Vegetation Type: Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands, Moderate to Good

Condition: M/G Ancillary Code: Trees

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
А	31	27	6	54	0	36	2	1	1	86	356637	6716726	56
BRGYBMGT1	11	18	0	0	0	14	68	1	1	11	357114	6719063	56
BRGYBMGT2	18	16	0	14	0	28	56	0	1	35	357962	6717174	56

Vegetation Zone: 5

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Condition: Low Ancillary Code:

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
А	19	0.8	0	30	0	6	72	0	0	0	345757	6713952	56
В	8	0.8	0	12	0	6	84	0	0	0	345300	6714036	56
MGLQ1	20	0.8	0	28	0	16	56	1	0	0	347617	6711603	56

Vegetation Zone: 6

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast, Moderate to Good,

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
В	23	0.8	0	48	0	16	28	0	1	0	355560	6708534	56
С	10	0.8	0	86	0	34	20	0	1	0	356932	6714683	56
E	17	0.8	0	80	0	30	34	0	1	12	357703	6714342	56
MGMGNP1	13	0.8	0	26	0	8	64	0	1	0.5	347211	6717029	56
MGMGNP2	14	0.8	0	10	0	34	54	0	1	0	348335	6715248	56
MGMGNP3	9	0.8	0	50	0	2	48	1	1	0	356765	6710846	56

Condition: M/G Ancillary Code: Native Pasture

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
В	27	20.5	0	68	0	70	8	3	1	49	344282	6717822	56
E	31	27	0	32	0	24	14	0	1	20	355509	6708571	56
MGMGT1	31	11.5	0	32	0	26	42	2	1	0	350604	6709645	56
А	30	21	0	58	0	22	18	2	1	41	345287	6717529	56
С	20	12.5	0	44	2	24	26	1	1	19	354956	6708526	56
D	30	16	0	30	0	26	0	2	1	15	355795	6709352	56

Condition: M/G Ancillary Code: Trees

Vegetation Zone: 8

Vegetation Type: Tenterfield Woollybutt - Silvertop Stringybark open forest of the New England Tablelands

Condition: M/G Ancillary Code: Trees

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
TWSSMGT1	30	0	0	52	0	8	28	0	1	39	357820	6718145	56
TWMGT2	42	4.5	0	50	0	20	28	0	1	40	357709	6718087	56

Vegetation Zone: 9

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: Low Ancillary Code:

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
A	15	0.6	0	4	0	0	98	0	0	4	343516	6714840	56
WBL1	9	0.6	0	4	0	4	92	0	0	0	343930	6714521	56
WBL2	6	0.6	0	16	0	0	84	1	0	0	341568	6715676	56

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
А	16	0.6	0	70	0	2	36	0	0.66	0.5	344409	6716970	56
В	20	0.6	0	88	0	30	36	0	0.66	0	343761	6717537	56
С	22	0.6	0	98	0	66	24	0	0.66	0.5	344824	6717432	56
WBMGNP1	10	0.6	0	4	0	2	88	0	0.66	0	345677	6711480	56
WBMGNP2	3	0.6	0	4	0	0	96	1	0.66	0	344836	6714218	56

Condition: M/G Ancillary Code: Native Pasture

Vegetation Zone: 11

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Trees

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
А	36	14.5	0	80	0	54	8	0	1	21	344161	6717781	56
WBMGT1	32	8.7	0.5	44	0	20	38	1	1	10	345546	6712570	56
WBMGT2	14	13	0	58	0	2	40	1	1	0	342148	6715139	56

Appendix 2: Species Predicted on Site

Common Name	Scientific Name	Surveyed on Site?	Found on Site?
Barking Owl	Ninox connivens	Yes	No
Black-chinned Honeyeater (eastern subspecies)	Melithreptus gularis gularis	Yes	No
Brown Treecreeper (eastern subspecies)	Climacteris picumnus victoriae	Yes	Yes
Bush Stone-curlew	Burhinus grallarius	Yes	No
Diamond Firetail	Stagonopleura guttata	Yes	Yes
Eastern Bentwing-bat	Miniopterus schreibersii oceanensis	Yes	No
Flame Robin	Petroica phoenicea	Yes	No
Greater Broad-nosed Bat	Scoteanax rueppellii	Yes	Yes
Grey-headed Flying-fox	Pteropus poliocephalus	Yes	No
Koala	Phascolarctos cinereus	Yes	No
Scarlet Robin	Petroica boodang	Yes	Yes
Speckled Warbler	Pyrrholaemus saggitatus	Yes	Yes
Spotted-tailed Quoll	Dasyurus maculatus	Yes	No
Swift Parrot	Lathamus discolor	Yes	No
Turquoise Parrot	Neophema pulchella	Yes	Yes
Yellow-bellied Sheathtail-bat	Saccolaimus flaviventris	Yes	Yes

In addition to the species predicted to occur by the Biobanking Credit Calculator, the following threatened species were also recorded (but not predicted to occur).

- Hooded Robin (Melanodryas cucullata cucullata);
- Little Lorikeet (Glossopsitta pusilla);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)
- Common Bentwing-bat (Miniopterus schreibersii);
- Eastern Freetail-bat (Mormopterus norfolkensis);
- Eastern Cave Bat (Vespadelus troughtoni).

Appendix 3: Site Value Scores

Vegetation Zone: 1

Vegetation Type: Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion

Condition: M/G Ancillary Code: Native Pasture

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	2	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	2	0	1
Exotic plant cover	1	0	1
Number of trees with hollows	1	1	1
Over-storey regeneration	3	0	1
Total length of fallen logs	1	0	1
Site Value	33	4	18

Vegetation Zone: 2

Vegetation Type: Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands

Condition: Low Ancillary Code:

Site Attribute	Current Score	Score for Temporary Loss Areas
Native plant species richness	1	1
Native over-storey cover	0	0
Native mid-storey cover	0	0
Native ground cover (grasses)	0	0
Native ground cover (shrubs)	0	0
Native ground cover (other)	0	0
Exotic plant cover	0	0
Number of trees with hollows	0	0
Over-storey regeneration	0	0
Total length of fallen logs	0	0
Site Value	5	5

Vegetation Type: Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	1	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	1	0	1
Exotic plant cover	1	0	1
Number of trees with hollows	1	1	1
Over-storey regeneration	0	0	0
Total length of fallen logs	0	0	0
Site Value	13	4	12

Vegetation Zone: 4

Vegetation Type: Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands

Condition: M/G Ancillary Code: Trees

2Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas	
Native plant species richness	2	1	2	
Native over-storey cover	3	1	1	
Native mid-storey cover	1	1	1	
Native ground cover (grasses)	2	0	1	
Native ground cover (shrubs)	0	0	0	
Native ground cover (other)	2	0	1	
Exotic plant cover	1	0	1	
Number of trees with hollows	1	1	1	
Over-storey regeneration	3	0	1	
Total length of fallen logs	2	0	1	
Site Value	51	14	30	

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Condition: Low Ancillary Code:

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	1	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	1	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	3	0	1
Exotic plant cover	0	0	0
Number of trees with hollows	1	1	1
Over-storey regeneration	0	0	0
Total length of fallen logs	0	0	0
Site Value	14	5	12

Vegetation Zone: 6

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Condition: Good Ancillary Code: Native Pasture

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	1	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	2	0	1
Exotic plant cover	1	0	1
Number of trees with hollows	1	1	1
Over-storey regeneration	3	0	1
Total length of fallen logs	0	0	0
Site Value	29	5	19

Vegetation Type: Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Condition: M/G Ancillary Code: Trees

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	2	1	2
Native over-storey cover	3	1	1
Native mid-storey cover	0	0	0
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	1	0	1
Native ground cover (other)	1	0	1
Exotic plant cover	2	0	1
Number of trees with hollows	3	2	2
Over-storey regeneration	3	0	1
Total length of fallen logs	1	0	1
Site Value	71	19	40

Vegetation Zone: 8

Vegetation Type: Tenterfield Woollybutt - Silvertop Stringybark open forest of the New England Tablelands

Condition: M/G Ancillary Code: Trees

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	2	1	2
Native over-storey cover	1	1	1
Native mid-storey cover	0	0	0
Native ground cover (grasses)	3	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	3	0	1
Exotic plant cover	2	0	1
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	1	0	1
Site Value	33	7	22

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: Low Ancillary Code:

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	1	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	1	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	1	0	1
Exotic plant cover	0	0	0
Number of trees with hollows	1	1	1
Over-storey regeneration	0	0	0
Total length of fallen logs	0	0	0
Site Value	10	4	10

Vegetation Zone: 10

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Native Pasture

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	1	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	0
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	2	0	1
Exotic plant cover	1	0	1
Number of trees with hollows	1	1	1
Over-storey regeneration	2	0	1
Total length of fallen logs	0	0	0
Site Value	21	4	16

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Trees

Site Attribute	Current Score	Score for Permanent Loss Areas	Score for Temporary Loss Areas
Native plant species richness	2	1	2
Native over-storey cover	2	1	2
Native mid-storey cover	3	1	3
Native ground cover (grasses)	2	0	2
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	2	0	2
Exotic plant cover	2	0	2
Number of trees with hollows	1	1	1
Over-storey regeneration	3	0	3
Total length of fallen logs	1	0	1
Site Value	53	14	30

Appendix 4: Credit Report



Biobanking Credit Report

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

Date of report: 05/04/2011 Time: 05:06 Too Version: 1.2

Development Details

Proposal ID: 0082/2011/D005 Development Name: Sapphire Wind Farm indicative Biobanking Assessment Development Location: Development Address:

CMA:	Border Bivere/Cwydin		
Proponent Name:	Wind Prospect		
Proponent Address:			
Proponent Phone:			
Assessor Name:	Darren James		
Assessor Address:	PO Box 12 Subjectand NSW 1499		
Assessor Phone:	02 5536 8618		
Assessor Accreditatio	n Number: 0032		

The following information is required to be submitted with this BioBanking Statement (where ticked)

Local reference data is required for the following vegetation zones.

Black Cypress Fine Tumbledown Guin. Narrow leaved Ironbark open forest of northein parts of the Nandewar Rioregion.

Blatelys Red Gur – Yellow Box grassy open forest or woodland of the New England Tablelands Blakelys Red Gur – Yellow Box grassy open forest or woodland of the New England Tablelands

Blakely's Red Curr - Yellow Box grassy open forest or woodland of the New England Tablelands Mann's Curr - Rough-barked Apple - Yellow Box presev woodland-open forest of the New England

Tablelands and North Coast Manna Gum - Rough-barked Apple - Yellow Rox grassy woodland-open forest of the New England. Tablelands and North Coast

Manna Gum Rough barked Apple Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Tenterfield Wool youth Silvenop Stringybark open forest of the New England Tablelands

White Box grassy wood and of the Nancewar and Brigalow Belt South Bioregions

White Box grassy wood and of the Nancewar and Brigalow Belt South Bioregions

White Box grassy wood and of the Nandewar and Brigalow Belt South Bioregions



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- An Expert Report for the following species
- L The minimium number of plots were not entered for the following vegetation zones



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Improving or maintaining biodiversity values

An application for a cost Lag determination is required for the following red Lag rises:

Ressor

Red Fleg

Bislocy's Red Com - Yellow Box sparses open location would and of the New England Tablelands

Manua Guin - Reaginbarked Action - Yollow Bosiguacy woodlandiccen toreal of the New England Labelance and North Caset

Vegetation fore being > 76% clearer; Vegetation (oper contents an endangered exclogical community; Vegetation (you bailing > 70% cleared;

White Box grassy wood and of the Nencewar and Rogalow Rei I Sould Hinragion (Boyder Thick-tailed Geoleo Vegetation type being \approx 30% statest: Vegetation type obtained to contain present cooling to contain anily, An impact greater than that allowed:

The oppication for a red ing determined on abould address the affects are out in section 2.3 of the S abBanking Association Mathedalogy - A DeBanking Stationant cannot be issued in section defarmination is approved.



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Ecosystem Credits

Loosystem broats			
Vegetation Type	Area (ha)	Credits Requires	d Red Flag
Black Cyprocs Fine - Tumbledown Gum - Narrow- leeved Ironoark open forest of northern perts of the Nandewar Bioregion (BR110)	1.3	23	No
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands [BR116]	6.6	119	Yes
Blakely's Red Gum - Yellow Box grassy open forest or woodland of the New England Tablelands [BR118]	1.0	35	Yes
Blakely's Red Gum - Yellow Box grassy open forest or wood and of the New England Tablelands [BR116]	4.0	34	Yes
Blakely's Red Gum - Yellow Box grassy open forest or wood and of the New England Tablelands [BR116]	D. 5	12	Yes
Blakely's Red Gum - Yellow Bex grassy open forest or woodland of the New England Tablelands [BR116]	5.5	18	No
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast [BR153]	42.9	744	Yes
vlanna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BR153]	53.6	1,874	Yes
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast (BR153)	31.5	329	Yes
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BR153]	24.1	649	Yes
vlanna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BB153]	6,7	70	Nc
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BR153]	17.7	185	Nc
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BR153]	26.1	334	Nc
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coast [BR159]	15.5	146	Yes
Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Fablelands and North Coest [BR153]	22.8	355	Yes
Terterfield Woollybull - Silvertop Stringybark open lorest of the New England Tablelands [BR227]	1.1	33	No



Environment, Climate Change & Water

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White Box grassy woodland of the Nancewar and Brigalow Belt South Bioregions [BB240]	4.7	64	Yes
White Box grassy woodland of the Nancewar and Brigalow Belt South Bioregions [BR240]	2.9	63	Yes
White Box grassy woodland of the Nancewar and Brigalow Belt South Biorogions (BR240)	3.5	67	Yes
White Box grassy woodland of the Nancewar and Brigalow Belt South Bioregions [BR240]	10	123	Yes
White Box grassy woodland of the Nancewar and Brigalow Belt South Bioregions [BR240]	3.2	30	No
White Box grassy woodland of the Nancewar and Brigalow Belt South Bioregions [BH240]	1.1	4	Nc
White Box grassy woodland of the Nandewar and Brigalow Belt South Bibreg ons [BR240]	6.1	95	Yes
White Box grassy woodland of the Nancewar and Brigalow Belt South Bioreg or s [BR240]	2.4	3 0	Yes

Credil Profiles

Group: 1 Black Cypress Pine - Tumblecown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion

Ecosystem credits: 23 credits

Local area of vegetation(s): 1.3 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	

3. GMA subregion & vegetation types

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types

Border Rivers/Gwydir

CMA Sub-Region(s)	Veg Type(s)
DirgH Plateau	Black Cypress Pire - Turnolecouri Curri - Narrow- eaved incribers open forest of Increase parts of the Management Blackgroup (1997) 11
Benduna Cavels (Par. A) Des verter listers	Ne now leaves increar cannots, weedland of the Brigalow Belt Couth Soney on (ET) 44)
Hastorn Nandow w (Part 4)	Reventions of Apple Strengtons, Revision strengtons grows, open most of norm western New England Tablelands (3P, 9S)
Glon Lines, Guyre Basa a	Caraktholine (M. v., Placeny's - nt 25 a.v., and shift in the measurement for Son Anney Bioregian (BR1223)
Invereil Bassits	While How - While Copyroad Pietr - Stock-Ladent - Critical Stradily open Resident The - Ne Reward Bloregion 1:57(236)
Moredun Volcanica	White Cyclesis – ite - Silver-leared harbars - Lit notedowr Hed Star (a mitbas upe a
Randewar, Northam Domplex	forest of the Nandawar and Brigelow Bert South Bicregiers (BRL+8)



Cate of report Con145-011 Time Of H6 Tool Version: 1.2

Peel

Sevent River Volcanece Juogha Piatoan

Central West

CMA Sub-Region(s) Pillys (9) de l'Ayunaas – en - Solour le sourt lan track struktur open i nor il of it a Auroawan Déregión (DADAT)

Veg Type(s)

Long-leaved Box - Ned Box - Ted Shingyback shehered open lonest of the NGW Sould Wassen (Stoppe 5 pregion (Belauti 25/1) (UTV119)

V stas Intelnet - Island Grev Box - tine to (wordings of the NEW Cox to Western Globes Biolegion (Denson 217) (CV) (55)

Naran brakada Ishand Grev Parata ate waar ardar ita Reinskev Pall Sralla Dieregion (CW156)

RE 1 we be needed to be a clary search out of the Park Park Roll South Compu-(Col163)

(Key Gu) would are at the phases of the scattering raw He . Here the one per $({\rm GW}(9))$

White Box - To multiplever Grans wood and an firm gran and auch invite on this NSW central western strokes idention 2701 UW212

While Boke mubic, open forest on the grained sediment, on steep stopes in the Manage region of the of contrast work mit opension NSW (filter son 210) (CM217)

Hawkesbury/Nepean

CMA Sub-Region(s)

Seeate.

Veg Type(s)

Bod Skyrwarer. They first wavefund in the order of the Carolieric w P are System Table (10, 564)

Hunter/Central Rivers

CMA Sub-Region(s) Huran Karool Marking Kershee Upper Huran Wollami (Pat A) Wollami (Pat B) Wollami (Pat C)

Yanga

Veg Type(s)

Clery Dox - Crey Cum shaubby woodland on foots open of the Lyper Hunter Valley, Sectiony mode (14.1476)



Cate of report CoN45-011 Time Of HE Tool Version 1.2

Namoi			
CMA Sub-Region(s)	Veg Type(s)		
Pesi	Narrow-leaved Instituting reason woodland of the Brigs, and Belt South & angle h (Net 64)		
	Mercaw-knowed intributy a model of the Exigation Bet South places on $(3.4,66)$		
	while Eventsis Ann. He row is aven interact of a regimes over level all the western Nacideen: Rindstein #M2233;		
	While Country Proc. Silver lands and technology. To makelywr Rad San standary dynau Iorest of the Nandawar and Brigalow Bert South Elenegions (194229)		
	While Cyclines IF an Silver-leaved fraction structure open local of the Nancowar Biologica (NA251)		
Northern Rivers			
CMA Sub-Region(s)	Veg Type(s)		
Arm dale Platsau	Western New England Blackbutt shrubby open torest of the New England (ab)stands (NH277)		
Clarence Lowlands	Tooley and the second to		
Charan da Standalar an			
Stor: Pope Plotonu			
Wongwiolada Plateau			

Group: 2 Blakely's Hed Gum - Yel ow Box grassy open forest or wood and of the New England Tablelands

Ecosystem credits: 119 credits

Total area of vegetation(s): 6.6 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 30%		Minimum area: 25 ha	

3. CMA subregion & vegetation types

Orodits must be obtained in any one or more of the following CMA Sub regions and vegetation types

Border Rivers/Gwydir

CMA Sub-Region(s)

Enalern Nordowsen (Part 3)

Vag Type(s)

Blandys Fed Gara - Yollow Bangras syloper Junet or weather tot if a New England Tablatanda (ER116)

Gien Innes-Cuyra Basa is

Moreilun Vakaniaz



Cate of report Coll45(11) Time 20166 Tool Version 1.2

Namoi	
CMA Sub-Region(s)	Veg Type(s)
Peel	Ble city's Fiel Cum - Mellow Box grassy open torest or woodland of the New England Tabletands (944150)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Zan i la Pleima	Flors: Nativergencey weathanced the New Progen (1) also do not (2000) 176
Clarence Lovelands	Pilet-by a Field Gura - Mellow Reaganety op the forter of wardland of the Now Frighteen following (1991) 72
Clarence Sendstones	Futury Bast aptivitance, of Inc Roov Eng. and Table and Bastagilia (Bername 2005) (INSTREE)
Star Forpe Plateau Wongwishda Plateau	Man isa Gurni - Hough-baiked Agole - Tellow Doxig asay woodlahoopen forest of the New England Tobolanika and Nerth Could (NK188)
8	New England Depoermint gravesy woodland be see mentary or besend substrates of the New England Teoleging (HET211)
	Frow Corr. Binds Fallen gromy was one of the New Engined Tablelands 3, 1237
	Snew Gyn – Mountain Gyn – Mountain Filipen Gyn, econ isyed of the pactors New England Tabletands and North Coset (NP229)
	Vet av 854 – C in 800 - Two C on wordhuids. It exertist explorings is all in New England Tablelands (NR200)

Group: 3 Blakely's Red Gum. Yellow Box grassy open forest or wood and of the New England Tablelands.

Ecosystem credits: 35 credits

To allarea of vegetation(s): 1 ha

			2. Patch size, including low condition	
Concerned And Sold	Minimum surrounding vogetation cover in which the credits must be obtained	Description:	Minimum area of contiguour vegetal on in which credits must be obtained.	
Minimum percent cover: 30%		Minimum area: 25 ha		

3. CMA subregion & vegetation types Credits must be obtained in any one or more of the following CMA Sub regions and vegetation types

Border Rivers/Gwydir

CMA Sub-Region(6) Eastern Nardewars (Part 9)

Vog Type(s)

Biowing the Carner Sellow Backmark oper times to wait the field d when Ergland Tablelands (DR1 to)

Gien Finnes-Cuyra Basa ta Moredun Volcanica

Namoi

CMA Sub-Region(s) Peol

Veg Type(a)

Diavaly's Field Gum - mellow Docgrassy open forest or woodland of the New -Englishe Tabletands (NATS)



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Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Black: Sallee gravey weedland of the New England Tab slands 'NPI (D)
Clarat on Londanda	Blavely's Fed Curri+ ≚ellow Occorately open forest or woodland of the ∿ew England Tabletanda (4RtM/)
Glorence Soudstation	Ficts/ Boo open lowes of the New End and Table and 5 predicts (Sensor 200) (NR162)
Star Forpe Plateau Worgwiende Plateau	N array Gran - Princip and and Apollo - Yollow France in the wonder scheme invest of the New England Tablelance and North Coast (NR 130)
	Now Frequest Programmed areas we wandlend as same earth, where Frequences and the the New Berghand Toole areas (NR21+)
	Survey Given + Hards burdes grassly server and set the Heav + η book values whe (3-423.4
	Briwe Gurt - Mauniah Gurt - Mauniah Filipen Gurt aport prosi of the senten New Englisher (Interlands and Norih Scott (198729)
	Yer we Buy - O w, Buy - Neo Gam would and c' 8 e central eastern pails of the New Englished following (NR283)

Group: 4 Blakely's Red Gum - Yellow Box grassy open forest or wood and of the New England Tablelands

Ecosystem credits: 34 credits

Total area of vegetation(s): 4 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minim an surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of configuous vegetal on in which dreats must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	

Gradita must be obtained in any one or more of the following CMA Sub-regions and vegetation types.

Border Rivers/Gwydir

Veg Type(s)

CMA Sub-Region(s) Eadern Nordeward (Paril 3)

Blassing of Fod Guine - Mollow Bucgrue og op in forset of wardikard of it in Now Pripleter tablematics (66178)

Gien Fines-Cuyra Basa ta

Monodun Vokrahise

Namoi

CMA Sub-Region(s)

Provel 1

Veg Type(s)

Pin (ny n Fari C un - Ankow Pas grie sy open inner or wordlined at the Yow Deglarie Tablelands (NAT-3)



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Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pistaau	Blast: Sallee grassy wessigned of the New England Tab slands 'NPi 10:
Clarer on Lowlands	Blavely's Fed Curs - ≚ellow Boograssy open fores: or woodland of the 'vew England Tablands (4991⊈.)
Clorence Soudatories	Fictory Box open lorest of the New End and Table and Dipredicts (Densor 200) (NET 02)
Star Forpe Plateau Worgwie de Plateau	Marine Gran - Parah at filmi Again - Yolka, Review may wonderschmar laved of the New England Factolishes and North Coast (NR106)
1999 - 1999 - 1997 -	Now Frequest Players relatively weaklend as and month was trans- as ideals and the Saw Brighand Tools and WR215
	Survey Grow Hilards Scalars gracesy constraint, of the Mean Augitaria California (2-1993)
	Brive Gun - Mauniah Gun - Mountain Filliper, Gun aport prod of the sectors New Englisher Interfaces and Neuro Scient (1997/9)
	Yellow Burk (Cley, Burk-Neo Gam southand c' Cle central eaclem pails of the New Frightman fulfidiants (NR283)

Group: 5 Blakely's Red Gum - Yellow Box grassy open forest or wood and of the New England Tablelands

Ecosystem credits: 12 credits

Total area of vegetation(s): 0.5 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minim an surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of configuous vegetal on in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types.

Border Rivers/Gwydir

Veg Type(s)

CMA Sub-Region(s) Eadon Nardeword (Fun 3)

Blesdy's Fod Garo - Mollow Bacigrae syligen force: or workfamiliof if a Now Higher Internets (66118)

Gien Three-Cuyra Basata

Monodun Vakranias

Namoi

CMA Sub-Region(s)

Veg Type(s)

Pin (ny n Fari C un - Ankow Pas grie sy open inner or wordlined at the Yow Deglarie Tablelands (NAT-3)



Cate of report Circl45(11) Time (21) 46 Tool Version: 1.2

Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pistaau	Blast: Sallee grassy wessigned of the New England Tab slands 'NPi 10:
Clarer on Lowlands	Blavely's Fed Curs - ≚ellow Boograssy open fores: or woodland of the 'vew England Tablands (4991⊈.)
Clorence Soudatories	Fictory Box open lorest of the New End and Table and Dipredicts (Densor 200) (NET 02)
Star Forpe Plateau Worgwie de Plateau	Marine Gran - Parah at filmi Again - Yolka, Review may wonderschmar laved of the New England Factolishes and North Coast (NR106)
1999 - 1999 - 1997 -	Now Frequest Players relatively weaklend as and month was trans- as ideals and the Saw Brighand Tools and WR215
	Survey Grow Hilards Scalars gracesy constraint, of the Mean Augitaria California (2-1993)
	Brive Gun - Mauniah Gun - Mountain Filliper, Gun aport prod of the sectors New Englisher Interfaces and Neuro Scient (1997/9)
	Yellow Burk (Cley, Burk-Neo Gam southand c' Cle central eaclem pails of the New Frightman fulfidiants (NR283)

Group: 6 Blakely's Red Gum - Yellow Box grassy open forest or wood and of the New England Tablelands

Ecosystem credits: 18 credits

Total area of vegetation(s): 5.5 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minim an surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of configuous vegetal on in which credits must be obtained.
Minimum percent cover: D%		Minimum area: 5 ha	

3. CMA subregion & vegetation types Gradits must be oblained in any one or more of the following CMA Sub-regions and vegetation types.

Border Rivers/Gwydir

Veg Type(s)

CMA Sub-Region(s) Eadon Nardeword (Fun 3)

Blassing Fod Garo - Mallaw Basigna sy op in force, or wardland of it in tow Higher Internets (66178)

Gien Fines-Cuyra Basata

Monodun Vokrahise

Namoi

CMA Sub-Region(s)

Veg Type(s)

 $\mathsf{Pin}(\mathsf{myn},\mathsf{Fint}(\mathsf{Curr}))$ while $\mathsf{Fint}(\mathsf{grin}(\mathsf{symplet}(\mathsf{interval}(\mathsf{structure}(\mathsf{dur}(\mathsf{dur}(\mathsf{truct}(\mathsf{structure}(\mathsf{symplet}(\mathsf{structure}(\mathsf{struc$



Cate of report Circl45(11) Time (21) 46 Tool Version: 1.2

Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Black Sellee gravey weedlate of the New England Tab elands (NPi) (Di
Clarer on Lowlands	Blavalys Fed Curr + Mellow Oxogramsy open forest or woodland of the New England Tablelands (NR12.)
Clarated Sandstarias	F(dts) Bro open (orest of the New End and Table and 5 predicts (Benson 200) (NR162)
Stan Forpe Plateau Worgwio-de Plateau	Normal Sum , Repairing dealers Agains, Yellew Receipting world reference levels of the New Day and Tablelence and North Coast $(NR)(36)$
	Now Freque V Regions and actually weaklend an and north was fram, " as diable due : the New England Toole area (MR21+)
	Moreover the τ + Hilbert function process contact and out the show τ replaced controls are gradient τ
	Briwe Gurt - Mauniaht Gurt - Mauniaht Fillisent Gurt sport areal of the senter's New Englished Interfacels and Non't Caser (198759)
	Yerow Box - Cie, Box - Rec Gam socialized of the central eactions parts of the New Englisher folloctures (NRSSS)

Group: 7 Manna Com - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 744 credits

Total area of vegetation(s): 42.9 ha

1. Surrounding vegetation cover		2. Patch size, including low condition		
Description:		mounding cover in which the tipe obtained	Deacription:	Minimum area of contiguous vegetal on in which crecits must be obtained.
Minimum percent cover: 30%		Minimum area: 25 ha		
	egion & vege oblared in any		Tollowing CMA S	ab-regions and vegetation types
Border Rive	rs/Gwydir			
CMA Sub-Regi	(a)na	Veg Type(s)		
Eastern Nandeward	(Fart 9)	Blandy's Fed Gum - 1 Employer Toblehouth ()	Tollow Box grae sy op 5/1115)	or toron or wacalland of the New
Gilan I in caGilayna H		Broad- seved Sp hypotano - Biabaly's Ried Grim grassy woodlands of the New England Telestands (FRTP))		
Moraka Vakonse Normest Forest ka		1. The	104 Y 5 K 5	Table and Entropics (Ecosor 202)
		Manager (1. Sec.). The second	STREET ADDRESS VALUES	- River and beauty Variatio addresson thread of the

Marina Garn - Rough to ked Apple - Yellow Box g cases woodtand open forest of the New England , at elance and Nath Coast (BP103)



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Tenter eld Platezu

Curroedand Plain. e souther Cumberland were of the southern

Hawkesbury/Nepean	
CMA Sub-Region(s)	Veg Type(s)
Yengs	Chay Box - Forest Red Gum greasy woodand on tists of the Cumperland Plain. Sydney Basin (JR-200)
	Crey Box - Forest Ted Gum grassy woodand on shale of the southern Cursterian Plan, Swory Easth (HK 523)
	Hitman Gurr. The material archest wordinaries and integration in all the senters. Role and S. South Finaters Highlands (HNS73)
Hunter/Central Rivers	
CMA Sub-Region(s)	Veg Type(s)
Eliorchan	Dia-aiys Fed Curb - Mellow Dok grassy open forset at woodland of the New England Tabletants (HER 11)
Horebr	Ritoch Gurr - Reugh-traved Apple - Tellow Dov grassly repotiand open to est of
Premish Mending	the North Coast and New Engand Tableters (HUS97) Elver Red Suin - Yellow Box (contant wood and in the Hunter Velley (Denson 42)
Live tool Bange	(FUESS)
Mummel Escaron er.	
Pillge	
Tomalla	
Upper Hurter	
Walcher Pictran	
Wellemi (Part A)	
Wollem (Fat B)	
Wellowi (Part C)	
Wisions	
Yengs	
Namoi	

CMA Sub-Region(s) **P**ried

Veg Type(s)

Blavaya FatiGan (- Yollow Bosyna -yayan lanas ar wardtard ol itu Yow Frydowr toberbada (1441-12)

Broad-scend ChingyLors - Blakaily's Havids rig assy would also of the New Product Total Johnski (NA118)

Marilla Gum - Pough-os Red Apple - Vellox Dox grassy woodland/open forest of the New Environ 4 Jun stores, and Neth Coust (NA1*9)



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Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Blact: Sellee gravey westland of the New England Tab elands (NP) (D)
Cara Fabiau	Diatesty's Fiel Curry - "eillow Doc grassy open forest or woodland of the New England Tabletands (NR12),"
Galeroot	F(doay Box open forest of the New End and Table and Dipregion (Benson 200) (NR102)
Chaelundi Chaeluce Lowlande	Marwar Gran - Francis as dard Agrain - Yollow Rose on any wonder scheme "broad of bir New England Tapletance and North Coast NIT 300
Clarence Senderares	Now Frequent Projector and areas as weakland an accurate work and the dealer area the New Frequencies Technology (MR24).1
Coffe Coast & Excerpment	Survey Chine + Hilado Scalles, grackly contra and at the Mean + syland rabbels whe (5-4930)
Contoyna Plateau	Briwy Gurt - Mauntahi Gurt - Mauntahi Hitsehi Gurt aport faresi at his acutora New England Interfaces and Net Filterer (198759)
Dalo sitai.	Yellow Box - Ole, Box - Rec Gam woodland of the central eaction parts of the New Employed tabletands (NRSS)
Hour Basalls	
Gian Fines Giyra Hasara (Part A)	
Guy Fawhas	
Manlony Gregos	
Masleay Hastings	
Mild Law	
Nor nessi -oresi Lumia	
Booky Black Corps	
Starthorpe Plateau	
Walche Plateau	
Wongwipinsta Plateau	
Weedenberg	

Group: 8 Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 1,874 credits

Total area of vegetation(s): 55.6 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vogetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum pe	rcent cover: 30%	Minimum are	ia: 25 ha



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3. CMA subregion & ve Credits mat ce obla red in :	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	1
CMA Sub-Region(s)	Veg Type(s)
Esalem Nandewara (Part 3)	Blakelys Fachsum - ≚onkow dox gracsy op ar horact or woodland of the New Drogland: Tabletands (D1:115)
Gine Lance (Guyer Rener a Moredun Volcanica	Detect- calved Stangyburs - Blakely's Res Gain grassy woodland a of the Kew. England Tablelands (BR121)
Northeast Torest Lands	Futury Box open forest of the New England 1 able and 6 preptrial benear 2001 (PP-427)
landeri etd Piateau	Marina Gura - Poligh to field Apolo, Velice Roxy a say woodle settated forest of the New Foretand - or otherwood Shath Control (\$FF163).
Hawkesbury/Nepean	
CMA Sub-Region(s)	Vag Type(s)
Yenu:	One, Box - Forest Ted Gum grazes woodand on tabl of the Clarithertand Plans. Evideory Basin (34) \$28.
	(3.4), Rox - Fore # Bert Gum grass, woodand on shalo if the sedner: Gunbarland Picht, Swewy Busin (MI, 527)
	Bitteen Gurri - Vollaw Rok groups woodland on unde along force - of the poplarm In the non-group it each - Bitget an in (BN 458)
Hunter/Central Rivers	
CMA Sub-Region(6)	Vcg Type(s)
Flerston	Bla-style Fiel Curs. Hollow Has grantly open investion woodland of the New England Tablejands (1995):5
Hur 🖃	Harnen Gurr - Haugo-Farset Angle - Fallow dos grazes wordiantroen brastin
Ke-uah Menning	it's North Coost and New England TubleIonds (HU507) Bive Rold Surr - Yollow Powe sorian when an function Valley (Bersson 41)
Live pool Range	He lead the sound sector was a sector was an an entitle stand (sector a -0) (F lead)
Munamel Escarby art	
Pill ₁₁ ::	
Tourselles	
Upper Hurter	
Walene Pieleau	
wellemi (Pat A)	
Wollemi (Pat D)	
Wullenin (Part C)	
Wycho	



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Yongo

The second second

Namoi

Ann delo Plataau

Clarer og LovAnde

Clarence Sandstones

Controyoe Plateau

Dale ofter Ever Dasalls

(Part A) Guy Fawkas Mableay Golgas Mableay Hashingt Nigit 12-0

Coll's Coast & Esca prisent

Gien Innes-Guyte Basa ta

Normeest Forest Lands Rocky River Corge Start:Torpe Mateau Wolche Platrou Worgwist de Plateau

Wousenburg

Carto Pulcau Colosof

Chaelundi

CMA Sub-Region(s)

Veg Type(s)

Bis (e)y a final Curr $_{\rm e}$ -follow Box grassly open iterest or weakland of the New England Tabletouchs (NATT-1)

Droed-leaved Six ngybars - Diakely's Red Skim çitessy woodlands of the New-England Tablalands (NA115)

Number Clean - Emission actived agrain - Vellow Box (Trany wondir temporer movel of the New England Tomolance and North Costst (NA143)

Northern Rivers CMA Sub-Region(s)

Veg Type(s)

Dias - Gallee grassy woodans of the Hew England Tab slands (NFI110)

Diaxaty's Field Gum - Mellow Goograssy open forest of woodland of the new brighted labelands (NB127)

Fuzzy Dou open release of the New England Table and Claregion (Censor 2004) (NHTVD)

Marine Clim. Enough ne deed Apple. Wellow Box gir say wondlond open hypert of the New England Tablelance and North Coest (MIT suc

New Forcard Expectation group waveled or and most workney is a distance of the New England Tects and AMERS.

Sense Gen - Heid, Schergenses care amount for Mais regional Infilm of (5.4087)

Serve Gure - Maximple Gure - Maximplin Rithona Gure appreciation of fact antitian New Engine - Tebelanda and North Coast (197279)

Yel ow Bax - G og Box - Eva, G ann was dami s' d' n cominal undern parte o' he New Frighten Talischnich (NR282)

Group: 9 Manna Com - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 329 credits

Total area of vegetation(s): 31.5 ha



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1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetal on in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	
	region & vegetation types		
Oradite must be	obla red in any one or more of the	following CMA S.	ub regions and vegetation types
Border Rive	rs/Gwydir		

CMA Sub-Region(s)	Veg Type(s)
Eastern Natidewats (Part B)	Blendy's Fat (Carl - "allow dus grassy oper forse, or a Juliar for its New England Tablelands (ER) 01
Cien Innes Cuyrt Boon to	Hereof worked ish applicate i Histophys Reel and a preserve excellence and the Reev-
Moredun Volcanica	Englenc Teblelands (BR121)
Northeast Forest Lands	Fullay Box open forest of the New England Table and 6 pregisin (Benson 200) (PE 20)
Toutor(add Philosa	Marina Gum - Rough - sched Apple - Velicy, Box creasy woodland open forest of the New Presant 1 - schedules and Verile Cread (3PD163)

Hawkesbury/Nepean

CMA Sub-Region(s)

Vog Type(s)

renge

Grey, Box - Forest Red Gum grassy woodland on fails of the Claribertand Plain, Sydney Basin (19, 525)

Uncy Box - Forest Hed form plassy woodland on shale of the southert Combariand Pbr 1, Swimey Fixin (MK520)

Richern Genn. Ver aw Filt+ graphs watching in under along towers of the sectors to do not a South Filter efforts and NV73



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Hunter/Central	Rivers
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CMA Sub-Region(s)	Veg Type(s)
Elierator	Blacelys Fad Curry - reliew Box grassy open forest or woodland of the New Employed Tabletanda (100–15)
Hur.ar	Ribbert Curr - Rough-barsed Apple - Fellow Box grassy woodlandropen torest of
Kanab Maanag	the Vorth Coast and New England Tablelands (HUx07)
Live pool Range	Heart Hard State – Violine, Box checker where or 1 in the Harden Violicy (Barance 22) (F-1599)
Mormael Esparon ar .	
Pillor	
Tomalla	
Upper Hurtar	
Wakas Philiau	
Wollemi (Pat A)	
Wallem (Pat H)	
Walloni (Pat C)	
Wyene	
Yengo	
Namoi	
CMA Sub-Hegion(s)	Veg Type(e)
Poul	Blanaly's Fred Game - "effory divegrassy open fores, or woodfard of it entrew Proglaver Informatic (96/170)
	Beoad-eaved Sangybark - Blabely's Neol Burn grassy woodlands of the Ivew. England Tablelands (Net116)

Manual Gum - Ditush-be field apple - Velicy Doxidiaasy woodland open forest of the New England Tablelance and North Coest (US1) is



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Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Biss : Sellee gravey westland of the New Englar I Tab slands 'NPi 1 Di
Car a Flabeau	Diskery's Fiel Curve **ellow Doc gravity open forest of woodland of the free England Tabletands (VR12);
Colored	Ficts, Bte open forest of the New End and Table and 5 pregion. Gensor 2001 (NR102)
Cheelundi Clarence Lowlands	Marker Gran. Founds as deal Agrain. Yellow Reversions wonderschmens loved of the New England Facilitations and North Coest, NR 1361
Clarence Senderares	New Frequent Register and areas as weakland as state in order was based on the large of the large the large state of the large state of MR21-1.
Colfe Coast & Eacarpment	Stream Grie + Hards Scales, gravity server and of the Mean - ighted called, whe fit-1990 is
Caritoyna Plateau	Drive Gun - Maunush Gun - Maunish Filipert Gun sport presi of the sectors New England Interfaces out North Science (19759)
Dalo zitai.	Yellow Box - Ole, Box - Rec Gam apodiandic' Bie central eastwrings is of the New Employed tablatants (NRS83)
Honr Rasalls	
(sion linnes (si iyra Hasa ti ("art.A)	
Gay Lawkes	
Manlany Grigos	
Masleay Hastings	
Mul	
Pior nesal Horeal Lauria	
Booky Blwer Cargo	
Starthoge Plateau	
Walche Plateau	
Wongwipinsla Plateau	
Wedsenhong	

Group: 10 Manna Gum - Bough-barked Apple - Yellow Box grassy weedland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 649 credits

Total area of vegetation(s): 24.1 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vogetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum pe	rcent cover: 10%	Minimum are	ia: 25 ha



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 CMA subregion & ve Credits must be obtained in . 	any one or more of the following CMA Sub-regions and vegetation types		
Border Rivers/Gwydir	1		
CMA Sub-Region(s)	Veg Type(s)		
Egatern fvandewara (Part B)	Blakevsk Fachsum - ≚ondow dox grassvopar lorastor woodland of tha New Drogland: Tablelands (DR115)		
Gren Lines G iyor Room n Moredun Volcanics Northeast Forest Lands	Deced-cu wed Sizingybut - Blakely's Red Guin grassy woodlands of the Kew, England Tablelands (ER121) Futsy Box open forest of the Kew England Table and Biblegich, Benson 2001 (PR: 42) Norma Guin - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guin - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guine - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guine - Polighted Key (1991)		
Hawkesbury/Nepean			
CMA Sub-Region(s)	Vag Type(s)		
Yenus	Crea, Box - Forest Ted Gum grazes woodand on take of the Clarithertand Plans. Evideory Basin (34) 528:		
	िङ, Rev. Fore 9 361 Gun gass, weedland on scale of the sentence Gunbarland Phys. Sweety Excit 66, 5277		
	Bittern Gurr – Vellaw Rek greazy woodland en undt alling forst – of the postorn Inder nors, doubt Fraders Hightern (CHN 458)		
Hunter/Central Rivers			
CMA Sub-Region(6)	Vcg Type(s)		
Flerston	Blandy is Field Curst Mellow Box granting open Invention woodland of the New England Tablelands (1995)		
Hur 🖃	Hittory Claim - Hango-Farsed Angle - Selbar dou gravey wordlandroven brastic		
Ke-vah Menning	it's North Coost and New England Tuelelands (HU507) Bive Rod Surr - Yollow Rove sortan when an fundre Valley (Research 41)		
Live pool Range	Heiner And Annum Annum Kan Kanton wohn and in the Human Annua (Rearch 4-9) (Friend)		
Muranel Escaroy art			
Pill ₁₁ ::			
Tourselles			
Upper Hurter			
Walche Pieleau			
Wellemi (Pat A)			
Wollemi (Pat D)			
Wullenii (Palt C)			
Wyong			



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1.1				<i>.</i>

CMA Sub-Region(s)

Northern Rivers

Ann delo Plataau

Clarer og LovAnde

Controyoe Plateau

Dale ofter Ever Dasalls

(Part A) Guy Fawkas Mableay Golgas Mableay Hashingt Nigit 12-0

Clarence Sandstones

Coll's Coast & Esca prisent

Gien Innes-Guyte Basa ta

Normeest Forest Lands Rocky River Corge Start:Torpe Mateau Wolche Platrou Worgwist de Plateau

Wousenburg

Carto Pulcau Colosof

Chaelundi

Veg Type(s)

Bis (e)y a final Curr $_{\rm e}$ -follow Box grassly open iterest or weakland of the New England Tabletouchs (NATT-1)

Droed-served Sir ngybars - Diakely's Red Skim çitessy woodiands of the New-England Tablalands (NA118)

Ninde Clear - Education and Aprillon Vellow Box (2019) world' actively found at the New England Topic lance and North Cosst, (NA143)

CMA Sub-Region(s)

Veg Type(s)

Dias - Gallee grassy woodand of the Hew England Tab slands (NET 10)

Diaxaty's Field Gum - Mellow Goograssy open forest of woodland of the new brighted labelands (NB127)

Floors, Dox open release of the flow England Table and Elsregion (Censor 2004) (NHIVD)

Marine Clim. Engine the diaphin. Wellow Box growy wordlowdropen hyperinf the New England Tablelance and North Coest (MIT suc

New Forcard Expectation group weathed on and most workfree it an instance of the New England Tects and a IMD214

Sense View - Hitzk Scherger av were consist for View - optical tablet who (64087)

Serve Gure - Maximple Gure - Maximplin Rithona Gure appreciation of fact antitian New Engine - Tebelanda and North Coast (197279)

Yel ow Bax - G og Box - Eva, G ann was dami s' d' n cominal undern parte o' he New Frighten Talischnich (NR282)

Group: 11 Manna Com - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 70 credits

Total area of vegetation(s): 6.7 ha



Cate of report Child Set 1 Time Of 16 Teal Version 1.2

1. Surrounding vegetation cover		2. Patch size, including low condition			
Description:	vegetat p	surrounding n cover in which the ust be obtained	Description:	Minimum area of contiguous vegetal on in which crecits must be obtained.	
Minimum per	rcent cover	:: 30%	Minimum are	ia: 25 ha	
		gelation types	foi owing CMA S	ib regions and vegetation types	
Border River					
CMA Sub-Regio	on(s)	Veg Type(s)			
Eastern Nai dewara	(Part B)	Blevely is Fact to in Frankwick due grassy upon to set or a builter of the New Einstein: Tabletands (ER) 101			
Gien Innes Cuyrt B	690 1 9	Bread worked ishingging selfatady's Basilan ng asay walada a nafito kow		in a group excellence of the body	
Maredun Volcanica		England TableInnds (ER121)			
Northeast Totest La	nde	Futury Box open forest of the New England Table and Storegic 1 (Benson 200) (PE 40)			
Tantori aki Philasa	120	Marine Gum - Rough to Red Apple - Velicy Boxy resay woodland/poer forest of the New Property - activities and Verile Const (BP163).			

Hawkesbury/Nepean

CMA Sub-Region(s)

renge

Veg Type(s)

Grey, Box - Forest Red Gum grassy woodland on fails of the Claribertand Plain, Sydney Basin (19, 525)

Unity Box - Folest Hed Gum grassy woodand on shale of the southert Cumberland Plon, Swimry Ficin (NES25)

Rithern Gam - Vellow Bakegraphy was diabatic numbers ing to wart of the station to do not give the back was being three a MNV73.



Cate of report Coll45(11) Time 20166 Tool Version 1.2

Hunter/Central	Rivers
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CMA Sub-Region(s)	Veg Type(s)
Elierator	Ble (e) ys fied Cum - ≻ellow Boc grassy open forest or woodland of the New Employed Tabletands (1905 to)
Hur .ar	Dibbon Curr - Dough-Enried Apple - Tellow Dov grassy woodlandropen lorest of
Kanab Maanag	the Vorth Coast and New England Tablelands (HG007)
Live pool Range	Here Hard Suitz – Vinitee Bay and the whole and in the Hugher Vinitay (Banava AP) (H-JE99)
Mornnet Estarion art.	
Pillar	
Tomalla	
Upper Human	
Wak na Philiau	
Wollemi (Pat A)	
Wallemi (Pat H)	
Walloni (Pat C)	
Wwene	
Yenga	
Namoi	
CMA Sub-Hegion(s)	Veg Type(e)
Poul	Blakery's Fed Gam - Mellow Bacgrassy open fores, or woodhard of the New Pripticity Internation (NVLTN)
	Broad-earwed Sit havbark - Blabely's Fled Burn grassy woodlands of the New. Emplored tablelands (NAS118)
	Manual China, Device and additionals, Mallow Devices and Income an

Manne Gum - Ditush-se feed Apple - Velicy, Doxic reasy woodlehotoper forest of the New England Tablelance and North Coast (MA164)



Cate of report Col/45/01 Time 20166 Tool Version: 1.2

Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Plateau	Blact: Sellee gravey websited of the New England Tab elands (NPi) (Di
Caria Plabeau	Diavaly's Fed Curry - "eillow Opcograssy open forest or woodland of the New England Tabletands (VRT2);
Galereat	Fubsy Bits open lowest of the New End and Table and E pregists (Benson 200) (NR102)
Chaelundi Clarence Lowlande	Marker Gran. Forein and and Agrain. Yollow Receiver was wonderwith the forein the Section of Carl Section 2010
Clarence Senderares	Now Frequent Projector and areas as weakland an accurate work and the dealer area the New Frequencies Technology (MR24).1
Colfe Coast & Excerpment	Survey Chine + Hards Statles, grackly server and at the show + sighted statistically (5-423.5
Comboyna Plateau	Briwk Gurt - Mauniah Gurt - Mauniah Hitsen Gurt agen faresi af ha acitorn New England Interfaces and Ner F Score (198750)
Dalo sitai.	Yellow Box - Ole, Box - Rec Gam accidiandic 10 e central eactornipalite of the New Employed tabletands (NRSS)
Hour Basalls	
Gian Fines Gilyra Hasars (*art A)	
Guy Fawhes	
Manlany Gregos	
Masleay Hastings	
Mild and	
Nornessi -oresi Lumia	
Booky Blwer Corpa	
Starthorpe Plateau	
Walche Plateau	
Wongwipinsta Plateau	
Wedgenberg	

Group: 12 Manna Gum - Bough-barked Apple - Yellow Box grassy weedland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 185 credits

Total area of vegetation(s): 17.7 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vogetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	



Cate of report Col/45/01 Time 20166 Tool Version: 1.2

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 CMA subregion & ve Credits must be obtained in . 	any one or more of the following CMA Sub-regions and vegetation types		
Border Rivers/Gwydir	1		
CMA Sub-Region(s)	Veg Type(s)		
Egatern fvandewara (Part B)	Blakevsk Fachsum - ≚ondow dox grassvopar lorastor woodland of tha New Drogland: Tablelands (DR115)		
Gren Lines G iyor Room n Moredun Volcanics Northeast Forest Lands	Deced-cu wed Sizingybut - Blakely's Red Guin grassy woodlands of the Kew, England Tablelands (ER121) Futsy Box open forest of the Kew England Table and Biblegich, Benson 2001 (PR: 42) Norma Guin - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guin - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guine - Polighted Key Apple - Vellow Rowg is say woodland softwork of the Norma Guine - Polighted Key (1991)		
Hawkesbury/Nepean			
CMA Sub-Region(s)	Vag Type(s)		
Yenus	One, Box - Forest Ted Gum grasss second on take of the Clarithertand Plans. Evideory Basin (34) \$28;		
	िङ, Rev. Fore 9 361 Gun gass, weedland on scale of the sentence Gunbarland Phys. Sweety Excit 66, 5277		
	Bittern Gurr – Vollaw Rok groupy woodland on unde along force – of the postorn In the non-group the fill mathematic group of HN 4582		
Hunter/Central Rivers			
CMA Sub-Region(6)	Vcg Type(s)		
Flerston	Blandy is Field Curst Mellow Box granting open Invention woodland of the New England Tablelands (1995)		
Hur 🖃	Hittory Claim - Hango-Farsed Angle - Selbar dou grazey wordlandrown brastie		
Ke-vah Menning	it's North Coost and New England Tuelelands (HU507) Bive Rod Surr - Yollow Rove sortan when an fundre Valley (Research 41)		
Live pool Range	Heiner And Annum Annum Kan Kanton wohn and in the Human Annua (Rearch 4-9) (Friend)		
Muranel Escaroy art			
Pill ₁₁ ::			
Tourselles			
Upper Hurter			
Walche Pieleau			
Wellemi (Pat A)			
Wollemi (Pat D)			
Wullenii (Palt C)			
Wyong			



Cate of report Col/45/01 Time 20166 Tool Version: 1.2

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The second second
Namoi

Ann delo Plataau

Clarer og LovAnde

Clarence Sandstones

Controyoe Plateau

Dale ofter Ever Dasalls

(Part A) Guy Fawkas Mableay Golgas Mableay Hashingt Nigit 12-0

Coll's Coast & Esca prisent

Gien Innes-Guyte Basa ta

Normeest Forest Lands Rocky River Corge Start:Torpe Mateau Wolche Platrou Worgwist de Plateau

Wousenburg

Carto Pulcau Colosof

Chaelundi

CMA Sub-Region(s)

Veg Type(s)

Bis (e)y a final Curr $_{\rm e}$ -follow Box grassly open iterest or weakland of the New England Tabletouchs (NATT-1)

Droed-served Six ngybars - Diakely's Red Skim çitessy woodlands of the New-England Tablalands (NA115)

Nation Clean - Emission actived agrain - Vellow Box (Frank wonder temporer traval at the New England Topiolance and North Costst (NA14-3)

Northern Rivers CMA Sub-Region(s)

Veg Type(s)

Dias - Gallee grassy woodans of the Hew England Tab slands (NFI110)

Diaxaty's Field Gum - Mellow Goograssy open forest of woodland of the new brighted labelands (NB127)

Fuery Day open release of the New England Table and Disregion (Censor 2004) (NH102)

Marine Clim. Enough ne deed Apple. Wellow Box gir say Woodlandonce "went of the New England Tablelance and North Coost (MITSU)

New Forcard Expectation group waveled or and most workney is a distance of the New England Tects and AMERS.

Series General Helick, Station gammass can a summaring the Minis – uptor of include with (0.4737)

Server Sum - Maximals Sum - Maximalin Ribana Gum again facts of fact software New Englishe Teblelands and North Coast (VP229)

Yel ow Bax - G og Box - Fila, G ant was damils ' it o contrat updam po to o' the Now Frighten Taliccineta (NR282)

Group: 13 Manna Com - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 334 credits

Total area of vegetation(s): 26.1 ha



Cate of report Collider 11 Time Of Hell Tool Version 1.2

1. Surrounding vegetation cover		2. Patch size, including low condition		
Description:	Minimum surrounding vegetation cover in which the credits must be obtained		Description:	Minimum area of contiguous vegetal on in which credits must be obtained.
Minimum percent cover: 0%		Minimum area: 5 ha		
	Contraction (1971)	elation types	foi owing CMA S	ib regions and vegetation types
Border River				
CMA Sub-Regio	vn(s)	Veg Type(s)		
Esislerii Nai dewata		Blevely school (Correct England Tabletande (I		ar lorad of wholks for the New
Gien Innes Cuyrr Be Monsdun Volcanics	196 (3	Funded surved ishingst England Tablelands (I		n i glassy weathing and tradew
Northeast Totest Lar	nde	Fidia, Bot open fores (P.1, 45)	of the New England	Table and 6 pregic + Benson 2054
Tanlori old Philas i		Marina Gurt - Rough- New Fridand Todieth		Box greasy woodlend/open forest of the (BP163)

Hawkesbury/Nepean

CMA Sub-Region(s)

renge

Veg Type(s)

Grey, Box - Forest Red Gum grassy woodland on fails of the Claribertand Plain, Sydney Basin (19, 525)

Unity Box - Forest Hed Gum grassy woodland on shale of the southert Cumberland Pbr 1, Swimry Filterin (NE 525)

Filterin Gen . Ye law fits get say watching is under along to wort of the station L do not $\sqrt{8\pi}$ db is observed by the $MMVTX_{1}^{2}$



Hunter/Central I	Rivers
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CMA Sub-Region(s)	Veg Type(s)
Elieretor	Ble (e) ye field Curri - ≻eBlow Boc grassy open forest or woodland of the New Circlary: Tablation (1905 to)
Hur .ar	Nilson Curr - Neigh-Earsed Apple - Tellow Dov grassy woodland:open lorest of
Kasubh Maaring	the Vorth Ceast and New England Tablelands (HU007)
Liverpool Range	Hiter Hart Stor Yn hite Bry charten wrae ar f in tro Huster Vinley (Benero A2) (Fulf99)
Mormael Estarion ar .	
Pillor	
Tomalla	
Upper Hurter	
Wak to Philipp	
Wollemi (Pat A)	
Wallem (Part H)	
Walloni (Pat C)	
Wyene	
Yenga	
Namoi	
CMA Sub-Region(s)	Veg Type(e)
Poul	Blakey's Fed Gam - Mellow Bacgrassy open forest at watchard of the new Pripleton Internation (NVITO)
	Broad-eared Sit hypbark - Blakely's Floo Burn grassy woodlands of the Ivev. England Tabletands (NAT18)
	Manager Company and Andrew Million Providence Manager Providence

Manne Gum - Ditush-se feed Apple - Velicy, Doxic reasy woodlandroper forest of the New England Tablelance and North Coast (MA164)



Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Blact: Sellee gravey westland of the New England Tab elands (NP) (D)
Cara Fabiau	Diatesty's Fiel Curry - "eillow Doc grassy open forest or woodland of the New England Tabletands (NR12),"
Galeroot	F(doay Box open forest of the New End and Table and Dipregion (Benson 200) (NR102)
Chaelundi Chaeluce Lowlande	Marwar Gran - Francis as dard Agrain - Yollow Rose on any wonder scheme "broad of bir New England Tapletance and North Coast NIT 300
Clarence Senderares	Now Frequent Projector and areas as weakland an accurate work and the dealer area the New Frequencies Technology (MR24).1
Coffe Coast & Excerpment	Survey Chine + Hilado Scalles, gracky center and ut the Mean + syland mittake with (5-4930)
Contoyna Plateau	Briwe Gurt - Mauntahi Gurt - Mauntahi Fili sen Gurt agon Tarosi af his acistoria New England Interfaceto ent Norih Zaver (198720)
Dalo sitai.	Yellow Box - Ole, Box - Rec Gam woodland of the central eaction parts of the New Employed tabletands (NRSS)
Hour Basalls	
Gian Fines Giyra Hasara (Part A)	
Guy Fawhas	
Manlony Gregos	
Masleay Hastings	
Mild Law	
Nor nessi -oresi Lumia	
Booky Black Corps	
Starthorpe Plateau	
Walche Plateau	
Wongwipinsta Plateau	
Weedenberg	

Group: 14 Manna Gum - Bough-barked Apple - Yellow Box grassy weedland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 146 credits

Total area of vegetation(s): 15.5 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vogetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 0%		Minimum eree: 5 ha	



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3. CMA subregion & ve Credits mat ce obla red in :	any one or more of the following CMA Sub-regions and vegetation types		
Border Rivers/Gwydir	1		
CMA Sub-Region(s)	Veg Type(s)		
Esalem Nandewara (Part 3)	Blakelys Fachsum - ≚onkow dox gracsy op ar horact or woodland of the New Drogland: Tabletands (D1:115)		
Gine Lunes Guyer Benn n Moredun Volcan es	Detect- on yed Sir http://dis- Blakely's Res Galin grassy woodland a of the licev. England Tablelands (BR121)		
Northeast Torest Lands	Futury Box open forest of the New England 1 able and 6 preptrial benear 2001 (PP-427)		
landeri etd Piateau	Marina Gura - Poligh to Kod Apolo, Velice Roxy a say woodle setupor forest of the New Foretand - to reference and Shath Control (\$P163).		
Hawkesbury/Nepean			
CMA Sub-Region(s)	Vag Type(s)		
Yendo	One, Box - Forest Ted Gum grazes woodand on tabl of the Clarithertand Plans. Evideory Basin (34) \$28.		
	for , Rox - Forent Secti Gum grass, woodland on shale of the sentence Comborland. Phys. Swowy Elsen 646,527		
	Ribbert Gurr - Ye, an De - greazy woodland en unde along forcer of the soularn In the non-greatly brahas blig data is this styl		
Hunter/Central Rivers			
CMA Sub-Region(6)	Vcg Type(s)		
Flerston	Bla-style Fiel Curs. Hollow Has grantly open investion woodland of the New England Tablejands (1995):5		
Hur 🖃	Harnen Gurr - Haugo-Farset Angle - Fallow dos grazes wordiantroen brastin		
Ke-uah Menning	it's North Coost and New England TubleIonds (HU507) Bive Rold Surr - Yollow Powe sorian when an function Valley (Bersson 41)		
Live pool Range	He lead the sound sector was a sector was an an entitle stand (sector a -0) (F lead)		
Munamel Escarby art			
Pill ₁₁ ::			
Tourselles			
Upper Hurter			
Walene Pieleau			
wellemi (Pat A)			
Wollemi (Pat D)			
Wullenin (Part C)			
Wycho			



Cate of report Col/45/01 Time 20166 Tool Version: 1.2

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1.1				<i>.</i>

CMA Sub-Region(s)

Northern Rivers

Ann delo Plataau

Clarer og LovAnde

Clarence Sandstones

Controyoe Plateau

Dale ofter Ever Dasalls

(Part A) Guy Fawkas Mableay Golgas Mableay Hashingt Nigit 12-0

Coll's Coast & Esca prisent

Gien Innes-Guyte Basa ta

Normeest Forest Lands Rocky River Corge Start:Torpe Mateau Wolche Platrou Worgwist de Plateau

Wousenburg

Carto Pulcau Colosof

Chaelundi

Veg Type(s)

Bis (e)y a final Curr \sim follow Box grassly open forest or weakland of the New England Tabletanda (HATTa)

Droed-served Sir ngybars - Diakely's Red Skim çitessy woodiands of the New-England Tablalands (NA118)

Ninche Clean, Education and Agrain, Vellow Box (2014) woodinationer toologiation. New England Top clance and North Costs (NA143)

CMA Sub-Region(s)

Veg Type(s)

Dias - Gallee grassy woodans of the Hew England Tab slands (NFI110)

Diaxaty's Field Gum - Mellow Goograssy open forest of woodland of the new brighted labelands (NB127)

Fuery Day open release of the New England Table and Disregion (Censor 2004) (NH102)

Marine Clim. Engine the diaphin. Wellow Box growy wondlend open hypering the New England Tablelance and North Coest (MIT suc

New Forcard Expectation group waveled or and most workney is a distance of the New England Tects and AMERS.

Sense Gen - Hinds Schergenses care mentilitie Mass - optical Infilm rule (E-4087)

Serve Gure - Maximple Gure - Maximplin Rithona Gure appreciation of fact antitian New Engine - Tebelanda and North Coast (197279)

Yel ow Bax - G og Box - Fila, G ant was damils ' it o contrat updam po to o' the Now Frighten Taliccineta (NR282)

Group: 15 Manna Com - Rough-barked Apple - Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast

Ecosystem credits: 355 credits

Total area of vegetation(s): 22.8 ha



Cate of report Child Set 1 Time Of 16 Teal Version 1.2

1. Surrounding vegetation cover		2. Patch size, including low condition		
Description:	Minimum surrounding vegetation cover in which the credits must be obtained		Description:	Minimum area of contiguous vegetal on in which crecits must be obtained.
Minimum percent cover: 0%		Minimum area: 5 ha		
University of Galacia and State	service of the service of the service of the	getation types		
Gradits must be	obla red in	any one or more of the	following CMA S.	ib regions and vegetation types
Border River	rs/Gwydir			
CMA Sub-Regi	on(s)	Veg Type(s)		
Easlern Nai dewara	N - 2012	Blensiyis Had (Correl) England Tabletands (I		at longe, or would a field a few
Gien Innes Cuyrt B	elati 11			n in grady wordlarn and the bow
Monedun Volkanica		England Tablelands (I	()	
Vortheast Totest La	nde	Plusy Box open fores (PR, 42)	tor the New England	Table and 6 pregic 1 [Benson 205)
Tantori uki Philas i	11242	Manne Gom - Rough as Red Apple - Yellow Box grassy woodland/coer forest of I New Fridan I. Adventus and MarkeGrad (RP163)		

Hawkesbury/Nepean

CMA Sub-Region(s)

renge

Veg Type(s)

Give, Box - Forest-Red Gum grassly velocitated on finite of the Clamberta of Plain, Sydney Basic (H) satisfy

Grey Box - Fotest Hed Gum passy woodand on shale of the southert Cumberland Plan, Swmey Fixin (MLS2D)

Rithern Gam - Vellow Bit+ grapsy wasdianelic truths along forwart of the station take an $\sqrt{8}$ with Friday elliptical coNNV2Q



Hunter/Central	Rivers
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CMA Sub-Region(s)	Veg Type(s)
Elierator	Blacelys Fad Curr - ≻ellow Box grassy open forest or woodlend of the New Employed Tabletanda (100515)
Hur.ar	Dibbon Curr - Nough-Encod Apple - Tellow Doc grapsy woodland:poen lorest of
Kanab Maanag	the Vorth Coast and New England Tablelands (HUx07)
Live pool Range	Here Hard Suitz - Vinites Box Leading whom and in the Hugher Vinity (Braskin 42) (FUR99)
Mornnel Estation art.	
Pillor	
Tomalla	
Upper Hurtar	
Wakas Philiau	
Wollemi (Pat A)	
Wallemi (Pat H)	
Wallomi (Pat C)	
Wyene	
Yengo	
Namoi	
CMA Sub-Region(s)	Veg Тура(в)
Poul	Blass(yis Hed Garris - "effory Blassgrassy open fores: an washland of the new englisher tabletrants (944130)
	Beoad-eaved Stringybark - Blakely's Neo Gum grassy woodlands of the New. England Tablelands (MAT18)

Manual Gum - Ditush-be field apple - Velicy Doxidiaasy woodland open forest of the New England Tablelance and North Coest (US1) is



Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Arm da e Pisteau	Bleat: Sellee greasy westland of the New England Tab slands (NP) (D)
Cata Pabeau	Diatesty's Fiel Curry - "eillow Docgrassy open forest or woodland of the New England Tabletands (NR12),"
Galerat	Fubsy Bits open lowest of the Key/Encland Table and Disregion (Densor 200) (Nation)
Chaelundi	Varies Gam. Foreshier data for Yoldes Foreign representation in the short of the New England Facilities and Neth Coast NR 1361
Staren de Lowlande Oprende Randsmussi	Now Friday of Payment of graday was allowed as start starts were form that in starting
Colfe Coast & Escarpment	the New England Toologing (MR214) Served Stark - Hilde Scales graces once and at the New - spland liables at 25-423-5
Camboyne Plateau	Snew Gurt - Maunial'i Gurt - Vicuniain Filippen Gurt sport prod of the sectors New Englished Interfaces and Marin Screen (19759)
Dalo zitai.	Yellow Box - Ole, Box - Rec Gam woodland of the central eaction parts of the New Employed tabletands (NRSS)
Front Hasalls	
Gian Fines & iyra Hasars (Part A)	
Goy Lawkas	
Janlany Gingas	
Masleay Hastings	
يهد الرابة	
Yor nesal Horesi Lawia	
Booky Blanc Corres	
Starthorpe Plateau	
Walche Plateau	
Wongwionste Plateau	
Woosenbong	

Group: 16 Tenterfield Wool ybutt - Silvertop Stringybark open forest of the New England Table ands

Ecosystem credits: 33 credits

Total area of vegetation(s): 1.1 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description	Minimum surrounding vegetation cover in which the credits must be obtained.	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 30%		Minimum area: 25 ha	



3. CMA subregion & v	
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydii	
CMA Sub-Region(s)	Veg Type(s)
Esatern Nandewara (Part B)	Bennemene White (sum - Silverion Siling) as it classy open intest of the Kap Sa cres and southern New Eng and Tableland edge of the Nenterval Okregion (OR104)
Sico Luce & yor Bron n Joredun Vokanca	Decerd-ou and Springlybatk - Moontain Gauni - Apple Devicem forest of the New Englisher Tablelands (SR122)
Yortheast Torest Lands	Broad- as wed Stinlight any grassly ocen "breat of the eastern New England Tablation 15 (RR 104)
Lenderi etd Pialeau	Mattinis Sching, acts. New Figure Slacks in Heart Starked Apple gales, spen loved of the New Formatt Lationauto MF1F3)
	Macatalin Gum - Broad lie aved Stringsberk shrabay ope norms of the easier's New Priglaria total and (P-8104)
	Na row-leaved People mint - Moundally Hibbor, Corn grassy open forests? the cestan "New England Tubloting, (BM1dd)
	No revelopee Peoplement - Waltle-issued Reppendint shoubby open breast of the New brig and i ad elands (Bhr 1,3)
	New End and B ac utilitions sy open fittest of the sestern New End and Tablelands (07:174)
	New England Exploration groupy weakload on go talls whether a soft to New England Tablelands (SR175)
	No w Propartical regionable propagation in the state investor 10. Now weight 11 all allocation (20177)
	-anti-make Wenrybuth - Sidowrop Stringet and upen to wait all the New Englands Tableton & (SE 2017)
Hunter/Central Rivers	
CMA Sub-Region(s)	Veg Type(s)
Elietsbor	Beard, actived Strangebark. Meantain Thiben Currer, Measurate open totals. of estamphiant ranges of the North Deast and Hew Degland Tablelands (Figure 4).
Hurter Katush Matering	Geny, Introduction Specifics I Sum - Groy Rescopers (second concluding of the Helphon Melloy - Evidency Bastin (31,1356)
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Kall He	
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Upper Humer	
Wallemi (Part A)	
Wollemi (Pat B)	
Myseng	
Aryaliya	



r	lamoi
¢	MA Sub-Region(s)
C	actern Nandeware
ł	'esl
¥	Valena Planau

Veg Type(s)

Broad - saved Spingybark grassy ocen to east of the eastern New England Tabilitian & (NA122) Mobile's Onling, both - New England Discribut: - Nough-burved Apple grassy open forest of the New England Tablelands (NA109) Non-Meso (1999). Association work Mining/Deck about the open context of the resident Mow-England Tablelands (MA156) Nerrow krawes Persperaties - Mauninin Biblion Guengent winsom loose is the eastern New England Tablebacci (NA156) No taxole avec Peraps the (+Walls, haves Papparter Laborable approximation of the set <math display="inline">c) the New England Tabilance (NA (67) New England Happer and gravity we called an gravitic substrates of the New England Tablefonds (NA172) New England stringysasks - peppennint open to est of the New England Tab slands $(\sqrt{4}-74)$ Rough-barved Apple - Stivenop Stringsberg - Manne Curt Annak/grass spenitorest -o Indino Antri Nurrawer Binright (NA 186) Yel aw Rev - Revertise and Stringshow simulative new terest of the New Project Laboration do (NA228)



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Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
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Caria Faleau	New England Exportmint grassy vectoriand on granile substrates of the Nev.
Coloradi	England Teblelands (NR213) New Protection and along you do a perpendicular oper theory in the New - syland Teblelands
Chaelundi	(%R×15)
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Gien Lines-Coyn, Bessio (Part B)	
Guy Fawkes	
Madada OK Bat	
Might = p	
Normanal Hours Lands	
Rocky River Gerge	
Nuche Meantain	
Star horpe Plateau	
Upper Manning	
Wak 🗤 Platrau	
Worspein of Philoso	
Weggenberg	

Group: 17 White Box grassy woodland of the Nandewar and Brigalow Belt South Biologions

Ecosystem credits: 64 credits

Total area of vegetation(s): 4.7 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 30%		Minimum area: 25 ha	



3. CMA subregion & ve	egetation types
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esalem Nardewars (Part 3)	in and Gray Box fall grassy wrostend on clay so a in the Briga twide t South and Nancewar Diolections (Defision 31) (2 1196)
Gen lance Gayor Boan a	White Box grassy woods indicities har dower and Srige ow Belt Sourh Blorey and (\$7240)
Hunter/Central Rivers	i i i i i i i i i i i i i i i i i i i
CMA Sub-Region(s)	(a)eqyT geV
Human	While Box - Yellow Box grass / woods no or casall clopes in the upper Hundri Valicy Brighter Ball Sci. 11 - USS1
Kaluah Mahring	Korsy, organis/nein 254 m 15002 1
Kamalawa	
Wyxiej	
Namoi	
CMA Sub-Region(s)	Vog Type(st
Pocl	While Bay gravity would studied be 3 in least and Ship are Bell Sec. in Storey cars (5.8226)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Ann dale Plateau	Mannas Gurn - Foogh as Ked Agule - Yellow Box g ussy woodla whopen lovest all the New Fing and the entries and North Chast (2017-06)
Clarence Lowlands	New England Pappermitt grassy woodland on sportrants wonkess to substrates of
Clarance Lowlands Clarance Sandstones	New England Reptermint grassy vectored on each mentary onbess he substrates of the New England Techolands (HRLT)
	New England Pappermitt grassy woodland on sed mantally on basen os abstratas of

Group: 18 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 63 credits

l otal area of vegetation(s): 2.9 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 30%		Minimum area: 25 ha	



3. CMA subregion & ve	agetation types
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esalem Nandewars (Part B)	in and Gray Box fail grassy wrodiand on clay so a in the Briga twilder South and Nancewar Diolections (Densing 31) (27156.)
Gentines Giya Rana n	While Box grassy woodland of the Nandewar and Erigs on Belt South Blorey and (B1240)
Hunter/Central Rivers	f and the second s
CMA Sub-Region(s)	Vag Type(a)
Human	While Box - Yellow Box grassy woods to or canali dependin the upper Hundrin Vol. w. Brigglaw Salit Source (HUSS)
Kaluah Mahring	And the Bourse sense 2 more a
Kanaboa	
Wyr e	
Namoi	
CMA Sub-Region(s)	Vog Type(st
Pod	While Box gran a prevention had the Conclement and Edge and Bell Sen, in Biologicuss (NA226)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Am dale Plaisau	Marines Gurn - Foogh as Ned Apule - Yellow Box glussy woodla whopen lovest all the Netwinn, and inclusions and North Coast (1973-66
and a second second and a second s	New End and Pappermint grassy weedland on sale mants worklass he substrates of
Clarence Lovilande	
Clarence Sandsteines	the New England Tacloards (HRL)

Group: 19 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 67 credits

l otal area of vegetation(s): 3.5 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	



3. CMA subregion & ve	
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esalem Nandewars (Part B)	in and Law, Box fail gravey woodand on clay so a in the Briga twick to South and Nancewar Diosticits. Detsor (31) (27156.)
Gentines Ciyo Rom a	While Box grassy woodland of the Nandower and Erigs on Belt South Blorey and (BR240)
Hunter/Central Rivers	
CMA Sub-Region(s)	Vag Type(a)
Human	While Box - Yellow Box grassy woods to or canali dependin the upper Hundri Value, Brigaliuw Sali Sec. (1+U654)
Ka uah Mahring	ter of the general sense of a second
Konaboa	
W) yr - El	
Namoi	
CMA Sub-Region(6)	Veg Type(si
Pod	While Bargmany woods into the Carl Levis and Ship ov Belt Sei, a Barennis (NA226)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Am dale Platau	Marina Gurt - Fibagh se ked Apole - Yellew Boxig uppy woodla whopen lovest of the New Fin, and the elaiwes and North Cossil NR1 tills
Clerence Lowlands	New England Pappermittigrasay woodland on sad mentary onbase he substrates of the New Contained Table and a HRUIT "
	the stand standard device state 11 (1) 11
Clarence Sandator es	
Clarence Sandstones Star horpe Pi ckeur	Yel wy Box - Gro, Box - Ree Gum woodland of the control eastern ports of the New England Tablelands (NR203)

Group: 20 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 123 credits

l otal area of vegetation(s): 4 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	



3. CMA subregion & ve	
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	2
CMA Sub-Region(s)	Veg Type(s)
Esalem Nandewars (Part B)	in and tare, Box fail grassy wrother dion cleviso a in the Briga twide t South and Nancewar Diost lots (Densor Bi) (27153.)
Gira Luce C iyo Rom n	While Box graphy woodland of the Nar dewar and Drigs ow Belt South Blorey brac (BR240) $^{\circ}$
Hunter/Central Rivers	
CMA Sub-Region(s)	Vag Type(a)
Human	While Box - Yellow Box grassy woods to or canali dependin the upper Hundrin Vol. yr Briggluw Gall Societ (+U654)
Kaluah Mahring	And of the Bounda result of success of
Komalate	
Wyx el	
Namoi	
CMA Sub-Region(6)	Veg Type(st
Poel	While Box shares a woods of all the X-m beaut and Sdgn aw Bell Son in Blove, cass (NR226)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Am dale Plaisau	Manina Gurn - Foogh se Ked Apale - Yellow Box g ussy woodla whopen lovest all the New Fra, and inclusions and Yorth Chaid 1947-66
Clarence Lowlands	New England Report mint grassey woodland on sed mantally on basen or substratus of
AND CONTRACTOR OF A CONTRACTOR	the New England Tacioands (HDa11)
Clarence Sandstones	Mel up Day Car Day Day Car Landland of the control or day to the Mark
Star Foga: Materia	Yot wy Box - Gro, Box - Ree Gran woodland of the control eastern perfs of the New England Tablelands (NRSO)

Group: 21 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 30 credits

l otal area of vegetation(s): 3.2 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%		Minimum area: 25 ha	



3. CMA subregion & ve	
Gradilis must be obliaired in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esatem Nandewars (Part 3)	in and text, Box fail grassy wrotherd on cleviso a in the Briga twide t South and Nancewar Diologicts (Denson 31) (CT193)
Gioclanos Giyar Bana n	While Box gradsy woodland of the Nardowshand Drigs ow Belt South Blorey and $(B^{\rm T}240)$
Hunter/Central Rivers	I
CMA Sub-Region(s)	Vag Type(s)
Human	White Box - Yellow Box grassly woods to or cancel dependin the upper Hundr Vollay, Brigglow Boll Statin (HBS2)
Kaluah Mahring	
Kanalatka	
Wyrat	
Namoi	
CMA Sub-Region(6)	Veg Type(s)
Poel	While Backgroup would stated the λ is been unit then we field South States runs (VA226)
Northern Rivers	
	Veg Type(s)
CMA Sub-Region(s)	Warne Gam - Roogh to fixed Apple - Yellow Box glussy woodla whopen latest of the
CMA Sub-Region(S) Ann dele Plesau	N an Na Gurn - Floogh as Ned Apple - Velicy, Box glussy woodla whopen lovest at the New Frighted Last elarways and North Chast (2017) IBN New England Reptermint gravey woodland on each manage on base he substrates of
CMA Sub-Region(s) Ann dae Ple sul Claracaa Lordanda	Man its Gum - Roogh to Ked Apple - Velice Box glassy woods relater forest of the New Frighted I at elanes and North Cristil (NR14th New Frighted Reptermint grassy woodland or sed mentary or base he substrates of the New England Techolands (HR211)
Northem Rivers CMA Sub-Region(s) Ann date Plateau Clarence Lowlands Clarence Sandstones Star Folge Maticiae	N an Nar Gurn – Floogh so, Ked Apple – Velice, Rox glussy woodland/open lovest of the New Frighted Lab elares, and North Chast (2017) Itin New England Reptermint gravey woodland on see mantage on base he substrates o

Group: 22 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 4 credits

l otal area of vegetation(s): 1.1 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 0%		Minimum area: 5 ha	



3. CMA subregion & ve	
Gradilis must be obliaired in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esatem Nandewars (Part 3)	in and text, Box fail grassy wrotherd on cleviso a in the Briga twide t South and Nancewar Diologicts (Denson 31) (CT193)
Gioclanos Giyar Bana n	While Box gradsy woodland of the Nardowshand Drigs ow Belt South Blorey and $(B^{\rm T}240)$
Hunter/Central Rivers	I
CMA Sub-Region(s)	Vag Type(s)
Human	White Box - Yellow Box grassly woods to or cancel dependin the upper Hundr Vollay, Brigglow Boll Statin (HBS2)
Kaluah Mahring	
Kanalatka	
Wyriel	
Namoi	
CMA Sub-Region(6)	Veg Type(s)
Poel	While Backgroup would stated the λ is been unit then we field South States runs (VA226)
Northern Rivers	
	Veg Type(s)
CMA Sub-Region(s)	Warne Gam - Roogh to fixed Apple - Yellow Box glussy woodla whopen latest of the
CMA Sub-Region(S) Ann dele Plesau	N an Na Gurn - Floogh as Ned Apple - Velicy, Box glussy woodla whopen lovest at the New Frighted Last elarways and North Chast (2017) IBN New England Reptermint gravey woodland on each manage on base he substrates of
CMA Sub-Region(s) Ann dae Ple sul Claracaa Lordanda	Man its Gum - Roogh to Ked Apple - Velice Box glassy woods relater forest of the New Frighted I at elanes and North Cristil (NR14th New Frighted Reptermint grassy woodland or sed mentary or base he substrates of the New England Techolands (HR211)
Northem Rivers CMA Sub-Region(s) Ann date Plateau Clarence Lowlands Clarence Sandstones Star Folge Maticiae	N an Nar Gurn – Floogh so, Ked Apple – Velice, Rox glussy woodland/open lovest of the New Frighted Lab elares, and North Chast (2017) Itin New England Reptermint gravey woodland on see mantage on base he substrates o

Group: 23 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 95 credits

l otal area of vegetation(s): 6.1 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 0%		Minimum area: 5 ha	



3. CMA subregion & ve	
Credits must be obtained in	any one or more of the following CMA Sub-regions and vegetation types
Border Rivers/Gwydir	
CMA Sub-Region(s)	Veg Type(s)
Esalem Nandewars (Part B)	in and Law, Box fail gravey woodand on clay so a in the Briga twick to South and Nancewar Diosticits. Detsor (31) (27156.)
Gira lance Giyar Bana n	While Box grassy woodland of the Nandower and Erigs on Belt South Blorey and (BR240)
Hunter/Central Rivers	
CMA Sub-Region(s)	Vag Type(a)
Human	While Box - Yellow Box grassy woods to or canali dependin the upper Hundri Value, Brigaliuw Sali Sec. (1+U654)
Ka uah Mahring	ter of the general sense of a second
Konaboa	
W) yr - El	
Namoi	
CMA Sub-Region(6)	Veg Type(si
Pod	While Bargmany woods into the Carl Levis and Ship ov Belt Sei, a Barennis (NA226)
Northern Rivers	
CMA Sub-Region(s)	Veg Type(s)
Am dale Platau	Marina Gurt - Fibagh se ked Apole - Yellew Boxig uppy woodla whopen lovest of the New Fin, and the elaiwes and North Cossil NR1 tills
Clerence Lowlands	New England Pappermittigrasay woodland on sad mentary onbase he substrates of the New Contained Table and a HRUIT "
	the stand standard device state 11 (1) 11
Clarence Sandator es	
Clarence Sandstones Star horpe Pi cicon	Yel wy Box - Gro, Box - Ree Gum woodland of the control eastern ports of the New England Tablelands (NR203)

Group: 24 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 60 credits

l otal area of vegetation(s): 2.4 ha

1. Surrounding vegetation cover		2. Patch size, including low condition	
Description:	Minimum surrounding vegetation cover in which the credits must be obtained	Description:	Minimum area of configuous vegetation in which credits must be obtained.
Minimum percent cover: 0%		Minimum area: 5 ha	



3. CMA subregion & veg	getation types	
Credits must be obtained in a	ny one or more of the following CMA Sub-regions and vegetation types	
Border Rivers/Gwydir		
CMA Sub-Region(s)	Veg Type(s)	
Eastern fvandewars (Part B)	in and Grey Box fail grassy wootland on clay so a in the Briga twide t South and Nancewar Diolectors (Densor 31) (CT192)	
Gen lance Cayor Bren a	White Box grassy woodland of the Nandowshand Brigs ov Belt Sourh Blong and (E1240)	
Hunter/Central Rivers		
CMA Sub-Region(s)	Vag Type(s)	
Human	While Box - Yellow Box grass # veedland on pasall clopes in the upper Hunter Value Bit galaw Sall Status (~1865)	
Kaluah Malaring	vor sy, to general tem site in the top 1	
Kanabasi		
Wyria		
Kanabaa Waxaa Namoi CMA Sub-Region(s)	Vog Type(si	
w _{yr u} Namoi	Vog Typetsi Wilde Borgrang woods of a few tim lever and Sign av Bell South Borgrans (54220)	
w _{eren} Namoi CMA Sub-Region(6) Pad	While Burghamy woods what we thin lever unit Sign are Bell Sen in Buren case	
Wyster Namoi CMA Sub-Region(s) Pad Northern Rivers	While Burghamy woods what we thin lever unit Sign are Bell Sen in Buren case	
Wyrau Namoi CMA Sub-Region(6) Peel Northern Rivers CMA Sub-Region(5)	Willie Box granty woods of all the Nan Jewar and Ship two Bell South Biolegicus (NA225) Veg Type(a) Manus Gurt - Floght as Ked Agule - Yellow Box glassy woods whaten larest of the	
Waran Namoi CMA Sub-Region(6) Peel Northern Rivers CMA Sub-Region(5) Am date Plasau	While Boregroup ywoods out of the Nambeau and Shiphow Bell Search Boregroup (NA226) Veg Type(s) Marko Gunt - Floogh to Ked Apole - Yellow Boregroup woodlate/open forest of the New Fragment I as elanvasiant Mark Coast (2011) Bit New Fragment I as elanvasiant Mark Coast (2011) Bit	
w _{yr e} Namoi CMA Sub-Region(s)	Willie Borgmany woods of all the Namlewer and Ship an Bell South Borgman (NA225) Veg Type(s) Man ts Gam - Flogh to Ked Apple - Yellow Box glassy woods whopen larest of the New Fright Schwarz and Nath Coast (2011-16)	

Species Credits

Species credits are required for 1 species.

Border Thick-tailed Gecko	Underwoodisaurus sphyrurus	
Number of species cred to required:	249	
Extent of impact:	187ha	
Identification method:	Survey	
impaction red llag area?	Yes	
Reason for red (lag area:	An impact greater than that allowed:	





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Appendix J: Biobank Local Benchmark Report



REQUEST FOR APPROVAL TO USE LOCAL BENCHMARK DATA

Sapphire Wind Farm

Prepared for Wind Prospect CVWP Pty Ltd

22 February 2011





DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Request for approval to use Local Benchmarks Data – Sapphire Wind Farm
Project Number	10SYDECO-0056
File location	G:\Synergy\Projects\10SYDECO\10SYDECO-0056 Sapphire Wind Farm Part 3A\Report\Local Benchmarks report
Prepared by	NS, AF, TH, PR
Approved by	RH
Status	Final
Version Number	1
Last saved on	22 February 2011
Cover photo	<i>Chrysocephalum apiculatum</i> (top left), <i>Wahlenbergia gracilis</i> (top right), Sapphire landscape (centre) (photo credit: AF, Eco Logical Australia).

This report should be cited as 'Eco Logical Australia 2011. Request for approval to use Local Benchmark Data - *Sapphire Wind Farm*. Prepared for Wind Prospect CWP Pty Ltd.'

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Abbreviations

ABBREVIATION	DESCRIPTION
BAMCCOM	Biobanking Assessment Methodology and Credit Calculator Operational Manual
BSMP	Biobank Site Management Plan
СМА	Catchment Management Authority
DECCW	NSW Department of Environment, Climate Change and Water
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
LGA	Local Government Area
Local area	Within 10 km radius of the site
LPMA	Land and Property Management Authority (formerly Department of Lands)
NPWS	National Parks and Wildlife Service (part of DECCW)
RBVT	Revised Biometric Vegetation Types
TSC Act	NSW Threatened Species Conservation Act 1995
Wind Prospect	Wind Prospect CWP Pty Ltd

1 Introduction

Wind Prospect CWP Pty Ltd (Wind Prospect) is currently finalising an Environmental Assessment Report for the proposed Sapphire Wind Farm (ELA in prep). The study area is located 18 km west of Glen Innes and 28 km east of Inverell, on the New England Tablelands of New South Wales (NSW), mainly within the Glen Innes - Guyra Basalts sub-region of the Border Rivers Gwydir CMA and a very small portion in the Severn Rivers subregion (Figure 1).

The project is being assessed under Part 3A of the *Environmental Planning and Assessment Act 1979* as a critical infrastructure project. The Department of Planning has issued Director-General's requirements for the environmental assessment that include a requirement to assess impacts to biodiversity values and offset any residual impacts that cannot be avoided, minimised or mitigated using "improve or maintain" principles.

Wind Prospect proposes to address this requirement using the Biobanking Assessment Methodology to "inform" the quantum of offset required, however, a formal Biobank Assessment and Credit Report is not being undertaken.

Section 2.11.2 and 3.4.3 of the Biobanking Assessment Methodology and Credit Calculator Operational Manual (BAMCCOM) allows the use of "certified local data", including local benchmark data, where the Director-General of the Department of Environment, Climate Change and Water (DECCW) certifies that they more accurately reflect local environmental conditions than the data in the Biobanking databases. The use of certified local data is subject to a number of conditions:-

- Use of certified local data must be approved by the Director-General <u>before</u> a biobanking statement or agreement is approved.
- The applicant <u>must</u> provide justification for the use of local data as part of the Biobanking Assessment report for the development proposal.
- Benchmark can be obtained from reference sites or published data.
- If local benchmark data are developed, they <u>must</u> be derived from reference site measurements of the same vegetation type in a relatively unmodified condition as indicated in the criteria listed in section 3.4.3 of the BAMCCOM (Section 2 of this report).

This report has been prepared by Eco Logical Australia for Wind Prospect CWP for the Sapphire Wind Farm project and addresses each of these requirements.

The request for use of local data is for the purpose of the Wind Farm only and not other projects in the region.

Local benchmark data have been collected in accordance with the requirements outlined in section 3.4.3 of the BAMCCOM (refer to section 5 of this report), justification for the use of local benchmark data has been provided (Section 3) and the data have been collected by accredited Biobank assessors and a vegetation mapping/condition expert.

Assessor Name: Nathan Smith (formerly ELA now Niche Consulting)

Assessor Number: 0047

Vegetation Expert: Peter Richards (formerly ELA now a self-employed ecological consultant)

Peter Richards is a highly experienced conservation ecologist who has extensive experience in ecological survey and assessment at both landscape-scale and finer scale. Through twenty-five years of work with the Royal Botanic Gardens, Sydney, the NSW National Parks and Wildlife Service, State Forests of NSW and private enterprise, Peter has acquired an excellent knowledge of NSW threatened flora and fauna, native vegetation and ecological processes, particularly of the NSW North Coast, New England Tablelands and Nandewar bioregions. He has been involved with a number of key Government broad-scale natural resource assessment projects including Comprehensive Regional Assessments (CRAs) and regional Wilderness assessments. Peter has submitted a number of scientific articles to peer-reviewed journals, and is also the author or co-author of several contributions to the Flora of New South Wales.

Peter possesses a diverse range of technical skills including systematic and targeted flora and fauna survey, habitat assessment, vegetation classification and mapping, data collation and analysis and GISbased spatial analysis. Peter has undertaken numerous systematic and targeted vegetation and flora surveys across the abovementioned bioregions. He has participated on a variety of government expert panels in reviewing native vegetation information for the 'Biometrics' vegetation database, threatened flora ecological information for the Biobanking assessment tool, allocation of native vegetation types to threatened flora and fauna species profiles, trialling the 'PVP assessment tool' for use by CMA vegetation officers, and analysis of vegetation data towards a classification of native vegetation of the Northern Rivers CMA. Peter also contributed a classification of native vegetation communities of the western New England Tablelands and Nandewar bioregions to the Botanic Gardens Trust's NSW Vegetation Classification and Assessment database (NSWVCA).



Figure 1: Location of Study Area and CMA sub-region boundaries

2 Criteria & Method for Developing Local Benchmarks

The following criteria (listed in section 3.4.3 of the BAMCCOM) must be addressed when developing benchmarks from local reference sites:-

Locating reference sites

Reference sites must have little modification relative to other vegetation in the region, as indicated by:-

- minimal timber harvesting (few stumps, coppicing, cut logs),
- minimal firewood collection,
- minimal exotic weed cover,
- minimal grazing and trampling by introduced or overabundant native herbivores,
- minimal soil disturbance,
- dieback not in excess of normal senescence,
- no evidence of very recent major perturbation such as fire or flood,
- not subject to high frequency burning, and
- evidence of recruitment of native species.

The BAMCCOM states that "*it may be difficult to find totally unmodified sites in a landscape, particularly in highly cleared regions or during periods of extended drought.* Vegetation *in relatively unmodified condition can be found in some travelling stock routes and reserves, national parks and nature reserves, state forests (especially Flora Reserves), cemeteries, roadsides and commons. Appropriate reference sites may sometimes exist on the development site or the biobank site. Reference sites can occur in small remnants, such as narrow roadsides and cemeteries. Different reference sites can be used to collect benchmark data on different condition attributes*".

Numbers of reference plots

To encompass the variation in benchmark condition, a minimum of three reference transects/plots for each variable should be measured at reference sites for each vegetation type, with more transects/plots being desirable.

Field methods for measuring vegetation condition variables on reference sites

The methods for recording data from reference plots are identical to the methods for recording data for Site Value, as outlined in Appendix 2 of the BAMCCOM. An Excel spreadsheet (Local Benchmark Calculator.xls) for calculating local benchmarks can also be downloaded from the DECCW website.

Determining a benchmark from a local reference site

The data from all reference plots for a specific assessment are then used to develop the local benchmark for that vegetation type.

Local benchmarks are entered into the credit calculator by the assessor in Step 5. The information sources used to develop the local benchmark must be provided to DECCW as part of the impact assessment. If the source is a local reference site, then the assessor should provide a copy of the site attribute data and a description of the site as part of the Biobanking Assessment Report.

Developing the benchmark

The data from all reference sites and transects/plots need to be entered into the Local Benchmark Calculator.xls for a specific development or biobank site (available for download from the BioBanking website). Once the data have been entered into the spreadsheet, the benchmark values are automatically calculated. These benchmarks then need to be copied into the credit calculator at *Step 5b* as part of data entry for the Site Value assessment. A copy of the data and other supporting information used to generate the benchmark should be submitted as part of the application for the biobanking agreement or statement.

Justification for the use of Local Benchmark Data

Section 2.11.2 of the BAMCCOM states that "the applicant must provide justification for the use of local data as part of the Biobanking Assessment report for the development proposal". Justification for the use of local data to inform benchmarks for the vegetation types present at the Sapphire study area is provided below.

The benchmarks in Version 1.1 of the BAMCCOM for the Border Rivers Gwydir CMA Revised Biometric Vegetation Types (RBVTs) are provided only at the vegetation class level of Keith (2004), and not for the individual RBVTs within the CMA. Since the collection of local floristic data has not been undertaken at the RBVT scale, the use of existing BAMCCOM benchmarks does not allow for a realistic assessment of relative condition of the subject vegetation types.

Most Keith vegetation classes, including those in the subject area, are represented by multiple vegetation types and the benchmarks at the class level are accordingly broad enough to encompass the full range of natural condition states of all of the vegetation types that are grouped within a single class. They are, therefore, not an entirely accurate reflection of the range of natural condition values for any one particular vegetation type and can lead to either an over- or under-estimation of site value scores. A comparison of the benchmark data collected for each vegetation type in the study area with the current benchmarks for the corresponding broad vegetation class (Tables 3,5,7,9,11 and 13 in chapter 6 following) clearly reveals this trend.

The use of local reference plots enables the generation of benchmarks that are specific, and therefore more relevant, to each vegetation type within the locality.

4 Location & Description of Reference Sites

Reference sites were chosen to reflect uncleared local vegetation in as near a natural, undisturbed state as possible. The Sapphire region has a long agricultural history of grazing and cropping, making finding totally unmodified sites difficult.

The sites selected as local reference sites were mainly from a Travelling Stock Reserve (TSR) along Kings Plains Road and on freehold land where vegetation has not been significantly cleared (Figure 2).

Eleven plots are located within the Kings Plains Road TSR, located between the study area and Kings Plains National Park, one within Kings Plain National Park and six within freehold land.

Three replicate plots were collected within each of the 6 vegetation types impacted by the Wind Farm proposal (i.e. 18 plots in total).

Site selection was largely influenced by the relative absence of previous disturbance.

Reference sites showed no evidence of recent major disturbance from fire, frequent burning regimes, flooding, and minimal or no evidence of timber harvesting, firewood collection, soil disturbance, or dieback (in excess of normal senescence). This statement is corroborated by the abundance of tree hollows and fallen timber as shown in the results for each plot in Tables 2-13.

Exotic weed cover was low relative to other vegetation in the region, and there was no evidence of recent trampling or grazing by introduced herbivores.

The reference sites in the TSR have not been subject to pasture improvement, and species richness/diversity was high. The vegetation on freehold land was in a similar condition.

There is no evidence to suggest that native herbivores, such as Swamp Wallabies and Eastern Grey Kangaroos, are overabundant in the area. Natural recruitment of native plant species was evident at each of the sites chosen for local benchmarks plots.



Figure 2. Location of local benchmark plots

Sapphire BioBanking Local Benchmarks Report
5 Methods

Six Border Rivers – Gwydir CMA Revised Biometric Vegetation Types (RBVTs) have been mapped throughout the study area and broader locality as part of the Environmental Assessment report (ELA in prep) (Figure 2). They are outlined in Table 1 along with their EEC equivalents.

 Table 1
 Revised Biometric Vegetation Types and EEC Equivalents mapped at proposed Sapphire Wind Farm study area

Revised Biometric Vegetation Type	TSC Act EEC	EPBC Act EEC
BR110: Black Cypress Pine – Tumbledown Gum – Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion	-	-
BR114: Blakely's Red Gum – Rough- barked Apple – Red Stingybark grassy open forest of the Western New England Tablelands		
BR116: Blakely's Red Gum – Yellow Box grassy open forest or woodland of the New England Tablelands	White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland)	White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland) – <i>Critically</i> <i>endangered on EPBC Act</i>
BR153: Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest of the New England Tablelands and North Coast	Ribbon Gum, Mountain Gum, Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion	-
BR227: Tenterfield Woollybutt – Silvertop Stringybark open forest of the New England Tablelands	-	-
BR240: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	White Box Yellow Box Blakely's Red Gum Woodland (Box-Gum Woodland)	White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Box-Gum Woodland) – <i>Critically</i> <i>endangered on EPBC Act</i>

Local benchmark data have been collected for each of these six vegetation types.

The method used in collecting local benchmark data is as described in Appendix 2 of the BAMCCOM and summarised in Table 2:-

Attribute	Assessment Method	Subject to Local Benchmark Variation
Native Plant Species Richness (Number of Species)	20m X 20m plot	Yes
Native Over-storey Cover (Tallest woody stratum – Trees in this case)	Percent Foliage Cover at 10 points along a 50m transect	Yes
Native Mid-storey Cover (Shrubs and tree regeneration between 1m and the Over-storey)	Percent Foliage Cover at 10 points along a 50m transect	Yes
Native Ground Cover (Grasses) (Native grasses below 1m)	Percent frequency of grasses at 50 points along the 50m transect (i.e. every 1m)	Yes
Native Ground Cover (Shrubs) (Native shrubs below 1m)	Percent frequency of shrubs at 50 points along the 50m transect (i.e. every 1m)	Yes
Native Ground Cover Other (Native herbaceous dicots, monocots, ferns, lilies, orchids, sedges and rushes. Fungi, lichens and bryophytes not included)	Percent frequency of native 'other' at 50 points along the 50m transect (i.e. every 1m)	Yes
Exotic Plant Cover (Exotic plants are vascular plants not native to Australia)	plants not Over-storey and mid-storey weeds - Percent Foliage Cover at 10 points along a 50m transect Ground cover weeds - Percent frequency of grasses at 50 points along the 50m transect (i.e. every 1m)	
Number of Trees with Hollows	Number of living and dead trees with hollows within 50m X 20m plot	Yes
Length of Fallen Logs	The total length of logs at least 10 cm in diameter and at least 0.5 m long	Yes
Over-storey Regeneration	The proportion of over-storey species present in the zone that are regenerating (i.e. with diameter at breast height < 5 cm)	No

Local Benchmark data were collected during May 2009 by Nathan Smith and Peter Richards. In total, 18 plots were completed for the six biometric vegetation types (Figure 2).

Field Data sheets for all plots are included in Appendix A and a summarised list of all species recorded in Appendix B.

The local benchmark calculator.xls was used to generate local benchmarks (Results included in Tables 2-13 and raw data in Appendix C).

These benchmarks are proposed for use, subject to Director-General DECCW approval, in Step 5b of the Biobanking Credit calculator for the Site Value assessment (DECC 2009).

6 Local Benchmark Data Results

6.1 BR110: BLACK CYPRESS PINE – TUMBLEDOWN GUM – NARROW-LEAVED IRONBARK OPEN FOREST

BR110 was an open forest type largely associated with acid volcanic outcrops in the locality (Figure 3).

BR110 was dominated by *Eucalyptus dealbata* (Tumbledown Gum) and *E. crebra* (Narrow-leaved Ironbark), while *Callitris endlicheri* (Black Cypress Pine) was present mostly as juvenile regrowth. *Eucalyptus laevopinea* (Silvertop stringybark) was present as a co-dominant tree species while Notelaea microcarpa (Native Olive), *Monotoca scoparia*, *Lespedeza juncea* subsp. *sericea* and *Indigofera australis* (Australian Indigo) were occasionally present as shrubs. A variety of native herbs and grasses dominated the ground layer and included species such as *Aristida ramosa* (Purple Wiregrass), *Bothriochloa macra* (Red Grass), *Poa sieberiana* (Snow Grass), *Calotis cuneata* (Mountain Burr-Daisy), *Desmodium varians* (Slender Tick-trefoil), *Geranium solanderi* (Native Geranium) and *Wahlenbergia communis* (Tufted Bluebell).

BR110 does not equate to any EEC as listed on the TSC or EPBC Acts.

Table 3 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark
for Vegetation Type BR110.

Keith Formation & Class: Dry sclerophyll forests (shrubby sub-formation) - Northern Tableland Dry Sclerophyll Forests

Vegetation Type: Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest of northern parts of the Nandewar Bioregion

Veg Type ID: BR110	Current Benchmark	Plot 1	Plot 2	Plot 3	Revised Local Benchmark
20m x 20m Plot					
Native plant species	30	46	40	43	≥43
50m transect					
Native over-storey cover	25-40	21	20	23.5	20-23
Native mid-storey cover	6-25	0	0	2	*0-2
Native ground cover (grasses)	20-30	62	64	58	59-64
Native ground cover (shrubs)	3-10	2	0	0	0-2
Native ground cover (other)	3-5	58	30	34	31-53
50m x 20m plot	-				
Number of trees with hollows	2	9	5	8	≥8
Total length of fallen logs	20	210	234	220	≥220

* Anything benchmark with a value of zero should be discussed with DECCW and changed to a value of 0.1 as per other benchmarks and correspondence with John Siedel.

Reference Plot	Easting	Northing
BR110 BM PLOT 1	343449	6717327
BR110 BM PLOT 2	343686	6717214
BR110 BM PLOT 3	343829	6717284

 Table 4 Location of reference plots used in local benchmark calculator.

6.2 BR114: BLAKELY'S RED GUM – ROUGH-BARKED APPLE – RED STRINGYBARK GRASSY OPEN FOREST

BR114 was an open forest type and was associated with a single acid volcanic outcrop within the study area (Figure 3).

Within the study area, BR114 was dominated by *Eucalyptus blakelyi* (Blakely's Red Gum) and *E. macrorhyncha* (Red Stringybark). *Acacia terminalis* (Sunshine Wattle), *N. microcarpa* and *L. juncea* subsp. *sericea* were occasionally present as shrubs. The ground layer was dominated by a variety of native herbs and grasses that were in common with BR110.

BR114 does not equate to an EEC as listed on the TSC or EPBC Acts.

Biometric benchmark comparison to local benchmark

Table 5 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark for Vegetation Type BR114.

New England Tablelands		1		~ -	
Veg Type ID: BR114	DECCW benchmark	Plot 1	Plot 2	Plot 3	Local Benchmark
20m x 20 m plot					
Native plant species	25	36	40	51	≥40
50m transect					
Native over-storey cover	6-25	24.5	30	33	26-32
Native mid-storey cover	0-5	6	0	1.5	*0-5
Native ground cover (grasses)	30-40	50	24	44	28-49
Native ground cover (shrubs)	3-10	8	4	0	1-7
Native ground cover (other)	3-5	24	16	32	18-30
50m x 20m plot		•			
Number of trees with hollows	1	6	4	4	≥4
Total length of fallen logs	15	266	125	53	≥125

* Anything benchmark with a value of zero should be discussed with DECCW and changed to a value of 0.1 as per other benchmarks and correspondence with John Siedel.

Table 6 Location of reference plots used in local benchmark calculator.

Reference Plot	Easting	Northing
BR114 BM PLOT 1	354676	6720081
BR114 BM PLOT 2	354560	6720073
BR114 BM PLOT 3	352692	6719983



Figure 3. Black Cypress Pine - Tumbledown Gum - Narrow-leaved Ironbark open forest.



Figure 4. Blakely's Red Gum - Rough-barked Apple - Red Stringybark grassy open forest

6.3 BR116: BLAKELY'S RED GUM - YELLOW BOX GRASSY OPEN FOREST OR WOODLAND

Within the study area BR116 was present as an open forest type or woodland and was associated with the basalt geology within the study area (Figure 4).

Within the study area, BR116 was dominated by *Eucalyptus blakelyi* (Blakely's Red Gum) and *E. melliodora* (Yellow Box). *Acacia implexa* (Hickory Wattle), *Exocarpos cupressiformis* (Native Cherry) and *Lespedeza juncea* subsp. *sericea* were only present as a sparse layer of shrubs at the benchmark plots. The ground layer of this RBVT was dominated by a variety of herbs and grasses including *Aristida* spp., *Asperula conferta* (Common Woodruff), *Carex inversa* (Knob Sedge), *Cymbopogon refractus* (Barbed Wire Grass), *Desmodium varians* (Slender Tick-trefoil), *Wahlenbergia communis* (Tufted Bluebell) and *Themeda australis* (Kangaroo Grass).

BR116 equates to the Box – Gum Woodland EEC as listed on the TSC and EPBC Acts.

Biometric benchmark comparison to local benchmark

Table 7 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark
for Vegetation Type BR116.

Veg Type ID: BR116	DECCW benchmark	Plot 1	Plot 2	Plot 3	Local Benchmark
20m x 20 m plot					
Native plant species	25	39	38	39	≥39
50m transect					
Native over-storey cover	6-25	21.5	20	21	20-21
Native mid-storey cover	0-5	0	0	1	*0-1
Native ground cover (grasses)	30-40	48	42	44	42-47
Native ground cover (shrubs)	3-10	0	2	0	*0-2
Native ground cover (other)	3-5	24	12	20	14-23
50m x 20m plot					
Number of trees with hollows	1	6	3	5	≥5
Total length of fallen logs	15	95	73	57	≥73

Table 8 Location of reference plots used in local benchmark calculator.

Reference Plot	Easting	Northing
BR116 BM PLOT 1	361334	6719672
BR116 BM PLOT 2	353624	6719994
BR116 BM PLOT 3	356357	6720186

6.4 BR153: MANNA GUM – ROUGH-BARKED APPLE – YELLOW BOX GRASSY WOODLAND/OPEN FOREST

Within the study area BR153 was present as an open forest type or woodland and was specifically associated with the basalt geology within the study area (Figure 5).

Within the study area, BR153 was dominated by *Eucalyptus viminalis* (Ribbon/Manna Gum) and *Angophora floribunda* (Rough-barked Apple) with *E. melliodora* (Yellow Box) less common. Shrubs were largely absent from this RBVT within the study area and the ground layer was dominated by a similar variety of herbs and grasses to BR116.

BR153 equates to the Ribbon Gum, Mountain Gum, Snow Gum Grassy Forest/Woodland of the New England Tableland Bioregion as listed on the TSC Act. There is no equivalent EEC listing on the EPBC Act for this RBVT.

Biometric benchmark comparison to local benchmark

 Table 9 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark

 for Vegetation Type BR153.

Veg Type ID: BR153	DECCW benchmark	Plot 1	Plot 2	Plot 3	Local Benchmark
20m x 20 m plot					
Native plant species	23	38	31	38	≥38
50m transect					
Native over-storey cover	6-25	18.5	12	21.5	13-21
Native mid-storey cover	0-5	0	0	0	*0-0
Native ground cover (grasses)	30-40	80	62	72	64-78
Native ground cover (shrubs)	0	8	10	2	3-10
Native ground cover (other)	3-5	16	0	16	3-16
50m x 20m plot					
Number of trees with hollows	1	0	1	4	≥1
Total length of fallen logs	15	146	31	133	≥133

Table 10. Location of reference plots used in local benchmark calculator.

Reference Plot	Easting	Northing
BR153 BM PLOT 1	344474	6718932
BR153 BM PLOT 2	345182	6718891
BR153 BM PLOT 3	343563	6718406



Figure 5. Blakely's Red Gum - Yellow Box grassy open forest or woodland.



Figure 6. Manna Gum - Rough-barked Apple - Yellow Box grassy woodland/open forest.

6.5 BR227: TENTERFIELD WOOLLYBUTT – SILVERTOP STRINGYBARK OPEN FOREST

BR227 was an open forest type and was associated with acid volcanic outcrops within the locality (Figure 6).

Within the study area, BR227 was dominated by *Eucalyptus banksii* (Tenterfield Woollybutt), a stringybark *E. subtilior* and *E. crebra*. The shrub layer was largely removed, however *Indigofera australis* (Australian Indigo) and *Lespedeza juncea* subsp. *sericea* were occasionally present. The ground layer was typical of the RBVTs associated with acid volcanics as previously described for BR110 and BR114.

BR227 does not equate to an EEC as listed on the TSC or EPBC Acts.

Biometric benchmark comparison to local benchmark

Table 11 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark for Vegetation Type BR227.

Vegetation Type: Tenterfield Woollybutt - Silvertop Stringybark open forest of the New England Tablelands										
Veg Type ID: BR227 DECCW benchmark Plot 1 Plot 2 Plot 3 Local Benchmark										
20m x 20 m plot										
Native plant species	33	53	35	49	≥49					
50m transect										
Native over-storey cover	25-40	30.5	18.5	15.5	16-28					
Native mid-storey cover	6-25	4	2	0	*0-4					
Native ground cover (grasses)	18-20	12	36	84	17-74					
Native ground cover (shrubs)	3-10	14	18	4	6-17					
Native ground cover (other)	3-5	8	18	18	10-18					
50m x 20m plot										
Number of trees with hollows	2	4	3	0	≥3					
Total length of fallen logs 20 80 364 157 ≥157										

Reference Plot	Easting	Northing
BR227 BM PLOT 1	344012	6726149
BR227 BM PLOT 2	352897	6720021
BR227 BM PLOT3	356086	6718319

6.6 BR240: WHITE BOX GRASSY WOODLAND

BR240 was present as a woodland type and was associated with the basalt geology largely in the western part of the study area (Figure 7).

Within the study area, BR240 was dominated by *Eucalyptus albens* (White Box) with *A. floribunda* as an associated species. Shrubs were largely absent while the ground layer was typical of the other units associated with basalt geology, BR116 and BR153. Clearing and grazing were substantial within this RBVT within the study area. Some areas retained some resilience with a variety of native grasses and herbs present but for the most part BR240 was degraded due to soil disturbance (tilling and pasture improvement) and subsequent weed invasion.

BR240 equates to the Box – Gum Woodland EEC as listed on the TSC and EPBC Acts.

Biometric benchmark comparison to local benchmark

 Table 13 Comparison of biometric benchmark, local benchmark plot data and calculated local benchmark for Vegetation Type BR240.

Keith Formation & Class: Grassy Woodlands - Western Slopes Grassy Woodlands										
Veg Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions										
Veg Type ID: BR240 DECCW benchmark Plot 1 Plot 2 Plot 3 Local Benchmark										
20m x 20 m plot										
Native plant species	23	40	47	33	≥40					
50m transect										
Native over-storey cover	6-25	26	18	25	19-26					
Native mid-storey cover	0-5	0	20	0	*0-16					
Native ground cover (grasses) 30-40 66 62 76 63-74										
Native ground cover (shrubs)	0	0	0	6	0-5					
Native ground cover (other)	3-5	6	18	14	8-17					
50m x 20m plot										
Number of trees with hollows 1 3 2 2 ≥ 2										
Total length of fallen logs 30 144 58 24 ≥58										
Note: * Anything benchmark with a value of zero should be discussed with DECCW and changed to a value of 0.1 as per other benchmarks and correspondence with John Siedel.										

Table 14 Location of reference	plots used in local benchmark calculator.

Reference Plot	Easting	Northing
BR240 BM PLOT 1	343300	6718331
BR240 BM PLOT 2	342777	6717896
BR240 BM PLOT 3	342354	6716288



Figure 7.Tenterfield Woollybutt – Silvertop Stringybark open forest.



Figure 8. White Box grassy woodland.

References

Department of Environment and Climate Change NSW (DECC). 2009. *BioBanking Assessment Methodology and Credit Calculator Operational Manual*, DECC, Sydney South.

ELA (In Prep) Sapphire Wind Farm Ecological Assessment. . Eco Logical Australia, NSW.

Keith, D. 2004. Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT. NSW Department of Environment and Conservation, Hurstville.

Appendix A: Reference site field data sheets

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No. . 110_BM P

	:						
	Ref Site ID	170	Recorders	N. San it	Date]
		112		P. Ridads.		4 May 09	
I	GPS datum	G DA 942	Easting *	3× 2.6.10	Northing*	1-1-727	-71.
		1.474 94		34-34-49		671/56/	874m

* Record from Basting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version) NUB TDG BCP 110_BM Ancillary Code (Usually condition description) Benchmark (Usually condition description) Benchmark (Low or Mod-Good Habrial Pestures Molbus, ground logs, necks (Low or Mod-Good Process etc)					
Condition (Low or Mod-Good Mod-Good Habitat Features Molbus, ground logs, neks	(Create a standard short version)	NUB TDG	BCP 1	IO_BM	
Condition (Low or Mod-Good Mod-Good Habitat Features Molbus, ground logs, neks	Ancillary Code (Usually condition description)	Benchmark	·		
	Condition (Low or Mod-Good)		Trocks etcl 17	Molbus, a	ground logs, neks

· · · · · · · · · · · · · ·						
20m x	Number of <u>native</u>	Use species list over page				
20m 🤇 🖯	plant species	(full Id is <u>not</u> required)	Щ			
🖉 Quadrat 🔬		Write no. natives here:	1	•		
	Native over-storey	30, 10, 10, 20,2	5,20,10	0,20,30,35	2(0	2/ %
ું 50m ્ર	COVER (%)	ŕ			Sum / 10	~, %
Transect -	Native mid-storey .	-				<u>+</u>
10 Points	cover (%)	0			Sum / 10	0%
<u> Andre and Andre and</u>						
	Native ground	UN UN UN UN	# 14 11		Double score out	1.
	cover (hits/50 points)	<i>A</i>)) <i>F</i>	A		of 50 to get %	62-%
	- Grasses					ļ
50m	Native ground	1	`		Double score out	<u> </u>
Transect	cover (hits/50 points)				of 50 to get %	2 %
OU POINTS	-shribts	وريبار ودسيبوا ويوسيه ورومين وترتر				₽
	Native ground cover (hits/50 points)	The me man the	4 (/I)		Double score out	50 0
		· .			of 50 to get %	58 %
50m	Exotic plant cover	Overstory (10 points)	0		Sum / 10.	Sum exotio
Transect -	Sum exotic cover (%)					% cove
10 points 🕂	from	Midstorey (10 points)	0		Sum / 10	
50 points	(a) overstorey + (b) midstorey +		\mathcal{O}			
	(c) ground cover	Ground (50 points)			Double score	2- "
	Real Contraction of the second second	1		 .		
	Number of trees	9				
20m x	with hollows	1	-			
50m	1.4.15 (1.8.17) (1.1.17) 1.1.17 (1.1.17) 1.17 (1.1.17)		<u> </u>	····	r	
Quadrat	Total length fallen	210 m				
	logs 210cm width	-, • ~		• •		
	(ni) Over-storey	Species	<u> </u>	Regenerating (ie.	poplines)?	Proportion
	regeneration	Euc. creb.		· ·	aufutities):	roportion
Whole	I CANTEL MILLION	_		E. ciebra .	·	- 11
Veg. Zone		Euc. (aevo .	·	z. deal.		0.66
		Eu. deal .				
and the second						

dis 138 110 BM PG+1

	Natives (20m Quadrat)	Exotics (20m Quadrat)
1	E. crebra	Bidens pilosa
2	E. laeopiles	Mypo radic
3	E dealbata	Someting
4	Lespedia jucin	Nedicaço
5	Modelace milion	Tribolium
6	Tedicate australiz	
7	Eddoporon casp.	
8	Minolaena stip	
9	Pesm brach	CTICKAL
10	Dich repers	
11	Asperta cafeta	·····
12	Cleitattes sieber	
13	Geranin	
14	Calot3	,
15	Poa sieb	OF TICINAL
16	ambo refacts	
17		
18	Glycine sp. 1 Brachscie micocase	
19		, ·
20		
21		OFTIONAL
21	Hibb obt sitelia	
23		
23	Arishda ramosa	·····
24	Austradationia Veronica plebeia (coligle?)	
1 <u>. </u>		<u> </u>
26 27	Venonia cinerea	OPTIONAL
	Hypericus grannilen Operularia diphylla	
28	Operana oppylla	· · ·
. 29	Vittadulia	
30	Vittadukia	
31	Glycile sp 2 Aspenla confector Goodensia pric Monotoca	
<u> </u>	Aspenia conterta	CONTROL A
33	400 ally a parce	231 3 5 7 1 . TI
34	Preparto Ch	
35	Melichis medits	
36	Exocapis	
37	P H ind de	
38	Panian Bothriochba Brantlea	OFTIONAL
<u>39</u> 40	10/ Antura	TEL 2 EXFLUXE
40	Cypenis Chamaesyce	
41	Viola ketonicipalia	
	Viola Letonicipalia	_
43	Digesbecking	·
44	Sigesbeckia Desmodia varians Litraceae Arthopoetium	OFTIONAL
45	-Littaceae Arthoposition.	(J), TEXH'/A.
46	Galium	
47	<u> </u>	
48	· · · · · · · · · · · · · · · · · · ·	
49	· · · · · · · · · · · · · · · · · · ·	
50	· · · · · · · · · · · · · · · · · · ·	<u> </u>
51		OFTION M
52		<u> </u>

M Plot Modification Table: Plot Number 172-

10_BM Plat!

Madification Total		Code			·	NOTES	
Modification Type	┢		ue			^	
Firewood collection and tidying up		R	0	ИR		- 	
Grazing and trampling	1	¢	O	R			
Soil disturbance	0		1		·		
Canopy dieback	6						
Dense regrowth post- disturbance	Ø						
Weeds	1	R	0	R			
Timber harvesting	Į.Į	c	0	R			
Fire damage	0						
Flood damage	0)			·		
Storm damage	0	1					:
Feral herbivores	Ø	,	1	T			
Other indicative type	C						
Severity codes	Frequency codes		cy codes	Evidence codes	Age codes		
0 = No evidence				n/a (i.e. absent)		O = Observation	R = Recent (<3 years)
1 = Light		B =	R	аге		P = Personal communication	NR = Not recent
2 = Moderate		C =	= O	cca	sional		O = Old
3 = Severe		D = Frequent		uent	L		

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No.

110_BM P6+2

Ref Site ID	167	Recorders	PRINS	Date	4/5/09	
GPS damm	·	Easting *	343686	Northing*	6717 244	

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat 898

Vegetation Zone Identification Biometric Vegetation Type NUB, TOG. BeP. 10 ₿M (Create a standard short version) Ancillary Code (Usually condition description) BM (Usuany Condition (Low or Mod-Good) Habital Features Rocks logs hallows ßΜ

Charles and the second		·	
20m x	Number of native	Use species list over page	
20m	plant species	(full Id is <u>not</u> required)	:
Quadrat		Write no. natives here: 40	
50m Transect	Native over-storey cover (%)	15/15/15/15/20/20/30/30/15/25/ 2000 10	20%
10 Points	Native mid-storey (cover (%)		0%
	Native ground cover (hits/50 points) — Grasses	HT HT HT HT HT HT I Double score out of 50 to get %	64-%
50m Transect 50 Points	Native ground cover (hits/50 points) - shruhs	Double score out of 50 to get %	0%
	Native ground cover (hits/50 points) — other	Double score out of 50 to get %	30 %
50m Transcot	Exotic plant cover- Sum exotic cover (%)	Overstory (10 points) O Sum/10.	Sum exotic
10 points + 50 points	from (a) overstorey +	Midstorey (10 points) O Sum / 10	
	(b) midstorey + (c) ground cover	Ground (50 points) []] [] [] []	[16 *]
20m x 50m	Number of trees with hollows	5	• ~~~.
Quadrat	Total length fallen logs >10cm width (m)	234m	
	Over-storey		Proportion
Whole	regeneration	E deal bath 7	7.00
Veg Zone		E. Cebra N	3-3-
		E. Cebra N E. laeroprier N	0.33

dB 139.

lio BM Platz

. /	, ap 137.	
1	Natives (20m Quadrat)	Exotics (20m Quadrat) Hypochaering 1201. Balans port. Medicing 0. Petiocescian rent.
2	En. deal. " (arvo".	Reference in the
3	u crahia	M. dich & O
4	u crebra. Eve. modilis	Petroveria rent
5	Notelach	Legisling Sel
6		Lepidica p.1. Soucher Steran.
7	M	Tether at .
	R to a l	
- 9	interesta	Congra 20
10	(1) 0541 1 4	
11	Carlock	
12	Degradien bracky.	<u></u>
12	Bursen Bursen Hibbertin Wahilm Sigesback Desnedium branchy M graat	
13	Geranium her.	
15		03141407.41
16	Parico- c.p. 1 Buthio sp. 1	
17	Arstroduith, 3p-1	
. 18	Aristida ran.	
19		· · · · · · · · · · · · · · · · · · ·
20	Pictin p. 1 Pictin p. 1 Picture deb. A-p. co-f. Oxalis Cheilathan Reaction	
21	Plantago dab.	OPTIONAL
22	A-p. co-f.	
23	Oxalis	
24	Cheilather.	· · · ·
_ 25	Brockyreane micro	
26	Bracksynname micro' Eragiostis bransnii Dich rep Hyperican gran Bauces glach	
27	Dich 14p.	OTTONAL
28	Hyperican gran.	
. 29	Bauces glack.	
30	Cally inversor.	· · · · · · · · · · · · · · · · · · ·
. 31	Vernonia cin.	
.32	- */ , 	. · SPETONAL
33	Lymbo refr. Vieronica plet.	273 SATES 723
34		
36	Colocine gas	
37	Brandia of estars	
38	leepidere int	
39	Vielal grass. Pour sp. V	OPTIONAL
40	Lon, with	
41		
42	· · · · · · · · · · · · · · · · · · ·	
43	· · · · · · · · · · · · · · · · · · ·	
44	· · · · · · · · · · · · · · · · · · ·	
45		OPTIONAL .
46		
47	· · · · · · · · · · · · · · · · · · ·	
48		
49		
50	ne	
51		OPTIONAL
52		

M Plot Modification Table: Plot Number 167 40-BM Plot 2

Modification Type		Co	de			NOTES	
Firewood collection and tidying up	2	С	0	R			<u>.</u>
Grazing and trampling	l	C	0	R			
Soil disturbance	0						
Canopy dieback	c	1				,	
Dense regrowth post- disturbance	0						
Weeds	2	C	0	R			
Timber harvesting	0						
Fire damage	0						
Flood damage	0						
Storm damage	0						
Feral herbivores	0					· -	
Other indicative type							
Severity codes	J	re	que	enc	y codes	Evidence codes	Age codes
0 = No evidence	4	\ =	n/a	i (i.	e. absent)	O = Observation	R = Recent (<3 years)
1 = Light			Ra	~		P = Personal communication	NR = Not recent
2 = Moderate	+				sional		O = Old
3 = Severe] [) =) = Frequent				

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No.

Ref Site ID	166	Recorders	NS/PR .	Date	4/5/09
GPS datum	GD494	Easting *	343828	Northing*	6717284

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat, eler, 875 -

	Vegetation Zone Identification
Biometric Vegetation Type (Create a standard short version)	- OF, TOG, NUB. 110_BM.
Ancillary Code (Usually condition description)	BENCHMARK
Condition (Low or Mod-Good)	BM Habitat Features Logi, rocky, Lollaurs, stags

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	:
50m Transect –	Native over-storey cover (%)	$\frac{20}{20}$ $\frac{20}{20}$ $\frac{20}{15}$ $\frac{20}{20}$ $\frac{20}{30}$ $\frac{30}{30}$ $\frac{30}{30}$ sum	1/10 23-5%
10 Points	Native mid-storey cover (%)		n/10 <u>2</u> %
	Native ground cover (htts/50 points) Grasses	HAT HAT HAT HAT IIII Double seen of 50 to p	
50m Transect	Native ground cover (hits/50 points) shrubs	Double scor of 50 to g	
	Native ground cover (hits/50 points) — other	Double scor of 50 to g	
50m Transect	Exotic plant cover - Sum exotic cover (%)	Overstory (10 points) O Sum	1/10. Sum exotic \ged % cover
10 points +	from (a) overstorey ±	Midstorey (10 points) 🔿 Sum	
50 points	(b) midstorey 4(c) ground cover	Ground (50 points)	BCOTE /0 %
20m x	Number of tress with hollows	⁴⁴ III 8	
50m Quadrát	Total length fallen logs >10cm width (m);	220m	
e de la constante de la constan La constante de la constante de	Ovér-storey règeneration	Species Regenerating (ie. saplings)?	Proportion
Whole	ve Percentition.	E dealbata 7 E creba	
Veg Zone		E. laevopinea	

3

(10 BM Plat 3

	₁ vatives (20m Quadrat)	Exotics (20m Quadrat)
1	Eve creb.	Bidens .
2	a deal.	Thefolium repiers
3	" marine la prisea . 	Flifolium repiera Hypochaeris ind Molicago p
4	E, mettindara	Molicago . p.
5	Ar. inplexen,	
6	" form.	
7	Vacksonia Scop.	
8	Bich mier.	· · · · · · · · · · · · · · · · · · ·
	Echi-o caes	
10	Micro	·
11	Wahlangin .	·
12	Brachygene	
13	Brachysens	
14	To inch	
15	Porcethore.	OPITCAAL
16	theilather .	
17	Opere, diph.	· · · · · · · · · · · · · · · · · · ·
. 18	(Hycine -	· ·
19 20	Jesmading grane	· ·
20	Aycine Desmadi grani Fit Plantago debile Hibbertia obtas	OPTIONAL
21	HABELTIK ODTVS.	the later set
22	Happenson granniner . Darcas glachidiatus.	<i>и</i>
24	Sejec hecking aristolik.	<u></u>
25	Oraliz	
26	Veronich	<u> </u>
27	Sware some	GETTONAL
28	Lomandia go- confect.	
. 29	n west fi	
30	Aristide	· *
. 31	Geranium	
.32	Austrode thank you 1	
33	Bothiochlom	· OPTIONAI
34	Horag 1.	· · · · · · · · · · · · · · · · · · ·
35	Horag In Melichers	
36	Hardenbergin	
37		· · · ·
38	Gragiantiz sp. (prob. brownin)	· ·
39	Eugoclaiding Evchita app.	OFTIONAL
40	Polygala zp. Veronia come. Notolaea.	
41	Vernonia comen	· · · · · · · · · · · · · · · · · · ·
42	Notalaeh.	· · ·
43	Asporala onforta	
44		A - 25 17 11 2 - 22 1 4 -
45		OPTIONAL
46	· · ·	
47	·	
48		· · · · · · · · · · · · · · · · · · ·
49	· · · ·	
50	······································	2617772352.57
51		OPTION U.
52	· · · · · · · · · · · · · · · · · · ·	

M Plot Modification Table: Plot Number 166 40 BM Plot 3

	Code					NOTES	12 Î	٦
Modification Type	⊢.	Cộ	de _~					\dashv
Firewood collection and tidying up]	C	0	0				
Grazing and trampling	l	в	0	R				
Soil disturbance	0							
Canopy dieback	0						· (· · · · · · · · · · · · · · · · · ·	
Dense regrowth post- disturbance	0							
Weeds	ł	C	0	R				
Timber harvesting	1	В	0	0				
Fire damage	D							
Flood damage	0	1						
Storm damage	0			1		· ·		
Feral herbivores	0		1			· .		
Other Indicative type				ļ				
Severity codes		Fre	qu	en	cy codes	Evidence codes	Age codes	
0 = No evidence	_		-		.e. absent)	O = Observation	R = Recent (years)	<3
1 = Light		B =	R	аге		P = Personal communication	NR = Not recent	
2 = Moderate	\neg	C =	0	çca	asional		O = Old	
3 = Severe		D = Frequent				[[`]		

240 BM PLOFI

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

10 - JC (0.14-

T

Site Sheet No. Plot 1

Ref Site IL	LUL	Recorders	NS + LC	Date	7/5/0	7
GPS dation		Easting *	343300		6718	331
* Record fi	rom Easting and North	ing from the end of t	he 50m transect which	1 also has the 20m	quadrat	
	· ·					
Biometric?	Vegetation Type	1210		<u>Zone Identifi</u>	ication	
(Create a sta	indard short version)	<u>240</u>	BM			
	dition déscription)	BENCHMAN			• .	
Condition (Low or Mb	Sector	Mad-400	I Habitat Feating (focks etc)	lags +	Lallours	
				<u>,,,,,,</u> ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	0	
20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list ove (full Id is <u>not</u> requir Write no. natives he	red) //m			:
50m Transect –	Native over-storey cover (%)	10,10,40,40	0,30 0,40,40,30,	20 260) Sum / 10	26 %
10 Points	Native mid-storey cover (%)	· · · · · · · · · · · · · · · · · · ·		┑╕╴┶═╱┵┙╧═╽╴┑╕╼═ _{╋┹┍┍} ┍╸┥┫	-**	0%
	Native ground cover (hits/50 points) —Grasses *	141 14 - 4114	H- WAT SHIT IN	(3)	Double score out of 50 to get %	66 %
50m Transect	Native ground cover (hits/50 points) - shrubs			÷	Double score out of 50 to get %	0%
	Native ground cover (hits/50 points) - other		· · ·	٩	Double score out of 50 to get %	6 %
50m N Transect -	Exotic plant cover - Sum exotic cover (%)	Overstory (10 poin	nts)		• Sum / 10.	Sum exotic % cover
10 points P 50 points	from (a) overstorey +;	Midstorey (10 poi Ground (50 points		۵۳۵۰۰۵۵۵۰۰۰۰ ویکی میرونی که میرونی می	🔊 Sam / 10	6 %
	(c) ground cover	Ciona (50 batte	») 		Double score	
20m x 30m	Number of trees with hollows	3	-			
Quadret	Total length fallen logs >10cm width (m)	144				`
	Over-storey regeneration	Species	Re	generating (ie. sag	olings)? F	roportion
Whole Veg. Zone		E. alberts A. ftari				1,0

	Natives (20m Quadrat)	Exotics (20m Quadrat)
$\begin{bmatrix} 1 \end{bmatrix}$	E-alban.	Exotics (20m Quadrat) Rosa India Varband India Trifolium Camp r
2	Therefore .	Varband ligida ;
3	Plantago deb.	Trifolin Camp .
4	Ac. demai	Ridens pit.
5	Mentha disnenica.	
6	Swainsona galegijalia.	
7	Viala bet	
8	Dichelorthe mice.	
9	Both unica.	STREETCH.
10	belyoing class.	
11	Park sieb	
12	Sorgham leion	
12	Jorghum levor	
	Dich. sp. A. Veranica calg	-+
14	Caree inv.	OTTODAL.
15		· / s 2 / s
16	Oxalis per.	
17	Wahlenborgin.	
. 18	Euchita q.	
19	Dimella rev. var. Ven.	
20	Sipolion op	(%3 ⁻ 5 ⁻)(3-5 ⁺), 2-5
21	Pim. cotv.	OPTIONAL
22	Hydroest. Inx.	
23	Colycine taka.	·
24	Alistida lopto.	
. 25	Geranica	
26	Acaeman ovina	
27	Ferenia que al.	OPTIONAL
28	Chalm \$5900 50.	
. 29.	Ajuga Caust.	
30	Chalmasgel =p. Ajuga ant. Dienella long.	λτ
. 31	Desm Brachy.	<u></u>
32	Notelaca n'aro.	
33	Poly japon.	<u>, e stratstocht</u>
34	Senerio hisp	· · ·
35	Cyroglassium "op"	
36	Charles laws.	
37	Enggiain levis	
38	Cymbo ref.	
39	Lora melt;	OFTIONAL
~ 40	Ang. flori	
41		
42	· · · · · · · · · · · · · · · · · · ·	
43	·	_
44		·
45		OPTIONAL .
46		
47		
48		· · · · · · · · · · · · · · · · · · ·
49		
50		
51	<u> </u>	OFTION VE
52		

M Plot Modification Table: Plot Number 202

Plat (2

		\sim	
245_	RM	-)	
24Q_	(2.)	<i>م</i> م	ſ

Modification Type	Τ	Co	de		<u> </u>	NOTES	i			
Firewood collection	\vdash			[-]						
Firewood conection and tidying up	0									
Rue - 7 -	ľ									
Grazing and trampling	-									
Grazing and many-	0									
Soil disturbance				-						
Solit close	0									
Canopy dieback			[]
020000	O									
Dense regrowth post-		["								
disturbance	Ø			1						
Weeds				1						
	11	K	ø	K,						
	⊥_			<u> </u>	~					
Timber harvesting		_								
	2	C	0	r/A	4					
	÷			₋						
Fire damage			1							
	ම									1
	_		╞	┢						
Flood damage										
	P	ļ								
	_	-		-		·				
Storm damage				1						
	Ø									
	+	┝╌	\vdash	\vdash					<u> </u>	
Feral herbivores						· .				
	p					۰.				
Other indicative type	+-~	-		\vdash						
Other moleauve ope	0									
	ÌF	re	, au	enc	y codes	Evidence codes		Age cod	des	`
Severity codes	_+_		·		e. absent)	O = Observation		<u> </u>	Recent	(<3
0 ≠ No evidence	'	•		- 1'-	o. aboutly		.	years)		1 7
	Ē	3 =	Ra	ire		P = Personal commun	ication	NR = No	at recent	
1 = Light					sional			O = Old		
2 = Moderate	\rightarrow	~~			ient	•				
3 = Severe				~4						· ·

240 BM PLFL

Eco Logical A	Australia -	Biobank	plot	data	sheet
Start a new sheet for each n	lot				

Site Sheet No. Plot 2

•	Ref Site ID	Recorders	NS/PR	Date	6/5/09
	GPS datum	Easting *	342777	Northing*	6717896

* Record from Basting and Northing from the end of the 50m transect which also has the 20m quadrat

100 - 02.93 Photo:

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version)	240	BM
Ancillary Code (Usually condition description)	BM	
Condition (Low or Mod-Good)	, . , .	Habitat Features hollows, good finder

20m x 20m Quadrat	Number of <u>native</u> plant species	Use sp (full Id Write r	is <u>not</u>	requi	red) -	ê		4	7	<u> </u>		:	
50m Transect	Native over-storey cover (%)	20.20	30	15	10	15	<u>2</u> 5	20	15	{D	Sum / 10	18	%
10 Points	Native mid-storey cover (%)	° (0	o	0	20	25	15	10	20	Sum / 10	9	%
	Native ground cover (hits/50 points) Grasses		łJ	Ψr.	HH	ЩH	HŊ	1			Double score out of 50 to get %	62	%
50m Transect – 50 Points	Native ground cover (hits/50 points) fhnibs	tive ground Double yer (hits/50 points) of 5											%
	Native ground cover (hits/50 points) + other	ЦН.	Цнr IIII									18	%
50m Transeot	Exotic plant cover 5	Overst	жу (1	0 poi	ints)	Õ					Sum / 10.	Sum ex	
$10 \mathrm{points} \oplus$	from (a) overstorey +	Midsu	rey (I	l0 po:	ints)	Sum / 10							
50 points	(b) midstorey + (c) ground cover.	Groun	Ground (50 points))								Double score	6	%
20m x 50m	Nimber of trees with hollows	2											
Quadran	Total length fallen logs >10cm width (m)	58	m			_		-	•				
2000 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 10 - 100	Over-storey regeneration	Specie D					·		Rege	nerat	ing (ie. saplings)?	Proporti	ion
Whole Veg. Zone		E: A: E:	flor Plor ma	ers bri	da hyr	ЛG					1 Y Y	1	

	Natives (20m Quadrat)	Exotics (20m Quadrat)
	E albers	Biders
$\frac{1}{2}$	Strates in advides	Pion's hierario isles
3	10 sa de c vi pro	Therecism
4	Kibbert & obtisit.	the pocheris
5	Vittadinia	compa
6	VINTAGUNIA	Helistropium
7	Wallerbreik	Viua
8	Did rejers	Medic
9	Brachyscone microcarpa Arstida	Euchitan 100 M.
10	Poa	
11	Avstastpa	· · · · · · · · · · · · · · · · · · ·
12	Gerannin sp.	
13	Glycile sp 2	
14	Lots astratis	
15	Scleranthos	
16	Swailsona	
17	Didathin cerem	
. 18	Bothrodloa mara	
19	Editopigon	
20	Acaera	
21	Viola betonnibin	GPTEONAL
22	Pullesoner vetusa	
23	Rtodatte leveschysum	
24	Culture presono	
25	E. macuorhynella	
26	Notelaca mimocryo	
27		
28	Angoptan (tertinden Acarita deaner	
. 29	Pineles antifon	
30	Metho plebeix	······································
31		
32	Varonica plebera Calotis	
33	Vardin / pressera	OPTIONAL
34	Cynboroty landowning	· · · ·
	Muchan is prost- news	
35	Carep mesa	
36	Kydocolyle Lomada millifka	· · · · · · · · · · · · · · · · · · ·
37	The back of the second se	
38	Didetache minuta	OPTIONAL
39	Dickelsche minnen Oleanin ellipplich Desmodilin sunnii Desm brinchypochum Diarella caevlun	
40	Degnodia gunii	
41	BRSM principle poconing	
42	Diarella caevia	
43	Lagenifia Eingdig	
44	Espadia	OFTIONAL
45	Ghaie sp. 2. Dillingnia Thanedh	<u> </u>
46	Dillognia	·
47	Thomadh	
48		_
49		
50		
51		OTIONAL
52		·

M Plot Modification Table: Plot Nun

Code

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0

BONR

1 COM

· · · · · ·

.

Modification Type

Grazing and trampling

Firewood collection

and tidying up

Soil disturbance

mber_ <u>196</u>	P6+2	(240_BM
	NOTES	·
	.	
	<u></u>	<u></u>

Canopy dieback	0						
Dense regrowth post- disturbance	0						
Weeds	1	C	0	R			
Timber harvesting	l	B	0	WR		,	~
Fire damage	0						
Flood damage	0	'					
Storm damage	0)		<u> </u>			
Feral herbívores	0	'i				· · ·	
Other indicative type		ļ	┼╌╴ ╿				
Severity codes	'	Fre	up:	ierit	⊥ cy codes	Evídence codes	Age codes
0 = No evidence			<u> </u>		.e. absent)	O = Observation	R = Recent (<3 years)
	1	B =	R	are		P = Personal communication	NR = Not recent
2 = Moderate	-	С=	Ō	cca	sional	·····	O = Old
3 = Severe		D۶	F	requ	uent		

240 BM Plots

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No. Plot 3

Ref Site ID	195	Recorders	NS PR	Daite	615/09
GPS datum	·	Easting *	342-354	Northing*	6716284

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification **Biometric Vegetation Type** ßм 240 (Create a standard short version Ancillary Code Ø. ., e i Ben (Usually condition description) Condition 🦉 Habitat Features (rocks etc) BM logs, hallows, 5 -**প**-^ (Low or Mod-Good)

Successive and the second	101711 13 St. 101741		
20m x	Number of <u>native</u>	Use species list over page	
20m	plant species	(full ld is <u>not</u> required) 33	1
Quadrat	an an air an	Write no. natives here:	
50m	Native over-storey cover (%)	20, 30, 40, 40, 30, 30, 15, 5, 20, 20 50, 40, 40, 10, 20, 20, 20, 20, 20, 20, Sum/10	25%
Transect – 10 Points	Native mid-storey cover (%)	Sum / 10	%
	Native ground cover (hits/50 points) - Grasses	147 141 141 141 141 111 38 Double score out of 50 to get %	76 %
50m Transect – 50 Points	Native ground cover (hits/50 points) shrubs	11/ (3) Double score out of 50 to get %	6 %
	Native ground cover (hits/50 points) 	Double score out of 50 to get %	14 %
50m Transect –	Exotic plant cover Sum exotic cover (%)	Overstory (10 points) $ Sum/10. $	Sum exotic % cover
. 10 points + 50 points	from (a) overstorey +	Midstorey (10 points) \circ $_{Sum / 10}$	2
	(b) midstorey + (c) ground cover	Ground (50 points) / Double score	2 %
20m x 50m	Number of trees with hollows	2	
Quadrat	Total length fallen logs>10cm width (m)	24 M	
	Over-storey	Species Regenerating (ie. saplings)? P	roportion
Whole	regeneration	6, alberts	1/1
Veg. Zone			D.

	Natives (20m Quadrat)	Exotics (20m Quadrat)
1	E. albert	Medicaco
$\frac{1}{2}$		Losm Publiq.
3	An dearan	Souther at.
4		
4	Aughostipa scat.	· · · · · · · · · · · · · · · · · · ·
6		
7	C I rol	
8	Kicherth. serie -	
9	Claitenther sieher	
10	Aristiala ran	
11	Rohn joyifolion	
12	Chipris vartice.	
12	Both i schlog	
14	11. hts berie	
14	De us object	(MPTCINA)
15	A la de the	
L	Autodinte	
17	Oralis per.	
. 18		
19		
20	Andronobyla	OTTONAL.
21	Praha	
22		
23	Reacona	
24	Geraniu	
25	Remode aust.	
26		OPTIONAL
27	Aspenda confi	
28	Sparkotton rolla juncea.	····
. 29	Leucophysum (?)	
30		
. 31	Carex in	
- 32		(9) EL(9) (4)
33	Rostellolaria	
34		
35	·	
36		
37	······································	
38		OFTIONAL
<u>39</u> 40	<u> </u>	
40	· · · · · · · · · · · · · · · · · · ·	
41 42	·	
42		
43		
44		OFTIONAL
45		· · · · · · · · · · · · · · · · · · ·
47		
48		
49		
50	· · · · · · · · · · · · · · · · · · ·	OUTSON M.
51	· · · · · · · · · · · · · · · · · · ·	
52		

M Plot Modification Table: Plot Number (15) (240 - 8M)

6(5/09 Plot 3,

	т—-	Ē.	ebc		[NOTES	
Modification Type	_−	<u>~</u>	T	Γ-			
Firewood collection and tidying up	0						
and hajing ap	10						
Grazing and trampling	╀╌	╞──	┼─	┢──			
Crazing and ramping	Ø	ľ					
				Ľ_			
Soil disturbance	┢╴		1				
	0						
		L_	╞	<u> </u> _	<u> </u>		
Canopy dieback				[
	0						
	╞	–	╞╌	–			
Dense regrowth post- disturbance							
()sturbance	Ø						
	┾╌	┼─	┝╴	┼─╴			
Weeds	1	R	0	R			
	ľ						
 Timber harvesting	┼╌	┢╴	†-				
	1	0	0	hR			
	<u>'</u>		L_	L-		,,	<u>.</u>
Fire damage	1-	Ī					
	0						
	┣-	╞	_	┢─		,,,,,	
Flood damage							
	Ø						
	╞	╞╌	┝	╞─			π
Storm damage	0						
	ľ						
Feral herbivores	+-	┢─	┢╴	1-			
	0						
			L	L	L	·	
Other indicative type	Γ	Γ_					
	Ô						
	╞	<u> </u>	1		<u> </u>	Evidence codes	Age codes
Severity codes		Fre	que	enc	y codes	O = Observation	R = Recent (<3
0 = No evidence		4 =	n/a	a (J.	e, absent)		years)
ļ	+,	3=	Re			P = Personal communication	NR = Not recent
1 = Light	╞			 Ca	sional		Q = Old
2 = Moderate					ient	· · ·	
3 = Severe	ļ	≡ ر	F ¹⁰			L	J

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Shept No. 153_BM Alot 1

Date Ref Site ID Recorders /VS + ∠C)9 204 4A Έ. Notthing* GPS datum Easting * 74 8 932 Ð 0. ι,

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version)	153	BM			
Ancillary Code (Usually condition description)	BENE	HHARK			
Condition (Low at Mod-Good)			Habitat Features	CREEK IN VI	SEARTY .

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	:
50m	Native over-storey cover (%)	20,40,30,20,5,20,0,0,10,40 (85) Sum/10	18.5%
Transect – 10 Points	Native mid-storey cover (%)	Sum / 10	0%
	Native ground cover (hits/50 points) Grasses	UN UN UN UN UN UN UN MAN (46) Double score out of 50 to get %	80 %
50m Transect 50 Points	Native ground cover (hits/50 points) - shrubs	(111) (Bouble score out (Saplings of Ang. floring) (Bouble score out of 50 to get %	8%
	Native ground cover (hits/50 points) other	UNIT III Double score out of 50 to get %	16 %
50m Transect –	Brotic plant cover { Sum exotic cover (%)	Overstory (10 points) Sam/10.	Sum exotic % cover
10 points ÷ 50 points	from (a) overstorey (f (b) midstorey (f	Midstorey (10 points)	8 %
	(c) ground cover :	Ground (50 points) //// Double score	
20m x 50m	Number of trees with hollows	0	
Quadrat	Total length fallen logs >10cm width (m)	146	
· · · · · · · · · · · · · · · · · · ·	Over-storey regeneration	Speeces	roportion
Whole Veg. Zone		G. V Ar flass	

153 BM Plot 1

	Natives (20m Quadrat)	Exotics (20m Quadrat)
1		Pictis p.
2	A. Mari	Rosa inbig.
3	tes jone	Trif. comp.
4		Luny 2m
5	Hip. Conf. Bar siel	Hyper.com perf.
6	Acesa ovin.	Consider Volgare
7	Sorghen laisel	Pagp. d.l.
8	Vala bartania.	Hypo 10,0 -
9	Austrada Sh. raca.	CH ANTANA A
-10	Riccosorus glob.	
11	Barers glock .	
12	Planterso deb.	
13	Buch ton SP.	
14	Such some gales.	
15	Parices queens	DYRDAAL
16	Sence. guad.	
17	Wahlen, com.	· · · · · · · · · · · · · · · · · · ·
18	Bralis pet.	·
19	Ajuga awyt,	
20	Gertin of .	
21	Microsaus lancalatur.	OPTEONAL
22	Pin cord.	
23	Dien rev.	
24	Both maria	
25	Miclo, stip	
26	Server sp. E	() () () () () () () () () ()
27	Imperata	OFTIONAL
- 28	Rubus parv,	
. 29	Dian long	·
30	Coley inv.	<u> </u>
. 31	Themeda aust	
.32	ghemeda aust. Dich el. mich.	20002782041-1-7
33	Reader that	· OPPRONAL
34	Plyllathors viva	
35	Def brachy	
36	Sclara those	<u></u>
37	Cyroglassum sp.	
38	Sipadin 30.	OFTIONAL
39		5PL 1 EC/15/2/L-
40_		
41	· · · · · · · · · · · · · · · · · · ·	
42		
43		
44		OFTIONAL .
45		
46		
47		
48		
49		_ <u></u>
50		OPTION L.
51		1.5% 645.01* ER.
52		<u></u>

M Plot Modification Table: Plot Number 204

153_BM PL+1

Modification Type		Co	de			NOTES	··· /,
Firewood collection and tidying up	O						
Grazing and trampling	0						
Soil disturbance	0						
Canopy dieback	O					·	
Dense regrowth post- disturbance	0						
Weeds	1	ß	0	R			
Timber harvesting	0						
Fire damage	0						
Flood damage	ø						
Storm damage	0						*
Feral herbivores	ø					· · . ,	
Other indicative type	0				-		
Severity codes	F	rę	qu	eno	cy codes	Evidence codes	Age codes
0 = No evidence	_				e. absent)	O = Observation	R = Recent (<3 years)
1 = Light	—	·	Ra			P = Personal communication	NR = Not recent
2 = Moderate	—				sional		O = Old
3 = Severe	[D = Frequent		uent	<u>.</u>		

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Ref Site ID	205	Recorders	NSALC .	Date	7/5/09
GPS datum	·	Easting *	345182	Northing*	6718891

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version)	153	BM		
Ancillary Code (Usually condition description)			•	-
Condition (Low or Mod-Good)	ВM	Habitat Featores (focks etc)	· · · · ·	

20m x 20m Quadrat	Number of <u>native</u> applant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	31				:	
50m	Native over storey obver (%)	20/30/20	10 20	0/10/0/m	b/o^{s}	um / 10	12	%
Transect	Native mid-storey cover (%)	· · · · · · · · · · · · · · · · · · ·			S	um / 10		%
	Native ground cover (hits/50 points) - Grasses	MX MX THL THL	TH MI		Double s of 50 t	core out 10 get %	6Z	%
50m Transect – 50 Points	Native ground cover (hits/50 points) shrubs	NH.			Double so of 50 t	core out 12 get %	10	%
	Native ground cover (hits/50 points) other	· .	· .		Doub <u>it</u> so of 50 t	vore out v get %	_	%
50m	Exotic plant cover - Sum exotic cover (%)	Overstory (10 points)			Si	um:/10.	Sum ex % c	otic over
Transect - 10 points F	from .	Midstorey (10 points)			Su	um / 10		
50 points,	(a) overstorey + (b) midstorey + (c) ground cover	Ground (50 points)			Davi	ble sective	2	%
20m x	Number of trees with hollows	1	 . ·					
50m Quadret	Total length fallen logs >10cm width (m)	314						
	Over-storey regeneration	Species Ecc vin/melle	al blat	Regenerating (ie. s	saplings)?	Р	roporti	ion
Whole Veg, Zone	A CONTRACTOR	Ang. flow.	7 8194-			4	2/4	2

	Natives (20m Quadrat)	Exotics (20m Quadrat)
1	Ever viburalis	Rosa rubinnes
2	E. melliadur	Pasaclum dilatation
3	E. Gahelyi	TRIAXACIÓN officinale
· · ·	Ancochara Spribunds	Hypelianis radicato
4		Cholum vulgare
5	Lesjedeza jucer	
6	Sorghan Leiocladum	
7	1 Print Parts y Carl	
8	Austrodentionia	
9	Mantaco debilis	
10	Senecio quadridentato	
11	Both wochlog a com	
12		· · · · · · · · · · · · · · · · · · ·
13	log sieberigns	, <u> </u>
14	Prais preunand	111111111111
15		
16	Glycine tolaicho	
17	Puchospilus alobosus	
. 18	Acaenia oring	
19	Waldenbergin communis	
20		OPTIONAL
21	Gersnivan solandei	
22	Erchiton sp.	
23	Sanjeum Gittore	
24		
25	Viruella cardes	
26	Brichycome sportitiva	OTTOLAL
27		
28	Aspecta conterts	
. 29	Myllauthus visaatus	
30	NOI TOMAKINA	······································
. 31	Elymus scaber	
32	· · · · · · · · · · · · · · · · · · ·	. OPTIONAL
	· · · · · · · · · · · · · · · · · · ·	
34	· · · · · · · · · · · · · · · · · · ·	
35		· · ·
36	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·
37	<u> </u>	
38	· · · · · · · · · · · · · · · · · · ·	OTTONAL
39		
40	· · · · · · · · · · · · · · · · · · ·	
41		
42		
43	+	
44		OTTONAL
45		
46		
47	· · · · · · · · · · · · · · · · · · ·	
48	· · · · · · · · · · · · · · · · · · ·	
49		l
50		GETTION VI
50 51 52		OPTION VI.
M Plot Modification Table: Plot Number wl_205

153_BM Plot 2

Modification Type	Γ	Co	de			NOTES	
manufaction	\square						
and tidying up		R	Ŋ	M	٤		
Grazing and trampling	P						
Soil disturbance	Ø						: -
Canopy dieback	Ø						
Dense regrowth post- disturbance	Ø				~		
Weeds]	R	0	Ł			
Timber harvesting	1	12	0	Ŋ			
Fire damage	Q						
Flood damage	Ŋ						
Storm damage	Ŋ						1
Feral herbivores	Ø					* -	
Other Indicative type	I						
Severity codes	1	Fre	qu	ena	y codes	Evidence codes	Age codes
0 = No evidence	-+				e. absent)	O ≂ Observation	R = Recent (<3 years)
1 = Light		B =	Ra	ire	-	P = Personal communication	NR = Not recent
2 = Moderate		¢ =	0	ca	sional		O = Old
3 = Severe		D =	Fr	equ	Jent	 	

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

3

Ref Site ID	41203	Recorders	NS+LC.	Date	7/5/09
GPS damm		Easting *	343564	Northing*	6718406

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version)	153 BM	
Ancillary Code (Usually condition description)	BENCHMARK.	·
Condition (Low or Mod-Good)	Habitat Features dup gully mearby	
	Legs, stags, hollows	

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	•		;
50m	Native over-storey cover (%)	30, 20, 10, 25, 30, 20, 0	1 ^{1a} , 40, 50, 2 185 2	(S Sum / 10	21.5%
Transect – 10 Points	Native mid-storey cover (%)			Sum/10	Ø %
	Native ground cover (hits/50 points) Grasses	M HT HT HT HT HT HT MI	6	Double score out of 50 to get %	72 %
50m Transect 50 Points	Native ground cover (hits/50 points) - strubs	7.	· 🕖	Double score out of 50 to get %	2%
	Native ground cover (htts/50 points) ether		٢	Double score out of 50 to get %	16 %
50m Transect 10 points +- 50 points	Exotic plant cover Sum exotic cover (%) from	Overstory (10 points)		 Sum / 10. Sum / 10 	Sum exotic % cover
	(a) overstorey + (b) midstorey + (c) ground cover	Ground (50 points)	······································	O Double score	%
20m x 50m Quadrat	Number of frees with hollows	4	· · · · · · · · · · · · · · · · · · ·		
	Total length fallen Togs >10 om width (m)	(33 m	•		
Whole Veg. Zone	Over-storey regeneration	Species	Regenerating (ie. s	saplings)? P	roportion 2/2
		E-vin A. flasi			Ó

153 BM Plot 3

	153 BM Plat 3	
	U = ,	Exotics (20m Quadrat)
	Natives (20m Quadrat)	Karg rubichas
1	Eve vinigalis	Pioris heirenal Hypo road
2	Acacia implexa Notelaca mico coma vo. mico. Villuynia sieberi Sun non galegitalia	Hupo road
3	Notelaca mico cape vor micon	
_4	Villeynia Sicochi	
5	Survissona galestation	
_ 6		
7	1664.149 70013-00	
8	bolk nac. " biloba (V)	ATTEON VI.
9	Des varias.	
10	Des Variation	
11	Pirro corr.	
12	Calex int.	
13	Springer	
<u>14</u> 15	Senel June	OTHONAL.
15	Senec quad Dicharthe series Nightie carcolar	
10	Ngt + A	· .
<u> </u>	Distanting A. Glucine clast	
18	Oraclia rev:	
19 20	Charles incla	
20	Lespedoza juncea - Erem. deb.	OPTIONAL
22	Green SP	· · · · · · · · · · · · · · · · · · ·
$-\frac{22}{23}$	a cuber.	
23	Acaena avine .	
24	Aracia	
26	Alist. pers	·
20	Sughren leidel.	OTTIONAL
28	Lamoneulus rap.	
. 29	Ang. flori	
30	Plant dab	, , ,
31	Oxactis pal.	
32	Wahlen grace.	A STATE OF A DECK
33	Wahlen grace. Runex Brausic	(YPTIONAL
34	Glycine tout.	
35	Dia long	
36	Therion anyt. (V)	
37	Vitt. cm-	
38	Buchiton spi	CARTICE I
39		OPTIONAL
40		
41		· · · · · · · · · · · · · · · · · · ·
42		· · · · · · · · · · · · · · · ·
43	· · · · · · · · · · · · · · · · · · ·	
44	··	OPTIONAL .
45		UL ELOI-ML.
46	·	
47		
48		````````````````````````````
49		
50		OPTION U.
51		
52	· · · · · · · · · · · · · · · · · · ·	· · · · · · · · · · · · · · · · · · ·

M Plot Modification Table: Plot Number $2\sigma3$

153_BM 964 3.

Code						NOTES	
Modification Type		-		-			
Firewood collection and tidying up	Ø						
Grazing and trampling	0		1				
Soil disturbance	8						
Canopy dieback	0						
Dense regrowth post- disturbance	ō						
Weeds	1	F	6	R			
Timber harvesting	Ø			 			
Fire damage	0			. 			
Flood damage	0						
Storm damage	Ø					,	
Ferai herbivores	0				· ·	· · ·	
Other indicative type	C	2					
Severity codes					cy codes	Evidence codes	Age codes
0 = No evidence		A =	= n/	′a (i	.e. absent)	O = Observation	R = Recent (<3 years)
1 = Light				are		P = Personal communication	
2 = Moderate		C =	= 0	icca	sional	·	0 = Oid .
3 = Severe		D = Frequent		uent			

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No.

Plat 1

Recorders 223 Date Ref Site ID NS/LC 17 Easting * Northing* GPS datum * Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat Vegetation Zone Identification Biometric Vegetation Type 4. Blakeije (Create a standard short version) Ancillary Code 114_BM (Usually condition description) Habitat Féatures Condition Stags, (Low or Mod-Good) Use species list over page Number of native 2**0m x*** 36 (full Id is not required) plant species 20m -Write no. natives here: Quadrat: iê. Native over-storey 30,20,10,40,20,30 30,20,15 245 24.5% cover (%) Sum / 10 50m () Transect -20,10,10,20 Native mid-storey 10 Points 60 covet (%) 6% Som / 10 Native ground M M M M M 0.14 Double score out = 2.5 585 cover (hits/50 points) 56 % of 50 to get % Grasses \tilde{T} m 50m , Native ground Ð Double score out Ŧ cover (hts/50 points) K Transect -% of 50 to get % 50 Points shrdbs 🔆 Native ground WH YHT 11 Double score out cover (hits/50 points) 24 % of 50 to get % – õther Ser S Exotic plant cover = Overstory (10 points) Sum exotic 30m: 5 Sum / 10. Sum exotic cover (%) % cover Transect from (a) overstorey + Midstorey (10 points) 10 points + Sum / 10 50 points % (b) midstorey + Ground (50 points) Double score (c) ground cover. Number of trees 87 g 6 with hollows 20m x 50m. Total length fallen 266 Quadrat. logs >10cm width <u>(d) ()</u> Species Over-storey Regenerating (ie. saplings)? Proportion E. blake regeneration E. suppli Whole : (.0 Veg. Zone E. backs. E. ciebra Ang. flari

dB. 114 BM Plot 1

		Exotics (20m Quadrat)
	Natives (20m Quadrat)	Bidens Allasy
1	Eve- Wahy	Compa bonarias
2	E. subtillibe	- Compan de an
3	E, banksli	
4	B. Crebra	
5	Ansonhorn Floribudg	
6	Leptonerman brennes	
7	Lissanthe Stripess	
8	Calotis cinctolia	
9	Givine dandating	121 (122) (1
10	Asistida reponata	
11	A stpdauthonia sp	
12	Wahlenberging commit	
13	Echynorosen caerpitosus	
14	Manella revolutar	· · · · · · · · · · · · · · · · · · ·
15	Loangudo Multitlog	OTTORAL.
16	(vintonotis (autoiniam)	
17	Pichelachine micraitha	
18	CATAN inversa	<u>·</u> · _ · _ · _ · _ · _ · _ · _ · _ · _ ·
19	Goodenis belliditation	
20	Country of card a	
21	Contendra longitolia	OTTIONAL
22	Vernoni- cineres	<u>^</u>
23	Opercularis espera	
24	Vesnedera increa	
25	Souces Allida	
26	Theneda artiglis	OFTONAL
27	Eragnetis Teptostachys	
28	TUNCES USITATUS	·
. 29	Acra- uticatolia	
30	Poa sieberiary	
. 31	Ajuga autralis	
32	Fruitrity US dichotons	CHPTEDRAT
33	Microlong Stippides	
34	lesmodium quinnil	
35	Millighno Sicedatus	
36	Vittadicio unerta	
37		
38		OPTIONAL
39		
40		
41		
42		
43	· · · · · · · · · · · · · · · · · · ·	· · · ·
44	· · · · · · · · · · · · · · · · · · ·	OPTIONAL
45	· _	
46		
47	<u> </u>	· · · · · · · · · · · · · · · · · · ·
48		
49		
50		OFTIONAL
51		

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	Code					NOTES				
Modification Type	<u> </u>	Co T	1 1							_
Firewood collection and tidying up	1	R	0	ß						
Grazing and trampling	0									
Soil disturbance	D									
Canopy dieback	D									
Dense regrowth post- disturbance	D									
Weeds	1	R	0	A		,				
Timber harvesting	1	0	0	Ø						
Fire damage	0				l	.				
Fibod damage	D									>
Storm damage	0				 					
Feral herbivores	0					· .		n—		
Other indicative type						Evidence	podec	Age cod		
Severity codes		Fre	qu	en	cy codes	O = Obser			Recent	(<3
0 = No evidence		A = n/a (i.e. absent)			~~~~~~	vears)				
1 = Light				are		P = Perso	nal communication	O = Old	n recent	
2 = Moderate					isional	ļ				
3 = Severe	-†-	D = Frequent		l		L	······			

Eco Logical Australia - Biobank plot data sheet

Site Sheet No.

THE BOT PLOT 2

Start a new sheet for each plot

Date Ref Site ID Recorders 9 LC M Northing* GPS datum 3 Easting * 54 500 6 Z0 07

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

 Vegetation Zone Identification

 Biometric Vegetation Type
 1/4 Blaholy R. G. / Rogh baket type

 (Create a standard short version)
 1/4 Blaholy R. G. / Rogh baket type

 Ancillary Code
 1/4 Blaholy R. G. / Rogh baket type

 (Usually condition description)
 1/4 Blaholy R. G. / Rogh baket type

 Condition
 1/4 BM

 Condition
 Habitat Features

 (Low or Mod-Good)
 BM

 BM
 Tools croit

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full 1d is not required) Write no. natives here:	
50m	Native over-storey cover (%)	40,30,20,40,20,20,30,40,40,20 300 Sum/10	<u></u> 30 %
Transect – 10 Points	Native mid-storey . cover (%)	Sum / 10	%
	Native ground cover (hits/50 points) - Grasses	Double scare out of S0 to get %	24 %
50m Transect 50 Points	Native ground cover (htts/50 points) —shrubs	Image: With the second	4 %
	Native ground cover (hits/50 points) 	UM 11) Double score out of 50 to get %	16 %
50m Transect	Exotic plant cover. Sum exotic cover (%)	Overstory (10 points) Sum / 10.	Sum exotic % cover
10 points 4	from s (a) overstorey ±	Midstorey (10 points) Sum / 10	ろ
50 points,	(b) inidstorey + (c) ground cover.	Ground (50 points)	0%
20m x 50m	Number of trees with hollows	4	· · ·
Quadrar	Total length fallen logs >10cm width (m)	125 m	
	Over-storey	Species Regenerating (ie. saplings)? P	roportion
Whole Veg. Zone	regeneration	E. well Ang. flari Ear. Sind.	6.0

	dB. 114 BM Plot 2	
	Natives (20m Quadrat)	Exotics (20m Quadrat)
1	Eve. blakely;	
2	EUC. MChipaus	
3	Euc- Bay Will	
4	Angorhors floribudg	
5	Melichas urceolarus	
6	Calgers Cappulaces	
7	Echinogogo crespitors	
8	Vichelate hicrantes	
9	Australithanis	
11	Walifer 6 283 > continis	
12	Hungicup archingup	
13	Oralls .	
14	figuelly rev.	
15	Hadenbergi violace	OPICOAL.
16	Onercularia espera	
17	Ussanthe strigger	·
. 18	Comax unbeliate	
19	Thenedo antralis	
20	Combospoon refracts	OPTIONAL
21	Verhaus cineres	3>1 3 13.6 × 132
22	Ma Cymbonotus / Gusonichy	
23	Carene inversa. Limbustilis dichotema	
24	The state of the state	
25	Hal crueis baterputulla	A
27	Aiuco autivalis	GITERIAL
28	Michlaene stippides	
. 29	Indigotar astrolis	
30	Aditida Vasan	· · · · · · · · · · · · · · · · · · ·
. 31	Glycine	· · · · · · · · · · · · · · · · · · ·
32	Elraspostis legitostachya	
33	heropoponticus'	· OFTINAL
34	Acada Implexes	
35	100 SIEberiaug	
36	Jucys ustatus	
37	Muellering evcalpitoides	· · · · · · · · · · · · · · · · · · ·
38	Gungard long tolla Gulardiena scanders	OFTIONAL
40	Concerding he It ton	
40		·
41		
43		
44		
45		OFTIONAL
46		
47		· · · · · · · · · · · · · · · · · · ·
48		· · · · · · · · · · · · · · · · · · ·
49		
50		
51		ONTION VI.
52		

M Plot Modification Table: Plot Number 219

354 560	(14.BM) - E
6120 011	
	Plot 2

	Г	Co	de			NOTES	
Modification Type	\vdash						
Firewood collection and lidying up		R	D	R			
Grazing and trampling	0					· · · · ·	
Soil disturbance	0						
Canopy dieback	0			 	• 		
Dense regrowth post- disturbance	0						~
Weeds	ļ.	p		R			
Timber harvesting	D			 	1		
Fire damage	Ø						
Flood damage	0				 		, ,
Storm damage	Q			 			
Feral herbivores	0						
Other indicative type	Ģ						<u>. </u>
Severity codes					cy codes	Evidence codes	Age codes
0 ⇒ No evidence					.e. absent)	O = Observation	R = Recent (<3 years)
1 = Light				are		P = Personal communication	
2 = Moderate		<u>C</u> :	= 0	eca	asional		O = Old
3 = Severe	1	D :	= F	req	uent		

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Sita Sheet No. 114_BM

З

Ref Site ID	235	Recorders	Notice .	Date	13/5/09
GPS datum	·.	Easting *	352692	Northing*	6719983

* Record from Basting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegetation Type (Create a standard short version)	114 - Bot			
Ancillary Code (Usually condition description)			· · ·	
Condition (Low or Mbd-Good)	BENCHMARK	Habitat Features a (rocks etc)	logs, tallans,	stergs -

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	:
50m	Native over-storey cover (%)	30, 40, 10, 20, 20, 50, 50, 40, 40, 40 = 330 Sum/10	33 %
Transect – 10 Points	Native mid-storey cover (%)	$\boldsymbol{o}_{1}, \boldsymbol{o}_{1}, \boldsymbol{o}_{1}, \boldsymbol{o}_{1}, \boldsymbol{o}_{1}, \boldsymbol{o}_{1}, \boldsymbol{o}_{2}, \boldsymbol{o}_{2}, \boldsymbol{o}_{2}$ Sum/10	1.5%
	Native ground cover (htts/50 points) Grasses	$\begin{array}{c} 147 \$	44%
50m Transect – 50 Points	Native ground cover (lins/50 points) -shrabs,	Double score out of 50 to get %	0 %
	Native ground cover (hits/50 points) _others	HTHTHTI = (b) Double score out of 50 to get %	32 %
50m Transect	Exotic plant bover-	Overstory (10 points) Sum / 10.	Sum exotic % cover
10 points 🕀	from (a) overstorey +	Midstorey (10 points) 6 Sum / 10	
50 points	(b) midstorey 4 (c) ground cover	Ground (50 points) O Double score	
20m x	Number of frees with hollows	4	
50m Quadrat	Total length fallen logs \$10cm width (m)	53	
ي: دي. دهند (مدر و الارد. روا	Over-storey	Species Regenerating (ie. saplings)?	Proportion
Whole	regeneration		100%
Veg. Zone			1.0

		119 BM Plots
15	Elilelys / Augol hus / Stinsy BM3	114 BM Plats inp 235 13/5/09 352692
4	Natives (20m Quadrat)	Exotics (20m Quadrat) 352 692 Exotics (20m Quadrat) 719983 Frosa rubiginons Conv29 Bonarien NIS
<u> </u>	Eus blakely	frost rubiginas
$\frac{1}{2}$	a shachleann	Hypochaeris sectionty
3	D bridgenang	Ayplacksens reducery
4	Angophora floribuda	Cirsium Wigare
5	- allo of the second	
6	Acacig Filicitais	Verbascun virsatu
7	Hadenbergia violaca Hadenbergia violaca Thenedla a stratir	Martino Igucos laita
8		Martin Jancoslaty Gidelij) Tabatternan
9		
10	Cyble Acon caspitorur	
11	Connoratio aspers	
12	Cyple Acgon retrictor Ching pogon caespitorus Opercitatio aspeta Clovadra multi Nora	
14	A r 16 10 10 10 10 10 10 10 10 10 10 10 10 10	OPPONAL.
15	Neverio	592 B282/1978.8.
16	Dianella revoluta	
17		
. 18	/ sange	
19	+chacing	
20	arycina lichardi)	OPTIONAL
21	Craftinette Tongitolia Disnette Tongitolia Juncis withats	
23	Juncy withat's	
24	1 madel 9 junce 9	
25	Hypestern gruinan Hypestern gruinan Accesso oving	
26	Acaena oving	OFTIONAL
27	Non siebeniana Non siebeniana Desmedium veriani	
28	Vesmodium on a	
. 29.	Brachycome Sp. Brachycome Sp. Calotis cuneifolia	
30	The second life and l	
31	Sanario Automotion	
33	Taucus a joca intrario	OPTIONAL.
34	Hydrocotyle peduscilaris	
35	Links sp.	
36	Bunglis spinorg	
37	Carere inversa	
38	Mesmodium gunai	OPTIONAL
<u>39</u> 40	TELL LUSINIS ON CHEROPE	
40	, scaber	
41	Elymonia longiblig	
43		
44	TTTISPARIS UTCOPIATOS	OFTIONAL .
45	Walstenbergis comainis	
46	Augaranous	
47	Euchitalin anculation	
48	Christen Taking yours	
49	yonothing shi	
50	Geranium & OF Geranium & CTCBSO, Sponoolus CTCBSO,	OPTION AL
51	1 - A POINT C	
32		

M Plot Modification Table: Plot Number 235

(114_BM Plots)

Modification Type	\square	Co	de			NOTES	
Firewood collection and tidying up	0						
Grazing and trampling	0						
Soil disturbance	θ						
Canopy dieback	Ø						
Danse regrowth post- disturbance	ð						
Weeds	1	8	0	R			
Timber harvesting	1	ß	0	ĸ		 	
Fire damage	0			 			
Flood damage	0						
Storm damage	0			1			\$
Feral herbivores	0					· -	
Other indicative type	D					w	
Severity codes	- <u> </u> -	Fre	qu	end	y codes	Evidence codes	Age codes
0 = No evidence		A = n/a (i.e. absent)			O = Observation	R = Recent (<3 years)	
1 = Light				аге		P = Personal communication	NR = Not recent
2 = Moderate	_				sional	<u> </u>	O = Old
3 = Severe		D = Frequent		lent			

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No.

116-13M Plot

Ref Site ID	217	Recorders	NS/CC	Date	11/5/09
GPS datum	·	Easting *	361334	Northing*	6719672

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

		Vegetation Zone	Identification	
Biometric Vegetation Type (Create a standard short version)	16	Stakelijs har him	/Yellow	Box
Ancillary Code (Usually condition description)	116_BM	1	· .	
Condition (Low or Mod-Good)	BM	Habitat Features		

Commence of the last					
20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	39		:
50m Transect –	Native over-storey cover (%)	20,40,20,20,30,10,	5,20,20,30	275 Sum / 10	24.5%
10 Points	Native mid-storey cover (%)	- <u> </u>		Sum / 10	3%
	Native ground cover (hts/50 points) - Grasses	114 1417 141 1418 1111	(24)	Double score out of 50 to get %	48 %
50m Transect 50 Points	Native ground cover (hits/50 points) - shrubs	· · · · · · · · · · · · · · · · · · ·		Double score out of 50 to get %	0%
	Native ground cover (hits/50 points) — other	JAM JULY 11	<u> </u>	Double score out of 50 to get %	24 %
50m Transect –	Exotic plant cover - Sum exotic cover (%)	Overstory (10 points)	<u></u>	Sum / 10.	Sum exotic % cover
10 points ∓	from (a) overstorey #	Midstorey (10 points)		Sum / 10	
50 points :	(b) midstorey + (c) ground cover	Ground (50 points)		Double store	8 %
20m x 50m	Number of trees with hollows	6	· ·		<u> </u>
Quadrat	Total length fallon logs >10cm width (m)	95 m	· · · · ·		
	Over-storey regeneration	Species E. brieft.	Regenerating (ie. sa	aplings)? F	roportion
Whole Veg. Zone		E. mell. E. blake			1.0
	en en en se se an la servició de la	A. Hari			

16 BM Plot 1

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dB. 16 Boy Plat 1	Exotics (20m Quadrat)
Natives (20m Quadrat)	fondas elegers
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19 recoluts	Cicius Jacob
1 LAND SIGLES	Salara il la anali
smile heilg	Hachsevil 9/60
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M Plot Modification Table: Plot Number 21

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(116_BM) Plot 1

Modification Type		Co	de			NOTES		
Firewood collection and tidying up	[2	0	R		······································	1 A 2 1	
Grazing and trampling	0							
Soil disturbance	0							
Canopy dieback	0							
Dense regrowth post- disturbance	Ø							
Weeds	ļ	C	0	۴				
Timber harvesting	1	ß	0	0				
Fire damage	0							
Flood damage	0							
Storm damage	p						7	
Feral herbivores	0	1				· -		
Other indicative type								
Severity codes	Ī	Fre	qu	enc	y codes	Evidence codes	Age codes	
0 = No evidence	/	4, =	= n/a (i.e. absent)		e. absent)	O = Observation	R = Recent (<3 years)	
1 = Light	I	3 =	Ra	are		P ⇒ Personal communication	NR = Not recent	
2 = Moderate	(C =	O	cca.	sional		O = Old	
3 = Severe		D = Frequent		ient	<i>7</i>			

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No. di t Plot 2 116_BM

 Ref Site ID
 220
 Recorders
 NS/LC
 Date
 11/5/09

 GPS datum
 Easting *
 353623
 Northing*
 67199994

* Record from Basting and Northing from the end of the 50m transect which also has the 20m quadrat

	Vegetation Zone Identification	
Biometric Vegetation Type (Create a standard short version)	116 Blakelys / Yell. Box	٦
Ancillary Code (Usually condition description)	116-BM	·
Condition (Low or Mod-Good)	BM Habitat Features Stass, logs, hollow, Inclused 14ther, deuse grass	

20m x 20m Quadrat	Number of <u>native</u> plant species	Use species list over page (full Id is not required) Write no. natives here: 33
50m Transect –	Native over-storey cover (%)	10 20 30 20 10 10 20 30 20 20 sum / 10 20%
10 Points	Native mid-storey cover (%)	Sum/10 - %
	Native ground cover (hits/50 points) - Grasses	MR HR IN MI Double score out of 50 to get % 4-Z %
50m Transect – 50 Points	Native ground cover (hits/50 points)	Double score out of 50 to get % Z %
	Native ground cover (hits/50 points) 	TTA 1 Double score out 050 to get % 12 %
50m Transeot –	Exotic plant cover- Sum exotic cover (%)	Overstory (10 points) Sum / 10 Sum exoti % cove
10 points +	from (a) overstorey +	Midstorey (10 points) Sum / 10
	(b) midstorey 4 (c) ground cover	Ground (50 points)
20m x 50m	Number of trees with hollows	3
Quadrat	Total length fallen logs >10cm width (m)	73m
	Over-storey regeneration	Species Regenerating (ie. saplings)? Proportion
Whole Veg. Zone		Ex plahelyi E. mellicatan 2/2 =1

dB. 116 BM P6F2

	Națives (20m Quadrat)	Exotics (20m Quadrat)
[]		Rosa rubiainora
- 1	Eve-mellidars	Manten Ignore late
2	E. Blakely;	Sorations pleracters
3	Expedicion junces	Every out - CUIVUIS
4		June Bytonivs
5	Theneels dustrals	Ride Ala
6	ACACUA OVIA	Hynachaen's radicate
7	Sorghun levolation	(oung congitusi)
8	Echinoposin coopit	OFTION VL
9	Pog stebrine	100 A X842 - 12.
10	ay carece invers	
11	"Pignella revolute	
12	Juce with	_ <u>_</u>
13	Anostida Specious	
14 .	Pichelachie nijerantles	1339157153.5.5
15	Cynboroger retractus	OFIONAL
16	alycine clauderting	
17	Aprila conterts	· · · · · · · · · · · · · · · · · · ·
. 18	Nermodium variani	
19	Operation aspers	· -
20	id allenberging	
21	Vernica Cabyer 18	OPTIONAL
22	Scheranthis Fitlons	
23	Gerahium	
24	Nota potonicitolia	
25	Caloto langulacec	
26	Elymus Scaber	
27	Lomandra multitlon	OPTIONAL
28	Manally longitalis	
. 29	Concendra filitoris	
30	Aichandra sp. A	
1. 31	Aiuso autraly	
32	Acaija implexe have	
- 33	Condenia pelliditolis	(SPIEDNA)
34	Find istylis dichotons	
35	Holorogis hetepply/16	
36	Euclito-sn.	N
37	Remarked ve langacers	
38	Arthonodium	
39		OPTIONAL
40		· · ·
41		
42		
43		
44		
45		OPTIONAL
46	· · · · · · · · · · · · · · · · · · ·	
47		
48		
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51		OPTION U
52		· · · · · · · · · · · · · · · · · · ·

M Plot Modification Table: Plot Number

220	Ċ

116_BM / Plot2

		200				NOTES	
Modification Type	┼┈┯╹	-00	Щ. те				
Firewood collection and tidying up		5	0	R			
Grazing and trampling	0						
Soil disturbance	0	1					
Canopy dieback	0				<u>.</u>		
Dense regrowth post- disturbance	Ø						
Weeds]	B	0	R			
Timber harvesting	ŀ	B	Ø	0			
Fire damage	0						
Flood damage	Ø				· · · ·		
Storm damage	Ø						•
Feral herbivores	0		_			`	
Other indicative type							
Severity codes	╺╴┤┏	- Fre	 	en	cy codes	Evidence codes	Age codes
0 = No evidence		4 =	n/	a (i	.e. absent)	O = Observation	R = Recent (<3 years)
1 = Light	E	3 =	R	are		P = Personal communication	NR = Not recent
2 = Moderate					isional	·	O = Old
3 = Severe					uent	<u> </u>	

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot



Ref Site ID	218	Recorders	NS/LC .	Date	11/5/09
GPS datum		Easting *	176 271	Northing [*]	6720186

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification 116 - Blakelys had am / Yellow Box Biometric Vegetation Type (Create a standard short version)

Ancillary Code (Usually condition description)	116-BM		· .	
Condition (Low or Mod-Good)	BM	Habitat Features		

		4												
20m x 20m Quadrat	Number of <u>native</u> plant species	(ईच्चा वि	Use species list over page (full Id is not required) Write no. natives here: 39										:	
50m	Native over-storey cover (%)	30	30	30	20	10	20	20	30	Ю	ю	Sam / 10	21	%
Transect – 10 Points	Native mid-storey cover (%)		—	5			5			-		Sum / 10	1	%
	Native ground cover (hits/50 points). Grasses	TKI 17	K 711	INK	.11	<u></u>			· · ·		Doubl of:	e score out 50 to get %	44	_%
50m Transect – 50 Points	Native ground cover (hits/50 points) -shubs											e score out 50 to get %	_	%
	'Native ground cover (hits/50 points) - other	ן איז	<u> </u>									e score out 50 to get %	<u>~</u> _)%
50m	Exotic plant cover	Overst	ory (10) point	ts)							Sum / 10.	Sum a %	xotic xover
Transect – 10 points + 50 points	Sum exotic cover (%) from (a) overstorey #	Midsto	rey (1	0 poin	ts)							Sum / 10.		%
	(b) midslörey + (c) ground cover	Groun	d (50 j	points))						I	Double score	_	~
20m x	Number of trees with hollows		7											
50m Quadrat	Total length fallen logs >10cm width (m)	57	7m	•						•			_	
	Over-storey	Specie	s //		Δ.			Regen	eratinį	g (ie. s	aplings)? Í	roport	ion
Whole	regeneration	$C \cup C$	01	a h C	ly					4	1/4	•	-	[
Veg. Zone		ย ย	mel	lid	1.00%					r	•	-	- 1	
		Eve E E E	ng	16.01	47-	J	4							

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TSC Ar

116 BM Plot3

	Natives (20m Quadrat)	Exotics (20m Quadrat)
1	The trade i	Avra rulaginas
2	11. 1915	Arsyation dilatorn
3	fatici talig	Convig bonarienis
	MONO NO GEE	Petto la vante ulli
4	Hadenberge	Bidens piloss
5		
6	Caren invers	
7	June Vitato	
8	Landerer This	
9	Alvine clandering	
10	Echinopages cheppilos 2	· · ·
11	Aristilla	· · · · · · · · · · · · · · · · · · ·
12	Lissanthe Strigory	
13	Autrodanthouse 150	· · · · · · · · · · · · · · · · · · ·
14	Fragostis leptottackya	
15	Crimberoga retraction	19912035 AL
16	Glunia Fabacina	
17	las a la part P(19	· · ·
18	Towning tochidiats	
19	The state long	
$\frac{15}{20}$	Min Jargue Still Orders	
$\frac{20}{21}$	Refly Ilon Daging	OPTIONAL
$\frac{21}{22}$	Javi Dia genistitolia	
23	Arthropoolium	
24	he rahi ch	_
. 25	Cynogloss un tola	
26	Viola petonicitolis	
27	Senecio hispidelus	OF MUSICIE
28	Califies (MR 1960	
. 29	1/einania Cineren	
_ 30 ·	Lowandin mitiTYDIG	*
. 31	Busan's Spinsts	
32	The ching of say the say	
33	Goodenia Bellightolia	OPPOSAL.
34	Scloranthy bitlorus	
35	A stod Buthonia racenosi	
36	Desmaline Valiga	
37	Sacature leiscledun	
38	to totatus in chieghs	
39	Prantis saturioide	OPTIONAL
	The proof of the p	
40		
41		
42		
43		
44		OPTIONAL
45		192 XXXI: (65).
46		
47		<u>.</u>
48		· · · ·
49		
50		
51		OPTION M.
52		



<i>E</i> .											25	-	
M Plot Modifica	tion	ı Ta	abl	e: F	Plo	t Numbe	er	15		(_BM)		2) A.	£ ?
Modification Type		Co	de		<u> </u>				NOT	ES		<u> </u>	
Firewood collection and tidying up	1	C	D	ŗ.								. %.	
Grazing and trampling	0	•			1						1 s. ,	· · · ·	
Soil disturbance	Ð								:				
Canopy dieback	p												
Dense regrowth post- disturbance	0												
Weeds	1	ß	0	R	+								
Timber harvesting	1	ß	0	R	ŀ								
Fire damage	Ð		-										
Flood damage	0		+								_		
Storm damage	ſ)		1									•
Feral herbivores	0)						· .					
Other indicative type	Ì												
Severity codes	-'1	Fre	àdn	ien	cγ	codes		Evidence	codes		Age co	des	
0 = No evidence						absent)		O = Obse			R ≍ years)	Recent	
1 = Light		в=	R	are				P = Persc	nal com	nunication		lot recent	
2 = Moderate		C :	= 0	cca	isic	onal		L	·-		0 = Ok	1	
3 = Severe		D =	≠ Fi	req	uer	nt					L		

215 BM Plot

Eco Logical Australia - Biobank plot data sheet Start a new sheet for each plot

Site Sheet No. 227-BM PG+ (

Ref Site ID Recorders WPin Date 11/5/09 \mathcal{L} NS GPS datum Easting * Northing* 344013 6726199

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

227_BM	·
	· · ·
	white were wancom Rock
	227_Bm.

Number of <u>native</u> plant species	Use species list over page (full Id is <u>not</u> required) Write no. natives here:	مت المستحد	53	- 	:
Native over-storey cover (%)		35,20,40,3	30 _{,1} 2\$	305 Sum / 10	30.5%
Native mid-storey cover (%)	to, 20,10	<u></u>	æ,	Sum / 10	4 %
Native ground cover (hits/50 points) - Grasses	Ш Г)	•		Double score out of 50 to get %	12-%
Native ground cover (hits/50 points) —shrubs	JHT II		0	Double score out of 50 to get %	14 %
cover (hits/50 points) - other	<i>₩Π</i>		٩	Double score out of 50 to get %	8%
Exotic plant cover- Sum exotic cover (%)	Overstory (10 points)		-	Sum / 10.	Sum exotic % cover
from (a) overstorey +	Midstorey (10 points)	,		Sum / 10	_ (2) ⊮
(c) ground cover	Ground (50 points)	·		Double score	% دی ا
Number of trees with hollows	4				
Total length fallen logs >10cm width (m)	80 ~		·	<u>.</u>	
Over-storey regeneration	Species Z	· I	Regenerating	(ie. saplings)? I	Proportion
	E. benkrii A. flori				(1.0)
	plant species Native over storey cover (%) Native mid-storey ööver (%) Native ground cover (mis/50 points) -Gresses Native ground cover (hits/50 points) -simubs Native ground cover (hits/50 points) -other Exotic plant cover= Sum exotic cover (%) from (a) overstorey ± (b) midstorey + (c) ground cover Number of trees with hollows Total length fallen logs ≥10cm width (m) Over-storey	plant species(full Id is not required) Write no. natives here:Native over-storey cover (%)2a, 2a, 3a, 2a, 3a, 2a, 3a, 2a, 3a,Native mid-storey cover (%)1a, 2a, 40Native ground cover (%)1a, 2a, 40Native ground cover (hits/50 points) -Brasses1a, 11Native ground cover (hits/50 points)1a, 11Cover (hits/50 points) -strubs1a, 11Native ground cover (hits/50 points)1a, 11Sum excue cover (b) midstorey + (c) ground cover (b) midstorey + (c) ground coverOverstory (10 points) Ground (50 points)Number of trees with hollows44Total length fallen logs > 10 cm width (m)Sum excues Cover's Species C, ureby here	plant species (full Id is not required) Write no. natives here: 20, 20, 30, 35, 20, 35, 20, 46, 5 Native over-storey 20, 20, 30, 20, 30, 35, 20, 46, 5 Native mid-storey 10, 20, 10 Cover (%) 10, 20, 10 Native ground 111 cover (%) 10, 20, 10 Native ground 111 cover (hits/50 points) - -Strabs 111 cover (%) Midstorey (10 points) Sum excute cover (%) Midstorey (10 points) Sum excute cover Ground (50 points) -(b) midstorey + (c) ground cover (c) ground cover Ground (50 points) -(c) ground cover \$ Number of trees *	plant specifies (full Id is not required) 53 Mative over-storey 20,20,30,20,30,15,20,40,30,20 Native ground (a, 2a, co) Native ground (b, 2a, co) Native ground (c) Second (c) Second (c) Second (c) Second (c) Second (c) Sum exche cover (%) (c) overstorey (10 points) Midstorey (10 points) (c) points) Second (50 points) (c) points) Number of trees (c) points) Number of trees (c) points) Secone	plant species (full Id is not required) 53 Native over storey $2a_1 2a_1 3a_1 2a_3 3a_1 35_1 2a_1 4a_3 3a_1 2a_5$ 505 Sum / 10 Native mid-storey $(a_2 2a_1 3a_1 2a_3 3a_1 35_1 2a_1 4a_3 a_1 2a_5)$ 505 Native ground $(a_2 2a_1 a_2 a_3 a_1 2a_1 3a_1 3a_1 2a_1 4a_3 a_1 2a_5)$ 505 Sum / 10 Native ground $(a_2 2a_1 a_2 a_1 a_2 a_1 a_2 a_1 a_2 a_1 a_2 a_1 a_2 a_1 a_3 a_1 a_2 a_1 a_3 a_1 a_2 a_1 a_3 a_1 a_3 a_1 a_2 a_1 a_3 a_1 a_1 a_3 a_1 a_3 a_1 a_3 a_1 a_1 a_1 a_1 a$

E. suft.

Natives (20m Quadrat)	Exotics (20m Quadrat)
	Hypo rad.
Euc. crobra	lyde. lepto.
44.70	Peb. rigida .
	14600 Glabia
1. Backson An merifalia	Cirsin vulgare.
	· · ·
Grev. Com.	
Polt. falioza	
Warter erenicola	WITCH NE.
Hrie per.	
Dich. nect.	
	1.2 (2007) (20.2) 1.2 (20.2) 1.2 (20.2) 1.2 (20.2)
Dich sericevin	
Bern. var.	
Hydrae. laxer	
scale int	· · · · · · · · · · · · · · · · · · ·
Danen glack	OPTEONAL.
Oxalix 3%.	
Caper. Sp.	
Euchita gr.	
Asp. conf.	
Cymbon laws	
lan nalti	OPTIONAL
Coerandan go.	
Brackycone f	· · · · · · · · · · · · · · · · · · ·
Galian gaver.	
Lesped. Joncen.	
Ang. flari	OPTRONAT.
Harden. Vial	·
Styph. Hig.	·
Alac, box.	
$\mathcal{Y}_{1} \mathcal{W}_{1} \mathcal{W}_{2} \mathcal$	
platys. ent.	
Wahlen comm.	OFTIONAL
Melich. orc.	
Indig. aust.	
Pers. cola	
Voucen particul	
Onto stricta	OPTIONAL_
Cyperus grac.	· · ·
7 Serve Sp.	
8 Echino caes.	
9 Vitt. CUA.	
0 Xn. Rorchaed johns.	EPPEREN LE
Cepto bres.	

Presstylis

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	т—		de			NOTES	
Modification Type	┢┑		500				
Firewood collection and tidying up	٥						
Grazing and trampling	0						
Soil disturbance	Ó						
Canopy dieback	0						
Dense regrowth post- disturbance	1	B	0	NR			
Weeds		B	0	R			
Timber harvesting	0					,	
Fire damage	2	c	0	JR		-	
Flood damage	0						
Storm damage	0						
Feral herbivores		ß	0	R		· -	,
Other indicative type	0						
Severity codes	-⊤- 	Fre	qu	enc	y codes	Evidence codes	Age codes
0 = No evidence	1	4 =	n/a	a (i.	e, absent)	O = Observation	R = Recent (<3 years)
1 = Light				ire		P = Personal communication	NR = Not recent
2 = Moderate			_		sional	· · · · · · · · · · · · · · · · · · ·	O = Old
3 = Severe	-†1	D = Frequent				-	L

Eco Logical Australia - Biobank plot data sheet

Start a new sheet for each plot

Site Sheet No 2

Recorders Ref Site ID Date C Easting * Northing* GPS datum 897 ΘZ * Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat Vegetation Zone Identification Tentrield Goolly butt Biometric Vegetation Type 227 (Create a standard short version) Ancillary Code (Usually condition description) 227_BM Habital Features * Logis, hollows, stags Condition BΜ (Low or Mod-Good) Use species list over page Number of native 20m x ((full Id is not required) 35 plant species 20mWrite no. natives here: Sec. Sec. Quadrat 15, 15, 5, 10, 5, 5, 10, 40, 40, 40 Native over-storey (85 18.5% Sum / 10 cover (%) 50m. Transect 20 Native mid-storey 10 Points 20 2 % o se s cover (%) Sum / 10 HT HT MINI Native ground -<u>8</u>28 Double score out 18 36 % cover (hits/50 points) of 50 to get % - Grasses > 7 Native ground LHTILL 5Ôm Ð Double score out cover (hits/50 points) 18 % Transect of 50 to get % shruba ^P 50 Points 411 111 Native ground (9) Double score out 18 % cover (hits/50 points) of 50 to get % - other Exotic plant cover -Overstory (10 points) 50m 🖄 Sum exotic Sum / 10. Sum exolic cover (%) % cover ransectfrom Midstorey (10 points) l 🛛 points 🗄 Sum / 10 (a) overstorey 2 50 points O % (b) midstorey + Ground (50 points) Double score (c) ground cover Number of trees 3 with hollows 20m x 50m Total length fallen 364 logs >10om width Quadrat (m) Over-storey Species. Regenerating (ie. saplings)? Proportion E. bak regeneration E-blake Whole 1.0 Veg. Zone C calie. E, sideron

ol8 .

227 BM Plot 2

	Natives (20m Quadrat)	Exotics (20m Quadrat)
		Hypahaens sadicats
1		C. a. box air
2	E. blahely,	Exaguatis CUIVUIS
3	E. caliginove E. crebra,	
4	E. Crebia,	
5	Cassinia quinquatanis	
6	Chellantho Sieberi	
7	Microlania stipoido	
8	Michelachne migrantla	
9	Cyplopunger retractus	JPTIONAL
10	Calof & Eine, tolis	_
11	Melichne urceptatus	
12	Hibbertia obtwitelia	
13	Glycine clandertins	<u></u>
14	Guzda sp.	a torus a the second
15	Brachycon procumbers	OPTIONAL
16	Echipsycogan capspitasus	
17	Lahady /01 gitalis	
18	VIALI/A SEPONIZ	
19	Laching with filitoinis	
20	Geroni Com	· · · · · · · · · · · · · · · · · · ·
21	Sehecio	OPTIONAL
22	7; seanthe Strigass	
23	Geodenia belliditolia	
23	Hardenbergra Violacec	
25	A stoduthouis	
26	Euc. Scht Mio-	·
20	Chrysoceahalin apiculation	OPTIONAL
28	Carex St.	
. 29	Indigotera australi	
	Opercularia aspera	· · · · · · · · · · · · · · · · · · ·
30	Operculation aspera Themeda, australis	
	Aristida	
32	Haloragis hereoxhylla	. STURONAL
33	1 astalliza	· · -
34	A A H do idea	
35	1711 4104 Vagals	
36		
37	· · · · · · · · · · · · · · · · · · ·	
38		OFTIONAL
39		
40		
41	<u> </u>	
42		
43	· · · · · · · · · · · · · · · · · · ·	• • • • · · · · · · · · · · · · ·
44	· · · · · · · · · · · · · · · · · · ·	OFTIONAL
45		
46		
47	·	
48	· · · · · · · · · · · · · · · · · · ·	·
49		
50		25-10 TO 20 B1 1 1
51		OPTIONAL
52		
	-	

M Plot Modification Table: Plot Number

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.) (m.	_
· · · ·	

BM) Blof 2

		Co	de		<u> </u>	NOTES	•
Modification Type	╞─┐			T [—]			
Firewood collection and tidying up	2	0	0	NK			
	_		-	┼─			·····
Grazing and trampling							
, es.	0			L			
Soil disturbance	0						
Canopy dieback	Ø	,					
Dense regrowth post- disturbance	0						
Weeds	1	в	0	4			
Timber harvesting	2	0	0	NR			
Fire damage	0						
Flood damage	0						
Storm damage	0						· • •
Feral herbivores	ρ					· .	
Other indicative type	þ	T		T			
Severity codes	- 	Гe	qu	θΠ	cy codes	Evidence codes	Age codes
0 = No evidence					.e. absent)	O = Observation	R = Recent (<3 years)
	+	3 =	Ra	are		P = Personal communication	NR = Not recent
2 = Moderate				_	sional		O = Old
3 = Severe				_	uent	<i>u</i> ,	

Eco Logical Australia - Biobank plot data sheet

Site Sheet No. P643 227 RM

Ref Site ID 225	Recorders	N'S/LC	Date	12/5/09
GPS datuin	Easting *	366 086	Northing*	6718319

* Record from Easting and Northing from the end of the 50m transect which also has the 20m quadrat

Vegetation Zone Identification

Biometric Vegatation Type (Create a standard short version)	227_ BM	(Tantegliald WE/ Silver Stringer)
Ancillary Code (Usually condition description)	·	- <u>(</u>
Condition (Low of Mod-Good)	 	Hilditat Features : Logs, Hallows, Stugs.

Sec. maintaine 14	AND THE PERSON A DOCTOR		
20m x	Number of native	Use species list over page	
20通	plant species	(full Id is not required) 4-9	:
Quadrat		Write no. natives here:	
50m Transect –	Native over-storey cover (%)	2a, 2a, 30, 70, 30, 10, 10, 0, 0, 5 = 155 Sum / 10	15.5%
10 Points	Native mid-storey cover (%)	$o_{j}e_{j}o_{j}o_{j}o_{j}o_{j}o_{j}o_{j}o_{j}o$	0 %
	Native ground cover (hits/50 points) Grasses	WT WW WT WT WT WT WT WI " = (42) Double score out of S0 to get %	84 %
50m Transect – 50 Points –	Native ground cover (hits/50 points) -shruby	1/ Double score out of 50 to get %	4 %
	Native ground oaver (his/50 points)	Image:	8%
50mi Transeot⊶	Exotic plant cover Sum exotic cover (%)	Overstory (10 points)	Sum exotic % cover
10 points ∓ 50 points _a	from (a) overstorey + (b) midstorey + (c) ground cover	Midstorey (10 points) \bigcirc Sum / 10 Ground (50 points) $/$ \Rightarrow \bigcirc Double score	2 %
20m' x 50m	Number of trees with hollows	0	
Quadrat	Total length fallen Jogs >10cm width (m)	157 M	
Whole	Over-storey regeneration	E. subtillior	ropartion
Veg Zone		E. mellio E. bonkzii V	1.0

E. mekina

227 BM Plat 3

dB .

Natives (20m Quadrat)	Exotics (20m Quadrat)
	Circian volg.
the list	Conyra bo-
2 cuelling	Erds. currela.
	Horo read glabra.
4 Mal. or	Rora Iobio
5 Acaria filie	Lochica !
6 Dillwyn. sieb.	
7 Gradt hell	
8 Hard viel	
9 Vern cm	
11 Micro stip	
12 Echio cars.	
13 Calartis con	
14 Operc. asp.	OPTIONAL.
15 Kelye clanger	
IC DOCT.	
Dick will.	
18 Austradanthe rate.	
10 Curcho. rel.	_
20 Withherther obter.	5455577554.13
21 Pinielia seria x	OPTIONAL
	^
TOU I D	
24 Augena p	
25 Diani (m): 26 Arctarle do 2	
20 10 10 10	OFTIONAL
L' T	
<u>50 /</u>	
31 Bol. Mrk.	
32 Lagenters P	SEPTER DIVAT
33 0191	
34 Finbry dich.	
35 0 0	
36 Dool vise ephat	
Dichadle in A.	
BR LIG. SWIP .	OFTIONAL
Arist vag.	TPA & EVPLOYMENT
10 Chrypor apric .	
1) Berenin y.	
Buchiton yo.	
Bothrio decip.	
Horea het.	
Brachycane sp .	OPTIONAL
charlanthes sich	· · · · · · · · · · · · · · · · · · ·
for with	
Them and.	
Paranthe millo.	
	OPTION VI.

M Plot Modification Table: Plot Number 22.5

(227_BM Plat 3)

Modification Type		Co	de			NOTES	
Firewood collection and tidying up	1	в	Ø	r#			
Grazing and trampling	ø						
Soil disturbance	Ø						
Canopy dieback	1	Ø	Ø	R			
Dense regrowth post- disturbance	0						
Weeds	ł	в	0	R			
Timber harvesting	1	6	ø	n/#	2		
Fire damage	Þ	б	ø	N	Ę		
Flood damage	Ø						
Storm damage	0						ø
Feral herbivores	G.					· .	
Other indicative type	13						
Severity codes			-		codes	Evidence codes	Age codes
0 = No evidence					e, absent)	O = Observation	R = Recent (<3 years)
1 = Light	—		Ra			P = Personal communication	NR = Not recent
2 = Moderate	—				sional		O = Old
3 = Severe	[) =	Fre	equ	lent		

Appendix B: Reference plot floristic data

Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2		BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
Acacia buxifolia	Box-leaved Wattle													х					
Acacia deanei	Green Wattle																x	х	x
Acacia filicifolia	Fern-leaved Wattle						x		x							х			
Acacia implexa	Hickory Wattle			x		х		х					x						
Acacia neriifolia	Silver Wattle													х					
Acacia terminalis	Sunshine Wattle			x															
Acacia ulicifolia	Prickly Moses				x														
Acaena ovina							x	х			x	x	x				x	x	x
Ajuga australis	Austral Bugle				x	x	x	х		x	x			х		х	x		
Amyema spp.																х			
Angophora floribunda	Rough-barked Apple				x	x	x				x	x	х	х			x	х	
Aristida leptopoda	White Speargrass																x		
Aristida ramosa	Purple Wiregrass	х	x																x
Aristida ramosa var. speciosa					x	x							х	х		x			
Aristida spp.				x			x	х	x	x					x			х	
Aristida vagans	Threeawn Speargrass					x									x	x			
Arthropodium spp.		х						х	x										
Asperula conferta	Common Woodruff	х	x	x				х			x	x	x	х					x
Austrodanthonia racemosa									x		x					х			
Austrodanthonia spp.		х	x	x	x	x			x	x		x			x	х			x
Austrostipa scabra	Speargrass																		x
Austrostipa spp.																		x	
Bidens pilosa	Cobbler's Pegs	х	x	x	x		x	х									x	х	
Bidens subalternans	Greater Beggar's Ticks						x												
Billardiera scandens	Appleberry					x													
Bothriochloa biloba													x						
Bothriochloa decipiens var. decipiens																х			
Bothriochloa macra	Red Grass	х	x	х					х		х	х	х				х	х	х
Brachyloma daphnoides	Daphne Heath					х													
Brachyscome microcarpa		х	x															х	
Brachyscome procumbens														х	х				
Brachyscome spp.				x			x					x				x			
Bursaria spinosa	Native Blackthorn		x				x		х										
Callitris endlicheri	Black Cypress Pine									х									
Calotis cuneata	Mountain Burr-Daisy	х					x												
Calotis cuneifolia	Purple Burr-Daisy				х										х	х		х	
Calotis lappulacea	Yellow Burr-daisy					х		х	х	x									

Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2	BR153 Plot 3	BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
Carex inversa	Knob Sedge	x	x		x	х	x	x			х	x	x		х		x	х	
Cassinia laevis	Cough Bush									х							x		
Cassinia quinquefaria										x					х				
Chamaesyce spp.		x															x		
Cheilanthes sieberi		x	x	х						x					х	x			х
Chloris ventricosa	Tall Chloris																		х
Choretrum candollei	White Sour Bush									x									
Chrysocephalum apiculatum	Common Everlasting						x			х				х	х	x			
Cirsium vulgare	Spear Thistle						x			х	х	x		х		x			
Conyza bonariensis	Flaxleaf Fleabane		x		х		x	x		x					х	x		х	
Conyza spp.											х								
Cotoneaster spp.										х									
Cyclospermum leptophyllum	Slender Celery													х					
Cymbonotus lawsonianus	Bear's Ear				х	х				x				х			х	х	
Cymbopogon refractus	Barbed Wire Grass	x	x		х	х	x	x	x	x				x	х	x	х	х	х
Cynoglossum spp.									x	x	х						х		
Cyperus gracilis	Slender Flat-sedge	x												x					
Daucus glochidiatus	Native Carrot		x	x			x		x	x	x			x					x
Daviesia genistifolia	Broom Bitter Pea								x	x									
Desmodium brachypodum	Large Tick-trefoil	x	x	x							x						x	x	
Desmodium gunnii	Slender tick trefoil		x	x	x		x											x	
Desmodium varians	Slender Tick-trefoil	x					x	x	x				x	x		x			
Deyeuxia spp.										x									
Dianella caerulea	Blue Flax-lily											x						x	
Dianella longifolia							x	x			x		x			x	x		
Dianella revoluta					х	х	x	x	x	x	x		x	x	х		x		
Dianella spp.			x																
Dichanthium sericeum	Queensland Bluegrass												x	x				x	x
Dichelachne micrantha	Shorthair Plumegrass	x		x	x	x	x	x		x	x			x	x	x	x	x	
Dichondra repens	Kidney Weed	x	x															x	
Dichondra sp. A	,						x	x	x	x			x			x	x		
Dillwynia phylicoides														x					
Dillwynia sieberi													x			x		x	
Dipodium spp.											x						x		
Dodonaea viscosa subsp. spatulata																x			
Echinopogon caespitosus	Bushy Hedgehog-grass	x	x	x	x	x	x	x	x	x				x	x	x		х	
Einadia nutans	Climbing Saltbush		x															x	
Elymus scaber							x	x				x	x						
Entolasia stricta	Wiry Panic													x					
Eragrostis brownii	Brown's Lovegrass		x	x															
Eragrostis curvula	African Lovegrass							x							x	x			
Eragrostis leptostachya	Paddock Lovegrass				x	x			x	x						x			
Eremophila debilis	Amulla		1										x						x

Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2	BR153 Plot 3	BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
Eucalyptus albens	White Box																x	x	x
Eucalyptus banksii	Tenterfield Woollybutt				x	x								x	x	x			
Eucalyptus blakelyi	Blakely's Red Gum				x	x	x	x	x	x		x			x				
Eucalyptus bridgesiana	Apple Box						x												
Eucalyptus caliginosa	Broad-leaved Stringybark														x				
Eucalyptus crebra	Narrow-leaved Ironbark	x	x	х	x									х	х				
Eucalyptus dealbata	Tumbledown Red Gum	x	x	х															
Eucalyptus laevopinea	Silver-top Stringybark	х	х	х															
Eucalyptus macrorhyncha	Red Stringybark																	x	
Eucalyptus mckieana (vulnerable)	McKie's Stringybark					х	х		х					х		х			
Eucalyptus melliodora	Yellow Box		х	х				x	х	х		х				х			
Eucalyptus subtilior					x									х	х	х			
Eucalyptus viminalis	Ribbon Gum										x	х	x						
Euchiton spp.				х			x	x		x	x	х	x	x		x	x	x	
Exocarpos cupressiformis	Native Cherry	x						x											
Fimbristylis dichotoma	Common Fringe-sedge				x	x	x	x								х			
Galium aparine	Goosegrass	x																	
Galium gaudichaudii	Rough Bedstraw						x							x		x			
Geranium solanderi	Native Geranium	x	x									x							
Geranium spp.				x			x	x	x		x		x	x	x	x	x	x	х
Glycine clandestina		x			x			x	x	x		x	x		x	x	x	x	
Glycine spp.			x	x															x
Glycine tabacina	Glycine	x				x	x		x			x	x			x	x	x	
Gonocarpus tetragynus	,						x												
Goodenia bellidifolia					x		x	x	x	x					x	x			
Goodenia paniculata		x																	
Grevillea ramosissima subsp. ramosissima	Fan Grevillea													x					
Haloragis heterophylla						х		x							х				
Hardenbergia violacea	False Sarsaparilla			х		х	х		х					х	х	х			
Heliotropium spp.																		х	
Hibbertia obtusifolia	Hoary guinea flower	х	x	х											х	х		х	
Hovea heterophylla							х									х			
Hovea linearis				х															
Hydrocotyle laxiflora	Stinking Pennywort													х			х		
Hydrocotyle peduncularis							х												
Hydrocotyle spp.																		х	х
Hypericum gramineum	Small St John's Wort	x	x	х		x	х			x								x	
Hypericum perforatum	St. Johns Wort										x								
Hypochaeris glabra	Smooth Catsear	1								x				х		x			
Hypochaeris radicata	Catsear	x	x	x			x	x		x	x	x	x	x	x			x	
Imperata cylindrica var. major	Blady Grass	1									x								
Indigofera australis	, Australian Indigo	x				x								х	x	x			
Jacksonia scoparia	Dogwood	1		x															

Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2	BR153 Plot 3	BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
Joycea pallida	Silvertop Wallaby Grass				x		x							x					
Juncus bufonius	Toad Rush							x											
Juncus usitatus					x	x	x	x		х									
Lachnagrostis filiformis															х				
Lactuca serriola	Prickly Lettuce									х						х			
Lagenophora stipitata	Blue Bottle-daisy													x		х		x	
Lepidium spp.			x																
Lepidosperma laterale														x					
Leptospermum brevipes					x									x					
Lespedeza juncea subsp. sericea		х	х		x		x	x			х	х	x	x	х			x	х
Leucochrysum albicans																		x	х
Leucopogon muticus	Blunt Beard-heath					x								x					
Lissanthe strigosa	Peach Heath				x	x	x		x						x	x			
Lolium perenne	Perennial Ryegrass						x												
Lomandra confertifolia				х															
Lomandra filiformis	Wattle Matt-rush							x											
Lomandra longifolia	Spiny-headed Mat-rush				x	x	x		x	x				x	х	х			
Lomandra multiflora subsp. multiflora	Many-flowered Mat-rush		x	x	x	x	x	x	x	x		x		x		x	x	x	
Lotus australis	Australian Trefoil																	x	
Luzula spp.							x								x				
Medicago spp.		x	x	x														x	
Melichrus urceolatus	Urn Heath	х		х	x	x	x			х				x	x	x			
Mentha diemenica	Slender Mint																x		
Mentha satureioides	Native Pennyroyal								x										
Mentha spp.																		x	
Micrantheum ericoides																			х
Microlaena stipoides		x	x	x	x	x	x		x	x	х				x	х			
Microseris lanceolata											х								
Monotoca scoparia		x												x					
Muellerina eucalyptoides						x													
Notelaea microcarpa	Native Olive	x	x	x									х				x	x	х
Olearia elliptica	Sticky Daisy Bush																	x	
Olearia sp. aff. elliptica							x												
Opercularia aspera	Coarse Stinkweed				x	x	x	x							x	x			
Opercularia diphylla		x	x	х															
Oxalis perennans		х	x	x		x					х	х	x	x			x		x
Oxalis spp.										х									
Panicum queenslandicum	Yadbila Grass	х	x								x	х							
Paspalum dilatatum	Paspalum										x	x							
Persoonia cornifolia														х					
Petrorhagia nanteuilii			х																
Phyllanthus spp.																			х
Phyllanthus virgatus											х	х							

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Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2	BR153 Plot 3	BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
Picris hieracioides	Hawkweed Picris												х					х	
Picris spp.			x								x								
Pimelea curviflora											х		х				х	х	х
Pimelea neo-anglica	Poison Pimelea															x			
Plantago debilis			х	x							х	x	x				х		x
Plantago lanceolata	Lamb's Tongues						x	x		x									
Platysace ericoides														x					
Poa sieberiana		x			x	x	x	x	x	x	x	x					х	х	x
Poa spp.			x																
Polygala japonica																	х		
Polygala spp.				x															
Pomax umbellata						x													
Poranthera microphylla																x			
Poranthera spp.		x		x															
Pratia concolor	Poison Pratia												x						x
Pterostylis spp.														x					
Pultenaea foliolosa														x					
Pultenaea retusa																		x	
Pycnosorus globosus											х	x							
Ranunculus lappaceus	Common Buttercup							x											
Ranunculus repens	Creeping Buttercup												x						
Rhodanthe spp.											х								
Rosa rubiginosa	Sweet Briar						x	x		x	x	x	x			x	х		
Rostellularia spp.																			x
Rubus parvifolius	Native Raspberry										x								x
Rumex brownii	Swamp Dock												x						
Sarga leiocladum								x	х		х	x	х				х		
Scleranthus biflorus								x	x		х	x						х	
Scutellaria humilis	Dwarf Skullcap													x					
Senecio hispidulus	Hill Fireweed								x								x		
Senecio prenanthoides							x				х								
Senecio quadridentatus	Cotton Fireweed										х	x	х				х		
Senecio spp.							x			x				x	х				
Sigesbeckia orientalis subsp. orientalis	Indian Weed	x	х	х															
Solanum nigrum	Black-berry Nightshade									x									
Sonchus oleraceus	Common Sowthistle	х	х					x		x									
Spartothamnella juncea																			x
Sporobolus creber	Slender Rat's Tail Grass						x												
Styphelia triflora	Pink Five-Corners													x					1
Styphelia viridis																		x	1
Swainsona galegifolia	Smooth Darling Pea										x	1	x				x	х	1
Swainsona spp.	Ŭ,			x								1							1
Taraxacum officinale	Dandelion											x					1	x	1
Scientific Name	Common Name	BR110 Plot 1	BR110 Plot 2	BR110 Plot 3	BR114 Plot 1	BR114 Plot 2	BR114 Plot 3	BR116 Plot 2	BR116 Plot 3	BR116 Plot 1	BR153 Plot 1	BR153 Plot 2	BR153 Plot 3	BR227 Plot 1	BR227 Plot 2	BR227 Plot 3	BR240 Plot 1	BR240 Plot 2	BR240 Plot 3
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Themeda australis	Kangaroo Grass				х	х	x	х		x	х	х	х		х	х	х	x	x
Thesium australe (vulnerable)	Austral Toadflax												х						
Trachymene incisa										x						х			
Trifolium campestre	Hop Clover										х						х		
Trifolium repens	White Clover	x	x	x															
Verbascum virgatum	Twiggy Mullein						x												
Verbena rigida var. rigida	Veined Verbena													х			х		
Vernonia cinerea		x	x	x	x	x			х							х			
Veronica calycina	Hairy Speedwell							х									х		
Veronica plebeia	Trailing Speedwell	x	x	x														x	
Vicia sativa																		x	
Viola betonicifolia	Native Violet	x						х	х		х	х		х			х	x	
Vittadinia cuneata	Fuzzweed	x			x								х	х				х	
Wahlenbergia communis	Tufted Bluebell	x	x	x	x	x	x	x		x	х	х		х		х	х	х	x
Wahlenbergia gracilis	Sprawling Bluebell												х						
Westringia eremicola	Slender Westringia													х					
Xanthorrhoea johnsonii														х					
Zornia dictyocarpa var. dictyocarpa				х															

Appendix C: Local Benchmark Calculator Spreadsheet

BioBanking Benchmark Calculator

Data entry: Local reference sites

To develop the benchmark, enter your transect/plot data that is collected from the reference sites. The benchmark will be generated automatically. The benchmark can then be transcribed manually into the Credit Calculator at *Step 5b: Enter Vegetation Transect/Plot Information* by selecting the *Edit Benchmarks* button.

Locating local reference sites and the field methods for measuring the vegetation condition variable must be made in accordance with the guidelines set out in section 3.4.3 and Appendix 2 of the Operational Manual.

Where a local reference site has been used to develop a benchmark for a biobank assessment, a copy of the site attribute data, description of the site and any other information that supports the local benchmark must be submitted to DECC as part of the application for the biobanking statement or agreement.

Vegetation formation			D	ry Sclerop	ohy ll Fore	sts (Shru	ubby)															
Vegetation class			Northe	rn Tablela	ands Dry	Scleroph	yll Forest	s]												
Vegetation type			BCP - T	DG - NLI	B O/F of	Northern	Nandew	ar		I												
50-m transect	Bench	nmarks	1	2	3	4	Plots 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Native plant species	2	43	46	40	43																	
Native over-storey cover	20 to	o 23	21	20	23.5																	
Native mid-storey cover	0 to	o 2	0	0	2																	
Native ground cover (grasses)	59 to	o 64	62	64	58																	
Native ground cover (shrubs)	0 to	o 2	2	0	0																	
Native ground cover (other)	31 to	o 53	58	30	34																	
50m x 20m plot																						
Number of trees with hollows		8	9	5	8																	
Total length of fallen logs	2	220	210	234	220																	

Median 10th percentile 90th percentile

Native over-storey cover 21 20.2 23 Native mid-storey cover 0 0 1.6 Native ground cover (grasses) 62 58.8 63.6	Native plant species	43	40.6	45.4
	Native over-storey cover	21	20.2	23
Native ground cover (grasses) 62 58.8 63.6	Native mid-storey cover	0	0	1.6
	Native ground cover (grasses)	62	58.8	63.6
Native ground cover (shrubs) 0 0 1.6	Native ground cover (shrubs)	0	0	1.6
Native ground cover (other) 34 30.8 53.2	Native ground cover (other)	34	30.8	53.2

Number of trees with hollows	8	5.6	8.8
Total length of fallen logs	220	212	231.2

BioBanking Benchmark Calculator

Data entry: Local reference sites

To develop the benchmark, enter your transect/plot data that is collected from the reference sites. The benchmark will be generated automatically. The benchmark can then be transcribed manually into the Credit Calculator at *Step 5b: Enter Vegetation Transect/Plot Information* by selecting the *Edit Benchmarks* button.

Locating local reference sites and the field methods for measuring the vegetation condition variable must be made in accordance with the guidelines set out in section 3.4.3 and Appendix 2 of the Operational Manual.

Where a local reference site has been used to develop a benchmark for a biobank assessment, a copy of the site attribute data, description of the site and any other information that supports the local benchmark must be submitted to DECC as part of the application for the biobanking statement or agreement.

Vegetation formation		Grassy Woodlands							I												
Vegetation class		N	ew Engla	nd Grass	y Woodl	ands			[
Vegetation type	BR 114 - E. I	R 114 - E. blake, A. flori, E. macro grassy OF of the western NE Tabl							I												
50-m transect	Benchmarks	1	2	3	4	Plots 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Native plant species	≥ 40	36	40	51																	
Native over-storey cover	r 26 to 32	24.5	30	33																	
Native mid-storey cover	r 0 to 5	6	0	1.5																	
Native ground cover (grasses) 28 to 49	50	24	44																	
Native ground cover (shrubs) 1 to 7	8	4	0																	
Native ground cover (other) 18 to 30	24	16	32																	
50m x 20m plot	-																				
Number of trees with hollows	\geq 4	6	4	4																	
Total length of fallen logs	≥ 125	266	125	53																	

Median 10th percentile 90th percentile

Native plant species	40	36.8	48.8
Native over-storey cover	30	25.6	32.4
Native mid-storey cover	1.5	0.3	5.1
Native ground cover (grasses)	44	28	48.8
Native ground cover (shrubs)	4	0.8	7.2
Native ground cover (other)	24	17.6	30.4

Number of trees with hollows	4	4	5.6
Total length of fallen logs	125	67.4	237.8

BioBanking Benchmark Calculator

Data entry: Local reference sites

To develop the benchmark, enter your transect/plot data that is collected from the reference sites. The benchmark will be generated automatically. The benchmark can then be transcribed manually into the Credit Calculator at *Step 5b: Enter Vegetation Transect/Plot Information* by selecting the *Edit Benchmarks* button.

Locating local reference sites and the field methods for measuring the vegetation condition variable must be made in accordance with the guidelines set out in section 3.4.3 and Appendix 2 of the Operational Manual.

Where a local reference site has been used to develop a benchmark for a biobank assessment, a copy of the site attribute data, description of the site and any other information that supports the local benchmark must be submitted to DECC as part of the application for the biobanking statement or agreement.

Vegetation formation		Grassy Woodlands							I													
Vegetation class				New Engla	and Grass	sy Woodl	ands															
Vegetation type	В	R 116 -	E. blake	yi, YB gra	ssy OF o	r woodlar	nd of the I	NE Table	land	Ι												
50-m transect	Benc	hmarks	1	2	3	4	Plots 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Native plant species		2 39	39	38	39																	
Native over-storey cover	20	to 21	21.5	20	21																	
Native mid-storey cover	0 1	to 1	0	0	1																	
Native ground cover (grasses)	42 1	to 47	48	42	44																	
Native ground cover (shrubs)	0 1	to 2	0	2	0																	
Native ground cover (other)	14 1	to 23	24	12	20																	
50m x 20m plot																						
Number of trees with hollows		≥ 5	6	3	5																	
Total length of fallen logs		≥ 73	95	73	57																	

Median 10th percentile 90th percentile

Native plant species	39	38.2	39
Native over-storey cover	21	20.2	21.4
Native mid-storey cover	0	0	0.8
Native ground cover (grasses)	44	42.4	47.2
Native ground cover (shrubs)	0	0	1.6
Native ground cover (other)	20	13.6	23.2

Number of trees with hollows	5	3.4	5.8
Total length of fallen logs	73	60.2	90.6

BioBanking Benchmark Calculator

Data entry: Local reference sites

To develop the benchmark, enter your transect/plot data that is collected from the reference sites. The benchmark will be generated automatically. The benchmark can then be transcribed manually into the Credit Calculator at *Step 5b: Enter Vegetation Transect/Plot Information* by selecting the *Edit Benchmarks* button.

Locating local reference sites and the field methods for measuring the vegetation condition variable must be made in accordance with the guidelines set out in section 3.4.3 and Appendix 2 of the Operational Manual.

Where a local reference site has been used to develop a benchmark for a biobank assessment, a copy of the site attribute data, description of the site and any other information that supports the local benchmark must be submitted to DECC as part of the application for the biobanking statement or agreement.

Vegetation formation		Grassy Woodlands																				
Vegetation class			We	estern Slo	pes Gras	ssy Wood	dlands															
Vegetation type	<u>۱</u>	WB Grassy Woodland of the Nandewar and Brigalow Belt							I													
50-m transect	Benchmark	ks	1	2	3	4	Plots 5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Native plant species	≥ 4	40	40	47	33																	
Native over-storey cover	19 to 2	26	26	18	25																	
Native mid-storey cover	0 to 1	16	0	20	0																	
Native ground cover (grasses)	63 to 7	74	66	62	76																	
Native ground cover (shrubs)	0 to 9	5	0	0	6																	
Native ground cover (other)	8 to 1	17	6	18	14																	
50m x 20m plot																						
Number of trees with hollows	≥ :	2	3	2	2																	
Total length of fallen logs	2 5	58	144	58	24																	

Median 10th percentile 90th percentile

Native plant species	40	34.4	45.6
Native over-storey cover	25	19.4	25.8
Native mid-storey cover	0	0	16
Native ground cover (grasses)	66	62.8	74
Native ground cover (shrubs)	0	0	4.8
Native ground cover (other)	14	7.6	17.2

Number of trees with hollows	2	2	2.8
Total length of fallen logs	58	30.8	126.8



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Appendix K: EPBC Significance Assessments

CRITICALLY ENDANGERED ECOLOGICAL COMMUNITIES

Box Gum Woodland

Both BRGYB and WB are characteristic of the CEEC *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* listed under the EPBC Act - more commonly known as Box Gum Woodland (BGW). Areas mapped as Moderate/Good condition BRGYB and WB reflect the listed BGW community, however areas mapped as Low condition do not retain sufficient integrity to be considered the CEEC. BGW is present primarily in the lower lying parts of the study area.

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

a) reduce the extent of an ecological community

The proposal involves the permanent removal of up to 20.29 ha of Moderate/Good condition BGW, with an additional 15.44 ha of temporary clearance for roads, reticulation and construction facilities (total 35.73 ha). This removal comprises 10.82 ha of remnant woodland and 24.91 ha of derived native grassland/native pasture. This represents only 2.2 % of the BGW mapped within the project site.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Road and transmission lines form necessary components of the infrastructure supporting a wind farm, and these features, coupled with the actual turbine layout, form a linear study area with potential to cause fragmentation of the landscape. However, avoidance measures have been implemented to minimise impacts on the ecological integrity of the site, while maintaining the engineering and economic feasibility of the wind farm. Access has been designed around current tracks and roads present within the study area to minimise additional vegetation clearance; turbines have been placed in cleared or treeless areas, to minimise tree clearance; turbines have largely been placed in woodland areas where groundlayer disturbance has previously taken place; and the reticulation has been placed underground and within the road footprint where possible to allow for temporary rather than permanent disturbance. Reticulation will pass overhead across gullies and waterways to reduce impacts.

The proposed fragmentation is relatively narrow, does not occur in one consolidated stand, is unlikely to impact on dispersal mechanisms for the BGW and will not prevent fauna movement between stands of vegetation.

c) adversely affect habitat critical to the survival of an ecological community

Habitat critical to the survival of the community includes habitat that is necessary for the long-term maintenance of the ecological community, or recovery of the ecological community. Given that only

2.2 % of the BGW mapped within the project site will be cleared, the proposal is unlikely to prevent the recovery of the ecological community or long-term maintenance of BGW within the project site and the locality. The proposal is not considered to adversely affect critical habitat. Furthermore, no critical habitat for BGW has been declared on the Register of Critical Habitat in NSW.

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

The study area is primarily located on ridge tops and, therefore, is largely not affected by the surrounding streams. Conversely, the proposal is not likely to significantly affect flooding or flow regimes for the study area. There may be small and localised alterations of surface water drainage patterns, in the form of an increase in run-off in areas where the ground within the construction area will be compacted, gravelled or concreted. Soil erosion and run-off control measures will be implemented as part of the mitigation measures undertaken for the proposal to avoid indirect impacts adjacent areas.

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

The risk of fire with wind farms is inherently low (CFA 2007). A low risk is associated with malfunctioning turbine bearings, inadequate crankcase lubrication, cable damage during rotation, electrical shorting or arcing occurring in transmission and distribution facilities (CFA 2007). The location of wind turbines away from tall vegetation in the study area minimises the risk of fire. The existing fire regime within the study area is not expected to change as a result of the proposed development. As an aside, the proposal may result in improved access for firefighting appliances in case of a bushfire within the project site, due to the construction of roads within the study area.

The site is grazed primarily by sheep and cattle. Due to extended drought, stocking rates were not heavy at the time of survey. Grazing pressure and management varies across the landscape, and the proposal is considered unlikely to exacerbate over-grazing at the site and may, in fact, contribute to a more sustainable grazing regime through the mitigation measures proposed in some parts of the site. In the absence of fire, grazing can be an important form of disturbance to prevent the accumulation of biomass that may not be favourable to some native flora species. Grazing will be periodically removed during construction, but should be reintroduced post-construction. Rotational periods of grazing and spelling help to foster healthy native pastures in the absence of fire.

Outside of the 10.82 ha of remnant woodland and 24.91 ha of derived native grassland/native pasture that is proposed to be cleared, the proposal is not expected to cause a substantial change in the species assemblage.

- f) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
 - assisting invasive species, that are harmful to the listed ecological community, to become established, or

Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These measures comprise:

- piling of soil that may contain seeds of exotic species at least 50 m away from the creeks, drainage lines and other areas of native vegetation, where possible, to prevent spread into adjacent areas of ecological significance during rainfall or wind events;
- all machinery, equipment and vehicles are to be washed down before entering and leaving a site;
- topsoil recovery will be undertaken in areas that have a high proportion of native vegetation and few weeds in the ground layer of vegetation;
- it should be ensured that any soil, rubble etc imported to the site is certified that it is free of weeds and weed seed;
- revegetation with locally native endemic species characteristic of the cleared vegetation type, recommended an aggressive coloniser such as *Austrostipa* spp. is used;
- weed management measures implemented to control perennial weed grasses;
- management of stock access during periods of vegetation and soil disturbance to prevent weed spread; and,
- all onsite staff and contractors will be made aware of noxious weeds present at the site and ways to prevent their spread.

causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or

The proposal does not involve the regular release of chemicals or pollutants into areas occupied by the community. However, mitigation measures are in place for contained hazardous materials that are required during the construction and operation of the wind farm:

- hazardous materials must be stored on or off-site in specific lay-down/storage areas, and will be handled and stored according to regulatory requirements and Australian Standards AS1940; and,
- the transformer as part of the collector substation may contain upwards of 20,000 litres of oil.
 Provisions will be made as part of the design for containment of any oil which may leak or spill. Prevention and containment of any potential spills will be described in detail in the EMP.

g) interfere with the recovery of an ecological community.

Given that the proposal will require the removal of only 2.2 % of all BGW mapped within the project site, the proposal is not expected to interfere with the recovery of the ecological community. Furthermore, as the proposed vegetation removal is scattered along narrow linear corridors, rather than one consolidated stand, it is unlikely to interfere with the recovery of the community in the long-term under favourable climatic conditions and sustainable land management.

FLORA

Acacia pubifolia (Velvet Wattle)

Acacia pubifolia is an erect or spreading tree that grows 3-8 m high with golden yellow flowers and dark-grey bark. The leaves are hairy and feel like velvet. Its flowers are clustered together in a long tube or spike 2 - 5 cm long (DECCW 2011b) and appear during September-November (DSEWPC 2011b).

This species is confined to the Darling Downs, between Glen Aplin and Wallangarra, in south-eastern Qld and to northern NSW, where it is less common (Orchard & Wilson 2001).

In NSW, it is known from two disjunct localities:

Torrington State Recreation Area, north-west of Emmaville in the south-western portion of the reserve. There is one dense but small population along Gulf Rd, and scattered mature plants along the lower portion of Carpet Snake Fire Trail (Clarke *et al.* 1998; Copeland & Hunter 1999).
 On private property near Warrabah NP, about 60 km west of Armidale. In consultation with the landholder, the NSW NPWS has fenced off the population and is monitoring its progress (Creamer 1999). This population consists of 95 plants (P. Metcalfe 1999, pers.comm. in Copeland & Hunter 1999).

This species generally grows on rocky granite hillsides, in sandy, stony or loamy soil in eucalypt-scrub woodland or *Eucalyptus-Callitris* forest (Orchard & Wilson 2001). In NSW it is recorded growing in shrubby woodland on granite (Clarke *et al.* 1998). The population near Warraba is in partially cleared country (Copeland & Hunter 1999). Within the study area, potential habitat occurs in woodland communities (DECCW 2011b), and within the study area would be associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Surveys for this species were undertaken during the 27 – 30 October 2008, 20 – 29 September 2010 and 13 – 15 October 2010 survey period. However, it was not recorded within the study area.

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

a) lead to a long-term decrease in the size of an important population of a species;

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• Key source populations either for breeding or dispersal;

Acacia pubifolia has not been recorded within the study area and, therefore, the proposal is not expected to lead to a long-term decrease in the size of a population.

• Populations that are necessary for maintaining genetic diversity, and/or;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to impact on a poplation of this species necessary for maintaining genetic diversity.

o populations that are near the limit of the species range;

Acacia pubifolia has not been recorded in the study area. Furthermore, the known distribution of Acacia pubifolia extends to the north and south of the project site in two locations: Torrington State Recreation Area located south of the study area; and, on private property near Warrabah NP which is north of the study area. Any potential habitat for Acacia pubifolia within the study area is not at the limit of its known distribution.

b) reduce the area of occupancy of an important population;

Acacia pubifolia has not been recorded within the study.

c) fragment an existing important population into two or more populations;

Acacia pubifolia has not been recorded within the study area and, therefore, the proposal will not fragment an important population.

d) adversely affect habitat critical to the survival of a species;

Potential habitat for this species will be removed in linear strips (for turbines, access tracks and the associated ancillary structures required for the running of the wind farm). As a worst case scenario, the area of vegetation permanently lost is 75.36 ha along with a temporary impact to 37.11 ha of potential habitat, totalling 112.47 ha. However, this potential habitat does not constitute habitat critical to the survival of a species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population as no individuals were recorded within the study area. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

o To maintain genetic diversity and long-term evolutionary development;

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Acacia pubifolia* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of an important population;

This is not applicable to a flora species.

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

The action will permanently remove up to 75.36 ha of potential habitat for *Acacia pubifolia* and temporarily remove up to 37.11 ha of potential habitat. No individuals of *Acacia pubifolia* have been detected during the ecological surveys and, therefore, removal of potential habitat is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Control measures will be implemented to ensure that impacts to habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from preconstruction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are detailed in Table 17 of the Ecological Assessment.

h) introduce disease that may cause the species to decline, or

No diseases are known that threaten *Acacia pubifolia*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act. Furthermore, as a worst case scenario, the action will only remove 1.8 % of potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Astrotricha roddii (Rod's Star Hair)

Astrotricha roddii is an upright, sparsely-branched shrub 1 - 3 m tall. The shiny, narrow leaves are 11-18 cm long and 1-2.5 cm wide with long pointed tips and hairy underside. The stems are covered with dense woolly hairs. The dull purplish flowers grow on stems up to 40 cm long, and appear during October-February. Rod's Star Hair is thought to be only short-lived, with a life-span of possibly less than 10 years (DECCW 2011b).

Astrotricha roddii occurs in NSW in the Ashford area north of Inverell, including Kwiambal and Kings Plains National Parks, Severn River Nature Reserve and Severn River State Forest, and has also been recorded at one site in southern Queensland (DECCW 2011ba). Astrotricha roddii was not recorded at the site but has the potential to occur and is known from previous records in the locality. Astrotricha roddii usually grows in low dry woodland and shrublands on granite and acid volcanic outcrops, often in rock crevices (DECCW 2011b). Potential habitat occurs in woodland communities (DECCW 2011b), and within the study area is associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Astrotricha roddii is listed as an endangered species under the EPBC Act. The proposal will affect potential habitat.

Vegetation surveys and targeted surveys were conducted across the proposed development footprint in suitable habitat during October-December 2008, September-October 2010 and January 2011, during the species' known flowering period. This species was not recorded on the site.

Vegetation will be removed in linear strips (for turbines, access tracks and the associated ancillary structures required for the running of the wind farm). As a worst case scenario, the area of vegetation to be cleared consists of a permanent loss of 75.36 ha and a temporary impact to 37.11 ha of potential habitat, totalling 112.47 ha. This loss of potential habitat is contiguous with similar vegetation mapped within the study area (amounting to 894.79 ha) and mapped within the project site (amounting to 6319.57 ha). The amount of potential habitat proposed to be impacted represents 12.6 % of the potential habitat mapped within the study area, and only 1.8 % of potential habitat mapped within the study area is likely to consistently support the low levels of disturbance and high species richness characteristic of habitat for this species. For these reasons, the proposal is unlikely to substantially reduce the amount of potential habitat for this species present in the project site.

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

a) lead to a long-term decrease in the size of a population;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to lead to a long-term decrease in the size of a population.

b) reduce the area of occupancy of the species;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will permanently remove up to 112.47 ha of potential habitat for *Astrotricha roddii* and 37.11 ha will be temporarily removed. However, this potential habitat does not constitute habitat critical to the survival of a species.

Habitat critical to the survival of a species refers to areas that are necessary:

For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. The study area is unlikely to be used for dispersal of *Astrotricha roddii*, as no individuals were recorded within the study area. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

o To maintain genetic diversity and long-term evolutionary development;

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Astrotricha roddii* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will permanently remove up to 75.36 ha of potential habitat for *Astrotricha roddii* and temporarily remove up to 37.11 ha of potential habitat. However, no individuals of *Astrotricha roddii* have been detected during the ecological surveys, therefore, removal of this habitat is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Although no individuals of *Astrotricha roddii* were detected, control measures will be implemented to ensure that impacts to potential habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Astrotricha roddii*. The action is not expected to introduce any disease to the study area.

i) interfer substantially with the recovery of the species.

As the study area does not currently support any *Astrotricha roddii* individuals, the potential habitat present within the study area is unlikely to be critical for the recovery of the species. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Bothriochloa biloba (Lobed Blue Grass)

Bothriochloa biloba, is an erect or decumbent grass to 1 m high. It is known from the Darling Downs district in Queensland, south along the western slopes of the Great Dividing Range to North Star, Warialda, Bingara and Merriwa in NSW (Quinn *et al.*, 1995; NSW Scientific Committee, 2004). It also occurs west to Dubbo and around the Hunter Valley (Quinn *et al.*, 1995). This species occurs within the Hunter– Central Rivers, Central West, Namoi, Northern Rivers and Border Rivers–Gwydir (NSW) and Border Rivers Maranoa–Balonne and Condamine (Queensland) Natural Resource Management Regions.

Bothriochloa biloba grows in cleared eucalypt forests and relict grassland, often dominated by Purple Wiregrass (*Aristida ramosa*), Red-leg Grass (*Bothriochloa macra*), Red Grass (*B. decipiens*), Queensland Bluegrass (*Dicanthium sericeum*) or *Austrostipa aristiglumis* (Bean, 1999). Dense stands of Lobed Blue-grass have been recorded in Windmill Grass (*Chloris truncata*) Grassland in the northwestern slopes of NSW (Hunter, 2003). *Bothriochloa biloba* prefers heavier-textured soils such as brown or black clay soils (Quinn *et al.*, 1995; Bean, 1999).

Surveys for this species were undertaken during the 1 - 3 December 2008, 10 - 14 January 2011 and 17 - 21 January 2011 suvrey periods and this species was recorded on site during the December 2008 surveys.

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

a) lead to a long-term decrease in the size of a population;

Approximately 9,372 individuals of *Bothriochloa biloba* were recorded within the study area. However, none would be impacted by the proposal and management measures would be implemented to prevent indirect impacts. Therefore, the proposal would not lead to a long-term decrease in the size of a population of *Bothriochloa biloba*.

b) reduce the area of occupancy of the species;

The proposal would not impact on the *Bothriochloa biloba* within the study area. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

The population of *Bothriochloa biloba* present within the study area would not be fragmented by the proposal.

d) adversely affect habitat critical to the survival of a species;

The proposal will not impact on known habitat for this species. Of the 1569.45 ha of potential habitat within the study area, 122.21 ha (8 %) would be permanenetly removed and 103.93 ha (6 %) temporaily disturbed for the proposal. Given no known habitat would be impacted and the area of potential habitat to be impacted is small compared to the amount within the study area, it is unlikely that the habitat to be impacted is critical to the survival of this species. Futhermore, management measures would be implemented during construction to prevent indirect impacts on any habitat from runoff and sedimentation.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of known habitat for this species and approximately 1569.45 ha of potential habitat is present within the study area. Therefore, it is unlikely that the proposal would disrupt any dispersal mechnisms.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The proposal will not remove areas of known habitat for this species and approximately 1569.45 ha of potential habitat is present within the study area. Therefore, it is unlikely that the proposal impact on the dispersal mechnisms responsible for the long term maintenance of the species;

o To maintain genetic diversity and long-term evolutionary development;

The proposal will not remove areas of known habitat for this species and, therefore, will not impact on the maintenance of the long-term genetic diversity of the species.

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting *Bothriochloa biloba* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site and that the areas of potential habitat are unlikely to be used for the reintroduction of populatins of the recovery of the species as the are on land used for agriculture and grazing.;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The proposal will not impact on known habitat for this species. In addition, 1569.45 ha of potential habitat is present within the study area of which 122.21 ha (8 %) would be permanenetly removed andd 103.93 ha (6 %) temporaily disturbed for the proposal. Given no known habitat would be directly impacted and the area of potential habitat to be impacted is small compared to the amount within the study area, it is unlikely that the habitat loss would lead to a decline of the species. Futhermore, management measures would be implemented during construction to prevent indirect impacts on any habitat from runoff and sedimentation.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Bothriochloa biloba*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

The proposal will not remove areas of known habitat for this species and approximately, 1569.45 ha of potential habitat is present within the study area. Therefore, it is unlikely that the proposal would substantially interfere with the recovery of the species.

Digitaria porrecta (Finger Panic Grass)

Digitaria porrecta is a loosely tufted perennial growing to 60 cm tall. It has grey leaves, 2–3 mm wide, with sharp hairs along the middle. The flowers are clustered together along a stalk in a cylinder shape. These flower clusters, which appear in late summer (mid January to late February), spread stiffly from the flowering stem, with the lower flower clusters arranged in a whorl of four to six, each up to 30 cm long. It seeds from March to April but also reproduces vegetatively by dying back to the tussock base, from which it resprouts in summer (DECCW 2011b). *Digitaria porrecta* occurs in NSW and Queensland. This species occurs within the Border Rivers–Gwydir, Namoi and Central West Natural Resource Management Regions. It is found on the North West Slopes and Plains, from near Moree south to Tambar Springs and from Tamworth to Coonabarabran. It largely occurs on private land (DECCW 2011b). *Digitaria porrecta* usually occurs in grasslands on extensive basaltic plains, and in undulating woodlands and open forests with an underlying basaltic geology. It usually occurs on dark and fine textured soils with some degree of seasonal cracking (Leigh et al. 1984; Halford 1995). It also persists in disturbed habitats, such as fallow paddocks, but its capability to maintain a viable population is unknown (Halford 1995) (DEWHA 2008).

Digitaria porrecta is listed as an Endangered species listed under the EPBC Act.

Vegetation surveys and target surveys were conducted across the proposed development footprint in suitable habitat during January 2011, during the species' known flowering period.

This species has not been recorded within the study area, however potential habitat occurs in woodland communities (DECCW 2011b), and within the study area is associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

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

a) lead to a long-term decrease in the size of a population;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to lead to a long-term decrease in the size of a population.

b) reduce the area of occupancy of the species;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will permanently remove up to 122.78 ha of potential habitat for *Digitaria porrecta* and temporarily remove up to 104.47 ha of potential habitat. However, this potential habitat does not constitute habitat critical to the survival of a species.

Habitat critical to the survival of a species refers to areas that are necessary:

$\circ~$ For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. The study area is unlikely to be used for dispersal of *Digitaria porrecta*, as no individuals were recorded within the study area. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

o To maintain genetic diversity and long-term evolutionary development;

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Digitaria porrecta* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will permanently remove up to 122.78 ha of potential habitat for *Digitaria porrecta* and temporarily remove up to 104.47 ha of potential habitat. However, no individuals of *Digitaria porrecta* have been detected during the ecological surveys, therefore removal of this habitat is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Although no individuals of *Digitaria porrecta* were detected, control measures will be implemented to ensure that impacts to potential habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Digitaria porrecta*. The action is not expected to introduce any disease to the study area.

i) interfer substantially with the recovery of the species.

As the study area does not currently support any *Digitaria porrecta* individuals, the potential habitat present within the study area is unlikely to be critical for the recovery of the species. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Dichanthium setosum (Bluegrass)

Dichanthium setosum is an erect perennial tussock grass that grows less than one metre in height (DECCW 2011b). Its distribution is concentrated in the northern tablelands of NSW and north-western slopes, however it has been recorded as far west as Narrabri on the NSW western plains, and in Queensland as far north as Rockhampton. *Dichanthium setosum* occurs in woodland communities (DECCW 2011b), and within the study area is associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Dichanthium setosum is listed as Vulnerable under the EPBC Act.

The surveys identified *Dichanthium setosum* in five localities within the study area (Figure 9); one large patch outside the development footprint in the Wellingrove cluster; two small patches within the Sapphire cluster adjacent to the turbine layout and an internal reticulation route; and one relatively large patch at the western edge of the Swan Vale cluster which, although immediately adjacent to the proposed study area, will be avoided during construction.

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

a) lead to a long-term decrease in the size of an important population of a species;

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• Key source populations either for breeding or dispersal;

The population of *Dichanthium setosum* is unlikely to be a key source population for dispersal, given the species is scattered throughout the district.

• Populations that are necessary for maintaining genetic diversity, and/or;

Little is known of the genetic mechanisms of *Dichanthium setosum*, however given the magnitude of the number of individuals estimated to be present within the study area alone is in the thousands, it is not expected that the population is necessary for maintaining genetic diversity of the species.

o populations that are near the limit of the species range;

The population is not at the limit of the geographical range of a species, as the known distribution of *Dichanthium setosum* extends west to Narrabri and north into south-east Queensland (DECCW 2011b).

Therefore, the population within the study area is not expected to constitute an important population. Furthermore, the action will not directly affect any plants of *Dichanthium setosum*. All plants within the study area have been avoided. Therefore a long-term decrease is not anticipated.

b) reduce the area of occupancy of an important population;

As detailed in part a), the population of *Dichanthium setosum* within the study area does not constitute an important population under the EPBC Act.

c) fragment an existing important population into two or more populations;

As detailed in part a), the population of *Dichanthium setosum* within the study area does not constitute an important population under the EPBC Act.

d) adversely affect habitat critical to the survival of a species;

The action will permanently remove up to 122.78 ha of potential habitat for *Dichanthium setosum* and temporarily remove up to 104.47 ha of potential habitat. However, this potential habitat does not constitute habitat critical to the survival of a species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The proposal will not remove habitat critical to the long-term maintenance of the species. As a worst case scenario, the action will only remove 2.6% of the potential habitat mapped within the project site. This leaves ample potential habitat available for the long-term maintenance of the species;

To maintain genetic diversity and long-term evolutionary development;

Little is known of the genetic mechanisms of *Dichanthium setosum*, however given the magnitude of the number of individuals estimated to be present within the study area alone is in the thousands, it is not expected that the population is necessary for maintaining genetic diversity of the species.

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Dichanthium setosum* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of an important population;

This is not applicable to a flora species.

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

The action will not directly affect any plants of *Dichanthium setosum*, as all plants adjacent to the study area have been avoided. The action will permanently remove up to 122.78 ha of potential habitat for *Dichanthium setosum* and temporarily remove up to 104.47 ha of potential habitat. However, given this represents 2.6 % of potential habitat mapped within the study area, this 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.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Control measures will be implemented to ensure that impacts to habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from preconstruction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are detailed in Table 17 of the Ecological Assessment.

h) introduce disease that may cause the species to decline, or

No diseases are known that threaten *Dichanthium setosum*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

Areas not currently supporting patches of *Dichanthium setosum* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Diuris pedunculata (Small Snake Orchid)

Diuris pedunculata is a small yellow orchid with two drooping side petals on a flowering stem less than 10 cm tall, and flowers between August and October.

Diuris pedunculata is endemic to NSW. Its original distribution was scattered extensively along the Great Dividing Range from Queensland to the Hawkesbury River, but is now primarily found on the northern tablelands (DECCW 2011b).

Diuris pedunculata prefers moist areas (Rouse 2003; Woolcock & Woolcock 1984), and has been found growing in open areas of dry sclerophyll forests with grassy understories, in riparian forests (including gallery rainforests), swamp forests, in sub-alpine grasslands and herbfields. The study area falls within the known altitude range of the species (DECCW 2011b), and although it has not been recorded within the study area, however potential habitat occurs in woodland communities (DECCW 2011b), and within the study area is associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Diurus pedunculata is listed as an Endangered species under the EPBC Act.

Vegetation surveys and target surveys were conducted across the proposed development footprint in suitable habitat during October 2008 and September-October 2010, during the species' known flowering period. Surveys were also timed when known populations of *Diuris pedunculata* were flowering. This species was not recorded on the site.

Vegetation will be removed in linear strips (for turbines, access tracks and the associated ancillary structures required for the running of the wind farm). As a worst case scenario, the area of vegetation to be cleared consists of a permanent loss of 122.78 ha and a temporary impact to 104.47 ha of potential habitat, totalling 227.25 ha. This loss of potential habitat is contiguous with similar vegetation mapped within the project site (amounting to 8856.66 ha). The amount of potential habitat proposed to be impacted represents only 2.6 % of potential habitat mapped within the project site. Furthermore, only a fraction of the potential habitat mapped within the study area is likely to consistently support the low levels of disturbance and high species richness characteristic of habitat for this species.

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

a) lead to a long-term decrease in the size of a population;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to lead to a long-term decrease in the size of a population.

b) reduce the area of occupancy of the species;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will permanently remove up to 122.78 ha of potential habitat for *Diuris pedunculata* and temporarily remove up to 104.47 ha of potential habitat. However, this potential habitat does not constitute habitat critical to the survival of a species. Furthermore, only a fraction of the potential habitat mapped within the study area is likely to consistently support the low levels of disturbance and high species richness characteristic of habitat for this species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. The study area is unlikely to be used for dispersal of *Diuris pedunculata*, as no individuals were recorded within the study area. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

• To maintain genetic diversity and long-term evolutionary development;

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Diuris pedunculata* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will permanently remove up to 122.78 ha of potential habitat for *Diuris pedunculata* and temporarily remove up to 104.47 ha of potential habitat. However, no individuals of *Diuris pedunculata* have been detected during the ecological surveys, therefore removal of this habitat is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Although no individuals of *Diuris pedunculata* were detected, control measures will be implemented to ensure that impacts to potential habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Diuris pedunculata*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

As the study area does not currently support any *Diuris pedunculata* individuals, the potential habitat present within the study area is unlikely to be critical for the recovery of the species. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Eucalyptus mckieana (McKies's Stringybark)

Eucalyptus mckieana is a medium sized eucalypt with red-brown fibrous bark and is confined to the rain shadow on the western side of the northern tablelands of NSW between Bendemeer in NSW and Stanthorpe in southem Queensland. *Eucalyptus mckieana* is most commonly found on gently sloping or flat site, on poor sandy loams, forming a grassy open forest in association with a suite of other eucalypt species (DECCW 2011a).

Vegetation surveys and targeted surveys were undertaken across the development footprint in areas of suitable habitat during October, November and December 2008, April and May 2009, September, October and December 2010, and January 2011.

The existing records of *Eucalyptus mckieana* were previously considered for inclusion into the turbine corridor. However, the final design has excluded this area from the development footprint, and thus these ten trees will not be affected by the development.

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

a) lead to a long-term decrease in the size of a population;

Ten *Eucalyptus mckieana* were recorded within the study area. However, none would be impacted by the proposal and management measures would be implemented to prevent indirect impacts. Furthermore, the proposed impacts are a distance from the population of this species known from within the study area. Therefore the proposal would not lead to a long-term decrease in the size of a population of *Eucalyptus mckieana*.

b) reduce the area of occupancy of the species;

The proposal would not impact on the *Eucalyptus mckieana* within the study area. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

The current population of *Eucalyptus mckieana* present within the study area would not be fragmented by the proposal.

d) adversely affect habitat critical to the survival of a species;

The proposal will not impact on known habitat for this species. Approximately 73.71 ha of habitat *Eucalyptus mckieana* is present within the project site of which only potential habitat in the form of native pasture (1.31 ha) would be impacted. Given no known habitat would be impacted and the area potential habitat to be impacted is small compared to the amount within the study area and project site, it is unlikely that the habitat to be impacted is critical to the survival of this species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not impact on known habitat for this species. Approximately 73.71 ha of habitat *Eucalyptus mckieana* is present within the project site of which only potential habitat in the form of native pasture (1.31 ha, 2 %) would be impacted. Therefore, it is unlikely that the proposal would disrupt any dispersal mechnisms.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The proposal will not impact on known habitat for this species. Approximately 73.71 ha of habitat *Eucalyptus mckieana* is present within the project site of which only potential habitat in the form of native pasture (1.31 ha, 2 %) would be impacted. Therefore, it is unlikely that the proposal impact on the dispersal mechnisms responsible for the long term maintenance of the species;

• To maintain genetic diversity and long-term evolutionary development;

The proposal will not remove areas of known habitat for this species and therefore will not impact on the maintenance of the long-term genetic diversity of the species.

• For the reintroduction of populations or recovery of the species;

The proposal will not impact on known habitat for this species and the 1.31 ha of native pasture that may provide potential habitat and are to be removed are unlikely to be critical for the recovery of the species. The areas of potential habitat are unlikely to be used for the reintroduction of populatins of the recovery of the species as the are on land used for agriculture and grazing.;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The proposal will not impact on known habitat for this species. Approximately 73.71 ha of habitat *Eucalyptus mckieana* is present within the project site of which only potential habitat in the form of native pasture (1.31 ha, 2 %) would be impacted. . Given no known habitat would be impacted and the area potential habitat to be impacted is small compared to the amount within the study area and is native pasture, it is unlikely that the habitat loss would lead to a decline of the species.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Eucalyptus mckieana*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

The proposal will not impact on known habitat for this species. Approximately 73.71 ha of habitat *Eucalyptus mckieana* is present within the project site of which only potential habitat in the form of native pasture (1.31 ha, 2 %) would be impacted. Therefore, it is unlikely that the proposal would substantially interfere with the recovery of the species.

Eucalyptus nicholii (Narrow-leaved Black Peppermint)

Eucalyptus nicholii is a tree growing to 15-20 m tall with thick, fibrous, grey to grey-brown, longitudinally furrowed rough bark over its trunk and branches. Adult foliage is dull greenish grey and narrowly lanceolate, with flowers in clusters of seven (DECCW 2011b).

The species is confined to the New England Tablelands of NSW, where it occurs largely on private property from north of Tenterfield to Nundle (DECCW 2011b). It occurs in grassy or sclerophyll woodland communities and within the study area is associated with the Blakely's Red Gum – Roughbarked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Eucalyptus nicholii is listed as Vulnerable under the TSC Act.

There is potential for *Eucalyptus nicholii* to occur within areas of woodland and derived grassland. Vegetation surveys and target surveys were conducted across the proposed development footprint in suitable habitat during October, November and December 2008, April & May 2009, and September, October and December 2010, and January 2011. No individuals were recorded during the surveys.

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

a) lead to a long-term decrease in the size of a population;

No individuals of *Eucalyptus nicholii* were recorded within the study area. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted it is unlikely that the proposal would lead to a long-term decrease in the size of a populatin of this species.

b) reduce the area of occupancy of the species;

Eucalyptus nicholii was not identified within the study area. Therefore, the proposal will not reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

No individuals of *Eucalyptus nicholii* were recorded within the study area and, therefore, fragmentation of populations would not occur.

d) adversely affect habitat critical to the survival of a species;

No individuals of *Eucalyptus nicholii* were recorded within the study area. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted it is unlikely that the proposal would lead to a long-term decrease in the size of a populatin of this species.
Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not impact on any individuals of this species. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted it is unlikely that the proposal would disrupt any dispersal mechnisms.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The proposal will not impact on any individuals of this species. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted, it is unlikely that the proposal will impact on the dispersal mechnisms responsible for the long-term maintenance of the species;

o To maintain genetic diversity and long-term evolutionary development;

The proposal will not remove areas of known habitat for this species and, therefore, will not impact on the maintenance of the long-term genetic diversity of the species.

• For the reintroduction of populations or recovery of the species;

The study area supports potential haitat for this species of which only a very small portion would be impacted. The areas of potential habitat are unlikely to be used for the reintroduction of populatins of the recovery of the species as they are on land used for agriculture and grazing;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The proposal will not impact on any known habitat for this species. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary

impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted and that the amount of habitat to be impacted is small in comparision to that remaining within the study area, it is unlikely that the proposed clearance would lead to a decrease in the availability or quality of habitat for this species such that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Measures to avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Eucalyptus nicholii*. The proposal is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

The proposal will not impact on any known habitat for this species. The total area of potential habitat for *Eucalyptus nicholii* within the study area is 1581.91 ha. An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha of potential habitat and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha of potential habitat and a temporary impact to 213.71 ha of potential habitat. Given no known habitat is to be impacted and that the amount of habitat to be impacted is small in comparision to that remaining within the study area, it is unlikely that the proposal would substantially interfere with the recovery of the species.

Picris evae (Hawkweed)

Picris evae is an erect annual herb growing 1.3–1.7 m high, with linear, variable, stalkless leaves, sparsely covered with split-ended hairs (that mostly grow around the base of the plant) and small yellow flower heads (DECCW 2011b).

Picris evae has been recorded across the northern tablelands from Oxley Park near Tamworth, to Elsmore (east of Inverell) and its distribution extends into south-east Queensland (DECCW 2011b).

Picris evae occurs in sclerophyll open woodland with a grassy understorey composed of *Dichanthium* spp.. Associated canopy species include *Eucalyptus melliodora*, *E. crebra*, *E. populnea*, *E. albens*, *Angophora subvelutina*, *Allocasuarina torulosa*, and *Casuarina cunninghamiana* (Holzapfel, 1994), and within the study area is associated with the Black Cypress Pine – Tumbledown Gum – Narrow-leaved Ironbark open forest, Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest and White Box grassy woodland communities.

Vegetation surveys and targeted surveys were conducted across the proposed development footprint in potential habitat during October-December 2008, September-October and December 2010 and January 2011, during the species' known flowering period. No individuals of *Picris evae* were detected during the ecological survey.

Picris evae is listed as a Vulnerable species under the EPBC Act.

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

a) lead to a long-term decrease in the size of an important population of a species;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to lead to a long-term decrease in the size of an important population.

b) reduce the area of occupancy of an important population;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to reduce the area of occupancy of an important population.

c) fragment an existing important population into two or more populations;

No populations were detected during targeted surveys of the study area within areas of potential habitat. Therefore, the proposal is not expected to fragment an existing important population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will permanently remove up to 75.36 ha of potential habitat for *Picris evae* and temporarily remove up to 37.11 ha of potential habitat. However, this potential habitat does not constitute habitat critical to the survival of a species. Furthermore, only a fraction of the potential habitat mapped within the study area is likely to consistently support the low levels of disturbance and high species richness characteristic of habitat for this species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. The study area is unlikely to be used for dispersal of *Picris evae*, as no individuals were recorded within the study area. As a worst case scenario, the action will only remove 1.8% of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

• To maintain genetic diversity and long-term evolutionary development;

Given no individuals were detected within or adjacent to the study area, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Picris evae* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 1.8 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a important population;

This is not applicable to a flora species.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will permanently remove up to 75.36 ha of potential habitat for *Picris evae* and temporarily remove up to 37.11 ha of potential habitat. However, no individuals of *Picris evae* have been detected during the ecological surveys, therefore removal of this habitat is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;

Although no individuals of *Picris evae* were detected, control measures will be implemented to ensure that impacts to potential habitat for the threatened species are minimised. Measures to

avoid the spread of weeds will be implemented from pre-construction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are outlined in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten *Picris evae*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

As the study area does not currently support any *Picris evae* individuals, the potential habitat present within the study area is unlikely to be critical for the recovery of the species. As a worst case scenario, the action will only remove 1.78 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Thesium australe (Austral Toadflax)

Thesium australe is a small, straggling herb to 40 cm tall and is found in very small populations and within NSW is scattered throughout the east of the state, from the northern to southern tablelands. *Thesium australe* occurs in grassland or grassy woodland, often in damp sites in association with Kangaroo Grass (*Themeda australis*) (DECCW 2011b).

Thesium australe is listed as a Vulnerable species under the EPBC Act.

Within the study area, the species is associated with the Blakely's Red Gum – Rough-barked Apple – Red Stringybark grassy open forest, Blakely's Red Gum – Yellow Box grassy open forest, Manna Gum – Rough-barked Apple – Yellow Box grassy woodland/open forest, Tenterfield Woollybutt - Silvertop Stringybark open forest, White Box grassy woodland communities and derived grassland.

Approximately 7,350 individuals were recorded across the study area including in the southern portion of the Sapphire cluster just west of the current powerline and north east of the site at a number of locations within the Wellingrove Cluster (Figure 9). The proposed layout has been modified to ensure that all known individuals will not be directly impacted and mitigation measures will be implemented to prevent indirect impacts.

An 80m turbine layout with 12 m roads would result in a permanent loss of 122.78 ha and a temporary impact to 104.47 ha of potential habitat. A 100m turbine layout with 12 m roads would result in a permanent loss of 116.95 ha and a temporary impact to 96.76 ha of potential habitat.

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

a) lead to a long-term decrease in the size of an important population of a species;

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• Key source populations either for breeding or dispersal;

The population of *Thesium australe* is unlikely to be a key source population for dispersal, given records of the species are scattered throughout the district.

Populations that are necessary for maintaining genetic diversity, and/or;

Little is known of the genetic mechanisms of *Thesium australe*, however given the magnitude of the number of individuals estimated to be present within the study area alone is in the thousands, it is not expected that the population is necessary for maintaining genetic diversity of the species.

o populations that are near the limit of the species range;

The population is not at the limit of the geographical range of a species, as the known distribution of *Thesium australe* extends to eastern Victoria and south-eastern Queensland (DECCW 2011b).

Therefore, the population within the study area is not expected to constitute an important population. Furthermore, the action will not directly affect any plants of *Thesium australe*. All

plants within the study area have been avoided, therefore a long-term decrease is not anticipated.

b) reduce the area of occupancy of an important population;

As detailed in part a), the population of *Thesium australe* within the study area does not constitute an important population under the EPBC Act.

c) fragment an existing important population into two or more populations;

As detailed in part a), the population of *Thesium australe* within the study area does not constitute an important population under the EPBC Act.

d) adversely affect habitat critical to the survival of a species;

All known populations and individuals of the species will be avoided. The action will permanently remove up to 122.78 ha of potential habitat for *Thesium australe* and temporarily remove up to 104.47 ha of potential habitat. However, surveys of the impacted areas did not detect the species in any of this potential habitat. This potential habitat does not constitute habitat critical to the survival of the species.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

The proposal will not remove areas of habitat that are necessary to the dispersal of the population. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for dispersal;

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The proposal will not remove habitat critical to the long-term maintenance of the species. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the long-term maintenance of the species;

o To maintain genetic diversity and long-term evolutionary development;

Little is known of the genetic mechanisms of *Thesium australe*. However, given the magnitude of the number of individuals estimated to be present within the study area alone is in the thousands and that no individuals will be impacted, it is unlikely that the habitat to be removed if critical for maintaining the genetic diversity of the species.

For the reintroduction of populations or recovery of the species;

Areas not currently supporting patches of *Thesium australe* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of an important population;

This is not applicable to a flora species.

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

The action will not directly affect any plants of *Thesium australe*, as all plants adjacent to the study area have been avoided. The action will permanently remove up to 122.78 ha of potential habitat for *Thesium australe* and temporarily remove up to 104.47 ha of potential habitat. However, given this represents 2.6 % of potential habitat mapped within the study area, this 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.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Control measures will be implemented to ensure that impacts to habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from preconstruction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are detailed in Table 17.

h) introduce disease that may cause the species to decline, or

No diseases are known that threaten *Thesium australe*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

Areas not currently supporting patches of *Thesium australe* are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 2.6 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

THREATENED FAUNA

Anthochaera phrygia (Regent Honeyeater)

Regent Honeyeater is a striking black and yellow honeyeater with a curved bill and a wingspan of 30cm. Adults are 20 - 24 cm long, and have a characteristic patch of dark pink or cream-coloured facial-skin around the eye. The call is a soft metallic bell-like song, and birds are most vocal in the non-breeding season (November to July) (DECCW 2011b). Preferred habitat is temperate woodland and open forest of the inland slopes of south-east Australia (DECCW 2011b).

The range of Regent Honeyeater has contracted dramatically in the last 30 years, to between north-east Victoria and south-east Queensland. Only three known key breeding populations remain, at Chiltern (NE Vic), Capertee Valley (NSW central highlands), and Bundarra-Barraba (NSW north-western slopes). The distribution is patchy, and mainly confined to breeding areas and surrounding patchy woodlands, however on occasional years flocks are recorded foraging in coastal woodlands and forests (DECCW 2011b).

Regent Honeyeater is listed as an Endangered species under the EPBC Act. It is also listed as a Migratory species under the EPBC Act, and is included in the Japan-Australia Migratory Bird Agreement (JAMBA).

The April 2009 and May 2009 survey periods coincided with the survey periods for the Regent Honeyeater. However, this species was not recorded.

There were no records of Regent Honeyeater on the Birds Australia data search (2009) although there is a historical record on the DECCW database (1968), approximately 1 km to the south of the site and a more recent record (1994) along Wellingrove Road, 7 km to the north east of the study area. It is worth noting that the Birds Australia survey effort in the area is considerable with a number of survey records having been submitted over many years.

Areas of potential habitat for Regent Honeyeater are shown in Figure 9. Within the project site, 6331.11 ha of potential habitat have been mapped. The removal of potential habitat will constitute 103.16 ha based on the 100 m turbine option, or 112.47 ha based on the 80 m turbine option.

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

a) lead to a long-term decrease in the size of a population;

As detailed above, Regent Honeyeater was not recorded within the study area during the ecological surveys, and Regent Honeyeater has not been recorded within the local area since 1994. The study area only provides habitat that may periodically be used for foraging by the Regent Honeyeater. Therefore, the action is not expected to lead to a long-term decrease in the size of a population.

b) reduce the area of occupancy of the species;

As detailed above, Regent Honeyeater is not known to currently occupy the study area or the local area. The study area only provides habitat that may periodically be used for foraging by the Regent Honeyeater. A relatively small amount of habitat is proposed to be removed, and vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

As detailed above, no populations of Regent Honeyeater have been detected within the study area during the ecological surveys, and this species has not been recorded within the local area since 1994. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will remove up to 112.47 ha of potential habitat for Regent Honeyeater. However, this potential habitat does not constitute habitat critical to the survival of a species, as it represents habitat used only periodically for foraging, and is not known breeding habitat.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

Sapphire is not a known breeding site for this species and given the transitory and migratory nature of this species, it is likely to only be used periodically for foraging. As a worst case scenario, the action will only remove 1.45 % of the potential habitat mapped. This leaves ample potential habitat available within the project site for foraging and movement, and large amounts of additional habitat is likely to exist beyond the study area on adjacent lands and more broadly within the region. The proposal will not remove areas of habitat that are necessary to the foraging, breeding, roosting or movement of the species.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

As detailed above, Sapphire is not a known breeding site for this species and given the transitory and migratory nature of this species, it is likely to only be used periodically for foraging. As a worst case scenario, the action will only remove 1.45 % of the potential habitat mapped, leaving ample potential habitat available within the local area for foraging and movement, The potential habitat present is not necessary for the long-term maintenance of the species or essential pollinators.

• To maintain genetic diversity and long-term evolutionary development;

Regent Honeyeater numbers are estimated to be between 800 and 2000 individuals remaining in the wild (DSEWPAC 2009). Habitat forming key linkages for migration, and known breeding locations are necessary for maintaining sustainable populations. However, given the potential habitat within the study area does not provide either of these functions, and is likely to only be used periodically as foraging habitat, the potential habitat present is not necessary for maintaining genetic diversity of the species;

• For the reintroduction of populations or recovery of the species;

Areas not currently supporting breeding populations of Regent Honeyeater are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site available for foraging. As a worst case scenario, the action will only remove 1.45 % of the potential habitat mapped. This leaves ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

Sapphire is not a known breeding site for this species and given the transitory and migratory nature of this species, it is likely to only be used periodically for foraging.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will remove up to 112.47 ha of potential habitat for Regent Honeyeater. However, no records of Regent Honeyeater have been ever been made within the study area, and no records of Regent Honeyeater within the local area have been made since 1994, despite bird survey effort in the area. Furthermore, the project site and local area provide ample available foraging habitat in similar or better condition than that within the study area. Therefore, removal of a relatively small amount of potential habitat within the study area is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Feral animals can have a detrimental impact on Regent Honeyeater through predation by species such as feral Cats and the European Red Fox. The proposal is considered unlikely to contribute to increasing feral animal activity across the project site and instead may assist with the management of these species. Landholders currently implement feral animal control programs across the site, particularly around lambing/calving time, and an increased income to landholders within the district may result in more funding available for baiting programs or other control measures which can be expensive.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten Regent Honeyeater. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

No records of Regent Honeyeater have been made within the local area since 1994, despite bird survey effort in the area. Furthermore the project site and local area provide ample available foraging habitat in similar or better condition than that within the study area. This leaves ample potential habitat available for the recovery of the species.

Dasyurus maculatus maculatus (SE mainland population) (Spot-tailed Quoll)

The Spot-tailed Quoll inhabits a range of forest communities including wet and dry sclerophyll forests, coastal heathlands and rainforests (Mansergh 1984; DECCW 2011b), more frequently recorded near the ecotones of closed and open forest. This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in (DECCW 2011b). Maternal den sites include logs with cryptic entrances, rock outcrops, windrows and burrows (Environment Australia 2000).

Spot-tailed Quoll is listed as an Endangered species under the EPBC Act.

Infra-red cameras were placed across the study area during May 2009 and September 2010 over a total of 65 camera nights. No records of Spot-tailed Quoll were made during the current survey, nor was any evidence of Spot-tailed Quoll dens or latrine sites detected. Spot-tailed Quoll has been recorded once within the local area (a 10 km radius of the study area) in 2006, when an incidental sighting was made on the south side of the Gwydir Highway. Spot-tailed Quoll habitat mapped within the study area comprises 894.79 ha of woodland. The proposed loss of potential habitat for Spot-tailed Quoll within the study area comprises permanent removal of up to 75.36 ha of woodland habitat and the temporary loss of 37.11 ha of woodland habitat.

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

a) lead to a long-term decrease in the size of a population;

As detailed above, no records of Spot-tailed Quoll were made during the current survey, nor was any evidence of Spot-tailed Quoll dens or latrine sites detected. Spot-tailed Quoll has been recorded once within the local area (a 10 km radius of the study area) in 2006, when an incidental sighting was made on the south side of the Gwydir Highway. Preferred habitat for the species includes large, forested areas with hollow logs and rocky outcrops, particularly areas with thick understorey or dense vegetation along drainage lines. The habitat at Sapphire is considered to be marginal for the species given the drainage lines are largely cleared of vegetation and the understorey is relatively sparse. A relatively small amount of potential habitat is proposed to be removed, representing only 12.6 % of potential habitat within the study area and 1.8 % of potential habitat mapped within the project site. Vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. The proposal will avoid tree clearance through siting of turbines in previously cleared areas where possible. Hollow-bearing trees will be retained where possible, and logs will be retained and installed as fauna habitat following construction. For these reasons, the action is not expected to lead to a long-term decrease in the size of any populations utilising the study area.

b) reduce the area of occupancy of the species;

As detailed above, no records of Spot-tailed Quoll were made during the current survey and it has been recorded only once within the local area. A relatively small amount of habitat is proposed to be removed, representing only 12.6 % of potential habitat within the study area and 1.8 % of potential habitat mapped within the project site. The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. Only in Tasmania is it still considered common (DECCW 2011b). At Sapphire, this species is not at the limit of its known distribution. Therefore, the proposal is not expected to reduce the area of occupancy of the species at a local or national scale.

c) fragment an existing population into two or more populations;

As detailed above, no records of Spot-tailed Quoll were made during the current survey and it has been recorded only once within the local area. Vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will remove up to 112.47 ha of potential habitat for Spot-tailed Quoll. However, this potential habitat is unlikely to constitute habitat critical to the survival of a species given it is marginal and extensive areas of potential habitat will remain within the project site (6331.11).

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

This species is known to forage over a wide area of up to 750 hectares for females and 3500 hectares for males. Preferred habitat for the species includes large, forested areas with hollow logs and rocky outcrops, particularly areas with thick understorey or dense vegetation along drainage lines. The habitat within the study area is considered to be marginal for the species given the drainage lines are largely cleared of vegetation and the understorey is relatively sparse. Areas of more suitable habitat occur outside the study area on the south-east upper slopes of Mount Buckley, where the shrub cover of *Bursaria spinosa* (Sweet Bursaria) is significantly higher, however large areas of their preferred habitat type are more commonly found in denser forest on the eastern side of the Great Dividing Range. The removal of 112.47 ha of potential habitat still avoids 98% of the potential habitat mapped within the project site available for foraging, breeding, roosting and movement. The proposal will not remove areas of habitat that are likely to be critical to the survival of the species.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

As detailed above, the habitat within the study area is considered to be marginal for the species and better habitat is being avoided and retained outside of the impact area. The removal of 112.47 ha of potential habitat leaves ample potential habitat available within the local area for foraging and movement, as large amounts of additional habitat occur outside within the project site and local area. The potential habitat present is unlikely to be necessary for the long-term maintenance of the species.

To maintain genetic diversity and long-term evolutionary development;

As detailed above, the habitat within the study area is considered to be marginal for the species and better habitat is being avoided and retained outside of the impact area. The removal of 112.47 ha of potential habitat leaves ample potential habitat available within the local area for breeding and movement of Quolls. The potential habitat present is unlikely to be necessary for maintaining genetic diversity of the species.

• For the reintroduction of populations or recovery of the species;

As detailed above, the habitat within the study area is considered to be marginal for the species and better habitat is being avoided and retained outside of the impact area. Of the potential habitat mapped within the project area, 98% will be avoided and be available for the reintroduction of populations or the recovery of the species.

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

Spot-tailed Quolls breed from April to July each year, with dens in hollow logs, tree hollows, rock outcrops or caves. The low-lying rock outcrops within the study area do not provide suitable habitat for dens, and there are no caves present within the study area. The only suitable habitat for Spot-tailed Quoll nests within the study area are fallen hollow logs or tree hollows. Given the marginal nature of the potential habitat for the Spot-tailed Quoll. Hollow-bearing trees will be retained where possible, and logs will be or relocated to continue to function as fauna habitat following construction. Any disturbance to hollow-bearing trees or logs will require a pre-clearance survey to be undertaken in accordance with a tree clearing protocol. An ecologist will be present on site during clearing to capture and re-release fauna (where appropriate). The project is not expected to disrupt the breeding cycle of any population.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

Preferred habitat for the species includes large, forested areas with hollow logs and rocky outcrops, particularly areas with thick understorey or dense vegetation along drainage lines, and as such records of Spot-tailed Quoll are significantly higher on the eastern slopes of the Great Dividing Range. The habitat at Sapphire is considered to be marginal for the species given the drainage lines are largely cleared of vegetation and the understorey is relatively sparse. The action will remove up to 112.47 ha of marginal potential habitat for Spot-tailed Quoll, which represents only 12.6 % of potential habitat within the study area and 1.78 % of potential habitat mapped within the project site. Vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. The proposal will avoid tree clearance through siting of turbines in previously cleared areas where possible. Hollow-bearing trees will be retained where possible, and logs will be or relocated to continue to function as fauna habitat following construction. Therefore, removal of a relatively small amount of potential habitat within the study area is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Feral animals can have a detrimental impact on Spot-tailed Quoll through predation by species such as feral Cats and the European Red Fox. The proposal is considered unlikely to contribute to increasing feral animal activity across the project site and instead may assist with the management of these species. Landholders currently implement feral animal control programs across the site, particularly around lambing/calving time, and an increased income to

landholders within the district may result in more funding available for baiting programs or other control measures which can be expensive. That said, landholders should consider the accidental poisoning of Spot-tailed Quoll when planning baiting programs. It is best to avoid placement of baits within the best areas of Quoll habitat within the project site (that is, slopes and drainage lines on the south-east slopes of Mount Buckley with a relatively dense shrub layer).

h) introduce disease that may cause the species to decline, or

Epidemic diseases, such as parasitic protozoans, are known to be passed from Cats to the Quolls (DECCW 2011b). The action is not expected to increase cat numbers within the study area or project site, and is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

One record of Spot-tailed Quoll was made in the local area in 2006, however no records were made during the ecological assessment, nor were any dens or latrine sites detected. Furthermore, the potential habitat within the study area represents marginal habitat for Spot-tailed Quoll based on their preference for densely vegetated drainage lines in open forest communities. The proposed removal of 112.47 ha of woodland represents only 1.78 % of potential habitat within the project site, and this still allows for ample potential habitat available for the recovery of the species, particularly given that Spot-tailed Quoll population records appear to be concentrated around the eastern slopes of the Great Dividing Range in open forest communities that are relatively undisturbed compared to the woodland within the study area.

Lathamus discolor (Swift Parrot)

The Swift Parrot breeds in Tasmania between September and January and migrates to the mainland in autumn, where it forages on profuse flowering eucalypts (Blakers *et al.* 1984; Schodde and Tidemann 1986). Hence on the mainland, autumn and winter flowering eucalypts are an important food source for this species and include *Eucalyptus robusta* (Swamp Mahogany), *Corymbia maculata* (Spotted Gum), *C. gummifera* (Red Bloodwood), *E. sideroxylon* (Mugga Ironbark), and *E. albens* (White Box).

Another food source is lerp, a carbohydrate exudate of insects that feed on eucalypt phloem through leaf surfaces (Smales 2005). Commonly used lerp infested trees include *E. microcarpa* (Inland Grey Box), *E. moluccana* (Grey Box) and *E. pilularis* (Blackbutt).

These resources may be very localised, eruptive and highly variable from one year to another. As a consequence, Swift Parrots appear to be very mobile, even nomadic, during the course of a given winter and their mainland distribution may differ considerably between years (Smales 2005).

In NSW, the Swift Parrot mostly occurs on the coast and south west slopes, but its range extends from Victoria and the eastern parts of South Australia to south-east Queensland (DECCW 2011b). The population estimates in 2005 estimated fewer than 2000 birds remaining (Smales 2005).

Swift Parrot is listed as an endangered species under the EPBC Act. It is also listed as a marine species, due to its migratory path over Bass Strait.

The April 2009 and May 2009 survey periods coincided with the survey periods for the Swift Parrot. Swift Parrot was not recorded at the site and there are no database records for the species within a 10 km radius of the study area. The species is predicted to occur in the Glenn Innes-Guyra Basalts CMA subregion and has the potential to occur at the site given the presence of winter-flowering eucalypts including *Eucalyptus blakelyi* Blakely's Red Gum, *E. laevopinea* Silvertop Stringybark, *E. albens*, *E. dealbata* Tumbledown Red Gum and *E. crebra* Narrow-leaved Ironbark.

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

a) lead to a long-term decrease in the size of a population;

As detailed above, no records of Swift Parrot were made during the current survey. Swift Parrot has never been recorded within the local area (a 10 km radius of the study area), despite bird survey effort on many occasions in the past. Therefore, the action is not expected to lead to a long-term decrease in the size of a population.

b) reduce the area of occupancy of the species;

As detailed above, no records of Swift Parrot were made during the current survey. Swift Parrot has never been recorded within the local area (a 10 km radius of the study area), despite bird survey effort on many occasions in the past. The study area supports 1594.62 ha of potential habitat for Swift Parrot in the form of vegetation communities containing autumn/winter flowering eucalypts. Of this amount, 123.64 ha (7.8 % of study area) will be permanently cleared and 104.92 ha (6.6 % of study area) will be temporarily cleared within the study area. Vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

c) fragment an existing population into two or more populations;

As detailed above, no individuals or populations of Swift Parrot have ever been detected within 10 km of the study area. Therefore, the proposal is not expected to fragment an existing population into two or more populations.

d) adversely affect habitat critical to the survival of a species;

The action will involve the permanent removal of 123.64 ha (7.8 % of study area) of potential habitat and 104.92 ha (6.6 % of study area) of temporary clearance. However, this potential habitat does not constitute habitat critical to the survival of a species, as it represents habitat used only periodically for foraging, and is not known breeding habitat.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

Sapphire is not a known breeding site for this species and given the transitory and migratory nature of this species, it is likely to only be used periodically for foraging. The removal of 11.93 ha of potential habitat leaves ample potential habitat available within the local area for foraging and movement, as large amounts of additional habitat is likely to exist beyond the study area on adjacent lands and elsewhere within the region. The proposal will not remove areas of habitat that are necessary to the foraging, breeding, roosting or movement of the species.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

As detailed above, Sapphire is not a known breeding site for this species and given the transitory and migratory nature of this species, it is likely to only be used periodically for foraging. The action will involve the permanent removal of 123.64 ha (7.8 % of study area) of potential habitat and 104.92 ha (6.6 % of study area) of temporary clearance. This leaves ample potential habitat available within the project site (6331.11 ha) for foraging and movement, as large amounts of additional habitat is exists beyond the study area within the project site and elsewhere within the region. The potential habitat present is not necessary for the long-term maintenance of the species.

o To maintain genetic diversity and long-term evolutionary development;

Habitat forming key linkages for migration, and known breeding locations are necessary for maintaining sustainable populations of Swift Parrot. However, given the potential habitat within the study area does not provide either of these functions, and is likely to only be used periodically as foraging habitat, the potential habitat present is not necessary for maintaining genetic diversity of the species.

For the reintroduction of populations or recovery of the species;

Swift Parrots breed in Tasmania from September to January and utilise winter-flowering gums on the mainland each year. Areas not known to support migrating or foraging groups of Swift Parrot are unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site and local area available for foraging. Swift Parrots breed in Tasmania from September to January and utilise winter-flowering gums on the mainland each year. .

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of a population;

Swift Parrots breed between September and January each year in Tasmania, utilising tree hollows in *Eucalyptus globulus* (Tasmanian Blue Gum). Given the transitory and migratory nature of this species, the study area is likely to only be used periodically for foraging.

f) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;

The action will remove up to 228.56 ha of potential habitat for Swift Parrot. However, no records of Swift Parrot have been ever been made within 10 km of the study area, despite bird survey effort in the area. Furthermore, the project site (6331.11 ha) and local area provide ample available foraging habitat in similar or better condition than that within the study area. Therefore, removal of a relatively small amount of potential habitat within the study area is unlikely to decrease the availability or quality of habitat to the extent that the species is likely to decline.

g) result in invasive species that are harmful to a endangered species becoming established in the endangered species' habitat;

Feral animals can have a detrimental impact on Swift Parrot through predation by species such as feral Cats and the European Red Fox. The proposal is considered unlikely to contribute to increasing feral animal activity across the project site and instead may assist with the management of these species. Landholders currently implement feral animal control programs across the site, particularly around lambing/calving time, and an increased income to landholders within the district may result in more funding available for baiting programs or other control measures which can be expensive.

h) introduce disease that may cause the species to decline, or

No diseases are known to threaten Swift Parrot. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

No records of Swift Parrot have ever been made within 10 km of the study area. Furthermore, the project site and local area provide ample available foraging habitat in similar or better condition than that within the study area. This leaves ample potential habitat available for the recovery of the species.

Nyctophilus corbeni (South-eastern Long-eared Bat)

The species has a preference for semi-arid areas. However, they have been recorded in the high rainfall areas of south-western Australia (Churchill 1998). In South Australia this species has been associated with a range of mallee species, and found to the fringes of the treeless Nullarbor Plain (Duncan *et al.* 1999). In northern NSW, this species is thought to prefer structurally complex forest as foraging habitat, and breeding and sheltering is in tree hollows (Environment Australia 2000). The species has had a recent name change from *N. timoriensis* to *N. corbeni*.

South-eastern Long-eared Bat is listed as Vulnerable under the EPBC Act as *N. timoriensis*.

Nyctophilus spp calls were detected on the site at three locations within the study area. The calls of *Nyctophilus* spp. are difficult to tell apart. In some cases calls were identified as 'possible' calls to species level. However in most cases, they were identified as *Nyctophilus* spp. which may include *N. geoffroyi*, *N. gouldi* or *N. corbeni*. Thus, *N. corbeni* has the potential to occur within the Sapphire study area and its presence has been assumed.

Areas of woodland provide potential habitat for this species. Of the 882.33 ha of habitat present across the study site, up to approximately 74.79 ha of this will be permanently removed and 36.57 ha will be temporarily cleared. Combined, the proposed 111.36 ha of impact represents 8.5% of the habitat within the study area and approximately 4.1% of the potential habitat mapped within the project site. Extensive areas of potential habitat are present in the areas around the study area (e.g. 6221.84 ha of mapped within the project site) and throughout the locality.

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

a) lead to a long-term decrease in the size of an important population of a species;

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• Key source populations either for breeding or dispersal;

Nyctophilus corbeni has not been recorded within the study area. Assuming it is present in the study area, it is unlikely that the proposal would impact on a key source population given the broad range of distribution of *Nyctophilus corbeni*, the mobile nature of the species and the large amount of habitat present throughout the project site (882.33 ha).

• Populations that are necessary for maintaining genetic diversity, and/or;

Little is known of the genetic mechanisms of *Nyctophilus corbeni*, however given the broad range of distribution of the species, and that the stronghold for the species is the Pilliga scrub, should a population be present at Sapphire is unlikely to be necessary in maintaining genetic diversity of the species. Furthermore, it is unlikely that the proposal would impact on this species or its habitat such that the population would be placed at risk of extinction and its contribution to the genetic diversity of the species lost.

• Populations that are near the limit of the species range;

Overall, the distribution of the south-eastern form of *Nyctophilus corbeni* coincides approximately with the Murray Darling Basin, with the Pilliga Scrub region being the distinct stronghold for this species (DECCW 2011b). At Sapphire, this species is not at the limit of its known distribution.

For these reasons, any populations within the study area are not considered to be an important population, and therefore the action will not lead to a long-term decrease in the size of an important population.

b) reduce the area of occupancy of an important population;

As outlined above, a population of *Nyctophilus corbeni* within the study area does not constitute an important population.

c) fragment an existing important population into two or more populations;

As outlined above, a population of *Nyctophilus corbeni* within the study area does not constitute an important population.

d) adversely affect habitat critical to the survival of a species;

e) Areas of woodland provide potential habitat this species. Of the 882.33 ha of habitat present across the study site, up to approximately 74.79 ha of this will be permanently removed and 36.57 ha will be temporarily cleared. Combined, the proposed 111.36 ha of impact represents 8.5 % of the habitat within the study area and approximately 4.1 % of the potential habitat mapped within the project site. Extensive areas of potential habitat are present in the areas around the study area (e.g. 6221.84 ha of mapped within the project site) and throughout the locality.

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

It is not certain that records of *Nyctophilus* spp. within the study area represent a population of *Nyctophilus corbeni*. However, assuming *Nyctophilus corbeni* does occur within the study area, it is unlikely that the removal of a small amount of the potential habitat (111.36 ha) compared to that present within the project site (6221.84 ha) would be critical to the survival of the species. The species has a broad distribution across the Murray-Darling Basin, and the stronghold for the species is the Pilliga scrub habitat. As a worst case scenario, the project will remove 4.1 % of the potential habitat mapped within the project site. Given extensive areas of habitat will remain, the range and preferred habitat of the species and the amount of similar potential habitat present within the project site it is unlikely that the habitat proposed for clearance would limit the availability of resources for the species at Sapphire and hence critical to the survival of the species.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

The action is unlikely to be necessary for the long-term maintenance of the species for similar reasons outlined in the response above, including the uncertainty of a present population, the habitat preference for Pilliga scrub communities, and the abundance of potential habitat present outside of the study area.

o To maintain genetic diversity and long-term evolutionary development;

Little is known of the genetic mechanisms of *Nyctophilus corbeni*. The project is expected to impact 4.1 % of the potential habitat that was mapped within the project site during the ecological assessment. However, it is not expected that any population within the study area that may be necessary for maintaining genetic diversity of the species would be significantly impact particularly given *Nyctophilus corbeni* has an extensive range and has been recorded across the Murray-Darling Basin.

For the reintroduction of populations or recovery of the species;

As a worst case scenario, the action will only remove 4.1 % of the potential habitat mapped within the project site, leaving ample potential habitat available for the recovery of the species.

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

f) disrupt the breeding cycle of an important population;

As outlined above, a population of *Nyctophilus corbeni* within the study area is unlikely to constitute an important population.

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

The proposed removal of 4.1 % of potential habitat mapped within the project site 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, especially given *Nyctophilus corbeni* has been recorded across the Murray-Darling Basin, and the stronghold for the species is the Pilliga scrub.

h) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Introduced predators were not identified as a threat to *Nyctophilus corbeni* in the Action Plan for Australian Bat.

Nonetheless, the proposal is considered unlikely to contribute to increasing feral animal activity across the project site and instead may assist with the management of these species. Landholders currently implement feral animal control programs across the site, particularly around lambing/calving time, and an increased income to landholders within the district may result in more funding available for baiting programs or other control measures which can be expensive.

i) introduce disease that may cause the species to decline, or

The Action Plan for Australian Bats does not identify any diseases that threaten *Nyctophilus corbeni*. The action is not expected to introduce any disease to the study area.

j) interfere substantially with the recovery of the species.

As a worst case scenario, the action will only remove 4.1 % of the potential habitat mapped within the project site. This leaves ample potential habitat available for the recovery of the species.

Underwoodisaurus sphyrurus (Border Thick-tailed Gecko)

Found only on the tablelands and slopes of northern NSW and southern Queensland, reaching south to Tamworth and west to Moree (DECCW 2011B). Most common in the granite country of the New England Tablelands (DECCW 2011B). Rocky hills with dry open eucalypt forest or woodland (DECCW 2011B). Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter (DECCW 2011B). These Geckos are active at night and shelter by day under rock slabs, in or under logs, and under the bark of standing trees.

Border Thick-tailed Gecko is listed as Vulnerable under the EPBC Act.

One record of Border Thick-tailed Gecko is present to the north-west of the study area in Kings Plains National Park in 1997 although this species was not recorded within the study area during the current surveys. Habitat for the Border Thick-tailed Gecko is present in isolated patches across the study area, in areas of potential and marginal potential habitat. Mapping is based on the following:

- Potential granite or basalt, dense canopy, rocky outcrops and / or fallen timber
- Marginal potential granite or basalt, agricultural land, limited rocky out crops fallen timber

The Border Thick-tailed Gecko shows a preference for steep rocky or scree slopes, especially granite although there are recent records from basalt and metasediment slopes and flats. This species favours forest and woodland areas with boulders, rock slabs, fallen timber, deep leaf litter and often a dense tree canopy that helps create a sparse understorey. They have been recorded in areas that were cleared for agriculture in the past (DECCW 2011b). It is likely that the majority of the study area is extremely marginal habitat for the Border Thick-tailed Gecko as woody debris is sparse and the understorey in most areas is grassy. Those areas mapped as potential are more likely to support this species should it be present at the site as they support either rocky outcrops or fallen timber and also a dense canopy.

The majority of the habitat mapped as marginal habitat is likely to be extremely marginal habitat for this species as it would primarily support a grassy understory with scattered woody debris and has been mapped as a precaution given that this species has been recorded in disturbed areas such as those cleared for agriculture in the past. This species is likely to be largely restricted to rocky outcrop areas particularly on granite soils and areas where there are rocky outcrops and leaf litter.

This species was not detected during the targeted surveys undertaken. However, due to suitable habitat on site there remains a low probability that the species may occur. As a worst-case scenario (80 m layout), 18.73 ha of potential habitat and 49.65 ha of marginal potential habitat will be impacted, which represents 14.71 % of potential habitat (127.29 ha within the study area) and 11.26 % of marginal potential habitat (440.78 ha within the study area) within the study area respectively. Furthermore, this represents 1.6 % of total potential habitat (1,183.58 ha) and 1.2 % of total marginal potential habitat mapped (4,033.67 ha).

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

a) lead to a long-term decrease in the size of an important population of a species;

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

• Key source populations either for breeding or dispersal;

While the likely occurrence of this species is low, given the narrow range of distribution of the Border Thick-tailed Gecko, the majority of potential habitat across the study area is extremely marginal and that populations appear to be fragmented, if this species were present at the site it is likely to represent an important population.

• Populations that are necessary for maintaining genetic diversity, and/or;

Little is known of the genetic mechanisms of *Border Thick-tailed Gecko*, however given the narrow range of distribution of the species, and that the stronghold for the species is the New England tablelands, any population should it be present is likely to necessary for maintaining genetic diversity of the species.

• Populations that are near the limit of the species range;

The Border Thick-tailed Gecko has a very limited distribution, only occurring on the tablelands and slopes of northern NSW and southern Queensland, reaching south to Tamworth and west to Moree and is most common in the granite country of the New England Tablelands. It occurs at sites ranging from 500 to 1000m elevation. Populations are apparently fragmented, with over 50 discrete sites currently known that are separated by at least 2 km (DECCW 2011b).

Sapphire is within the altitudinal range of the species, as the site is between 750-1100m AHD. The western limit of the species distribution is approximately 160 km to the west (Moree) and the southern limit is 160 km south at Tamworth. Therefore Sapphire is close to, but not at the limit of the species' known distribution. However, given the small distribution of the species within the cool highland granite belt of New England, any location within the species distribution is likely to be close to the edge of its range.

Therefore, any population of Border Thick-tailed Gecko within the study area could comprise an important population. As no individuals were recorded during the current surveys, the size of such a population is unknown. Habitat removal will impact any populations present through a reduction in sheltering, foraging and breeding opportunities. However, the amount of habitat removal across the site (1.6 % of potential habitat mapped) is relatively low. Targeted searches of potential habitat will be undertaken prior to clearing, with any species found relocated to undisturbed areas of potential habitat. Therefore, a long-term decrease in any important population is not expected.

b) reduce the area of occupancy of an important population;

As outlined above, any population of Border Thick-tailed Gecko could constitute an important population given its limited distribution and that the species' stronghold is the New England Tablelands. Therefore, any habitat removal has the potential to reduce the area of occupancy of the population. Habitat removal will impact any populations present through a reduction in sheltering, foraging and breeding opportunities. However, given the relatively low amount of habitat removal across the site (1.6 % of potential habitat mapped), potential impacts to a population of Border Thick-tailed Gecko are not considered to be significant.

c) fragment an existing important population into two or more populations;

As outlined above, any population of Border Thick-tailed Gecko could constitute an important population given its limited distribution and that the species' stronghold is the New England Tablelands. As no individuals were recorded during the current surveys, the size and distribution range of such a population is unknown. It is possible that where the study area bisects areas of rocky outcrops, an important population may be fragmented into two or more populations. Targeted searches of potential habitat will be undertaken prior to clearing, with any species found relocated to undisturbed areas of potential habitat, however this will not avoid the fact that the clearing proposed may fragment an important population.

d) adversely affect habitat critical to the survival of a species;

The amount of habitat removal has been calculated by differentiating between potential and marginal potential habitat within the study area. As a worst-case scenario (80 m layout), 18.73 ha of potential habitat and 49.65 ha of marginal potential habitat will be impacted, which represents 14.71 % of potential habitat (127.29 ha within the study area) and 11.26 % of marginal potential habitat (440.78 ha within the study area) within the study area respectively. Furthermore, this represents 1.6 % of total potential habitat (1,183.58 ha) and 1.2 % of total marginal potential habitat mapped (4,033.67 ha).

Habitat critical to the survival of a species refers to areas that are necessary:

• For activities such as foraging, breeding, roosting, or dispersal;

No populations are known within the study area, however if Geckos are present, only the potential habitat within the study area is likely to be necessary for activities such as foraging, breeding, roosting and dispersal. As a worst case scenario, the action will only remove 18.73 ha of h potential habitat. An impact to 1.6% of potential habitat mapped locally is unlikely to be habitat that is necessary for the survival of the species, given the extent of habitat present throughout the study area and including Kings Plains National Park.

For the long-term maintenance of the species (including the maintenance of species essential to the survival of the species such as pollinators);

 No populations are known within the study area, however if Geckos are present, only the potential habitat within the study area is likely to be necessary for the long-term maintenance of the species. As a worst case scenario, the action will only remove 18.73 ha of potential habitat. An impact to 1.6% of potential habitat mapped locally is unlikely to be habitat that is essential for the survival of the species, given the extent of habitat present throughout the study area and including Kings Plains National Park.

o To maintain genetic diversity and long-term evolutionary development;

Little is known of the genetic mechanisms of *Border Thick-tailed Gecko*, however given the project is expected to impact on such a small amount of 1.6 % of the potential habitat that was mapped locally during the ecological assessment and that pre-

clearance surveys will be conducted, it is not expected that this area would impact on a population required for maintaining genetic diversity of the species..

• For the reintroduction of populations or recovery of the species;

As the study area is not known to support any populations of Border Thick-tailed Gecko, the 18.73 ha of potential habitat that is proposed to be removed is unlikely to be critical for the recovery of the species, given the vast amount of potential habitat within the project site. As a worst case scenario, the action will only remove 1.6 % of the potential habitat mapped locally, leaving ample potential habitat available for the recovery of the species;

The potential habitat proposed to be removed does not constitute habitat identified in a recovery plan for the species, habitat critical for that species, or habitat listed on the Register of Critical Habitat maintained by the Minister under the EPBC Act.

e) disrupt the breeding cycle of an important population;

As outlined above, any Geckos utilising habitat within the study area are likely to form part of an important population. However, little is known of their breeding cycle. Although no Geckos were recorded during the ecological assessment, it is not possible to discount the possibility that this cryptic species inhabits some of the potential habitat within the study area. If any habitat utilised by Geckos is cleared during the proposed action, it is assumed that it may disrupt the breeding cycle of at least some individuals belonging to an important population.

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

As the study area is not known to support any populations of *Border Thick-tailed Gecko*, the 18.73 ha of potential habitat that is proposed to be removed 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. Furthermore, pre-clearance surveys will be conducted and this species is known to occur within Kings Plains National Park.

g) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat

Control measures will be implemented to ensure that impacts to habitat for the threatened species are minimised. Measures to avoid the spread of weeds will be implemented from preconstruction works, throughout construction and operation until decommissioning, thereby reducing potential impacts of the proposal to potential habitat for this species. These are detailed in Table 17.

Feral animals can have a detrimental impact on Border Thick-tailed Gecko through predation by species such as feral Cats and the European Red Fox. The proposal is considered unlikely to contribute to increasing feral animal activity across the project site and instead may assist with the management of these species. Landholders currently implement feral animal control programs across the site, particularly around lambing/calving time, and an increased income to landholders within the district may result in more funding available for baiting programs or other control measures which can be expensive.

h) introduce disease that may cause the species to decline, or

No diseases are known that threaten *Border Thick-tailed Gecko*. The action is not expected to introduce any disease to the study area.

i) interfere substantially with the recovery of the species.

As a worst case scenario, the action will only remove 1.6 % of the potential habitat mapped. This leaves ample potential habitat available for the recovery of the species.

MIGRATORY SPECIES

Anthochaera phrygia (Regent Honeyeater)

Regent Honeyeater is listed as a critically endangered species under the TSC Act and an endangered and migratory species under the EPBC Act. A description of the species and distribution in NSW has been included above for threatened species.

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) 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;

Within the project site, 6331.11 ha of potential foraging habitat has been mapped. Breeding habitat for the Regent Honeyeater is not present within the project site. The removal of potential habitat will constitute 103.16 ha based on the 100 m turbine option, or 112.47 ha based on the 80 m turbine option.

The proposal will not substantially increase fragmentation in the area which would isolate areas of important habitat for the species, particularly given Regent Honeyeater is migratory, forages widely and the amount of vegetation that would be directly impacted comprises only a small portion of vegetation throughout the study area (12.6 %) and an even smaller portion of vegetation within the project site (1.8 %).

The impacts in terms of disturbance to potential habitat for Regent Honeyeater within the project site are likely to be negligible given they forage widely, with the species capable of making large regional movements in the order of hundreds of kilometres (DECCW 2011b). The species is likely be present infrequently while migrating or foraging. Further, only the minimal amount of clearing will be required, which represents a small amount comparative to the amount of habitat present within the project site. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

The study area is unlikely to support an important population of this species as it is unlikely that an ecologically significant proportion of the population would occur at Sapphire given the paucity of records and this species would not breed at the site. Habitat present at the site is unlikely to be critical to the lifecycle of the species and it is not at the limit of the range for this species. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

It is unlikely that the proposed works would result in the introduction of invasive species that are considered likely to impact on Regent Honeyeater in the locality. The species suffers from competition from larger aggressive honeyeaters, particularly Noisy Miners (*Manorina melanocephala*), Noisy Friarbirds (*Philemon corniculatus*) and Red Wattlebirds (*Anthochaera carunculata*). It is unlikely that the proposal would not lead to an increase in the incidence of these species in the project site.

c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

It is unlikely that the study area would support an ecological significant proportion of Regent Honeyeater given the paucity of records, they do not breed at the site and it is likely that they only periodically visit the site during migration. The closest known key breeding area in NSW is located to the south west of the site in the Bundarra-Barraba region (DECCW 2011a). The site could be used as a foraging resource for this population although there are few records within the locality.

The amount of foraging habitat that would be removed represents a small proportion of the foraging habitat in the project site and the locality, with impacted habitat unlikely to supply large quantities of nectar resources for the species. Regent Honeyeaters would be able to continue using resources remaining within and outside of the project site.

The proposal may affect the lifecycle of the Regent Honeyeater changes to migration through accidental strike with the turbines during operation of the wind farm. However, the study area is not known to occur along any key migratory pathways for the species and therefore the changes of strike are considered extremely low. Therefore, it is unlikely that the proposal would seriously disrupt the lifecycle of an ecologically significant portion of the Regent Honeyeater population.

Apus pacificus (Fork-tailed Swift)

The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. In Australia, they mostly occur over inland plains but sometimes above foothills or in coastal areas. They often occur over cliffs and beaches and also over islands and sometimes well out to sea. They also occur over settled areas, including towns, urban areas and cities. They mostly occur over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. They are also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes (DSEWPAC 2011b).

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) Criterion 1: substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species;

The proposal involves the permanent removal of up to approximately 140.72 ha of potential habitat for this species. Further, approximately 148.05 ha will be temporarily cleared within the project site. This includes areas of woodland, grassland and areas cleared

However, the majority of clearance impacts will occur in previously cleared open grassy areas which provide limited habitat for this species and the majority of vegetation within the project site will be retained. The proposal will not substantially increase fragmentation in the area which would isolate areas of important habitat for the species, particularly given the Fork-tailed Swift forages aerially over both wooded and open areas. The amount of vegetation that would be directly impacted comprises only a small portion of vegetation throughout the study area (15.3 %) and an even smaller portion of vegetation within the project site (2.9 %).

The study area is unlikely to support an important population of this species as it is unlikely that an ecologically significant proportion of the population would occur at Sapphire given the habitat is not critical to the lifecycle of the species and the species in not at the limit of its range. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

The proposal would not result in the establishment of an invasive species that is harmful to Fork-tailed Swifts.

c) 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 the population is unlikely to be present at Sapphire which would support only foraging habitat for this aerial species which does not breed in Australia. Therefore, the proposal is unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of Fork-tailed Swift.

The removal and fragmentation of vegetation in the project site would be unlikely to affect the species, which forages aerially over a range of habitats including cleared areas. It is unlikely that the turbines would result in changes to migration and foraging behaviour or increase the mortality rates of the

species through bird strike given the measures taken to minimise the risk of bird strike from the wind turbines and the height at which Fork-tailed Swifts generally forage in Australia (DSEWPAC 2011b).

Ardea alba (Great Egret)

The Great Egret has been reported in a wide range of wetland habitats, for example inland and coastal, freshwater and saline, permanent and ephemeral, open and vegetated, large and small, natural and artificial habitats. The species may retreat to permanent wetlands or coastal areas when other wetlands are dry (DSEWPAC 2011b).

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) 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 study area provides marginal habitat for this species which is likely only to be used following heavy rainfall. No wetlands are present within the study area and therefore it is unlikely that the study area would support an important population of this species.

The impacts in terms of disturbance to potential habitat for the Great Egret within the project site are likely to be negligible given they forage widely, with the species capable of making large regional movements in the order of hundreds of kilometres (DECCW 2011b). Further, only the minimal amount of clearing will be required, which represents a small amount comparative to the amount of habitat present within the project site. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) Criterion 2: result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

The proposal would not result in the establishment of an invasive species that is harmful to Great Egret.

c) Criterion 3: seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The proposal is unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of Great Egret as the study area supports only marginal habitat for this species which is only likely to use the site following heavy rainfall events.

Ardea ibis (Cattle Egret)

The Cattle Egret 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 (DSEWPAC 2011b).

The species often forages away from water on low lying grasslands, improved pastures and croplands. It is commonly found in cattle fields and other farm areas that contain livestock. The Cattle Egret has also been observed foraging in rubbish tips. It is becoming more frequent in drier regions; consuming the ticks of livestock in the absence of other food sources. This inland spread is believed to be due to the construction of artificial waterways (DSEWPAC 2011b). The Cattle Egret roosts in trees, or amongst ground vegetation in or near lakes and swamps. It has also been recorded roosting near human settlement and industrial areas in Murwillumbah, NSW (DSEWPAC 2011b).

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) 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 study area in unlikely to support an important population of this species as the project site may provide occasional foraging habitat for the species following heavy rainfall periods, but would be unlikely to provide permanent foraging or breeding habitat for the species. The proposal could remove some of this potential, occasional foraging habitat given the majority of clearance impacts will occur in previously cleared open grassy areas. However, the impacts in terms of disturbance to potential habitat for Cattle Egret within the project site are likely to be negligible given they forage widely, with the species capable of making large regional movements. The species is likely be present infrequently while migrating or foraging. Further, only the minimal amount of clearing will be required, which represents a small amount comparative to the amount of habitat present within the project site. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

The proposal would not result in the establishment of an invasive species that is harmful to Cattle Egret.

c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The proposal is unlikely support an ecologically significant proportion of the population of Cattle Egret given this species is only likely to be present in the study area opportunistically following rain periods. The majority of potential foraging habitat would be retained in the project site.

Hirundapus caudactus (White-throated Needletail)

In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Given 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. 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. In coastal areas, they are sometimes seen flying over sandy beaches or mudflats, and often around coastal cliffs and other areas with prominent updraughts, such as ridges and sand-dunes (DSEWPAC 2011b).

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

a) 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 proposal involves the permanent removal of up to approximately 140.72 ha of potential habitat for this species. Further, approximately 148.05 ha will be temporarily cleared within the project site. This includes areas of woodland, grassland and areas cleared

However, the majority of clearance impacts will occur in previously cleared open grassy areas which provide limited habitat for this species and the majority of vegetation within the project site will be retained. The proposal will not substantially increase fragmentation in the area which would isolate areas of important habitat for the species, particularly given White-throated Needletails forage aerially over both wooded and open areas. The amount of vegetation that would be directly impacted comprises only a small portion of vegetation throughout the study area (15.3 %) and an even smaller portion of vegetation within the project site (2.9 %).

The study area is unlikely to support an important population of this species as it is unlikely that an ecologically significant proportion of the population would occur at Sapphire given the habitat is not critical to the lifecycle of the species and the species not at the limit its range. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

The proposal would not result in the establishment of an invasive species that is harmful to Whitethroated Needletails.

c) 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 the population is unlikely to be present at Sapphire which would support only foraging habitat for this aerial species which does not breed in Australia. Therefore, the proposal is unlikely to seriously disrupt the lifecycle of an ecologically significant proportion of the population of White-throated Needletail.

The removal and fragmentation of vegetation in the project site would be unlikely to affect the species, which forages aerially over a range of habitats including cleared areas. It is unlikely that the turbines would result in changes to migration and foraging behaviour or increase the mortality rates of the species through bird strike given the measures taken to minimise the risk of bird strike from the wind turbines and the height at which White-throated Needletails generally forage in Australia (at "cloud level", over 1000 m above the ground) (DSEWPAC 2011b).

Lathamus discolor (Swift Parrot)

Swift Parrot is listed as an endangered species under the TSC Act and an endangered and migratory species under the EPBC Act. A description of the species and distribution in NSW has been included above for threatened species.

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) 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;

No records of Swift Parrot were made during the current survey. Swift Parrot has never been recorded within the local area (a 10 km radius of the study area), despite bird survey effort on many occasions in the past. The study area supports 1594.62 ha of potential habitat for Swift Parrot in the form of vegetation communities containing autumn/winter flowering eucalypts. Of this amount, 123.64 ha (7.8 % of study area) will be permanently cleared and 104.92 ha (6.6 % of study area) will be temporarily cleared within the study area. Vegetation removal is to occur in linear fingers within clusters rather than one consolidated stand. Therefore, the proposal is not expected to reduce the area of occupancy of the species.

The proposal will not substantially increase fragmentation in the area which would isolate areas of important habitat for the species. The impacts in terms of disturbance to potential habitat for Swift Parrot within the project site are likely to be negligible given they forage widely, with the species capable of making large regional movements in the order of hundreds of kilometres (DSEWPAC 2011b). The species is likely to be present infrequently while foraging, therefore the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

It is unlikely that the proposed works would result in the introduction of invasive species that are considered likely to impact on Swift Parrot in the locality.

c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The proposal may affect the lifecycle of the Swift Parrot through changes to foraging behavior resulting from removal of foraging habitat and changes to migration through accidental strike with the turbines during operation of the wind farm. No breeding habitat would be impacted as the Swift Parrot breeds in Tasmania.

The amount of foraging habitat that would be impacted represents a small proportion of the habitat in the project site and the locality. Swift Parrots would be able to continue using resources remaining within and outside of the project site. Further, wind turbines are solid, opaque structures and the risks posed by moving rotors are generally within the height range of between 30 and 120 metres above the ground. Swift Parrot generally forages within the height of the trees in which they feed. It is thus considered unlikely that the types of collision situations that the parrot presently encounters in urban environments will exist at wind farms. Further, issues associated with the impacts of turbines on birds have been addressed in the layout design to minimise the risk of bird strike where possible.

Given the availability of remaining habitat in the project site, with measures taken to minimise the risk of bird strike from the wind turbines, the proposed works are unlikely to seriously disrupt the lifecycle of a Swift Parrot population.

Merops ornatus (Rainbow Bee-eater)

The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation. It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in proximity to permanent water. It also occurs in inland and coastal sand dune systems, and in mangroves in northern Australia, and has been recorded in various other habitat types including heathland, sedgeland, vine forest and vine thicket, and on beaches (DSEWPAC 2011b).

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will meet any of the following criteria:

 a) 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 proposal involves the permanent removal of up to approximately 140.72 ha of potential habitat for the species. Further, approximately 148.05 ha will be temporarily cleared within the project site. This includes areas of woodland, grassland and areas cleared

However, the majority of clearance impacts will occur in previously cleared open grassy areas and the majority of vegetation in the project site will be retained. The proposal will not substantially increase fragmentation in the area which would isolate areas of important habitat for the species, particularly given Rainbow Bee-eaters can make large regional movements across the continent and beyond. The amount of vegetation that would be directly impacted comprises only a small portion of vegetation throughout the study area (15.3 %) and an even smaller portion of vegetation within the project site (2.9 %).

The study area is unlikely to support an important population of this species as it is unlikely that an ecologically significant proportion of the population would occur at Sapphire, given the habitat is not critical to the lifecycle of the species and the species is not at the limit of its range. Therefore, the proposed loss of potential habitat is not likely to substantially modify, destroy, or isolate an area of important habitat for the species.

b) result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species;

The proposal would not result in the establishment of an invasive species that is harmful to Rainbow Bee-eater. The species is threatened by Cane Toads, but the proposal would not introduce Cane Toads to the project site.

c) seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

The proposal would impact on potential foraging and breeding habitat for the Rainbow Bee-eater. However, the amount of foraging and breeding habitat that would be impacted represents a small portion of vegetation throughout the study area (15.3 %) and an even smaller portion of vegetation within the project site (2.9 %). Rainbow Bee-eaters would be able to continue using resources remaining within and outside of the project site.

The proposal may affect the lifecycle of the Rainbow Bee-eater through changes to foraging behavior resulting from removal of foraging habitat and changes to migration through accidental strike with the

turbines during operation of the wind farm. Rainbow Bee-eater populations in southern Australia migrate to northern Australia from February to April, returning to their southern breeding grounds in September and October (DSEWPAC 2011b). However, the impacts of turbines on birds appear to be dependent on a number of factors including proximity to water, migratory pathways, proximity to bird concentrations and forested areas. Given there are no major waterbodies within the study area and that the Rainbow Bee-eater would generally fly at a moderate height whilst on the site, it is the potential for strike from turbines is considered moderate to low. Furthermore, the study area is unlikely to support an ecologically significant proportion of the population as this species has not been recorded at the site.

Given the availability of remaining habitat in the project site, the proposed works are unlikely to seriously disrupt the lifecycle of a Rainbow Bee-eater population.

Appendix L: Example of Environmental Management Plan Framework

This Environmental Management Plan Framework has been prepared by Wind Prospect CWP.

STATEMENT OF COMMITMENTS

The Statement of Commitments (SoC) is a review of all management and mitigation measures mentioned in previous chapters of the Environmental Assessment (EA) that will be managed by the Proponent. The framework for the SoC is displayed in Figure 16, and comprises an Environmental Management Plan (EMP) that combines the Construction Environmental Management Plan (CEMP) and the Operational Environmental Management Plan (OEMP). Within both of these plans there are a number of sub-plans to assist in the amelioration, management and mitigation of environmental impacts from the construction and operational phases of the Project.



Figure 16: Environmental Management Plan Framework

Management Plans

Below is an overview of each of the plans and how each relates to the overall scheme of ameliorating, mitigating and managing identified environmental impacts in this EA during the construction and operational phases of the Project.

CEMP: The main aim of the CEMP will be to ameliorate, mitigate and manage any identified environmental impacts during the construction phase of the Project. This will be done through controlling, training and monitoring measures. The CEMP will cover a number of other plans, creating a working environmental plan during construction.

OEMP: The main aim of the OEMP will be to ameliorate, mitigate and manage any identified environmental impacts during the operation phase of the Project. This will be done by combining, where feasible, with the CEMP and adding additional mitigation and management strategies for operational environmental impacts. The OEMP will cover a number of other plans, creating a working environmental plan during operation.

Weed Management Plan: The main aim of this plan will be to stop the spread of weeds during both the construction and operation phase of the Project. This will involve areas of the Project that will have soil disturbance and vegetation clearance, vehicle and machinery movement between sites, importation of soil, rocks and revegetation. By implementing a Weed Management Plan into both the CEMP and OEMP, the spread of weeds can be mitigated and managed.

Conservation Management Plan: The main aim of this plan is to limit vegetation clearance/disturbance during the construction phase of the Project and monitor fauna during the operational phase of the Project. This plan will involve the movement of vehicles and machinery between sites, damage to surrounding tree roots, vegetation clearance, smothering of vegetation by dust particles, accidental capture/injury/death to fauna and temporary removal of fauna habitat. By implementing the Conservation Management Plan into both the CEMP and OEMP, vegetation clearance/disturbance and the impact on fauna can be ameliorated, mitigated and managed.

Cultural Heritage Management Protocol: The main aim of this protocol is to limit the impact on Cultural Heritage items found during the construction and operational phase of the Project. By implementing the Cultural Heritage Management Protocol into the CEMP and OEMP the impact on Cultural Heritage items can be ameliorated, mitigated and managed.

Traffic Management Plan: The main aim of this plan is to minimise risk from increased traffic on the roads in the Project site during the construction phase of the Project. This plan will involve the movement of vehicles and machinery between sites and the haulage process. By implementing the Traffic Management Plan into the CEMP the impact of increased traffic on the roads can be ameliorated, mitigated and managed.

Emergency Evacuation Plan: The main aim of this plan is to provide an effective and suitable emergency evacuation plan for use on-site during the construction and operational phase of the Project. This plan will consist of plans for activities occurring during construction and maintenance activities and if a fire or bushfire were to occur in/around the Project Site. By implementing the Emergency Evacuation Plan into the CEMP and OEMP all emergency evacuations will be carried out in an effective and suitable manner decreasing the risk of injury and damage.

Bushfire Emergency and Evacuation Plan: The main aim of this plan is to provide planned and orderly evacuation plans to construction and maintenance employees, visitors and landowners in the event of a bushfire impacting the Project site during the construction and operational phases of the Project. This plan will be a sub-plan under the Emergency Evacuation Plan. By implementing the Bushfire Emergency and Evacuation Plan into the CEMP and OEMP the plan will be able to provide planned and orderly instructions to all impacted persons decreasing the risk of injury.

Soil and Water Management Plan: The main aims of this plan are to minimise loss of water quality and changes in the hydraulic regime during the construction and operational phases of the Project. This plan will involve soil disturbance, erosion events from surface run-off and disturbance of water resources in the Project site. By implementing the Soil and Water Management Plan into the CEMP and OEMP, water quality and hydraulic regimes will be ameliorated, mitigated and managed.

Construction Dust Management Plan: The main aim of this plan is to minimise the generation and spread of dust during the construction phase of the Project. T his plan will involve vehicle and machinery movement and activities on dry and windy days. By implementing the Construction Dust Management Plan into the CEMP, dust generation will be able to be mitigated and managed.



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