AREAS OF MORE ABUNDANT MISTLETOE WITHIN THE STUDY AREA

Elleron Drive extension

- Study area
- Revised subject site
- Mistletoe (Amyema pendula) more abundant

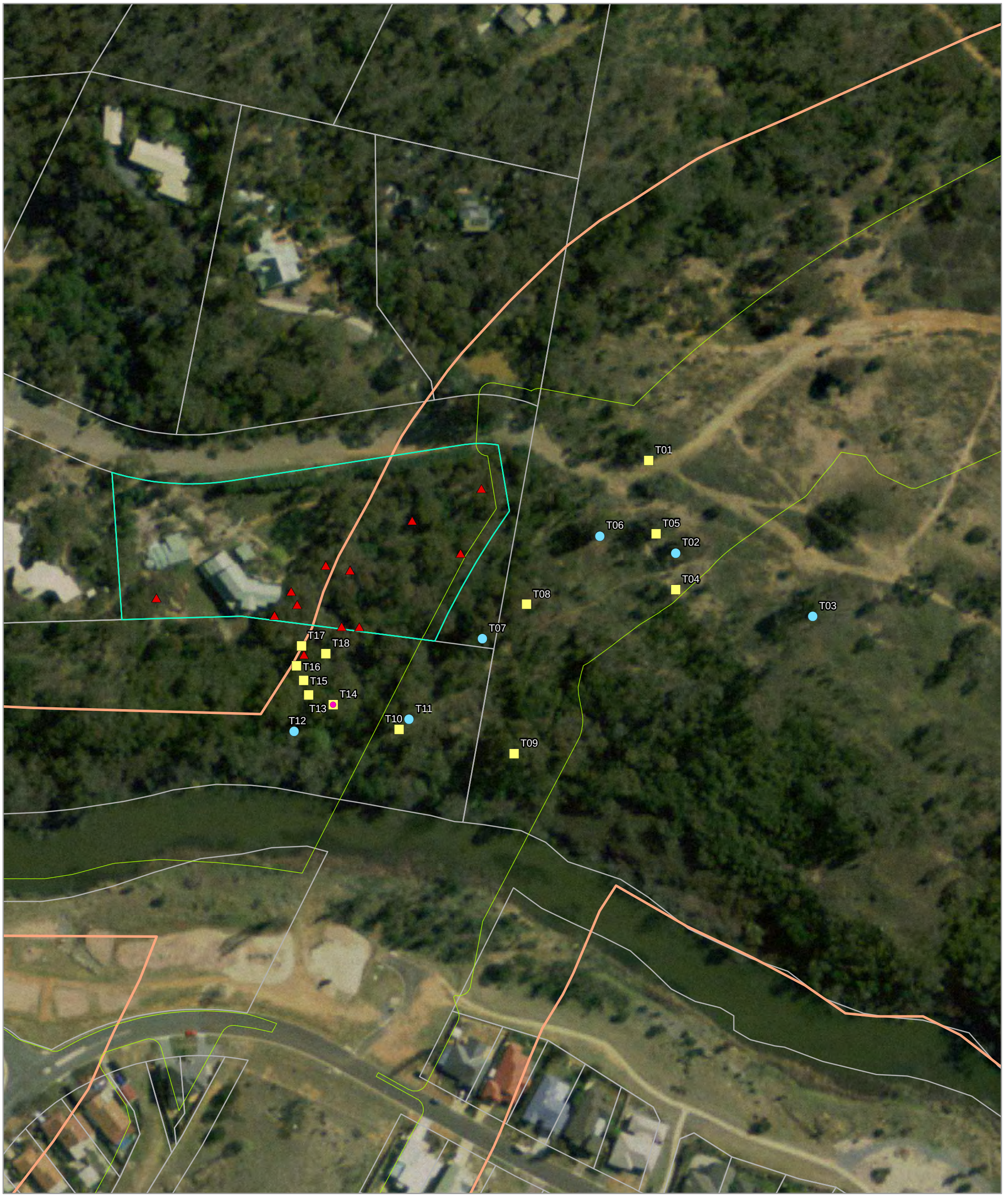
0 125 250 Metres

A3 @ 1:11500
Ref: 4733 - 8
Author: JB

ngh environmental

www.nghenvironmental.com.au

Notes:
- Data collected by nghenvironmental (October 2012)
- Development footprint and aerial imagery provided by QCC



GLIDER SURVEYS - June/July 2015

Ellerton Drive extension

- Property boundary - 35 Lonergan Drive
- Subject site
- Study area
- Cadastre
- Original trap locations

New trap locations

- Cage
- Tube
- Location of captures x 2

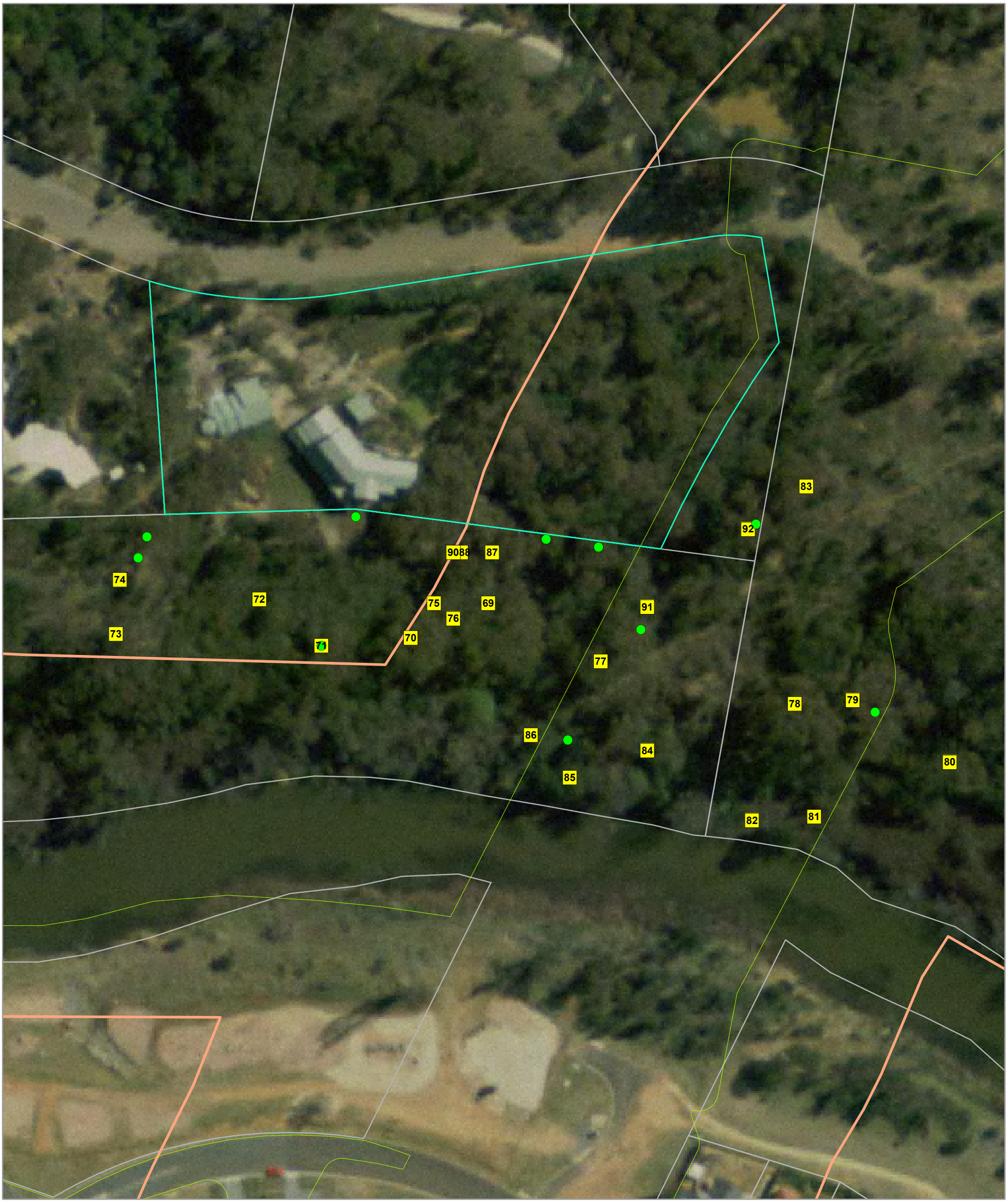
Notes:
- Footprint and Cadastre data courtesy QCC
- Aerial imagery supplied by QCC 2012
- Field data collected by NGH Environmental June - July 2015

0 25 50 Metres

A3 @ 1:1500
Ref: 6134
Author: JB

ngh environmental

www.nghenvironmental.com.au



GLIDER SURVEYS - October 2015

Ellerton Drive extension

- Trap locations October 2015
- Stag watching locations
- Property boundary - 35 Lonergan Drive
- Subject site
- Study area
- Cadastre

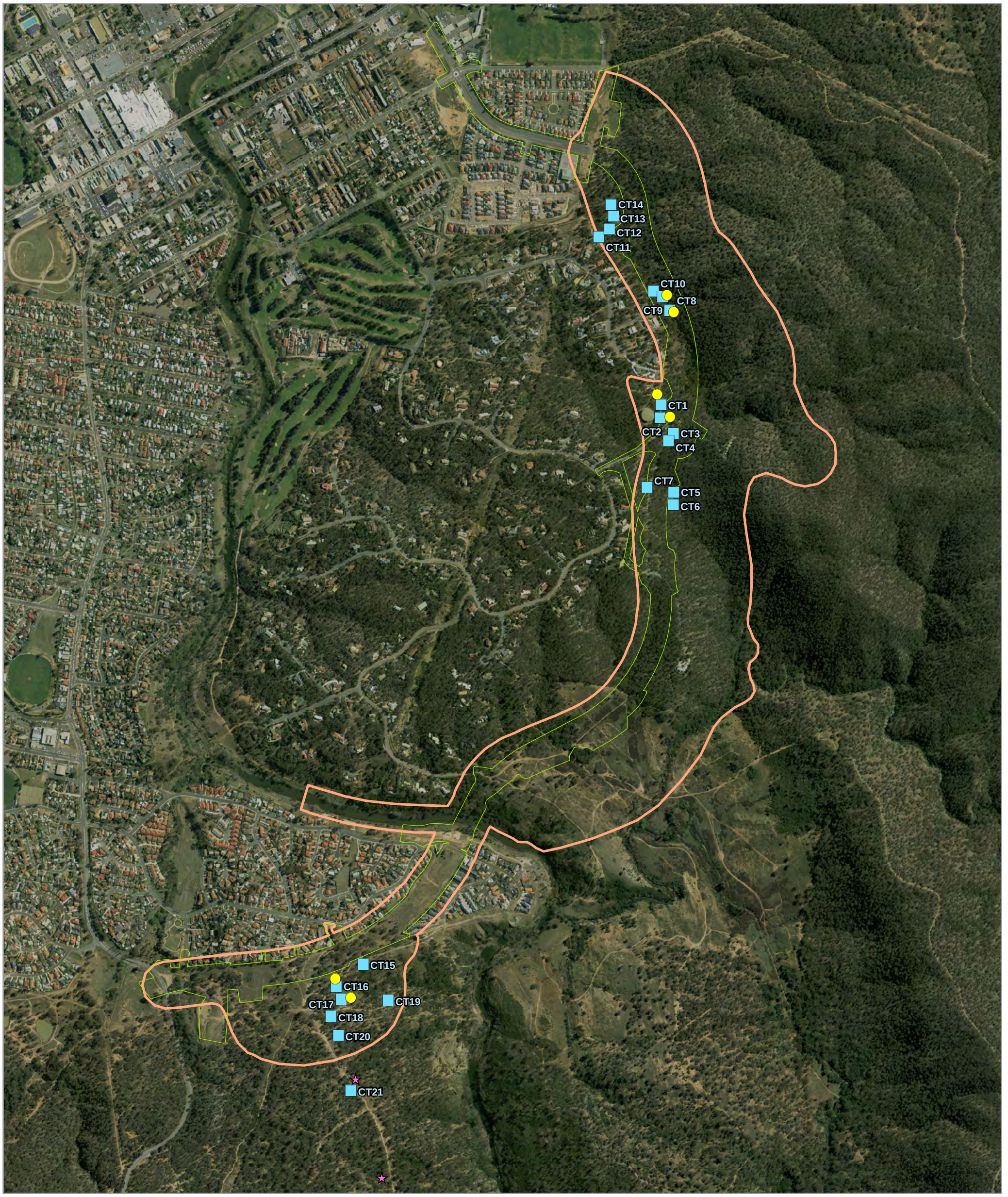
Notes:
- Footprint and Cadastre data courtesy QCC
- Aerial imagery supplied by QCC 2012
- Field data collected by NGH Environmental June - July 2015

0 20 40 Metres

A3 @ 1:950
Ref: 6134
Author: JB

ngh environmental

www.nghenvironmental.com.au



GLIDER SURVEYS - November 2015

Ellerton Drive extension

- Sugar Glider observations (spotlighting)
- Stagwatching locations
- Trap locations Nov 2015
- Subject site
- SIS study area

Notes:
- Footprint data courtesy QCC
- Aerial imagery supplied by QCC 2012
- Field data collected by NGH Environmental November 2015

0 100 200 Metres

A3 @ 1:12500
Ref: 6134
Author: JB

ngh environmental

www.nghenvironmental.com.au

APPENDIX C UPDATED SURVEY DATA

*Asterisk indicates new data from April 2015 and February 2016 surveys.

Hollow sizes are as defined in the original SIS; small (< 10 cm entrance diameter), medium (11 to 20 cm entrance diameter) or large (>20 centimetres entrance diameter).

C.1 HOLLOW-BEARING TREES RECORDED WITHIN THE STUDY AREA

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT1	90			1	1				704333	6083262
HT2	200		2		2			Potential	703514	6082566
HT3	100	1			1	yes			704437	6083313
HT4	120	1	1	1	3			Potential	704427	6083284
HT5	80		2		2				704386	6083516
HT6	70		1		1				704307	6083307
HT7	70		1	1	2			Potential	704345	6083291
HT8	70			1	1				703277	6082671
HT9	90		2		2		141		703584	6082632
HT10	100		2		2			Galah	703562	6082673
HT11	80		1	1	2		140	Sulphur Crested Cockatoo	703576	6082703
HT12	80		1		1		139		646607	6150988
HT13	100		4		4		132	Crimson Rosella	651675	6137486
HT14	40		1		1				703845	6082717
HT15	90	2	2		4		118		703822	6082770
HT16	90		3		3		134	Crimson Rosella	650241	6143250
HT17	50	1			1	yes		Potential	704928	6084602

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT18	80	1			1			Potential	704862	6084588
HT19	80			2	2			Potential	704851	6084536
HT20	120	1	1	1	3	yes			704809	6084532
HT21	70		1		1				704795	6084486
HT22	70		1		1			Potential	704801	6084352
HT23	40		1	1	2				704783	6084235
HT24	40		1		1	yes			704783	6084234
HT25	40			1	1				704800	6084230
HT26	60			1	1			Potential	704805	6084236
HT27	20			1	1	yes			704969	6084596
HT28	30	1			1	yes			704980	6084552
HT29	70		1	1	2		62		704904	6084527
HT30	50		1	1	2				704884	6084481
HT31	20	2			2			Potential	704906	6084362
HT32	30		2		2			Potential	704849	6084345
HT33	40		1		1	yes			704872	6084469
HT34	40	1			1	yes			704903	6084290
HT35	40	1			1	yes			704909	6084257
HT36	40	1			1			Potential	704909	6084247
HT37	80			1	1			Potential	704802	6084228
HT38	80	1			1				704801	6084183
HT39	80			1	1	yes		Worn	704838	6084131
HT40	70			1	1				704872	6084082
HT41	120		2	1	3				704868	6084079
HT42	50			1	1	yes		Scratches	704777	6083992
HT43	90		1	1	2				704784	6083982

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT44	90			1	1				704812	6083975
HT45	70		1		1	yes		Scratches	704798	6083939
HT46	70			2	2				704815	6083947
HT47	40	2			2	yes			704865	6084229
HT48	50		1		1				704862	6084214
HT49	40	2			2	yes			704919	6084089
HT50	40		1		1	yes			704906	6084076
HT51	40		1		1	yes			704907	6084079
HT52	40		1		1	yes			704903	6084081
HT53	40	1			1				704922	6084052
HT54	20	1			1			Potential	704890	6084045
HT55	40		1		1			Potential	704856	6083999
HT56	40		2		2				704875	6083960
HT57	120		1		1			Potential	704811	6083933
HT58	60			1	1			Potential	704803	6083879
HT59	50		1		1				704797	6083856
HT60	70		1		1				704832	6083826
HT61	30	1			1	yes			704844	6083964
HT62	40	1			1				704843	6083960
HT63	70		1		1				704844	6083931
HT64	80		1		1				704855	6083921
HT65	40	1			1				704895	6083891
HT66	50		1		1				704900	6083879
HT67	80		1		1			Bees	704857	6083866
HT68	50		1		1				704882	6083831
HT69	50		1		1				704850	6083745

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT70	80		2	1	3				704874	6083768
HT71	200			1	1				704591	6083423
HT72	50	7	2		9				6083648	704786
HT73	25		1		1				6083648	704826
HT74	20	1			1				6083648	704831
HT75	70		1	2	3				6083688	704826
HT76	60			2	2				6083683	704845
HT77	90		3		3				6083714	704815
HT78	60	1	2		3			Scratches	6083729	704814
HT79	90			1	1		176		6083730	704798
HT80	85		3	2	5		175	Bees	6083733	704789
HT81	50	1	2		3				6083731	704788
HT82	50	1	1	1	3			Scratches	6083694	704798
HT83	60	1			1				6083679	704810
HT84	25	1			1				6083660	704801
HT85	50	1			1		81		6083657	704797
HT86	65	2	3		5				6083659	704786
HT87	120		2		2				6083658	704779
HT88	70	2	3		5				6083660	704770
HT89	45		2		2				6083689	704787
HT90	25	2	2		4				6083695	704782
HT91	30	1	2		3				6083777	704781
HT92	40		2		2			Used?	6083778	704776
HT93	40		2		2				6083786	704780
HT94	25	2			2			Used?	6083814	704791
HT95	20	1	1		2				6083830	704791

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT96	40		1		1				6083750	704760
HT97	45		2	1	3				6083710	704745
HT98	45	3	1		4				6083701	704718
HT99	150	1	1		2				6083673	704730
HT100	50	2	3		5				6083673	704711
HT101	60	2			2				6083672	704704
HT102	40	1	2		3				6083664	704707
HT103	40	1	1		2				-35.3564	149.2555
HT104	80		1		1			Spout	-35.3595	149.2594
HT105	50		2		2				-35.3598	149.2596
HT106	40	1			1			Spout	-35.3598	149.2595
HT107	100		1	1	2				-35.3616	149.2596
HT108	70			1	1	Yes		Deep vertical hollow	-35.3618	149.2594
HT109	40		1		1				-35.3617	149.259
HT110	70	2	1		3	Yes		Bats	-35.3563	149.2549
HT111	60	2			2			Bats	-35.3667	149.2568
HT112	80	2	2	1	5	Yes		Bats	-35.3666	149.2569
HT113	30		1		1			Bats	-35.3646	149.2573
HT114	120	3	3	1	7			Birds	-35.3702	149.2556
HT115	45	2	1		3	Yes		Bats, parrots	-35.3702	149.2554
HT116	150	1			1			Bats	-35.37	149.2557
HT117*	400	4			4		HT24	All spouts. Likely >4 hollows	704787	6084487
HT118*	1200			1	1			Large trunk hollow	703747	6082830
HT119*	800		3		3			Spouts	703759	6082824
HT120*	1000	1	2		3				703748	6082809
HT121*	600	2	2		4				704675	6084423

Tree ID	DBH (cm)	Hollow Size			Total	Signs	QCC Tree ID	Comment	GPS Location	
		Small	Medium	Large					Easting	Northing
HT122*	600		1	1	2				704653	6084405
HT123*	500	1	3	4	8				704767	6084319
HT124*	300	1	3	1	5				704765	6084291
HT125*	150		1		1				704766	6084289
HT126*	250	1	1		2				704775	6084213
HT127*	500			2	2				704755	6084141
HT128*	150	1			1				704771	6084093
HT129*	250		2	2	4				704776	6084076

C.2 TERMITE MOUNDS RECORDED WITHIN THE STUDY AREA

*Asterisk indicates new data from April 2015 and February 2016 surveys.

Mound ID	GPS Location	
	Easting	Northing
M01	704948	6084650
M02	704980	6084654
M03	704983	6084576
M04	704992	6084563
M05	704963	6084560
M06	704960	6084534
M07	704934	6084503
M08	704960	6084468
M09	704887	6084286
M10	704870	6084276
M11	704823	6084296
M12	704830	6084252
M13	704908	6084205
M14	704892	6084189
M15	704867	6084151
M16	704836	6084108
M17	704897	6084058
M18	704920	6084030
M19	704908	6084024
M20	704880	6083894
M21	704882	6083803
M22	704820	6083757
M23	704807	6083745
M24	704843	6083695
M25	704334	6083292
M26	703692	6082676
M27	703714	6082704
M28	704737	6085489
M29	704682	6085447
M30	704777	6085228
M31	704799	6085218
M32	704940	6084871
M33	704932	6084815
M34	704917	6084813
M35	704889	6084620
M36	704851	6084498
M37	704838	6084505
M38	704852	6084519
M39	704813	6084521
M40	704818	6084490
M41	704796	6084406
M42	704818	6084371
M43	704796	6084310
M44	704764	6084362

M45	704758	6084361
M46	704812	6084159
M47	704876	6084065
M48	704838	6084041
M49	704816	6084023
M50	704826	6083932
M52	703202	6082723
M53	704901	6085085
M54	703922	6082582
M55*	704709	6085761
M56*	704781	6084474
M57*	704794	6084462
M58*	703746	6082833
M59*	704696	6084435
M60*	704653	6084405
M61*	704660	6084402
M62*	704679	6084408
M63*	704696	6084419
M64*	704725	6084421
M65*	704734	6084389
M65*	704742	6084387
M66*	704760	6084350
M67*	704757	6084088
M68*	704793	6084068

C.3 SQUIRREL GLIDER TRAPPING, SPOTLIGHT AND STAGWATCH RESULTS

C.3.1 June/July survey session

Raw data from Squirrel Glider survey sessions.

Weather observations from Canberra Airport http://www.bom.gov.au/climate/dwo/IDCJDW2801.latest.shtml

Table Key:

Y - Yes (trap set)

Trap Removed/Not Installed

Cage Traps:

O - Open

CNC – Closed - No Capture

CC – Closed - Capture

OB - Open bait taken

Tube Traps:

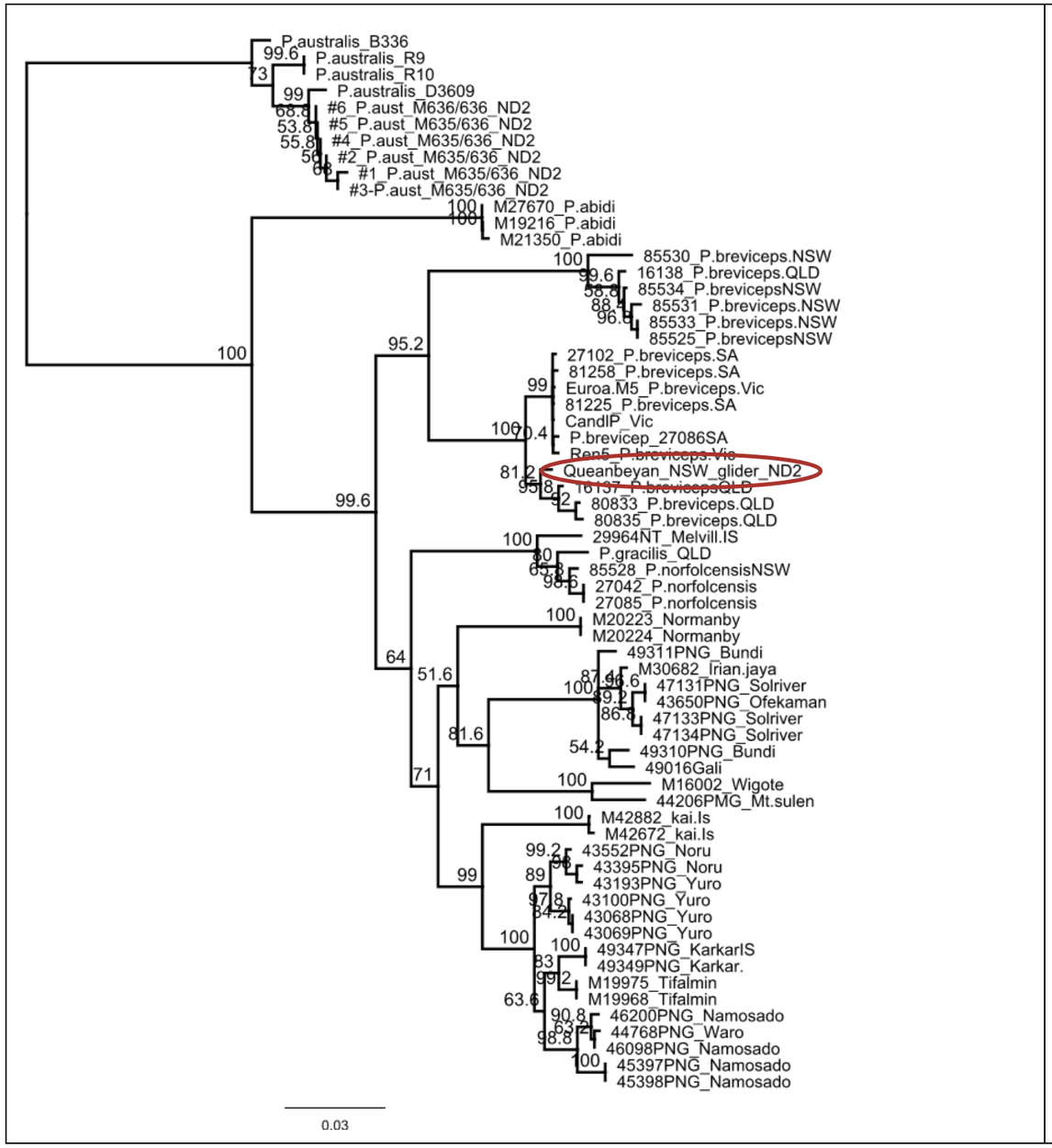
NC - No capture

Trap ID			T01	T02	T03	T04	T05	T06	T07	T08	T09	T10	T11	T12	T13	T14	T15	T16	T17	T18	Notes/Observations
Trap Type			Cage	Tube	Tube	Cage	Cage	Tube	Tube	Cage	Cage	Cage	Tube	Tube	Cage	Cage	Cage	Cage	Cage	Cage	
Easting			704293	704304	704360	704304	704296	704273	704225	704243	704238	704191	704195	704148	704154	704164	704152	704149	704151	704161	
Northing			6083360	6083322	6083296	6083307	6083330	6083329	6083287	6083301	6083240	6083250	6083254	6083249	6083264	6083260	6083270	6083276	6083284	6083281	
Date Installed			15.06.15	15.06.15	15.06.15	15.06.15	15.06.15	15.06.15	15.06.15	15.06.15	17.06.15	17.06.15	17.06.15	17.06.15	18.06.15	18.06.15	19.06.15	19.06.15	19.06.15	07.07.15	
Dates Set/Checked	Temp (min/max)	Rain (mm)																			
Set: 15.06.15 PM (Mon)	-0.2/7.9	0	Y	Y	Y	Y	Y	Y	Y	Y											
Check: 16.06.15 AM (Tue)			O	NC	NC	O	O	NC	NC	O											
Set: 17.06.15 PM (Wed)	-4.1/10.8	21	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y							
Check: 18.06.15 AM (Thu)			O	NC	NC	O	O	NC	NC	O	O	O	NC	NC							
Set: 18.05.15 PM (Thu)	-4.2/11.0	25	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y					
Check: 19.06.15 AM (Fri)			O	NC	NC	O	O	NC	NC	OB	O	O	NC	NC	O	O					
Set: 19.06.15 PM (Fri)	-2.2/12.8	4.8							Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Check: 19.06.15 PM (Fri)									NC	O	O	O	NC	NC	O	O	CNC	O	CNC		
Set: 22.06.15 PM (Mon)	-4.6/9.6	0								Y		Y	Y	Y	Y	Y	Y	Y	Y		
Check: 22.06.15 PM (Mon)										O		O	NC	NC	O	O	O	O	O		
Set: 23.06.15 PM (Tue)	-2.4/10.8	0													Y	Y	Y	Y	Y		
Check: 24.06.15 AM (Tue)															O	CC	O	CNC	O		Sugar Glider Caught
Set: 24.06.15 PM (Wed)	3.5/11.6	0													Y	Y	Y	Y	Y		T01 Removed - potential for theft by member of public
Check: 25.06.15 AM (Thu)															OB	O	O	OB	O		
Set: 25.06.15 PM (Thu)	1.1/13.4	0													Y	Y	Y	Y	Y		

Trap ID			T01	T02	T03	T04	T05	T06	T07	T08	T09	T10	T11	T12	T13	T14	T15	T16	T17	T18	Notes/Observations
Check: 25.06.15 (Thu)															O	O	Trap fallen	O	O		
Set: 29.06.15 PM (Mon)	-0.9/12.9	0													Y	Y	Y	Y	Y		
Check: 29.06.15 PM (Mon)															O	O	O	O	O		
Set: 30.06.15 PM (Tue)	-2.0/12.3	0					Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Check: 30.06.15 PM (Tue)							O	NC	NC	O	O	O	NC	NC	O	O	O	O	O		
Set: 01.07.15 PM (Wed)	-4.1/10.0	0		Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y		
Check: 01.07.15 PM (Wed)				NC		O	O	NC	NC	O	O	O	NC	NC	O	O	O	O	O		
Set: 06.07.15 PM (Mon)	-2.4/11.2	0													Y	Y	Y	Y	Y		Glider seen near T18 - likely Sugar Glider (but unconfirmed - unable to clearly see animal's features).
Check: 06.07.15 PM (Mon)															O	O	O	O	O		
Set: 07.07.2015 PM (Tue)	-4.7/11.5	0													Y	Y	Y	Y	Y	Y	
Check: 07.07.2015 PM (Tue)															O	O	O	O	O	O	
Set: 08.07.2015 PM (Wed)	-3.0/12.6	0													Y	Y	Y	Y	Y	Y	
Check: 08.07.2015 PM (Wed)															O	O	O	O	O	O	
Set: 21.07.2015 PM (Tue)	N/a/14.1	0													Y	Y	Y	Y	Y	Y	
Check: 22.07.2015 PM (Wed)															O	CC	O	O	O	O	Sugar Glider Caught
Set: 22.07.2015 PM (Wed)	0.2/9.6														Y	Y	Y	Y	Y	Y	
Check: 23.07.2015 AM (Thu)															O	O	O	O	O	O	
Set: 23.07.2015 PM (Thu)	4.3/10.8	8													Y	Y	Y	Y	Y	Y	
Check: 24.07.2015 AM (Fri)		3.2													O	O	O	O	O	O	

DNA analysis results

Capture on 23 June 2015 Analysis by SA Museum obtained about 720 bp of the mitochondrial DNA ND2 gene from the specimen, the sequence was aligned with other Petaurus ND2 sequences and then a phylogenetic tree using the Neighbour Joining method was generated. The phylogenetic tree with bootstrap support values (produced by SA Museum and provided below) shows the sample (Queanbeyan_NSW_glider_ND2, circled in red) clearly groups with *Petaurus breviceps*, with strong bootstrap support.	Capture on 21 July 2015 Similar analysis methods used as for the previous sample. The phylogenetic tree (produced by SA Museum and provided below) shows the sample (Queanbeyan #2, circled in red) grouping with the previous *Petaurus breviceps* sample.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#5_P.aust_M635/636_ND2
#4_P.aust_M635/636_ND2
#2_P.aust_M635/636_ND2
#1_P.aust_M635/636_ND2
#3-P.aust_M635/636_ND2
M27670_P.abidi
M19216_P.abidi
M21350_P.abidi
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16138_P.breviceps.QLD
85534_P.brevicepsNSW
85531_P.breviceps.NSW
85533_P.breviceps.NSW
85525_P.brevicepsNSW
27102_P.breviceps.SA
81258_P.breviceps.SA
Euroa.M5_P.breviceps.Vic
81225_P.breviceps.SA
CandlP_Vic
P.brevicep_27086SA
Ren5_P.breviceps.Vic
Queanbeyan_NSW_glider_ND2
16137_P.brevicepsQLD
80833_P.breviceps.QLD
80835_P.breviceps.QLD
29964NT_Melvill.IS
P.gracilis_QLD
85528_P.norfolcensisNSW
27042_P.norfolcensis
27085_P.norfolcensis
M20223_Normanby
M20224_Normanby
49311PNG_Bundi
M30682_Irian.jaya
47131PNG_Solriver
43650PNG_Ofekaman
47133PNG_Solriver
47134PNG_Solriver
49310PNG_Bundi
49016Gali
M16002_Wigote
44206PMG_Mt.sulen
M42882_kai.Is
M42672_kai.Is
43552PNG_Noru
43395PNG_Noru
43193PNG_Yuro
43100PNG_Yuro
43068PNG_Yuro
43069PNG_Yuro
49347PNG_KarkarIS
49349PNG_Karkar.
M19975_Tifalmin
M19968_Tifalmin
46200PNG_Namosado
44768PNG_Waro
46098PNG_Namosado
45397PNG_Namosado
45398PNG_Namosado
0.03
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#3-P.aust_M635/636_ND2
#2_P.aust_M635/636_ND2
#4_P.aust_M635/636_ND2
#5_P.aust_M635/636_ND2
#6_P.aust_M636/636_ND2
P.australis_D3609
P.australis_R9
P.australis_R10
P.australis_B336
M19216_P.abidi
M21350_P.abidi
M27670_P.abidi
P.brevicep_27086SA
Ren5_P.breviceps.Vic
81258_P.breviceps.SA
27102_P.breviceps.SA
Euroa.M5_P.breviceps.Vic
81225_P.breviceps.SA
CandlP_Vic
80833_P.breviceps.QLD
80835_P.breviceps.QLD
16137_P.brevicepsQLD
Queanbeyan_NSW_glider_ND2
Queanbeyan_#2_Collected_22-7-2015
85525_P.brevicepsNSW
85531_P.breviceps.NSW
85534_P.brevicepsNSW
16138_P.breviceps.QLD
85530_P.breviceps.NSW
27042_P.norfolcensis
27085_P.norfolcensis
85528_P.norfolcensisNSW
P.gracilis_QLD
29964NT_Melvill.IS
M30682_Irian.jaya
47131PNG_Solriver
43650PNG_Ofekaman
47133PNG_Solriver
47134PNG_Solriver
49311PNG_Bundi
49310PNG_Bundi
49016Gali
M16002_Wigote
44206PMG_Mt.sulen
M20223_Normanby
M20224_Normanby
M42882_kai.Is
M42672_kai.Is
43395PNG_Noru
43193PNG_Yuro
43552PNG_Noru
43068PNG_Yuro
43069PNG_Yuro
43100PNG_Yuro
44768PNG_Waro
46098PNG_Namosado
46200PNG_Namosado
45397PNG_Namosado
45398PNG_Namosado
M19975_Tifalmin
M19968_Tifalmin
49347PNG_KarkarIS
49349PNG_Karkar.
0.05

C.3.2 October survey session

Raw data from Squirrel Glider survey sessions follows.

Trapping results

Weather observations from Canberra Airport http://www.bom.gov.au/climate/dwo/IDCJDW2801.latest.shtml

Table Key:
Y - Yes (trap set)
▒ Trap removed/Not installed
Cage Traps:
O - Open
CNC – Closed - no capture
CC – Closed - capture
OB - Open bait taken
Tube Traps:
NC - No capture

Trap ID			T69	T70	T71	T72	T73	T74	T75	T76	T77	T78	T79	T80	T81	T82	T83	T84	T85	T86	T87	T88	T90	T91	T92	Notes/Observations
Trap Type			Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	Cage	
		Easting	704161	704141	704118	704102	704065	704066	704147	704152	704190	704240	704255	704280	704245	704229	704243	704202	704182	704172	704162	704154	704152	704202	704228	
Northing			6083272	6083263	6083261	6083273	6083264	6083278	6083272	6083268	6083257	6083246	6083247	6083231	6083217	6083216	6083302	6083234	6083227	6083238	6083285	6083285	6083285	6083271	6083291	
Date Installed			04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	04.10.15	
Dates Set/Check	Temp (min/midnight /max)	Rain																								
Set: 04.10.15 PM	9.1/ 10.6/31.7	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Check: 05.10.15 AM			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	
Set: 05.10.15 PM	6.8/13.0/ 31.8	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	T77 & 86: Bait taken and replaced (likely Rat - a number seen in area during spotlight surveys. T88: Brush-tailed Possum caught
Check: 06.10.15 AM			O	O	O	O	O	O	O	O	OB	O	O	O	O	O	O	O	O	OB	O	CC	O	O	O	

Trap ID			T69	T70	T71	T72	T73	T74	T75	T76	T77	T78	T79	T80	T81	T82	T83	T84	T85	T86	T87	T88	T90	T91	T92	Notes/Observations
Set: 06.10.15 PM	7.4 /12.6/18.6	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	T86: Bait taken and replaced (likely Rat - a number seen in area during spotlight surveys.
Check: 07.10.15 AM			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	OB	O	O	O	O	O	
Set: 07.10.15 PM	8.5/10.2/20.0	0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	T86: Bait taken and replaced (Rat seen to take bait). T82 & 87: Bowerbird (Female) captured
Check: 08.10.15 AM			O	O	O	O	O	O	O	O	O	O	O	O	O	CC	O	O	O	OB	CC	O	O	O	O	
Set: 08.10.15 PM	7.6/8.9/27.1	0	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	
Check: 09.10.15 AM			O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	

Key:
Y - Yes (trap set)
Trap removed/Not installed
Cage Traps:
O - Open
CNC – Closed - no capture
CC – Closed - capture
OB - Open bait taken
Tube Traps:
NC - No capture

Stagwatch Survey - Locations, Timing and Results

Tree Species/Feature	Person	Date	Start Time	Duration	Longitude	Latitude	Easting	Northing	Species Recorded
House	George	4-Oct	1945	30 mins					Sugar Glider
Eucalyptus bridgesiana	Nick		1945	30 mins			704187	6083292	Nil
E. bridgesiana	Sam		1945	30 mins			704175	6083293	Nil
E. bridgesiana	George	5-Oct	1940	30 mins			704073	6083289	Nil
E. bridgesiana	Nick		1940	30 mins	-35.37324	149.2485			Nil
E. bridgesiana	George	6-Oct	1930	40 mins			704118	6083261	Nil
E. bridgesiana	Nick		1930	40 mins	-35.37306	149.24783			Nil
E. bridgesiana	Sam	7-Oct	1930	30 mins	-35.37237	149.24886			Nil
E. bridgesiana	Nick		1930	30 mins	-35.37292	149.2464			Nil
E. bridgesiana	Brenton	8-Oct	1935	30 mins	-35.37281	149.24815			Nil
E. bridgesiana	Nick		1935	30 mins	-35.37332	149.24763			Black Rat

October Spotlighting Survey – Timing and Results

Date	Time Start	Duration	Species Recorded	Notes	Participants
04.10.15	20:15	45 minutes	Common Brush-tailed Possum Common Ringtail Possum	With back young Single young nearby	Nick, George
05.10.15	20:10	30 minutes	House Cat		Nick, George
06.10.15	20:10	30 minutes	Black Rat Common Ringtail Possum Common Brush-tailed Possum Rabbit	Mother and young	Nick, George
07.10.15	20:00	30 minutes	Black Rat (eating bait from a trap) Wombat Large Macropod		Nick, Sam
08.10.15	20:05	40 minutes	Rabbit (x3) Brush-tailed Possum		Nick, Brenton

C.3.3 November survey session

Raw data from Squirrel Glider survey sessions follows.

Trapping results

Trap number	Latitude	Longitude	Tree species	Common Name	DBH (mm)	3/11/15	4/11/15	5/11/15	6/11/15
1	-35.360683	149.254761	*Eucalyptus bridgesiana*	Apple Box	250	open	open	Closed bait taken	open
2	-35.361087	149.254746	*E. bridgesiana*	Apple Box	500	closed	Brush-tailed Possum	open	Brush-tailed Possum
3	-35.361569	149.255256	*E. bridgesiana*	Apple Box	500	open	open	open	open
4	-35.361785	149.255074	*E. bridgesiana*	Apple Box	550	open	open	open	open
5	-35.363371	149.255316	*E. bridgesiana*	Apple Box	600	open	open	open	open
6	-35.363748	149.255316	*E. bridgesiana*	Apple Box	450	open	open	open	open
7	-35.363236	149.254315	*E. bridgesiana*	Apple Box	550	open	open	open	open
8	-35.357795	149.255011	*E. bridgesiana*	Apple Box	500	open	open	open	open
9	-35.357368	149.254734	*E. bridgesiana*	Yellow Box	600	open	open	open	open
10	-35.357205	149.254385	*E. bridgesiana*	Apple Box	700	open	open	open	open
11	-35.355580	149.252292	*E. melliodora*	Yellow Box	1100	open	open	open	open
12	-35.355324	149.252689	*E. melliodora*	Yellow Box	650	open	open	open	open
13	-35.354934	149.25282	*E. melliodora*	Yellow Box	450	open	open	open	open
14	-35.354582	149.252722	*Eucalyptus blakelyi*	Blakey's Red Gum	700	open	open	open	open
15	-35.378069	149.244087	*E. melliodora*	Yellow Box	650	open	open	open	open
16	-35.378781	149.243096	*E. polyanthemos*	Red Box	1100	open	open	open	open

Trap number	Latitude	Longitude	Tree species	Common Name	DBH (mm)	3/11/15	4/11/15	5/11/15	6/11/15
17	-35.379162	149.243287	*E. polyanthemos*	Red Box	600	open	open	open	open
18	-35.37969	149.242925	*E. melliodora*	Yellow Box	750	open	open	Bower bird	open
19	-35.379165	149.245054	*E. bridgesiana*	Apple Box	800	open	open	open	open
20	-35.380278	149.243215	*E. blakelyi*	Blakey's Red Gum	700	open	open	open	Magpie
21	-35.381953	149.243734	*E. melliodora*	Yellow Box	600	open	open	open	open

Stagwatching and spotlighting results

The following species were recorded during the spotlighting surveys:

Dates	Species recorded	Number of individuals	Location	Comments
2nd November	Grey Kangaroo European Rabbit	5 2		
3rd November	Sugar Glider Sugar Glider Brush-tailed Possum	1 1 1	-35.384607, 149.244960 -35.381607, 149.243892	
4th November	Common Ringtail Possum Grey Kangaroo	1 2		
5th November	Common Ringtail Possum	1		Inside tree hollow

APPENDIX D UPDATED MITIGATION MEASURES

D.1 UNEXPECTED THREATENED SPECIES FIND PROCEDURE

PURPOSE

This procedure details the actions to be taken when a threatened species is unexpectedly encountered during excavation / construction activities.

SCOPE

This procedure is applicable to all activities conducted by personnel that have the potential to come into contact with threatened species.

Where threatened fauna is unexpectedly encountered that requires handling or rescue, refer to the Fauna Handling and Rescue Procedure (Appendix D.2).

INDUCTION / TRAINING

Where required, personnel will be inducted on the identification of potential threatened species occurring on site and the relevant actions for them with regards to this procedure during the Project Induction, Site Inductions and regular Toolbox Talks.

PROCEDURE

The Environmental Manager (EM) is responsible for implementing the procedure listed below.

1. Threatened species/ EEC unexpectedly encountered during excavation/ construction activities

If a threatened species is unexpectedly encountered during excavation / construction activities:

a) STOP ALL WORK in the vicinity of the find.
b) Immediately notify the Environmental Manager (EM) or Environmental Officer (EO) who will notify the Project Ecologist, Environmental Representative (ER), and QCC/RMS Representative. The RMS Representative will then contact the relevant agencies as required.

2. Assessment of Impact

An assessment is to be undertaken by the EM and the Project Ecologist to identify the animal to species level, and the likely impact to the threatened species and appropriate management options, such as re-location measures, developed in consultation with QCC/RMS.

3. Approvals

Obtain any relevant licences, permits or approvals required if the threatened species is likely to be significantly impacted.

4. Recommencement of Works

Construction works may recommence once the Environmental Manager has:

- Obtained approvals as required, and
- Confirmed that all corrective actions and additional mitigation measures have been implemented.

The Environmental Manager must also:

- Ensure that the threatened species is included in subsequent Sensitive Area Plans, Project Inductions and Toolbox Talks.
- Provide information to QCC/RMS to enable updating of ecological monitoring and/ or biodiversity offset requirements.

D.2 FAUNA HANDLING AND RESCUE PROCEDURE

PURPOSE

This procedure explains the actions to be undertaken in the event fauna (including injured, shocked, juvenile or other animal) are discovered on the project site that require handling or rescue during vegetation and soil clearance, and ongoing construction activities.

SCOPE

This procedure is applicable to all native and introduced fauna species that are found on the project site.

Where a threatened fauna species is unexpectedly encountered during construction activities, refer to the Unexpected Threatened Species/ EEC Find Procedure (Appendix D.1).

INDUCTION AND TRAINING

All site personnel and subcontractors will be made aware of the actions to be taken in the event that fauna are discovered on the project. This training will occur on site during the Project Induction and as required in Toolbox Talks.

PROCEDURE

If wildlife is discovered on the project site during site construction activities **that may harm the animal** or **pose risk to site personnel**, the following steps will be taken.

a) Stop all work in the vicinity of the fauna and immediately notify the Foreman who is then to notify the Environmental Manager or Environmental Officer. The EM is then to notify the Project Ecologist.

b) Preferably allow fauna to leave an area without intervention if it is not injured or in shock and if safe to do so (i.e. no machinery in the immediate vicinity).

c) If the animal is injured, call the appropriate rescue agency immediately and follow any advice provided by the agency. Once the rescue agency arrives at the site, they are responsible for the animal. Any decisions regarding the care of the animal will be made by the rescue agency. The licensed fauna ecologist, rescue services and local veterinary surgeries contact details are as follows:

Agency / business	**Contact Number**
Project Ecologist	*TBC - [insert number once appointed]*
Wildlife Rescue ACT/Queanbeyan	*TBC - [insert number once appropriate branch confirmed]*
RSPCA ACT/Queanbeyan	*TBC - [insert number once appropriate branch confirmed]*
RSPCA Lost, stray and found animals	*TBC - [insert number once appropriate branch confirmed]*

Veterinary Services	*TBC - [insert number once appropriate branch confirmed]*

d) If the animal is able to and required to be captured (such as for animals that will not leave the construction area and require relocation outside of the construction area), the following measures should be applied:
    a. Place smaller animals in a cotton bag, tied at the top; and
    b. Keep the animal quiet, warm, ventilated and in a dark location away from noisy construction activities.

e) If the fauna is to be released, the Project Ecologist must identify suitable fauna release locations within or near the Project site. Suitable release locations should be identified before commencement of activities that may displace fauna (such as tree felling).

f) The Environmental Manager is to record the find in an Environmental Incident Report where required following consultation with the QCC/RMS Representative, any sightings of threatened species, particularly unexpected threatened species such as Squirrel Gliders. All relevant characteristics of the fauna find should be recorded to the extent practicable (e.g. visual signs of behaviour; habitat; health signs; sex; time; date; weather).

g) Following consultation with all relevant stakeholders, the Environmental Manager shall implement any corrective actions and additional safeguards.

a) Following confirmation by the Environmental Manager that all appropriate safeguards have been implemented, construction works shall recommence.

b) All fauna handling/ rescue events will be recorded on a Fauna Rescue Event Record (to be prepared and included in the Construction and Environmental Management Plan).

APPENDIX E CORRESPONDENCE FROM OEH ON GLIDER TRAPPING REQUIREMENTS

NSW GOVERNMENT | Office of Environment & Heritage

DOC15/311991

Mr Tim Alexander
Contractor - Queanbeyan City Council
Project Manager Ellerton Drive Extension
NSW Public Works/ Queanbeyan City Council
tim.alexander@qcc.nsw.gov.au

Dear Mr Alexander

Thank you for your email on 20 July 2015 and for meeting with us on 28 July 2015 to discuss the glider survey requirements for the Ellerton Drive Extension proposal. These surveys are intended to establish whether there are threatened squirrel gliders present within the study area for this project.

A need to define the minimum survey requirements
You have requested that the Office of Environment and Heritage (OEH) provide a defined criteria outlining the minimum number of acceptable specimens required, or duration of trapping nights, to satisfy the minimum survey requirements for the species impact statement (SIS).

Current survey approach
OEH understands that at the time of your email, Queanbeyan City Council's consultants had undertaken trapping for over 16 nights. Two specimens had been trapped by your consultants, both confirmed to be sugar gliders through DNA analysis. It is possible that these low trapping rates are due to the low seasonal temperatures during the trapping period. Trapping is currently continuing in the areas to the south and east of 35 Lonergan Drive.

OEH's proposed survey approach
OEH have consulted with internal experts and propose the following trapping approach to increase the probability of trapping more gliders in the area. The trapping method is intensive, but we consider that it's likely to increase the likelihood of detecting additional glider individuals in the area, which will provide important information and confidence in the SIS.

Ideally, OEH considers that trapping should be undertaken on 35 Lonergan Drive, where the potential squirrel/sugar gliders were originally recorded. Trapping as close to the house on this property is desirably, but you have communicated to OEH that Council's access to this property has been withdrawn. As such, the following proposal focuses more intensive effort around the areas where Council's consultants recorded the two sugar gliders already.

Method:

1. Establish two roughly parallel transects along the river corridor vegetation, south of the property at 35 Lonergan Drive
2. Transects should be 200m at a minimum
3. Set up traps along these transects, 20m apart from each other. I.e. a minimum of 10 traps on each transect
4. Trap for four consecutive nights, with minimum night temperatures above 10 degrees

5. Couple trapping with stag watching of all hollow-bearing trees in this area. Stag watching should be carried out by professionals who are confident at differentiating between sugar gliders and squirrel gliders.

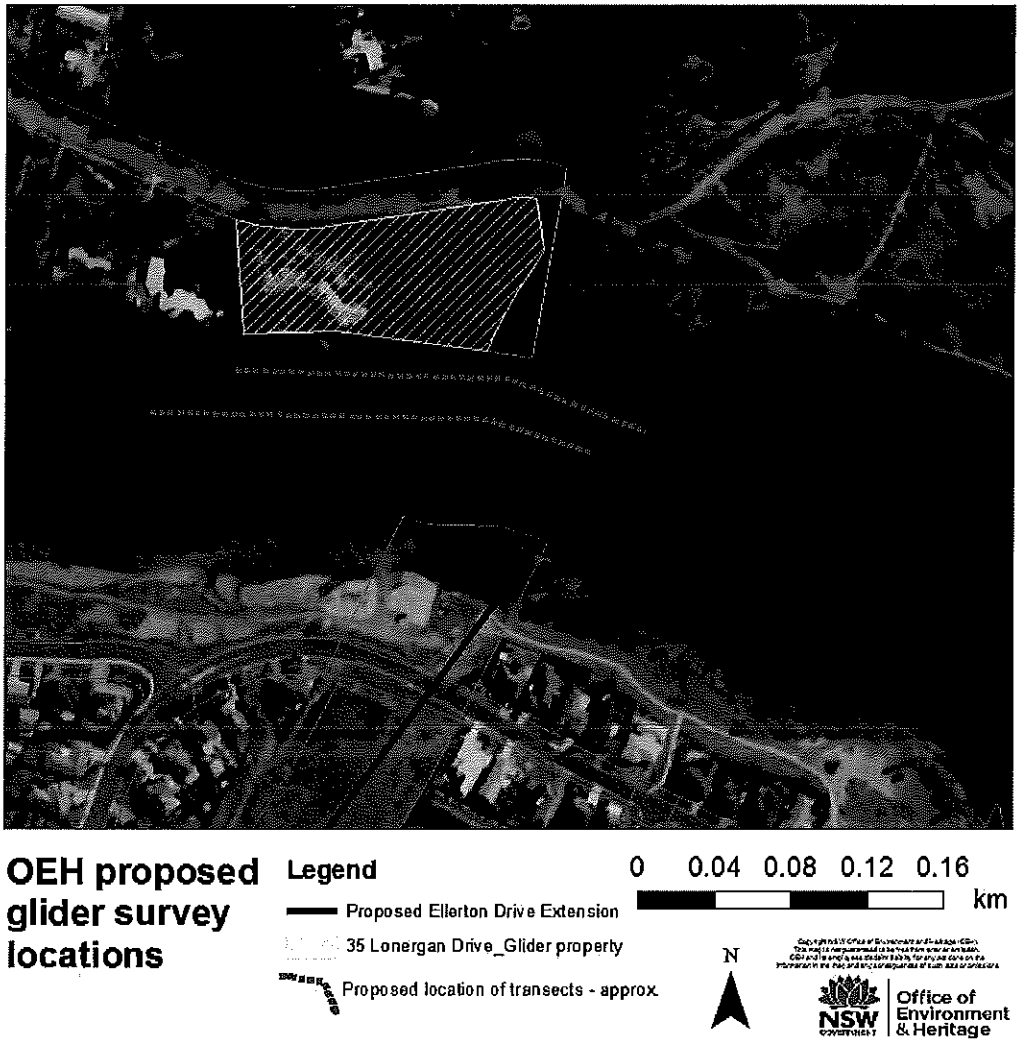


Figure 1: Example of where glider trapping transects should be placed

Future surveys and assessments

The above surveys are designed to capture any individuals utilising the habitat surrounding 35 Lonergan Drive and determine, with some confidence, whether squirrel gliders are present. It is important to note that if squirrel gliders are confirmed to be present, then additional surveys may be required to determine *how* they are using the habitat within the proposed Ellerton Drive extension study area.

Should you require any additional assistance or wish to discuss the matter further please contact myself on 6229 7082 or Suzie Lamb on 6229 7117.

Yours sincerely

18/8/13

ALLISON TREWEEK
Senior Team Leader – South East Planning
Regional Operations Group
Office of Environment and Heritage

APPENDIX F OFFSET EVALUATION ATTACHMENTS

The following additional information is provided, specific to the development site and evaluation of offset candidates:

DEVELOPMENT SITE ZONES AND PLOT LOCATIONS

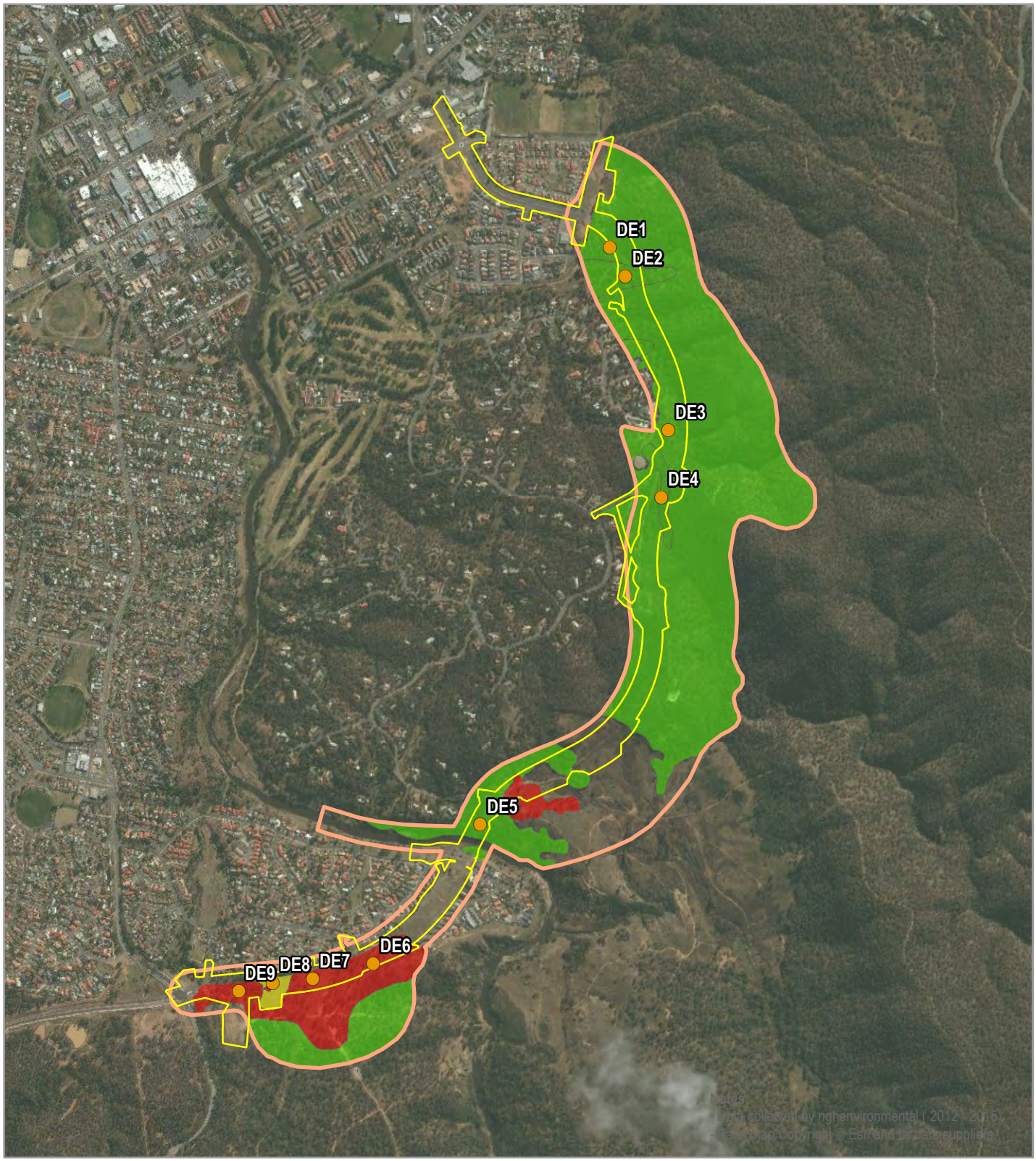
BIOBANKING CREDIT SUMMARY; DEVELOPMENT SITE

CANDIDATE OFFSET SITE LOCATIONS

VEGETATION ZONES AND HOARY SUN RAY LOCATIONS; SITE 6

VEGETATION ZONES; SITE 5 (ZONE 3)

VEGETATION ZONES; SITE 7



DEVELOPMENT SITE ZONES AND PLOTS

Ellerton Drive Extension

- Revised subject site
- Bometric plots

Biometric vegetation type

- Red Stringybark open forest - MR598 (Moderate to good)
- Box Gum woodland - MR648 (Moderate to good)
- Box Gum woodland - MR648 (Low)

0 125 250 500 Meters

A4 @ 1:20000
Ref: 4733 OS_Development site
Author: DM

ngh environmental

www.nghenvironmental.com.au

BioBanking credit report

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

Date of report: 16/02/2016 Time: 1:34:22PM Calculator version: v4.0

Development details

Proposal ID:	0035/2014/1459D
Proposal name:	Ellerton Drive Extension
Proposal address:	Ellerton Drive Queanbeyan NSW 2620
Proponent name:	Queanbeyan City Council
Proponent address:	PO Box 90 Queanbeyan NSW 2620
Proponent phone:	02 6285 6264
Assessor name:	Brooke Marshall
Assessor address:	1/216 Carp St Bega NSW 2250
Assessor phone:	64928333
Assessor accreditation:	0035

Improving or maintaining biodiversity

An application for a red flag determination is required for the following red flag areas

Red flag	Reason
Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;
Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;
Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	Vegetation type being > 70% cleared; or it contains an endangered ecological community;

The application for a red flag determination should address the criteria set out in the BioBanking Assessment Methodology. Please note that a biobanking statement cannot be issued unless the determination is approved.

Additional information required for approval:

- ☐ Change to percent cleared for a vegetation type/s
- ☐ Use of local benchmark
- ☐ Change negligible loss
- ☐ Expert report...
- ☐ Request for additional gain in site value
- ☐ Predicted threatened species not on site
- ☐ Change threatened species response to gain (Tg value)

Ecosystem credits summary

Plant Community type	Area (ha)	Credits required	Red flag
Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion	22.85	1,064.00	No
Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	0.97	29.81	No
Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion	6.44	407.00	Yes
Total	30.26	1,501	

Credit profiles

1. Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, (MR648)

Number of ecosystem credits created	407
IBRA sub-region	Monaro - Murrumbidgee

Offset options - vegetation types	Offset options - CMA sub-regions
Black Sally grassy low woodland in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion, (MR524) Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, (MR648) Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion, (MR651)	Monaro - Murrumbidgee and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

2. Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, (MR648)

Number of ecosystem credits created	30
IBRA sub-region	Monaro - Murrumbidgee

Offset options - vegetation types	Offset options - CMA sub-regions
Black Sally grassy low woodland in valleys in the upper slopes sub-region of the NSW South Western Slopes Bioregion and western South Eastern Highlands Bioregion, (MR524) Yellow Box - Blakely's Red Gum grassy woodland on the tablelands, South Eastern Highlands Bioregion, (MR648) Yellow Box grassy woodland of the northern Monaro and Upper Shoalhaven area, South Eastern Highlands Bioregion, (MR651)	Monaro - Murrumbidgee and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

3. Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion, (MR598)

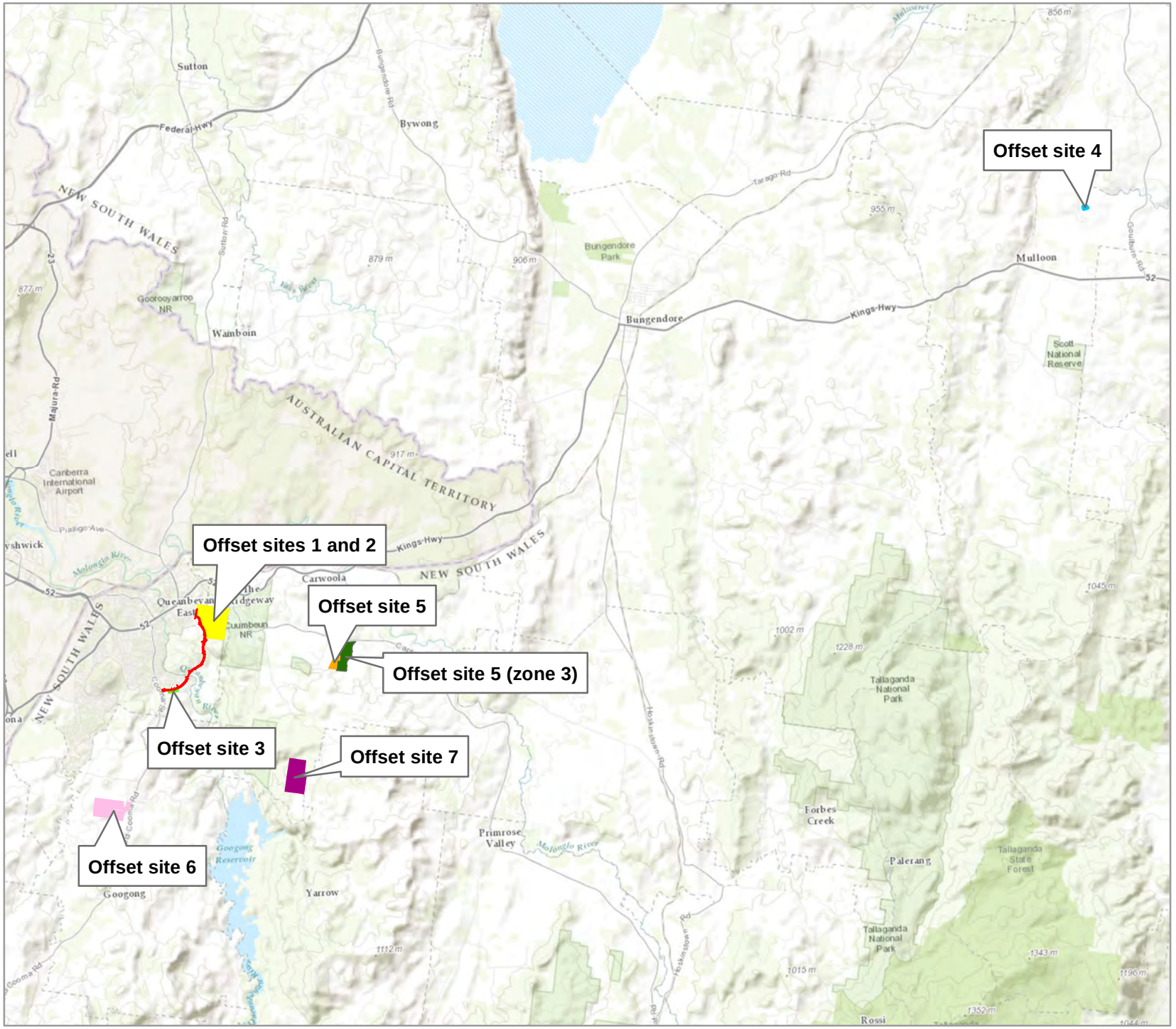
Number of ecosystem credits created	1,064
IBRA sub-region	Monaro - Murrumbidgee

Offset options - vegetation types	Offset options - CMA sub-regions
Apple Box - Broad-leaved Peppermint - Red Stringybark shrubby hill open forest in the upper NSW South Western Slopes Bioregion and adjacent South Eastern Highlands Bioregion, (MR508) Apple Box - Nortons Box - Blakely's Red Gum valley flat moist grassy tall open forest in the southern NSW South Western Slopes Bioregion and adjoining South Eastern Highlands Bioregion, (MR511) Riparian Blakely's Red Gum - Broad-leaved Sally woodland - tea-tree - bottlebrush - wattle shrubland wetland of the NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (MR527) Broad-leaved Peppermint - Nortons Box - Red Stringybark tall open forest	Monaro - Murrumbidgee and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

on red clay on hills in the southern part of the NSW South Western Slopes Bioregion, (MR533) Broad-leaved Sally grass - sedge woodland on valley flats and swamps in the NSW South Western Slopes Bioregion and adjoining South Eastern Highlands Bioregion, (MR534) Mugga Ironbark - Inland Scribbly Gum - Red Box shrub/grass open forest on hills in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (MR578) Nortons Box - Red Box - White Box tussock grass open forest of the southern section of the NSW South Western Slopes Bioregion, (MR585) Nortons Box - Red Stringybark grassy tall open forest on sheltered slopes in the Tumbarumba - Murray River region of the NSW South Western Slopes Bioregion, (MR586) Red Box - Red Stringybark - Nortons Box hill heath shrub - tussock grass open forest of the Tumut region, (MR592) Red Stringybark - Red Box - Long-leaved Box - Inland Scribbly Gum tussock grass - shrub low open forest on hills in the southern part of the NSW South Western Slopes Bioregion, (MR598) White Box - Blakely's Red Gum - Red Box - Red Stringybark shrubby woodland on shallow soils on metamorphic hills in the Albury region of the NSW South Western Slopes Bioregion, (MR642) Mugga Ironbark - mixed box woodland on hills in the Cowra - Boorowa - Young region of the NSW South Western Slopes Bioregion, (MR674)	

Species credits summary

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Rosenbergs Goanna	Varanus rosenbergi	20.30	670



PROPOSED OFFSET AREAS

Ellerton Drive Extension

- Development site
- Offset sites 1 and 2
- Offset site 4
- Offset site 3
- Offset site 5
- Offset site 5 (zone 3)
- Offset site 6
- Offset site 7

Notes:
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0 1.5 3 6 Kilometres

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Ref: 4733 OS_a
Author: JB

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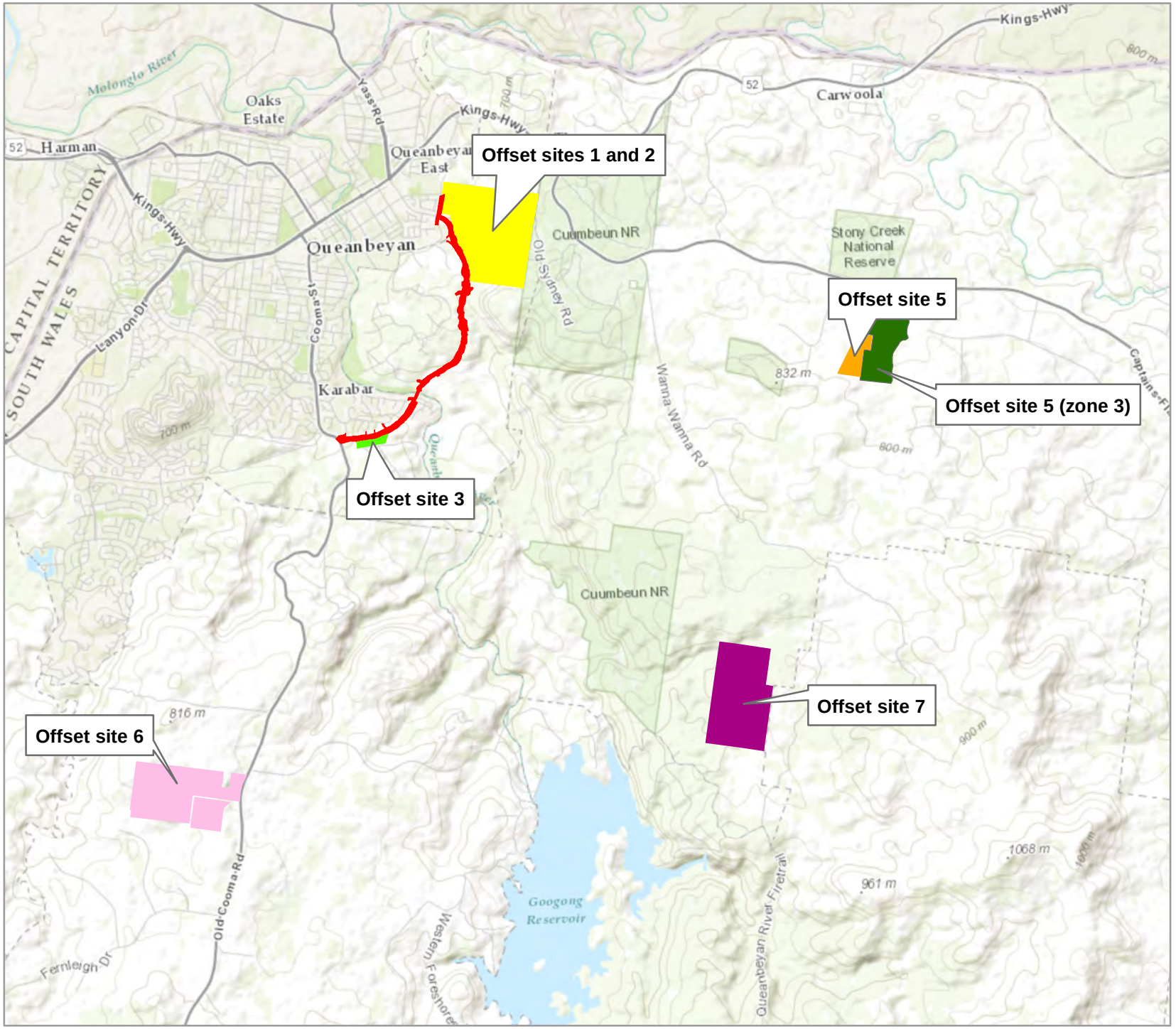

PROPOSED OFFSET AREAS

Ellerton Drive Extension

- Development site
- Offset sites 1 and 2
- Offset site 4
- Offset site 3
- Offset site 5
- Offset site 5 (zone 3)
- Offset site 6
- Offset site 7

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0 0.5 1 2 Kilometres

A4 @ 1:70000
Ref: 4733 OS_b
Author: JB

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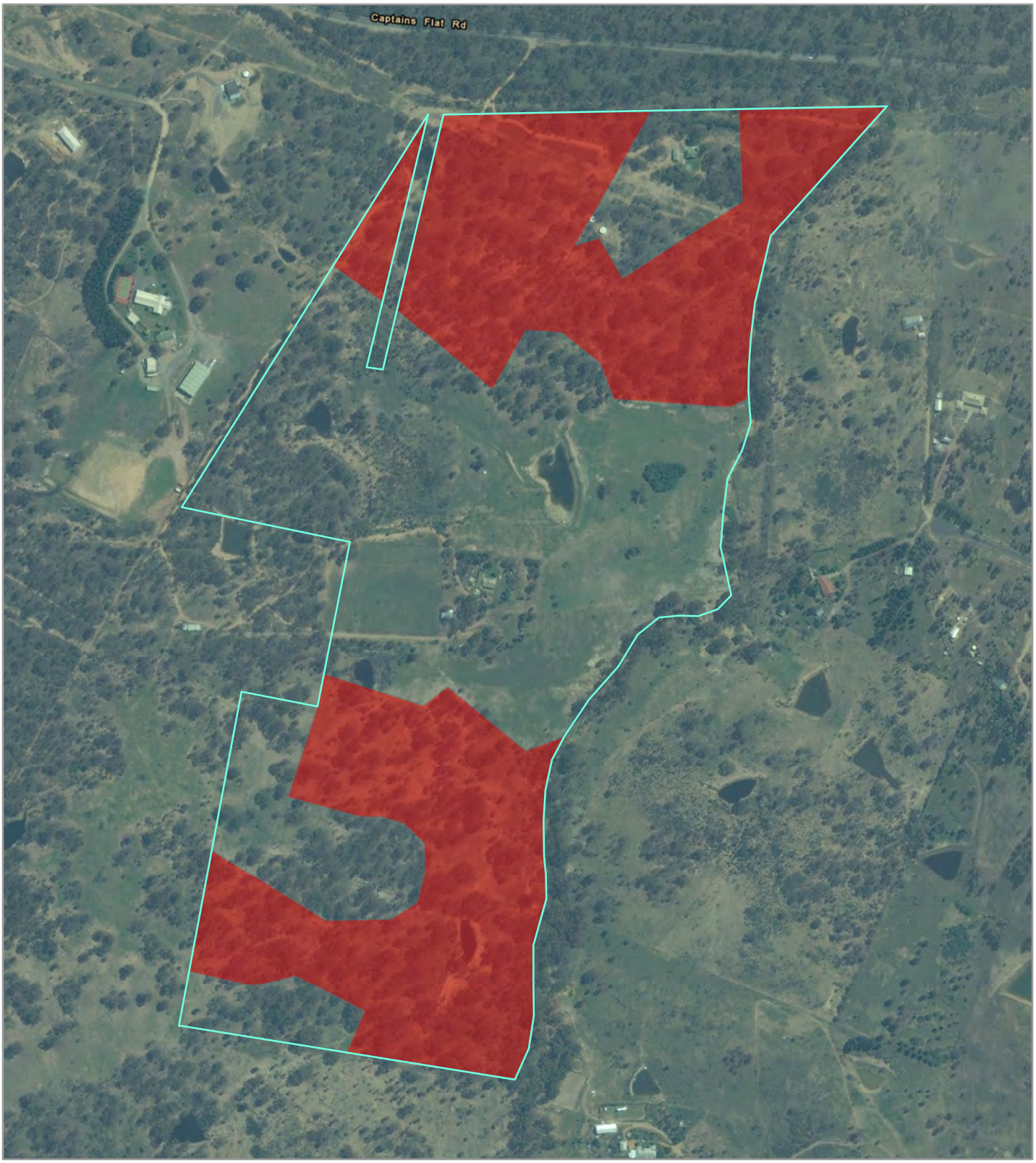

OFFSET SITE 5 (ZONE 3)

Ellerton Drive Extension

Proposed offset area

Box-Gum Woodland

0 50 100 200 Metres

A4 @ 1:6500
Ref: 4733_OS_5(3)
Author: JB

Notes:
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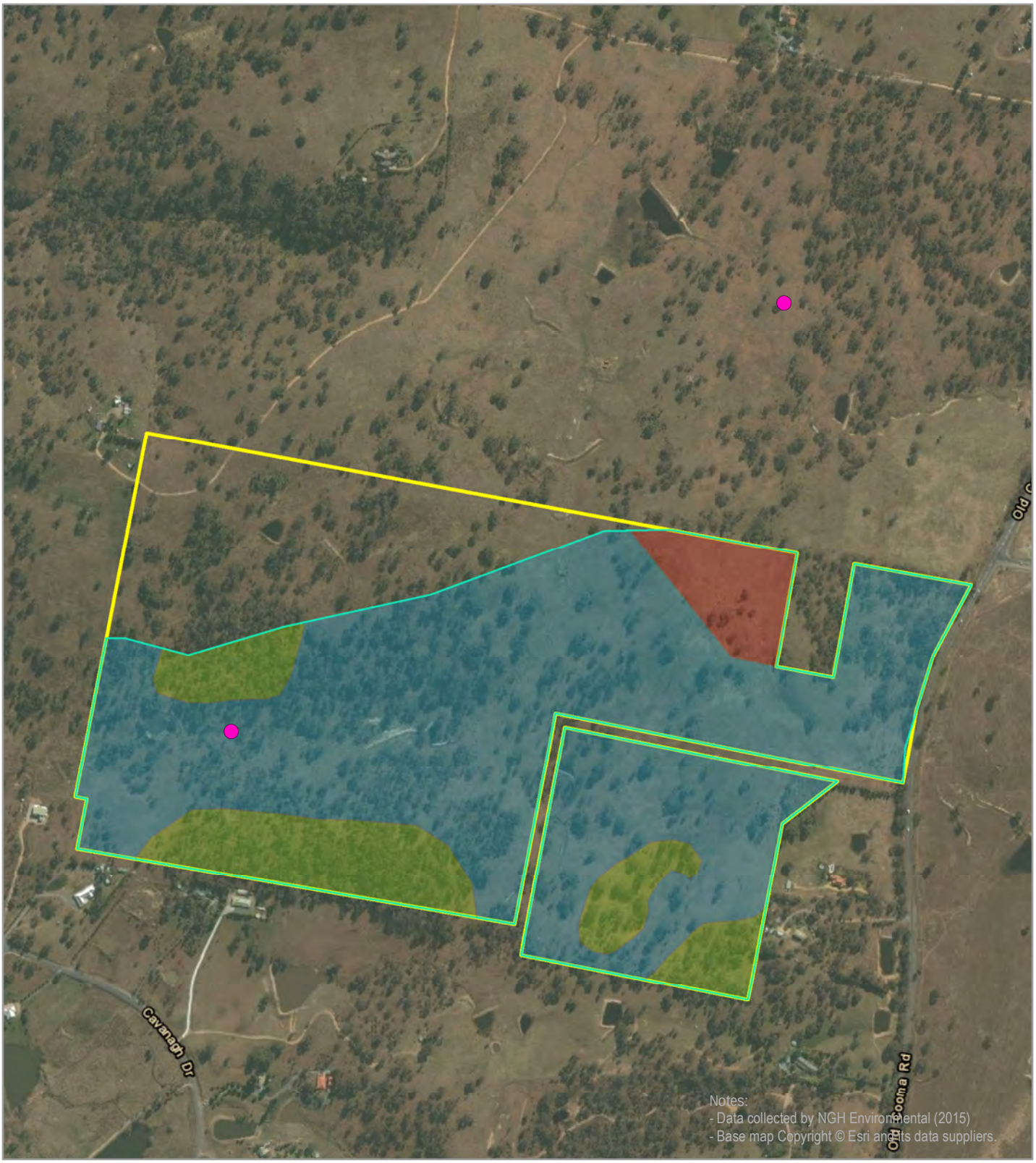

OFFSET SITE 6

Ellerton Drive Extension

- Lot boundary
- Proposed offset area
- Hoary Sunray record

Vegetation type

- Red Stringybark open forest (moderate to good)
- Box Gum woodland (moderate to good – disturbed)
- Box Gum woodland (moderate to good)

0 100 200 400 Metres

A4 @ 1:9500
Ref: 4733 OS_6
Author: JB

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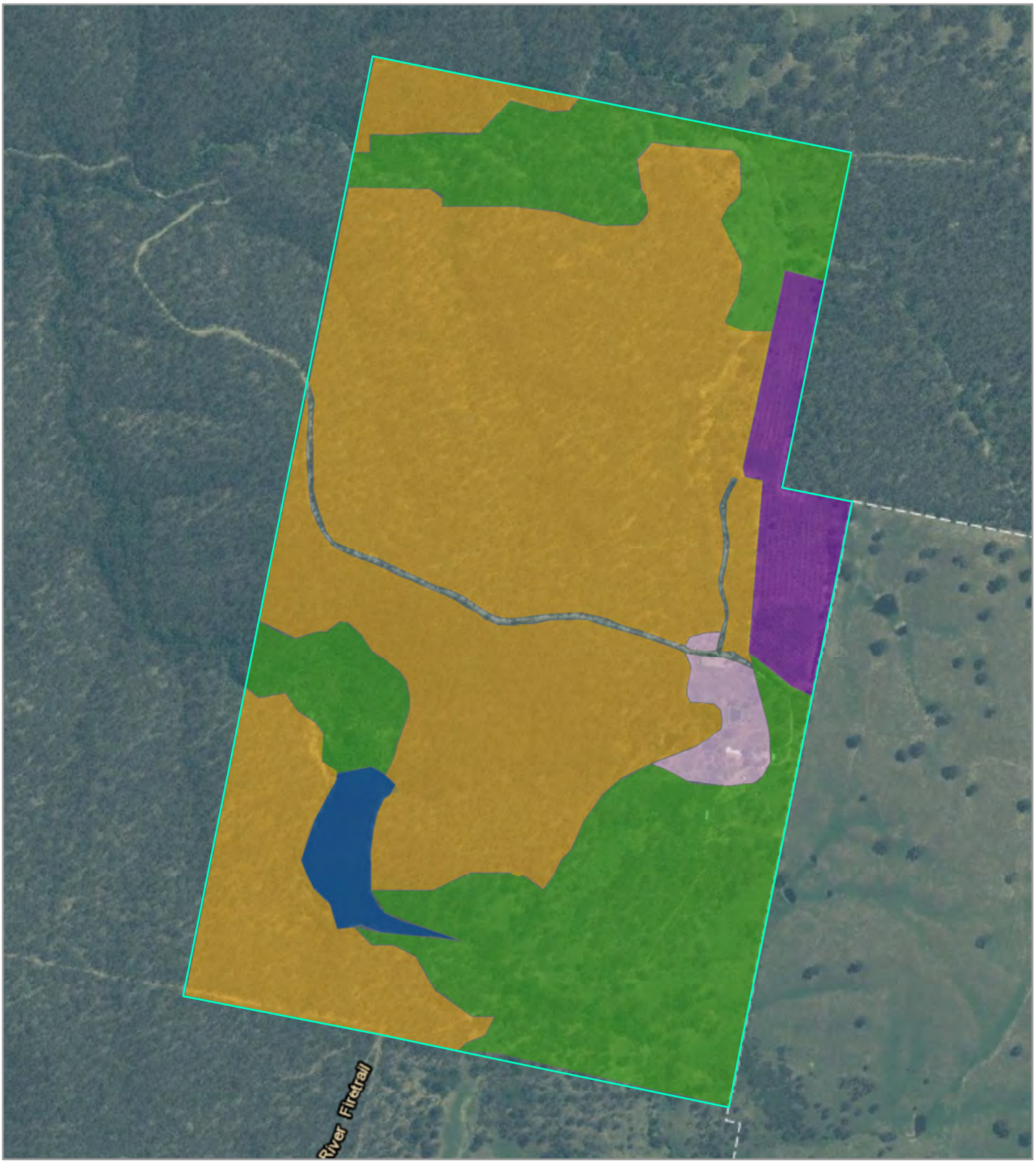

OFFSET SITE 7

Ellerton Drive Extension

- Proposed offset area
- Red Stringybark open forest
- Box Gum woodland
- Cleared area surrounding house
- Agriculture
- Dam

0 50 100 200 Metres

A4 @ 1:7600
Ref: 4733 OS_7
Author: JB

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