** For each of the relevant matters protected that are likely to be significantly impacted by the action, the EIS must provide information on proposed avoidance and mitigation measures to manage the relevant impacts of the action including: — a description, and an assessment of the expected or predicted effectiveness of the mitigation measures — any statutory policy basis for the mitigation measures — the cost of the mitigation measures — an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing — the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.	The BDAR concludes that based on full and comprehensive seasonal targeted survey data, that no MNES are likely to be significantly impacted, so this factor does not strictly apply. Avoidance measures are discussed in Section 8 of Technical paper 1. Also for consideration, further relevant description is provided in Sections 1.6, 7, 9, 10 and Appendix E of Technical paper 1 in relation to these factors. A consolidated list of mitigation measures is provided in Section 23.1 of the EIS. Section 11 of Technical paper 1 summarises the mitigation measures specific to the biodiversity assessment

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
	<u>Additional provisions of Schedule 4 of the EPBC Regulations</u> Clause 4, Schedule 4 of the EPBC Regulations also requires the following: a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent	
	12 Where a significant residual adverse impact to a relevant protected matter is considered likely, the EIS must provide information on the proposed offset strategy, including discussion of the conservation benefit associated with the proposed offset strategy	Technical paper 1 (the BDAR) concludes that based on full and comprehensive seasonal targeted survey data, that no MNES are likely to be significantly impacted, so this factor does not strictly apply. Nevertheless, all impacts of the project will be offset via the application of the Biodiversity Assessment Method (BAM) for the recorded MNES. The BAM is the approved method required to be implemented under the bilateral process.
	13 for each of the relevant matters likely to be impacted by the action the EIS must provide reference to, and consideration of, relevant Commonwealth guidelines and policy statements including any: — conservation advice or recovery plan for the species or community — relevant threat abatement plan for the species or community — wildlife conservation plan for the species — any strategic assessment	Refer to Section 9.9 and Appendix E of Technical paper 1.
	14 In addition to the general requirements described above, specific information is required with respect to each of the determined controlling provisions. These requirements are outlined in paragraphs 15-17.	Refer to responses to requirements 15-17 below.

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
Biodiversity	**15** The EIS must identify each EPBC Act listed threatened species and community and migratory species likely to be impacted by the action. For any species and communities that are likely to be impacted, the proponent must provide a description of the nature, quantum and consequences of the impacts. For species and communities potentially located in the project area or in the vicinity that are not likely to be impacted, provide evidence why they are not likely to be impacted	Refer to Sections 1.6, 7, 9, 10 and Appendix E of Technical paper 1 in relation to these factors.
	16 For each of the EPBC Act listed threatened species and communities and migratory species likely to be impacted by the action the EIS must provide a separate: — description of the habitat (including identification and mapping of suitable breeding habitat, suitable foraging habitat, important populations and habitat critical for survival), with consideration of, and reference to, any relevant Commonwealth guidelines and policy statements including listing advice, conservation advice and recovery plan — details of the scope, timing and methodology for studies or surveys used and how they are consistent with (or justification for divergence from) published Australian Government guidelines and policy statements — description of the relevant impacts of the action having regard to the full national extent of the species or community's range — description of the specific proposed avoidance and mitigation measures to deal with relevant impacts of the action — identification of significant residual adverse impacts likely to occur after the proposed activities to avoid and mitigate all impacts are taken into account — a description of any offsets proposed to address residual adverse significant impacts and how these offsets will be established	These factors have specifically been considered in Appendix E of Technical paper 1.

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
	— details of how the current published NSW Biodiversity Assessment Method (BAM) has been applied in accordance with the objects of the EPBC Act to offset significant residual adverse impacts — details of the offset package to compensate for significant residual impacts including details of the credit profiles required to offset the action in accordance with the BAM and/or mapping and descriptions of the extent and condition of the relevant habitat and/or threatened communities occurring on proposed offset sites	
	17 Any significant residual impacts not addressed by the BAM may need to be addressed in accordance with the EPBC Act 1999 Environmental Offset Policy. http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy.	Technical paper 1 (the BDAR) concludes that based on full and comprehensive seasonal targeted survey data, that no MNES are likely to be significantly impacted, so this factor does not strictly apply. Nevertheless, all impacts of the project will be offset via the application of the Biodiversity Assessment Method (BAM) for the recorded MNES. The BAM is the approved method required to be implemented under the bilateral process. Any biodiversity offsets will be provided in accordance with the EPBC Act 1999 Environmental Offset Policy.
Other approvals and conditions	**18** Information in relation to any other approvals or conditions required must include the information prescribed in Schedule 4 Clause 5 (a) (b) (c) and (d) of the EPBC Regulations 2000. <u>Provisions of Schedule 4 of the EPBC Regulations</u> Clause 5, Schedule 4 of the EPBC Regulations requires the following: — details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including: — what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy — how the scheme provides for the prevention, minimisation and management of any relevant impacts *(clause 5.01a)*	This EIS presents the environmental impact assessment to support the application for the proposal under Division 5.2, Part 5 of the EP&A Act. The status of the NSW planning approval process is summarised in Section 1.4 of the EIS. A determination from the NSW Minister for Planning and Public Spaces will be required in addition to an approval under the EPBC Act. Other approvals, licences or permits required under NSW legislation is summarised in Appendix C of this EIS. Other than the EIS, no other environmental assessment has been, or is being carried out for the project for the purpose of any local or state plan or policy.

REQUIREMENT	PARAGRAPH	WHERE ADDRESSED IN THE EIS AND/OR TECHNICAL PAPER 1
	— a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action *(clause 5.01b)* — a statement identifying any additional approval that is required *(clause 5.01c)* — a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action *(clause 5.01d).*	A brief description of monitoring, enforcement and review processes is provided in Section 23.1 of the EIS. Environmental management system (EMS) of the construction contractor and TransGrid are accredited under ISO 14001:2015. The procedures during construction would be further detailed in the Construction Environmental Management Plan. Operational management of the proposal would be under TransGrid's Environmental Management System, and associated procedures.
Environmental record of person proposing to take the action	**19** Information in relation to the environmental record of a person proposing to take the action must include details as prescribed in Schedule 4 Clause 6 of the EPBC Regulations 2000. <u>Provisions of Schedule 4 of the EPBC Regulations</u> Clause 6, Schedule 4 of the EPBC Regulations requires the following: — Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against: — the person proposing to take the action; and — for an action for which a person has applied for a permit, the person making the application *(clause 6.01a)* — If the person proposing to take the action is a corporation—details of the corporation's environmental policy and planning framework. *(clause 6.01b)*	Refer to the detail provided below this table.
Information sources	For information given in an EIS, the EIS must state the source of the information, how recent the information is, how the reliability of the information was tested; and what uncertainties (if any) are in the information.	Technical paper 1 was prepared by suitably qualified and accredited ecologists based on comprehensive seasonal targeted field surveys and reviews of relevant publicly available desktop sources. As such, the level of reliability is high. Internal reviews by expert ecologists were undertaken to ensure the reliability of the information and no uncertainties exist. A table presenting the information sources and the associated required details is presented in Technical paper 1 (References section).

ENVIRONMENTAL RECORD OF PERSON PROPOSING TO TAKE THE ACTION

TransGrid has a consistent record of proactively seeking environmental approvals where required and ensuring that any commitments or conditions placed on activities as a result of these approval processes are adhered to.

In 2001, TransGrid was subject to proceedings under State Environmental laws for clearing vegetation in the vicinity of transmission lines. TransGrid subsequently invested $5 million toward site rehabilitation. Since the 2001 incident, TransGrid has not been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources.

TransGrid is committed to conducting its activities and services in a manner that minimises pollution and complies with relevant environmental legislation, industry standards and codes of practice. TransGrid implores all employees and contractors to stop and consider the potential impact to the environment from their activities.

TransGrid aim to enhance their systems and processes in a manner that promotes continuous improvement in environmental management and which will lead to the achievement of industry best practice.

In meeting these commitments, TransGrid:

- maintains an Environmental Management System (EMS) that provides the framework for setting and reviewing our environmental objectives and targets, including the implementation, monitoring and review of these objectives and targets, as well as facilitating continuous improvement in environmental performance
- continues to develop systems that recognise sensitive environmental and cultural sites on or near our infrastructure, and provides processes to manage and our activities with the aim of preventing environment harm or adversely impacting the environment
- integrates environmental management considerations into the planning, design, siting, construction, maintenance, operation, decommissioning and disposal of all TransGrid assets;
- provides environmental training, assessment and authorisation under our Environmental Management System to employees and contractors to enable them to perform their duties in an environmentally sensitive manner;
- engages with the community, customers, employees, government and other stakeholders regarding potential environmental or cultural impacts associated with our plans and activities
- pursues opportunities to maximise resource efficiencies and reduce the generation of waste through avoidance, reduction, reuse and recycling programs.
- identifies, sets and monitors realistic environmental measures and communicates them to all employees and stakeholders.

The proposal (the action) would be undertaken in accordance with TransGrid's environmental policy and planning framework TransGrid Environment Policy is available on their web site, and the construction contractor's EMS. Both EMS' are accredited under ISO 14001:2015.

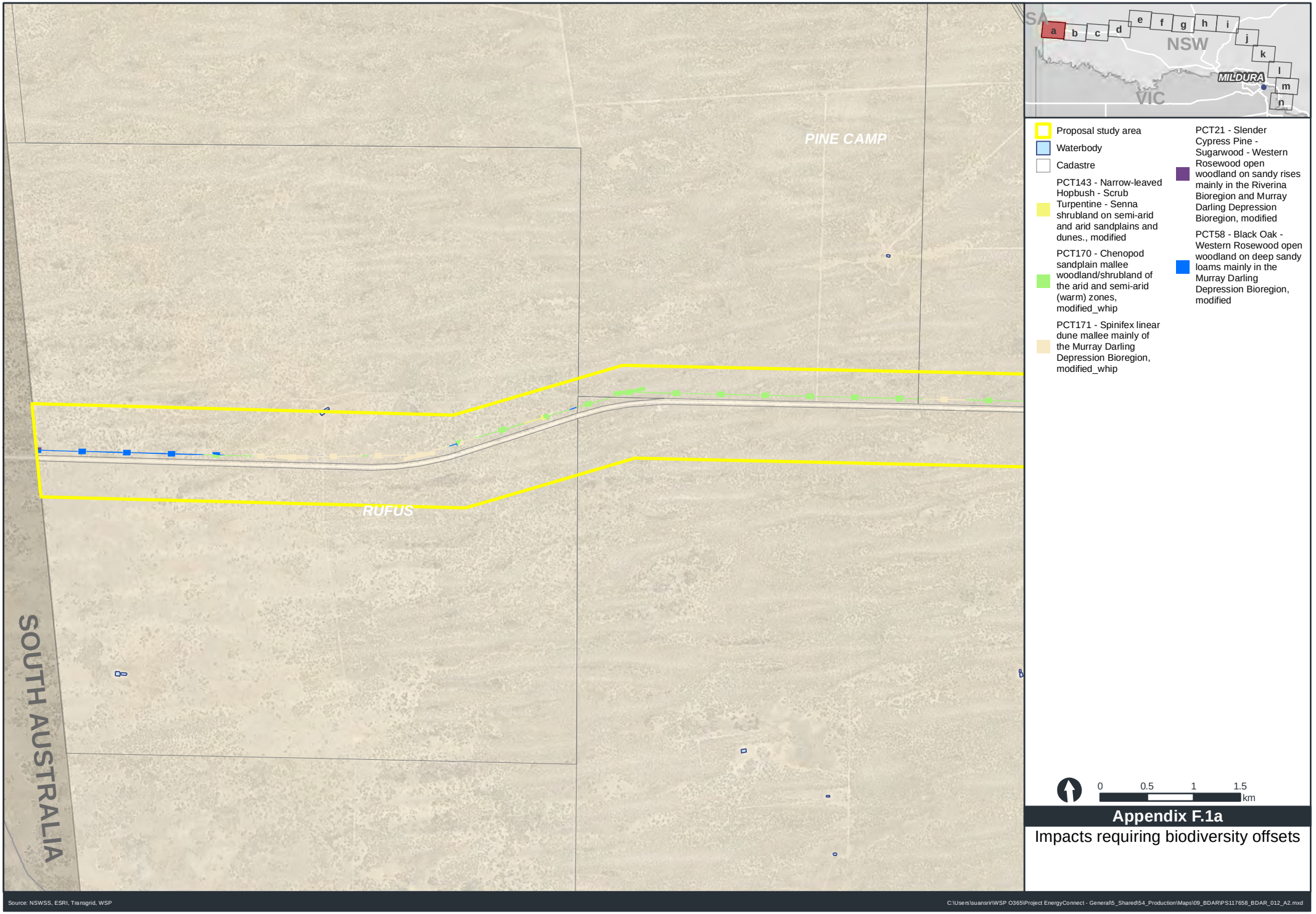
TransGrid's Environmental Policy commits to protecting and enhancing the natural environmental and social values in all TransGrid's activities. TransGrid's planning framework allows for early identification of environment and social values and methods for avoiding, minimising and mitigating impacts caused as a result of their developments via preliminary detailed screening and risk assessments within the development envelope and finally subsequent footprint selection.

TransGrid's EMS is independently certified and covers all of their processes and activities that have the potential to impact on the environment. The EMS enables compliance with TransGrid's environment and heritage compliance obligations, providing the framework for driving environmental requirements throughout leadership, planning, support, operation, performance evaluation and continuous improvement actions. The proposed action, therefore, will be undertaken, monitored and measured in accordance with the TransGrid's EMS.

APPENDIX F

IMPACT ASSESSMENT

APPENDIX F-1
IMPACT ASSESSMENT – MAPS SHOWING BIODIVERSITY VALUES REQUIRING OFFSETS



Appendix F.1a

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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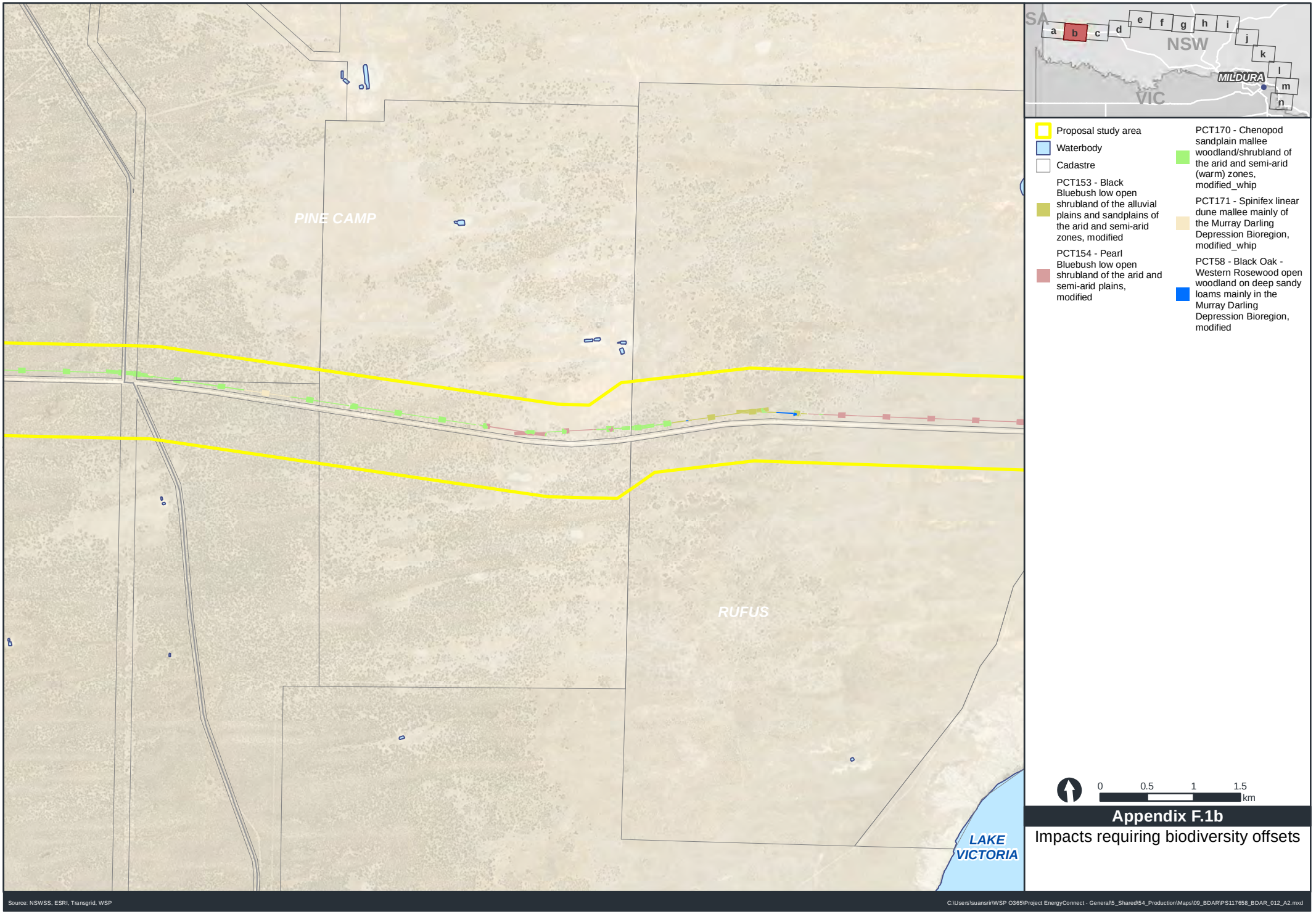
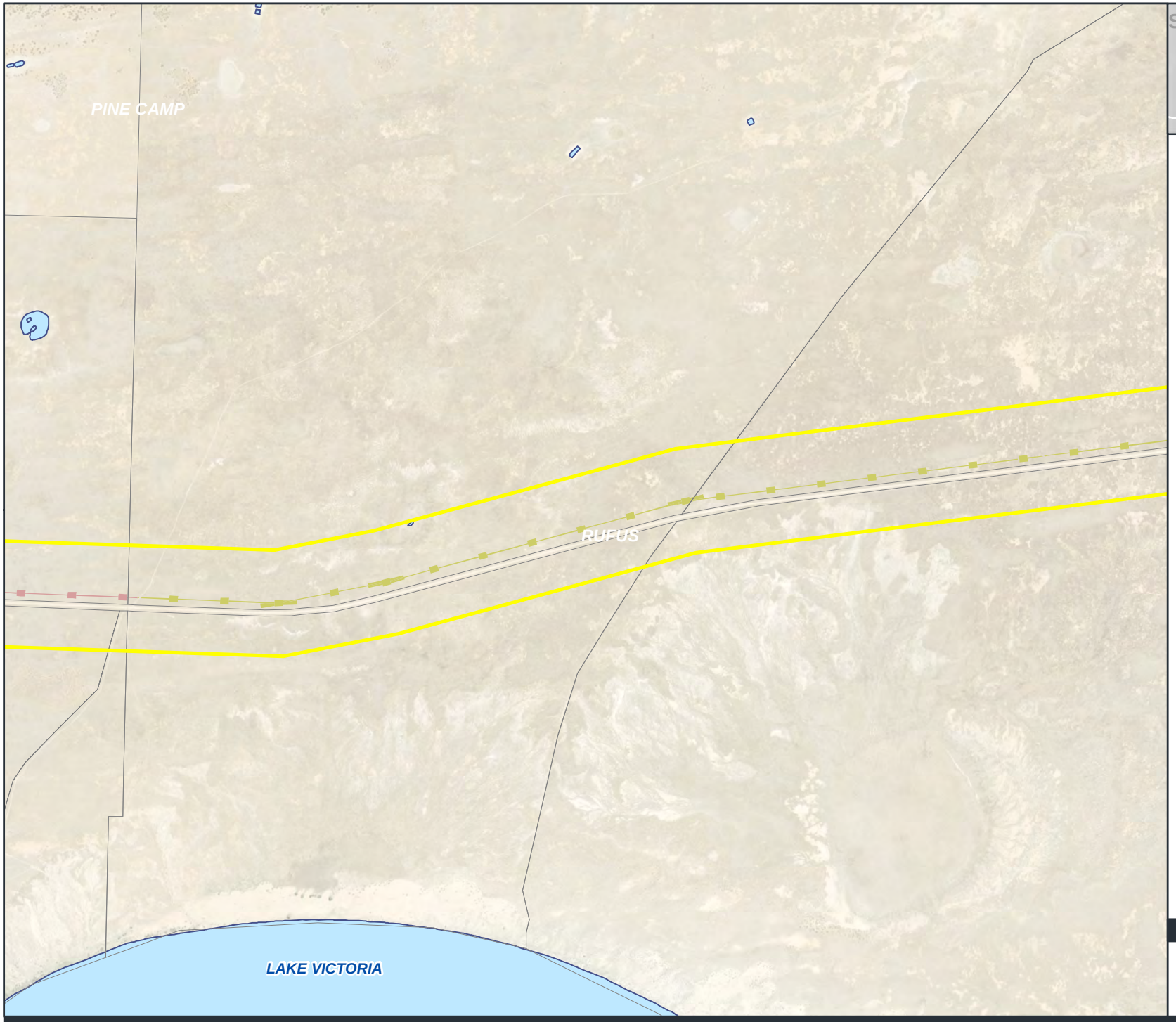


Appendix F.1b

Impacts requiring biodiversity offsets



- Proposal study area
- Waterbody
- Cadastre
- PCT153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones, modified
- PCT154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains, modified

0 0.5 1 1.5 km

Appendix F.1c

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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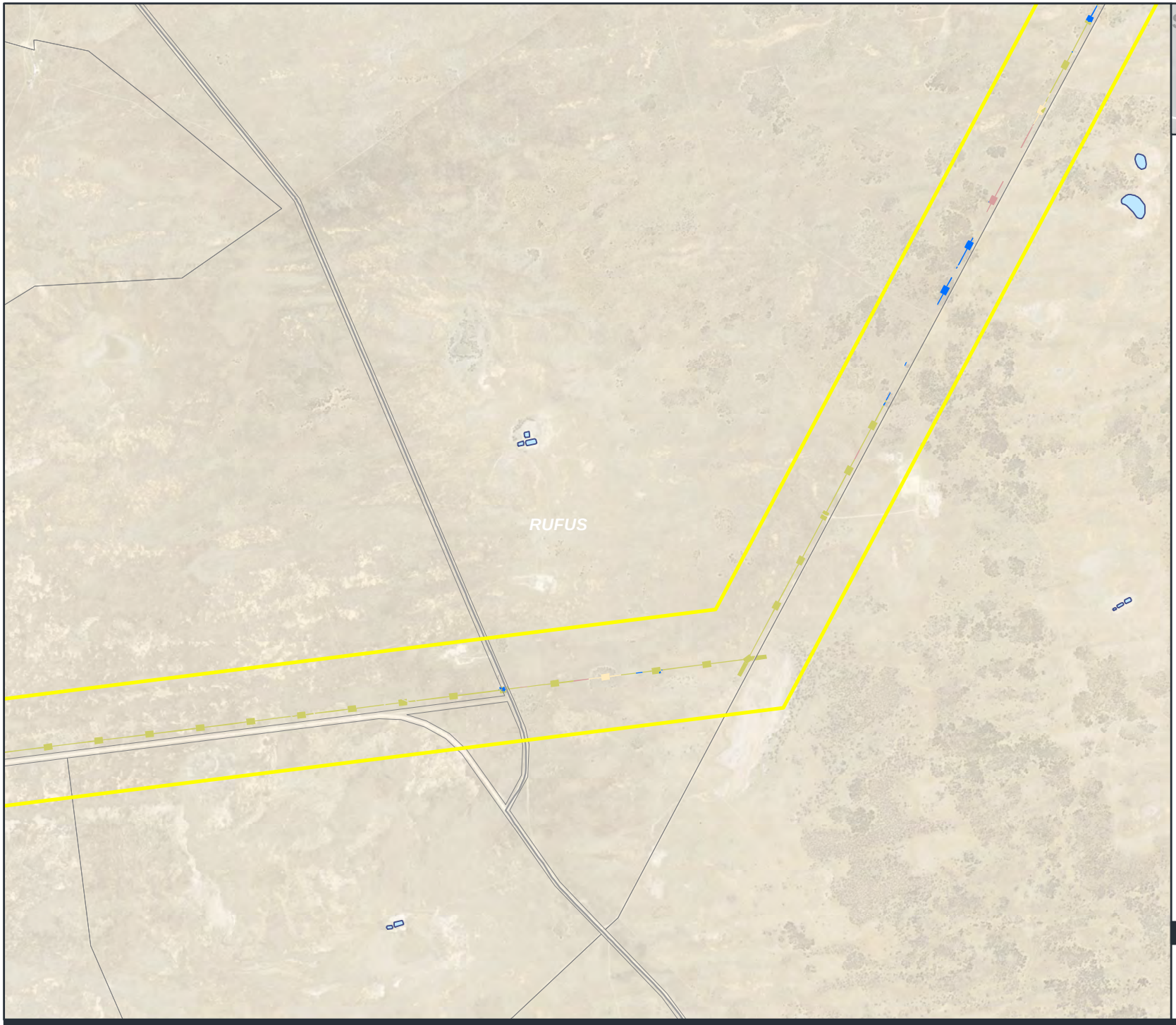

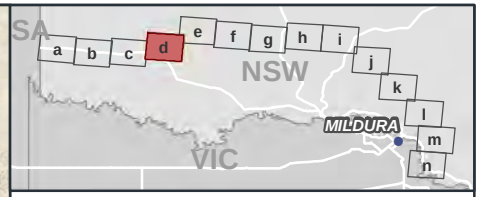

- Proposal study area
- Waterbody
- Cadastre
- PCT153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones, modified
- PCT154 - Pearl Bluebush low open shrubland of the arid and semi-arid plains, modified
- PCT221 - Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones, modified
- PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified

0 0.5 1 1.5 km

Appendix F.1d

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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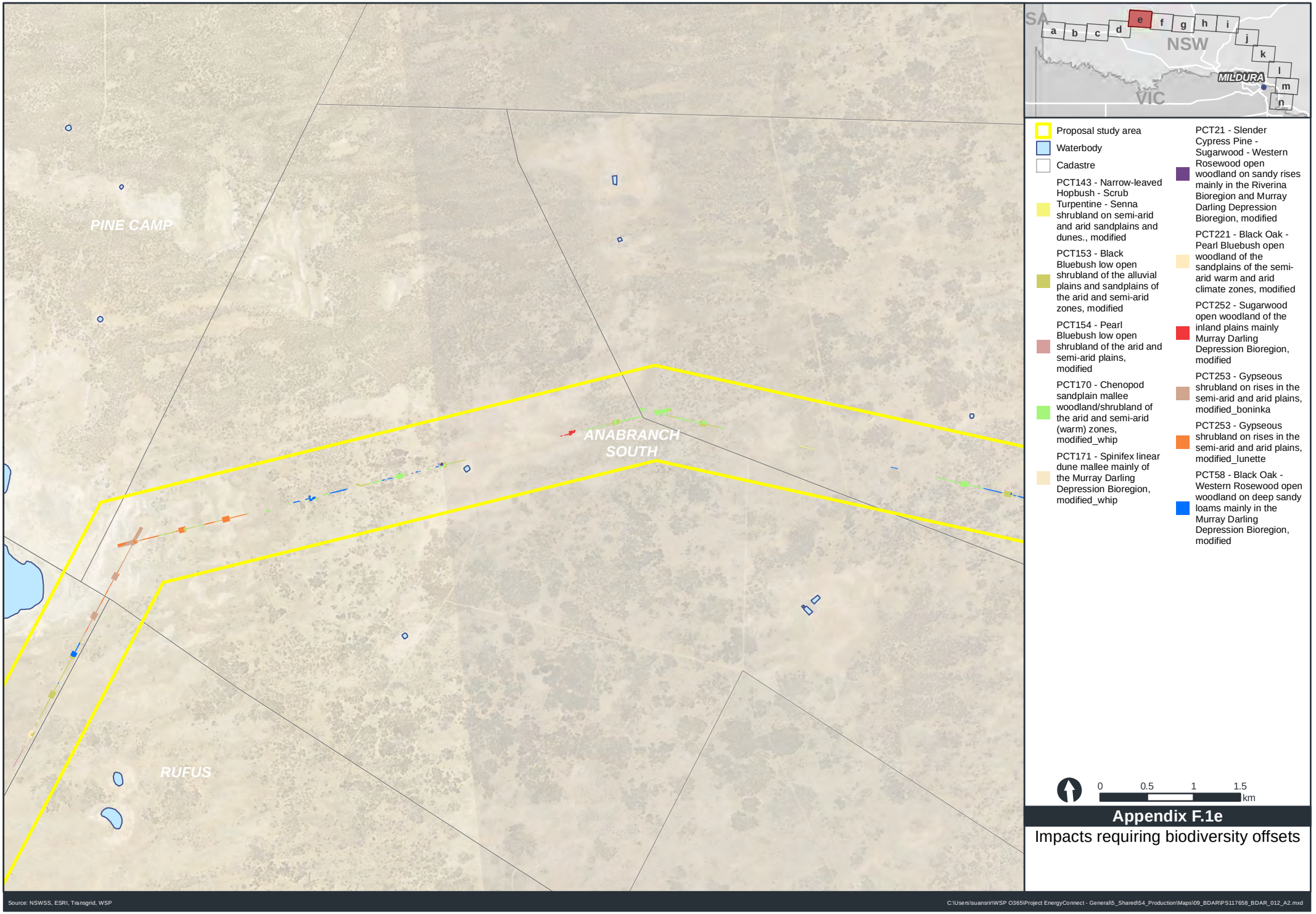

Appendix F.1e

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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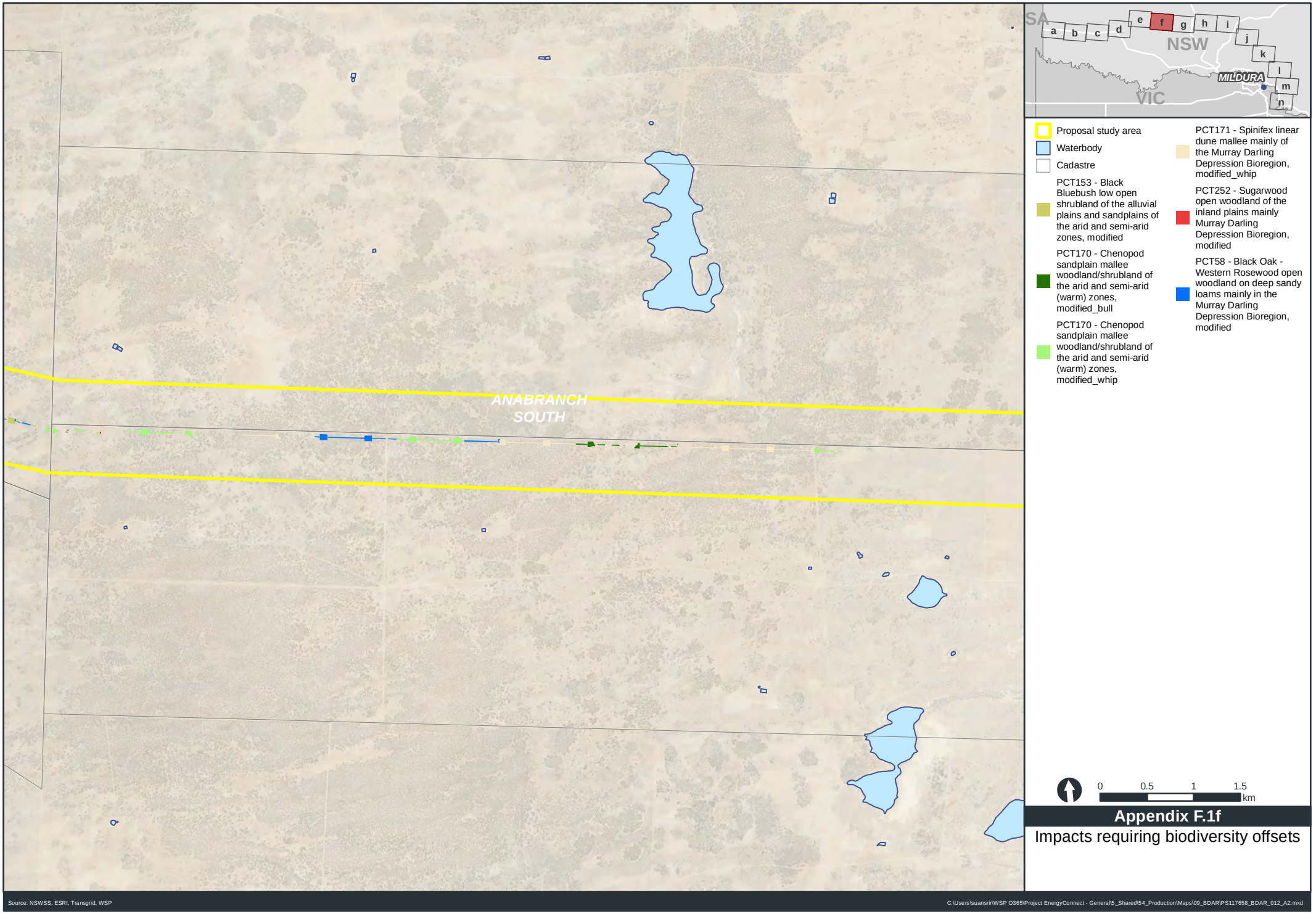
ANABRANCH
SOUTH
SA
NSW
VIC
MILDURA
a
b
c
d
e
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h
i
j
k
l
m
n
Proposal study area
Waterbody
Cadastre
PCT153 - Black Bluebush low open shrubland of the alluvial plains and sandplains of the arid and semi-arid zones, modified
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_bull
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_whip
PCT171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion, modified_whip
PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, modified
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified
0
0.5
1
1.5
km
Appendix F.1f
Impacts requiring biodiversity offsets
Source: NSWSS, ESRI, Transgrid, WSP
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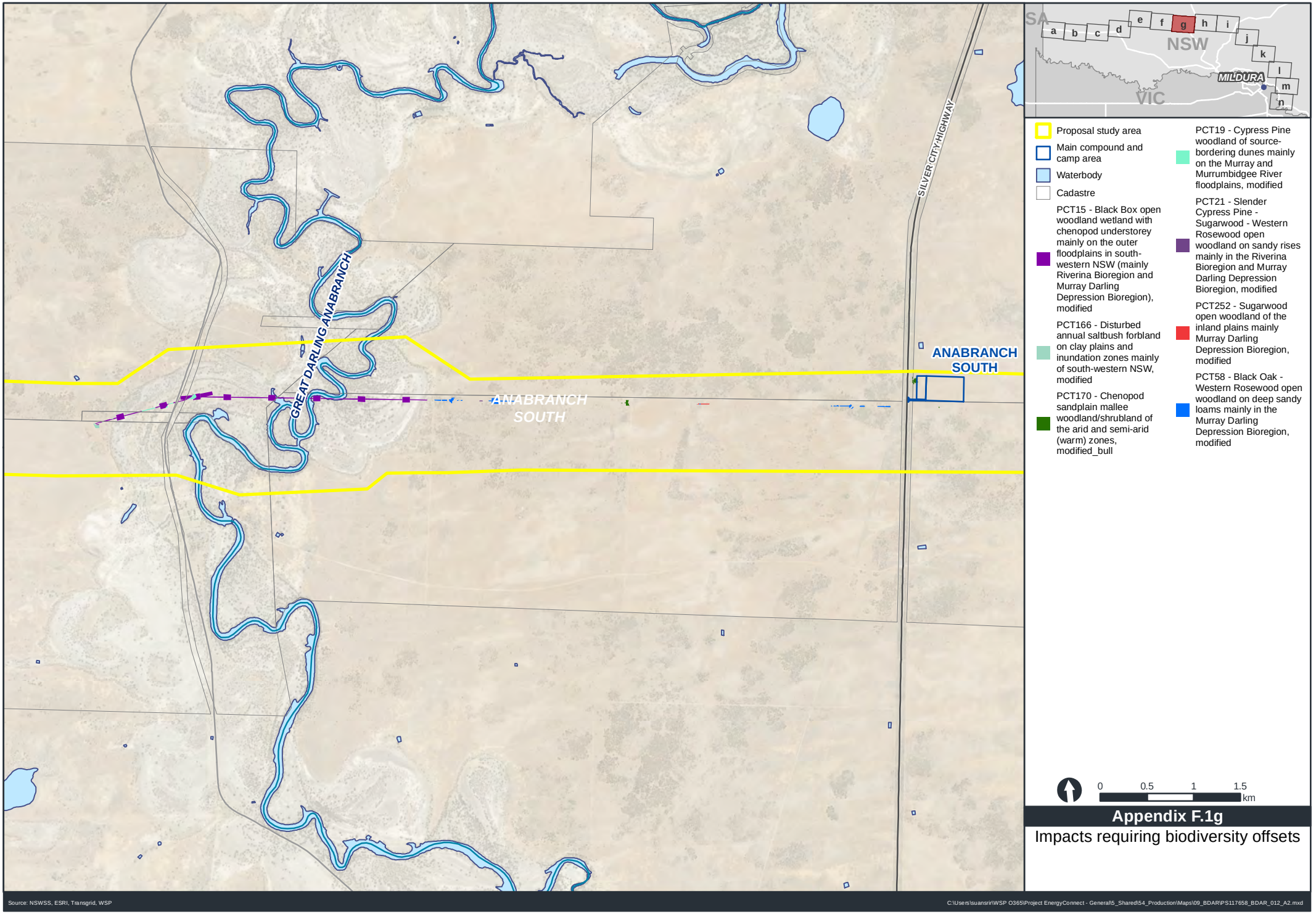
SILVER CITY HIGHWAY
GREAT DARLING ANABRANCH
ANABRANCH SOUTH
ANABRANCH SOUTH
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Main compound and camp area
Waterbody
Cadastre
PCT15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion), modified
PCT166 - Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW, modified
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_bull
PCT19 - Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains, modified
PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, modified
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified
0
0.5
1
1.5
km
Appendix F.1g
Impacts requiring biodiversity offsets
Source: NSWSS, ESRI, Transgrid, WSP
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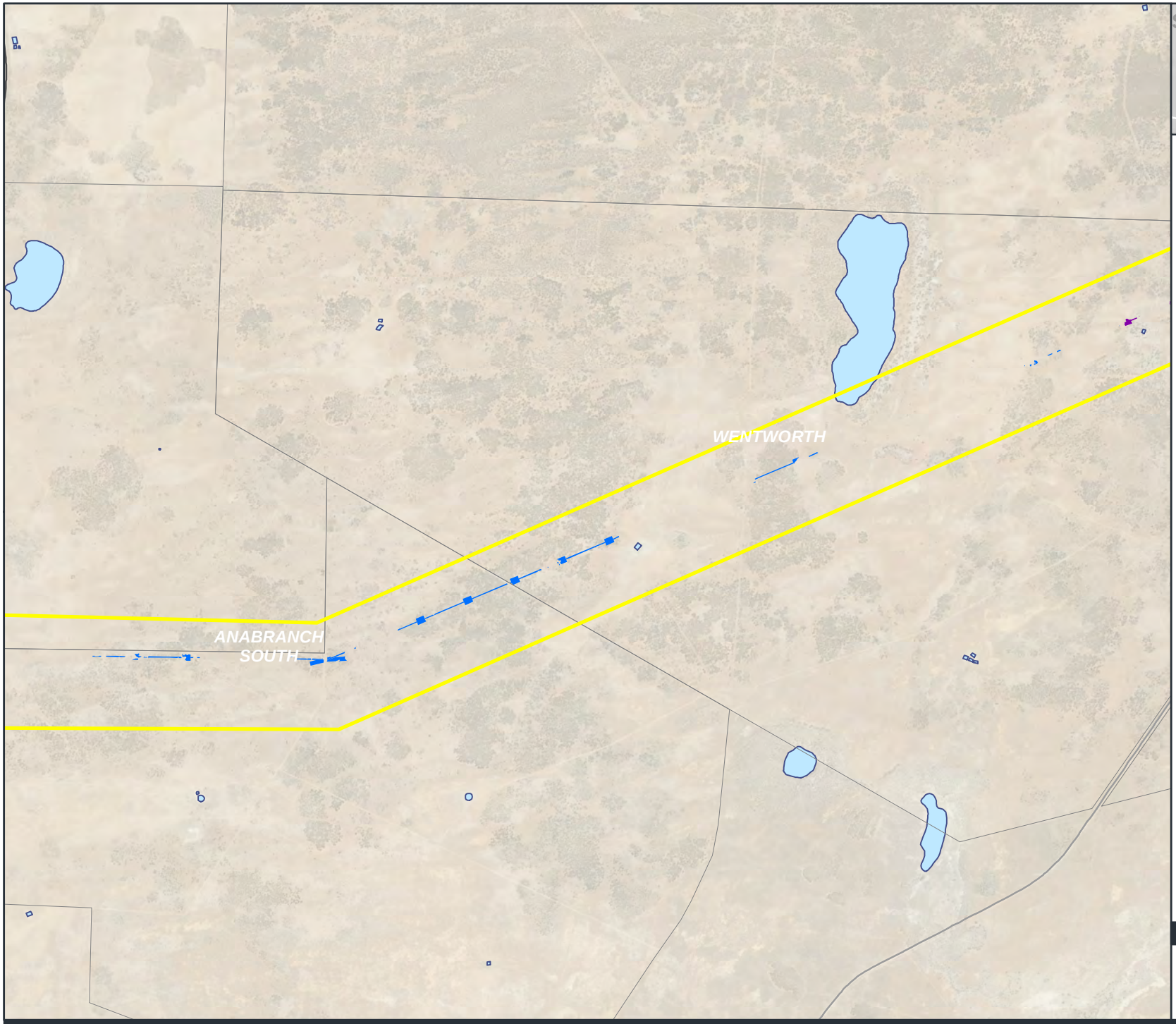
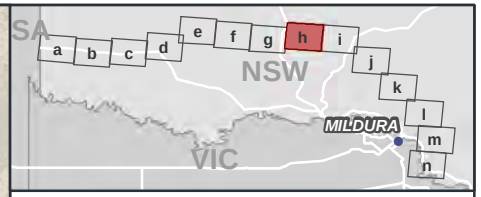




- Proposal study area
- Waterbody
- Cadastre
- PCT15 - Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion), modified
- PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified

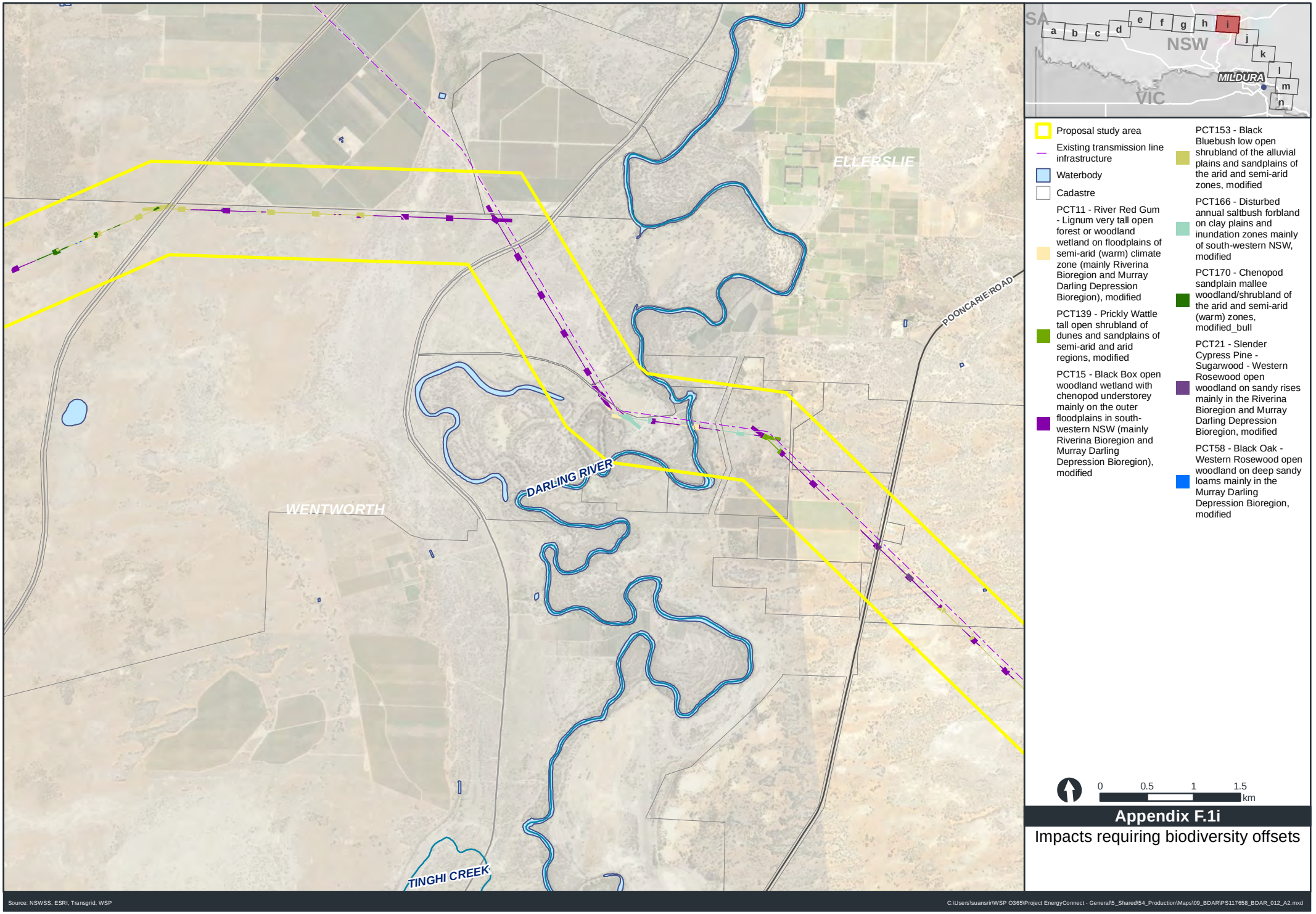
0 0.5 1 1.5 km

Appendix F.1h

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_012_A2.mxd

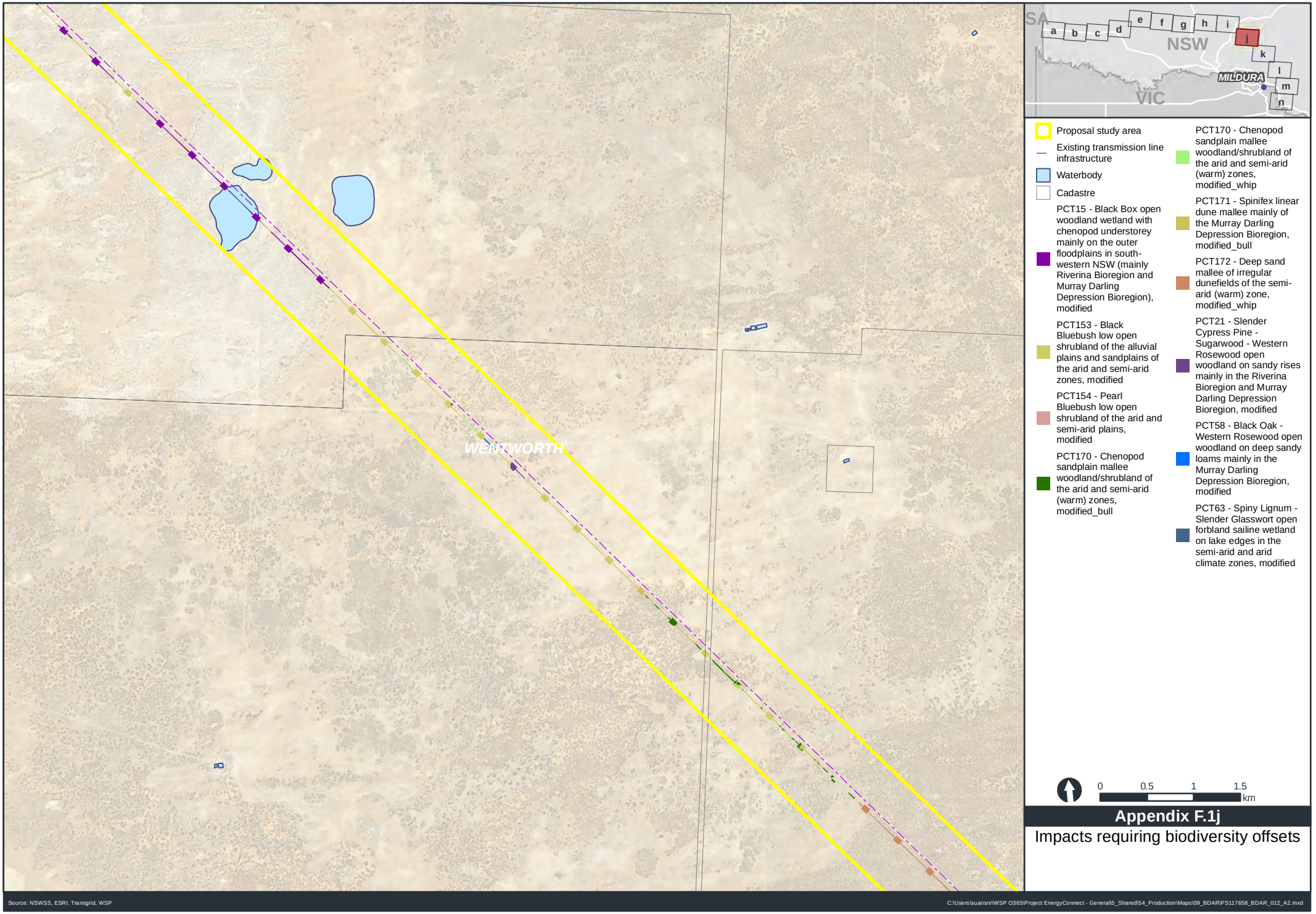


Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_012_A2.mxd

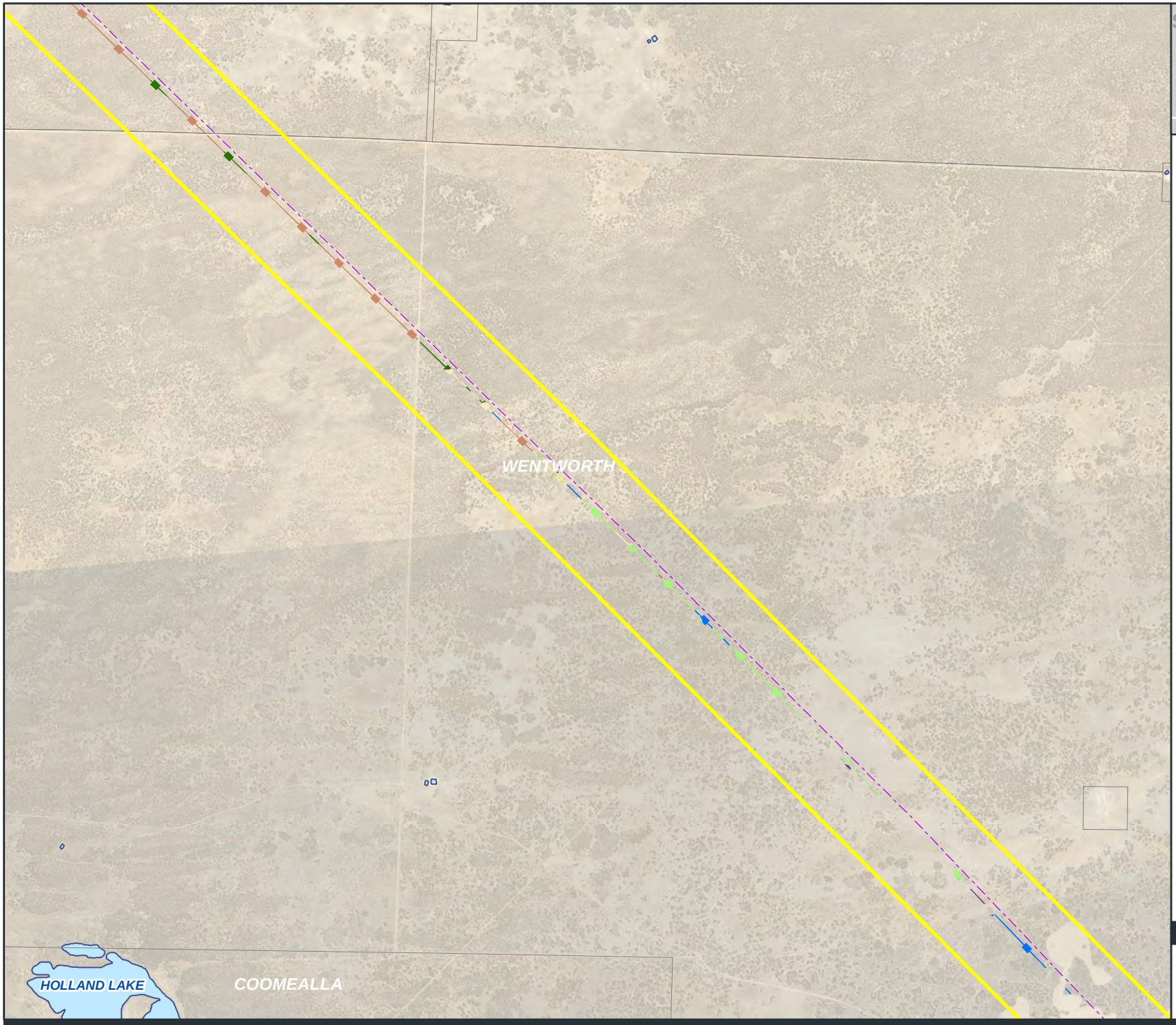
Appendix F.1i

Impacts requiring biodiversity offsets



Appendix F.1j

Impacts requiring biodiversity offsets



- Proposal study area
- Existing transmission line infrastructure
- Waterbody
- Cadastre
- PCT143 - Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes., modified
- PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_bull
- PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, modified_whip
- PCT171 - Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion, modified_whip
- PCT172 - Deep sand mallee of irregular dunefields of the semi-arid (warm) zone, modified_whip
- PCT21 - Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion, modified
- PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, modified
- PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, modified

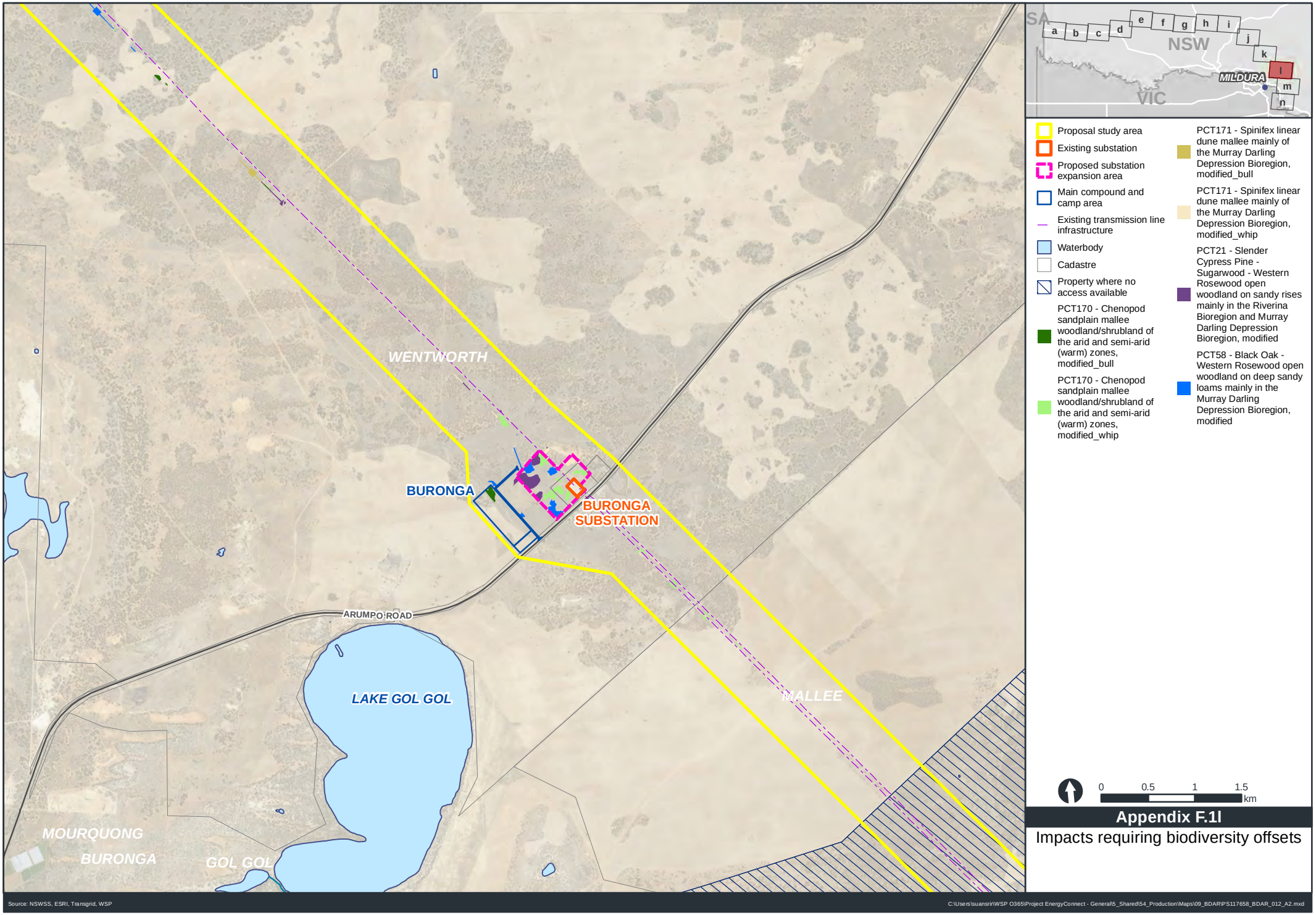
0 0.5 1 1.5 km

Appendix F.1k

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_012_A2.mxd



Appendix F.1l

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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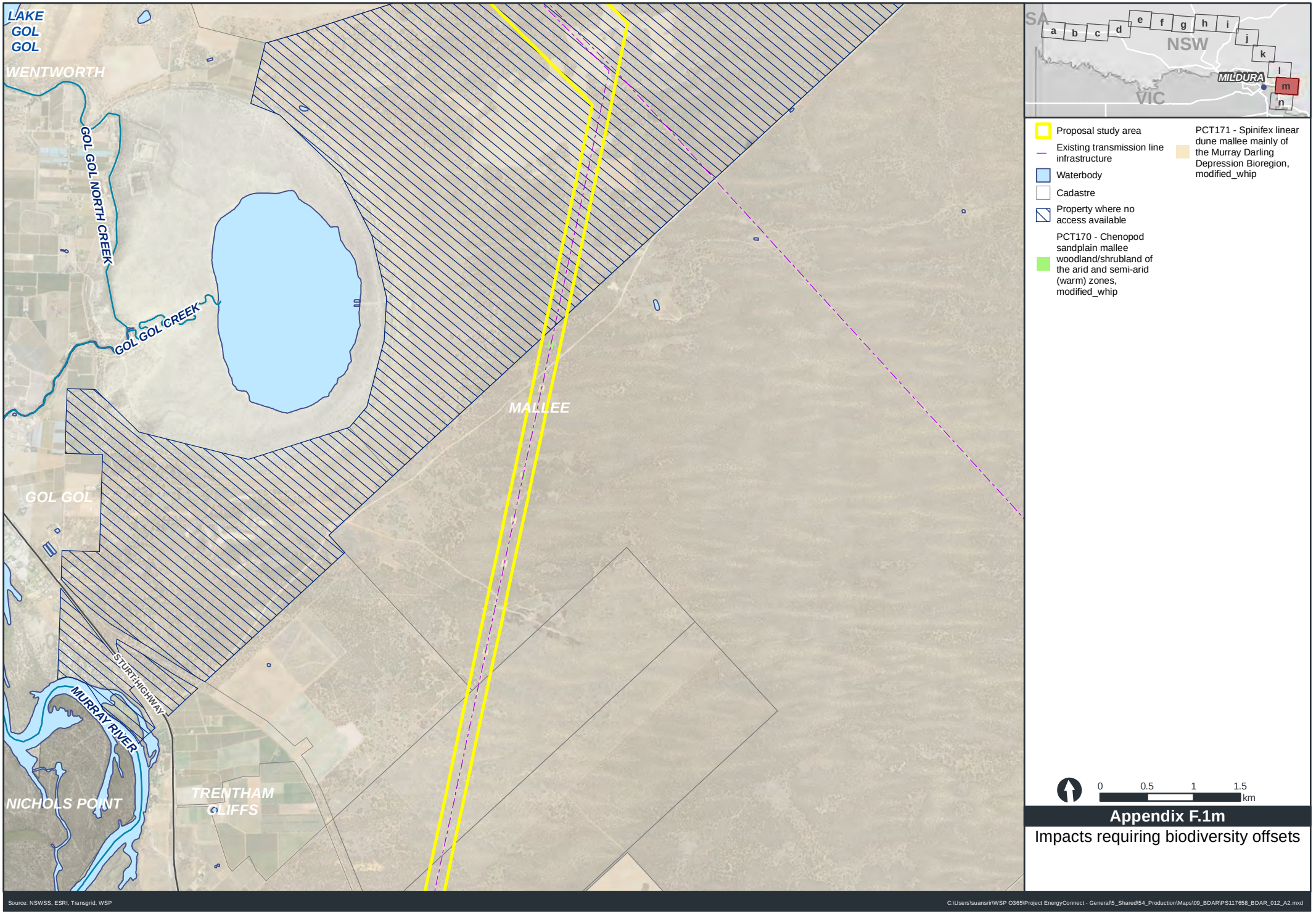

Appendix F.1m

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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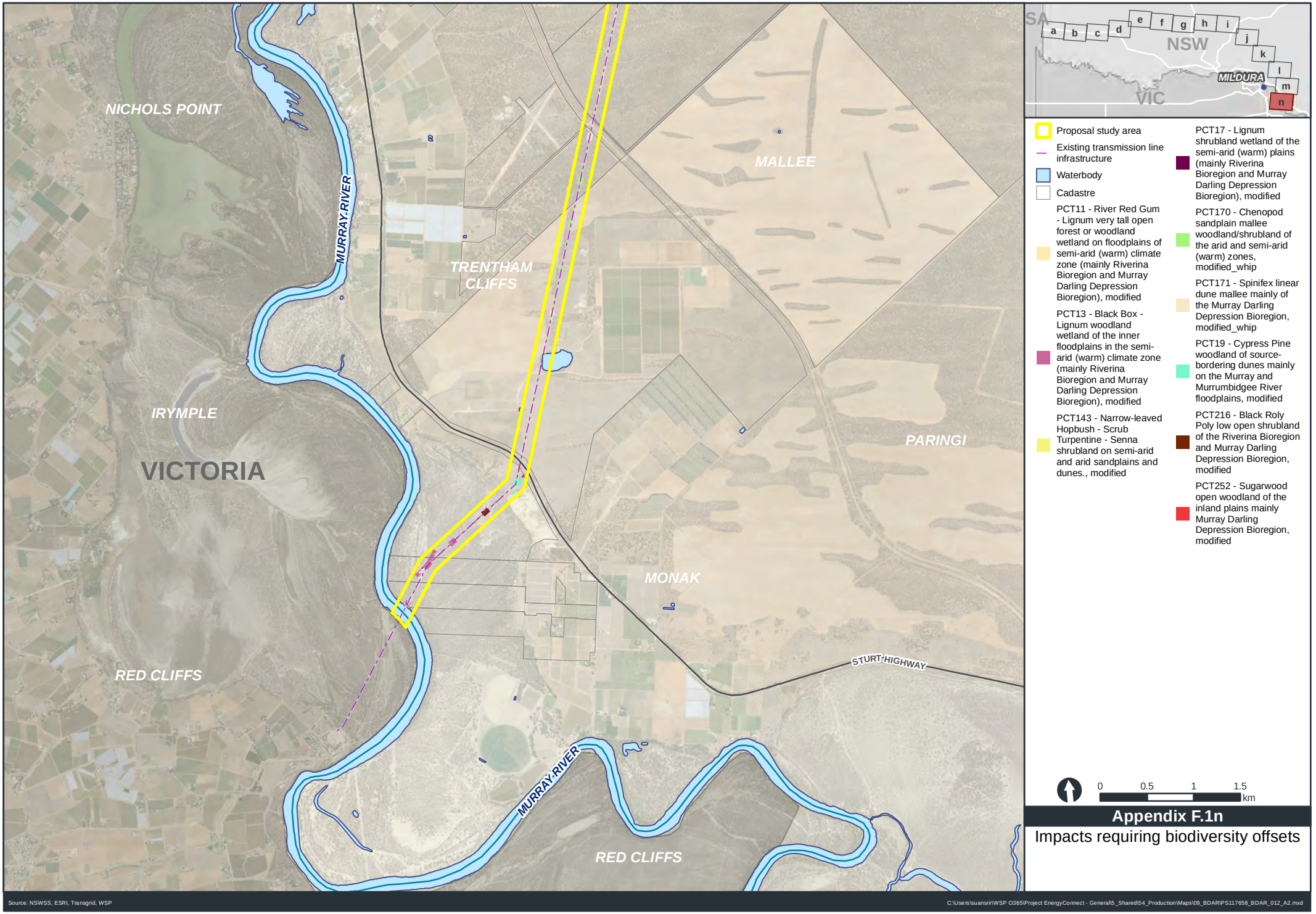


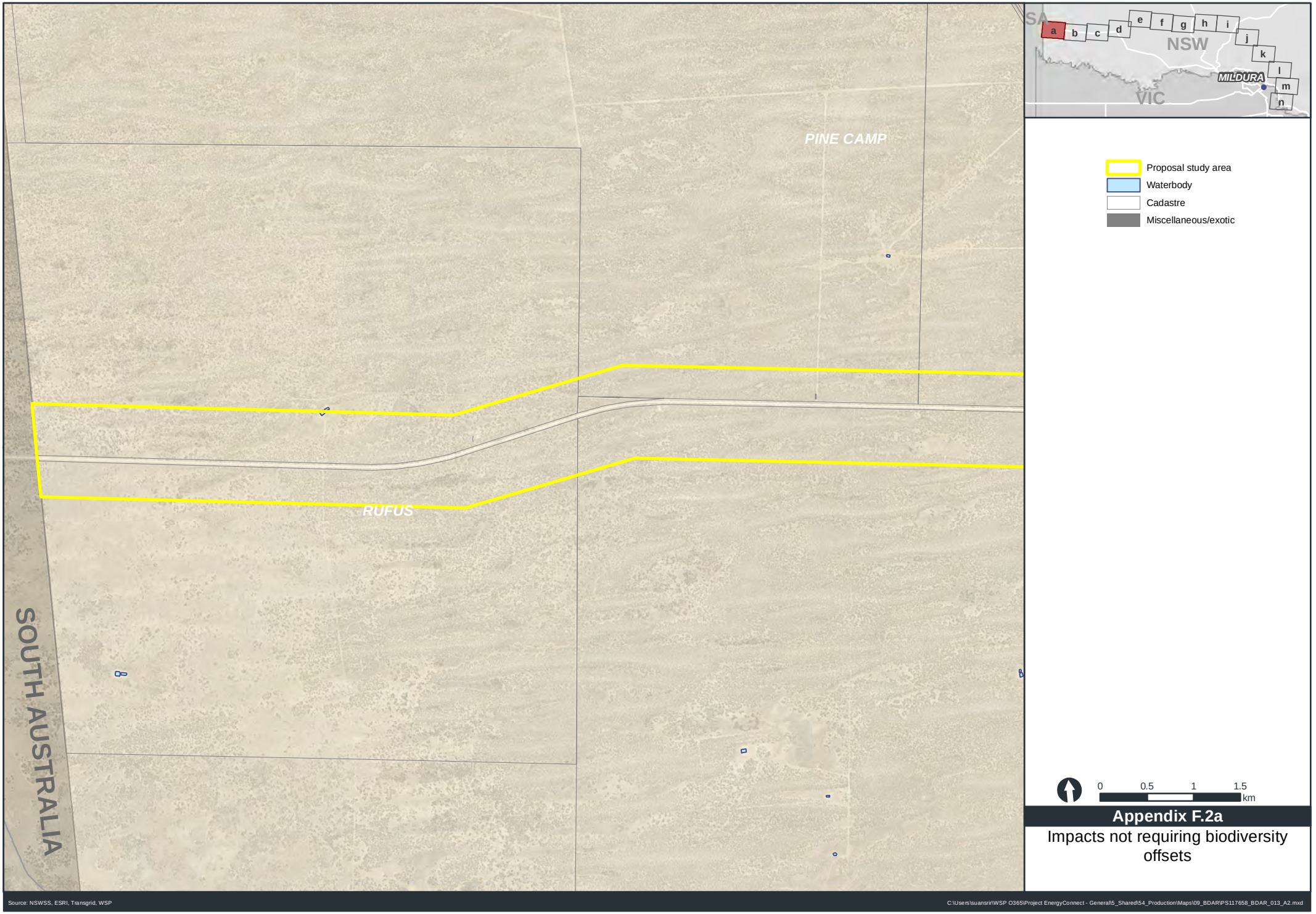
Appendix F.1n

Impacts requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_012_A2.mxd

APPENDIX F-2
IMPACT ASSESSMENT – MAPS SHOWING BIODIVERSITY VALUES THAT DO NOT REQUIRE OFFSETS



Appendix F.2a

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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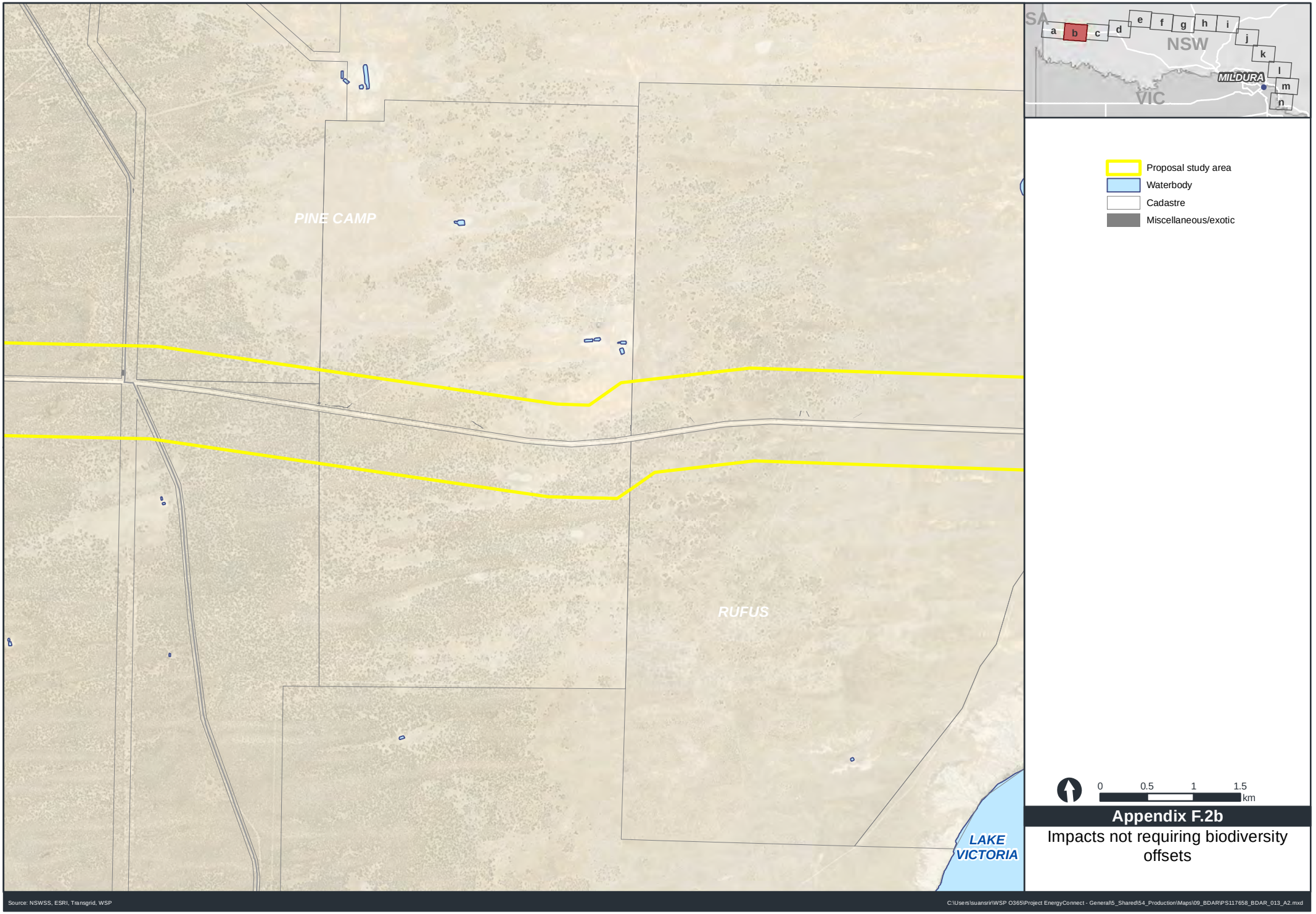
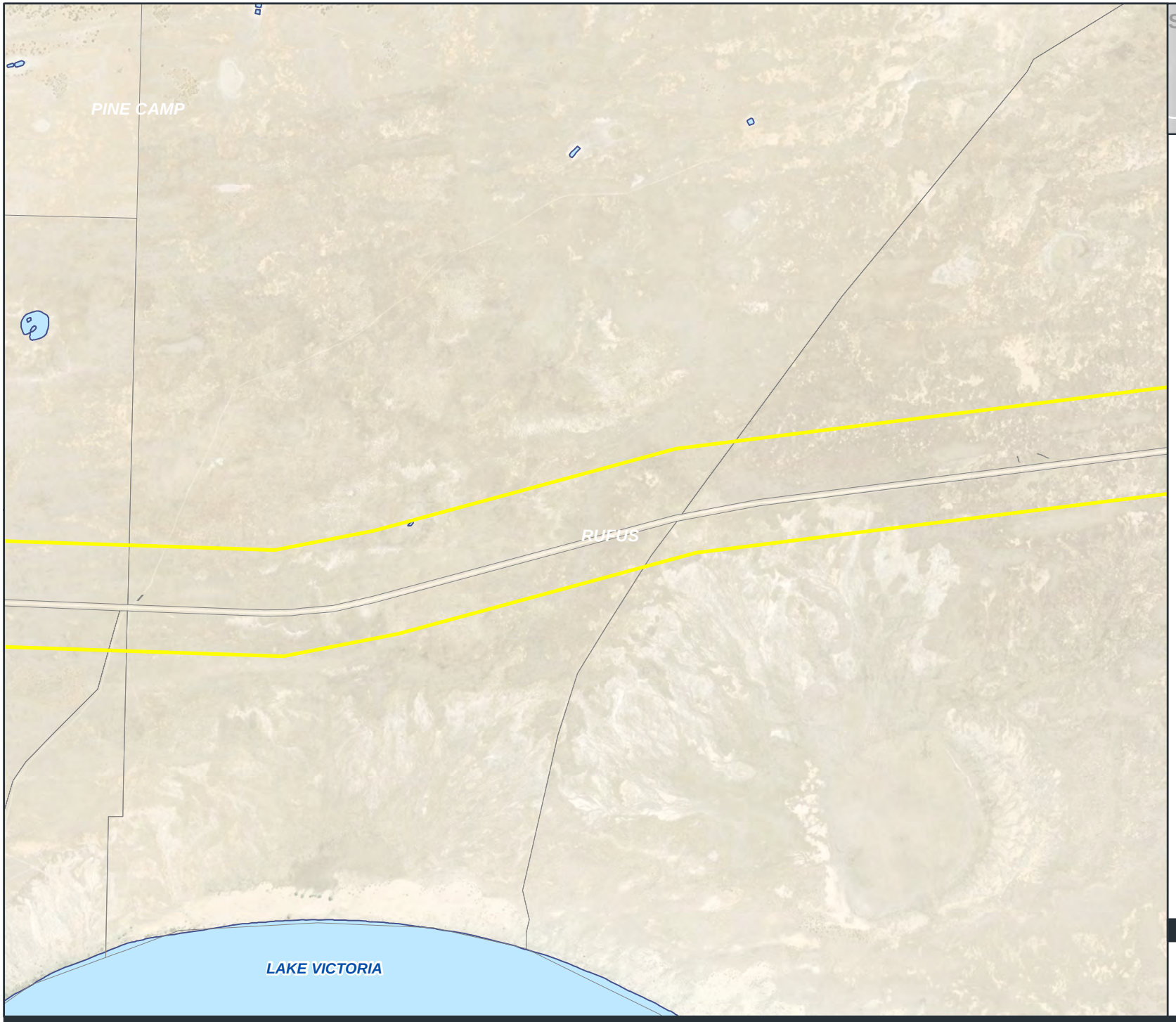


Appendix F.2b

Impacts not requiring biodiversity offsets



Proposal study area
Waterbody
Cadastre
Miscellaneous/exotic

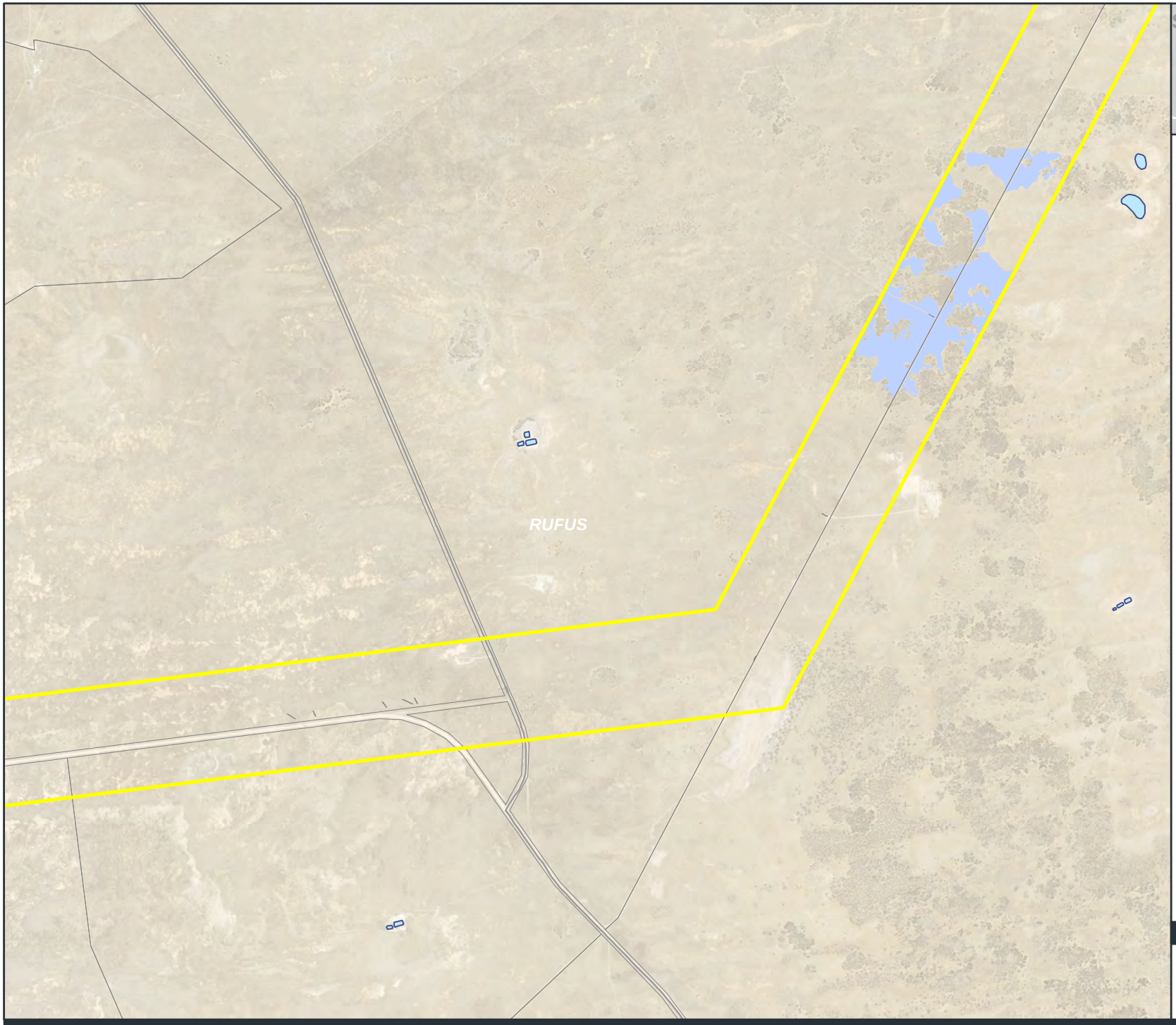
0 0.5 1 1.5
km

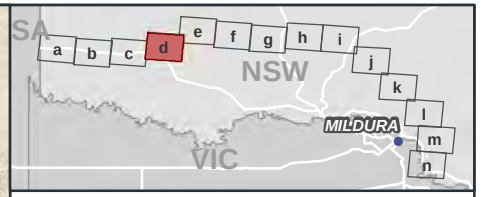
Appendix F.2c

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_013_A2.mxd





Proposal study area

Waterbody

Cadastre

PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived

Miscellaneous/exotic

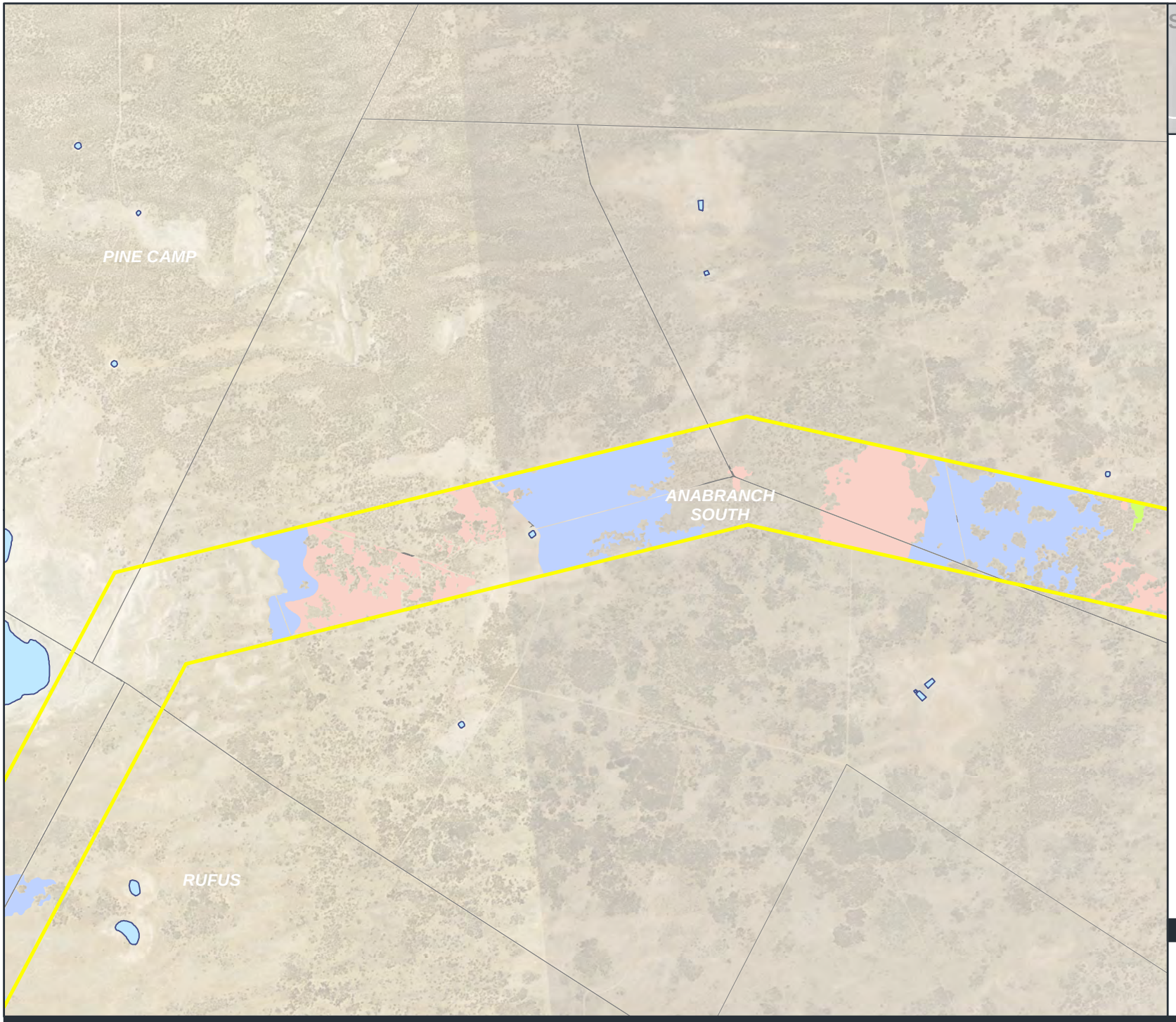
0 0.5 1 1.5 km

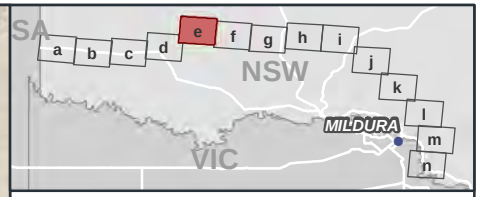
Appendix F.2d

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_013_A2.mxd





Proposal study area
Waterbody
Cadastre
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, derived
PCT252 - Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion, derived
PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived
Miscellaneous/exotic

0 0.5 1 1.5 km

Appendix F.2e

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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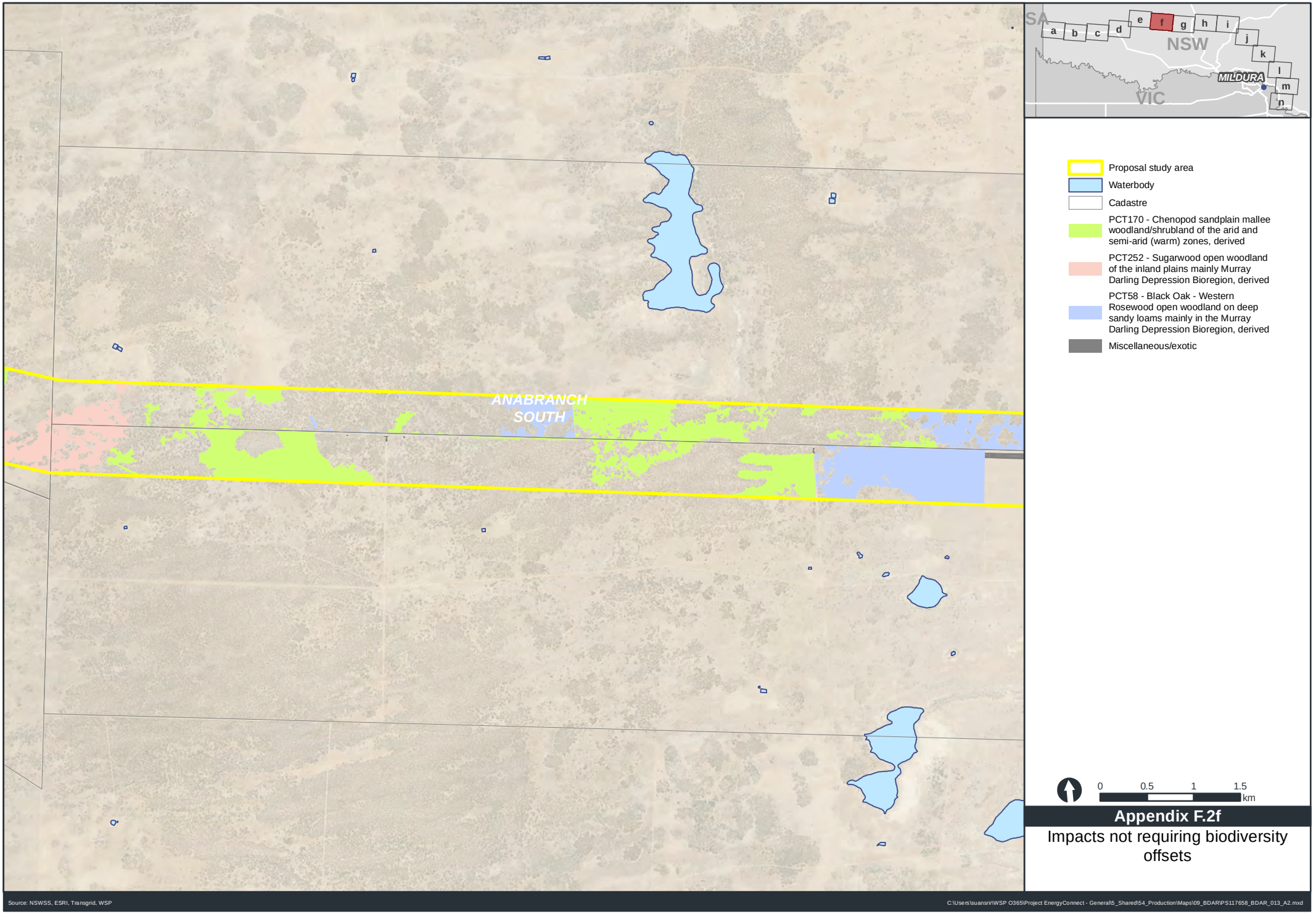
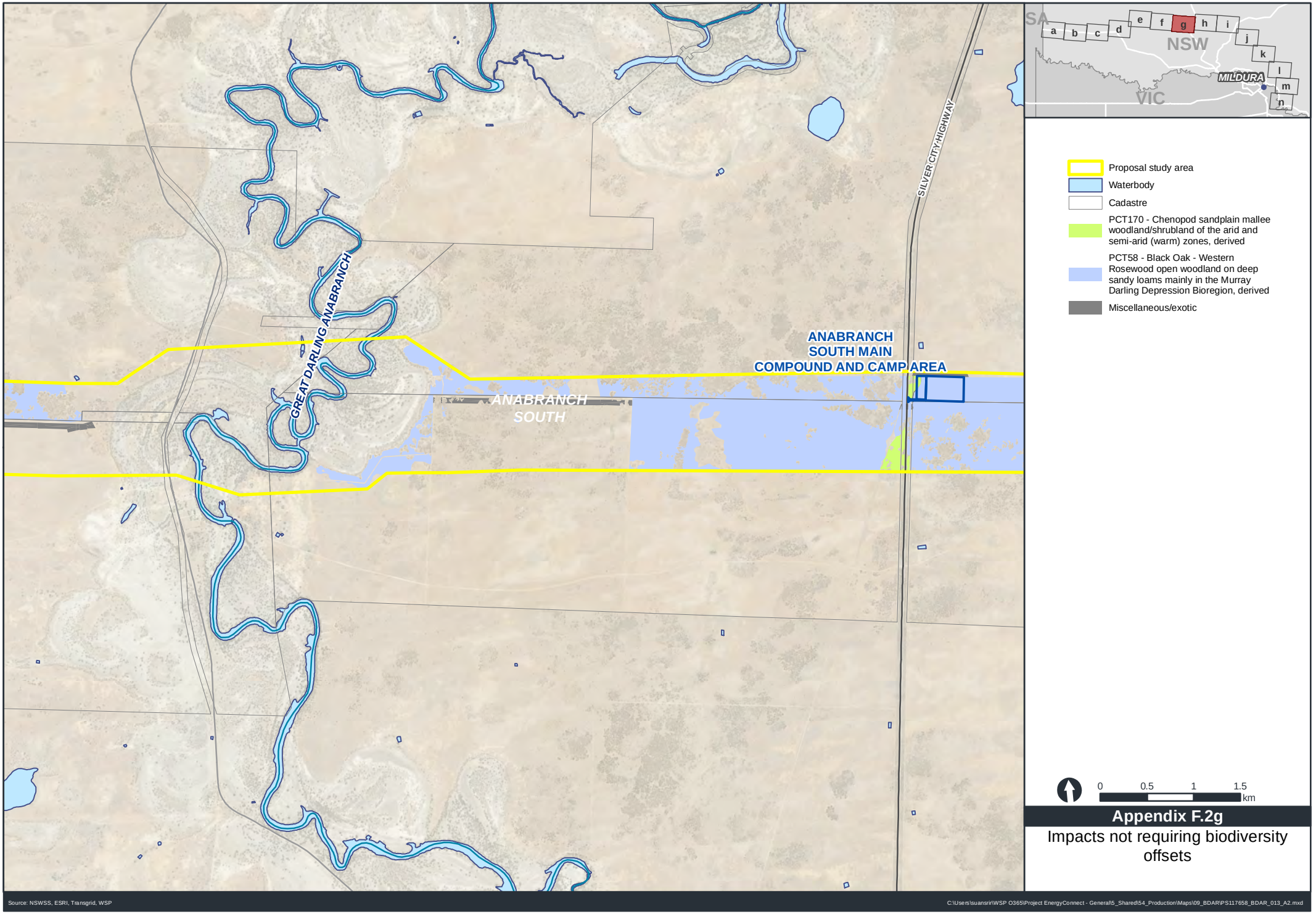


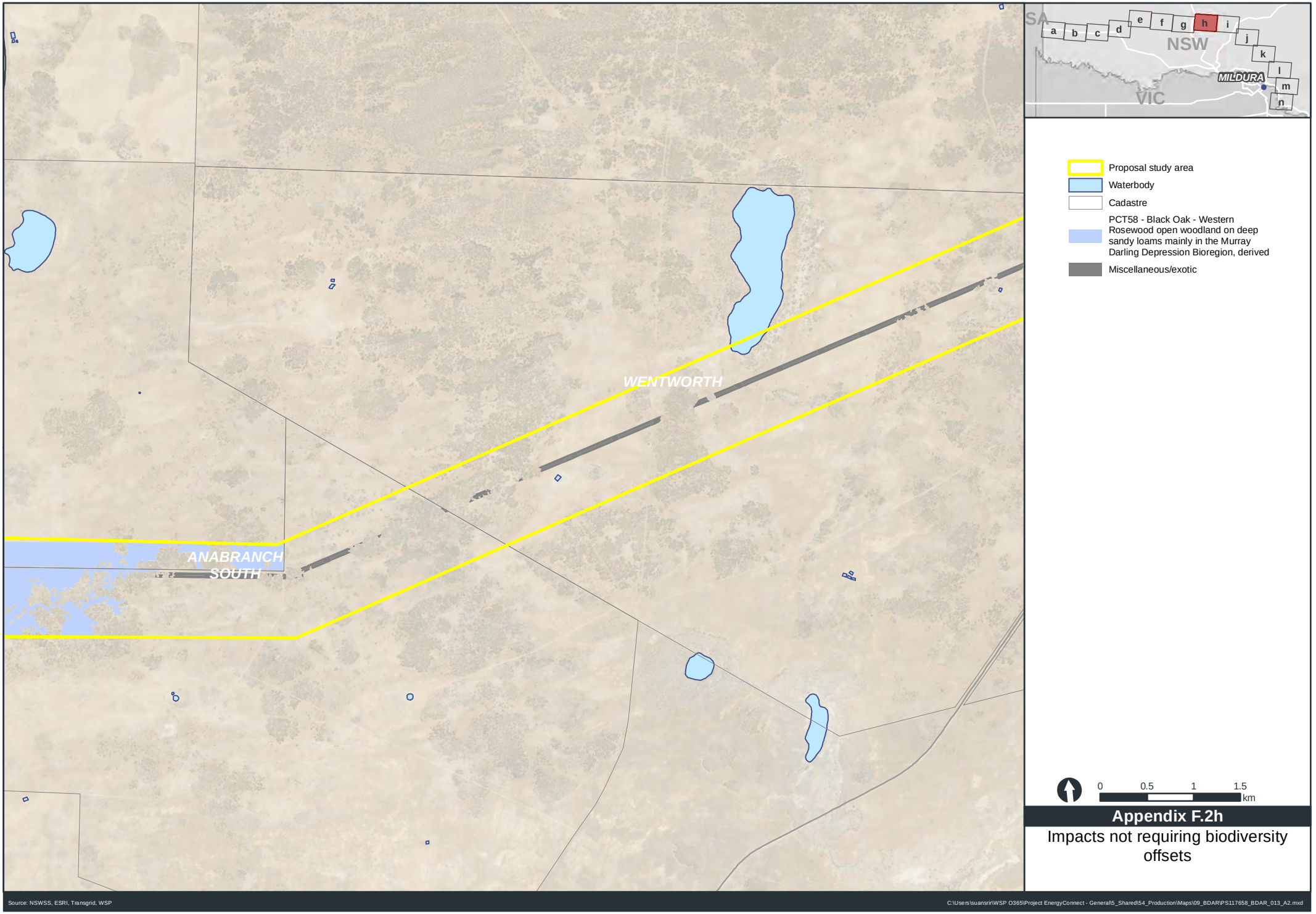
Appendix F.2f

Impacts not requiring biodiversity offsets



Appendix F.2g

Impacts not requiring biodiversity offsets



Appendix F.2h

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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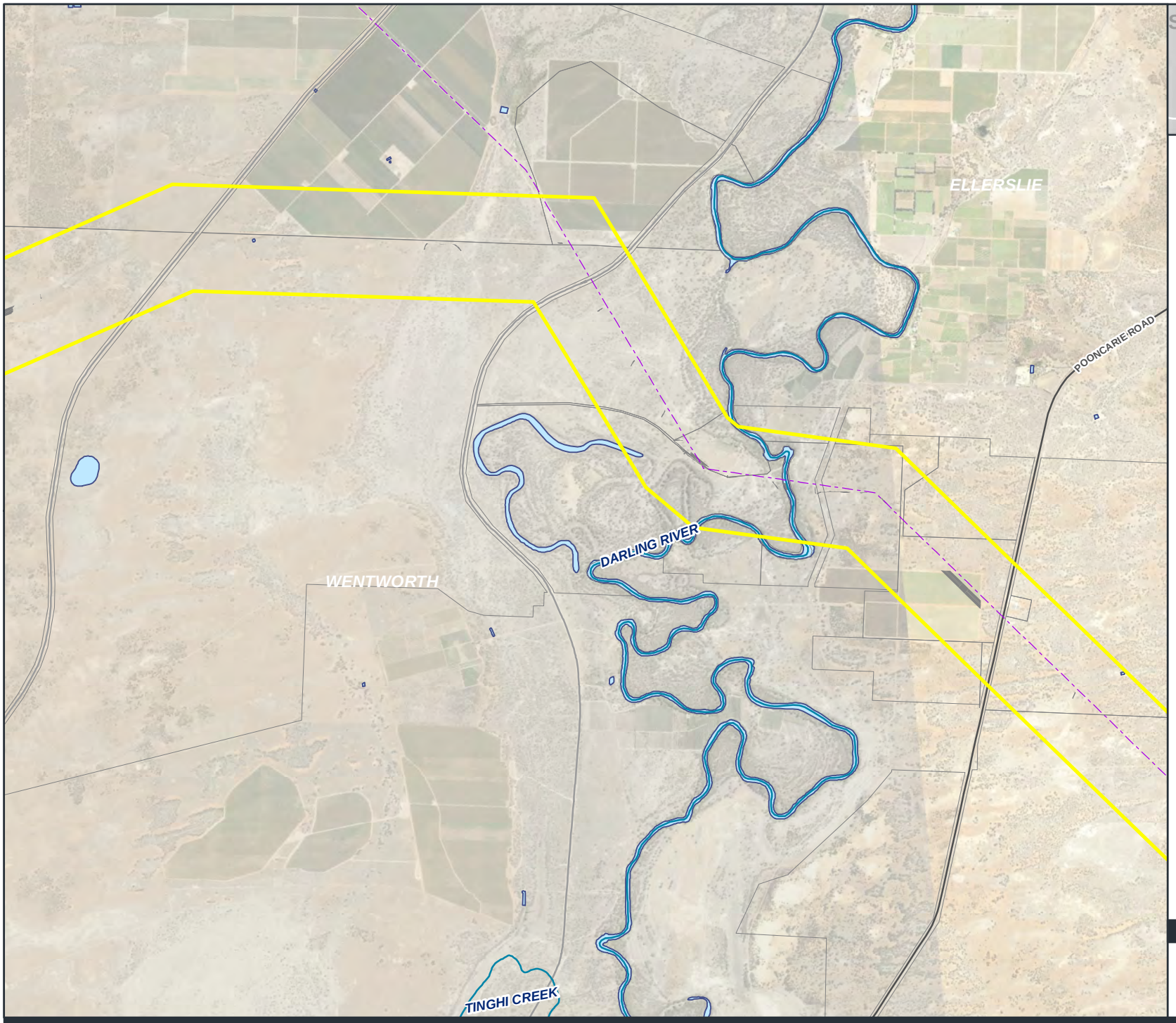
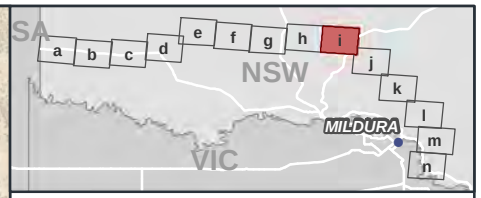




Proposal study area

Existing transmission line infrastructure

Waterbody

Cadastre

Miscellaneous/exotic

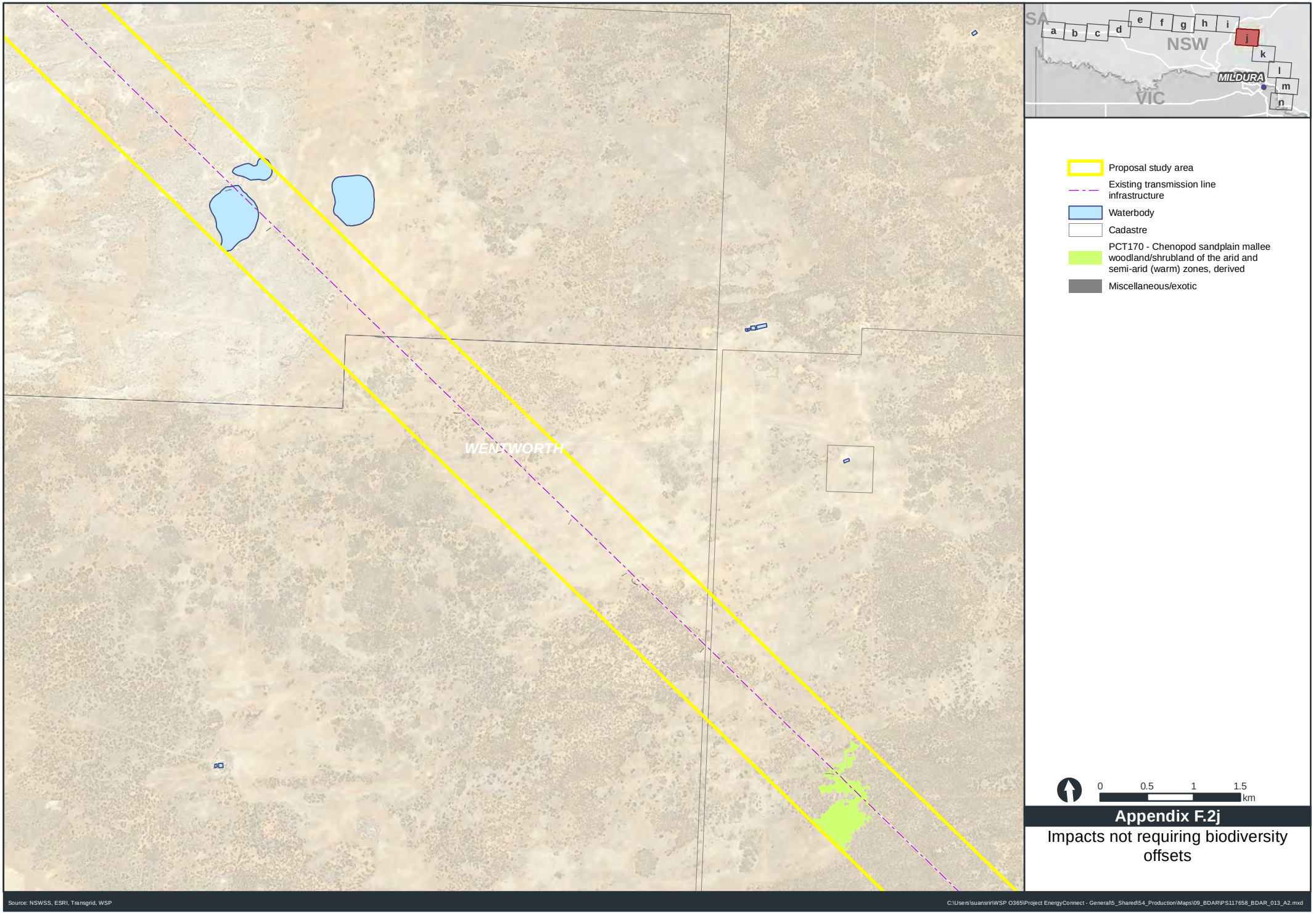
0 0.5 1 1.5 km

Appendix F.2i

Impacts not requiring biodiversity offsets

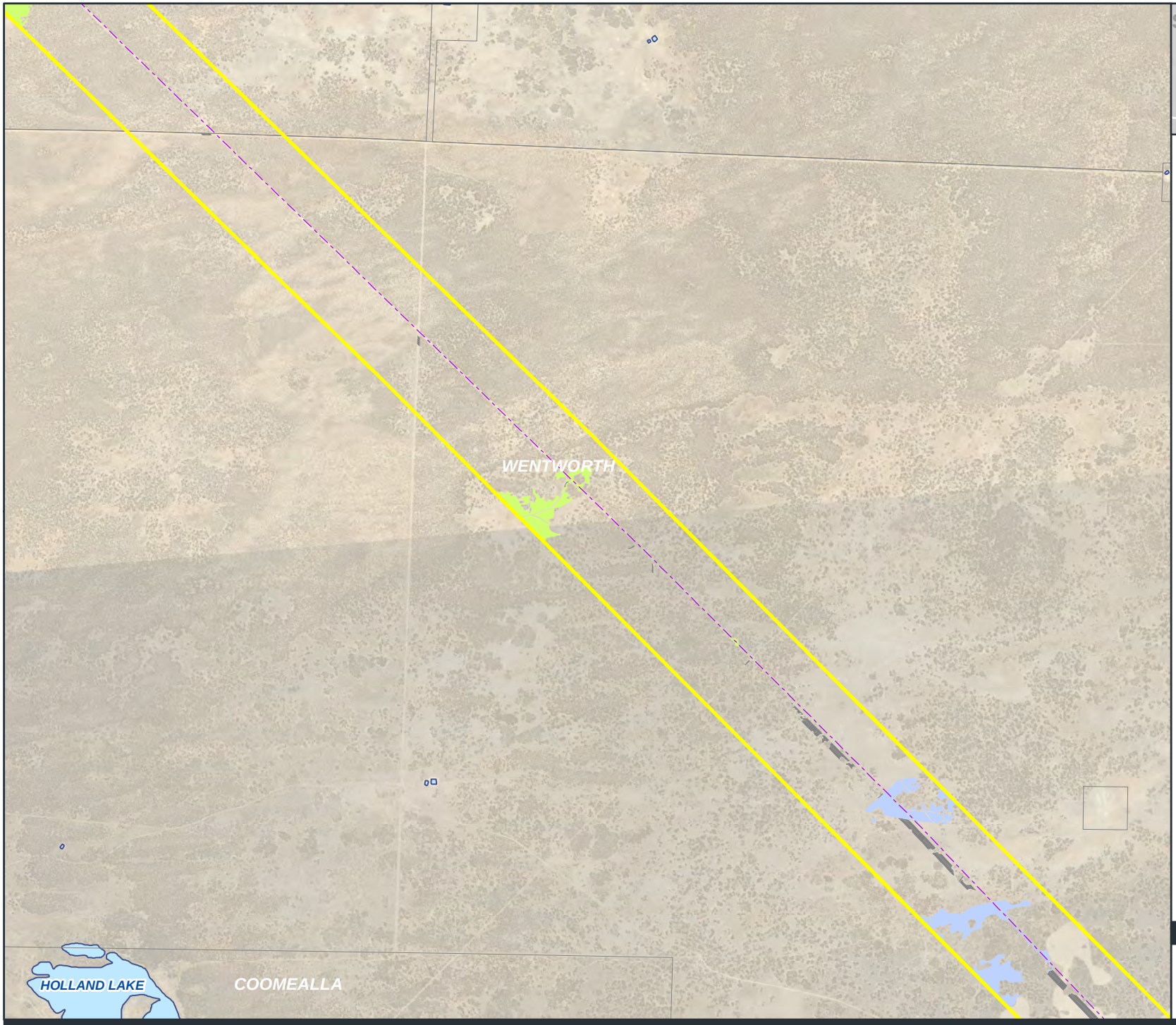
Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_013_A2.mxd



Appendix F.2j

Impacts not requiring biodiversity offsets



Proposal study area

Existing transmission line infrastructure

Waterbody

Cadastre

PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, derived

PCT58 - Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion, derived

Miscellaneous/exotic

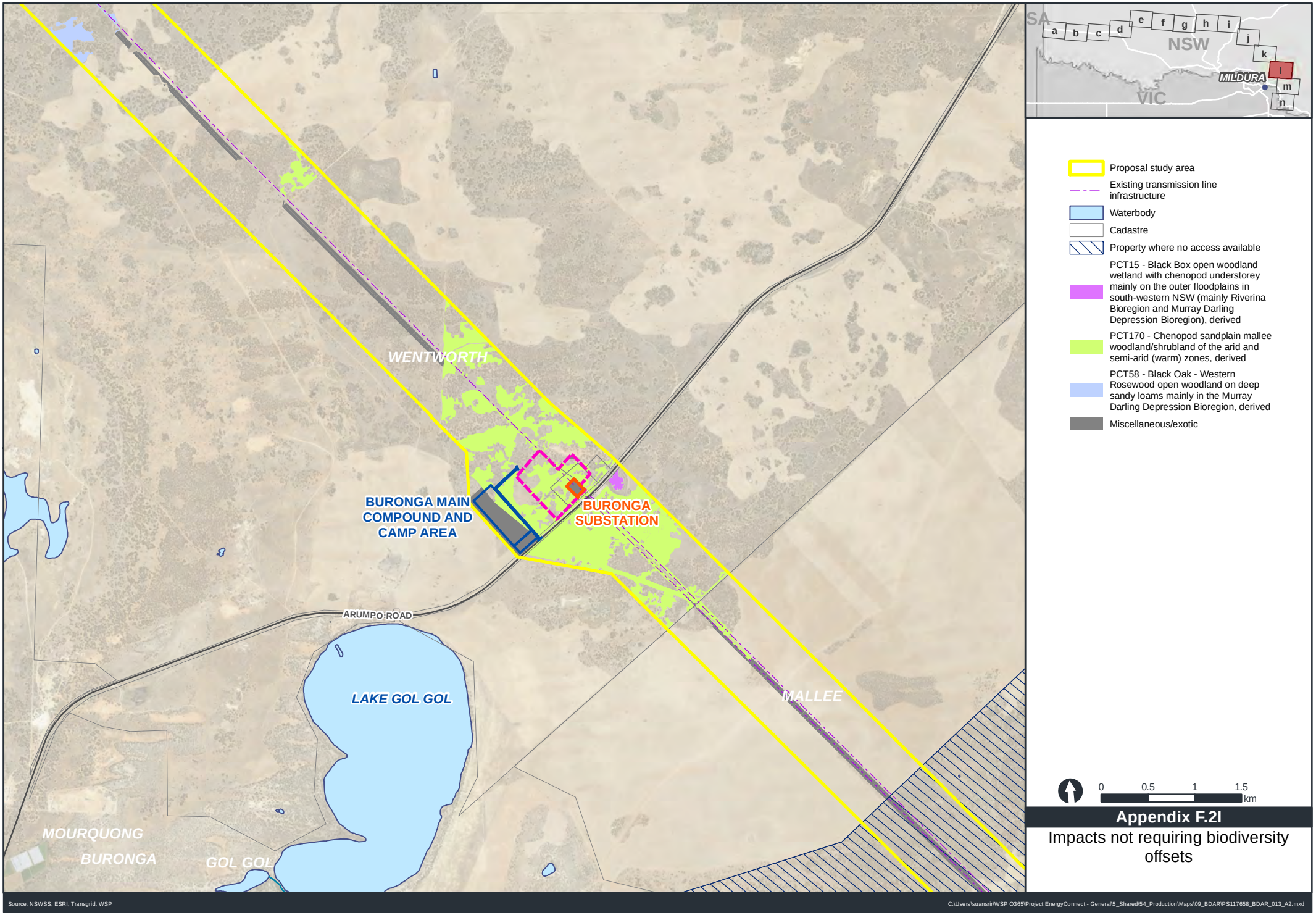
0 0.5 1 1.5 km

Appendix F.2k

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_013_A2.mxd



Appendix F.2l

Impacts not requiring biodiversity offsets

Source: NSWSS, ESRI, Transgrid, WSP

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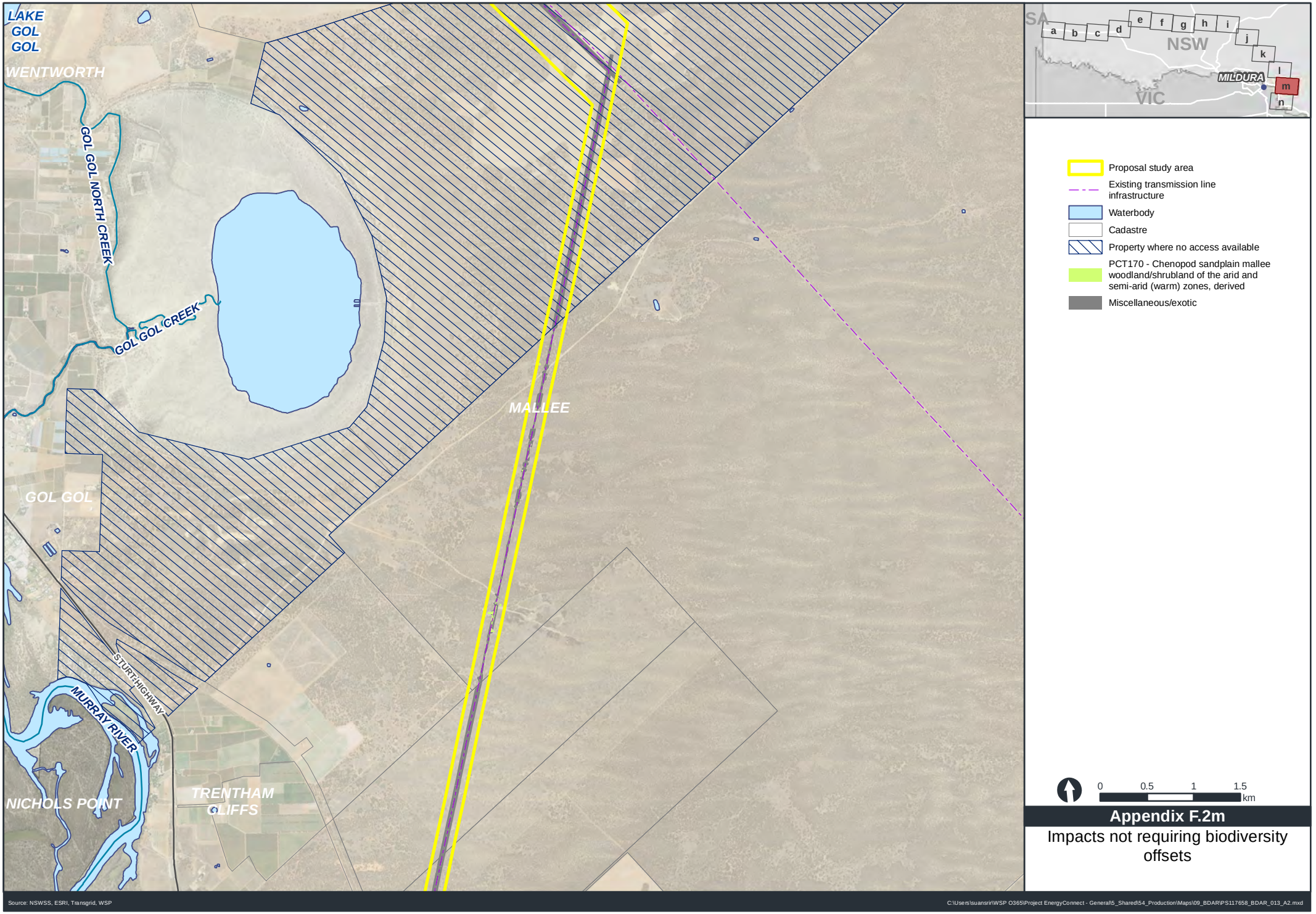
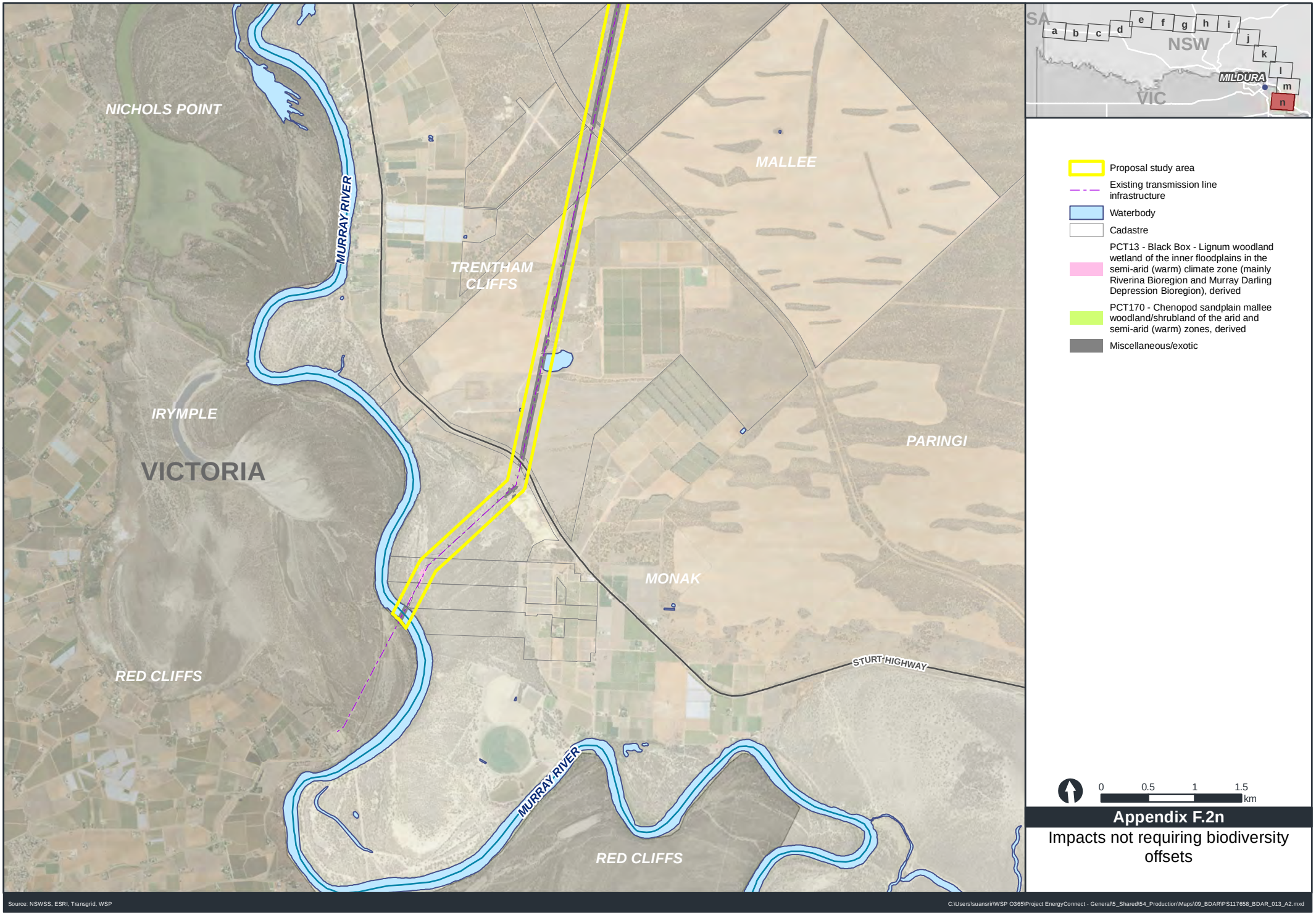


Appendix F.2m

Impacts not requiring biodiversity offsets


NICHOLS POINT
MURRAY RIVER
TRENTHAM CLIFFS
MALLEE
IRYMPLE
VICTORIA
PARINGI
MONAK
RED CLIFFS
STURT HIGHWAY
MURRAY RIVER
RED CLIFFS
SA
NSW
VIC
MILDURA
a
b
c
d
e
f
g
h
i
j
k
l
m
n
Proposal study area
Existing transmission line infrastructure
Waterbody
Cadastre
PCT13 - Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion), derived
PCT170 - Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones, derived
Miscellaneous/exotic
0
0.5
1
1.5
km
Appendix F.2n
Impacts not requiring biodiversity offsets
Source: NSWSS, ESRI, Transgrid, WSP
C:\Users\suansrin\WSP O365\Project EnergyConnect - General\5_Shared\54_Production\Maps\09_BDAR\PS117658_BDAR_013_A2.mxd

APPENDIX F-3
FM ACT ASSESSMENT OF SIGNIFICANCE

F-3.1 AQUATIC ECOLOGICAL COMMUNITY IN THE NATURAL DRAINAGE SYSTEM OF THE LOWLAND CATCHMENT OF THE DARLING RIVER

F-3.1.1 CONSERVATION STATUS

Lowland Darling River aquatic ecological community is listed as Endangered under the FM Act.

F-3.1.2 DESCRIPTION

The aquatic ecological community of the lowland Darling River includes all native fish and aquatic invertebrates within all natural creeks, rivers, streams and associated lagoons, billabongs, lakes, anabranches, flow diversions to anabranches and floodplains of the Darling River within NSW. The listing includes:

- Menindee Lakes
- Barwon River
- main Barwon-Darling channel from Mungindi (Qld-NSW border) to the convergence with the Murray River
- the arid zone intermittent intersection streams (Warrego, Culgoa, and Narran rivers)
- the border rivers (Macintyre, Severn, and Dumaresq rivers)
- the regulated tributaries (Gwydir, Namoi, Macquarie, Castlereagh, and Bogan rivers).

Artificial canals, water distribution and drainage works, farm dams and off-stream reservoirs are excluded from the aquatic ecological community. The community has a diverse assemblage of native species, including 21 native fish species and hundreds of species of native invertebrates, many of which have not been comprehensively studied.

The Darling River aquatic ecological community occurs in a lowland riverine environment, characterised by meandering channels and a variety of habitats, including deep channels, pools, wetlands, gravel beds and flood plains. The complex river morphology provides a multitude of habitats that play a critical role in the life cycles of the species comprising the community. In their natural state, many of the water bodies in this area are characterised by variable and unpredictable patterns of high and low flows. This variability in environmental conditions has led to adaptations in native aquatic flora and fauna; for example, many fish species rely on the seasonal flow pattern to trigger spawning and create suitable breeding habitats.

F-3.1.3 SPECIFIC IMPACTS

The proposal would span the Great Darling Anabranch and Darling River.

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

F-3.1.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions. It is unlikely that the minor works would adversely effect or modify the extent of this ecological community such that its occurrence is placed at risk of extinction.

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
- **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of the community's quality.

It is recommended that mitigation measures include the implementation of weed and pest management plans, vegetation clearing protocols, and installation vehicle wash stations to reduce the limit the spread of weeds, pathogens, and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occurs within or near these TECs to minimise sedimentation and hydrological impacts. As such, it is unlikely that the proposed action would significantly further fragment, isolate or substantially modify the community to the point that the community does not persist in the locality.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been listed for the community. Furthermore, it is unlikely that the persistence of the community within the proposal study area constitutes important habitat, and as such, is not considered the occurrence of the community with the proposal study area is critical to the survival of the community.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

No recovery plan has been produced for this community. However, the following recovery actions have been provided for the community within its range:

- allocate and manage environmental water flows in regulated rivers to lessen the impacts of unseasonal flow and temperature patterns
- conserve and (where possible) restore habitats by protecting aquatic and riparian vegetation and encouraging the use of effective erosion control measures
- mitigate the impact of cold water pollution from major regulating structures
- develop and implement control programs for introduced species
- reinstate large woody debris where appropriate
- manage fishing activities to ensure sustainable fisheries are maintained
- provide fish passage by removing barriers or installing fishways in consultation with affected stakeholders.

The proposed action is not consistent with the '*conserve and (where possible) restore habitats by protecting aquatic and riparian vegetation'*. It is recommended that mitigation measures include the implementation of weed and pest management plans, vegetation clearing protocols, and installation vehicle wash stations to reduce the limit the spread of weeds, pathogens, and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occurs within or near these TECs to minimise sedimentation and hydrological impacts. It is unlikely that the proposed action (i.e. minor works around riparian vegetation trimming on river banks) would be significant impact this community and unlikely to adversely interfere significantly with any of the management or recovery actions for the community.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this community are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the community within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of the community's quality.

- **CONCLUSION**

The proposal would span the Great Darling Anabranch and Darling River and would provide minor direct impacts on the vegetation that forms part of this ecological community. The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions. It is unlikely that the proposed action would lead to a significant impact to this listed community.

F-3.2 AQUATIC ECOLOGICAL COMMUNITY IN THE NATURAL DRAINAGE SYSTEM OF THE LOWER MURRAY RIVER CATCHMENT

F-3.2.1 CONSERVATION STATUS

Lower Murray River aquatic ecological community is listed as Endangered under the FM Act.

F-3.2.2 DESCRIPTION

The Lower Murray aquatic ecological community includes all native fish and aquatic invertebrates within all natural creeks, rivers and associated lagoons, billabongs, and lakes of the regulated portions of the Murray, Murrumbidgee, and Tumut rivers, as well as all their tributaries and branches. The listing includes:

- Murray River below Hume Weir
- Murrumbidgee River below Burrinjuck Dam
- Tumut River below Blowering Dam
- Billabong Creek, Yanco Creek, Colombo Creek, and their tributaries
- Frenchmans Creek
- Edward River, the Wakool River, and their tributaries
- Rufus River
- Lake Victoria.

The Lachlan and Darling rivers and their tributaries, along with artificial canals, water distribution and drainage works, farm dams and off-stream reservoirs, are excluded from the aquatic ecological community. The community includes 23 native fish species and over 400 recorded native invertebrate species. The lower Murray ecological community occurs in a lowland riverine environment, characterised by meandering channels and wide floodplains. The land is generally flat to gently sloping. In their natural state, these lowland rivers experienced extremely variable water flows, ranging from floods to droughts. Variability in environmental conditions has led to adaptations in the native aquatic flora and fauna; for example, many species rely on floods to trigger spawning and create suitable breeding habitats. Lowland rivers provide a wide range of habitats for fish and invertebrates, including pools, runs or riffles, backwaters and billabongs, large woody habitats, and aquatic plants. Floodplains also provide a mosaic of habitat types, including permanent and temporary wetlands, as well as terrestrial habitats.

F-3.2.3 SPECIFIC IMPACTS

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

F-3.2.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions. It is unlikely that the minor works would adversely effect or modify the extent of this ecological community such that its occurrence is placed at risk of extinction.

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
  - **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of the community's quality.

It is recommended that mitigation measures include the implementation of weed and pest management plans, vegetation clearing protocols, and installation vehicle wash stations to reduce the limit the spread of weeds, pathogens, and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occurs within or near these TECs to minimise sedimentation and hydrological impacts. As such, it is unlikely that the proposed action would significantly further fragment, isolate or substantially modify the community to the point that the community does not persist in the locality.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been listed for the community. Furthermore, it is unlikely that the persistence of the community within the proposal study area constitutes important habitat, and as such, is not considered the occurrence of the community with the proposal study area is critical to the survival of the community.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

No recovery plan has been produced for this community. However, the following recovery actions have been provided for the community within its range:

- allocate and manage environmental water flows in regulated rivers to lessen the impacts of unseasonal flow and temperature patterns
- conserve and (where possible) restore habitats by protecting aquatic and riparian vegetation and encouraging the use of effective erosion control measures
- mitigate the impact of cold water pollution from major regulating structures
- develop and implement control programs for introduced species
- reinstate large woody debris where appropriate
- manage fishing activities to ensure sustainable fisheries are maintained
- provide fish passage by removing barriers or installing fishways in consultation with affected stakeholders.

The proposed action is not consistent with the '*conserve and (where possible) restore habitats by protecting aquatic and riparian vegetation'*. It is recommended that mitigation measures include the implementation of weed and pest management plans, vegetation clearing protocols, and installation vehicle wash stations to reduce the limit the spread of weeds, pathogens, and disease. Sediment and control measures around large-scale excavation works and stockpiles areas that occurs within or near these TECs to minimise sedimentation and hydrological impacts. It is unlikely that the proposed action (i.e. minor works around riparian vegetation trimming on river banks) would be significant impact this community and unlikely to adversely interfere significantly with any of the management or recovery actions for the community.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS.**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this community are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the community within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of the community's quality.

- **CONCLUSION**

The proposal would span the Great Darling Anabranch and Darling River and would provide minor direct impacts on the vegetation that forms part of this ecological community. The proposal disturbance area would lead to modification of native vegetation associated with the riparian zone influence of this community. Disturbance within the riparian zone would be limited to upper stratum tree removal with all shrub and ground stratum vegetation below two metres in height would be retained in-situ. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions. It is unlikely that the proposed action would lead to a significant impact to this listed community.

F-3.3 DARLING RIVER SNAIL AND HANLEY'S RIVER SNAIL

The Darling River Snail (*Notopala sublineata*) and Hanley's River Snail (*Notopala hanleyi*) have been grouped for assessment owing to family similarities and overlap in ecology and habitat preferences.

F-3.3.1 CONSERVATION STATUS

- Darling River Snail (*Notopala sublineata*) is listed as Critically Endangered under the FM Act.
- Hanley's River Snail (*Notopala hanleyi*) is listed as Critically Endangered under the FM Act.

F-3.3.2 DESCRIPTION

The Darling River Snail (*Notopala sublineata*) is restricted to the Darling River and its tributaries. Collections and sightings of the species in NSW declined in the 1960s and 1970s and by the 1980s, populations were thought to only occur in a small number of locations. The species once occurred in flowing rivers throughout the Murray-Darling system, along the banks attached to logs and rocks or crawling in the mud. Artificially introduced hard surfaces now provide habitat for the species with populations being recorded as surviving in irrigation pipelines. The pipeline environment is thought to promote microbial production and organic accumulation, which is a highly nutritious food source for the species. The Darling River Snail feeds on the bacteria and microflora associated with detritus.

The Hanley's River Snail (*Notopala hanleyi*) once occurred in flowing, well oxygenated waters throughout the Murray River catchment. Artificially introduced hard surfaces now provide habitat for the species with populations being recorded as surviving in irrigation pipelines. The pipeline environment is thought to promote microbial production and organic accumulation, which is a highly nutritious food source for the species. Hanley's River Snail feeds on the bacteria and microflora associated with detritus.

F-3.3.3 SPECIFIC IMPACTS

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Regarding the Darling River Snail and Hanley's River Snail, it is unlikely that any direct impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures.

F-3.3.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Potential habitat for both species was identified in the proposal study area in relation to freshwater rivers & creeks. It is unlikely that any significant impact on known or potential habitat (i.e. irrigation pipelines or permanent freshwater creeks/rivers) would occur because of the proposal. Minor works involving riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. Due to the minor works to be undertaken it is unlikely that the proposed action would affect the life cycle of individuals within the population through the minor disturbance of vegetation trimming of riparian banks.

Given that the proposal is only likely to remove a small proportion of adjacent habitat for the species and that measures to minimise any potential indirect impacts, the proposal is unlikely to affect the life cycle of either species to such an extent that the local population would to be placed at risk of extinction.

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

Not applicable

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
  - **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

Regarding the Darling and Hanley's River Snail it is unlikely that any direct impact on potential habitat (i.e. irrigation pipelines or permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The proposed action would only be spanning of freshwater creeks/rivers and not result in the fragmenting of any potential habitat that either species may utilise. It is unlikely that the potential habitat within the proposal study area constitutes important habitat for either species in the locality. The area of potential habitat to be disturbed is unlikely to be of critical importance to the long-term survival of either species.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been declared for this species.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

A recovery plan listing a number of recovery actions has been prepared for River Snails (2007) a review of this recovery plan was undertaken 2017. In 2001 the FSC listed the River Snail (*Notopala sublineata*) as an endangered species in NSW under the FM Act. In 2016 the FSC made a final determination to change the listing of the River Snail to recognise two separate species – the Darling River Snail (*Notopala sublineata*) and Hanley's River Snail (*Notopala hanleyi*). Those final determinations also amended the listing status for both species from 'endangered' to 'critically endangered'.

The recovery plan includes three program areas:

- research and investigation activities
- compliance and regulatory activities; and
- management activities.

It is unlikely that the proposed action (i.e. minor works around riparian vegetation trimming on river banks) would be significant to either species and will not interfere significantly with any of the management or recovery actions for either species.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS.**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this species are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the species within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of habitat quality.

– CONCLUSION

Regarding the Darling and Hanley's River Snail is it unlikely that any direct impact on potential habitat (i.e. irrigation pipelines or permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The minor works will not fragment any known population, nor is it considered that the potential habitat within the proposal study area is considered important habitat for either species. It is therefore unlikely that the proposed action will significantly impact either species.

F-3.4 MURRAY CRAYFISH

F-3.4.1 CONSERVATION STATUS

Murray Crayfish (*Euastacus armatus)* is listed as Vulnerable under the FM Act.

F-3.4.2 DESCRIPTION

Murray Crayfish can be found in the Murray River upstream of Mildura, in the Murrumbidgee River and in some dams, and are the only species in the Euastacus genus that live in both cold and warm water habitats. They are opportunistic feeders, feeding on decaying animals and plants. Murray Crayfish become more active during the winter months. Mating activity usually occurs during May, most likely cued to a decline in water temperatures.

F-3.4.3 SPECIFIC IMPACTS

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Regarding the Murray Crayfish it is unlikely that any direct impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures.

F-3.4.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Potential habitat for the species was identified in the proposal study area in relation to freshwater rivers & creeks. It is unlikely that any direct impact on known or potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works involving riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. Due to the minor works to be undertaken it is unlikely that the proposed action would affect the life cycle of individuals within the population through the minor disturbance of vegetation trimming of riparian banks.

Given that the proposal is only likely to remove a small proportion of adjacent habitat for the species and that measures to minimise any potential indirect impacts, the proposal is unlikely to affect the life cycle of either species to such an extent that the local population would to be placed at risk of extinction.

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

Not applicable

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
  - **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

Regarding the Murray Crayfish, is it unlikely that any direct impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The proposed action would only be spanning of freshwater creeks/rivers and not result in the fragmenting of any potential habitat that either species may utilise. It is unlikely that the potential habitat within the proposal study area constitutes important habitat for either species in the locality. The area of potential habitat to be disturbed is unlikely to be of critical importance to the long-term survival of either species.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been declared for this species.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

There is no recovery plan for the Murray Crayfish under the FM Act. The Department of Primary Industries has however; identified recovery management actions to help recover this species within Murray Crayfish Primefact. The proposed action is not likely to interfere substantially with the recovery of the management actions stated in the Primefact and therefore the proposed action is unlikely to interfere with the recovery of this species.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS.**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this species are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the species within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of habitat quality.

- **CONCLUSION**

Regarding the Murray Crayfish it is unlikely that any impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The minor works will not fragment any known population, nor is it considered that the potential habitat within the proposal study area is considered important habitat for either species. It is therefore unlikely that the proposed action will significantly impact this species.

F-3.5 EEL-TAILED CATFISH

F-3.5.1 CONSERVATION STATUS

Eel-tailed Catfish (*Tandanus tandanus)* is listed as an Endangered population under the FM Act.

F-3.5.2 DESCRIPTION

Eel Tailed Catfish are naturally distributed throughout the Murray-Darling Basin and in the Eastern drainages NSW north of Newcastle. Occupies a wide range of habitats including rivers, creeks, lakes, billabongs, and lagoons. It inhabits flowing streams but prefers slow and still waters and can be found in clear or turbid water over substrates including mud, gravel, and rock.

The western population of *Tandanus tandanus* was originally widely distributed throughout the Murray-Darling River System in NSW, Queensland, Victoria, and South Australia, except for the cooler parts of the southern tributaries. It was uncommon upstream of Wagga Wagga on the Murrumbidgee River and Lake Mulwala on the Murray River. It is found in freshwater areas, including tidal reaches of coastal rivers from the Shoalhaven River to the Tweed River in NSW. Native fish, including catfish have been translocated into coastal rivers from the Murray-Darling Basin and it is not known if the populations of *T. tandanus* in those catchments south of the Karuah River are endemic to the eastern river systems.

F-3.5.3 SPECIFIC IMPACTS

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Regarding the Eel-tailed Catfish it is unlikely that any impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures.

F-3.5.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Potential habitat for the species was identified in the proposal study area (freshwater rivers & creeks) and the proposal occurs within the mapped endangered population for Eel-tailed Catfish. It is unlikely that any direct impact on known or potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works involving riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. Due to the minor works to be undertaken it is unlikely that the proposed action would affect the life cycle of individuals within the population through the minor disturbance of vegetation trimming of riparian banks.

Given that the proposal is only likely to remove a small proportion of adjacent habitat for the species and that measures to minimise any potential indirect impacts, the proposal is unlikely to affect the life cycle of either species to such an extent that the local population would to be placed at risk of extinction.

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

Not applicable

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
  - **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

Regarding the Eel-tailed Catfish, is it unlikely that any impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The proposed action would only be spanning of freshwater creeks/rivers and not result in the fragmenting of any potential habitat that either species may utilise. It is unlikely that the potential habitat within the proposal study area constitutes important habitat for either species in the locality. The area of potential habitat to be disturbed is unlikely to be of critical importance to the long-term survival of either species.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been declared for this species.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

There is no recovery plan for the Eel-tailed Catfish under the FM Act. The proposed action is not likely to interfere with any recovery of the objectives and therefore the proposed action is unlikely to interfere with the recovery of this species.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS.**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this species are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the species within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of habitat quality.

- **CONCLUSION**

It is unlikely that any direct impact on known or potential habitat (i.e. permanent freshwater creeks/rivers) for Eel-tailed Catfish would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The minor works will not fragment any known population, nor is it considered that the potential habitat within the proposal study area is considered important habitat for either species. It is therefore unlikely that the proposed action will significantly impact this species.

F-3.6 MURRAY HARDYHEAD AND SILVER PERCH

F-3.6.1 CONSERVATION STATUS

- Silver Perch (*Bidyanus bidyanus)* is listed as Vulnerable under the FM Act.
- Murray Hardyhead (*Craterocephalus fluviatilis)* is listed as Critically Endangered under the FM Act.

F-3.6.2 DESCRIPTION

The Silver Perch most abundant remaining natural population occurs in the central Murray River downstream of Yarrawonga Weir as well as several of its anabranches and tributaries. The central Murray population is considered secure and self-sustaining. There have also been reports of self-sustaining populations in other rivers, including the MacIntyre and Macquarie Rivers in northern NSW and the Warrego River in Queensland, mostly from recreational anglers. It prefers fast-flowing waters but is also known from rivers, lakes, and reservoirs.

Murray Hardyhead live along the edges of slow-flowing lowland rivers, as well as in lakes, billabongs, and backwaters. They are often found amongst aquatic weeds, in both fresh and quite saline waters. They were once widespread and abundant in the Murray and Murrumbidgee river systems in southern NSW and northern Victoria; however, they have suffered a serious population decline, and now seem to be limited to a few sites, mainly in northern Victoria. Since 2000, only one individual has been collected in extensive surveys in NSW.

F-3.6.3 SPECIFIC IMPACTS

Impacts from the proposal on aquatic habitats, particularly mapped key fish habitats (Strahler 4/5th Order streams) are considered likely to be negligible. Avoiding and minimising impacts on aquatic habitats would be a priority of detailed design and any residual indirect impacts would be subject to mitigation measures.

The maximum aquatic impact likely to occur to any of the key fish habitat would be the removal or trimming of tree canopy on the river banks to facilitate the construction and operation of the powerlines spanning each riparian area. All trunk bases and understorey would be retained in-situ adjoining the river banks. All potential erosion and sedimentation impacts would be managed and monitored to ensure that these do not impact the riparian areas. At most, any impact to water quality would be temporary and negligible. Each riparian area would continue to function as it currently functions.

Regarding the Murray Hardyhead and Silver Perch, it is unlikely that any direct impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures.

F-3.6.4 DETERMINATION OF WHETHER PROPOSED DEVELOPMENT OR ACTIVITY LIKELY TO SIGNIFICANTLY AFFECT THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY

In accordance with Section 221ZV of the FM Act, the following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species, populations or ecological communities (unless it is carried out in critical habitat):

- **IN THE CASE OF A THREATENED SPECIES, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

The Murray Hardyhead has a prolonged spawning season from September to March, with peak larval abundance occurring in late October to early November. The species is a batch spawner, with females depositing clutches of eggs. Regarding the Silver Perch, adult Silver Perch can move large distances, often associated with spawning activity in spring and summer. Juveniles disperse over large distances and are often seen at fishways travelling upstream in large schools. Silver Perch have been found in a wide range of habitats and climates across the Murray-Darling Basin. They are found in faster-flowing water including rapids and races and more open sections of river. Individuals sometimes form large shoals in open water.

Potential habitat for both species was identified in the proposal study area in relation to freshwater rivers & creeks. It is unlikely that any significant impact on known or potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works involving riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. Due to the minor works to be undertaken it is unlikely that the proposed action would affect the life cycle of individuals within the population through the minor disturbance of vegetation trimming of riparian banks.

Given that the proposal is only likely to remove a small proportion of adjacent habitat for the species and that measures to minimise any potential indirect impacts, the proposal is unlikely to affect the life cycle of either species to such an extent that the local population would to be placed at risk of extinction.

- **IN THE CASE OF AN ENDANGERED POPULATION, WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE LIFE CYCLE OF THE SPECIES THAT CONSTITUTES THE ENDANGERED POPULATION SUCH THAT A VIABLE LOCAL POPULATION OF THE SPECIES IS LIKELY TO BE PLACED AT RISK OF EXTINCTION:**

Not applicable

- **IN THE CASE OF AN ENDANGERED ECOLOGICAL COMMUNITY OR CRITICALLY ENDANGERED ECOLOGICAL COMMUNITY, WHETHER THE ACTION PROPOSED:**
  - **IS LIKELY TO HAVE AN ADVERSE EFFECT ON THE EXTENT OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION, OR**
  - **IS LIKELY TO SUBSTANTIALLY AND ADVERSELY MODIFY THE COMPOSITION OF THE ECOLOGICAL COMMUNITY SUCH THAT ITS LOCAL OCCURRENCE IS LIKELY TO BE PLACED AT RISK OF EXTINCTION**

Not applicable

- **IN RELATION TO THE HABITAT OF A THREATENED SPECIES, POPULATION OR ECOLOGICAL COMMUNITY:**
  - **THE EXTENT TO WHICH HABITAT IS LIKELY TO BE REMOVED OR MODIFIED AS A RESULT OF THE ACTION PROPOSED**
  - **WHETHER AN AREA OF HABITAT IS LIKELY TO BECOME FRAGMENTED OR ISOLATED FROM OTHER AREAS OF HABITAT AS A RESULT OF THE PROPOSED ACTION**
  - **THE IMPORTANCE OF THE HABITAT TO BE REMOVED, MODIFIED, FRAGMENTED OR ISOLATED TO THE LONG-TERM SURVIVAL OF THE SPECIES, POPULATION OR ECOLOGICAL COMMUNITY IN THE LOCALITY**

Regarding both the Murray Hardyhead and Silver Perch it is unlikely that any direct impact on potential habitat (i.e. irrigation pipelines or permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The proposed action would only be spanning of freshwater creeks/rivers and not result in the fragmenting of any potential habitat that either species may utilise. It is unlikely that the potential habitat within the proposal study area constitutes important habitat for either species in the locality. The area of potential habitat to be disturbed is unlikely to be of critical importance to the long-term survival of either species.

- **WHETHER THE ACTION PROPOSED IS LIKELY TO HAVE AN ADVERSE EFFECT ON CRITICAL HABITAT (EITHER DIRECTLY OR INDIRECTLY)**

No critical habitat has been declared for either species.

- **WHETHER THE ACTION PROPOSED IS CONSISTENT WITH THE OBJECTIVES OR ACTIONS OF A RECOVERY PLAN OR THREAT ABATEMENT PLAN**

A recovery plan (2006) listing a number of recovery actions has been prepared for the Silver Perch. The recovery plan includes five recovery areas:

- research
- habitat protection and restoration
- introduced species and disease
- fishing, and
- aquaculture and stocking

Owing to the small area of minor works around riparian vegetation trimming on river banks to be removed, the proposal is not likely to interfere with these recovery actions or significantly interfere with the recovery of this species.

The Murray Hardyhead has a National Recovery Plan (2008) which listed a number of recovery objectives and actions for the species across its distribution. The recovery plan includes seven recovery areas:

- investigate and manage threats to populations and habitats
- determine population persistence and trends
- determine habitat preferences
- investigate important life history attributes
- establish and maintain the Murray Hardyhead in captivity
- establish new populations of Murray Hardyhead in the wild
- increase community awareness of Murray Hardyhead conservation.

It is unlikely that the proposed action (i.e. minor works around riparian vegetation trimming on river banks) would be significant to either species and will not interfere significantly with any of the management or recovery actions for either species.

- **WHETHER THE ACTION PROPOSED CONSTITUTES OR IS PART OF A KEY THREATENING PROCESS OR IS LIKELY TO RESULT IN THE OPERATION OF, OR INCREASE THE IMPACT OF, A KEY THREATENING PROCESS.**

A key threatening process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. KTPs of relevance to this species are listed under the FM Act. Of these KTPs, the proposal involves degradation of native riparian vegetation along NSW water courses. The extent of native vegetation clearing, and habitat removal associated with the proposal (minor works around riparian vegetation trimming on river banks) is considered negligible in terms of the habitat impacted for the species within the surrounding landscape. Additionally, mitigation measures would be implemented during construction to minimise the likelihood of spread of weeds or pathogens into the site. These mitigation measures would aid in reducing potential impacts associated with the proposed action that may otherwise result in the further reduction of habitat quality.

- **CONCLUSION**

Regarding the Murray Hardyhead and Silver Perch it is unlikely that any direct impact on potential habitat (i.e. permanent freshwater creeks/rivers) would occur because of the proposal. Minor works around riparian vegetation trimming on river banks would be negligible and managed through mitigation measures. The minor works will not fragment any known population, nor is it considered that the potential habitat within the proposal study area is considered important habitat for either species. It is therefore unlikely that the proposed action will significantly impact either species.

APPENDIX F-4
POWERLINE IMPACTS AND AMELIORATIVE

F-4.1 BIRDS AND POWER TRANSMISSION INFRASTRUCTURE

Ecologically, birds encounter power transmission infrastructure in two broad ways, as landscape features occurring in their resident territories, whether those territories are permanent or seasonal, or as unfamiliar features they encounter during long or short-distance movements. For birds which migrate, both broad types of power transmission infrastructure interaction may apply during different periods of their lifecycle.

The distinct types of impacts power transmission infrastructure represent to birds also fall into two broad categories; impacts associated with the power being carried through the infrastructure and impacts the infrastructure represents as collision risks. The different ways birds encounter power transmission infrastructure determines the type of risk infrastructure will represent to them.

The potential effects of power carried by electrical infrastructure are more likely to affect birds that are familiar with the infrastructure, and who use it on a day to day basis, while the collision risks power transmission infrastructure represents to birds are more likely to affect those birds that are unfamiliar with its presence or distracted by important behaviours.

Both behavioural groups are at risk from electrocution, for the same two behavioural reasons, both familiarity and ignorance.

Collision risk also represents a significant hazard to birds that are familiar with power infrastructure at a given location, just as humans might fall foul of familiar hazards due to concentration distractions. For example, while birds are defending territories, hunting, are being hunted, or area displaying, they will naturally be more susceptible to collisions with infrastructure that is usually familiar to them and otherwise avoided, particularly if the obstacles have some degree of detection difficulty.

F-4.2 POWER TRANSMISSION AND ELECTRIC AND MAGNETIC FIELDS

Electricity is generated from both natural and artificial sources. Extremely low frequency (ELF) Electrical and Magnetic fields (EMF) are those that fall within the 0–3000 Hz frequency range. ELF EMF's exist wherever electricity is generated, transmitted or distributed in power lines or cables, or used in electrical appliances (arpansa, 2020). Although ELF EMF's are sometimes produced through natural processes, artificial sources are the most common sources of ELF EMF and are generally a product of the generation, distribution and use of electricity at the frequency of 50 Hz in Australia or 60 Hz in some other countries (arpansa, 2020). The electrical component of ELF EMF is formed by voltage, but current produces the magnetic field component of ELF EMF (arpansa, 2020).

The level of electrical fields is measured in thousands (k) of volts (V) per (/) metre (m), kV/m or just as V/m. The level of magnetic fields is measured in units of amperes (A) per (/) metre (m), A/m, however it is often denoted by its magnetic flux density quantified in units of tesla (T) or microtesla (μT). Another unit that is often applied to the quantification of magnetic fields is the gauss (G) or milliGauss (mG), where one gauss is equal to 10^{-4} T (or 1 mG = 0.1 μT) (arpansa, 2020).

F-4.2.1 ELF EMF AND BIRDS

It is widely known and observed that, of all fauna groups, birds most regularly use electrical power lines, and their associated infrastructure, such as towers and poles, for perching and nesting. The reasons bird species use tall structures, such as electrical transmission infrastructure include:

- increased separation from terrestrial threats
- as vantage points to allow early detection of airborne and terrestrial threats
- for a commanding view over a patch of hunting territory
- for the defence and proclamation of breeding territories, and
- as safe elevated locations to build nests and raise their young.

The use of power lines does not extend across all bird species, as the open spaces in which aerial power infrastructure are located is too exposed for many bird species, especially smaller cover preferring bird groups. Therefore, the most common powerline using groups are birds that use open and aerial habitats.

The infrastructure of electricity transmission is often desirable as nesting locations for large species, such as birds of prey and the corvids (ravens and crows), due to their propensity to build on high landscape features in otherwise open habitats.

While several small open country birds, such as larks, pipits and finches will use power lines through direct observations, there appears to be a reduced use of the tallest power infrastructure by such species, due to the considerable expenditure of energy required to reach it and the considerable separation it represents from their territories.

Aerial foraging species, such as dollarbirds, bee-eaters, swallows, martins and woodswallows are also frequent users of electricity infrastructure for resting or as hunting vantage points, however, the insect prey that this group targets can often be in greater densities closer to the ground, and so lower perches are more desirable when available.

Therefore, as the distance between vegetation from associated electricity infrastructure increases, many smaller bird species appear less likely to use it, particularly when lower and less exposed options are present in their habitats.

In wooded habitats where vegetation heights more closely approach the height of power lines, avifauna appear more likely to use them, due to the increased opportunity to perch on power infrastructure where it is more accessible, because of higher adjacent canopy heights.

Apart from those birds that use power infrastructure as perching opportunities, a small group of birds also use power infrastructure for nesting sites. Birds of prey, storks and cranes, and the corvids are the groups that are most likely to use the tallest power line infrastructure.

F-4.3 EFFECTS OF ELECTRIC AND MAGNETIC FIELDS ON BIRDS

Considerable research has been undertaken to determine if there are any significant effects from EMF upon living organisms, including birds. Several scientific papers have endeavoured to determine if there are changes to bird biology because of proximity to EMF with few undertaken on wild birds outside of laboratory contexts. Nevertheless, there are some studies which have tested the effects of EMFs on wild birds.

In their 2005 review paper, Fernie and Reynolds (2005) observe that electrical power lines are widely used throughout the developed world, and that, all electric currents, including those conducted by electrical power lines, produce electric and magnetic fields (EMFs) (Fernie and Reynolds, 2005). They note that, due to their propensity to use power line infrastructure, some birds, like humans, are exposed to EMFs throughout their lives. They also note that EMFs have been, not without controversy, implicated in adversely affecting different components of human health, and that past and ongoing laboratory research have used mammal and bird surrogates to determine if EMFs may adversely affect key life systems in humans. Their 2005 review, draws on previous EMF research on effects to wild and aviary kept birds, to determine if this body of work might contribute to the current knowledge on EMF potential to adversely affect humans (Fernie and Reynolds, 2005). They found that the majority of studies found when birds are subjected to EMFs, changes are observed in; bird behaviour, reproductive success, growth and development, physiology and endocrinology, and oxidative stress, although not always with a consistent effect or direction (Fernie and Reynolds, 2005).

Fernie *et al* (1999) observe that some bird groups reproduce within EMFs from transmission lines, and that critical survival processes are dependent on melatonin, while melatonin has only been equivocally suppressed by EMFs in mammalian species. They erected a study to examined whether EMFs affect photophasic plasma melatonin in adult and fledgling American Kestrels (*Falco sparverius*) during short-term (one breeding season) and long-term (two breeding seasons) breeding behaviours, and compared the results to observed changes in body mass (Fernie et al., 1999). The study included kestrels subjected to EMF effects and a control group of kestrels (56 pairs in all) against which results could be compared. They found that EMFs affected plasma melatonin in male kestrels, by suppressed plasma values at 42 days and elevated plasma values at 70 days of EMF exposure. The 42 day melatonin levels in EMF males were the same levels as 70 day control males, suggesting a seasonal phase-shift in melatonin profile due to EMF exposure (Fernie et al., 1999). Melatonin levels were also suppressed in long-term fledglings but not short-term fledglings or females. They propose higher levels of melatonin in male kestrels than females may affect the sexually different results to EMF exposure. Results found that melatonin levels were not correlated to body-mass in American Kestrels and it was considered likely that results returned by the study are relevant to wild raptors nesting within EMFs (Fernie et al., 1999).

Fernie *et al* (2000a) observed that although there was documentation of reduced avian reproductive success when associated with power lines, such impacts had not been directly attributable to EMFs. They also noted that while laboratory studies had been undertaken to determine the effects of EMFs on embryonic development, such studies were unable to test the effects of EMFs on other factors that affect breeding success in wild birds, such as fertility, egg size, hatching, and fledgling success (Fernie et al., 2000a). In response, they undertook a study to determine the effect of EMFs on the reproductive success on birds, using captive American Kestrels (*Falco sparverius*) over two consecutive annual breeding seasons. The kestrels were separated into separate control and EMF effect groups (Fernie et al., 2000a). EMF exposure was set to the same levels as would be experienced by wild breeding kestrels and weakly correlated with a reduction in egg laying in only the first year (Fernie et al., 2000a). In both breeding events pairs subjected to EMF exposure, experienced higher fertility and lower hatching success than control pairs (Fernie et al., 2000a). Fledgling success was higher for EMF subjected pairs than control pairs in only one of the breeding events. In a single year when egg composition and embryonic development were examined, eggs were larger, with more yolk, albumen, and water, but exhibited thinner egg shells than control eggs (Fernie et al., 2000a). Late-term EMF embryos were larger and longer than control embryos, although hatchlings were similar in body mass and size (Fernie et al., 2000a). For their study Fernie *et al* (2000a) found that there was a different result in reproductive success in EMF exposed kestrels, resulting in increased

fertility, egg size, embryonic development and fledgling success and reducing hatching success when compared to control kestrels.

Fernie *et al* (2006b) note that wild birds particularly raptors use electrical transmission infrastructure for perching, hunting, roosting nesting, and consequently are exposed to EMFs. They determined the time periods wild American Kestrels (*Falco sparverius*) were exposed to EMFs from 735-kV power lines, so that the effect of EMFs on the behaviour of captive breeding kestrels could be studied (Fernie et al., 2000b). During their study they found that wild kestrels were exposed to EMFs for 25% to 75% of the observation periods. Over a 24 hr period, it was estimated that EMF exposure to wild kestrels ranged from 71% during courtship, to 90% during incubation, which was comparable to the exposure figures (88%) that captive breeding kestrels were subjected to (Fernie et al., 2000b). The results found that captive female EMF kestrels exhibited increased activity and alertness, and, in comparisons to control females, perched more often on the pen roof. EMF female kestrels were observed to preen and rest less often during the rearing of their broods (Fernie et al., 2000b). As with female EMF kestrels, male EMF kestrels were observed to be more active than control males during courtship, and more alert during incubation (Fernie et al., 2000b). The observed behavioural changes in breeding EMF kestrels were unlikely to contribute to increased growth of nestlings or increase the survival rates of fledglings, or reduce hatching success, though previously reported as such (Fernie et al., 2000b). Fernie *et al* (2000b) note that behavioural changes observed in captive EMF kestrels may be observed in wild kestrels.

Fernie and Bird (2001) observe that exposure to EMFs alters melatonin, behaviour, growth, and reproduction of captive American Kestrels (*Falco sparverius*), particularly males. Therefore, they undertook a study to determine whether EMF exposure triggers an avian immune response and alters oxidative stress levels. Captive kestrels were bred under control or EMF conditions at levels similar to those wild kestrels are subject to (Fernie and Bird, 2001). They found that short-term (single breeding season) exposure to EMFs suppressed plasma total proteins, hematocrits and carotenoids in the first half of the breeding cycle, as well as suppressing erythrocyte cells and lymphocyte proportions at the end of the breeding season (Fernie and Bird, 2001). Long-term (two breeding seasons) studies also resulted in a suppression of hematocrits in the first half of the reproductive period (Fernie and Bird, 2001). The study deduced that the elevation of granulocytes, and the suppression of carotenoids, total proteins, and previously melatonin in the same kestrels, signified that the short-term EMF male kestrels had higher level of oxidative stress, due to an immune response and/or EMF exposure and that long-term EMF exposure may be linked to higher levels of oxidative stress through EMF exposure alone (Fernie and Bird, 2001).

In a study conducted over nine (9) breeding seasons, Tomas *et al* (2012) note that within a single population of Great Tits (*Parus major*), breeding occurrences subjected to the effects of EMF exposure showed an increase in clutch size (7%) and an increase in egg volume (3%) (Tomas et al., 2012). Although the study showed that there was an increase in both clutch size and egg volume the overall average productivity as a function of fledgling and reproductive success, including nestling body mass, did not exhibit any change (Tomas et al., 2012). In comparison to Great Tit breeding events not associated with artificial EMF influences, researchers noted Great Tit breeding events subjected to artificial EMF's influences realise the same breeding success, but with a greater expenditure of energy resources (Tomas et al., 2012).

F-4.4 POWER TRANSMISSION LINE BIRD STRIKE

Bernardino *et al.* (2018) observe that growing global energy demands are causing worldwide increases in electrical infrastructure, representing significant negative impacts to biodiversity, predominantly birds.

They undertook a systematic review of available literature, dealing with bird power line related collisions, with attention to specific areas of previous research, including:

- an assessment of overall trends in scientific research in recent decades
- a review of existing knowledge of bird collision factors, as well as their effectiveness in reducing collision risk; including
  - species-specific factors (e.g. vision, morphology)
  - site-specific factors (e.g. topography, light and weather conditions, and anthropogenic disturbance), and
  - power line-specific factors (e.g. number of wire levels, wire height and diameter)
- an evaluation of existing mitigation measures (e.g. power line routing, underground cabling, power line configuration, and wire marking), as well as their effectiveness in reducing collision risk (Bernardino et al., 2018).

The Bernardino *et al.* (2018) review concluded:

- a general paucity of specific scientifically tested information regarding factors leading to bird power line collision
- there are few studies conducted in Asia, Africa, and South America; and
- several suggested methods of good practice were not at the time of publication, supported by scientific evidence.

Gap analysis undertaken by the Bernardino *et al.* (2018) study identified three key directions for future research, innovation, and scientific testing of current impact avoidance methodologies:

1. Bird behaviour – including the use of data loggers and sensors
2. Impact assessment – the identification and understanding of specific drivers at mortality hotspots, assessment of population-level impacts, development of methods for automatic detection of bird impacts; and
3. Mitigation measures – outlining a greater need for BACI level studies to determine the effectiveness of different wire- marking/bird avoidance devices and strategies (Bernardino et al., 2018).

They conclude by observing that, globally, the predictiveness and effectiveness of bird power line impact and mitigation, is compromised by a general lack of understanding about the regionally specific complexity of bird ecologies and how they interact with different collision drivers (Bernardino et al., 2018).

In a review of 14 studies, qualified by specific inclusion criteria, Loss *et al* (2014) estimated that between 12 and 64 million birds are killed each year in the United States (U.S.) through power line associated fatalities. Eighty-nine percent (89%) of the bird fatalities were attributable to collision mortality, the remaining eleven percent (11%) were caused by electrocution (Loss et al., 2014). Variations in mortality rates were a product of the relatively small number of rigorous studies available that deal with the study of bird mortality (Loss et al., 2014). The review found that while there is a general dearth of studies, and most were limited in scope (relating to diversity of species, habitat types and locations), the data collected showed that bird mortality associated with power lines in the U.S. is substantial and requires conservation management and policies to lower mortality rates (Loss et al., 2014).

F-4.5 POWER TRANSMISSION LINE IMPACTS AND THE PROPOSAL

F-4.5.1 COLLISION RISKS

F-4.5.1.1 ALIGNMENT GEOGRAPHICAL CONTEXT

The proposal study area traverses some 150 km of south-western NSW in a general east-west orientation from the South Australian border to Buronga. It occurs within the NSW rangelands, occurring within the semi-arid zone of south-western NSW. In effect, large areas of the proposal study area occur on the boundary between areas with more regular rainfall and inland areas that are classified as being deprived of rainfall.

The rangelands of semi-arid and arid Australia occur as areas bereft of significant water for extended periods of time, although they encompass the most extensive proportions of the largest catchment areas of the Australian continent. Nevertheless, when periodic high rainfall events fill their basin's reservoirs, such areas transform to represent foraging and breeding opportunities for a wide range of water birds, including waterfowl, wading birds, and both resident and migratory shorebirds, as well a host of open country terrestrial birds, which move to take advantage of transformed inland areas after high inland rainfall events. While birds respond to such rainfall events with movements to and from a variety of regions, the greatest proportion of water bird movements to, and from, inland areas in response to rain, or the deprivation of it, are from, or back to, coastal areas.

The proposal alignment falls within the basin of the Murry-darling system, the Murray occurring to the alignment's south, the Darling to the north. It crosses the Darling and its Great Anabranch to the north of Wentworth.

To the north of the alignment, the Darling is an important feeder of large ephemeral lake systems, including the Menindee lakes, and its Great Anabranch feeding the Nearie Lakes cluster to the southwest of Menindee.

To the south of the alignment, the Murray's flooding influence broadens to extend across low lying topographies that are inundated by the river during periods of high flow. The river is a source of water level continuity for Lake Victoria and a portion of its flows are used to maintain environmental water for wetland habitats like Chowilla Regional Reserve, which occurs within South Australia in lands immediately adjacent to the NSW/South Australia border, south of Renmark Road.

F-4.5.1.2 MIGRATORY AND NOMADIC BIRDS

Large numbers of resident water birds are attracted to the ebb and flow of water levels between regional and state level distributions, which often entail long-distance movements to and from ephemeral wetlands, including those that occur to the north and south of the proposal study area. Apart from resident waterbirds, large numbers of international migratory shorebirds also respond to such variations in water availability during their seasonal occupation of Australian habitats.

A number of waterbirds and shorebirds have been observed to undertake movements from one wetland habitat to another during nocturnal hours (Richardson, 2016a). During winter occupation of the Hunter River estuary, migratory wading birds were observed to move equally during day and night periods, as a response to the availability of foraging areas and the need to access roosting areas during high tide levels (Richardson, 2004). Long distance movements, representing 1,000's of kilometres, by a number of shorebird species take place continuously without breaks throughout nocturnal and diurnal hours (Battley et al., 2012). McEvoy (2015) observed that long distance movements undertaken by radio-tracked South Australian Pacific Black Ducks, in response to moderate to high rainfall events, were almost exclusively undertaken during nocturnal hours (McEvoy, 2015). During the Pacific Black Duck study, reasons for nocturnal movements could not be clearly determined, although avoidance of diurnal avian predators, which are key predators of waterbirds and shorebirds, were cited as a likely incentive to avoiding long distance movements during the day (McEvoy,

2015). Birds of prey were observed to be the major predatory risk for diurnal shorebirds in a study of wintering shorebirds in the Hunter River Estuary (Richardson, 2004, Richardson, 2016c).

Considering the orientation of the alignment from east to west, it likely intersects flight lines between inland and coastal wetlands. As such, there is a likelihood that large numbers of waterbirds would periodically cross the alignment from south to north and back again, often during nocturnal hours. This suggests that increasing the number of power lines in the current easement would realise an increase in potential for bird strike.

Other groups of birds prone to nomadic movements are also likely to be at risk of collision, such as the larger birds of prey. While possessing excellent eyesight, birds of prey are at risk of power line strike as a consequence of their potential to strike obstacles before them when searching the ground for prey and the location of power lines within elevations where they fly.

While most birds of prey are not usually migratory, many periodically move in relation to variations in productivity (i.e. prey availability). Birds of prey respond by moving to areas where greater productivity increases survival and breeding-cycle success. The larger birds of prey, with some of the largest wingspans (WS) of Australia's birds, have been observed in habitats associated with the alignment, or are considered likely to occur in its vicinity from time to time, include; Wedge-tailed Eagle (WS~2.8 m), White-bellied Sea-eagle (WS~2.0 m), Black-breasted Buzzards (WS~1.5 m), Square-tailed Kite (WS~1.3 m), Little Eagle (WS~1.3 m), Spotted Harrier (WS~1.2 m) Black Kite (WS~1.2) Whistling Kite (WS~1.2), Brown Falcon (WS~1.2) and Black Falcon (WS~1.2) (Pizzey and Knight, 2012).

While it is highly likely that some bird species, within collision risk bird groups, would be at lesser risk of collision than others, even when closely related (Loss et al., 2014) to those at greatest risk, a greater or lesser proportion of different migrating or nomadic bird species are likely to be impacted by the introduction of additional infrastructure into their flight paths.

F-4.5.1.3 RESIDENT BIRDS

A substantial proportion of birds that occur in territories through which the alignment passes, will not be at risk of power lines strike, since their use of habitat never extends to open areas especially at elevations where power lines are located. Nevertheless, there are some groups of resident birds that favour open areas, which are at increased risk of collision, because power lines occur in the habitats they often frequent. Although resident birds around the alignment footprint are likely to quickly adapt to changes made within their well-known territories, new infrastructure represents an increase in hazardous obstacles with which some groups might collide when distracted by high priority activities, such as hunting, territorial defence, breeding behaviours and learning to fly.

As noted above, a proportion of local birds are unlikely to be placed at risk of collision since their habits do not extend to the open elevated habitats where greater risk of collisions occurs. Large areas of the alignment are associated with either open country or low canopied mallee and black box communities, where the flight lines of small to small-medium sized birds are much less likely to intercept power lines and for such species, the chances of impact are considered unlikely.

Tall vegetation communities where riparian canopies are dominated by tall River Red Gum trees are areas most likely to represent higher risk for smaller resident woodland bird guilds, although their lower flight speeds and sedentary behaviour reduce collision risks for many in this group.

Those considered as bird species to be at higher risk of collision include local birds that fall into guilds of larger and higher-flying birds, and which reside over larger territories, such as birds of prey, ravens and magpies, cockatoos and some parrots, waterbirds, and waterfowl.

F-4.5.2 MITIGATION OF COLLISION RISKS TO BIRDS

Power lines represent a collision risk to birds, because they occur within spaces where they do not expect to encounter obstacles, and, due to relatively narrow linear profile, power lines easily blend in with the landscape or are obscured by lighting conditions, such as darkness or other light conditions that obscure the presence of the lines or make them appear much further away. Key strategies for reducing the numbers of birds striking power lines is making them visible to birds. Mitigation measures employed in areas where birds are at greater risk often take the form of large bright beacon-like objects to make birds aware of the presence of power lines.

F-4.5.3 EMF AND ELECTROCUTION RISKS

F-4.5.3.1 MIGRATORY AND NOMADIC BIRDS

Even though some species of migratory birds are electrocuted when they collide with power lines, it is most likely that many of these incidents are associated with smaller power line infrastructure, or installations where individual conductors and earth potentials are close together, such that birds have the potential to touch multiple components of different electrical potential. For birds moving through the alignment, it is considered unlikely that birds would be at high risk of electrocution, as electrocution would require contact with different phases or conductor potentials, and the horizontal separation between individual conductors, or bundled conductors, exceeds the wingspans (WS) of all birds, including the largest migratory birds, such as Brolgas (WS~2.4 m) Pelicans (WS~2.4–2.6 m) Black Swans (WS~2.0 m) and Australian Shelduck (WS~1.2 m) (Pizzey and Knight, 2012). Separation distances between tower arms and conductors achieved by insulators are shorter than between different conductors (7,200 mm and smaller designs 5,700 mm), but the separation, at 3,720 mm, is beyond the wingspans of all the world's birds. Large bird species are at a greater risk of collision impact injuries, than electrocution, due to their size and flight speed.

The other group of nomadic birds of sufficient sizes to be at risk of electrocution are the larger birds of prey, although as with other large bird species their wing spans are not sufficient to reach between different conductors or from conductors to conductive tower components. While most are not migratory many periodically move in relation to variations of ecological productivity, since dryer and wetter periods drive resource increases and lulls, and birds of prey respond by moving to areas where greater productivity increases survival and breeding-cycle success. Those larger birds of prey observed in habitats associated with the alignment, or are considered likely to occur in its vicinity from time to time, include; Wedge-tailed Eagle (WS~2.8 m), White-bellied Sea-eagle (WS~2.0 m), Black-breasted Buzzards (WS~1.5 m), Square-tailed Kite (WS~1.3 m), Little Eagle (WS~1.3 m), Spotted Harrier (WS~1.2 m) Black Kite (WS~1.2) Whistling Kite (WS~1.2 m), Brown Falcon (WS~1.2 m), Black Falcon (WS~1.2 m) and Peregrine Falcons (WS~0.95 m) (Pizzey and Knight, 2012). All bird of prey species have wingspans that are well below the smallest separations between conductors and other conductors, or potential earthing infrastructure components.

Although some birds of prey undertaking dispersive or nomadic movements may occasionally land on powerline infrastructure, under such circumstances they are unlikely to be sufficiently affected by EMF's to be of any significant effect. Nevertheless, birds of prey, which are resident in habitats associated with the alignment, are part of the group of birds which are most likely at risk to longer periods of exposure to EMFs.

F-4.5.3.2 RESIDENT BIRDS

Those birds that occur as residents in the habitats surrounding power line infrastructure are that subset of all birds that will have to live with power transmission infrastructure for a good portion, if not all, of their lives. However, for many of the birds that live in close association with such infrastructure the greatest risk is loss of habitat during the construction phase of the project. Providing sufficient habitat has been retained for them to survive after the infrastructure's installation their behaviour will continue as it did before construction. A range of small birds that prefer the cover and foraging opportunities that the foliage of trees and shrubs offer will never ascend to the powerline region of the installation or use the bottom of towers for perches.

Those species most likely to ascend to power lines and the tops of towers are those species that are tolerant of open spaces and which habitually fly at those elevations and above. The candidates to use power line infrastructure are large passerines like ravens and crows, birds of prey preferring open habitats, and aerial foraging species, such as woodswallows, swallows and martins, and dollarbirds and bee-eaters. Although magpies will use power lines, they forage on the ground and prefer perches and nesting locations with the added cover of trees. Often the height of high transmission lines is too high for them, and for much of the time smaller aerial foragers, which also prefer to perch low when foraging close to the ground.

There is a small group of birds for which transmission towers are preferable for nest building, including ravens and crows, medium to large birds of prey and, in some areas, storks and cranes. Several nests located in the top of transmission line towers were observed during field surveys, but not all could be assigned to species. Most nests were in the size range built or used by the corvids and medium sized birds of prey, although due to the longevity of nests, it isn't always the builders that utilise the nests in subsequent breeding seasons. Several nests of sufficient size to be built by Wedge-tailed Eagles or White-bellied Sea-eagles were observed on the existing transmission line towers between Trentham Cliffs and Red Cliff, and both species were observed in the area. A pair of Peregrine Falcons were observed to be using a tower in the existing easement for nesting and were raising young at the time of observation. The nest was discovered on 21 October 2019 at -33.923420, 142,075656 in an older transmission tower type, not protected by galvanising treatments, southeast of Pooncarie Road.

It is such species that have the greatest risk of EMF effects, due to their familiarity with infrastructure and extended periods in relatively close proximity to conductors. Most towers are designed to minimise their use by birds, however the benefits of power infrastructure to bird behavioural priorities make birds determined to use such structures across locations where elevated nest sites in old growth trees are limited.

In assessing the types of large transmission towers likely to be used for the project, the dimensions of transmission tower structures were considered. The minimum distance from conductors to earthed infrastructure that birds might build nests on is 3,930 mm, and greater than the wingspans of the largest Australian birds. If a nest is built on an arm with a conductor above it, the height of the nest and the bird will reduce that figure.

The period chicks will occupy the nest from the laying of the egg to leaving the nest has been added below for the birds of prey most likely to occur. For all these species the nest is not usually occupied outside the breeding period.

The largest Australian birds of prey occurring in the alignment locality are the Wedge-tailed Eagle and White-bellied Sea-Eagle, which have the longest incubation and nestling periods of Australian birds of prey with a maximum incubation period of 45 days and 40 days, respectively, and maximum nestling periods of 85 days and 70 days respectively. The maximum nest occupation time for these species, from egg laying to departure, is around 130 days (~19 weeks) and 110 days (~16 weeks) respectively.

For the next largest group of birds of prey (size wise), including species such as the Black-breasted Buzzard, Little Eagle, Square-tailed Kite and Spotted Harrier, the incubation periods are around 40 days and nestling period around 60 days. The maximum nest occupation time for these species, from egg laying to departure, is around 100 days (~14 weeks).

Nest occupancy periods for smaller birds of prey from medium sized birds, such as Whistling Kites and Black Kites (~83 days), reduce progressively with size through the Pacific Baza and falcons, down to the smallest, represented by the Nankeen Kestrel, which has an incubation period of 29 days and a nestling period of 35 days, representing a total nest occupation time of 64 days (~9 weeks). The corvids will fall into a group that is smaller than the kites and largest falcons.

From data derived from a range of studies, it is considered likely that EMF's may influence the physiology of birds nesting on transmission towers. However, the levels of those effects to each species under all different conditions is not easily quantifiable and there is currently no conclusive evidence that such effects would have a significant effect on the long-term viability of local bird populations.

F-4.5.4 MITIGATION OF EMF IMPACTS TO BIRDS

Mitigation for EMF impacts are best implemented by tower designs that discourage birds from building nest on them. As it is an important priority for managers maintaining power transmission lines to ensure that nesting birds do not constitute a risk to power delivery, towers being considered are currently designed to discourage their use by birds, which also reduces the numbers of birds which may be affected by EMFs to a minimum.

F-4.6 CONCLUSIONS AND RECOMMENDATIONS

Based on the available research, the following conclusions on potential impacts have be reached:

- The bird species considered to be at higher risk of collision include local birds that fall into guilds of larger and higher-flying birds, and which reside over larger territories. These birds include birds of prey, ravens and magpies, cockatoos and some parrots, waterbirds, and waterfowl.
- It is likely that EMF's may influence the physiology of birds nesting on transmission towers. However, the levels of those effects to each species under a range of different conditions is not easily quantifiable and there is currently no conclusive evidence to suggest that such effects would have a significant effect on the long-term viability of local bird populations.

Recommendations for management and mitigation consist of the following:

- Line markers, otherwise known as "bird flappers" and "diverters" are well known throughout the world to be an effective mitigation strategy to warn birds of the presence of powerlines and would be included in the project design.
- Towers would be designed to discourage nesting to reduce both potential collision and EMF impacts.
- A monitoring program would be considered for implementation to assess the ongoing risk to fauna, particularly birds from the proposal.

F-4.7 REFERENCES

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APPENDIX G

BIODIVERSITY CREDIT REPORT

APPENDIX G-1
BAM CREDIT REPORT – SOUTH OLARY PLAIN IBRA SUBREGION

BAM Credit Summary Report

Proposal Details

Assessment Id
00020938/BAAS17020/20/00020939

Proposal Name
PEC Western - South Olary

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Report Created
21/09/2020

BAM Data version *
30

Assessor Number
BAAS17020

BAM Case Status
Open

Date Finalised
To be finalised

Assessment Revision
0

Assessment Type
Major Projects

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

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
18	15_mod-area_A	50.2	1.2	0.25	High Sensitivity to Potential Gain	1.75		25
19	15_mod-area_B	13.5	1.9	0.25	High Sensitivity to Potential Gain	1.75		11

							Subtotal	**36**
Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones								
26	221_mod-area_A	66.2	1.3	0.25	High Sensitivity to Potential Gain	1.50		31
27	221_mod-area_B	12.7	2.1	0.25	High Sensitivity to Potential Gain	1.50		10
							Subtotal	**41**
Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion								
6	58_mod-area_A	60.2	29.3	0.25	High Sensitivity to Potential Gain	1.75		773
7	58_mod-area_B	28.6	59.6	0.25	High Sensitivity to Potential Gain	1.75		747
8	58_derived-area_A	1.3	36.6	0.25	High Sensitivity to Potential Gain	1.75		0
							Subtotal	**1520**
Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones								
1	170_mod-bull-area_A	66.5	9.8	0.25	High Sensitivity to Potential Gain	1.50		246
2	170_mod-bull-area_B	27.4	18.2	0.25	High Sensitivity to Potential Gain	1.50		187
3	170_mod-whip-area_A	58.6	45.4	0.25	High Sensitivity to Potential Gain	1.50		999
4	170_mod-whip-area_B	20.7	87.6	0.25	High Sensitivity to Potential Gain	1.50		681
5	170_derived-area_A	2.6	34.5	0.25	High Sensitivity to Potential Gain	1.50		0

							Subtotal	**2113**
Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains								
9	19_mod-area_A	56.0	0.59	0.25	High Sensitivity to Potential Gain	2.00		17
10	19_mod-area_B	16.6	0.32	0.25	High Sensitivity to Potential Gain	2.00		3
							Subtotal	**20**
Deep sand mallee of irregular dunefields of the semi-arid (warm) zone								
24	172_mod-whip-area_A	61.9	8.7	0.25	High Sensitivity to Potential Gain	1.50		202
25	172_mod-whip-area_B	18.9	19.5	0.25	High Sensitivity to Potential Gain	1.50		138
							Subtotal	**340**
Gypseous shrubland on rises in the semi-arid and arid plains								
16	253_mod-boninka-area_A	39.7	2.8	0.25	High Sensitivity to Potential Gain	1.50		42
17	253_mod-lunette-area_A	32.6	2.1	0.25	High Sensitivity to Potential Gain	1.50		25
							Subtotal	**67**
Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.								
13	143_mod-area_A	91.9	0.99	0.25	High Sensitivity to Potential Gain	1.50		34
							Subtotal	**34**

Pearl Bluebush low open shrubland of the arid and semi-arid plains								
14	154_PCT153-mod-area_A	54.8	57.5	0.25	High Sensitivity to Potential Gain	1.50		1183
15	154_mod-area_A	72.1	9.7	0.25	High Sensitivity to Potential Gain	1.50		263
							Subtotal	**1446**
Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion								
11	21_mod-parea_A	70.1	6.2	0.25	High Sensitivity to Potential Gain	2.00		217
12	21_mod-area_B	20.1	3.8	0.25	High Sensitivity to Potential Gain	2.00		38
							Subtotal	**255**
Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion								
20	171_mod-bull-area_A	66.4	1.8	0.25	High Sensitivity to Potential Gain	1.50		45
21	171_mod-bull-area_B	24.1	4.5	0.25	High Sensitivity to Potential Gain	1.50		41
22	171_mod-whip-area_A	73.4	16.6	0.25	High Sensitivity to Potential Gain	1.50		458
23	171_mod-whip-area_B	28.1	32.5	0.25	High Sensitivity to Potential Gain	1.50		342
							Subtotal	**886**
Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion								
28	252_mod-area_A	28.3	0.73	0.25	High Sensitivity to Potential Gain	1.75		9

29	252_mod-area_B	10.9	1.7	0.25	High Sensitivity to Potential Gain	1.75		8
30	252_derived-area_A	0.6	5.3	0.25	High Sensitivity to Potential Gain	1.75		0
							Subtotal	**17**
							Total	**6775**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits
Acacia acanthoclada / Harrow Wattle (Flora)						
171_mod-whip-area_A	73.4	0.01	0.25	2	False	1
					Subtotal	**1**
Austrostipa nullanulla / A spear-grass (Flora)						
253_mod-boninka-area_A	39.7	0.11	0.25	3	True	3
253_mod-lunette-area_A	32.6	2.1	0.25	3	True	51
					Subtotal	**54**
Santalum murrayanum / Bitter Quandong (Flora)						
171_mod-whip-area_B	N/A	4	0.25	2	False	8
170_mod-whip-area_A	N/A	6	0.25	2	False	12
170_mod-whip-area_B	N/A	8	0.25	2	False	16

					Subtotal	**36**

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020938/BAAS17020/20/00020939	PEC Western - South Olary	20/08/2020
Assessor Name	Report Created	BAM Data version *
Alexander Cockerill	21/09/2020	30
Assessor Number	Assessment Type	BAM Case Status
BAAS17020	Major Projects	Open
	Assessment Revision	Date Finalised
	0	To be finalised

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Bardick	Echiopsis curta	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Barking Owl	Ninox connivens	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black Falcon	Falco subniger	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.

Black Falcon	Falco subniger	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Black-breasted Buzzard	Hamirostra melanosternon	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion

Bolam's Mouse	Pseudomys bolami	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
Brolga	Grus rubicunda	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Chestnut Quail-thrush	Cinclosoma castanotum	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Corben's Long-eared Bat	Nyctophilus corbeni	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
Diamond Firetail	Stagonopleura guttata	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Diamond Firetail	Stagonopleura guttata	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Dusky Woodswallow	Artamus cyanopterus cyanopterus	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Gilbert's Whistler	Pachycephala inornata	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Gilbert's Whistler	Pachycephala inornata	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Grey Falcon	Falco hypoleucos	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Grey-crowned Babbler (eastern subspecies)	Pomatostomus temporalis temporalis	143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Inland Forest Bat	Vespadelus baverstocki	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.

Inland Forest Bat	Vespadelus baverstocki	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
Interior Blind Snake	Ramphotyphlops endoterus	143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
Jewelled Gecko	Strophurus elderi	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Kultarr	Antechinomys laniger	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Little Eagle	Hieraaetus morphnoides	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Little Eagle	Hieraaetus morphnoides	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Little Pied Bat	Chalinolobus picatus	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains

Little Pied Bat	Chalinolobus picatus	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Magpie Goose	Anseranas semipalmata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Major Mitchell's Cockatoo	Lophochroa leadbeateri	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Major Mitchell's Cockatoo	Lophochroa leadbeateri	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Mallee Slender Blue-tongue Lizard	Cyclodomorphus melanops elongatus	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Mallee Worm-lizard	Aprasia inaurita	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Malleefowl	Leipoa ocellata	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Marble-faced Delma	Delma australis	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Painted Honeyeater	Grantiella picta	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.

Painted Honeyeater	Grantiella picta	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Pied Honeyeater	Certhionyx variegatus	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Purple-crowned Lorikeet	Glossopsitta porphyrocephala	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Purple-gaped Honeyeater	Lichenostomus cratitius	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone

Redthroat	Pyrrholaemus brunneus	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
Ringed Brown Snake	Pseudonaja modesta	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Sandy Inland Mouse	Pseudomys hermannsburgensis	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
Scarlet-chested Parrot	Neophema splendida	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone

Shy Heathwren	Hylacola cautus	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Southern Ningaui	Ningaui yvonneae	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Southern Scrub-robin	Drymodes brunneopygia	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
Spotted Harrier	Circus assimilis	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion

Square-tailed Kite	Lophoictinia isura	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Stripe-faced Dunnart	Sminthopsis macroura	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
Varied Sittella	Daphoenositta chrysoptera	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion

Varied Sittella	Daphoenositta chrysoptera	172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion
Wedgesnout Ctenotus	Ctenotus brooksi	143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Western Blue-tongued Lizard	Tiliqua occipitalis	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
Western Pygmy Possum	Cercartetus concinnus	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
White-bellied Sea-Eagle	Haliaeetus leucogaster	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

White-bellied Sea-Eagle	Haliaeetus leucogaster	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
White-fronted Chat	Epthianura albifrons	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Yellow-tailed Plain Slider	Lerista xanthura	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.

Yellow-tailed Plain Slider	Lerista xanthura	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones
		252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
Magpie Goose	Anseranas semipalmata	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
		143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		253-Gypseous shrubland on rises in the semi-arid and arid plains
		171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion
		172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone

BAM Candidate Species Report

Proposal Details

Assessment Id 00020938/BAAS17020/20/00020939	Proposal Name PEC Western - South Olary	BAM data last updated * 20/08/2020
Assessor Name Alexander Cockerill	Report Created 21/09/2020	BAM Data version * 30
Assessor Number BAAS17020	Assessment Type Major Projects	BAM Case Status Open
	Assessment Revision 0	Date Finalised To be finalised

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

List of Species Requiring Survey

Name	Presence	Survey Months
Acacia acanthoclada Harrow Wattle	Yes (surveyed)	Jan Feb Mar Apr May Jun Jul **Aug** **Sep** **Oct** **Nov** Dec
Atriplex infrequens A saltbush	No (surveyed)	**Jan** **Feb** Mar Apr May Jun Jul Aug Sep Oct **Nov** **Dec**
Austrostipa metatoris A spear-grass	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep **Oct** **Nov** Dec
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** **Dec**
Calotis moorei A burr-daisy	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** Dec

Cratystylis conocephala Bluebush Daisy	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Dodonaea stenozyga Desert Hopbush	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lasiopetalum behrii Pink Velvet Bush	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lasiorhinus latifrons Southern Hairy-nosed Wombat	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lepidium monoplocoides Winged Peppercress	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Leptorhynchos waitzia Button Immortelle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Manorina melanotis Black-eared Miner	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Pimelea serpyllifolia subsp. serpyllifolia Thyme Rice-Flower	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Polytelis anthopeplus monarchoides Regent Parrot (eastern subspecies)	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Neobatrachus pictus Painted Burrowing Frog	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Santalum murrayanum Bitter Quandong	Yes (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Swainsona colutoides Bladder Senna	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Swainsona pyrophila Yellow Swainson-pea	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lucasium stenodactylum Crowned Gecko	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hieraaetus morphnoides Little Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Acacia carneorum Purple-wood Wattle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Ardeotis australis Australian Bustard	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Burhinus grallarius Bush Stone-curlew	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lophoictinia isura Square-tailed Kite	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Amytornis striatus Striated Grasswren	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Austrostipa nullanulla A spear-grass	Yes (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Geophaps scripta scripta Squatter Pigeon (southern subspecies)	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Kippistia suaedifolia Fleshy Minuria	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Pachycephala rufogularis Red-lored Whistler	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Ninox connivens Barking Owl	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Solanum karsense Menindee Nightshade	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Pseudomys desertor Desert Mouse	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Swainsona murrayana Slender Darling Pea	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

List of Species Not On Site

Name
Pterostylis cobarensis Greenhood Orchid
Brachyscome papillosa Mossgiel Daisy

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00020938/BAAS17020/20/00020939

Assessment name
PEC Western - South Olary

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Report Created
21/09/2020

BAM Data version *
30

Assessor Number
BAAS17020

Assessment Type
Major Projects

BAM Case Status
Open

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

Assessment Revision
0

Date Finalised
To be finalised

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	170_mod-bull-area_A	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	mod-bull-area_A	9.85	3	
2	170_mod-bull-area_B	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	mod-bull-area_B	18.17	3	

3	170_mod-whip-area_A	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	mod-whip-area_A	45.43	4	
4	170_mod-whip-area_B	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	mod-whip-area_B	87.56	5	
5	170_derived-area_A	170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	derived-area_A	34.53	4	
6	58_mod-area_A	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	mod-area_A	29.34	4	
7	58_mod-area_B	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	mod-area_B	59.62	5	
8	58_derived-area_A	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	derived-area_A	36.56	4	
9	19_mod-area_A	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_A	0.59	1	
10	19_mod-area_B	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_B	0.32	1	

11	21_mod-parea_A	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	mod-parea_A	6.18	3	
12	21_mod-area_B	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	mod-area_B	3.79	2	
13	143_mod-area_A	143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.	mod-area_A	0.99	1	
14	154_PCT153-mod-area_A	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	PCT153-mod-area_A	57.53	5	
15	154_mod-area_A	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	mod-area_A	9.72	3	
16	253_mod-boninka-area_A	253-Gypseous shrubland on rises in the semi-arid and arid plains	mod-boninka-area_A	2.84	2	
17	253_mod-lunette-area_A	253-Gypseous shrubland on rises in the semi-arid and arid plains	mod-lunette-area_A	2.07	2	

18	15_mod-area_A	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	1.15	1	
19	15_mod-area_B	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_B	1.87	1	
20	171_mod-bull-area_A	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	mod-bull-area_A	1.82	1	
21	171_mod-bull-area_B	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	mod-bull-area_B	4.53	2	
22	171_mod-whip-area_A	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	mod-whip-area_A	16.64	3	
23	171_mod-whip-area_B	171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	mod-whip-area_B	32.48	4	
24	172_mod-whip-area_A	172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	mod-whip-area_A	8.69	3	
25	172_mod-whip-area_B	172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	mod-whip-area_B	19.48	3	
26	221_mod-area_A	221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	mod-area_A	1.26	1	

27	221_mod-area_B	221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	mod-area_B	2.11	2	
28	252_mod-area_A	252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	mod-area_A	0.73	1	
29	252_mod-area_B	252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	mod-area_B	1.66	1	
30	252_derived-area_A	252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	derived-area_A	5.32	3	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00020938/BAAS17020/20/00020939

Proposal Name
PEC Western - South Olary

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Assessor Number
BAAS17020

BAM Data version *
30

Proponent Names

Report Created
21/09/2020

BAM Case Status
Open

Assessment Revision
0

Assessment Type
Major Projects

Date Finalised
To be finalised

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

Potential Serious and Irreversible Impacts

Nil

Species
Austrostipa nullanulla / A spear-grass
Austrostipa nullanulla / A spear-grass

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

Predicted Threatened Species Not On Site

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones	Not a TEC	195.5	2113.00
58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Not a TEC	125.5	1520.00
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	0.9	20.00
21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions	10.0	255.00
143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.	Not a TEC	1.0	34.00
154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	Not a TEC	67.3	1446.00

253-Gypseous shrubland on rises in the semi-arid and arid plains	Not a TEC	4.9	67.00
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	3.0	36.00
171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	Not a TEC	55.5	886.00
172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	Not a TEC	28.2	340.00
221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	Not a TEC	3.4	41.00
252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	Not a TEC	7.7	17.00

15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region

	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	**Like-for-like credit retirement options**			
	Name of offset trading group	Trading group	HBT	IBRA region
	Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion

Like-for-like credit retirement options

Name of offset trading group	Trading group	HBT	IBRA region
Sandhill Pine Woodland in the Riverina, Murray-Darling Depression and NSW South Western Slopes bioregions This includes PCT's: 19, 21, 28, 48, 75	-	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region

	Semi-arid Sand Plain Woodlands This includes PCT's: 58, 252	Semi-arid Sand Plain Woodlands >=50% and <70%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Sand Plain Mulga Shrublands This includes PCT's: 69, 119, 124, 128, 129, 139, 140, 143, 199, 215, 220, 232	Sand Plain Mulga Shrublands <50%	No	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

143-Narrow-leaved Hopbush - Scrub Turpentine - Senna shrubland on semi-arid and arid sandplains and dunes.

154-Pearl Bluebush low open shrubland of the arid and semi-arid plains

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Aeolian Chenopod Shrublands This includes PCT's: 151, 152, 154, 222, 225	Aeolian Chenopod Shrublands <50%	No	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

170-Chenopod sandplain mallee woodland/shrubland of the arid and semi-arid (warm) zones

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region

	Sand Plain Mallee Woodlands This includes PCT's: 142, 170, 173, 174, 190, 193, 355, 474	Sand Plain Mallee Woodlands <50%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Dune Mallee Woodlands This includes PCT's: 171, 172, 191	Dune Mallee Woodlands <50%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

171-Spinifex linear dune mallee mainly of the Murray Darling Depression Bioregion				
172-Deep sand mallee of irregular dunefields of the semi-arid (warm) zone	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Dune Mallee Woodlands This includes PCT's: 171, 172, 191	Dune Mallee Woodlands <50%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
221-Black Oak - Pearl Bluebush open woodland of the sandplains of the semi-arid warm and arid climate zones	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

	Semi-arid Sand Plain Woodlands This includes PCT's: 57, 58, 59, 221, 252	Semi-arid Sand Plain Woodlands <50%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Semi-arid Sand Plain Woodlands This includes PCT's: 58, 252	Semi-arid Sand Plain Woodlands >=50% and <70%	Yes	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

252-Sugarwood open woodland of the inland plains mainly Murray Darling Depression Bioregion	
253-Gypseous shrubland on rises in the semi-arid and arid plains	**Like-for-like credit retirement options**

Class	Trading group	HBT	IBRA region
Inland Saline Lakes This includes PCT's: 18, 62, 63, 64, 65, 149, 162, 164, 166, 189, 198, 253, 262, 263	Inland Saline Lakes <50%	No	South Olary Plain, Barrier Range Outwash, Darling Depression, Great Darling Anabranch, Lachlan, Menindee, Murray Fans, Murray Scroll Belt, Murrumbidgee, Pooncarie-Darling and Robinvale Plains. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

Species	Area	Credits
Acacia acanthoclada / Harrow Wattle	0.0	1.00
Austrostipa nullanulla / A spear-grass	2.2	54.00

Santalum murrayanum / Bitter Quandong	18.0	36.00

Acacia acanthoclada/ Harrow Wattle	171_mod-whip-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Acacia acanthoclada/Harrow Wattle	Any in NSW
Austrostipa nullanulla/ A spear-grass	253_mod-boninka-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Austrostipa nullanulla/A spear-grass	Any in NSW
	253_mod-lunette-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Austrostipa nullanulla/A spear-grass	Any in NSW

Santalum murrayanum/ Bitter Quandong	170_mod-whip-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Santalum murrayanum/Bitter Quandong	Any in NSW
	170_mod-whip-area_B	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Santalum murrayanum/Bitter Quandong	Any in NSW
	171_mod-whip-area_B	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Santalum murrayanum/Bitter Quandong	Any in NSW

APPENDIX G-2
BAM CREDIT REPORT – GREAT DARLING ANABRANCH IBRA SUBREGION

BAM Credit Summary Report

Proposal Details

Assessment Id
00020944/BAAS17020/20/00020945

Proposal Name
Western PEC - Great Darling Anabranch

BAM data last updated *
20/08/2020

Assessor Name
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21/09/2020

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Assessor Number
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0

Assessment Type
Major Projects

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
1	15_mod-area_A	72.0	7.2	0.25	High Sensitivity to Potential Gain	1.75		225

2	15_mod-area_B	33.4	12.1	0.25	High Sensitivity to Potential Gain	1.75		176
							Subtotal	**401**
Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion								
5	58_mod-area_A	67.4	0.13	0.25	High Sensitivity to Potential Gain	1.75		4
6	58_mod-area_B	12.1	0.59	0.25	High Sensitivity to Potential Gain	1.75		3
7	58_derived-area_A	0.7	0.06	0.25	High Sensitivity to Potential Gain	1.75		0
							Subtotal	**7**
Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains								
3	19_mod-area_A	50.3	0.47	0.25	High Sensitivity to Potential Gain	2.00		12
4	19_mod-area_B	8.1	1.2	0.25	High Sensitivity to Potential Gain	2.00		5
							Subtotal	**17**
Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW								
8	166_mod-area_A	74.8	0.24	0.25	High Sensitivity to Potential Gain	1.50		7
							Subtotal	**7**
							Total	**432**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020944/BAAS17020/20/00020945	Western PEC - Great Darling Anabranch	20/08/2020
Assessor Name	Report Created	BAM Data version *
Alexander Cockerill	21/09/2020	30
Assessor Number	Assessment Type	BAM Case Status
BAAS17020	Major Projects	Open
	Assessment Revision	Date Finalised
	0	To be finalised

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Barking Owl	Ninox connivens	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black Falcon	Falco subniger	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Black-breasted Buzzard	Hamirostra melanosternon	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Black-breasted Buzzard	Hamirostra melanosternon	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Brolga	Grus rubicunda	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Corben's Long-eared Bat	Nyctophilus corbeni	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Gilbert's Whistler	Pachycephala inornata	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Grey Falcon	Falco hypoleucos	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW

Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Little Eagle	Hieraaetus morphnoides	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Little Pied Bat	Chalinolobus picatus	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Magpie Goose	Anseranas semipalmata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Major Mitchell's Cockatoo	Lophochroa leadbeateri	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Major Mitchell's Cockatoo	Lophochroa leadbeateri	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Pied Honeyeater	Certhionyx variegatus	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Spotted Harrier	Circus assimilis	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Square-tailed Kite	Lophoictinia isura	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

White-bellied Sea-Eagle	Haliaeetus leucogaster	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
White-fronted Chat	Epthianura albifrons	166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
Yellow-tailed Plain Slider	Lerista xanthura	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
Magpie Goose	Anseranas semipalmata	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
		58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW

BAM Candidate Species Report

Proposal Details

Assessment Id 00020944/BAAS17020/20/00020945	Proposal Name Western PEC - Great Darling Anabranch	BAM data last updated * 20/08/2020
Assessor Name Alexander Cockerill	Report Created 21/09/2020	BAM Data version * 30
Assessor Number BAAS17020	Assessment Type Major Projects	BAM Case Status Open
	Assessment Revision 0	Date Finalised To be finalised

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

List of Species Requiring Survey

Name	Presence	Survey Months
Burhinus grallarius Bush Stone-curlew	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	Sep Oct Nov Dec
Cratystylis conocephala Bluebush Daisy	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	Sep Oct Nov
Lasiorhinus latifrons Southern Hairy-nosed Wombat	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Polytelis anthopeplus monarchoides Regent Parrot (eastern subspecies)	No (surveyed)	Jan Feb Mar Apr May Jun Jul **Aug** **Sep** **Oct** **Nov** Dec
Lophoictinia isura Square-tailed Kite	No (surveyed)	**Jan** Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** **Dec**
Neobatrachus pictus Painted Burrowing Frog	No (surveyed)	**Jan** **Feb** **Mar** **Apr** **May** **Jun** **Jul** **Aug** **Sep** **Oct** **Nov** **Dec**
Ninox connivens Barking Owl	No (surveyed)	Jan Feb Mar Apr **May** **Jun** **Jul** **Aug** **Sep** **Oct** **Nov** **Dec**
Solanum karsense Menindee Nightshade	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** Dec
Hieraaetus morphnoides Little Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul **Aug** **Sep** **Oct** Nov Dec
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	Jan Feb Mar Apr May Jun **Jul** **Aug** **Sep** **Oct** **Nov** **Dec**

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00020944/BAAS17020/20/00020945

Assessment name
Western PEC - Great Darling Anabranch

BAM data last updated *
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Assessor Name
Alexander Cockerill

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21/09/2020

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Assessor Number
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Assessment Type
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BAM Case Status
Open

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Assessment Revision
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Date Finalised
To be finalised

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	15_mod-area_A	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	7.16	3	

2	15_mod-area_B	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_B	12.07	3	
3	19_mod-area_A	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_A	0.47	1	
4	19_mod-area_B	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_B	1.2	1	
5	58_mod-area_A	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	mod-area_A	0.13	1	
6	58_mod-area_B	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	mod-area_B	0.59	1	
7	58_derived-area_A	58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	derived-area_A	0.06	1	
8	166_mod-area_A	166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	mod-area_A	0.24	1	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00020944/BAAS17020/20/00020945

Proposal Name
Western PEC - Great Darling Anabranch

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Assessor Number
BAAS17020

BAM Data version *
30

Proponent Names

Report Created
21/09/2020

BAM Case Status
Open

Assessment Revision
0

Assessment Type
Major Projects

Date Finalised
To be finalised

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

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	19.2	401.00
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	Not a TEC	1.7	17.00
58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	Not a TEC	0.8	7.00
166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	Not a TEC	0.2	7.00

15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	Yes	Great Darling Anabranch, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Riverine Sandhill Woodlands This includes PCT's: 19, 20, 21, 22, 23, 28, 48, 75, 86	Riverine Sandhill Woodlands >=70% and <90%	Yes	Great Darling Anabranch, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

58-Black Oak - Western Rosewood open woodland on deep sandy loams mainly in the Murray Darling Depression Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Semi-arid Sand Plain Woodlands This includes PCT's: 58, 252	Semi-arid Sand Plain Woodlands >=50% and <70%	No	Great Darling Anabranch, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

	Inland Saline Lakes This includes PCT's: 18, 62, 63, 64, 65, 149, 162, 164, 166, 189, 198, 253, 262, 263	Inland Saline Lakes <50%	No	Great Darling Anabranch, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

APPENDIX G-3
BAM CREDIT REPORT – POONCARIE-DARLING IBRA SUBREGION

BAM Credit Summary Report

Proposal Details

Assessment Id
00020948/BAAS17020/20/00020949

Proposal Name
Pooncarie-Darling

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Report Created
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0

Assessment Type
Major Projects

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
3	15_mod-area_A	74.7	20.5	0.25	High Sensitivity to Potential Gain	1.75		671
4	15_mod-area_B	27.1	40.6	0.25	High Sensitivity to Potential Gain	1.75		480

							Subtotal	**1151**
Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW								
10	166_mod-area_A	60.3	2.3	0.25	High Sensitivity to Potential Gain	1.50		52
							Subtotal	**52**
Pearl Bluebush low open shrubland of the arid and semi-arid plains								
8	154_PCT153-mod-area_A	83.6	5.2	0.25	High Sensitivity to Potential Gain	1.50		163
9	154_mod-area_A	95.2	0.15	0.25	High Sensitivity to Potential Gain	1.50		5
							Subtotal	**168**
Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions								
6	139_mod-area_A	73.0	1.1	0.25	High Sensitivity to Potential Gain	1.75		35
7	139_mod-area_B	50.3	0.94	0.25	High Sensitivity to Potential Gain	1.75		21
							Subtotal	**56**
River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
1	11_mod-area_A	59.8	1	0.25	High Sensitivity to Potential Gain	1.50		24
2	11_mod-area_B	39.5	0.43	0.25	High Sensitivity to Potential Gain	1.50		6
							Subtotal	**30**
Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion								
11	21_mod-area_A	66.5	0.46	0.25	High Sensitivity to Potential Gain	2.00		15
12	21_mod-area_B	10.6	0.68	0.25	High Sensitivity to Potential Gain	2.00		4

							Subtotal	**19**
Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones								
5	63_mod-area_A	38.9	0.3	0.25	High Sensitivity to Potential Gain	1.50		4
							Subtotal	**4**
							Total	**1480**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020948/BAAS17020/20/00020949	Pooncarie-Darling	20/08/2020
Assessor Name	**Report Created**	**BAM Data version ***
Alexander Cockerill	21/09/2020	30
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS17020	Major Projects	Open
	Assessment Revision	**Date Finalised**
	0	To be finalised

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

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Barking Owl	Ninox connivens	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black Falcon	Falco subniger	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Black Falcon	Falco subniger	63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Black-breasted Buzzard	Hamirostra melanosternon	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Brolga	Grus rubicunda	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Brolga	Grus rubicunda	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Corben's Long-eared Bat	Nyctophilus corbeni	139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Dusky Woodswallow	Artamus cyanopterus cyanopterus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Freckled Duck	Stictonetta naevosa	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Gilbert's Whistler	Pachycephala inornata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Gilbert's Whistler	Pachycephala inornata	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Grey Falcon	Falco hypoleucos	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Inland Forest Bat	Vespadelus baverstocki	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Inland Forest Bat	Vespadelus baverstocki	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Little Eagle	Hieraaetus morphnoides	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Little Pied Bat	Chalinolobus picatus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion

Magpie Goose	Anseranas semipalmata	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Major Mitchell's Cockatoo	Lophochroa leadbeateri	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Pied Honeyeater	Certhionyx variegatus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Redthroat	Pyrrholaemus brunneus	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains

Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Spotted Harrier	Circus assimilis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Square-tailed Kite	Lophoictinia isura	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
White-bellied Sea-Eagle	Haliaeetus leucogaster	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

White-bellied Sea-Eagle	Haliaeetus leucogaster	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
White-fronted Chat	Epthianura albifrons	63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion
Yellow-tailed Plain Slider	Lerista xanthura	139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
Magpie Goose	Anseranas semipalmata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones

Magpie Goose	Anseranas semipalmata	139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions
		154-Pearl Bluebush low open shrubland of the arid and semi-arid plains
		166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW
		21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion

BAM Candidate Species Report

Proposal Details

Assessment Id 00020948/BAAS17020/20/00020949	Proposal Name Pooncarie-Darling	BAM data last updated * 20/08/2020
Assessor Name Alexander Cockerill	Report Created 21/09/2020	BAM Data version * 30
Assessor Number BAAS17020	Assessment Type Major Projects	BAM Case Status Open
	Assessment Revision 0	Date Finalised To be finalised

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

List of Species Requiring Survey

Name	Presence	Survey Months
Burhinus grallarius Bush Stone-curlew	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lepidium monoplocoides Winged Peppercress	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lophoictinia isura Square-tailed Kite	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Neobatrachus pictus Painted Burrowing Frog	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Ninox connivens Barking Owl	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Polytelis anthopeplus monarchoides Regent Parrot (eastern subspecies)	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hieraaetus morphnoides Little Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Leptorhynchos waitzia Button Immortelle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00020948/BAAS17020/20/00020949

Assessment name
Pooncarie-Darling

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Assessor Name
Alexander Cockerill

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Assessment Type
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Assessment Revision
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Date Finalised
To be finalised

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	11_mod-area_A	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	1.05	1	

2	11_mod-area_B	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_B	0.43	1	
3	15_mod-area_A	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	20.54	3	
4	15_mod-area_B	15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_B	40.55	4	
5	63_mod-area_A	63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones	mod-area_A	0.3	1	
6	139_mod-area_A	139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions	mod-area_A	1.11	1	
7	139_mod-area_B	139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions	mod-area_B	0.94	1	

8	154_PCT153-mod-area_A	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	PCT153-mod-area_A	5.2	3	
9	154_mod-area_A	154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	mod-area_A	0.15	1	
10	166_mod-area_A	166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	mod-area_A	2.29	2	
11	21_mod-area_A	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	mod-area_A	0.46	1	
12	21_mod-area_B	21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	mod-area_B	0.68	1	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00020948/BAAS17020/20/00020949

Assessor Name
Alexander Cockerill

Proponent Names

Assessment Revision
0

Proposal Name
Pooncarie-Darling

Assessor Number
BAAS17020

Report Created
21/09/2020

Assessment Type
Major Projects

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20/08/2020

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BAM Case Status
Open

Date Finalised
To be finalised

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

Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	1.5	30.00
15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	61.1	1151.00
63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones	Not a TEC	0.3	4.00
139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions	Not a TEC	2.1	56.00
154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	Not a TEC	5.4	168.00
166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	Not a TEC	2.3	52.00

21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	Not a TEC	1.1	19.00

11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 112, 233, 234, 249, 356, 362	Inland Riverine Forests <50%	Yes	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Like-for-like credit retirement options

Class	Trading group	HBT	IBRA region
Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	Yes	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

15-Black Box open woodland wetland with chenopod understorey mainly on the outer floodplains in south-western NSW (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	
21-Slender Cypress Pine - Sugarwood - Western Rosewood open woodland on sandy rises mainly in the Riverina Bioregion and Murray Darling Depression Bioregion	**Like-for-like credit retirement options**

Class	Trading group	HBT	IBRA region
Riverine Sandhill Woodlands This includes PCT's: 19, 20, 21, 22, 23, 28, 48, 75, 86	Riverine Sandhill Woodlands >=70% and <90%	Yes	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

63-Spiny Lignum - Slender Glasswort open forbland sailine wetland on lake edges in the semi-arid and arid climate zones	**Like-for-like credit retirement options**

Class	Trading group	HBT	IBRA region

	Inland Saline Lakes This includes PCT's: 18, 62, 63, 64, 65, 149, 162, 164, 166, 189, 198, 253, 262, 263	Inland Saline Lakes <50%	No	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
139-Prickly Wattle tall open shrubland of dunes and sandplains of semi-arid and arid regions	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Sand Plain Mulga Shrublands This includes PCT's: 69, 128, 139, 220	Sand Plain Mulga Shrublands >=50% and <70%	No	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

154-Pearl Bluebush low open shrubland of the arid and semi-arid plains	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Aeolian Chenopod Shrublands This includes PCT's: 151, 152, 154, 222, 225	Aeolian Chenopod Shrublands <50%	No	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
166-Disturbed annual saltbush forbland on clay plains and inundation zones mainly of south-western NSW	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Saline Lakes This includes PCT's: 18, 62, 63, 64, 65, 149, 162, 164, 166, 189, 198, 253, 262, 263	Inland Saline Lakes <50%	No	Pooncarie-Darling, Menindee, Murray Scroll Belt and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

No Species Credit Data

APPENDIX G-4
BAM CREDIT REPORT – ROBINVALE PLAIN IBRA SUBREGION

BAM Credit Summary Report

Proposal Details

Assessment Id
00020942/BAAS17020/20/00020943

Proposal Name
Western PEC - Robinvale Plains

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20/08/2020

Assessor Name
Alexander Cockerill

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

Zone	Vegetation zone name	Vegetation integrity loss / gain	Area (ha)	Constant	Species sensitivity to gain class (for BRW)	Biodiversity risk weighting	Potential SAII	Ecosystem credits
Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
2	13_mod-area_A	74.0	2.2	0.25	High Sensitivity to Potential Gain	1.75		73
3	13_mod-area_B	29.8	4.6	0.25	High Sensitivity to Potential Gain	1.75		59

6	13_derived_area_A	18.6	0.47	0.25	High Sensitivity to Potential Gain	1.75		4
							Subtotal	**136**
Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion								
5	216_mod-area_A	70.1	0.54	0.25	High Sensitivity to Potential Gain	1.50		14
							Subtotal	**14**
Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains								
7	19_mod-area_A	46.2	0.18	0.25	High Sensitivity to Potential Gain	2.00		4
8	19_mod-area_B	12.0	0.17	0.25	High Sensitivity to Potential Gain	2.00		1
							Subtotal	**5**
Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
4	17_mod-area_A	59.5	0.04	0.25	High Sensitivity to Potential Gain	1.75		1
							Subtotal	**1**
River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)								
1	11_mod-area_A	60.3	0.1	0.25	High Sensitivity to Potential Gain	1.50		2
							Subtotal	**2**
							Total	**158**

Species credits for threatened species

Vegetation zone name	Habitat condition (HC)	Area (ha) / individual (HL)	Constant	Biodiversity risk weighting	Potential SAII	Species credits

Atriplex infrequens / A saltbush (Flora)						
13_mod-area_A	74.0	0.18	0.25	2	False	7
17_mod-area_A	59.5	0.04	0.25	2	False	1
13_derived_area_A	18.6	0.04	0.25	2	False	1
					Subtotal	**9**
Polytelis anthopeplus monarchoides / Regent Parrot (eastern subspecies) (Fauna)						
11_mod-area_A	60.3	0.1	0.25	2	False	3
13_mod-area_A	74.0	2.2	0.25	2	False	83
13_mod-area_B	29.8	4.6	0.25	2	False	68
					Subtotal	**154**

BAM Predicted Species Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020942/BAAS17020/20/00020943	Western PEC - Robinvale Plains	20/08/2020
Assessor Name	**Report Created**	**BAM Data version ***
Alexander Cockerill	24/09/2020	30
Assessor Number	**Assessment Type**	**BAM Case Status**
BAAS17020	Major Projects	Open
	Assessment Revision	**Date Finalised**
	0	To be finalised

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Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Types(s)
Australasian Bittern	Botaurus poiciloptilus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Australian Painted Snipe	Rostratula australis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Barking Owl	Ninox connivens	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Black Falcon	Falco subniger	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Black-breasted Buzzard	Hamirostra melanosternon	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Blue-billed Duck	Oxyura australis	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Brolga	Grus rubicunda	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Corben's Long-eared Bat	Nyctophilus corbeni	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Diamond Firetail	Stagonopleura guttata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Dusky Woodswallow	Artamus cyanopterus cyanopterus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Freckled Duck	Stictonetta naevosa	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Freckled Duck	Stictonetta naevosa	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Gilbert's Whistler	Pachycephala inornata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Grey Falcon	Falco hypoleucos	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Hooded Robin (south-eastern form)	Melanodryas cucullata cucullata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Inland Forest Bat	Vespadelus baverstocki	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Little Eagle	Hieraaetus morphnoides	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Little Pied Bat	Chalinolobus picatus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
Magpie Goose	Anseranas semipalmata	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Major Mitchell's Cockatoo	Lophochroa leadbeateri	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Pied Honeyeater	Certhionyx variegatus	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Purple-crowned Lorikeet	Glossopsitta porphyrocephala	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Purple-gaped Honeyeater	Lichenostomus cratitius	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Regent Parrot (eastern subspecies)	Polytelis anthopeplus monarchoides	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Spotted Harrier	Circus assimilis	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
Square-tailed Kite	Lophoictinia isura	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Square-tailed Kite	Lophoictinia isura	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Swift Parrot	Lathamus discolor	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
Varied Sittella	Daphoenositta chrysoptera	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
White-bellied Sea-Eagle	Haliaeetus leucogaster	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
White-fronted Chat	Epthianura albifrons	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)

Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

Threatened species not within the area of these PCT's

Common Name	Scientific Name	Vegetation Types(s)
Corben's Long-eared Bat	Nyctophilus corbeni	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains
Magpie Goose	Anseranas semipalmata	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)
		216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion
		19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains

BAM Candidate Species Report

Proposal Details

Assessment Id 00020942/BAAS17020/20/00020943	Proposal Name Western PEC - Robinvale Plains	BAM data last updated * 20/08/2020
Assessor Name Alexander Cockerill	Report Created 24/09/2020	BAM Data version * 30
Assessor Number BAAS17020	Assessment Type Major Projects	BAM Case Status Open
	Assessment Revision 0	Date Finalised To be finalised

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List of Species Requiring Survey

Name	Presence	Survey Months
Austrostipa metatoris A spear-grass	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep **Oct** **Nov** Dec
Burhinus grallarius Bush Stone-curlew	No (surveyed)	**Jan** **Feb** **Mar** **Apr** **May** **Jun** **Jul** **Aug** **Sep** **Oct** **Nov** **Dec**
Lophochroa leadbeateri Major Mitchell's Cockatoo	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** **Dec**
Hamirostra melanosternon Black-breasted Buzzard	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug **Sep** **Oct** **Nov** Dec
Lathamus discolor Swift Parrot	No (surveyed) *Survey months are outside of the months specified in Bionet.	**Jan** **Feb** **Mar** **Apr** **May** **Jun** **Jul** **Aug** **Sep** **Oct** **Nov** **Dec**

Litoria raniformis Southern Bell Frog	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lophoictinia isura Square-tailed Kite	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Ninox connivens Barking Owl	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Polytelis anthopeplus monarchoides Regent Parrot (eastern subspecies)	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Eucalyptus leucoxylon subsp. pruinosa Yellow Gum	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Hieraaetus morphnoides Little Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Haliaeetus leucogaster White-bellied Sea-Eagle	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Atriplex infrequens A saltbush	Yes (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Swainsona sericea Silky Swainson-pea	No (surveyed)	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec
Lepidium monoplocoides Winged Peppercress	No (surveyed) *Survey months are outside of the months specified in Bionet.	Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

List of Species Not On Site

BAM Candidate Species Report

Name
Casuarina obesa Swamp She-oak

BAM Vegetation Zones Report

Proposal Details

Assessment Id
00020942/BAAS17020/20/00020943

Assessment name
Western PEC - Robinvale Plains

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Report Created
24/09/2020

BAM Data version *
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Assessor Number
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Assessment Type
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Assessment Revision
0

Date Finalised
To be finalised

Vegetation Zones

#	Name	PCT	Condition	Area	Minimum number of plots	Management zones
1	11_mod-area_A	11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	0.1	1	

2	13_mod-area_A	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	2.25	2	
3	13_mod-area_B	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_B	4.56	2	
4	17_mod-area_A	17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	mod-area_A	0.04	1	
5	216_mod-area_A	216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	mod-area_A	0.54	1	
6	13_derived_area_A	13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	derived_area_A	0.47	1	
7	19_mod-area_A	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_A	0.18	1	

8	19_mod-area_B	19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	mod-area_B	0.17	1	

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id
00020942/BAAS17020/20/00020943

Proposal Name
Western PEC - Robinvale Plains

BAM data last updated *
20/08/2020

Assessor Name
Alexander Cockerill

Assessor Number
BAAS17020

BAM Data version *
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Proponent Names

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24/09/2020

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Major Projects

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Potential Serious and Irreversible Impacts

Nil

Nil

Additional Information for Approval

PCTs With Customized Benchmarks

No Changes

BAM Biodiversity Credit Report (Like for like)

Predicted Threatened Species Not On Site

No Changes

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

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	Number of credits to be retired
11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0.1	2.00
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	7.3	136.00
17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	Not a TEC	0.0	1.00
216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	Not a TEC	0.5	14.00
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	Not a TEC	0.4	5.00

11-River Red Gum - Lignum very tall open forest or woodland wetland on floodplains of semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Riverine Forests This includes PCT's: 2, 5, 7, 8, 9, 10, 11, 36, 78, 112, 233, 234, 249, 356, 362	Inland Riverine Forests <50%	Yes	Robinvale Plains, Murray Fans, Murray Scroll Belt, Murrumbidgee and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
13-Black Box - Lignum woodland wetland of the inner floodplains in the semi-arid (warm) climate zone (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Floodplain Woodlands This includes PCT's: 13, 15, 16, 83, 438, 454, 630	Inland Floodplain Woodlands >=50% and <70%	Yes	Robinvale Plains, Murray Fans, Murray Scroll Belt, Murrumbidgee and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

17-Lignum shrubland wetland of the semi-arid (warm) plains (mainly Riverina Bioregion and Murray Darling Depression Bioregion)	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Inland Floodplain Shrublands This includes PCT's: 17, 115, 161, 241, 247, 375	Inland Floodplain Shrublands >=50% and <70%	No	Robinvale Plains, Murray Fans, Murray Scroll Belt, Murrumbidgee and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.
19-Cypress Pine woodland of source-bordering dunes mainly on the Murray and Murrumbidgee River floodplains	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region

	Riverine Sandhill Woodlands This includes PCT's: 19, 20, 21, 22, 23, 28, 48, 75, 86	Riverine Sandhill Woodlands >=70% and <90%	No	Robinvale Plains, Murray Fans, Murray Scroll Belt, Murrumbidgee and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

216-Black Roly Poly low open shrubland of the Riverina Bioregion and Murray Darling Depression Bioregion	**Like-for-like credit retirement options**			
	Class	Trading group	HBT	IBRA region
	Riverine Chenopod Shrublands This includes PCT's: 157, 158, 159, 163, 165, 168, 195, 196, 211, 212, 216, 236, 254, 377, 466	Riverine Chenopod Shrublands <50%	No	Robinvale Plains, Murray Fans, Murray Scroll Belt, Murrumbidgee and South Olary Plain. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

Species Credit Summary

BAM Biodiversity Credit Report (Like for like)

Species	Area	Credits
Atriplex infrequens / A saltbush	0.3	9.00
Polytelis anthopeplus monarchoides / Regent Parrot (eastern subspecies)	6.9	154.00

Atriplex infrequens/ A saltbush	13_derived_area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Atriplex infrequens/A saltbush	Any in NSW
	13_mod-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Atriplex infrequens/A saltbush	Any in NSW
	17_mod-area_A	**Like-for-like credit retirement options**	
		Spp	IBRA region
		Atriplex infrequens/A saltbush	Any in NSW

Atriplex infrequens/ A saltbush	17_mod-area_A	
Polytelis anthopeplus monarchoides/ Regent Parrot (eastern subspecies)	11_mod-area_A	**Like-for-like credit retirement options**
		Spp: IBRA region
		Polytelis anthopeplus monarchoides/Regent Parrot (eastern subspecies): Any in NSW
	13_mod-area_A	**Like-for-like credit retirement options**
		Spp: IBRA region
		Polytelis anthopeplus monarchoides/Regent Parrot (eastern subspecies): Any in NSW
	13_mod-area_B	**Like-for-like credit retirement options**
		Spp: IBRA region
		Polytelis anthopeplus monarchoides/Regent Parrot (eastern subspecies): Any in NSW

Polytelis anthopeplus monarchoides/ Regent Parrot (eastern subspecies)	13_mod-area_B

ABOUT US

WSP is one of the world's leading engineering professional services consulting firms. We are dedicated to our local communities and propelled by international brainpower. We are technical experts and strategic advisors including engineers, technicians, scientists, planners, surveyors, environmental specialists, as well as other design, program and construction management professionals. We design lasting Property & Buildings, Transportation & Infrastructure, Resources (including Mining and Industry), Water, Power and Environmental solutions, as well as provide project delivery and strategic consulting services. With 43,600 talented people in more than 550 offices across 40 countries, we engineer projects that will help societies grow for lifetimes to come.

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