

## **APPENDICES**

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**Appendix 2.1** Vegetation communities of Paddy's Land plateau and Bob's Creek, DRF = Dry Rain Forest, DSF = Dry Sclerophyll Forest (Adapted from Austeco, 1999).

<b>Community 1: DRF</b> <i>Dendrocnide excelsa</i> & <i>Drypetes australasica</i>	<b>Structure</b>	<b>Indicator species</b>
Canopy	6-40m	<i>Backhousia sciadophora</i> , <i>Dendrocnide excelsa</i> , <i>Drypetes australasica</i>
Small tree layer	4-12m (if present)	<i>Streblus brunonianus</i>
Shrub layer	1-6m (if present), 40-70% cover	No indicator species
Ground cover	0-1m (if present), 5-30% cover	<i>Adiantum aethiopicum</i> ,
<b>Community 10: Medium DFS</b> <i>Eucalyptus dorrigoensis</i>		
Canopy	Medium 20-30	Insufficient data to identify
Small tree layer	May be absent	Insufficient data to identify
Shrub layer	0.5-2 m, 40% cover	Insufficient data to identify
Ground cover	0-0.5 m, 60% cover	Insufficient data to identify
<b>Community 12: DSF</b> <i>Eucalyptus bridgesiana</i> , <i>E. campanulata</i> , <i>E. caliginosa</i> and <i>E. laevopinea</i>		
Canopy	Medium 18-25m	<i>Eucalyptus bridgesiana</i> , <i>E. caliginosa</i> , <i>E. campanulata</i> , <i>E. laevopinea</i> and <i>E. retinens</i>
Small tree layer	4-10m (if present)	<i>Allocasuarina littoralis</i> and <i>A. torulosa</i> ; as well as small individuals of canopy species
Shrub layer	1-2m (if present), 5-20% cover	<i>Acacia filicifolia</i> , <i>Jacksonia scoparia</i> and <i>Lomatia silaifolia</i>
Ground cover	0-1m 20-90% cover	<i>Imperata cylindrica</i> , <i>Poa sieberiana</i> , <i>Sorghum leiocladum</i> and <i>Themeda australis</i>
<b>Community 16: Medium Moist/DSF</b> <i>Angophora subvelutina</i> & <i>Corymbia intermedia</i>		
Canopy	Medium 8-25m	<i>Angophora subvelutina</i> and <i>Corymbia intermedia</i>
Small tree layer	2-10m (if present)	No indicator species
Shrub layer	1-5m (if present), 5-40% cover	No indicator species
Ground cover	0-1m, 10-40% cover	<i>Cymbopogon refractus</i> and <i>Imperata cylindrica</i>
<b>Community 20: Medium DSF</b> <i>Eucalyptus biturbinata</i> , <i>E. campanulata</i> & <i>E. laevopinea</i>		
Canopy	Medium 15-25m	<i>Eucalyptus biturbinata</i> , <i>E. campanulata</i> and <i>E. laevopinea</i>
Small tree layer	5-10m (if present),	<i>Allocasuarina torulosa</i>
Shrub layer	1-3m (if present), 5-30% cover	<i>Allocasuarina torulosa</i> and <i>Jacksonia scoparia</i>
Ground cover	0-1m, 15-70% cover	<i>Desmodium brachypodium</i> and <i>Themeda australis</i>

**Appendix 3.1** Identifiable free-ranging horse bands, and dates and locations of their being observed, on Paddy's Land plateau and Bob's Creek.

Observations of identifiable horse bands over 8 survey days during Autumn 2002, PLP

Identifiable Band	Band Members	Dates Encountered	Location	Landscape Position
Lone female	1 palomino juvenile female	18/04/02	By dam behind B. Hut	Mid-slope
Band of 8	1 bay stallion 2 bay juveniles 1 bay mare 1 gray 1 chestnut	19/04/02	Near west Wonga dam	Mid-slope
2 horses	2 bay juveniles with small white stars	10/05/02	On road near Two-mile Hut between gates	Mid-slope
Band of 3 * (seen again in winter 04/06 with 2 more)	1 gray male with white face 1 black male 1 chestnut male	11/05/02	Paddy's land Hut trailer	Mid-slope
Band of 5	1 chestnut stallion 1 black mare 2 bay 1 chestnut foal	11/05/02 18/05/02	On fire-trail east of T. Hut & at dam	Mid-slope Drainage-line
Band of 10	Mixed (unable to observe)	18/05/02	West Wonga dam	Drainage-line

Observations of identifiable horse bands over 12 survey days during Winter 2002, PLP

Identifiable Band	Band Members	Dates Encountered	Location	Landscape Position
Band of 5 (*seen autumn 11/05 only 3 males)	1 gray male 1 black male 1 chestnut male 2 bay males	04/06/02	Near Mt. Gardiner	Mid-slope
2 horses	2 bay juveniles	06/06/02	West T2 dam	Drainage-line
Lone male	1 chestnut with small white diamond	06/06/02	J. Creek bark-chew patch north of Q2	Ridge-top
Lone male	1 bay male with thin white stripe down face	06/06/02	Spotted gum bark-chew patch	Drainage-line
Band of 5	Unknown	04/07/02	Near west T2 dam	Mid-slope
Band of 6 (*seen again in summer ~ changed group composition)	1 bay stallion 2 bay males 1 chestnut male 1 chestnut mare w/ socks (pregnant) 1 bay juv. female	05/07, 06/07, 13/07, 14/07, 02/08 & 03/08/02	Around Tallagandra Hut	MS MS MS MS MS DL
Band of 4	1 heavy bay stallion 2 brown 1 unknown	28/07/02	Fork in road leading to Mt. Gardiner	Drainage-line
Lone male	Unknown	02/08/02	Deep drainage	Drainage-line
2 horses	Unknown	02/08/02	Dingo Top	Drainage-line
Band of 4	Unknown	04/08/02	Dead Pig gully	Drainage-line

Band of 3	Unknown	04/08/02	Dingo Top	Drainage-line
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Observations of identifiable horse bands over 6 survey days during Spring 2002, PLP

Identifiable Band	Band Members	Dates Encountered	Location	Landscape Position
Band of 4	4 bays	28/09/02 29/09/02	Yards with dams 500m east of T. Hut	Drainage-line Mid-slope
Band of 3 *(seen again in summer 19/01/03)	1 bay stallion 1 palomino mare 1 bay foal	29/09/02	30km south of Boban Hut	Ridge-top
Band of 3	1 bays 2 chestnuts	29/09/02	Directly after NP entrance gate	Drainage-line
2 horses	1 gray mare 1 chestnut mare (both pregnant)	12/10/02	Large clearing near west PLP	Mid-slope
2 horses	1 bay mare 1 bay filly (heavy blood)	13/10/02	Yards with dams 500m east of T. Hut	Drainage-line
2 horses	2 bay males	14/10/02 02/11/02	Dam (mid-T2) & Drainage after shed by bridge	Drainage-line Drainage-line
Band of 5	1 bay stallion 1 chestnut mare (pregnant) 1 bay filly 1 black 1 buckskin	15/10/02	Dam (mid-T2) near Ryan's Gully	Drainage-line
Lone male	1 bay	29/10/02	Dam (mid-T2)	Drainage-line
Band of 6	2 gray 2 buckskin 2 bays	29/10/02	On ridge to Dingo Top	Ridge-top
Band of 3	2 bay mares 1 chestnut	29/10/02	30m west of Jock's Creek bark-chewing quadrat	Mid-slope
Band of 9	8 bays 1 chestnut	29/10/02 03/11/02	Yards with dams 500m east of T. Hut	Drainage-line Drainage-line
2 horses	1 bay 1 chestnut	01/11/02	50m north of T. Hut	Mid-slope
Band of 4 *(seen again summer 20/01/03 & 25/01/03)	1 bay stallion (heavy blood w/ white muzzle) 1 bay mare 1 new bay foal 1 juv. chestnut w/ flaxen mane (female)	03/11/02	Cockatoo Creek	Mid-slope

Observations of identifiable horse bands over 16 survey days during Summer 2003/2003, PLP

Identifiable Band	Band Members	Dates Encountered	Location	Landscape Position
Band of 3	1 bay stallion 1 bay mare 1 bay foal	17/01/03	Wonga dam	Mid-slope
Band of 7	1 buckskin stallion	17/01/03	Old Station Creek	Mid-slope



	2 buckskins 2 gray 1 new gray foal 1 bay			
Band of 3	2 bay juveniles 1 chestnut juvenile	19/01/03 26/01/03	Near patch	Mid-slope Mid-slope
Band of 6	1 bay stallion 2 chestnut mares 1 gray mare 1 chestnut foal 1 paint foal	19/01/03	1km south of bark-chew Q1	Mid-slope
1 lone	1 light bay juvenile	19/01/03	Drainage by gate	Drainage-line
Band of 3 *(seen in spring 29/9/02)	1 bay stallion 1 palomino mare 1 bay foal	19/01/03	30km south of Boban Hut	Ridge-top
Band of 8	4 bays 1 gray 1 paint 1 chestnut 1 palomino	19/01/03	T3 near 600m	Mid-slope
Band of 7	4 bays 1 black male 1 palomino mare 1 palomino foal	19/01/03	T3 near 600m	Drainage-line
Band of 4 *(seen in spring 03/11/02)	1 bay stallion (heavy blood w/ white muzzle) 1 bay mare 1 new bay foal 1 juv. chestnut w/ flaxen mane	20/01/03 25/01/03	Old Station Creek	Mid-slope Mid-slope
1 lone	1 juv. male buckskin	24/01/03	In clearing	Mid-slope
1 lone	1 juv. male chestnut	24/01/03	In Boban Creek drainage	Drainage-line
Band of 5	3 buckskins 1 palomino 1 bay	25/01/03	Slope by dam	Mid-slope
Band of 5	3 bays 1 chestnut 1 seal brown	25/01/03 27/01/03	East slope near bridge	Drainage-line Mid-slope
2 horses	1 buckskin mare 1 bay foal	26/01/03	75m north of the road	Ridge-top
2 horses	1 bay juv. male 1 palomino juv. female	26/01/03	Near T3 by fresh chew	Mid-slope
Band of 7 *(mix of horses from band of 7 and band of 8 seen on 19/01/03)	3 bays 2 palomino 1 palomino foal 1 roan/black	26/01/03	T3 at 100m	Drainage-line
2 horses	1 bay stallion 1 piebald/paint mare	26/01/03	T3 at 200m near Boban	Mid-slope
Band of 9	4 bays 2 chestnuts 1 dark gray	26/01/03	T3 at 300m	Mid-slope

	1 light gray 1 white			
Band of 3	1 bay stallion 1 black & gray mare 1 bay foal	26/01/03	T3 at 1800m	Mid-slope
Band of 3	1 roan/black stallion 1 gray mare 1 chestnut foal	27/01/03	T3 at 1600m	Drainage-line
Band of 6	2 buckskin males 1 bay male 1 chestnut male 1 chestnut mare 1 chestnut foal	27/01/03	Fence near gate near Paddy's Land Hut	Mid-slope
Band of 7	2 gray 1 dark gray 1 dark gray foal 1 seal brown 1 chestnut mare w/ white socks 1 chestnut foal w/ white blaze	27/01/03	Wonga dam	Drainage-line
Band of 5	1 heavy bay stallion 2 bay mares 1 chestnut 1 chestnut foal	27/01/03	Near dry dam	Mid-slope
Band of 4	1 dark bay 1 light bay 1 chestnut 1 piebald/paint	27/01/03	West slope of dam w/ water	Mid-slope
2 horses	1 palomino mare 1 chestnut foal	02/02/03 03/02/03	Near cemetery	Mid-slope Mid-slope
Band of 5	3 bays 1 chestnut 1 buckskin	02/02/03	Near fork in road leading to Paddy's Ridge	Drainage-line
1 lone	1 gray female	03/02/03	Open clearing	Mid-slope
Band of 3	2 bays 1 chestnut	04/02/03	Drainage behind Perry's Hut.	Drainage-line
1 lone	1 bay male	04/02/03	Slope T. Hut	Mid-slope
Band of 7	2 buckskin 2 chestnut 3 gray	09/02/03	Wonga dam	Drainage-line
2 horses	1 roan/black mare 1 chestnut foal	09/02/03	Open clearing	Mid-slope
2 horses *(seen in winter with band of 6)	1 bay (old stallion) 1 chestnut	10/02/03	2km west of Wonga block	Drainage-line

Observations of identifiable horse bands over 11 survey days during Winter 2002, Bob's Creek

Identifiable Band	Band Members	Dates Encountered	Location	Landscape Position
Band of 5	2 gray 1 buckskin stallion 1 bay mare 1 chestnut foal	27/06/02	Sara/Bob's jct.	Drainage-line
Band of 7	4 buckskin	06/07/02	Ballard's camp	Mid-slope

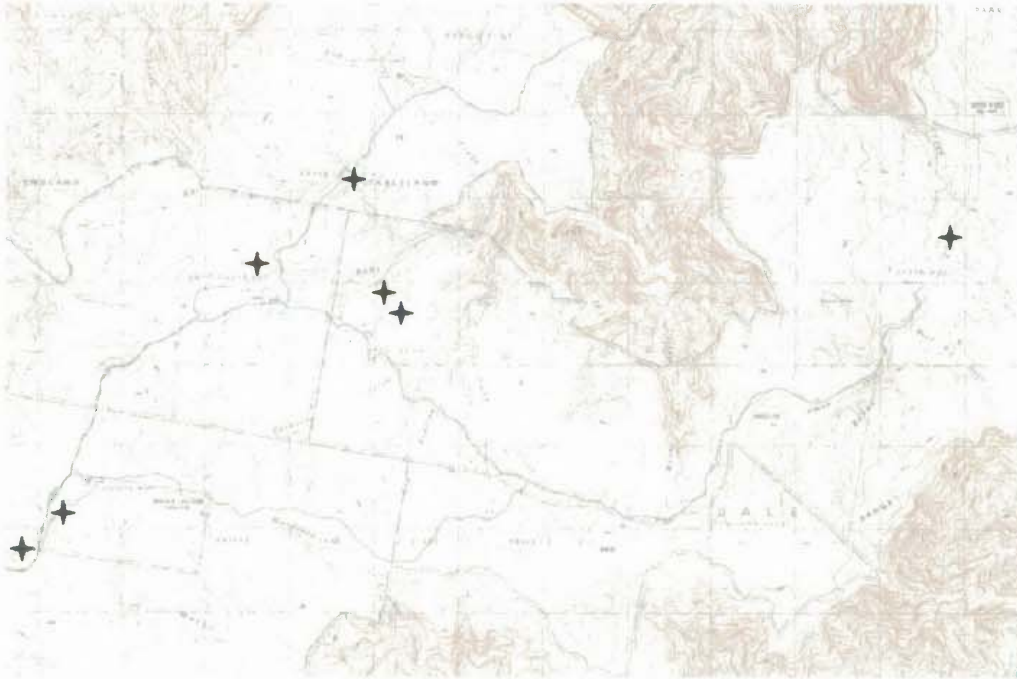
	3 bays			
Band of 6	4 bays 2 chestnuts	07/07/02	Site 6 & 7	Mid-slope
Band of 6	1 black 2 chestnuts 1 bay 2 brown	07/07/02	Sara/Bob's jct.	Drainage-line
Lone male	1 heavy bay chestnut	08/07/02	2km west of Ballard's Flat	Drainage-line
2 horses	2 buckskins	08/07/02	Dead man's point	Mid-slope
Band of 6	3 buckskins 2 bays 1 gray	08/07/02	Ballard's camp	Mid-slope
Band of 3	3 bays	18/07/02	Pargo area	Ridge-top
Band of 8	Unknown	21/08/02	Paddy's ridge	Ridge-top
1 juvenile	1 chestnut juv.	21/08/02	Sara/Bob's jct.	Drainage-line

Observations of identifiable horse bands over 4 survey days during Summer 2003, Bob's Creek

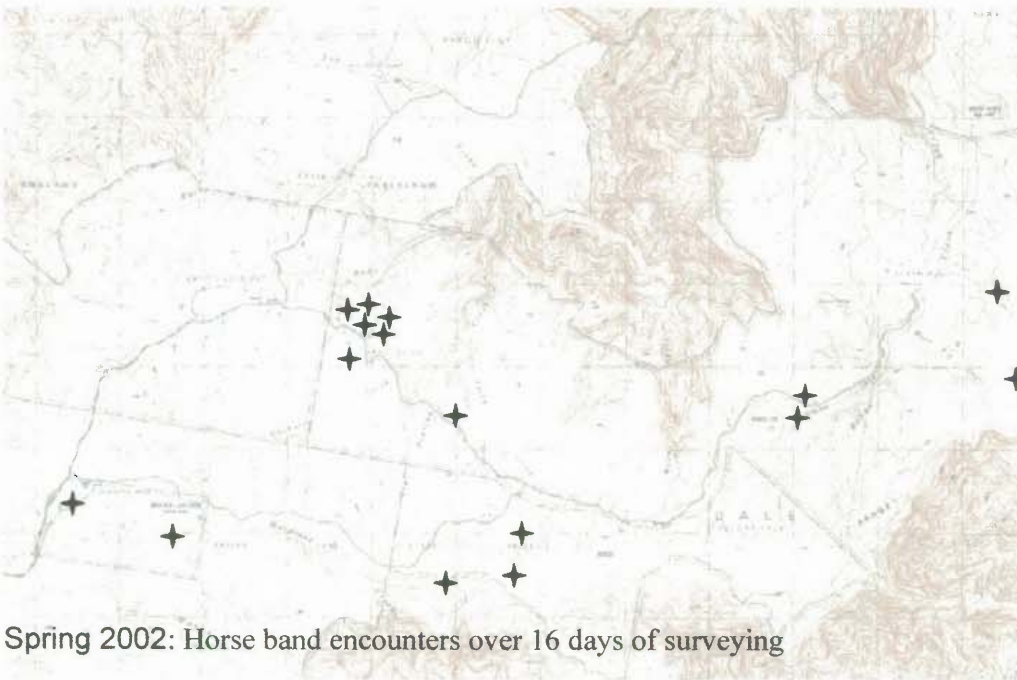
<b>Identifiable Band</b>	<b>Band Members</b>	<b>Dates Encountered</b>	<b>Location</b>	<b>Landscape Position</b>
Band of 3	1 buckskin 1 piebald/paint 1 chestnut bay	17/02/03	Near Sara River	Mid-slope
Band of 6	1 bay stallion 1 palomino 1 buckskin 1 bay 1 gray w/ black mane & tail 1 chestnut foal	19/02/03	Site 4	Drainage-line
Band of 6	4 buckskins 1 chestnut foal 1 black with white star	19/02/03	Site 3	Mid-slope

**Appendix 3.2** Map of horse observations on Paddy's Land plateau.

Autumn 2002: Horse band encounters over 8 days of surveying.

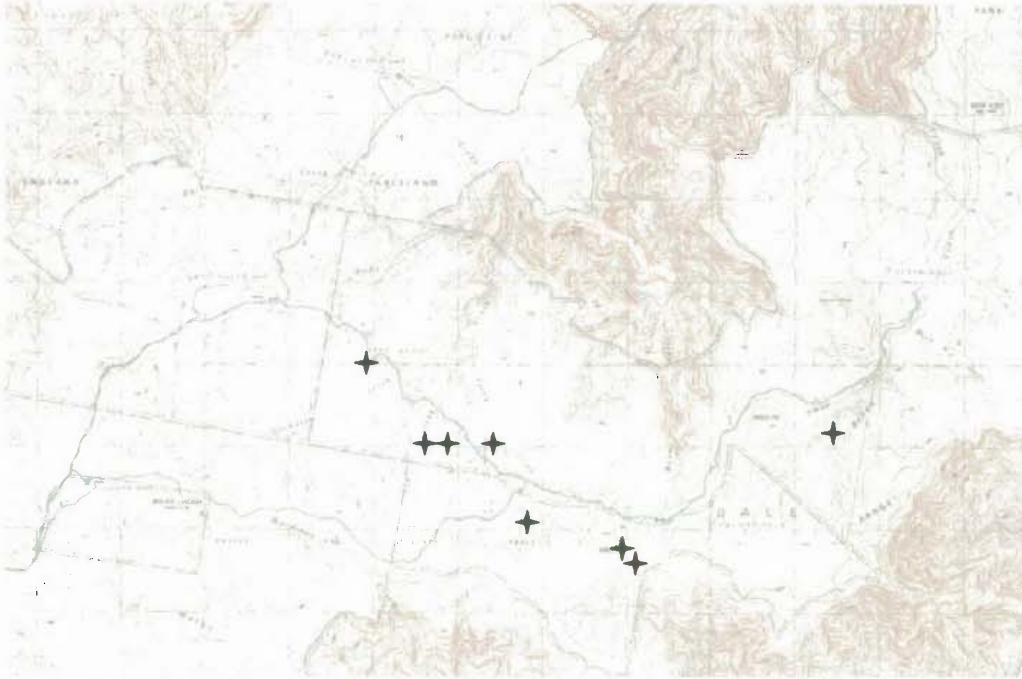


Winter 2002: Horse band encounters over 12 days of surveying.

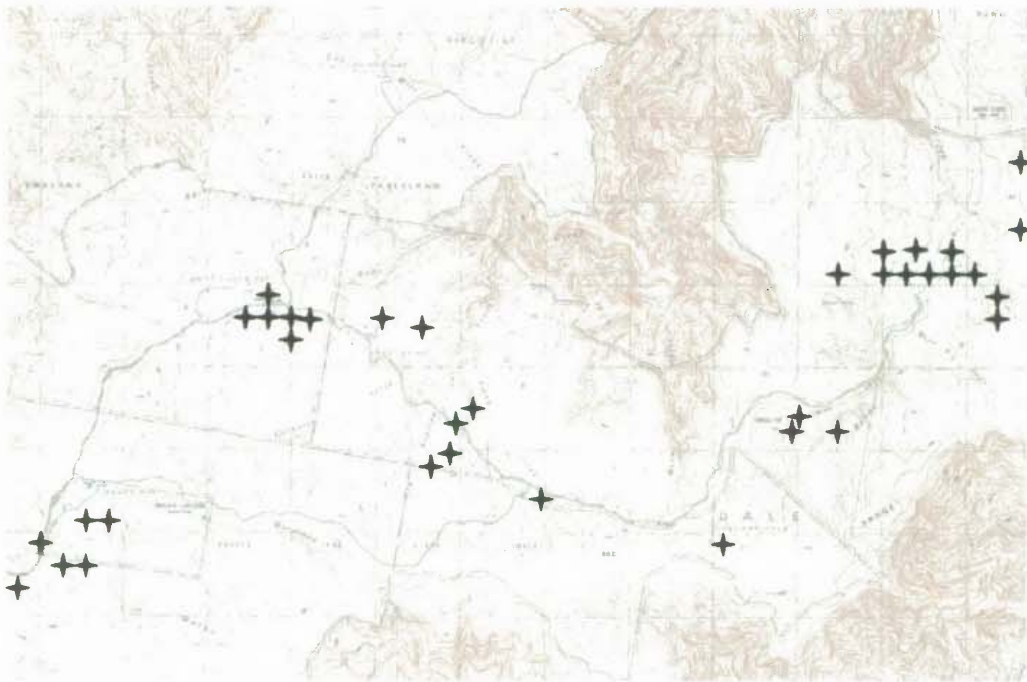


Spring 2002: Horse band encounters over 16 days of surveying





Summer 2003: Horse band encounters over 16 days of surveying.



**Appendix 3.3** Example photos of individuals and bands (Photos by CJ Schott).



‘Big Boy’ with harem, including ‘Blondie,’ seen over spring and summer (4 individuals) on western Paddy’s Land plateau near Cockatoo Creek and Old Station Creek.

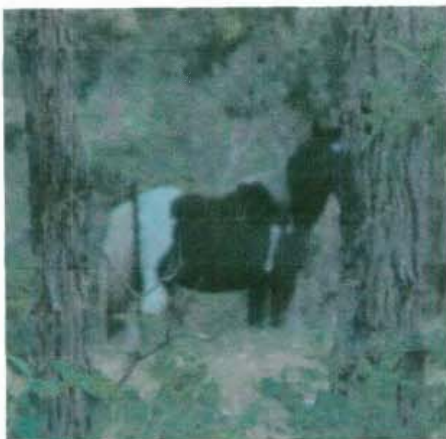


Pregnant mare, ‘Ghost’ with other pregnant mare seen together twice over spring on western Paddy’s Land plateau near Paddy’s Land Hut trailer.





Stallion 'Moon-shine' with harem seen spring on the southern plateau near Ryan's Gully.



Piebald mare seen with bay stallion on the eastern plateau near Boban Hut in summer.





Band formation on the eastern plateau, Transect 3, in summer.



Mare with foal seen summer near paddy's Land Hut clearing interacting with four bachelors





'Two Socks' with harem on western Paddy's land plateau behind Tallagandra Depot. Seen over winter and again in summer with less members.



Band of eight bays and one chestnut seen twice in spring on the western plateau near Braziers Hut. Juvenile appeared to have heavy draught blood with black strip running down back.



Bob's Creek bachelor group seen winter at Ballard's Flat.



Pregnant Mable's band (with daughter Nib and 4 males) seen 6 times over Winter near Tallagandra Depot. Mable and Nib both appeared to have heavy draught blood. They were seen again with another band on the eastern side of the plateau in summer. Two of the males were seen in poor condition together in summer at Wonga dam.



**Appendix 3.4** Transect catena level measurements: Taken in 100m sections

<b>Transect 1</b>			
<b>Section</b>	<b>Drainage-line</b>	<b>Mid-slope</b>	<b>Ridge-top</b>
	20m		
1	(3 dams within 500 m west of transect)	80m	
2		100m	
3		100m	
4	25m	75m	
5		60m	40m
6	10m	90m	
7	25m	60m	15m
8	20m	65m	15m
9		60m	40m
10	35m	65m	
11		75m	25m
12		85m	15m
13		100m	
14	25m	75m	
15		80m	20m
16		100m	
17	25m	75m	
18	20m	80m	
19	10m	90m	
20		85m	15m
Total	215m	1600m	185m
%	0.1075	0.8	0.0925
<b>Transect 2</b>			
<b>Section</b>	<b>Drainage-line</b>	<b>Mid-slope</b>	<b>Ridge-top</b>
1	50m (1 dam within 100 m west of transect)	50m	
2		100m	
3	10m	90m	
4	15m	85m	
5		100m	
6		60m	40m
7	25m	75m	
8		100m	
9		100m	
10		100m	
11	10m	90m	
12	15m	85m	
13		100m	
14		75m	25m
15	1 dam within 1 km north of the transect	85m	15m
16	25m	75m	
	15m		
17	(1 dam within 100 m of the transect)	85m	
18		60m	40m
19		100m	
20		70m	30m
Total	165m	1685m	150m

%	0.0825	0.8425	0.075
<b>Transect 3</b>			
<b>Section</b>	<b>Drainage-line</b>	<b>Mid-slope</b>	<b>Ridge-top</b>
1	25m	75m	
2	50m	50m	
3	75m	25m	
4		60m	40m
5	1 dam within 500 m south of transect	100m	
6		100m	
7		100m	
8	25m	75m	
9		100m	
10		100m	
11		80m	20m
12		80m	20m
13			100m
14		20m	80m
15		100m	
16		100m	
17		60m	40m
18		100m	
19	15m	85m	
20	10m	90m	
total	200m	1500m	300m
%	0.1	0.75	0.15



**Appendix 4.1** Clustering of damage indicated by Poisson series: Pilot landscape-level. Comparison of the observed frequency of numbers of damaged trees per sample (of ten trees), compared with the frequencies expected from a Poisson series with the same mean (0.875 damaged trees) per plot.

Damaged trees per sample	Expected frequency	Observed frequency
0	6.670	12
1	5.836	0
2	2.555	1
3	0.745	0
4 or more	0.194	3

**Appendix 4.2** Clustering of damage indicated by Poisson series: Formal landscape-level. (mean = 4.8 damaged trees per plot).

No. damaged trees per plot	Expected frequency	Observed frequency
0	0.1234	6
1	0.5925	0
2	1.4220	2
3	2.2753	1
4	2.7304	1
5	2.8441	1
6	2.0970	0
7	1.4379	1
8	0.8628	0
9	0.4602	0
10 and more	0.2208	3

**Appendix 4.3** Chi-squared analyses indicating clustering of catena level damage. Significant departure of fresh damage from random between catena levels. Data from Transect 1 was not testable because of very low expected and observed values.

Spring & Summer	DL Catena	MS Catena	RT Catena	X <sup>2</sup> value (df=2)	Significance
Transect 1 N=8	Exp=0.86 Obs=2	Exp=6.4 Obs=3	Exp=0.74 Obs=3	Not testable	Not testable
Transect 2 N=41	Exp=3.38 Obs=17	Exp=34.5 Obs=24	Exp=3.07 Obs=0	61.15	P ≤0.001
Transect 3 N=32	Exp=3.2 Obs=13	Exp=24 Obs=10	Exp=4.8 Obs=9	41.84	P ≤0.001

**Appendix 4.4** Analysis of biological health attributes across damaged and undamaged trees

**4.4a** Analysis of vigour across damaged and un-damaged trees +/- standard errors (n=20 un-chewed, n=20 chewed for each of the four impacted species).

Vigour	Mean scale Un-damaged	Mean scale damaged	Variance Cochran's test p-value	Test	Probability
<i>E. amplifolia</i>	6.625 +/- 0.144	6.1 +/- 0.160	0.650	ANOVA 0.019	P<0.05
<i>E. saligna</i>	6.475 +/- 0.128	6.25 +/- 0.203	0.050	Kruskal-Wallis 0.746	<i>ns</i>
<i>E. moluccana</i>	6.475 +/- 0.111	4.7 +/- 0.384	0.000001	Kruskal-Wallis 0.000017	P<0.001
<i>E. melliodora</i>	6.425 +/- 0.182	4.1 +/- 0.517	0.00003	Kruskal-Wallis 0.00104	P<0.001

**4.4b** Analysis of vitality across damaged and undamaged trees +/- standard errors (n=20 un-chewed, n=20 chewed for each of the four impacted species).

Vitality	Mean Un-damaged	Mean damaged	Variance Cochran's test p-value	P-value	Significance
<i>E. amplifolia</i>	5.9 +/- 0.172	5.625 +/- 0.180	0.836	ANOVA 0.278	<i>Ns</i>
<i>E. saligna</i>	5.525 +/- 0.128	5.425 +/- 0.199	0.060	ANOVA 0.675	<i>Ns</i>
<i>E. moluccana</i>	5.975 +/- 0.190	5.175 +/- 0.246	0.264	ANOVA 0.014	**
<i>E. melliodora</i>	5.55 +/- 0.173	4.575 +/- 0.257	0.094	ANOVA 0.003	**

**4.4c** Analysis of foliage class across damaged and undamaged trees +/- standard errors (n=20 un-chewed, n=20 chewed for each of the four impacted species).

Foliage cover	Mean Un-damaged	Mean damaged	Variance Cochran's test p-value	P-value	Significance
<i>E. amplifolia</i>	3.55 +/- 0.231	2.65 +/- 0.126	0.010	Kruskal-Wallis 0.0008	***
<i>E. saligna</i>	3.47 +/- 0.122	3.22 +/- 0.239	0.005	Kruskal-Wallis 0.791	<i>Ns</i>
<i>E. moluccana</i>	3.32 +/- 0.206	2.5 +/- 0.211	0.910	ANOVA 0.008	**
<i>E. melliodora</i>	3.3 +/- 0.189	2.12 +/- 0.223	0.487	ANOVA 0.0003	***

**Appendix 5.1** Significance of differences between treatments in each enclosure site over two time trials. (Trial 1= August 2002, Trial 2 = February 2003).

Variable/Trial	All treatments in site	Variance check (Cochran's C test)	Test	Probability
Biomass/1	3	0.098	ANOVA 0.494	P>0.01
Biomass/1	4	0.231	ANOVA 0.2509	P>0.01
Biomass/1	8	0.395	ANOVA 0.6115	P>0.01
Biomass/2	3	0.652	ANOVA 0.0012	P>0.001
Biomass/2	4	0.065	ANOVA 0.603	P>0.01
Biomass/2	8	0.793	ANOVA 0.8037	P>0.01
Seedbank/1	3	0.037	Kruskal-Wallis 0.437	P>0.01
Seedbank/1	4	0.798	ANOVA 0.948	P>0.01
Seedbank/1	8	0.311	ANOVA 0.716	P>0.01
Seedbank/2	3	0.702	ANOVA 0.188	P>0.01
Seedbank/2	4	0.974	Kruskal-Wallis 0.974	P>0.01
Seedbank/2	8	0.00017	Kruskal-Wallis 0.0005	P>0.001
Richness/1	3	0.613	ANOVA 0.154	P>0.01
Richness/1	4	0.496	ANOVA 0.937	P>0.01
Richness/1	8	1.0	ANOVA 0.032	P>0.01
Richness/2	3	0.162	ANOVA 0.266	P>0.01
Richness/2	4	0.025	Kruskal-Wallis 0.792	P>0.01
Richness/2	8	0.009	Kruskal-Wallis 0.004	P>0.001

**Appendix 5.3a** Analysis of variance for seedbank – Type I Sum of Squares (main effects and interactions). All f-ratios based on the residual mean square error. Two p-values are less than 0.05 showing that site and time have a statistically significant effect on seedbank.

Source	Sum of sq.	Df	Mean sq.	F-ratio	Probability
A: Site	60.4519	2	30.2259	0.28	0.7572
B: Treatment	259.43	2	129.715	1.20	0.3044
C: Time	1898.73	1	1898.73	17.49	≤0.001
AB	507.837	4	126.959	1.17	0.3246
AC	671.207	2	335.604	3.09	0.0471
BC	222.096	2	111.048	1.02	0.3609
ABC	333.704	4	83.4259	0.77	0.5465

**Appendix 5.3b** Fisher's Least Significant Difference for seedbank.

Site	LS mean	Contrast / Difference
3	13.9222	3-4 / -0.5
4	14.4222	3-8 / -1.15556
8	15.0778	4-8 / -0.655556



**Appendix 5.4a** Analysis of variance for species richness –Type 1 sum of squares (main effects and interactions). All f-ratios based on the residual mean square error. Three p-values are less than 0.05 showing that site and time have a statistically significant effect on species richness.

Source	Sum of sq.	Df	Mean sq.	F-ratio	Probability
A: Site	21.4222	2	10.7111	9.30	0.001
B: Treatment	2.75556	2	1.37778	1.20	0.3041
C: Time	40.8333	1	40.8333	35.45	≤0.001
AB	3.48889	4	0.87222	0.76	0.5540
AC	2.22222	2	1.11111	0.96	0.3825
BC	4.62222	2	2.31111	2.01	0.1366
ABC	17.8889	4	4.47222	3.88	0.0044

**Appendix 5.4b** Fisher’s Least Significant Difference for species richness.

Site	LS mean	Contrast / Difference	Probability
8	2.81111	3-4 / -0.311111	<i>ns</i>
3	3.18889	3-8 / 0.377778	p≤0.05
4	3.5	4-8 / 0.688889	p≤0.05



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