JACOBS

Site ID: 219	Survey type:Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Eucalyptus tectricornis -	3	3	41			
2	E. moluccana -	3	5	42			
3	Lycium ferocissimum	3	30	43			
4	Senecio madagascariensis	4	20+	44			
5	Cirsium vulgare	3	20+	45			
6	cotula -	3	20+	46			
7	Oxalis - smooth Yellow -	3	20+	47			
8	Solanum nigrum	1	1	48			
9	Pennisetum clandestinum	4	20+	49			
10	Paspalum	2	20+	50			
11	sida rhombifolia	1	1	51			
12	Daucus - carrot tops	1	1	52			
13	Conyza bonariensis	2	20+	53			
14	Cyperus gracilis -	2	20+	54			
15	Chloris divgata	1	1	55			
16	Hypochaeris radicata	2	20+	56			
17	Sporobolus parramattensis	2	20+	57			
18	Taraxacum officinale	1	1	58			
19	Sonchus oleraceus	1	1	59			
20	Stinking roger	1	1	60			
21	Trifolium repens	2	20+	61			
22	Cleick weed	1	1	62			
23	Bromus catharticus	1	1	63			
24	Vicia sativa	1	1	64			
25	Dichondra repens -	2	20+	65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree		
Shrub		
Grass (annual)	6	
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HW 529 Mod/Good

Shale Hills - Mod/Good

BioBanking Field Sheet

Entered ✓

JACOBS

Sales Park 63

Survey Site Form - BioBanking		Site ID: Church Block 63	Vegetation zone: CPW		
Date	2/9/2015	Surveyor(s): Lucas Clews			
Waypoint ID	~~529~~ 63	Photo numbers	1263	1264	1265	1266
Coordinates	E / N	Photo direction	N	E	S	W

Mapped Vegetation type: CPW	Condition:	Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): S	Altitude: 115m	

Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?

Soil type: sand, loam, clay, organic, gravel, skeletal, ? — Soil disturbance: intact, topsoil removed, fill

Remnant / Old growth (uncleared): Yes / No / Undecided?

Vegetative Structure (formation) = Open Forest — Ecologically Dominant Layer (EDL) - most biomass = Canopy

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20 25m			Eucalyptus moluccana Eucalyptus tereticornis Eucalyptus crebra
T2	-			
T3	-			
S1	-			Acacia Bursaria spinosa Indigofera australis
S2	-			
G	-			Eragrostis curvula Chloris gayana Themeda Aristida Microlaena

Definitions

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover I = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	20	0	0
10m	0	0	0
15m	0	0	0
20m	20	0	0
25m	40	0	0
30m	10	0	0
35m	30	10	0
40m	20	20	0
45m	5	0	0
50m	5	0	0
Total (sum / 10) =	15	3	0

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	56.4
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 卌 卌 卌 卌 卌 卌	60%
Native other (herb, fern, sedge, etc) tally - IIII	8%
Native shrub tally -	0%
Exotic tally - 卌 卌 II	24%

92%

JACOBS

Site ID: Sales Park 63

Survey type: Quadrat 20m x 20m

#	Species	Cover	Abund.	#	Species	Cover	Abund.
1	Geitonoplesium cymosum -	1	6	41			
2	Themeda triandra -	3	20+	42			
3	Dichondra repens -	2	20+	43			
4	Senecio madagascariensis	2	20+	44			
5	Indigofera australis -	2	4	45			
6	Wurmbea dioica -	2	20+	46			
7	Chloris gayana	2	20+	47			
8	Bidens pilosa	2	30+	48			
9	Bursaria spinosa -	3	20+	49			
10	Eragrostis curvula	4	20+	50			
11	Oplismenus aemulus -	2	20+	51			
12	Asparagus asparagoides	2	20+	52			
13	Aristida vagans -	2	20+	53			
14	Eucalyptus moluccana -	5	10	54			
15	Eucalyptus tereticornis -	2	2	55			
16	Small Lamiaceae -	2	20+	56	Mentha satureioides		
17	Olea europaea	2	20+	57			
18	Plantago lanceolata	1	1	58			
19	Sonchus oleraceus	1	1	59			
20	Cirsium vulgare	1	1	60			
21	Oxalis -	1	1	61			
22	Cyperus gracilis -	2	20+	62			
23	Lilly - Arthropodium -	1	1	63			
24	Glycine tabacina -	2	20+	64			
25	Geranium -	1	1	65			
26	Cheilanthes sieberi -	2	20+	66			
27	Wahlenbergia communis -	1	1	67			
28	Anagallis arvensis	2	10+	68			
29	Dianella - Blue green -	1	1	69			
30	Setaria	2	20+	70			
31	father Galium -	1	1	71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree	20	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN 52a Mod/Good

Entered ✓

JACOBS

BioBanking Field Sheet

Shale Hills - Mod/Good

Survey Site Form - BioBanking				Site ID: 57		Vegetation zone: RFEF	
Date	2/9/2015			Surveyor(s): Lukas Clews			
Waypoint ID	57			Photo numbers	1237		
Coordinates	E 285649 N 6744509			Photo direction	N	E	S / W
Mapped Vegetation type: RFEF				Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep		Aspect (degrees or cardinal): NE		Altitude: 96m			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace							
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?							
Soil type: sand, loam, clay, organic, gravel, skeletal, ?				Soil disturbance: intact, topsoil removed, fill			
Remnant / Old growth (uncleared): Yes / No / Undecided?							
Vegetative Structure (formation) = Open Forest				Ecologically Dominant Layer (EDL) - most biomass = Canopy			
Strata	Height interval	Median	Est. cover	Dominant Species & Dominance			
E	-						
T1	20-25m			Eucalyptus tereticornis; Eucalyptus moluccana; Eucalyptus crebra			
T2	-						
T3	-						
S1	4-6m			Acacia parramattensis; Solanum sp.; Olea europaea			
S2	1m			Bursaria; Clematis			
G	-			Bromus, Sida; Senecio madagascariensis, Bursaria spinosa; Cirsium vulgare, Microlaena; Dichondra repens			

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover I = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover			Ground cover tally sheet, 50 points along 50m transect	
Point	Canopy % (photos)	Midstorey %	Exotic %	- every 1m record if plant intersects (hits) point	
5m	30	0	0	Native grass tally - |||	Total (hits/50) 6%
10m	10	0	0		
15m	5	0	0		
20m	10	40	0		
25m	5	0	0		
30m	10	10	10	Native other (herb, fern, sedge, etc) tally -	Total (hits/50) 0%
35m	20	0	50		
40m	5	0	0		
45m	5	0	0		
50m	10%	5%	6		
Total (sum / 10) =	11	5.5	6.6	Native shrub tally -	Total (hits/50) 0%
Larger 50 x 20m plot					
Length of woody debris >10cm wide & >0.5m long			45m		
Proportion of canopy sp. regeneration			100%	Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |||	Total (hits/50) 86%
Number of trees with hollows >5cm			1		

92%

JACOBS

Site ID: S7	Survey type: Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Eucalyptus tereticornis	5	9	41			
2	E. moluccana	4	5	42			
3	Acacia parramattensis	4	20+	43			
4	Bursaria spinosa	3	20+	44			
5	Dichondra repens	2	20+	45			
6	Modiola caroliniana	2	20+	46			
7	Cirsium vulgare	2	20+	47			
8	Microlaena stipoides	3	20+	48			
9	Sida rhombifolia	2	20+	49			
10	Fire weed	2	20+	50			
11	Blackberry	1	1	51			
12	Clematis - smooth	2	20+	52			
13	Oplismenus aemulus	3	20+	53			
14	Einadia hastata	2	20+	54			
15	Plectranthus parviflorus	1	1	55			
16	Bidens pilosa	2	20+	56			
17	Glycine clandestina	1	2	57			
18	Olea europaea	3	20+	58			
19	Lycium ferocissimum	2	20+	59			
20	Sporobolus pyramidalis	1	1	60			
21	Lantana	3	20+	61			
22	Trifolium repens	2	20+	62			
23	Dichelachne	1	1	63			
24	Cotula	1	1	64			
25	Medicago polymorpha	2	20+	65			
26	Stinking Roger	1	1	66			
27	Solanum sapium Apple	2	5	67			
28	Convolvulus erubescens	1	1	68			
29	Eragrostis brownii	1	1	69			
30	Poa annua	2	20+	70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree		
Shrub	16	
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN529 Mod/Good

BioBanking Field Sheet

Entered ✓

JACOBS

Shale Hills - Mod/Good

Survey Site Form - BioBanking		Site ID: 40	Vegetation zone: CPW = cleared understorey			
Date	3/9/2015	Surveyor(s):				
Waypoint ID	40	Photo numbers	1284	→	→	1288
Coordinates	E N	Photo direction	N	E	S	W
Mapped Vegetation type: CPW		Condition:			Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): SW	Altitude: 78m				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?		canopy but cleared & grazed understorey				
Vegetative Structure (formation) = Open forest		Ecologically Dominant Layer (EDL) - most biomass = canopy				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20-25m			Eucalyptus molluccana (d) Eucalyptus tereticornis (sd) Eucalyptus eugenioides (o)
T2	-			Brachychiton populneus (o)
T3	8m			Olea europaea (o)
S1	-			
S2	0.5-1m			Bursaria spinosa (o)
G	-			Dichondra repens Chloris ventricosa Oplismenus aemulus Cynodon dactylon Ehrharta erecta

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover I = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	60	0	0
10m	30	0	0
15m	40	0	60
20m	30	0	60
25m	5	0	0
30m	10	0	0
35m	20	0	0
40m	40	0	0
45m	5	0	0
50m	5	10	0
Total (sum / 10) =	24.5	1%	12%
Larger 50 x 20m plot			
Length of woody debris >10cm wide & >0.5m long			0
Proportion of canopy sp. regeneration			100%
Number of trees with hollows >5cm			0

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 ||||	36%
Native other (herb, fern, sedge, etc) tally - 𝍸 𝍸 |	22% (58%)
Native shrub tally - |	2%
Exotic tally - 𝍸 ||||	28%

JACOBS

Site ID: 40	Survey type:Quadrat 20m x 20m				
Species	**Cover**	**Abund.**	**Species**	**Cover**	**Abund.**
1 cymbopogon	2	20+	41		
2 Plantago gaudichaudii	1	1	42		
3 Senecio madagascariensis	2	20+	43		
4 Brassica	1	1	44		
5 Eucalyptus molluccana	5	18	45		
6 Eucalyptus tereticornis	2	1	46		
7 Olea europaea	1	1	47		
* 8 Solanum spiky apple	2	6	48		
9 Cynodon dactylon	3	20+	49		
10 Chloris ventricosa	3	20+	50		
11 Entolasia aciculata	2	20+	51		
12 Cyperus gracilis	2	20+	52		
13 Ehrharta erecta	4	20+	53		
14 Dichondra repens	5	20+	54		
15 Hypochaeris radicata	1	1	55		
16 Cirsium vulgare	2	20+	56		
17 Chick weed	2	20+	57		
18 Oxalis small - yellow	2	20+	58		
19 Bursaria spinosa	2	20+	59		
20 Eremophila debilis	2	20+	60		
21 Poa annua	2	20+	61		
22 Solanum prinophyllum	1	1	62		
23 Glycine tabacina	2	20+	63		
24 Modiola	1	1	64		
25 Taraxacum officinale	1	1	65		
26 Sonchus oleraceus	1	1	66		
27 Sida rhombifolia	1	1	67		
28 Centella asiatica	2	20+	68		
29 Ranunculus sp.	1	1	69		
30 Solanum nigrum	1	1	70		
31 Einadia nutans	1	1	71		
32 Oplismenus aemulus	2	20+	72		
33 Gomphocarpus physocarpus	1	1	73		
34 Brunoniella australis	1	1	74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	18	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing: ✓	Other:

HN 529 Mod/Good

Entered ✓

JACOBS

BioBanking Field Sheet

Shale Hills - Mod/Good

Survey Site Form - BioBanking				Site ID: 2 Bradley 2		Vegetation zone: CPW		
Date	30/9/2015			Surveyor(s):				
Waypoint ID	634			Photo numbers	2170	→	2172	2173
Coordinates	E 286577			Photo direction	N	E	S	W
	N 6256645							
Mapped Vegetation type: CPW				Condition:			Low	Mod-good
Slope: Gentle, Mod, Steep		Aspect (degrees or cardinal): SE		Altitude: 71m				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace								
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?								
Soil type: sand, loam, clay, organic, gravel, skeletal, ?				Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?								
Vegetative Structure (formation) = Open forest				Ecologically Dominant Layer (EDL) - most biomass = Canopy				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	15-25m			Eucalyptus tereticornis Eucalyptus molluccana
T2	-			
T3	-			
S1	-			Bursaria spinosa
S2	-			
G	-			Kikuyu Fireweed.

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	50	0	0
10m	60	0	0
15m	40	0	0
20m	0	0	0
25m	0	0	0
30m	10	10	5
35m	20	20	0
40m	10	0	0
45m	10	0	0
50m	0	20	0
Total (sum / 10) =	20%	5	0.5

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long	1.5m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	2

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally -	0%
Native other (herb, fern, sedge, etc) tally - |	Total (hits/50) 2%
Native shrub tally -	Total (hits/50) 0%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 ||	Total (hits/50) 74%

2174

76%

JACOBS

Site ID: 2 Bradley 2

Survey type: Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus moluccana	1	1	41		
2 Eucalyptus tereticornis	5	6	42		
3 Senecio madagascariensis	4	20+	43		
4 Solanum prickly apple	1	2	44		
5 Pennisetum clandestinum	5	20+	45		
6 Sida rhombifolia	2	20+	46		
7 Capsella bursa-pastoris	2	20+	47		
8 Eragrostis curvula	2	20+	48		
9 Calmat tops	2	20+	49 cyclospermum leptophyllum		
10 Cotula	2	20+	50		
11 Medicago	2	20+	51		
12 Glycine tabacina	2	20+	52		
13 Einadia nutans	2	20+	53		
14 Bursaria spinosa	2	10	54		
15 Dichondra repens	2	20+	55		
16 Malva parviflora	1		56		
17 Cirsium vulgare	1	4	57		
18 Trifolium repens	2	20+	58		
19 Sigesbeckia orientalis	2	20+	59		
20 Plantago lanceolata	2	20+	60		
21 Oplismenus aemulus	1	2	61		
22 Brunoniella australis	1	2	62		
23 Conyza bonariensis	2	20+	63		
24 Rumex crispus	1	1	64		
25 Lotus sp.	1	1	65		
26 Hypochaeris radicata	1	1	66		
27			67		
28			68		
29			69		
30			70		
31 Juncus acutus			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	10	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN 529 Mod/Good

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Entered ✓

JACOBS

BioBanking Field Sheet

Shale Hills - Mod/Good

Survey Site Form - BioBanking		Site ID: 149	Vegetation zone: CPW - Hills		
Date	9/9/2015	Surveyor(s): Lukas Clews			
Waypoint ID	iphone photo	Photo numbers	1412		
Coordinates	E -33.865643 / N 150.688971	Photo direction	N	E	S / W
Mapped Vegetation type: CPW - Hills		Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): S	Altitude: ?			

Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?

Soil type: sand, loam, clay, organic, gravel, skeletal, ? | Soil disturbance: intact, topsoil removed, fill

Remnant / Old growth (uncleared): Yes / No / Undecided?

Vegetative Structure (formation) = Open forest | Ecologically Dominant Layer (EDL) - most biomass = Canopy

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20-25m			Eucalyptus tereticornis (d) Eucalyptus fibrosa (a)
T2	-			
T3	-			
S1	-			Bursaria spinosa Daviesia Lycium ferocissimum
S2	-			
G	-			Ehrharta, Chloris gayana, Cirsium Eragrostis curvula, Bromus, Dichondra Plantago, Arctotheca, Setaria Pennisetum

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	30	25	0
10m	5	10	0
15m	0	0	0
20m	0	0	0
25m	5	0	0
30m	10	60	0
35m	10	30	0
40m	40	0	0
45m	50	20	0
50m	0	0	0
Total (sum / 10) =	15%	14.5	0%

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - II	4%
Native other (herb, fern, sedge, etc) tally - III	6%
Native shrub tally -	0%
Exotic tally - (tally marks)	90%

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	1
Number of trees with hollows >5cm	0

100%

JACOBS

Site ID: 149	Survey type: Quadrat 20m x 20m				
Species	**Cover**	**Abund.**	**Species**	**Cover**	**Abund.**
1 Centella asiatica	2	20+	41		
2 Eucalyptus tereticornis	4	2	42		
3 Bursaria spinosa	4	20+	43		
4 Chloris gayana	2	20+	44		
5 Senecio madagascariensis	2	20+	45		
6 Hypochaeris radicata	2	20+	46		
7 Plantago lanceolata	2	20+	47		
8 Cotula	2	20+	48		
9 Lolium perenne	2	20+	49		
10 Chick weed	2	20+	50		
11 Eragrostis curvula	2	20+	51		
12 Lotus	2	20+	52		
13 Anagallis arvensis	2	20+	53		
14 Pennisetum clandestinum	3	20+	54		
15 Wurmbea dioica	1	2	55		
16 Dichondra repens	2	20+	56		
17 Sonchus	1	1	57		
18 Araujia sericifera	1	1	58		
19 Cirsium vulgare	1	1	59		
20 Wahlenbergia gracilis	2	20+	60		
21 Cyperus gracilis	2	20+	61		
22 Sida rhombifolia	2	20+	62		
23 Microlaena stipoides	2	20+	63		
24 Oxalis	2	20+	64		
25 Themeda triandra	1	1	65		
26			66		
27			67		
28			68		
29			69		
30			70		
31			71 SEA EAGLE!		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	11	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN529 Mod/Good

Entered. ✓

BioBanking Field Sheet

Shale Hills - Good

JACOBS

Survey Site Form - BioBanking		Site ID: P2 - 1 SUB	Vegetation zone: CPW			
Date	18/11/2015	Surveyor(s): LC				
Waypoint ID	680	Photo numbers	2389	→		2395
Coordinates	E N	Photo direction	N	E	S	W
Mapped Vegetation type: CPW			Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal):		Altitude: 98m			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Open Forest		Ecologically Dominant Layer (EDL) - most biomass = Canopy				

Strata	Height Interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	10-25m			Eucalyptus tereticornis (d) E. moluccana (c)
T2	-			
T3	-			
S1	1-10m			Bursaria spinosa - dense
S2	-			
G	-			Microlaena Brunoniella Themeda Dichondra

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	5	0	0
10m	10	0	0
15m	30	0	0
20m	40	10	0
25m	30	30	0
30m	20	60	0
35m	10	20	0
40m	20	60	0
45m	10	50	0
50m			
Total (sum / 10) =	17.5	23	0

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long: 1.5m

Proportion of canopy sp. regeneration: 100%

Number of trees with hollows >5cm: 1

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Native grass tally - |||| |||| |||| |||| |||| |||| |||| — Total (hits/50): 70%

Native other (herb, fern, sedge, etc) tally - |||| |||| — Total (hits/50): 18%

Native shrub tally - — Total (hits/50): 0%

Exotic tally - |||| | — Total (hits/50): 12%

100%

2397

BioBanking Field Sheet

JACOBS

Site ID: P21-sub

Survey type: Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus tereticornis	5	6	41		
2 E. moluccana	1	1	42		
3 Bursaria spinosa	6	20+	43		
4 Araujia sericifera	2	20+	44		
5 Microlaena stipoides	6	20+	45		
6 Cirsium vulgare	1	1	46		
7 Tiny wahlenbergia	1	20+	47		
8 Sida	2	20+	48		
9 Dichondra repens	2	20+	49		
10 Commelina cyanea	2	20+	50		
11 Oxalis perennans	2	20+	51		
12 Bidens	1	1	52		
13 Glycine tabacina	2	20+	53		
14 Hydrocotyle	1	1	54		
15 Brunoniella australis	2	20+	55		
16 Opercularia diphylla	1	1	56		
17 Solanum prinophyllum	2	20+	57		
18 Anagallis arvensis	1	1	58		
19 Arthropodium milleflorum	1	1	59		
20 Cyperus gracilis	1	1	60		
21 Small mint	1	1	61 Scutellaria humilis		
22 Aristida vagans	1	1	62		
23 Asperula conferta	1	1	63		
24 Centella asiatica	1	1	64		
25 Cheilanthes sieberi	1	1	65		
26 Euphorbia	1	1	66		
27			67		
28			68		
29			69		
30			70		
31			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	21	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN529 Mod/Good

JACOBS

Cumberland ~~Plains~~ Hills
BioBanking Field Sheet
Shale ~~Hills~~ - Mod/Good

Survey Site Form - BioBanking		Site ID: 2627 NR		Vegetation zone: CPW	
Date	1/10/2015	Surveyor(s):	Lukas Clews		
Waypoint ID	672	Photo numbers	2281	→	2285
Coordinates	E 286035 / N 6256?0	Photo direction	N	E	S	W

2289
2291

Mapped Vegetation type: CPW	Condition:	Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): SE	Altitude: 92m	

Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?

Soil type: sand, loam, clay, organic, gravel, skeletal, ? | Soil disturbance: intact, topsoil removed, fill

Remnant / Old growth (uncleared): Yes / No / Undecided? Roadside trees

Vegetative Structure (formation) = Open forest | Ecologically Dominant Layer (EDL) - most biomass = Canopy

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			Eucalyptus moluccana
T2	-			
T3	-			
S1	-			Bursaria spinosa Lycium ferocissimum
S2	-			
G	-			Lolium perenne Eragrostis curvula Plantago Themeda Arthropodium Dichondra repens Brunoniella

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	20	0	0
10m	5	0	0
15m	30	0	0
20m	30	0	0
25m	25	0	0
30m	20	0	0
35m	30	0	0
40m	30	0	0
45m	0	0	0
50m	10	0	0
Total (sum / 10) =	20	0	0
Larger 50 x 20m plot			
Length of woody debris >10cm wide & >0.5m long			2.4m
Proportion of canopy sp. regeneration			100%
Number of trees with holows >5cm			2

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 卌 ǁ	24%
Native other (herb, fern, sedge, etc) tally - 卌 卌 卌 卌 ǁ	44%
Native shrub tally -	0%
Exotic tally - 卌 卌 卌 ǀǀǀǀ	38%

96%

JACOBS

Site ID: 2627 NR

Survey type: Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus moluccana –	5	10	41		
2 Dianella longifolia –	1	3	42		
3 Arthropodium milleflorum –	2	20+	43		
4 Dichondra repens –	4	20+	44		
5 Araujia sericifera	1	1	45		
6 Senecio madagascariensis	2	20+	46		
7 Plantago ~~debilis~~ –	3	20+	47 ← gaudichaudii		
8 Sonchus oleraceus	1	2	48		
9 Olea europaea	1	1	49		
10 Ehrharta erecta	3	20+	50		
11 Bidens pilosa	1	1	51		
12 Eragrostis curvula	3	20+	52		
13 Brunoniella australis –	3	20+	53		
14 Themeda triandra –	3	20+	54		
15 Einadia nutans –	3	20+	55		
16 Conyza bonariensis	1	1	56		
17 Lactuca serriola	1	1	57		
18 Asperula conferta –	2	20+	58		
19 Cirsium vulgare	1	1	59		
20 Lomandra gracilis –	2	20+	60		
21 Lolium perenne	3	20+	61		
22 Sida rhombifolia	1	1	62		
23 Lycium ferocissimum	1	1	63		
24 Pennisetum clandestinum	3	20+	64		
25 Echium	1	1	65 Marsdenia viridiflora on fence post		
26			66 outside plot		
27			67		
28			68		
29			69		
30			70		
31			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree		
Shrub	10	
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN S2a DNG
Entered ✓

JACOBS

Survey Site Form - BioBanking		Site ID: 33 DNG	Vegetation zone:			
Date	21/01/2016	Surveyor(s):				
Waypoint ID	770	Photo numbers	2324	2325	2326	2327
Coordinates	E 0285897 N 6246813	Photo direction	N	E	S	W
Mapped Vegetation type:			Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal):		Altitude:			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone/shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) =	GRASSLAND	Ecologically Dominant Layer (EDL) - most biomass =	GROUNDLAYER			

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			
S2	-			
G	-			Themeda triandra Briza subaristata Paspalum Hydrocotyle peltata

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m			
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	4
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	70%
Native other (herb, fern, sedge, etc) tally - 𝍸 -	8%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 1	22%

100%

JACOBS

Site ID: 33 DNG	Survey type:Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Themeda triandra	6	100+	41			
2	Hypochoeris radicata	2	20+	42			
3	Senecio madagascariensis	2	20+	43			
4	~~Gamochaeta~~ sp. Evelyton	2	20+	44			
5	Aspenula conferta	2	20+	45			
6	Briza sub.	3	20+	46			
7	Cynodon dactylon	3	20+	47			
8	Glycine tabacina	1	20+	48			
9	Hypericum gramineum	1	5	49			
10	Plantago lanceolata	1	1	50			
11	Oxalis bowiei	1	5	51			
12	Paspalum dilatatum	3	20+	52			
13	Trichorine elatior	1	1	53			
14	Centella asiatica	2	20+	54			
15	Paspalidium distans	2	20+	55			
16	Phyllanthus sp.	1	1	56			
17	Zornia	1	1	57			
18	Embrystylis dichotoma	1	1	58			
19	Bothriochloa macra	1	1	59			
20	Eragrostis brownii	1	1	60			
21	Scaevola pumpernellii	1	1	61			
22				62			
23				63			
24				64			
25				65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
~~Tree~~	14	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

BioBanking Field Sheet

HN 529 DNG
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JACOBS

Survey Site Form - BioBanking		Site ID: P2 DNG	Vegetation zone: DNG			
Date	3/2/2016	Surveyor(s):	Lukas Clews			
Waypoint ID	SC4	Photo numbers	iPhone			
Coordinates	E 0285811 N 6254935	Photo direction	N	E	S	W
Mapped Vegetation type: NA		Condition:		Low	Mod-good	
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): Flat	Altitude: 92m				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Grassland		Ecologically Dominant Layer (EDL) - most biomass = ground layer				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			
S2	-			
G	-		95%	Themeda triandra (d)

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m			
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	0
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 ||	54%
Native other (herb, fern, sedge, etc) tally - 𝍸	10%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 |||	36%

100%

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Site ID: P2 ONG	Survey type:Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Themeda triandra	+ 6	100+	41			
2	Digitaria	4	20+	42	Axonopus		
3	Cynodon dactylon	+ 3	20+	43			
4	Hypochaeris radicata	3	20+	44			
5	Rhytidosporum diosmeum	+ 2	20+	45			
6	Hypericum gramineum	+ 2	20+	46			
7	Senecio madagascariensis	2	20+	47			
8	Centella asiatica	+ 1	20+	48			
9	Setaria	1	20+	49			
10	Briza subaristata	+ 2	20+	50			
11	Conyza [illegible]	1	~~20+~~ 1	51			
12	Aristida vagans	+ 1	~~2~~ 5	52			
13	Eragrostis brizula	1	1	53			
14	Sporobolus paranensis	1	1	54			
15	Stackhousia	+ 1	1	55			
16	Euphorbia	+ 1	1	56			
17	Wahlenbergia gracilis	+ 1	1	57			
18	Oxalis [illegible]	+ 1	1+	58			
19	Eragrostis brownii	+ 1	1	59			
20	Cymbopogon refractus	+ 1	2	60			
21				61			
22				62			
23				63			
24				64			
25				65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree		
Shrub		
Grass (annual)	12	
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

BioBanking Field Sheet HN 529 DNG

Entered ✓

JACOBS

Survey Site Form - BioBanking		Site ID:	DNG 139	Vegetation zone:		
Date	2/2/2016	Surveyor(s):	LC			
Waypoint ID	803	Photo numbers	2486	2487	2488	2489
Coordinates	E 0286625 N 6251787	Photo direction	N	E	S	W
Mapped Vegetation type: NA			Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): flat		Altitude:	98m		
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Grassland		Ecologically Dominant Layer (EDL) - most biomass = Ground				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			
S2	-			
G	0 0.5m		95%	Themeda Digitaria Sporobolus

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m	↓	↓	↓
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0
Larger 50 x 20m plot			
Length of woody debris >10cm wide & >0.5m long			0
Proportion of canopy sp. regeneration			0
Number of trees with hollows >5cm			0

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 I	62%
Native other (herb, fern, sedge, etc) tally - I	2%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 III	36%

100%

JACOBS

Site ID: DNG 139	Survey type: Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Themeda triandra	+ 5	100+	41			
2	Digitaria	4	100+	42	≠ Axonopus		
3	Aristida ramosa	+ 2	100+	43			
4	Setaria	2	100+	44			
5	Briza subaristata	2	20+	45			
6	Sporobolus creber	+ 2	20+	46			
7	Paspalum dilatatum	2	20+	47			
8	Senecio madagascariensis	1	20+	48			
9	Cyperus ~~compressus~~ sp.	+ 2	10	49			
10	Bothriochloa macra	+ 2	20+	50			
11	Wahlenbergia gracilis	+ 1	20+	51			
12	Euphorbia sphaerica	+ 1	1	52			
13	Hypericum gramineum	+ 2	20+	53			
14	Hypochaeris radicata	2	20+	54			
15	Sporobolus parviflorus	1	1	55			
16	Fimbristylis dichotoma	+ 1	10	56			
17	Centaurium erythraea	1	1	57			
18	Conyza bonariensis	1	1	58			
19	Eragrostis brownii	+ 1	1	59			
20	Cynodon dactylon	+ 2	20+	60			
21				61			
22				62			
23				63			
24				64			
25				65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree		
Shrub		
Grass (annual)	19	
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN529 DNG entered ✓

JACOBS

Survey Site Form - BioBanking		Site ID: 30DNG1	Vegetation zone:			
Date	21/01/2016	Surveyor(s):				
Waypoint ID	71	Photo numbers	2328	2329	2330	2331
Coordinates	E 0286389 N 6247532	Photo direction	N	E	S	W
Mapped Vegetation type:			Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal):		Altitude:			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared):	Yes / No / Undecided?					
Vegetative Structure (formation) = GRASSLAND		Ecologically Dominant Layer (EDL) - most biomass =	GROUNDLAYER			

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			E. tereticornis
S2	-			
G	-			Themeda triandra Eriza sub.

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m			
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	1
Number of trees with hollows >5cm	0

Regen - no canopy

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	80%
Native other (herb, fern, sedge, etc) tally - 1 1	2% (100%)
Native shrub tally -	0%
Exotic tally - 𝍸 1111	18%

JACOBS

Site ID: 39 DNG

Survey type: Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Themeda tri	6	200+	41			
2	Briza sub.	4	190+	42			
3	Glycine tabacina	2	20+	43			
4	Paspalum dilatatum	3	20+	44			
5	Verbena	2	20+	45			
6	Plantago lanceolata	2	20+	46			
7	Hypochaeris radicata	2	20+	47			
8	Centaurium	1	1	48			
9	Scarlet pimpernel	1	1	49			
10	Setaria	2	20+	50			
11	Rosa rubiginosa	1	1	51			
12	Oxalis perennans	1	1	52			
13	Glycine clandestina	1	1	53			
14	Eucalyptus tereticornis	1	3	54			
15	Rumex conglomeratus	1	1	55			
16	Aristida ramosa	1	1	56			
17				57			
18				58			
19				59			
20				60			
21				61			
22				62			
23				63			
24				64			
25				65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree		
Shrub		
Grass (annual)	6	
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN529 Mod/Good - High

BioBanking Field Sheet

entered

JACOBS

Shale Hills - mod/good - High quality

Survey Site Form - BioBanking		Site ID: 332	Vegetation zone: CPW - Hills			
Date	27/1/2016	Surveyor(s): Lukas Clews				
Waypoint ID	769	Photo numbers	2316 to	2319		
Coordinates	E 0285928 N 6246941	Photo direction	N	E	S	W
Mapped Vegetation type: CPW		Condition:			Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): Who cares	Altitude: 94m.				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Open forest		Ecologically Dominant Layer (EDL) - most biomass = Canopy.				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	15 - 25	20		Eucalyptus moloccana Eucalyptus tereticornis
T2	-			
T3	-			
S1	1 - 6	4		African olive Bursaria spin lantana com E. moloccana Africa boxthorn
S2	-			
G	0 - 1			Micro. stip. Sida rhomb. Conyza

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	30	0	0
10m	10	0	0
15m	5	0	0
20m	5	0	0
25m	40	0	40
30m	10	0	0
35m	10	50	0
40m	5	60	0
45m	0	0	0
50m	0	0	0
Total (sum / 10) =	11.5	11	4

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 ||	44%
Native other (herb, fern, sedge, etc) tally - 𝍸 𝍸 |||	26%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 ||||	28%

98%

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	11.5m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	1

JACOBS

Site ID: 332	Survey type:Quadrat 20m x 20m				
Species	**Cover**	**Abund.**	**Species**	**Cover**	**Abund.**
1 Eucalyptus tereticornis	2	2	41 Eychiton spearicus	1	12
2 Eucalyptus molluccana	5	29	42 Tricoryne elatior	1	1
3 olea europaea	3	5	43 Hypericum greneenium	1	2
4 Carex bananiensis	3	59	44 Scarlet pimpernell	1	1
5 Cirsium vulgare	2	4	45 Bursaria spinosa	1	2
6 Solanum prickly apple	1	1	46 Bothriochloa macra	1	10
7 Plectranthus parviflorus	2	20+	47 Cymbonotus lawson.	1	2
8 Commelina cyanea	2	20+	48 Phyllanthus sp.	1	1
9 Centella asiatica	1	1	49 Cheilanthes sieberi	1	1
10 oxalis perennans	1	1	50		
11 Sida rhombifolia	2	20+	51		
12 Glycine tabacina	2	20+	52		
13 Microlaena stipoides	5	>100+	53		
14 Cyclospermum leptophyllum	2	20+	54		
15 Aspenla conferta	2	20+	55		
16 Senecio madagascariensis	2	20+	56		
17 Plantago lanceolata	2	20+	57		
18 Brunoniella australis	2	20+	58		
19 Lepidium africanum	1	1	59		
20 Cynoglossum australe	1	1	60		
21 Cassia sp.	1	1	61		
22 Dichondra repens	2	20+	62		
23 Einadia trigonos (saltbush)	1	1	63		
24 Modiola	2	20+	64		
25 Convolvulous erubesens	1	1	65		
26 Bidens pilosa	2	2	66		
27 African boxthorn	2	2	67		
28 Austrodanthonia tenuior	2	20+	68		
29 Cyperus gracilis	2	20+	69		
30 Alternanthera denticulata	1	2	70		
31 Sigesbeckia orientalis	1	1	71		
32 Rumex brownii	1	1	72		
33 Einadia polygonoides	2	20+	73		
34 Echinopogon caespitosus	1	3	74		
35 Paspalidium sp.	2	20+	75		
36 Cyperus (small)	1	1	76		
37 Setaria sp.	2	20+	77		
38 Chloris ventricosa	2	20+	78		
39 Plantago gaudichaudii	1	2	79		
40 Opuntia stricta	1	1	80		

Sp. Richness	Native	Exotic
Tree	39	
Shrub		
Grass (annual)	84	
Grass (perennial)		
Other (annual)	30	
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN529 Mod/Good - High

BioBanking Field Sheet

JACOBS

Shale Hills - mod/good - high quality

Survey Site Form - BioBanking		Site ID: 34-1	Vegetation zone: CPW Good			
Date	20/1/2016	Surveyor(s):	Lukas Clews			
Waypoint ID	768	Photo numbers				
Coordinates	E 0285891	Photo direction	N	E	S	W
	N 6246984					
Mapped Vegetation type:	CPW	Condition:			Low	Mod/good
Slope: Gentle, Mod, Steep		Aspect (degrees or cardinal):		Altitude:		
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared):	Yes / No / Undecided?	Young trees				
Vegetative Structure (formation) =	Open forest	Ecologically Dominant Layer (EDL) - most biomass =	Canopy			

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	15-25m	20m		Eucalyptus tereticornis Eucalyptus moluccana
T2	-			
T3	-			
S1	1-6m			Bursaria spinosa Olea europaea subsp. cuspidata
S2	-			
G	0-02		95%	Microlaena stipoides

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	5	0	0
10m	20	60	10
15m	20	60	0
20m	15	10	0
25m	5	40	0
30m	0	10	60
35m	0	60	0
40m	0	20	0
45m	5	20	0
50m	5	10	0
Total (sum / 10) =	7.5	27	7

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long	77m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	2

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 |	56%
Native other (herb, fern, sedge, etc) tally - 𝍸 𝍸 𝍸 |	36%
Native shrub tally -	0%
Exotic tally - ||||	8%

100%

JACOBS

Site ID: 34 - 1	Survey type: Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus molluccana	6	50+	41		
2 Bursaria spinosa	6	50+	42		
3 Olea europaea	4	20+	43		
4 Panicum simile	2	20+	44		
5 Echinopogon caespitosus	2	20+	45		
6 Microlaena stipoides	6	100+	46		
7 Fimbristylis dichotoma	2	20+	47		
8 Pteridium esculentum	2	20+	48		
9 Conyza	3	20+	49		
10 Glycine tabacina	2	20+	50		
11 Senecio madagascariensis	2	20+	51		
12 Wahlenbergia gracilis	2	20+	52		
13 Phyllanthus	1	1	53		
14 Commelina cyanea	2	2+	54		
15 Cassia	1	2+	55		
16 Erechtites valerianifolia	1	20+	56		
17 Native flatweed	2	2+	57		
18 Brunoniella australis	2	2+	58		
19 Dichondra repens	2	20+	59		
20 Cheilanthes sieberi	2	20+	60		
21 Cyperus gracilis	1	2+	61		
22 Bidens pilosa	1	1	62		
23 Cyclosorus	1	1	63		
24 Cirsium vulgare	3	20+	64		
25 Oxalis perennans	1	20+	65		
26 Setaria	1	1	66		
27 Oplismenus aemulus	2	20+	67		
28 Cyperus gracilis	1	20+	68		
29 Sorghum leiocladum	1	20+	69		
30 Solanum pungetium	1	20+	70		
31 Sida rhombifolia	1	1	71		
32 Aristida arenosa	1	1	72		
33 Paspalum dilatatum	1	1	73		
34 Desmodium varians	1	1	74		
35 Paspalidium	2	20+	75		
36 Cymbopogon refractus	1	1	76		
37 Medicago sativoides	1	20+	77		
38 Chloris ventricosa	1	1	78		
39 Bothriochloa	1	1	79		
40 Aristida vagans	1	1	80		

Sp. Richness	Native	Exotic
Tree	90	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN 529 Mod/Good – High   Entered ✓

BioBanking Field Sheet

JACOBS   Shale Hills - Mod/Good - High

Survey Site Form - BioBanking		Site ID: 39-3	Vegetation zone: CPW - Hills		
Date	2/9/2015	Surveyor(s): Lukas Clews			
Waypoint ID	39-3	Photo numbers	1249	→	1255
Coordinates	E / N	Photo direction	N	E	S / W
Mapped Vegetation type: CPW - Hills		Condition:		Low	Mod/good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): N	Altitude: 105m			

Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ? - ironstone nodules

Soil type: sand, loam, clay, organic, gravel, skeletal, ?

Soil disturbance: intact, topsoil removed, fill

Remnant / Old growth (uncleared): Yes / No / Undecided? — High Quality CPW

Vegetative Structure (formation) =

Ecologically Dominant Layer (EDL) - most biomass =

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20 - 25m			Eucalyptus tereticornis Eucalyptus moluccana Eucalyptus crebra
T2	-			Eucalyptus eugenioides
T3	-			
S1	to - 1m			Bursaria spinosa - sparse ~~Leucopogon~~ Monotoca scoparia
S2	-			
G	-			Aristida, Themeda, Microlaena Chloris ventricosa Cheilanthes sieberi

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	10	0	0
10m	20	0	↓
15m	30	0	
20m	40	0	
25m	30	0	
30m	20	0	
35m	20	0	
40m	30	0	
45m	30	0	
50m	30	0	↓
Total (sum / 10) =	24%	0%	0%

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	80%
Native other (herb, fern, sedge, etc) tally - 𝍸	10%
Native shrub tally -	0%
Exotic tally - |	2%

92%

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	13.7m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	2

JACOBS

Site ID: 39 - 3	Survey type: Quadrat 20m x 20m				
Species	**Cover**	**Abund.**	**Species**	**Cover**	**Abund.**
1 Eucalyptus tereticornis	4	4	41		
2 E. ~~resinifera~~ eugenioides	1	2	42		
3 Bursaria spinosa	2	20+	43		
4 Cheilanthes sieberi	3	20+	44		
5 Setaria	2	20+	45		
6 Themeda	4	20+	46		
7 dying Aristida	3	20+	47		
8 Senecio madagascariensis	2	20+	48		
9 Chloris ventricosa	2	20+	49		
10 Microlaena stipoides	4	20+	50		
11 Wahlenbergia sp.	2	20+	51		
12 Verbena bonariensis	2	20+	52		
13 Sida rhombifolia	2	20+	53		
14 Cyperus gracilis	2	20+	54		
15 Solanum pseudocapsicum	1	1	55		
16 Oxalis yellow	2	20+	56		
17 Solanum prinophyllum	2	20+	57		
18 Solanum prickly apple	1	2	58		
19 Hypochaeris radicata	1	2	59		
20 Aristida vagans	2	20+	60		
21 Gamochaeta	1	1	61		
22 Paspalidium distans	1	1	62 Auchratia wurica		
23 Veronica plebeia	7	5	63		
24 Phyllanthus	1	1	64		
25 Glycine clandestina	2	20+	65		
26 Hypericum	2	20+	66		
27 Calotis sp.	1	1	67		
28 Cotula	1	1	68		
29 mini oxalis	1	20+	69		
30 Hibbertia sp.	2	20+	70		
31 herb 1 - Stackhousia?.	1	1	71		
32 Anagallis arvensis	2	20+	72		
33 lilly	1	2	73		
34 Goodenia hederacea	1	1	74		
35 Lomandra filiformis	2	20+	75		
36 Monotoca scoparia	1	1	76. Lissathe strigosa		
37 Dichondra repens	1	1	77		
38 Pratia purpurascens	1	1	78		
39 Desmodium varians	1	1	79		
40			80		

Sp. Richness	Native	Exotic
Tree	34	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)	28	
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN529 Mod/Good- High

Entered ✓

BioBanking Field Sheet

Mod/Good- High

JACOBS

Survey Site Form - BioBanking		Site ID: PZ CPW regen	Vegetation zone: CPW Good			
Date	3/2/2016	Surveyor(s):	Lukas Clews			
Waypoint ID	805	Photo numbers	Ignore			
Coordinates	E 0285779	Photo direction	N	E	S	W
	N 6254812					
Mapped Vegetation type: CPW		Condition:		Low	Mod-good	
Slope: Gentle/ Mod, Steep	Aspect (degrees or cardinal): E	Altitude: 91m				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Open Forest		Ecologically Dominant Layer (EDL) - most biomass = canopy				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	10-20	14m	10%	Eucalyptus moluccana Eucalyptus tereticornis
T2	3-6m	6m	40%	Eucalyptus regen
T3	-			
S1	1-4m	2m	20%	Acacia falcata Eucalyptus regen Acacia parramattensis
S2	-			
G	0-1m	0.2m	90%	Microlaena, Themeda, Aristida, Cymbopogon Dichondra, Bossiaea prostrata, Lobelia, Glycine Diverse ground layer.

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	5	10	0
10m	0	20	0
15m	0	40	0
20m	0	60	0
25m	0	0	0
30m	5	10	0
35m	20	20	0
40m	0	5	0
45m	0	5	0
50m	0	2	0
Total (sum / 10) =	3%	17.2	0%

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long	4m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	1

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 𝍸 |	60%
Native other (herb, fern, sedge, etc) tally - 𝍸 𝍸 |||	26%
Native shrub tally - ||	4%
Exotic tally - |	2%

92%

JACOBS

Site ID: P2 CPW regen

Survey type: Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus tereticornis	3	20+	41 Richardia	1	1
2 Eucalyptus moluccana	2	6	42 Conyza	1	1
3 Acacia falcata	3	20+	43 Acacia parramattensis	1	2
4 Bursaria spinosa	1	2	44 native flatweed	1	2
5 Themeda triandra	3	20+	45 Glossocardia bidens	1	2
6 Cymbopogon refractus	2	20+	46 Ozothamnus diosmifolius	1	1
7 Cyperus congestus	1	20+	47 Briza subaristata	1	2
8 Dichondra repens	3	20+	48 Olea europaea	1	1
9 Mentha satureioides	1	5	49 Euchiton sphaericus	1	1
10 Oxalis perennans	1	20+	50 Phyllanthus / euphorbia	1	20+
11 Geranium sp.	1	20+	51 Lomandra filiformis	1	1
12 Cynodon dactylon	3	20+	52 Cyperus gracilis	1	1
13 Senecio madagascariensis	1	2	53 Themeda elatior	1	1
14 Glycine tabacina	2	20+	54 Eleocharis gracilis	1	1
15 Microlaena stipoides	5	20+	55 Vernonia cinerea	1	1
16 Hypericum gramineum	2	20+	56		
17 Wahlenbergia gracilis	2	20+	57		
18 Glycine clandestina	1	1	58		
19 Goodenia hederacea	2	20+	59		
20 Bidens pilosa	2	20	60		
21 Centella asiatica	2	20+	61		
22 Stackhousia viminea	1	20+	62		
23 Aristida vagans	2	20+	63		
24 Opercularia diphylla	1	20+	64		
25 Bothriochloa macra	2	20+	65		
26 Digitaria	2	20+	66 Axonopus		
27 Cheilanthes sieberi	2	20+	67		
28 Eragrostis brownii	2	20+	68		
29 Cotula australis	1	1	69		
30 Asperula conferta	1	20+	70		
31 Zornia sp.	1	20+	71		
32 Hibbertia sp.	1	3	72		
33 Fimbristylis dichotoma	2	20+	73		
34 Brunoniella australis	2	20+	74		
35 Polygala japonica	1	1	75		
36 Desmodium varians	1	1	76		
37 Rostellularia prostrata	2	20+	77		
38 Anagallis	1	1	78		
39 Chrysocephalum apiculatum	1	10	79		
40 Setaria	1	1	80		

Solenogyne

Sp. Richness	Native	Exotic
Tree	47	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN 52a Mod/Good - Medium Medium

Entered ✓

BioBanking Field Sheet

JACOBS

Shale Plains - mod/good - Olive fest

Survey Site Form - BioBanking		Site ID: 29-2		Vegetation zone:		
Date	21/01/2016	Surveyor(s):				
Waypoint ID	773	Photo numbers	2336	2337	2338	2339
Coordinates	E 0285915 N 6246621	Photo direction	N	E	S	W
Mapped Vegetation type:			Condition:		Low	Mod-good
Slope: (Gentle) Mod, Steep	Aspect (degrees or cardinal):		Altitude:			

Topography: crest, ridge, upper slope, mid slope, down slope, (gully) flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, (alluvium), limestone, metamorphics, gravel, ?

Soil type: sand, loam, (clay) organic, gravel, skeletal, ? — Soil disturbance: (intact) topsoil removed, fill

(Remnant) / Old growth (uncleared): Yes / No / Undecided?

Vegetative Structure (formation) = WOODLAND — Ecologically Dominant Layer (EDL) - most biomass = EXOTIC SHRUB LAYER

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	20 - 25			E. tereticornis E. moluccana
T1	-			
T2	-			
T3	-			
S1	1 - 8			Olea europa (Olive) - dominant - dense Bursaria spinosa
S2	-			
G	0 - 1			Microlaena stip Dichondria oplismenus

Definitions

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover I = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	50
10m	0	0	70
15m	0	0	60
20m	0	0	90
25m	0	0	40
30m	0	20	60
35m	5	0	60
40m	0	0	20
45m	5	10	70
50m	0	0	70
Total (sum / 10) =	1%	3%	59%

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	13.5
Proportion of canopy sp. regeneration	0
Number of trees with hollows >5cm	2

Ground cover tally sheet. 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 卌 卌 卌 卌 卌 卌 I	62%
Native other (herb, fern, sedge, etc) tally - 卌 III	16%
Native shrub tally -	0%
Exotic tally - 卌 卌 I	22%

JACOBS

Site ID: 292	Survey type: Quadrat 20m x 20m

#	Species	Cover	Abund.	#	Species	Cover	Abund.
1	E. tereticornis -	3	1	41			
2	E. moluccana -	4	3	42			
3	Olea europea	6	40	43			
4	Bursaria spin -	1	3	44			
5	Dichondra repens -	3	100+	45			
6	Micro. stip. -	4	100+	46			
7	Oplismenus aimilus -	3	50	47			
8	Setaria sp.	2	20+	48			
9	Scarlet pimp.	1	1	49			
10	Century plant	1	1	50			
11	Cyperus gracilis -	2	20+	51			
12	Schkuhria orientalis -	1	1	52			
13	Bidens pilosa	1	2	53			
14	Verbena bonariensis	1	2	54			
15	Cirsium vulgare	1	1	55			
16	Green cestrum	2	20+	56			
17	Solanum morum	1	1	57			
18	Cyperus eragrostis	2	20+	58			
19	Sida rhom.	2	20+	59			
20	Paspalidium -	2	20+	60			
21	Solanum prinophylum -	1	1	61			
22	Cynodactylum (couch) -	4	100+	62			
23	Commelina -	2	20+	63			
24	Ricinus communis	1	2	64			
25	Cyperus congestus -	2	20+	65			
26	Geranium -	1	3	66			
27	Asthema weed	1	7	67			
28	Petty spurge	2	20+	68			
29	Alternanthera dent. -	1	1	69			
30	Adiantum sp. -	1	5	70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree	16	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN529 Mod/good - Poor

Entered ✓

BioBanking Field Sheet

JACOBS

394

39-4

Shale Hills - Poor

Survey Site Form - BioBanking		Site ID: 39-4 CPW	Vegetation zone:			
Date	21/01/16	Surveyor(s):				
Waypoint ID	772	Photo numbers	2332	2333	2334	2335
Coordinates	E 0286184 N 6247434	Photo direction	N	E	S	W
Mapped Vegetation type:		Condition: DISBACH	Low		Mod-good	
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal):	Altitude:				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = WOODLAND		Ecologically Dominant Layer (EDL) - most biomass =				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	20 - 25	22.5		E. moluccana
T1	-			
T2	-			
T3	-			
S1	1 - 2	1.5		Eucalyptus spp. Allocasuarina littoralis
S2	-			
G	0 - 1.2	0.6		Paspalum dilatatum Setaria

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	5	0	0
10m	5	0	0
15m	0	0	0
20m	0	0	0
25m	5	0	0
30m	10	0	0
35m	0	0	0
40m	2	0	0
45m	20	0	0.2
50m	0	0	0
Total (sum / 10) =	4.7	0	0.2

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long	37
Proportion of canopy sp. regeneration	↑
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 |	12%
Native other (herb, fern, sedge, etc) tally - 𝍸 |||	16%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 |	72%

100%

JACOBS

Site ID: 394	Survey type: Quadrat 20m x 20m				
Species	**Cover**	**Abund.**	**Species**	**Cover**	**Abund.**
1 E. malucanna —	4	7	41		
2 Setaria	3	20+	42		
3 Paspalum dilatatum	5	100+	43		
4 Chloris ventricosa —	3	20+	44		
5 Austrodanthonia tenui. —	1	1	45		
6 Sida rhomb.	4	100+	46		
7 Commelina cyania —	3	20+	47		
8 Senecio madag.	3	20+	48		
9 Einadia trigonos —	4	100+	49		
10 Alternanthera (fat leaf) —	1	1	50		
11 Glycine tabacina —	2	20+	51		
12 Oxalis perennans —	2	20+	52		
13 Paspalidium —	2	20+	53		
14 Cyperus lono brachis —	1	1	54		
15 Ricardia	A 1	20+	55		
16 Lepidium africanum	2	20+	56		
17 Modiola caroliniana	2	20+	57		
18 Teaetedes Sticky Roc.	1	1	58		
19 Twomeda trindae —	1	5	59		
20 Gomphrena celosioides	1	1	60		
21 African Boxthorn	1	1	61		
22 Chloris gayana	1	2	62		
23 Solanum nigrum	1	1	63		
24 Cirsium vulgare	1	5	64		
25 Indigophora australis —	1	1	65		
26 Plantago lanceolata	1	1	66		
27 Alternanthera denticulata —	1	2	67		
28 Verbena sp	1	1	68		
29 Briza sub	1	1	69		
30 Wahlenbergia gracilis —	1	1	70		
31 Conyza	1	1	71		
32 Scarlet pimpernell	1	1	72		
33 Hypochaeris radicata	1	1	73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	14	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN52a Mod/Good_Poor

BioBanking Field Sheet

Shale Hills - Poor

JACOBS

Eton Rd

Entered ✓

Survey Site Form - BioBanking		Site ID: ~~330~~ 371	Vegetation zone: CPW			
Date	3/9/2015	Surveyor(s): Lukas Clews				
Waypoint ID	~~330~~ 371	Photo numbers	1270			
Coordinates	E N	Photo direction	N	E	S	W
Mapped Vegetation type: CPW		Condition:		Low	Mod-good	
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): NNW	Altitude: 91m				
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided?						
Vegetative Structure (formation) = Open forest		Ecologically Dominant Layer (EDL) - most biomass = Canopy				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20–25m			Eucalyptus tereticornis
T2	-			
T3	-			Eucalyptus cupressiformis
S1	2 - 8m			Olea europaea
S2	1 - 4m			Bursaria spinosa
G	-			Themeda triandra Dichanthium sericeum Eragrostis curvula

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	20	25	90
10m	30	65	0
15m	20	80	0
20m	20	0	60
25m	40	50	0
30m	40	60	30
35m	30	70	0
40m	5	50	0
45m	5	25	0
50m	0	0	50
Total (sum / 10) =	21	42.5	23

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	4.6m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	4

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 |	42%
Native other (herb, fern, sedge, etc) tally - ||	4%
Native shrub tally - |	2%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 |	52%

100%

BMAD

JACOBS

Site ID: 530971 | Survey type: Quadrat ~~20m x 20m~~ 10x40m roadside

Species	Cover	Abund.	Species	Cover	Abund.
1 Eucalyptus tereticornis	5	12	41		
2 Eucalyptus melliodora	4	10	42		
3 Olea europaea	5	20+	43		
4 Bursaria spinosa	4	20+	44		
5 Dichondra repens	2	20+	45		
6 Themeda triandra	3	20+	46		
7 setaria	3	20+	47		
8 Eragrostis curvula	3	20+	48		
9 Verbena	2	20+	49		
10 Chloris gayana	3	20+	50		
11 Senecio madagascariensis	1	1	51		
12 Sonchus oleraceus	1	5	52		
13 Hypericum	2	20+	53		
14 Exocarpos cupressiformis	1	2	54		
15 Myellois eucalyptidos?	1	2	55		
16 Brachychiton populneus	1	1	56		
17 Vicia sativa	2	20+	57		
18 Hypochaeris radicata	1	5	58		
19 Sigesbeckia orientalis	1	1	59		
20 Plantago lanceolata	1	1	60		
21 Solanum pinnatifidum	2	10	61		
22 Desmodium	1	1	62		
23 Glycine clandestina	1	1	63		
X 24 Malvaceae?	1	1	64 Parsonsia laccolata		
25 Acacia parramattensis	1	1	65		
26 Asparagus asparagoides	1	1	66		
27 Trifolium arvense	1	1	67		
28 Aspenia corifolia	1	1	68		
29 Bidens pilosa	2	20+	69		
30 Trifolium repens	1	1	70		
31			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	17	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

HN 529 Mod/Good _ Poor

BioBanking Field Sheet

Entered

JACOBS

Shale Hills - Poor

Survey Site Form - BioBanking				Site ID:	1071 170-1	Vegetation zone:	~~RFEF~~ CPW	
Date	3/9/2015			Surveyor(s):	Lukas clews			
Waypoint ID	~~1071~~ 170-1			Photo numbers	1298			
Coordinates	E			Photo direction	N	E	S	W
	N							
Mapped Vegetation type:	~~RFEF~~ CPW				Condition:		Low	Mod/good (circled)
Slope: Gentle, Mod, Steep (Gentle circled)		Aspect (degrees or cardinal):	S		Altitude:	98m		
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace (down slope circled)								
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ? (shale circled)								
Soil type: sand, loam, clay, organic, gravel, skeletal, ? (clay circled)				Soil disturbance: intact, topsoil removed, fill				
Remnant / Old growth (uncleared): Yes / No / Undecided? (No circled)								
Vegetative Structure (formation) = Open forest				Ecologically Dominant Layer (EDL) - most biomass = Canopy				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	20 - 25m			Eucalyptus tereticornis Eucalyptus moluccana
T2	-			
T3	-			
S1	1 - 2m			Lycium ferocissimum
S2	-			
G	-			Pennisetum clandestinum Senecio madagascariensis Ehrharta erecta Dichondra repens

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover I = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	40	0	0
10m	60	0	0
15m	50	0	0
20m	60	0	0
25m	25	0	0
30m	40	20	50
35m	60	0	10
40m	40	0	0
45m	20	0	0
50m	0	0	0
Total (sum / 10) =	39.5	2	6

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	12.8m
Proportion of canopy sp. regeneration	100%
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - |	2%
Native other (herb, fern, sedge, etc) tally - ||	4%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸	90%

96%

JACOBS

Site ID: 1071	Survey type:Quadrat 20m x 20m

	Species	Cover	Abund.		Species	Cover	Abund.
1	Eucalyptus tereticornis –	5	17	41			
2	Eucalyptus molluccana –	5	14	42			
3	Lycium ferocissimum	3	5	43			
4	Ginadia baylata –	3	20+	44			
5	Sida rhombifolia	2	20+	45			
6	Plantago erecta	4	20+	46			
7	Dichondra repens –	3	20+	47			
8	Araujia sericifera	2	20+	48			
9	Cotula –	1	1	49			
10	Oxalis yellow –	2	Rot	50			
11	Chickweed	2	20+	51			
12	Phytolacca octandra	1	1	52			
13	Conyza bonariensis	1	3	53			
14	Cynodon dactylon –	2	20+	54			
15	Cirsium vulgare	1	1	55			
16	Solanum nigrum	1	2	56			
17	Plantago lanceolata	1	1	57			
18	Pennisetum clandestinum	4	20+	58			
19	Juncus acutus	1	4	59			
20	Hypochaeris radicata	1	1	60			
21				61			
22				62			
23				63			
24				64			
25				65			
26				66			
27				67			
28				68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree	7	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN 630 Mod/Good_Other

BioBanking Field Sheet

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JACOBS

Survey Site Form - BioBanking		Site ID: P12 - Wetland 1	Vegetation zone: Wetland			
Date	2/2/2016	Surveyor(s):	Lukas Dews			
Waypoint ID	781	Photo numbers	2448	2449	2450	2451
Coordinates	E 0286937 N 6257521	Photo direction	N	E	S	W
Mapped Vegetation type:	NA	Condition:			Low	Mod/good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): flat	Altitude:	62m			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill		sulfur smell		
Remnant / Old growth (uncleared):	Yes / No / Undecided?	man made dams on watercourse -				
Vegetative Structure (formation) =		Ecologically Dominant Layer (EDL) - most biomass =				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			
S2	-			
G	0-3m	1-8m	98%	Juncus acutus (d), Juncus usitatus, Paspalum distichum, Persicaria hydropiper, Leptinella reptoides, Typha orientalis, Paraserianthes lophantha

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m			
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0%	0%	0%

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	0%
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 ||	24%
Native other (herb, fern, sedge, etc) tally - 𝍸 |||	16%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 ||||	58%

JACOBS

Site ID: P12 Wetland 1

Survey type: Quadrat 20m x 20m

No.	Species	Cover	Abund.	No.	Species	Cover	Abund.
1	Persicaria hydropiper	- 3	20+	41			
2	Persicaria decipiens	- 2	10	42			
3	Juncus acutus	5	20+	43			
4	Paspalum distichum	- ~~2~~ 4	20+	44			
5	Cynodon dactylon	- ~~2~~ 4	20+	45			
6	Aster subulatus	2	20+	46			
7	Senecio madagascariensis	2	20+	47			
8	Plantago lanceolata	2	20+	48			
9	Atriplex	- 3	20+	49			
10	Conyza bonariensis	2	14	50			
11	Bidens pilosa	2	20+	51			
12	Trifolium repens	2	20+	52			
13	Juncus usitatus	- 3	20+	53			
14	Typha orientalis	- 2	20+	54			
15	Ranunculus inundatus	- 2	20+	55			
16	Rumex ~~crispus~~ conglomeratus	- 2	20+	56			
17	Ludwigia peploides	- 3	20+	57			
18	Echinochloa crus-galli	1	3	58			
19	Damasonium minus	- 2	20+	59			
20	Eleocharis sphacelata	- 1	10	60			
21	Myriophyllum	- 2	20+	61			
22	Philydrum lanuginosum	- 1	3	62			
23	Triglochin	- 1	~~50~~ +	63			
24	Spirodela	- 1	20+	64			
25	Azolla pinnata	- 2	20+	65			
26	Lachnagrostis filiformis	- 2	20+	66			
27	Rubus fruticosus	1	1	67			
28	Calochlaena dubia	- 1	2	68			
29				69			
30				70			
31				71			
32				72			
33				73			
34				74			
35				75			
36				76			
37				77			
38				78			
39				79			
40				80			

Sp. Richness	Native	Exotic
Tree	19	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN 630 Mod/Good - Other

Entered ✓

BioBanking Field Sheet

JACOBS

Survey Site Form - BioBanking		Site ID: PIR Wetland 2	Vegetation zone: Wetland		
Date	2/2/2016	Surveyor(s):			
Waypoint ID	782	Photo numbers	2454	2455	2456	2457
Coordinates E	0286948	Photo direction	N	E	S	W
Coordinates N	6257386					
Mapped Vegetation type:	NT	Condition:			Low	Mod-good
Slope: Gentle, Mod, Steep		Aspect (degrees or cardinal): flat	Altitude: 52m			
Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace						
Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?						
Soil type: sand, loam, clay, organic, gravel, skeletal, ?		Soil disturbance: intact, topsoil removed, fill	Water - shin deep - 20cm			
Remnant / Old growth (uncleared): Yes / No / Undecided?		you made dam				
Vegetative Structure (formation) = wetland		Ecologically Dominant Layer (EDL) - most biomass = grass				

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	-			
T1	-			
T2	-			
T3	-			
S1	-			
S2	-			
G	0-3m			Paspalum dilatatum, Juncus usitatus, Persicaria hydropiper, Ludwigia peploides, Typha orientalis, plylidium lysimachioides, Persicaria decipiens, Persicaria strigosa, Ranunculus inundatus

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m			
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0

Larger 50 x 20m plot	
Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	0
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect

- every 1m record if plant intersects (hits) point

	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 𝍸 ||||	48%
Native other (herb, fern, sedge, etc) tally - 𝍸 𝍸 𝍸 𝍸 ||||	50%
Native shrub tally -	0%
Exotic tally -	0%

BioBanking Field Sheet

JACOBS

Site ID: P12 Wetland 2

Survey type:Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Paspalum distichum +	5	100+	41		
2 Juncus usitatus +	4	100+	42		
3 Philydrum lanuginosum +	2	20+	43		
4 Ranunculus inundatus +	2	20+	44		
5 Ludwigia peploides +	3	20+	45		
6 Myriophyllum +	2	20+	46		
* 7 Juncus prismatocarpus ?	1	10	47		
8 Triglochin +	1	20+	48		
9 Persicaria hydropiper +	4	20+	49		
10 Persicaria decipiens +	2	10	50		
11 Persicaria strigosa +	1	2	51		
12 Typha orientalis +	2	20+	52		
13 Alternanthera denticulata +	2	20+	53		
14 Damasonium minus +	2	20+	54		
15 Spirodela +	1	20+	55		
16 Rumex conglomeratus +	1	5	56		
17 Cyperus eragrostis	1	2	57		
18 Juncus acutus	1	3	58		
19 Setaria	1	1	59		
20 Conyza bonariensis	2	10	60		
21 Centella asiatica +	2	20+	61		
22 Bidens pilosa	1	20	62		
23 Plantago lanceolata	1	20	63		
24 Paspalum dilatatum	1	2	64		
25 Schoenoplectus validus +	1	1	65		
26			66		
27			67		
28			68		
29			69		
30			70		
31			71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	18	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb & other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale

Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	
Clearing (inc. logging):	Fire damage:
Cultivation (inc. pasture):	Storm damage:
Soil erosion:	Trampling:
Firewood collection:	Flood damage:
Stock grazing:	Feral herbivores:
	Other:

HN 630 Mod/Good – Other (dam)

BioBanking Field Sheet

Entered ✓

JACOBS

Survey Site Form - BioBanking		Site ID: P13 wetland		Vegetation zone:	Wetland
Date	4/2/2016	Surveyor(s):	Lukas	Clews	
Waypoint ID	806	Photo numbers	2492	2493	2494	2495
Coordinates	E 0286692 N 6256088	Photo direction	N	E	S	W
Mapped Vegetation type: NA		Condition:		Low	Mod-good
Slope: Gentle, Mod, Steep	Aspect (degrees or cardinal): flat	Altitude: 59m			

Topography: crest, ridge, upper slope, mid slope, down slope, gully, flat, depression, watercourse, escarpment, terrace

Geology: basalt, granite, conglomerate, sandstone, siltstone/mudstone, shale, alluvium, limestone, metamorphics, gravel, ?

Soil type: sand, loam, clay, organic, gravel, skeletal, ? | Soil disturbance: intact, topsoil removed, fill

Remnant / Old growth (uncleared): Yes / No / Undecided?

Vegetative Structure (formation) = Wetland | Ecologically Dominant Layer (EDL) - most biomass = ground layer

Strata	Height interval	Median	Est. cover	Dominant Species & Dominance
E	10-15m	10m	5%	Casuarina glauca
T1				
T2				
T3				
S1				
S2				
G	0-2.5m	1m	98%	Juncus acutus (d) Typha, Persicaria decipiens Cynodon dactylon, Schoenoplectus

Tree height (clino) level ground or top of slope = distance from tree x (top% + bottom%)

Tree height (clino) from bottom of slope = distance from tree x (top% - bottom%)

Definitions

Dominance d = dominant; c = co-dominant; s = subdominant; a = associated

Estimated cover i = isolated (0.2-2%); v = very sparse (2-20%); s = sparse (20-50%); m = mid dense (50-80%); d = dense (80-100%)

Walker & Hopkins height classes: 1-3m = dwarf; 3-6m = low; 6-12m = mid-high; 12-20m = tall; 20-35m = very tall; >35m = extremely tall

W&H Crown cover: <0.2% = isolated trees or clumps; 0.2-20% = open woodland; 20-50% = woodland; 50-80% = open forest; 80-100% = closed forest

50m Transect	10 Points - Foliage Projective Cover		
Point	Canopy % (photos)	Midstorey %	Exotic %
5m	0	0	0
10m	↓	↓	↓
15m			
20m			
25m			
30m			
35m			
40m			
45m			
50m			
Total (sum / 10) =	0	0	0

Larger 50 x 20m plot

Length of woody debris >10cm wide & >0.5m long	0
Proportion of canopy sp. regeneration	0
Number of trees with hollows >5cm	0

Ground cover tally sheet, 50 points along 50m transect - every 1m record if plant intersects (hits) point

Tally	Total (hits/50)
Native grass tally - 𝍸 𝍸 𝍸 (15)	30%
Native other (herb, fern, sedge, etc) tally -	0%
Native shrub tally -	0%
Exotic tally - 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 𝍸 (35)	70%

JACOBS

Site ID: P13 wetland	Survey type:Quadrat 20m x 20m

Species	Cover	Abund.	Species	Cover	Abund.
1 Juncus acutus	6	100	41		
2 Conyza bonariensis	2	30	42		
3 Rubus ulmifolius	1	2	43		
4 Persicaria lapathifolia	1	20+	44		
5 Cynodon dactylon	3	>100	45		
6 Setaria	2	20+	46		
7 Plantago lanceolata	2	20+	47		
8 Senecio madagascariensis	1	3	48		
9 Rubus fruticosus	1	3	49		
10 Araujia sericifera	1	1	50		
11 Cotula coronopifolia	2	1	51		
12 Malva sp.	2	20+	52		
13 Cirsium vulgare	2	20+	53		
14 Bidens pilosa	1	1	54		
15 Pollaea falcata	1	1/2	55		
16 Modiola caroliniana	1		56		
17 Alternanthera denticulata	1	20+	57		
18 Centella asiatica	2	50	58		
19 Cyclosporum leptophyllum	1	20+	59		
20 Aster subulatus	2	20+	60		
21 Juncus usitatus	2	20+	61		
22 Epilobium billardiamum	1	2	62		
23 Sonchus oleraceus	1	1	63		
24 Verbena bonariensis	1	4	64		
25 Oxalis perrenans	1	1	65		
26 Trifolium repens	1	1	66		
27 Anagallis arvensis	1	1	67		
28 Cyperus eragrostis	1	1	68		
29 Eclipta prostrata	1	10	69		
30 Persicaria hydropiper	1	1	70		
31 Atriplex	1	1	71		
32			72		
33			73		
34			74		
35			75		
36			76		
37			77		
38			78		
39			79		
40			80		

Sp. Richness	Native	Exotic
Tree	13	
Shrub		
Grass (annual)		
Grass (perennial)		
Other (annual)		
Other (perennial)		

Ground layer % 1x1 plots	Q1	Q2	Q3	Q4	Q5
Native perennial grass					
Native other grass					
Native forb &other					
Native shrub (<1m)					
Exotic grass					
Exotic forb & other					
Leaf & stick litter					
Rocks					
Bare ground					
Cryptogams					
Total	100	100	100	100	100

Cover abundance scale
Modified Braun-blanquet 6 scale

1	<5% - rare
2	<5% - common
3	5 - 25%
4	25 - 50%
5	50 - 75%
6	75 - 100%

Plot Disturbance	Fire damage:
Clearing (inc. logging):	Storm damage:
Cultivation (inc. pasture):	Trampling:
Soil erosion:	Flood damage:
Firewood collection:	Feral herbivores:
Stock grazing:	Other:

Appendix B – Revised Figure 3.1 of the BAR

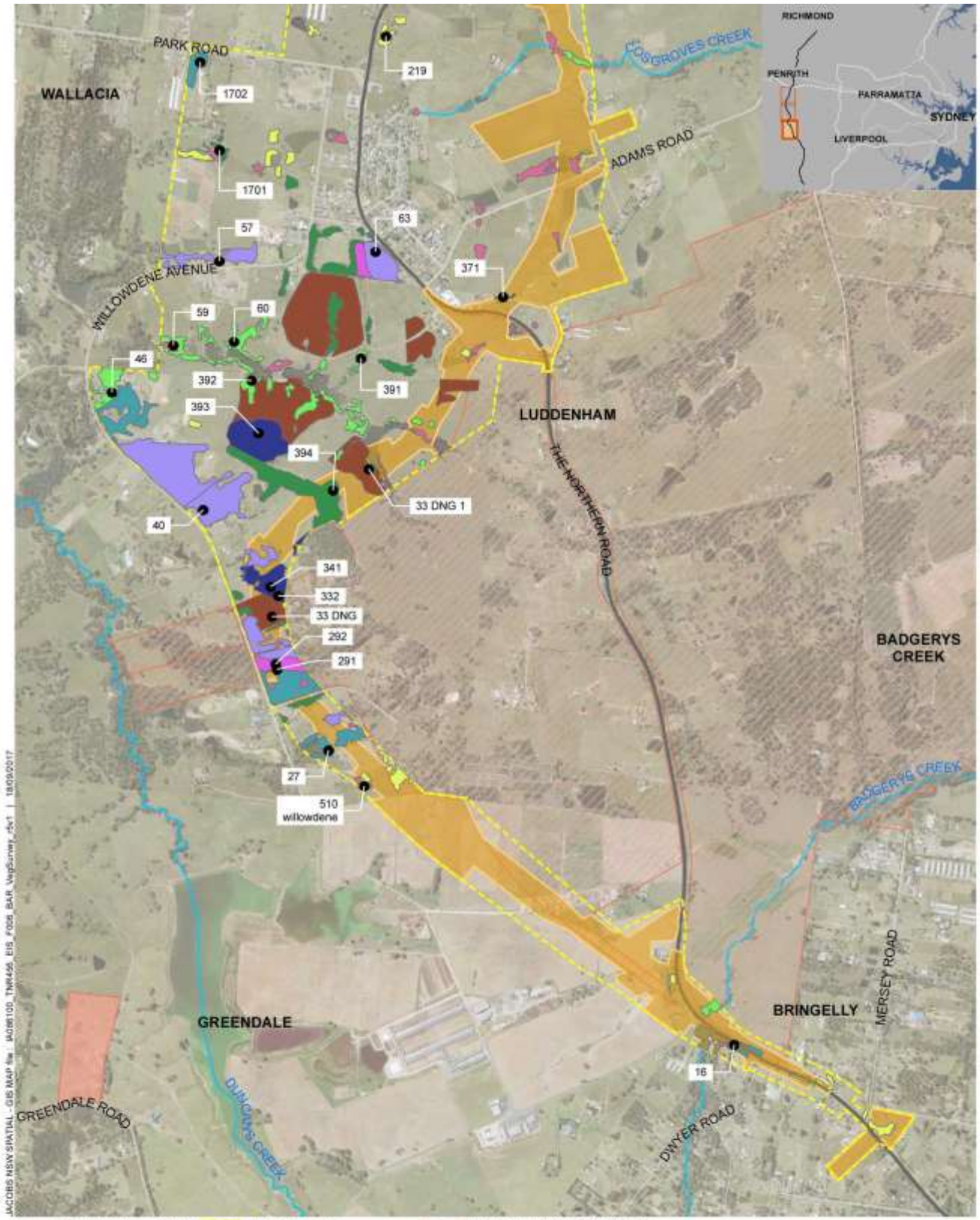

Figure 3-1 | Vegetation survey locations

Figure 3-1 | Vegetation survey locations

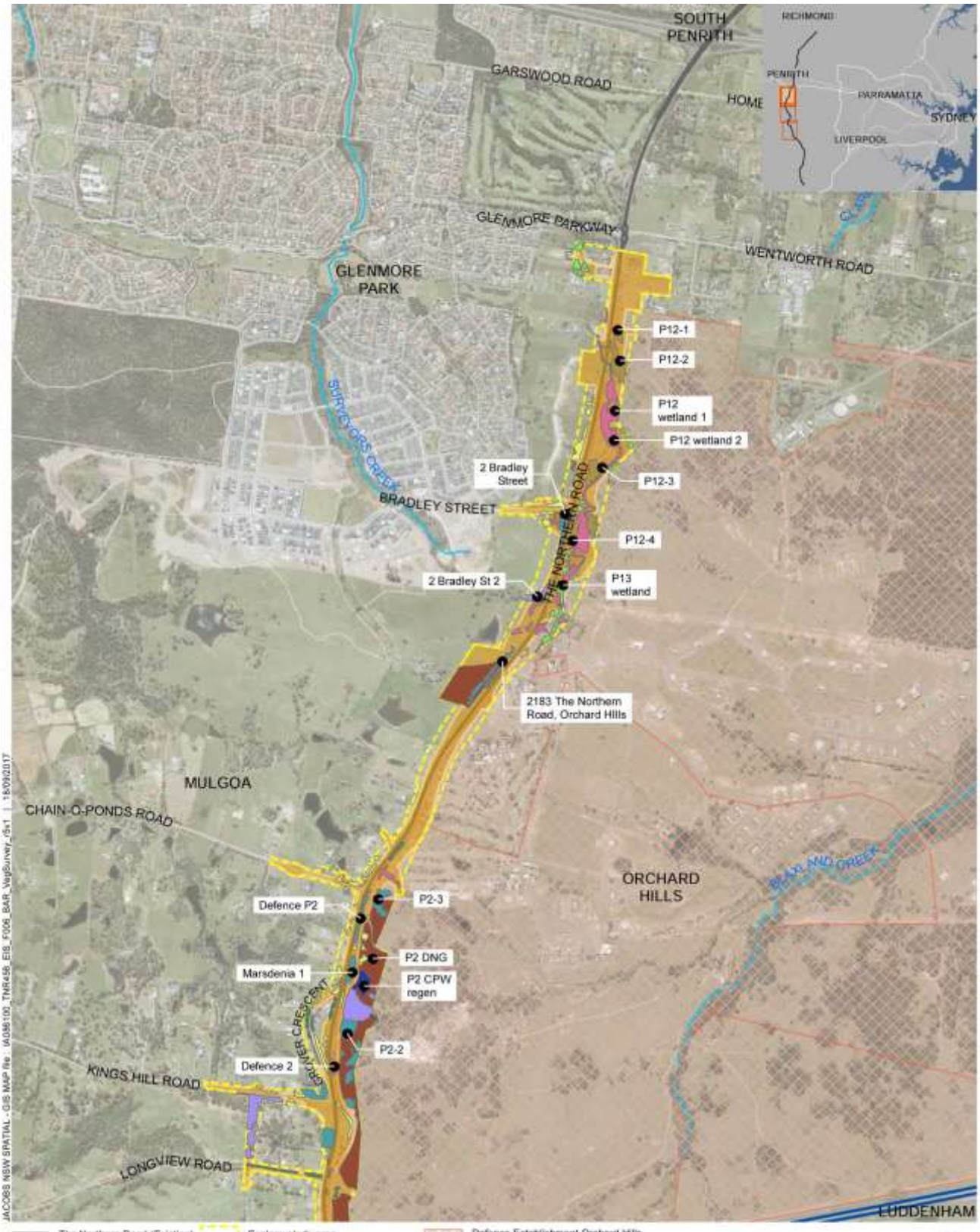

Figure 3-1 | Vegetation survey locations

Appendix C – Habitat assessment for threatened fauna species

Habitat assessment table for threatened fauna species identified from the BioBanking credit calculator and PMST

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Australian Painted Snipe (*Rostratula australis*)	V	E	The Australian Painted Snipe is restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	1 – OEH Atlas Predicted by BioBank Calculator PMST	Low. Occurs in permanent creeks, vegetated swamps particularly with dense riparian habitat, very few records in the locality, although secretive species. Targeted and not recorded.	Ecosystem
Australasian Bittern (*Botaurus poiciloptilus*)	E	E	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spikerushes (*Eleocharis* spp.).	1 – OEH Atlas Predicted by BioBank Calculator PMST	Low. Occurs in permanent creeks, rivers and swamps particularly with dense riparian habitat and emergent vegetation. Very few records in the locality although secretive. This species may occur in dams along drainage lines and adjacent waterways particularly where *Phragmites australis* and *Typha orientalis* occur, and is associated with PCT835. Recent records of this species exist from Oran Park from 2011.	Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Australian Grayling (*Prototroctes maraena*)	E (FM Act)	V	The Australian Grayling is diadromous, spending part of its lifecycle in freshwater and at least part of the larval and/or juvenile stages in coastal seas. Adults (including pre spawning and spawning adults) inhabit cool, clear, freshwater streams with gravel substrate and areas alternating between pools and riffle zones such as the Tambo River, which is also known to have granite outcrops. The species has also been associated with clear, gravel-bottomed habitats in the Mitchell and Wonnangatta Rivers (Victoria) and in a muddy-bottomed, heavily silted habitat in the Tarwin River (Victoria). The species has been found over 100 km upstream from the sea.	PMST	Low. No suitable habitat is present.	-
Barking Owl (*Ninox connivens*)	V	-	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey on these fertile soils.	37 – OEH Atlas Predicted by BioBank Calculator	Moderate. Nearest record in locality is from Mulgoa Creek opposite the Golf Course from 2002. May forage in the study area.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Black Bittern (*Ixobrychus flavicollis*)	V	-	The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	2 – OEH Atlas Predicted by BioBank Calculator	Low. Occurs in permanent creeks, vegetated swamps particularly with dense riparian habitat, very few records in the locality, although secretive species. Targeted during bird surveys.	Species
Black-chinned Honeyeater (eastern subspecies) (*Melithreptus gularis subsp. gularis*)	V	-	In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range. Occupies mostly upper levels of drier open forests or woodlands.	1 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species was recently recorded on private property off Tyson Rd Greendale in 2013. While likely to only rarely occur in the study area there is a possibility that this species does occur based on the habitat that is present.	Ecosystem
Black-tailed Godwit (*Limosa limosa*)	V	M	The Black-tailed Godwit is a migratory wading bird. Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	1 – OEH Atlas Predicted by BioBank Calculator	Low. The wetlands (farm dams) in the study area are not considered likely to provide suitable habitat for this species.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Broad-headed Snake (*Hoplocephalus bungaroides*)	V	V	Shelters in rock crevices and under flat sandstone rocks on exposed cliff edges during autumn, winter and spring. Moves from the sandstone rocks to shelters in hollows in large trees within 200 m of escarpments in summer.	0 – OEH Atlas PMST	None. This species does not occur in the study area. No habitat is present.	Ecosystem and Species
Brown Treecreeper (eastern subspecies) (*Climacteris picumnus subsp. victoriae*)	V	-	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey.	0 – OEH Atlas Predicted by BioBank Calculator	Low. This species has not been recorded from the Cumberland Plain within the locality. The closest records are to the west at the edges of Lake Burragorang. This species is considered unlikely to occur in the study area.	Ecosystem
Brush-tailed Rock-wallaby (*Petrogale penicillata*)	E	V	Range extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	2 – OEH Atlas PMST	None. This species does not occur in the study area. No habitat is present.	Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Bush Stone-curlew (*Burhinus grallarius*)	E	-	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber.	2 – OEH Atlas Predicted by BioBank Calculator	Low. Two birds previously existed on the Defence Establishment Orchard Hills but have not been seen recently. Records exist from Prestons and Carne's Hill (last recorded in 1950). The species is considered unlikely to occur in the study area due to predation pressure and habitat modification.	Ecosystem
Comb-crested Jacana (*Irediparra gallinacea*)	V	-	The Comb-crested Jacana occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW, with stragglers recorded in south-eastern NSW (possibly in response to unfavourable conditions further north). Inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	0 – OEH Atlas Predicted by BioBank Calculator	Low. This species is not known form the locality or study area. Any birds that may occur in the study area would be vagrants. The study area is not in the natural range of this species.	Species
Cumberland Plain Land Snail (*Meridolum corneovirens*)	E	-	Lives in small areas on the Cumberland Plain west of Sydney, from Richmond and Windsor south to Picton and from Liverpool west to the Hawkesbury and Nepean Rivers at the base of the Blue Mountains. Known from over 100 different locations, but not all are currently occupied, and they are usually isolated from each other as a result of land use patterns. Primarily inhabits Cumberland Plain Woodland (a critically endangered ecological community). This community is a grassy, open woodland with occasional dense patches of shrubs. It is also	200 – OEH Atlas Predicted by BioBank Calculator	Present Numerous records in the locality, occurs in natural and disturbed woodland of varying patch size. Targeted during the fauna surveys.	Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
			known from Shale Gravel Transition Forests, Castlereagh Swamp Woodlands and the margins of River-flat Eucalypt Forest, which are also listed communities.			
Diamond Firetail (*Stagonopleura guttata*)	V	-	Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands.	1 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species was recorded from the Defence Establishment Orchard Hills in 2006. It was recorded at 'Twin Creeks' Luddenham in 2012. Also recorded near Wallacia in 1990 on the Golf Course. Considered unlikely to be common but a small population may occur in the study area.	Ecosystem
Dural Land Snail (*Pommerhelix duralensis*)	-	E	The Dural land snail is endemic to New South Wales. The species is a shale-influenced habitat specialist, which occurs in low densities along the northwest fringe of the Cumberland Plain on shale-sandstone transitional landscapes. The species has been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris.	0 – OEH Atlas PMST	None. Study area is habitat for Cumberland Plain Land Snail.	Species
Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*)	V	-	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	46 – OEH Atlas Not predicted by BioBank Calculator	Present. This species was recorded on Anabat during the field survey.	Ecosystem and Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Eastern False Pipistrelle (*Falsistrellus tasmaniensis*)	V	-	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m	5 – OEH Atlas Predicted by BioBank Calculator	Present. This species was recorded on Anabat during the field survey.	Ecosystem
Eastern Freetail-bat (*Mormopterus norfolkensis*)	V	-	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	34 – OEH Atlas Predicted by BioBank Calculator	Present. This species was recorded on Anabat during the field survey.	Ecosystem
Eastern Pygmy Possum (*Cercartetus nanus*)	V	-	Found in a broad range of habitats from rainforest through to wet and dry sclerophyll forest and woodland to heath, but in most areas woodlands and heath appear to be preferred.	1 – OEH Atlas Predicted by BioBank Calculator	Low. May occur in a diversity of forest types depending on distribution, typically in dry sclerophyll forest in coastal areas, with heathy understorey or dry and wet heath. Found in wet forest and rainforest in northern NSW. Not expected in the dry fragmented woodland habitat in the study area.	Species
Flame Robin (*Petroica phoenicea*)	V	-	The Flame Robin is endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains.	6 – OEH Atlas Predicted by BioBank Calculator	Moderate. Three records of the Flame Robin exist in Mulgoa Nature Reserve from 2001 and 2002. This species may utilise habitat in the study area on occasion in winter as birds move down onto the Cumberland Plain in winter.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Freckled Duck (*Stictonetta naevosa*)	V	-	Prefer permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	0 – OEH Atlas Predicted by BioBank Calculator	Low. Records of this species in the locality are from Penrith Lakes form the 1980s. The dams in the study area are not considered optimal for this species.	Ecosystem
Gang-gang Cockatoo (*Callocephalon fimbriatum*)	V	-	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box ironbark assemblages, or in dry forest in coastal areas.	17 – OEH Atlas Predicted by BioBank Calculator	Moderate. Inhabits the forests of the lower Blue Mountains to the west of the study area and in winter will move down into the western areas of the Cumberland Plain. Records exist at Mulgoa from December 2015.	Ecosystem
Gang-gang Cockatoo population, Hornsby and Ku-ring-gai Local Government Areas	EP	-	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box ironbark assemblages, or in dry forest in coastal areas. It requires tree hollows in which to breed.	0 – OEH Atlas Predicted by BioBank Calculator	None. The study area is not in the Ku-ring-gai or Hornsby LGA	Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Giant Burrowing Frog (*Heleioporus australiacus*)	V	V	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Spends more than 95 per cent of its time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat it burrows below the soil surface or in the leaf litter. Individual frogs occupy a series of burrow sites, some of which are used repeatedly. The home ranges of both sexes appear to be non-overlapping suggesting exclusivity of non-breeding habitat. Home ranges are about 0.04 hectares in size. Requires ephemeral and permanent freshwater wetlands, ponds, dams with an open aspect and fringed by Typha and other aquatics, free from predatory fish.	5 – OEH Atlas PMST	Low. No suitable habitat is present.	Species
Greater Broad-nosed Bat (*Scoteanax rueppellii*)	V	-	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.	17 – OEH Atlas Predicted by BioBank Calculator	Moderate. Records of this species exist in Mulgoa Nature Reserve from 2004, 2013 and 2014. A record is also present at Wallacia from 1993. This species may utilise habitat in the study area.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Green and Golden Bell Frog (*Litoria aurea*)	E	V	Since 1990 there have been about 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range; however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Ephemeral and permanent freshwater wetlands, ponds, dams with an open aspect and fringed by *Typha* and other aquatics, free from predatory fish.	8 – OEH Atlas Predicted by BioBank Calculator PMST	Low. Records within 20 years within the study area, although no recent records. Occurs in a variety of ephemeral and permanent creek and pond habitats, typically with emergent vegetation. The abundance of farm dams along creek lines suggests potential habitat is present.	Species
Grey-headed Flying-fox (*Pteropus poliocephalus*)	V	V	Generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young.	44 – OEH Atlas PMST Not predicted by BioBank Calculator	Recorded. Recorded in the study area during surveys.	Ecosystem and Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Hooded Robin (south-eastern form) (*Melanodryas cucullata* subsp. *cucullata*)	V	-	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	3 – OEH Atlas Predicted by BioBank Calculator	Low. A record of this species exists at Mulgoa from 2004. Two records also exist at Greendale from 1990. 1995 and 1996. No records of this species have been made in the locality in the last 12 years. This species is considered to have a low likelihood of occurring in the study area.	Ecosystem
Koala (*Phascolarctos cinereus*)	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	20 – OEH Atlas Predicted by BioBank Calculator	Low. The Koala is considered to have a very low chance of occurring and there is only one historic record from the study area in 1999 from west of Mulgoa Nature Reserve near the Warragamba River around 8 km from the study area.	Species
Large-eared Pied Bat (*Chalinolobus dwyeri*)	V	V	Forages over a broad range of open forest and woodland habitats, this species is a cave roosting bat which favours sandstone escarpment habitats for roosting, in the form of shallow overhangs, crevices and caves.	9 – OEH Atlas PMST	Moderate. May forage in the study area. Records exist nearby in Mulgoa Nature Reserve.	Ecosystem and Species
Little Eagle (*Hieraaetus morphnoides*)	V	-	Occupies open eucalypt forest, woodland or open woodland. Sheoak or acacia woodlands and riparian woodlands of interior NSW are also used.	4 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species is likely to fly over the study area and may roost in trees.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Little Lorikeet (*Glossopsitta pusilla*)	V	-	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in apples (Angophora sp.), paperbarks (Melaleuca sp.) and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country (e.g. paddocks, roadside remnants) and urban trees also help sustain viable populations of the species.	3 – OEH Atlas Predicted by BioBank Calculator	Moderate. While all records of this species are from the north, the study area provides some foraging resources and may contain potential nesting sites.	Ecosystem
Littlejohn's Tree Frog *(Litoria littlejohni*)	V	V	Distribution includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria. This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.	0 – OEH Atlas PMST	Low. No suitable habitat is present.	Species
Macquarie Perch (*Macquaria australasica*)	E (FM Act)	E	The Macquarie Perch is a riverine, schooling species. It prefers clear water and deep, rocky holes with lots of cover. As well as aquatic vegetation, additional cover may comprise of large boulders, debris and overhanging banks. Spawning occurs just above riffles (shallow running water). Populations may survive in impoundments if able to access suitable spawning sites.	PMST	Low. No suitable habitat is present.	-
Masked Owl (*Tyto novaehollandiae*)	V	-	Dry eucalypt forests and woodland, typically prefers open forest with low shrub density. Requires old trees for roosting and nesting.	12 – OEH Atlas Predicted by BioBank Calculator	Moderate. Known from the Mulgoa Nature Reserve and may utilise habitat in the study area for foraging.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
New Holland Mouse (*Pseudomys novaehollandiae*)	-	V	Distribution is fragmented across all eastern states of Australia, where it inhabits open heath lands, open woodlands with heath understorey and vegetated sand dunes.	0 – OEH Atlas PMST	Low. No suitable habitat is present.	NA
Painted Honeyeater (*Grantiella picta*)	V	V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occur on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema*.	0 – OEH Atlas PMST Predicted by BioBank Calculator	Low. This species has complex movement patters and is most likely to be detected in and around the study area when mistletoes are in fruit. Lack of records in locality suggests this species is unlikely to occur.	Ecosystem
Powerful Owl (*Ninox strenua*)	V	-	Open forests with dense wet gullies and creek areas, requires large mature trees with hollows for breeding and dense areas of vegetation for prey and roosting.	37 – OEH Atlas Predicted by BioBank Calculator	Moderate. Known from the Mulgoa Nature Reserve and may utilise habitat in the study area for foraging.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Regent Honeyeater (*Anthochaera phrygia*)	E	CE	Temperate woodlands and open forests of the inland slopes of south-east Australia. The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters usually nest in horizontal branches or forks in tall mature eucalypts and Sheoaks.	6 – OEH Atlas Predicted by BioBank Calculator PMST	Moderate. Records are associated with PCT835, PCT849 and PCT850 and small fragments of higher quality shale hills woodland may be utilised by this species. This species has complex movement patters and is most likely to be detected in and around the study area in late autumn to early spring (Department of Environment Water Heritage and the Arts 2010b).	Species
Scarlet Robin (*Petroica boodang*)	V	-	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and re-growth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps	3 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species may utilise habitat in the study area on occasion in winter as birds move down onto the Cumberland Plain in winter.	Ecosystem
Speckled Warbler (*Chthonicola sagittatus*)	V	-	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt re-growth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	18 – OEH Atlas Predicted by BioBank Calculator	Moderate. The Speckled Warbler has been regularly recorded from the Defence Establishment Orchard Hills. May utilise habitat in the study area.	Ecosystem
Spotted Harrier (*Circus assimilis*)	V	-	Occurs throughout the Australian mainland and disperses into NSW as one single population. It occurs on grassy open woodland, inland riparian woodlands, grasslands and shrub steppe.	0 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species may utilise habitat in the study area on occasion. Foraging habitat present in grasslands and open areas.	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Spotted-tailed Quoll (*Dasyurus maculatus*)	V	E	Wet and dry sclerophyll forests and rainforests, and adjacent open agricultural areas. Generally associated with large expansive areas of habitat to sustain territory size. Requires hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites.	12 – OEH Atlas PMST Predicted by BioBank Calculator	Low. The Spotted-tailed Quoll is considered to have a very low chance of occurring and there are few historic record from the locality.	Ecosystem
Square-tailed Kite (*Lophoictinia isura*)	V	-	It is widely distributed to the coastal and sub-coastal area of Australia. Migrates to NSW in September for breeding. Occurs in dry woodlands and open forests, and timbered watercourses.	8 – OEH Atlas Predicted by BioBank Calculator	Moderate. This species may utilise habitat in the study area on occasion. Foraging habitat present in woodlands.	Ecosystem
Squirrel Glider (*Petaurus norfolcensis*)	V	-	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	0 – OEH Atlas Predicted by BioBank Calculator	Low The Squirrel Glider is considered to have a low chance of occurring. Searches of the OEH Atlas shows a lack of records in the study area and the species was absent from two comprehensive targeted fauna surveys conducted in the Defence Establishment Orchard Hills on the Northern Road (AMBS 2003; SKM 2011).	Species
Stuttering Frog (*Mixophyes balbus*)	V	E	Occur along the east coast of Australia from southern Queensland to north-eastern Victoria. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.	0 – OEH Atlas PMST	Low. No suitable habitat is present.	Species

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
Swift Parrot (*Lathamus discolor*)	E	CE	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Red Ironbark, and White Box.	13 – OEH Atlas PMST Predicted by BioBank Calculator	Moderate. Records are associated with PCT835, PCT849 and PCT850 and small fragments of higher quality shale hills woodland may be utilised by this species. This species has complex movement patters and is most likely to be detected in and around the study area in winter.	Ecosystem
Turquoise Parrot (*Neophema pulchella*)	V	-	Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	1 – OEH Atlas Predicted by BioBank Calculator	Low. Not known form the locality and considered unlikely to occur in western Sydney.	Ecosystem
Varied Sittella (*Daphoenositta chrysoptera*)	V	-	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and acacia woodland.	40 – OEH Atlas Predicted by BioBank Calculator	Moderate. Likely to use habitats throughout the study area	Ecosystem

Common Name *(Scientific Name)*	TSC Act	EPBC Act	Habitat requirements	Number of records (source)	Likelihood of occurrence	Ecosystem or species credit species?
White-fronted Chat (*Epthianura albifrons*)	V	-	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	0 – OEH Atlas Predicted by BioBank Calculator	Low. Not known from the locality and considered unlikely to occur based on absence of suitable habitat.	Ecosystem
Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*)	V	-	Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Roost in tree hollows and buildings.	3 – OEH Atlas Predicted by BioBank Calculator	Moderate. May utilise habitats in the study area.	Ecosystem

Memorandum

TECHNICAL MEMO – Biodiversity

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December 2017
RMS 17.630