



egwatch Manual

By Sarah Sharp and Lori Gould





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ACT Region Vegwatch Manual: Vegetation and habitat condition assessment and monitoring for community

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† u ° # u *Facing the challenges: positioning our nature reserves for the 21st century* @

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u o o O 8 @ *ACT Vegetation Monitoring Manual: a step by step guide to assessing and monitoring vegetation and habitat in grassy ecosystems*

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Acknowledgements

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by-Step Guide to Monitoring Native Vegetation in the ACT o o 8 O
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Condition Monitoring Manual: Southern Mount Lofty Ranges V # o
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1. Introduction to the Vegwatch Manual



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1.1 Vegwatch: monitoring across multiple sites

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1.2 Using the Vegwatch Manual

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Who should use the Vegwatch program?

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Relationship with other condition assessment and monitoring programs

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1.3 Steps to complete the Vegwatch program

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Step 1. Plan the Vegwatch monitoring program

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Step 2. Establish plots and transects and describe the plots

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Step 3. Undertake the Vegwatch monitoring field work

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Step 4. Summarise and interpret your data

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Step 5. Regional data collation and analysis

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1.4 Using the indicators to undertake other assessment and monitoring

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1.5 Other information in the Vegwatch Manual

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1.6 How to obtain the Vegwatch Manual

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2. What is condition assessment and monitoring?

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2.1 What is condition assessment and condition monitoring?

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2.2 Why undertake condition assessment and monitoring of vegetation and habitat?

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Condition monitoring

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Monitoring implementation of management actions within sites

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2.6 Working out what you want to do and why

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2.7 Description of the indicators

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3. Methods used to measure vegetation and habitat

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Names of the Measurement Units

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3.1 Understanding the terminology used in the Vegwatch Manual

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Species Names

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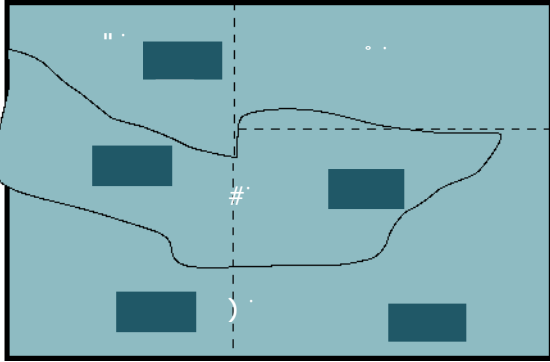
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3.2 Methods used for assessing or monitoring the condition of a site

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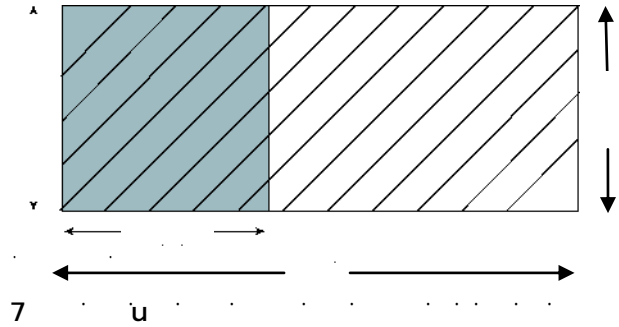
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Transects

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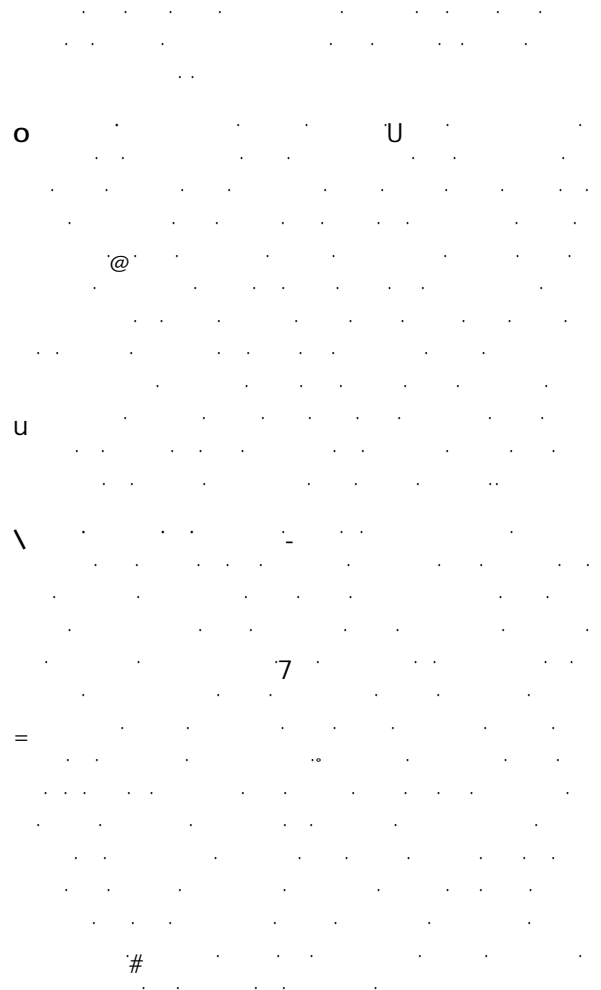
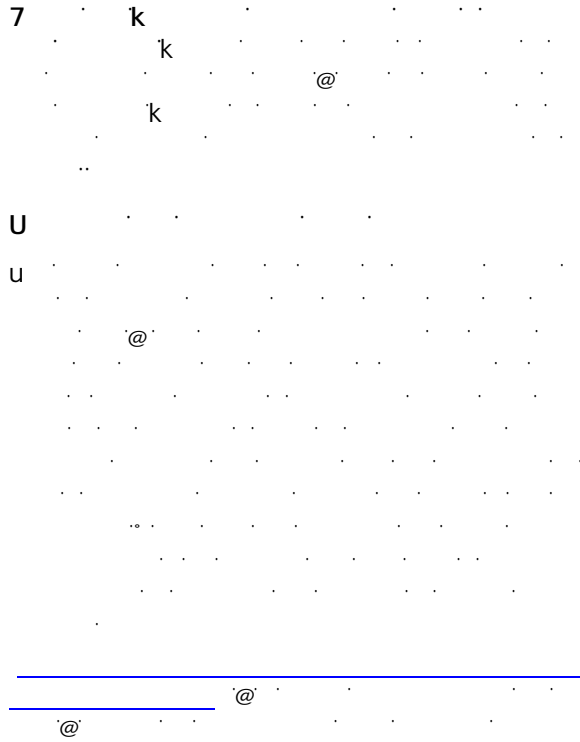
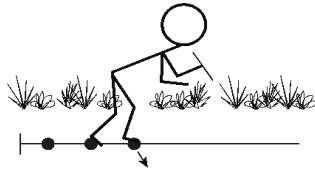
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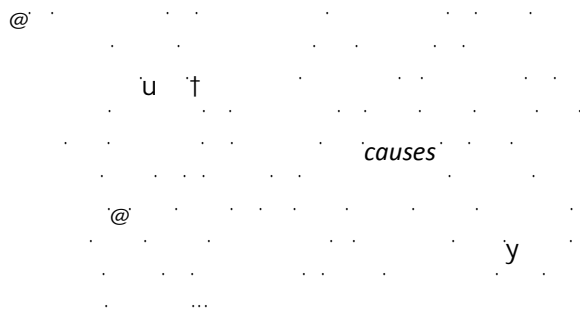
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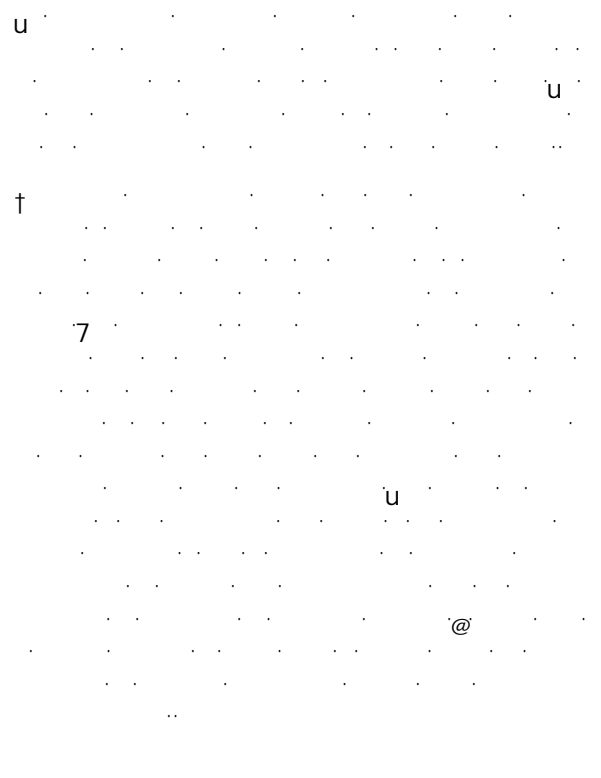
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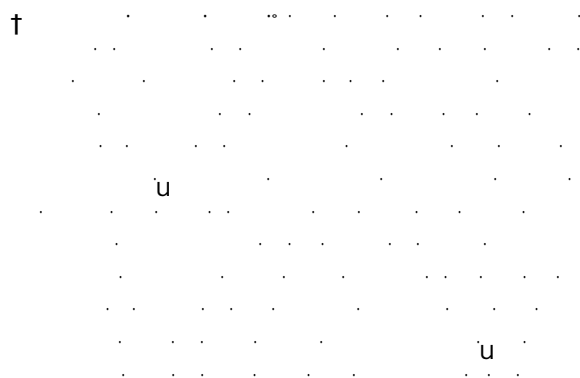
3.3 Statistical validity and interpreting the data



Using multiple plots to represent a site's variability and diversity



Variability of values measured



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Number of plots or transects to measure

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Using control sites to compare results with and without management being applied

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3.4 Accessing materials for field work

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3.5 Links to resources

Where to get help

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Entering data, storage of data and sharing data

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Links to management advice

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4. Guidelines for undertaking condition assessment and monitoring

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Step 1. Plan the monitoring program

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2. Plan the program

1. Collate background information and map the site

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3. Maintain records of actions and other information
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Step 2. Establish and describe assessment sites

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Step 3. Undertake the assessment or monitoring field work

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1. Find the location of the plot and transects

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3. Measure the condition indicators

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Indicator 4. Species Cover

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Indicator 5. Terrestrial Habitat Condition

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Unknown Species Identification

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Supplementary Monitoring

Indicator 6. Revegetation Success

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Indicator 7. Distribution and Abundance of a Species

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Indicator 8. Waterbody Habitat Condition

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Indicator 2. Structural Diversity of Native and Introduced Plants

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Indicator 3. Condition of Native Trees and Shrubs

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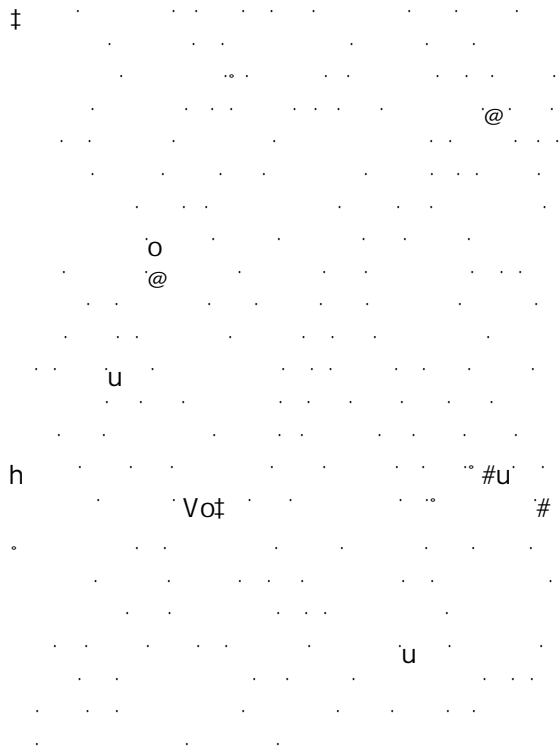
Indicator 4. Species Cover

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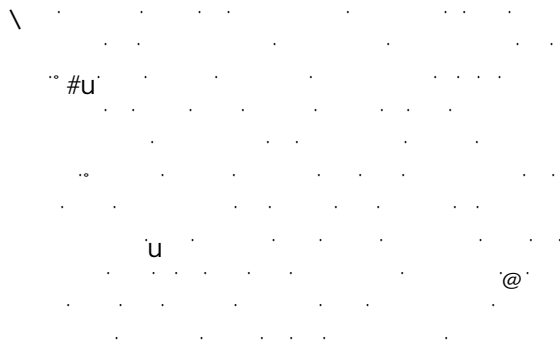
Single species

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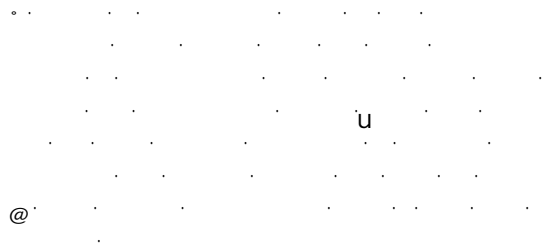
Weed Abundance



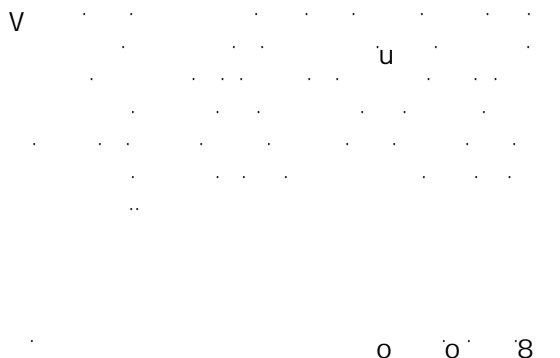
Assessment of species in the groundlayer



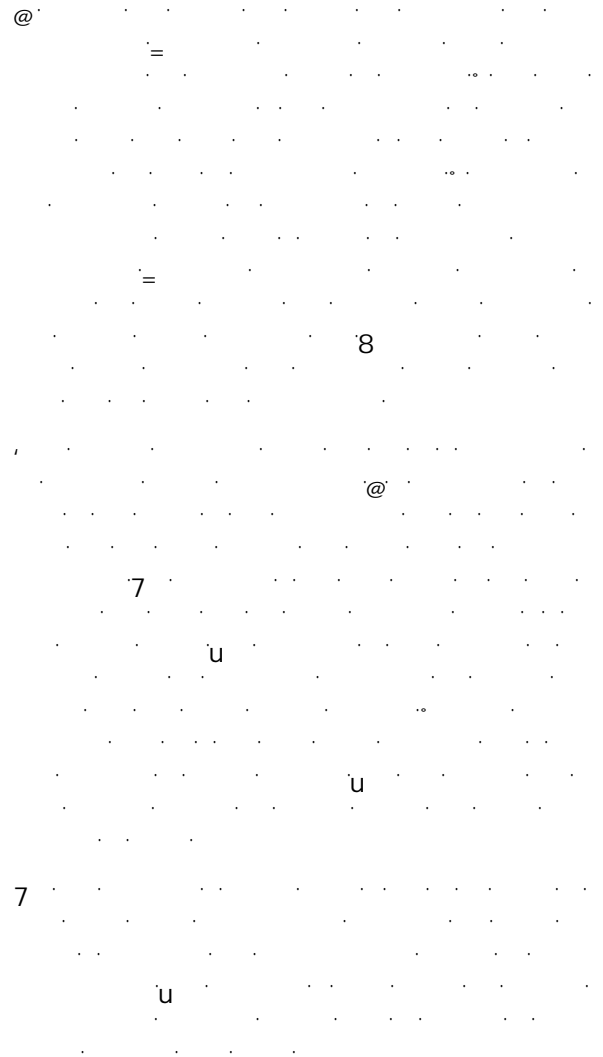
Structural diversity of the groundlayer



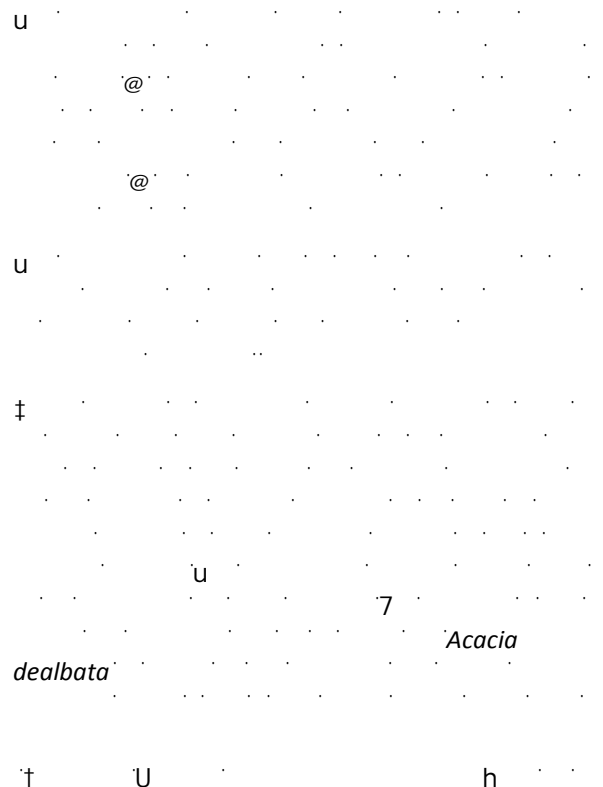
Cover of trees and shrubs



Indicator 5. Terrestrial Habitat Condition



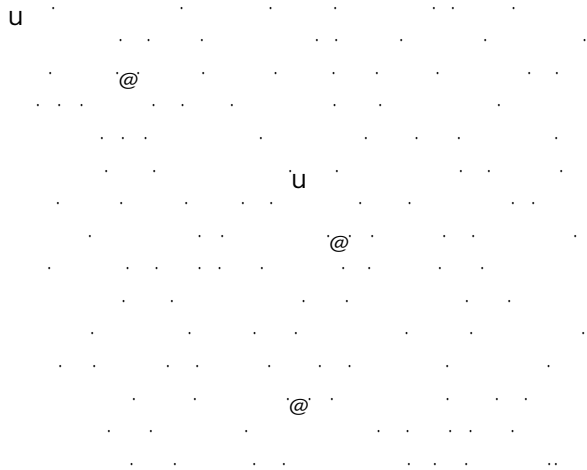
Indicator 6. Revegetation Success



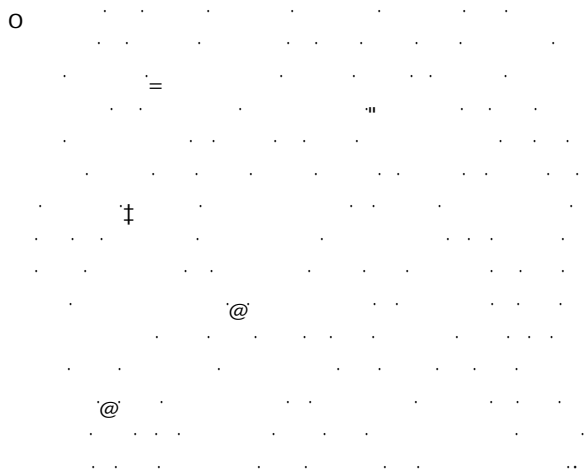
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Indicator 7. Distribution and Abundance of a Species

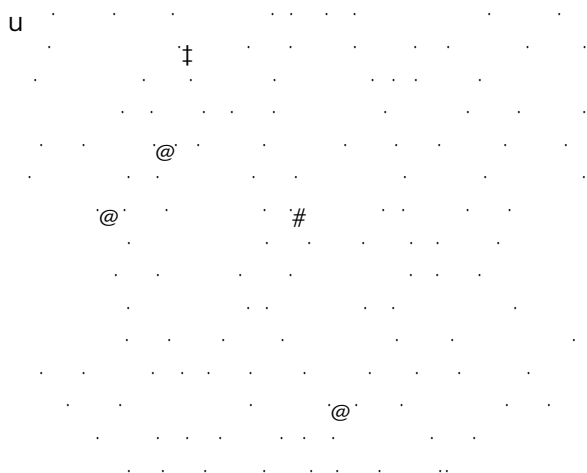
Weed control success



Threatened species or uncommon species

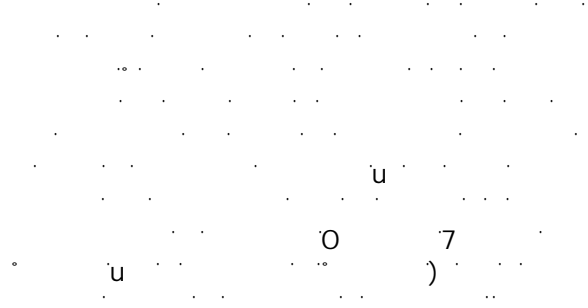


Indicator 8. Waterbody Habitat Condition

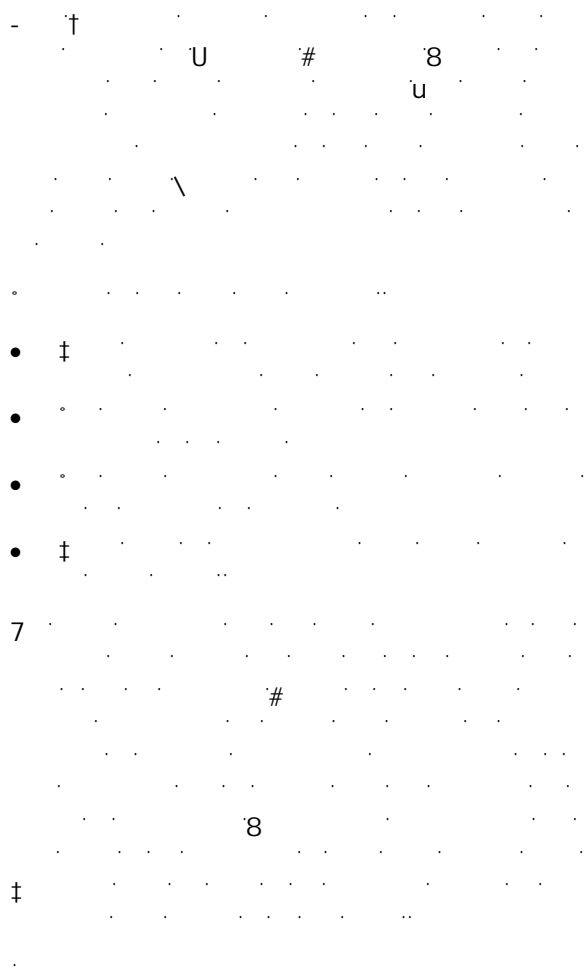


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Step 5. Regional data collation and analysis



5. An example of a set of recording sheets



Grevillea alpina



Field researchers in a woodland



Woodland landscape

Study Plan

h	Vegwatch	
O	Black Mountain Nature Reserve	
h	Friends of Black Mountain: Linda (tel.) Rosemary (tel.) and Molonglo Catchment Group	
)	26/2/13	
† @	†	To measure change in condition in vegetation and habitat: the site is included in the Vegwatch program
	O u	Vegwatch study site (Molonglo Catchment Group), to monitor condition over a large number of sites using the same methods, to compare the changes occurring within the sites and between the sites. To develop a monitoring program that will provide consistent, long-term data relevant to on-ground management of the reserve. Management of the sites is mainly through control burns to reduce fuel levels, but also includes control of environmental weeds and control of rabbits To see whether changes are occurring that may relate to control burns.
	O	To inform fire management In comparison to the initial assessment results: The native vegetation diversity is retained; No increase in exotic vegetation; and Bare ground does not exceed 5% of groundcover
† @	† u @	Does native species/introduced annuals and perennials change in cover, frequency and composition? Does the cover of bare ground increase?
	O	Indicators 1, 2, 3, 4, 5
† @	O	Zone CA5 in area to be burnt regularly for wildfire fuel management and area adjacent that will not be burnt (control). Doherty Black Mtn West and East Black Mtn South ANBG (refer to reference and map xxxx)
	h	Representative, and all build on existing plots of Doherty monitoring and community fire plots (refs). Two plots to be established
†	O O	Convenor: Linda Back up convenor: Carol Adviser and species identification: Rosemary, Michael Data entry: Linda Data mgmt/quality check: Rosemary Photos mgmt: Jean
† @	V	2013: Autumn, winter and spring: changes over 12 months Orchids: early and late spring, summer Annually thereafter?? Minimum 5 years ideally ten Review at 5 and 10 years
† @	O	Parks and Conservation Service: rangers and fire management team Conservation Research (ESDD) CSIRO (Michael) Licence to collect plants (Rosemary)
= @	V	Data will be stored on spreadsheets by Molonglo Catchment Group and will available on their website. Hard copies of the data held by the convenor, as well as electronic copies. Molonglo Catchment Group will organise data analysis at 5 years and 10 years. Rosemary and Linda: electronic copies Interpretation: Michael D, Rosemary P; Vegwatch program
@	k	Molonglo Catchment Group project officer, Michael

Plot Location

	V	Black Mountain NE Frith Road
	O	Between the Powerline Fire trail and Little Black Mountain Fire Trail.
	U	Doherty Site C
O \		ACT Government
)		VegWatch - monitoring vegetation condition
o o		Rosemary P, Linda B, Sarah S (trainer), Carol B (Recorder), Dierk B, Rosemary B, John F, Jean G, Rachel M (Molonglo Catchment Group)
)		Park in Frith Road near the stile along the fence north of the sub-station; walk up informal track from the road, over the stile, to the Powerline Fire Trail, continue up the informal walking track on the upper side of the Powerline Fire Trail until the track forms an inverted V junction with another informal walking track.
)		About 15 m north of junction of two rough walking tracks between Powerline Fire Trail and Little Black Mtn Fire Trail (see map)
h		20 m x 50 m along the slope: 20 m x 50 m corners, 20 m points on long sides, and 6 m & 14 m points along short sides all permanently marked with green plastic square-top pegs
U	8hok	h o
at		Easting: 35° 16' 01.2" S Northing: 149° 06' 27.7" E
8ho)		± 80 (° 8) (° 8) (° 8)
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O		SW corner peg at the foot of a small-diameter <i>Eucalyptus rossii</i> (Scribbly Gum) tree about 15 m c. north of junction of two rough walking tracks between Powerline Fire Trail and Little Black Mtn Fire Trail. Long edge of plot aligned c. 345 degrees from SW corner; short edge aligned c. 75 degrees from SW corner
O		# SW corner peg: c. 35° 16' 01.2" S, 149° 06' 27.7" E SE corner peg: c. 35° 16' 01.0" S, 149° 06' 28.2" E NE corner peg: c. 35° 15' 59.3" S, 149° 06' 27.6" E NW corner peg: c. 35° 15' 59.3" S, 149° 06' 27.0" E Location maps: Map 1: general location of area containing plot in relation to Frith Road and Barry Drive, using Google Earth. Map 2: specific location of plot in relation to the Power Line Fire Trail, the Little Black Mountain Fire Trail and informal walking tracks, using Google Earth. Map 3: sketch of the monitoring plot at Black Mtn NE Doherty Site C.
u		Two transects each running parallel to the long sides of the plot, starting 6 m and 14 m from the SW corner along the short side; 6 m and 14 m points permanently marked along both short sides with green plastic pegs

Plot Description

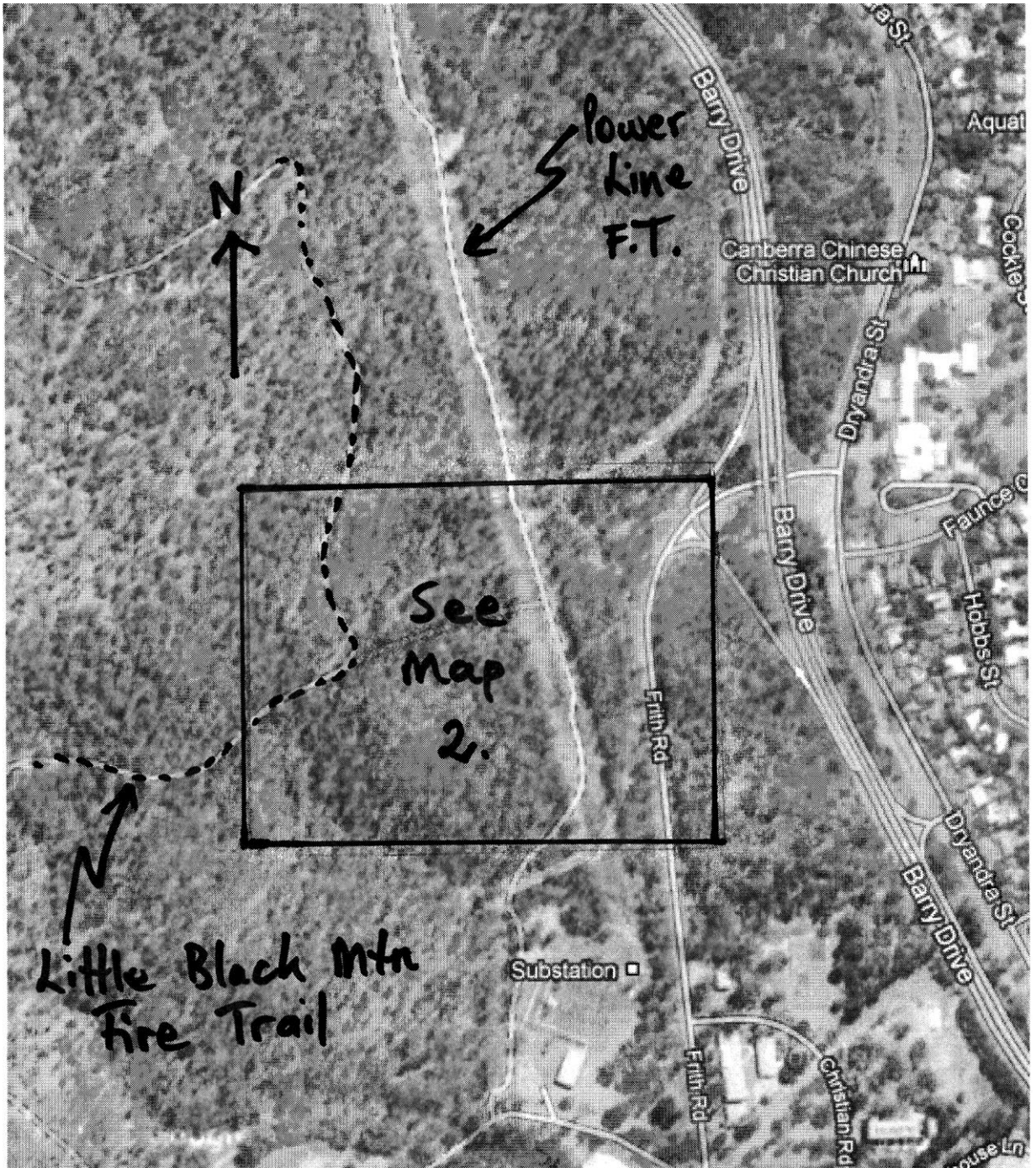
o O	Black Mountain NE, Frith Rd	U h	Doherty Site C
)	26/2/13	o	Rosemary P, Linda B, Sarah S (trainer), Carol Billett (Recorder), Dierk vB, Rosemary vB, John F, Jean G, Rachel W (Molonglo Catchment Group)
O	Nature reserve		
o Gentle	-	668 m ± 5 m	V V- - o o ot † V†
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o	Natural grassland @ Sedgeland @ Woodland u Closed Forest	Secondary grassland u Shrubland @ Open Forest	
)	<i>Eucalyptus macrorhyncha</i> (Red Stringybark) and <i>E. rossii</i> (Scribbly Gum) trees and <i>Daviesia mimosoides</i> (Bitter Pea) shrubs		
)	<i>Rytidosperma pallidum</i> (Red-anther Wallaby Grass)		
=	40 cm		
k	Seedlings, saplings, mature trees, dead trees		
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h	Low. Some evidence of kangaroo scats and camps, last fire 1991 (pers. com. M.Doherty, 1/3/13), lots of fallen timber (some over last 1-2 years probably).		
-	No evidence		
h	Fuel reduction burns		
8	Native animals only		
)	Large number of small diameter trees (c. 6-7 cm diam at breast height), some larger trees (Red Stringybark and Scribbly Gum); lots of fallen dead timber; lots of Red-anther Wallaby Grass tussocks with old flowering heads to c. 1.5 m tall, a fairly sparse Bitter Pea shrub layer 1-2 m tall, a good layer of leaf litter on the ground.		

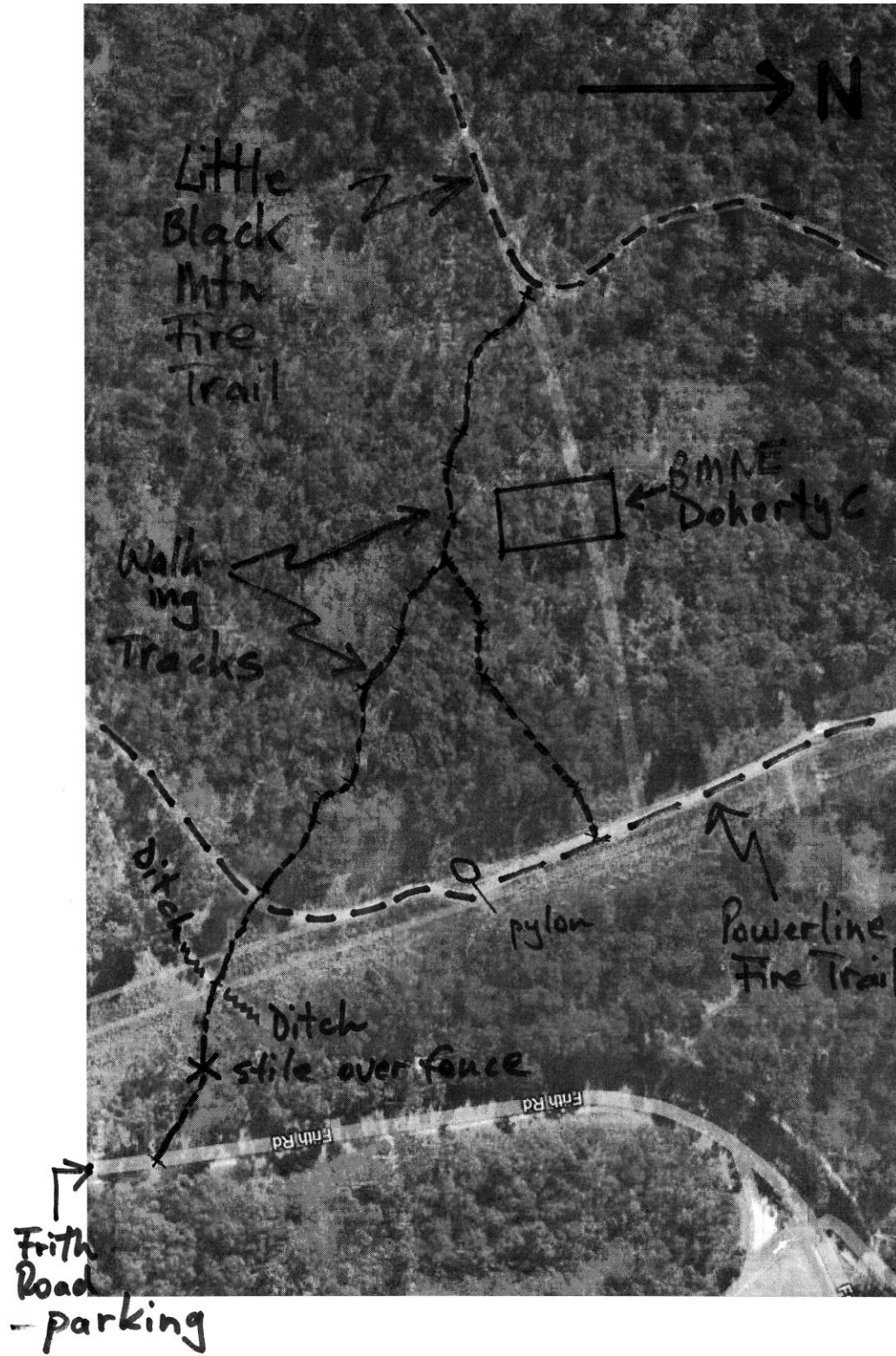
View from SW corner of plot diagonally across the plot towards sighter post. Photo: Jean G.

<FrithRdNE-C_marker-GP1870541-r>

Within SW part of the plot, looking up-slope towards western long edge. Photo: Jean G.

<FrithRdNE-C_transect-GP1870517-r>





Photopoint Monitoring

)	26/2/13	U	Black Mtn NE Doherty Site C
8ho	36° 16' 01.2" S 149° 06' 27.7 E	U	
)	ot		
=	1.5 m	h	Jean G
=	1 m	)	5 m
u	4:25 pm	‡	Very overcast
k	Vegwatch / vegetation condition		
†	ot		

SW corner of plot, looking along southern short edge from down-slope. Photo: Jean G.

<FrithRdNE-C_SWcorner-GP1870433-r>

NW corner, looking from just inside plot on western long edge. Photo: Jean G.

< FrithRdNE-C_NWcorner-GeueP1870442-r >

Indicator 1: Plant Species Diversity

) : 26/2/13	o Black Mtn NE / Frith Rd	U Doherty Site C
o Rosemary P, Sarah S	k Carol B	h Jean G

o V			V V @ @ y y	V " " 7 7) 7)
<i>Acacia implexa</i> (Hickory Wattle)	C	R	V @ y	
<i>Daviesia mimosoides</i> (Bitter Pea)	C	O	V @ y	DF
<i>Eucalyptus macrorhyncha</i> (Red Stringybark)	C	R	V @ y	
<i>Eucalyptus rossii</i> (Scribbly Gum)	C	R	V @ y	
<i>Exocarpos cupressiformis</i> (Cherry Ballart)	C	R	V @ y	
<i>Acacia buxifolia</i> (Box-leaved Wattle)		R	V @ y	
<i>Acacia genistifolia</i> (Early Wattle)		R	V @ y	
<i>Acacia gunnii</i> (Ploughshare Wattle)		R	V @ y	
<i>Billardiera scandens</i> (Common Appleberry)		R	V @ y	
<i>Brachyloma daphnoides</i> (Daphne Heath)		O	V @ y	
<i>Cassinia longifolia</i> (Cauliflower Bush)		R	V @ y	
<i>Cassytha</i> sp. (Dodder)		R	V @ y	
<i>Coronidium oxylepis</i> (<i>Helichrysum collinum</i>) (Painted Everlasting)		O	V @ y	
<i>Dianella revoluta</i> (Blue Flax Lily)		R	V @ y	
<i>Dillwynia phyllicoides</i> (Small-leaved Pea Parrot)		R	V @ y	DF
<i>Gonocarpus tetragynus</i> (Common Raspwort)		O	V @ y	
<i>Goodenia hederacea</i> var. <i>hederacea</i> (Ivy Goodenia)		O	V @ y	
<i>Grevillea alpina</i> (Mountain Grevillea)		R	V @ y	
<i>Hakea decurrens</i> (Bushy Needlebush)		R	V @ y	
<i>Hardenbergia violacea</i> (False Sarsaparilla)		O	V @ y	
<i>Hibbertia calycina</i> (Lesser Guinea Flower)		R	V @ y	
<i>Hibbertia obtusifolia</i> (Guinea Flower)		O	V @ y	
<i>Leucopogon microphyllus</i> var. <i>pilibundus</i> (Hairy Beard-heath)		R? det	V @ y	
<i>Lomandra filiformis</i> (Wattle Matrush)		O	V @ y	
<i>Phyllanthus hirtellus</i> (Thyme Spurge)		O	V @ y	
<i>Poa sieberiana</i> (Snowgrass)		O	V @ y	
<i>Pultenaea procumbens</i> (Hairy Bushpea)		R	V @ y	
<i>Rhytidosporum procumbens</i> (White Rhytidosporum)		O	V @ y	
<i>Rytidosperma pallidum</i> (Red-anther Wallaby Grass)	C		V @ y	
<i>Stylidium graminifolium</i> (Grass Trigger Plant)		R	V @ y	
<i>Stypandra glauca</i> (Nodding Blue Lily)		R	V @ y	
TOTAL	5	31	31 0 0	

Indicator 2. Structural Diversity of Native and Introduced Plants

) : 26/2/13	o Black Mtn NE /Frith Rd	U Doherty site C
o : Rosemary P, Sarah S	k Carol B	h Jean G
8	V h	@
u	C	#
U	A	3 trees
o	O	
u	O	
U	C	
o	C	
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O	A	
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O		
h	C	
7		
†	C	
U		
#	A	
u	10	

No introduced species present

Indicator 3. Condition of Native Trees and Shrubs

)

) 26/2/13	o Black Mtn NE /Frith Rd	U Doherty Site C
o Rosemary P, Sarah S	k Carol B	h Jean G

3.1 Regeneration and tree health in the vegetation zone

u	k	=
<i>Eucalyptus macrorhyncha</i> *	Yes	5
<i>E. rossii</i> *	Yes	5
<i>Acacia implexa</i>	Yes	5
<i>Exocarpos cupressiformis</i>	yes	5
V	4	
h		100%

3.2 Regeneration in the plot

o V	o	o K	o	U	†	o	o
	V	V	V	V	V	V	V
<i>E. macrorhyncha</i> *	<5	0		10		) 20	3
<i>E. rossii</i> *	<5	8	50	4		)	4
<i>Acacia implexa</i>		1					1
<i>Exocarpos cupressiformis</i>	1		1				2
<i>Daviesia mimosoides</i>			c. 15	c. 75			2

* Lot of mature eucalypts have several stems from the base; individual number of stems counted

3.3 Length of fallen timber

y

2	1	0.5	0.5
1	1	2	3.5
5	1	6	5
5	10.5		44 m

3.4 Number of trees with hollows

†

V	1
---	---

Indicator 4. SpeciesCover

) 26/2/13	o Black Mtn NE / Frith Rd	U Site C	Doherty	
o Rosemary P, Sarah S etc	k Carol B; Dierk vB	h Jean G		
8	u U 200 points	7		
# U O	@@@ @	4 + 2		3%
"	@@@ @	7 + 2		4.5%
k	@@@ @@@	5 + 4		4.5%
O) †	@@ @@@@@@@@ @@ @@@@@@@@@	85 + 92		88.5%
8 7		0		
h 8 7		0		
V	@@@@@@@@@ @@@@@@@@@@@@@@@@@@@@	17 + 33		25%
\	#			
V	20, 0, 15, 40, 70, 0, 20, 40, 30, 0			24%
@				0
U	#			
V	80, 0, 100, 90, 0, 0, 0, 70, 80, 0			42%
				0
#		u		
V				25%
h V V h-				100%
u				91%
-				0%

u

Indicator 5. Terrestrial Habitat Condition Assessment

o O		Black Mtn NE / Frith Rd	† Forest	h Doherty Site C		
)		26/2/13	o	Rosemary P, Sarah S		
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u			60			
			83%			

Indicator 6. Revegetation Success Recording Sheet

)	11/9/12	O	My woodland	†	MW1 R1
o	L. Smith	k		h	LS

--	--	--	--	--	--	--

o	y	o	h	†	h
---	---	---	---	---	---

h	Population count (planted: 30 shrubs and trees, 10 <i>Lomandra longifolia</i>)				
o	0.25 ha (50 m x 50 m)				
@	n/a				
o)	=	
<i>Eucalyptus melliodora</i>	4		1	0.5, 0.6, 0.6, 0.4	0.5
<i>Acacia implexa</i>	3			0.8, 0.8, 0.6	0.75
<i>E. bridgesiana</i>	4			0.6, 0.3, 0.5, 0.4	0.45
<i>E. blakelyi</i>	5		1	0.3	0.3
<i>A. dealbata</i>	6	1	1	0.9, 0.7, 0.7, 0.6, 0.8, 0.7, 0.5	0.7
<i>Indigofera australis</i>	2	1	1	0.6, 0.3, 0.5	0.5
<i>Lomandra longifolia</i>	8		2	0.3 - 0.4	0.35
u	32	2	6		
u	85%				

Indicator 7. Distribution and Abundance of a Species

)	21/1/14	O	Stirling Ridge	†	Zone 5
o	SS	k	L. Smith	h	LS, 13/10/12 - 1, 2

o	V	V	h
<i>Lotus australis</i>	42	0	100%
<i>Dianella longifolia</i>	12	0	100%
<i>Calotis lappulacea</i>	174	0	100%
u	228		

)	1/1/14	O	Collector	†	Eagle Dam
o	SS	k	SS	h	SS, 1/1/14 1-3

o	V	V	V	D
<i>Nassella neesiana</i> Serrated Tussock	25	13	0	>200
<i>Eragrostis curvula</i> African Lovegrass	5	0	0	0
u	30	13	0	>300
o	14.5%			
o				
<i>Centaurium erythraea</i>	>100			
<i>Austrostipa scabra</i>	50-100			

Indicator 8. Waterbody Habitat Condition (Vegetation Zone)

)	2/1/14	O	Collector	†	-	Main dam
o	SS	k	SS	h		SS
<p>)</p> <p>Large dam constructed about 20 years ago. Acacias, a few eucalypts, scattered grasses on banks, otherwise banks bare, good cover and diversity of vegetation (native) upstream. Very little fringing or submerged vegetation in the dam itself. Yabbies, tortoise, ducks, observed in the dam. No fish ever observed or likely to be present.</p>						
				o		
Additional features in farm dams or wetlands						
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@		1		@	o	
@		2	V	h		
@		2	V			
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@		2	V			
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†		2	#	@		V
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†		1		@		k
		2	V			V
		0	V			
@		0	V	†		
@		1	V	†		
		1	V	h	U	
		1	V	o	#	
		0	V	h		
		2		h	V	
		2	V	h		
@		2	V	@		
Additional features in farm dams or wetlands						
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		67%				

6. Recording sheets

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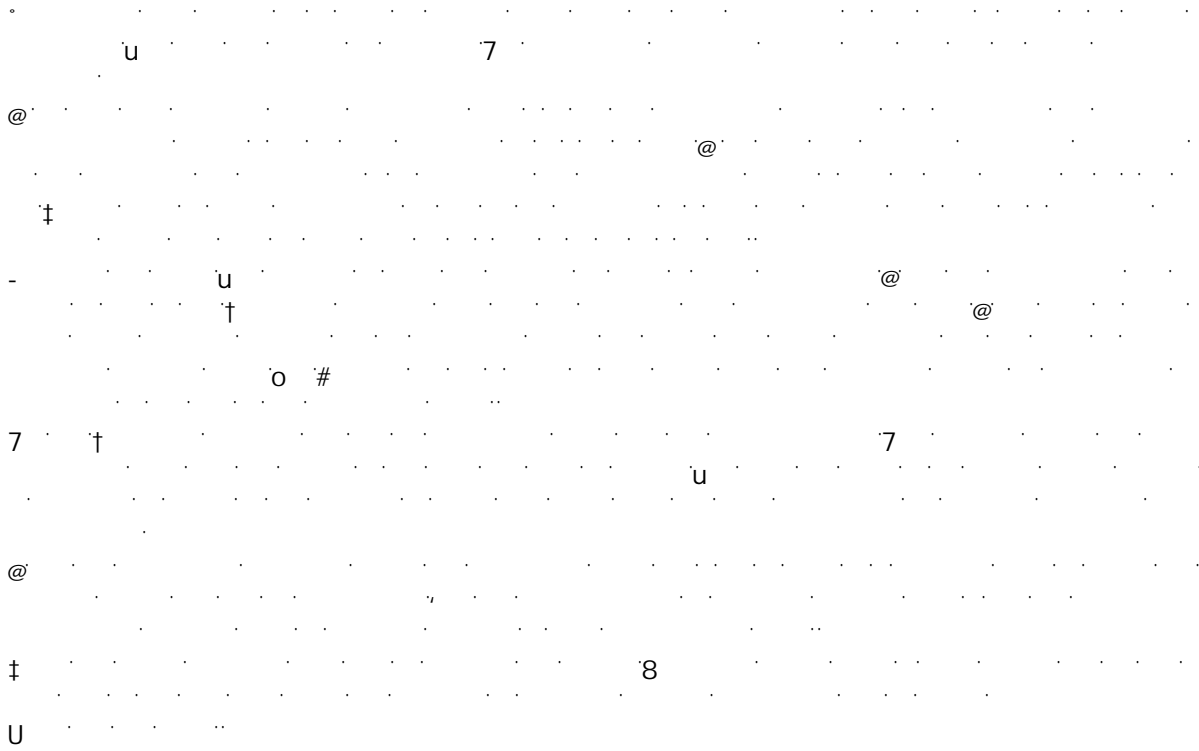
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Plot Establishment and Location

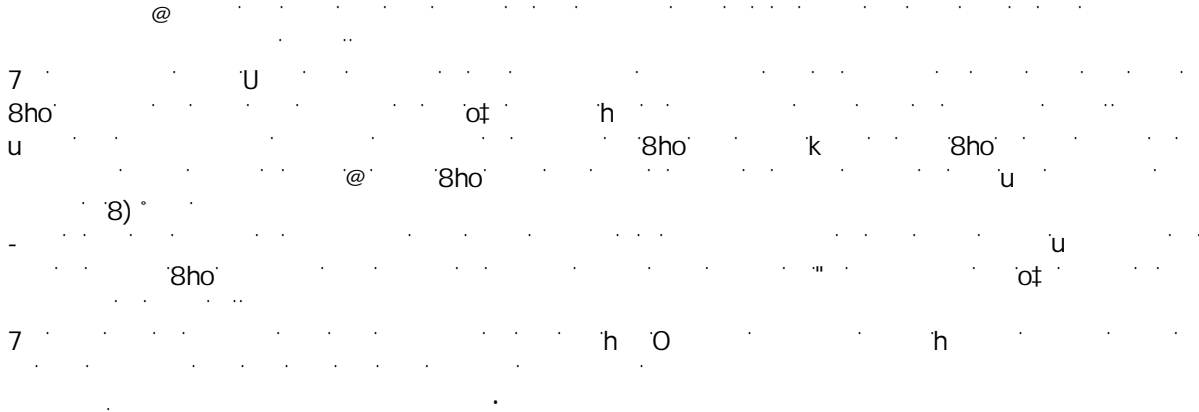
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Plot based assessments: 7

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b) Transect based assessment:



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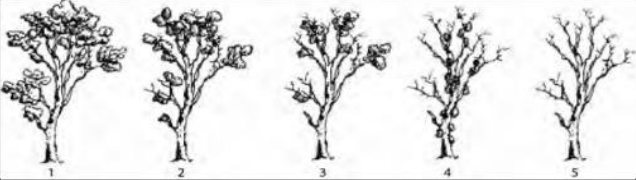
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Plot Description

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Photopoint Monitoring

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Indicator 1. Plant Species Diversity

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Indicator 2. Structural Diversity of Native and Introduced Plants

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Indicator 2. Structural Diversity of Native and Introduced Plants

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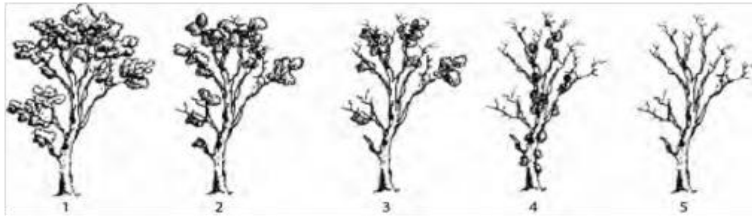
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Indicator 3. Condition of Native Trees and Shrubs

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3.1. Regeneration and tree health in the vegetation zone

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3.2. Regeneration in the plot

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3.3. Length of fallen timber in the plot

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3.4. Number of trees with hollows in the plot

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Indicator 4. Species Cover

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Instructions

4.1. Groundcover

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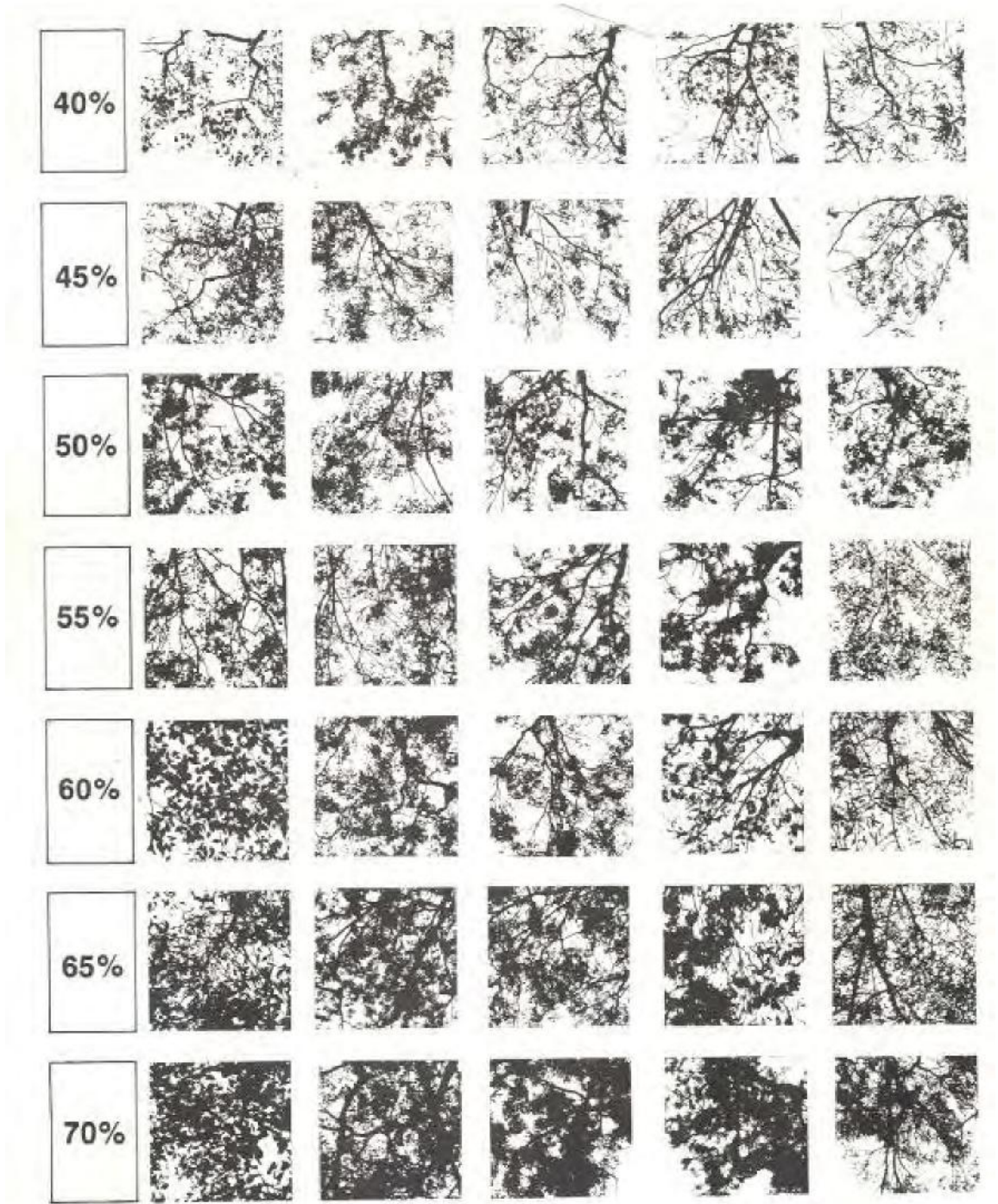
4.2. Overstorey

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4.3. Midstorey

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Indicator 4. Species Cover

Date	Location	Veg Zone, plot#	
Surveyor	Recorder	Photographer	
4.1. Groundcover	Tally over at least 50 points: Total no of points measured (P):	Frequency (F)	% cover (F/P)x100
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4.2. Overstorey cover	Cover (%) tally over at least ten points	Average	
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4.3. Midstorey cover	Cover (%) tally over at least ten points	Average	
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Calculated cover values			Totals
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Indicator 5. Terrestrial Habitat Condition

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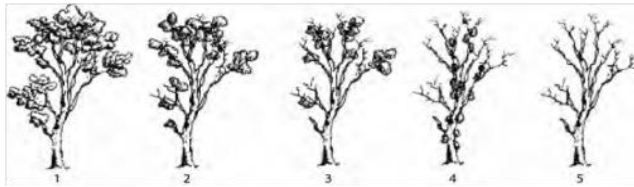
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Indicator 5. Terrestrial Habitat Condition

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Indicator 6. Revegetation Success

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Indicator 7. Distribution and Abundance of a Species

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Indicator 7. Distribution and Abundance of a Species

7.1 Desirable species

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7.2 Undesirable species

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Indicator 8. Waterbody Habitat Condition

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Indicator 8. Waterbody Habitat Condition

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Appendix A. Glossary of terms

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Appendix B. References, contacts and resources

1. References used to develop the Vegwatch Manual

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2. Field and plant identification guides

Flora

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3. Management guidelines and other references

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4. Government departments

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Territory and Municipal Services (TAMS)

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5. Community groups and non-government organisations

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6. Where to obtain field equipment

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Appendix C. Species in Grasslands and Grassy Woodlands in the Capital Region

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	o	V	#	V	8	o
"	<i>Acacia acinacea</i>	<i>Acacia rotundifolia</i>	8	†	o	"
"	<i>Acacia baileyana</i>		#	†	o	"
"	<i>Acacia buxifolia</i>	<i>Acacia buxifolia</i>	"	†	o	"
"	<i>Acacia dawsonii</i>		h	†	o	@
"	<i>Acacia dealbata</i>	<i>Acacia dealbata</i>	o	†	o	"
"	<i>Acacia decora</i>		†	o	†	@
"	<i>Acacia decurrens</i>		8	†	"	†
"	<i>Acacia doratoxylon</i>		#		o	k
"	<i>Acacia falciformis</i>		7	†	o	"
"	<i>Acacia genistifolia</i>	<i>Acacia diffusa</i>	-	†	o	@
"	<i>Acacia gunnii</i>	<i>Acacia vomeriformis</i>	h	†	o	"
"	<i>Acacia implexa</i>		)	†	o	"
"	<i>Acacia mearnsii</i>		=	†	u	"
"	<i>Acacia melanoxylon</i>		"	†	8	†
"	<i>Acacia pycnantha</i>		"		u	"
"	<i>Acacia rubida</i>		8	†	o	"
"	<i>Acacia siculiformis</i>		k	†	o	"
"	<i>Acacia ulicifolia</i>		k	†	o	"
"	<i>Acacia verniciflua</i>)	†	#	†
"	<i>Acacia ulicifolia</i>		K	†	o	"
"	<i>Acacia verniciflua</i>		†	†	u	"
"	<i>Acacia paradoxa</i>	<i>Acacia armata</i>	M	u	o	"
"	<i>Acaena echinata</i>		o	"	7	"
"	<i>Acaena novae-zelandiae</i>	<i>Acaena anserinifolia</i>	"	"	†	7
"	<i>Acaena ovina</i>	<i>Acaena agnipila</i>	o	"	7	"
"	<i>Acetosella vulgaris</i>	<i>Rumex acetosella</i>	o	o	7	"
"	<i>Acrotriche serrulata</i>		8		o	"
"	<i>Adiantum aethiopicum</i>		#	U	7	"
"	<i>Aira caryophylla</i>	<i>Aira caryophylla</i>	o	=	8	"
"	<i>Aira cupaniana</i>		o	=	8	"
"	<i>Aira elegantissima</i>	<i>Aira elegans</i>	)	=	8	"
"	<i>Ajuga australis</i>		"	"	7	@
"	<i>Allocasuarina littoralis</i>		"	o	u	"
"	<i>Allocasuarina luehmannii</i>		k	\	u	k
"	<i>Allocasuarina verticillata</i>	<i>Casuarina stricta</i>	)	o	u	"
"	<i>Alternanthera sp. A7</i>	<i>Alternanthera nana</i>	=	K	7	@
"	<i>o † U 8</i>					
"	<i>Ammobium alatum</i>		u	"	7	@
"	<i>Amphibromus nervosus</i>	<i>Amphibromus neesii</i>	#	o	†	8
"	<i>Amphibromus pithogastrus</i>	<i>Amphibromus</i>	h	o	†	8
"	<i>Anthosachne scaber</i>	<i>Elymus scaber var. scaber, Agropyron scabrum</i>	#	†	8	"
"	<i>Aphanes arvensis</i>		h	h	7	"

	o	v	o	#	v	8	o
..		<i>Aphanes australiana</i>		.	.	7	..
..		<i>Arachnorchis actensis</i>	<i>Caladenia actensis</i>	#	o \	7	u@
..		<i>Aristida behriana</i>		"	†	8	k
..		<i>Aristida calycina</i> . <i>calycina</i>		)	†	8	..
..		<i>Aristida ramosa</i>		h	†	8	..
..		<i>Arthropodium fimbriatum</i>	<i>Dichopogon fimbriatus</i>	h	† O † O	k	@
..		<i>Arthropodium milleflorum</i>		o	† O	k	@
.		<i>Asparagus officinalis</i>		v	# O	7	..
..		<i>Asperula ambleia</i>		o	†	7	..
..		<i>Asperula conferta</i>		#	†	7	@
..		<i>Asperula scoparia</i> . <i>scoparia</i>	<i>Asperula scoparia</i> . <i>scoparia</i>	h	†	7	@
..		<i>Asplenium flabellifolium</i>		v	7	7	..
.		<i>Aster subulatus</i>		"	o †	7	..
..		<i>Astroloma humifusum</i>	<i>Astroloma humifusum</i> . <i>humifusum</i>	v	#	o	@
..		<i>Astrotricha ledifolia</i>		#	o	o	..
..		<i>Australopyrum pectinatum</i>	<i>Agropyron</i> <i>pectinatum</i>	h	†	8	..
..		<i>Austrostipa bigeniculata</i>	<i>Stipa bigeniculata</i>	'	M o	8	..
..		<i>Austrostipa blackii</i>		..		8	..
..		<i>Austrostipa densiflora</i>	<i>Stipa densiflora</i>	7	o	8	..
..		<i>Austrostipa nodosa</i>	<i>Stipa nodosa</i>	M	o	8	..
.		<i>Austrostipa scabra</i> . <i>falcata</i>	<i>Stipa falcata</i>	o	o	8	..
.		<i>Austrostipa scabra</i> . <i>scabra</i>	<i>Stipa scabra</i>	k	o	8	..
.		<i>Avena fatua</i>		†	\	8	..
..		<i>Baloskion australe</i>	<i>Restio australis</i>	U	#	o	..
..		<i>Banksia marginata</i>		o	"	o	..
..		<i>Billardiera scandens</i>		#	" =	u	..
..		<i>Blechnum nudum</i>		7	† 7	7	..
..		<i>Boerhavia dominii</i>	<i>Boerhavia diffusa</i>	u		7	..
..		<i>Bossiaea buxifolia</i>		U	"	o	@
..		<i>Bossiaea foliosa</i>		O	"	o	..
..		<i>Bossiaea grayi</i>	<i>Bossiaea bracteosa</i>	o	"	o	..
..		<i>Bossiaea prostrata</i>		#	"	o	k@
..		<i>Bossiaea riparia</i>		k	O "	o	@
..		<i>Bothriochloa macra</i>	<i>Bothriochloa biloba</i>	k	8 k	8	..
..		<i>Brachyloma daphnoides</i>	<i>Brachyloma daphnoides</i> . <i>daphnoides</i>	)	=	o	..
..		<i>Brachyscome aculeata</i>	<i>Brachycome aculeata</i>	=	)	7	@
..		<i>Brachyscome dentata</i>	<i>Brachyscome heterodonta</i> . <i>heterodonta</i>	O	)	7	@
..		<i>Brachyscome diversifolia</i> . <i>diversifolia</i>	<i>Brachycome diversifolia</i>	O	)	7	@
..		<i>Brachyscome ptychocarpa</i>		..		7	..
..		<i>Brachyscome rigidula</i>	<i>Brachycome rigidula</i>	#	)	7	@
..		<i>Brachyscome spathulata</i> . <i>spathulata</i>	<i>Brachycome spathulata</i>	o	)	7	@
.		<i>Briza maxima</i>		j	8	8	..
.		<i>Briza minor</i>		o	8	8	..
.		<i>Bromus catharticus</i>	<i>Bromus uniloides</i>	h	8	8	..
.		<i>Bromus diandrus</i>		8	"	8	..
..		<i>Brunonia australis</i>		"	h	7	..
..		<i>Bulbine bulbosa</i>	<i>Bulbinopsis bulbosa</i>	"	O	7	@

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..	<i>Bulbine glauca</i>			k	o	7	@
..	<i>Burchardia umbellata</i>			U		7	k @
..	<i>Bursaria spinosa</i> . <i>lasiophylla</i>			'	"	o	..
..	<i>Caesia calliantha</i>			"	8 o	k	k @
..	<i>Caladenia dimorpha</i>	<i>Stegostyla dimorpha</i>				7	..
..	<i>Calandrinia eremaea</i>	<i>Parakeelya eremaea</i>		o	h	7	..
..	<i>Calocephalus citreus</i>			O	" =	7	@
..	<i>Calochilus robertsonii</i>	<i>Calochilus imberbis</i>		h	" \	7	..
..	<i>Calotis anthemoides</i>			#	")	7	k
..	<i>Calotis lappulacea</i>			'	")	7	@
..	<i>Calotis scabiosifolia</i> . <i>integrifolia</i>			k	")	7	@
..	<i>Calytrix tetragona</i>			#	7 U	o	..
..	<i>Cardamine paucijuga</i>			o	"	7	..
..	<i>Carduus tenuiflorus</i>			o	u	7)
..	<i>Carex appressa</i>			u	o u u o	o	..
..	<i>Carex bichenoviana</i>			h	o	o	..
..	<i>Carex breviculmis</i>			o	o	o	..
..	<i>Carex inversa</i>			M	o	o	..
..	<i>Cassinia aculeata</i>			)		o	..
..	<i>Cassinia arcuata</i>			#	o	o	..
..	<i>Cassinia hewsoniae</i>			=	#	o	..
..	<i>Cassinia longifolia</i>			#	"	o	..
..	<i>Cassinia quinquefaria</i>			o	"	o	..
..	<i>Cassytha pubescens</i>			)	) O	†	..
..	<i>Cenchrus purpurascens</i>	<i>Pennisetum alopecuroides</i>		o	7	8	..
..	<i>Centaurium erythraea</i>			#	#	7	..
..	<i>Centella asiatica</i>			@	h	7	@
..	<i>Centipeda cunninghamii</i>			#	o	7	..
..	<i>Centipeda elatinooides</i>	<i>Centipeda minima</i>		o	o	7	..
..	<i>Centipeda minima</i>			..		7	..
..	<i>Centrolepis strigosa</i> . <i>strigosa</i>	<i>Centrolepis strigosa</i>		=	#	o	..
..	<i>Cerastium glomeratum</i>			U	#	7	..
..	<i>Cheilanthes austrotenuifolia</i>			k	7	7	..
..	<i>Cheilanthes distans</i>			o	k 7	7	@
..	<i>Cheilanthes sieberi</i> . <i>sieberi</i>			U	k 7	7	..
..	<i>Cheiranthra linearis</i>	<i>Cheiranthra cyanea</i>		7	7	7	k
..	<i>Chenopodium album</i>			7	=	7	..
..	<i>Chloris truncata</i>			†	8	8	..
..	<i>Chondrilla juncea</i>			o	†	7	..
..	<i>Chrysocephalum apiculatum</i>	<i>Helichrysum apiculatum</i>		'	"	7	@
..	<i>Chrysocephalum semipapposum</i>	<i>Helichrysum semipapposum</i>		#	-	7	@
..	<i>Cichorium intybus</i>			#		7	..
..	<i>Cirsium vulgare</i>			o	u	7	..
..	<i>Clematis leptophylla</i>	<i>Clematis microphylla leptophylla</i>		o	#	†	..
..	<i>Comesperma ericinum</i>			=	U	7	..
..	<i>Conium maculatum</i>			o	#	7	..
..	<i>Convolvulus angustissimus</i> . <i>angustissimus</i>	<i>Convolvulus erubescens</i>		o	"	7	..
..	<i>Conyza bonariensis</i>			h	"	7	..
..	<i>Conyza canadensis</i>			7	7	7	..
..	<i>Coronidium scorpioides</i>	<i>Helichrysum scorpiodes</i>		#	7	7	..

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..	<i>Corunastylis arrecta</i>		<i>Genoplesium arrectum</i>	-	U \	7	k
..	<i>Corunastylis ectopa</i>		<i>Genoplesium ectopum</i>	"	U \	7	u
..	<i>Corunastylis nuda</i>		<i>Genoplesium nudum</i>	u	U \	7	..
..	<i>Cotula alpina</i>			°	#	7	..
..	<i>Cotula australis</i>			#	#	7	..
..	<i>Craspedia variabilis</i>			†	" "	7	@
..	<i>Crassula colorata</i> . <i>acuminata</i>			)	# o	7	..
..	<i>Crassula decumbens</i> . <i>decumbens</i>		<i>Crassula macrantha</i>	o	#	7	..
..	<i>Crassula helmsii</i>			k	o	7	..
..	<i>Crassula peduncularis</i>		<i>Crassula purpurata</i>	o	o	7	..
..	<i>Crassula sieberiana</i>			°	#	7	..
..	<i>Crepis capillaris</i>			°	=	7	..
..	<i>Cryptandra amara</i>		<i>Cryptandra amara</i> . <i>amara</i>	h	# o	o	..
..	<i>Cullen microcephalum</i>		<i>Psoralea adscendens</i>	)	o	7	@
..	<i>Cullen tenax</i>		<i>Psoralea tenax</i>	-	7	7	k @
..	<i>Cyanicula caerulea</i>		<i>Caladenia caerulea</i>	"	#	7	..
..	<i>Cymbonotus lawsonianus</i>			"	-	7	..
..	<i>Cymbonotus preissianus</i>			°	"	7	..
..	<i>Cymbopogon refractus</i>			"	8	8	..
..	<i>Cynodon dactylon</i> . <i>dactylon</i>			#	..	8	..
..	<i>Cynoglossum australe</i>			°	= u	7	..
..	<i>Cynoglossum suaveolens</i>			o	= u	7	..
..	<i>Cynosurus echinatus</i>			k	)	8	..
..	<i>Cyperus concinnus</i>			u	7	o	..
..	<i>Cyperus difformis</i>			)	)	o	..
..	<i>Cyperus eragrostis</i>			y	o	o	..
..	<i>Cyperus gunnii</i> subsp. <i>gunnii</i>			7	7	o	..
..	<i>Cyperus lhotskyanus</i>		<i>Cyperus rutilans</i>	°	..	o	..
..	<i>Cyperus lucidus</i>			O	7	o	..
..	<i>Cyperus sanguinolentus</i>			)	7	o	..
..	<i>Cyperus sphaeroideus</i>			M	†	o	..
..	<i>Dactylis glomerata</i>			#	..	8	..
..	<i>Daucus glochidiatus</i>			°	#	7	@
..	<i>Daviesia genistifolia</i>			"	" o "	o	@
..	<i>Daviesia latifolia</i>			=	"	o	@
..	<i>Daviesia leptophylla</i>		<i>Daviesia virgata</i>	o	"	o	@
..	<i>Daviesia mimosoides</i> . <i>mimosoides</i>			V	"	o	@
..	<i>Desmodium brachypodum</i>			O	u u	7	@
..	<i>Desmodium gunnii</i>			o	u u	7	..
..	<i>Desmodium varians</i>			o	u u o	7	@
..	<i>Deyeuxia quadriseta</i>			u	..	7	..
..	<i>Dianella longifolia</i> . <i>longifolia</i>			k	"	8	..
..	<i>Dianella revoluta</i> . <i>revoluta</i>			o	7 O	7	@
..	<i>Dianella tasmanica</i>			o	7 O	7	@
..	<i>Dichelachne hirtella</i>			"	7 O	7	..
..	<i>Dichelachne inaequiglumis</i>			°	..	8	@
..	<i>Dichelachne micrantha</i>			°	..	8	@
..	<i>Dichelachne parva</i>			o	h	8	@
..				°	..	8	@

	o	v	o	#	v	8	o
						7	
"	<i>Dichelachne</i>	<i>rara</i>		#	h	8	@
"	<i>Dichondra</i>	<i>repens</i>		M	†	7	"
"	<i>Digitaria</i>	<i>brownii</i>		#	h	8	"
"	<i>Dillwynia</i>	<i>cinerascens</i>		.	.	o	@
"	<i>Dillwynia</i>	<i>prostrata</i>		U	h	o	@
"	<i>Dillwynia</i>	<i>sericea</i>	<i>Dillwynia sericea . sericea</i>	o	h	o	@
"	<i>Dipodium</i>	<i>punctatum</i>		"	= \	7	@
"	<i>Discaria</i>	<i>pubescens</i>		.	" h	o	k @
"	<i>Diuris</i>	<i>behrii</i>		8	#	7	k @
"	<i>Diuris</i>	<i>chryseopsis</i>		8	U	7	@
"	<i>Diuris</i>	<i>dendrobioides</i>		O	U)	7	k @
"	<i>Diuris</i>	<i>punctata . punctata</i>		h	) \	7	k
"	<i>Diuris</i>	<i>semilunulata</i>		O	O \	7	@
"	<i>Diuris</i>	<i>sulphurea</i>		=	\	7	@
"	<i>Dodonaea</i>	<i>boroniifolia</i>		7	=	o	"
"	<i>Dodonaea</i>	<i>viscosa . angustissima</i>	<i>Dodonaea attenuata</i>	V	=	o	"
"	<i>Dodonaea</i>	<i>viscosa . cuneata</i>		†	=	o	"
"	<i>Dodonaea</i>	<i>viscosa . spatulata</i>		"	=	o	"
"	<i>Drosera</i>	<i>auriculata</i>		u	o	7	"
"	<i>Drosera</i>	<i>peltata</i>		h	o	7	"
"	<i>Dysphania</i>	<i>pumilio</i>	<i>Chenopodium pumilio</i>	o	#	7	"
"	<i>Echinopogon</i>	<i>cheelii</i>		k	" 8	8	"
"	<i>Echinopogon</i>	<i>mckiei</i>		.	.	8	"
"	<i>Echinopogon</i>	<i>ovatus</i>		7	= 8	8	"
"	<i>Echium</i>	<i>plantagineum</i>	<i>Echium lycopsis</i>	h	#	7)
"	<i>Echium</i>	<i>vulgare</i>		†	"	7)
"	<i>Einadia</i>	<i>hastata</i>		o	.	o	k
"	<i>Einadia</i>	<i>nutans . nutans</i>	<i>Rhagodia nutans</i>	#	o	7	"
"	<i>Einadia</i>	<i>trigonos</i>		7	.	7	"
"	<i>Eleusine</i>	<i>tristachya</i>		8	8	8	"
"	<i>Enneapogon</i>	<i>nigricans</i>		V	8	8	"
"	<i>Epilobium</i>	<i>billardiereanum . cinereum</i>	<i>Epilobium billardieranum . cinereum</i>	†	†	7	"
"	<i>Epilobium</i>	<i>billardiereanum . hydrophilum</i>	<i>Epilobium billardieranum . hydrophilum</i>	k	†	7	"
"	<i>Epilobium</i>	<i>hirtigerum</i>		=	†	7	"
"	<i>Eragrostis</i>	<i>brownii</i>	<i>Eragrostis benthamii</i>	"	O	8	"
"	<i>Eragrostis</i>	<i>curvula</i>		.	O	8)
"	<i>Eragrostis</i>	<i>parviflora</i>		†	O	8	"
"	<i>Eragrostis</i>	<i>trachycarpa</i>		k	O	8	"
"	<i>Eriochilus</i>	<i>cucullatus</i>		h	"	7	@
"	<i>Erodium</i>	<i>crinitum</i>		"	o v #	7	"
"	<i>Eryngium</i>	<i>ovinum</i>	<i>Eryngium rostratum</i>	"	)	7	@
"	<i>Eryngium</i>	<i>vesiculosum</i>		h	")	7	k @
"	<i>Eschscholzia</i>	<i>californica</i>		#	h	7	"
"	<i>Eucalyptus</i>	<i>aggregata</i>		"	8	u	u k
"	<i>Eucalyptus</i>	<i>blakelyi</i>		"	k 8	u	"
"	<i>Eucalyptus</i>	<i>bridgesiana</i>		.	"	u	"
"	<i>Eucalyptus</i>	<i>dives</i>		"	h	u	"
"	<i>Eucalyptus</i>	<i>macrorhyncha . macrorhyncha</i>	<i>Eucalyptus macrorhyncha</i>	k	o	u	"
"	<i>Eucalyptus</i>	<i>mannifera</i>	<i>Eucalyptus mannifera,</i>	"	8	u	"

	<i>mannifera</i>	<i>Eucalyptus mannifera maculosa</i>			
..	<i>Eucalyptus melliodora</i>		,	"	u
..	<i>Eucalyptus nortonii</i>		O	" U	u
..	<i>Eucalyptus pauciflora pauciflora</i>	<i>Eucalyptus pauciflora</i>	o	8	u
..	<i>Eucalyptus polyanthemos polyanthemos</i>	<i>Eucalyptus polyanthemos</i>	k	"	u
..	<i>Eucalyptus rossii</i>		@	o 8 o	u
..	<i>Eucalyptus rubida rubida</i>	<i>Eucalyptus rubida</i>	#		u
..	<i>Eucalyptus stellulata</i>		"	o	u
..	<i>Eucalyptus viminalis viminalis</i>	<i>Eucalyptus viminalis</i>	U	8 k 8	u
..	<i>Euchiton involucratus</i>	<i>Gnaphalium involucratum</i>	o	#	7
..	<i>Euchiton japonicus</i>	<i>Euchiton collinus, Euchiton gymnocephalus</i>	#	#	7
..	<i>Euchiton sphaericus</i>	<i>Gnaphalium sphaericum</i>	K	#	7
..	<i>Euphorbia drummondii</i>	<i>Chamaesyce drummondii</i>	o	o	7
..	<i>Euphorbia hyssopifolia</i>	<i>Chamaesyce hyssopifolia</i>	#	o	7
..	<i>Euphorbia maculata</i>	<i>Chamaesyce maculata</i>	-	o	7
..	<i>Eutaxia diffusa</i>	<i>Eutaxia microphylla diffusa</i>	..		o
..	<i>Fimbristylis dichotoma</i>		#	7 o	o
..	<i>Foeniculum vulgare</i>		7		7
..	<i>Galium aparine</i>		#		7
..	<i>Galium gaudichaudii gaudichaudii</i>	<i>Galium gaudichaudii</i>	k	"	7
..	<i>Gastrodia sesamoides</i>		#	"	7
..	<i>Geranium antrorsum</i>		k	#	7
..	<i>Geranium graniticola</i>		..		7
..	<i>Geranium homeanum</i>		..		7
..	<i>Geranium neglectum</i>		k	#	7
..	<i>Geranium potentilloides potentilloides</i>	<i>Geranium potentilloides</i>	#	#	7
..	<i>Geranium solanderi solanderi</i>		V	8	7
..	<i>Gingidia harveyana</i>		o		7
..	<i>Glossodia major</i>		†	\	7
..	<i>Glycine clandestina</i>	<i>Glycine clandestina clandestina</i>	u	8	u
..	<i>Glycine tabacina</i>		8	h	7
..	<i>Gompholobium huegelii</i>		h	†	o
..	<i>Gonocarpus tetragynus</i>	<i>Haloragis tetragyna</i>	#	k	o
..	<i>Goodenia hederacea hederacea</i>		@	8	7
..	<i>Goodenia pinnatifida</i>		#	8	7
..	<i>Grevillea alpina</i>	<i>Grevillea alpina</i>	U	8	o
..	<i>Grevillea lanigera</i>		†	8	o
..	<i>Grevillea ramosissima ramosissima</i>		..		o
..	<i>Gynatrix pulchella</i>		=		o
..	<i>Gypsophila tubulosa</i>	<i>Gypsophila australis</i>	#		7
..	<i>Hakea microcarpa</i>		K	o =	o
..	<i>Haloragis heterophylla</i>		†	k	7
..	<i>Hardenbergia violacea</i>		7	o	†
..	<i>Helichrysum luteoalbum</i>	<i>Pseudognaphalium luteoalbum, Gnaphalium</i>	K	#	7

		<i>luteo-album</i>				
"	<i>Helichrysum rutidolepis</i>		h	-		7
"	<i>Hemarthria uncinata</i> . <i>uncinata</i>		U			8
"	<i>Hibbertia obtusifolia</i>		=	8		0
"	<i>Hibbertia riparia</i>		-	8		7
"	<i>Hirschfeldia incana</i>		"	†		7
"	<i>Holcus lanatus</i>		'	7		8
"	<i>Hovea linearis</i>		"			0
"	<i>Hydrocotyle algida</i>		U	h		7
"	<i>Hydrocotyle callicarpa</i>		u	h		7
"	<i>Hydrocotyle laxiflora</i>		o	h		7
"	<i>Hydrocotyle sibthorpioides</i>	<i>Hydrocotyle peduncularis</i>	O	h		7
"	<i>Hymenochilus bicolor</i>	<i>Pterostylis bicolor</i>	"		8	7
"	<i>Hymenochilus cynnocephalus</i>	<i>Pterostylis cynnocephala</i> , <i>Hymenochilus sp. Slate</i> (D.L.Jones 16267)	o	8		7
"	<i>Hymenochilus muticus</i>	<i>Pterostylis mutica</i>	U	8		7
"	<i>Hypericum gramineum</i>		o	o	K	†
"	<i>Hypericum japonicum</i>		U	o	K	†
"	<i>Hypochaeris glabra</i>		o	#		7
"	<i>Hypochaeris radicata</i>		7	#	#	7
"	<i>Hypoxis hygrometrica</i> var. <i>hygrometrica</i>		8	†	8	7
"	<i>Hypoxis hygrometrica</i> var. <i>villosisepala</i>		8	†	8	7
"	<i>Hypoxis vaginata</i> var. <i>vaginata</i>		'	o		7
"	<i>Imperata cylindrica</i>	<i>Imperata cylindrica</i> <i>major</i>	"	8		8
"	<i>Indigofera adesmiifolia</i>	<i>Indigophera adesmiifolia</i>	O	@		0
"	<i>Indigofera australis</i> subsp. <i>australis</i>	<i>Indigofera australis</i>	"	@		0
"	<i>Isoetopsis graminifolia</i>		8	#		7
"	<i>Isolepis aucklandica</i>	<i>Scirpus aucklandicus</i>	o	#		0
"	<i>Isolepis cernua</i>	<i>Scirpus cernuus</i>	V	#		0
"	<i>Isolepis crassiuscula</i>	<i>Scirpus crassiusculus</i>	"	#		0
"	<i>Isolepis fluitans</i>	<i>Scirpus fluitans</i>	7	#		0
"	<i>Isolepis gaudichaudiana</i>		"			0
"	<i>Isolepis habra</i>	<i>Scirpus habrus</i>	†	#		0
"	<i>Isolepis hookeriana</i>	<i>Scirpus hookeranus</i>	8	#		0
"	<i>Isolepis inundata</i>	<i>Scirpus inundatus</i> <i>inundatus</i>	o	#		0
"	<i>Isolepis montivaga</i>	<i>Scirpus montivagus</i>	U	#		0
"	<i>Isolepis platycarpa</i>	<i>Scirpus platycarpus</i>	7	#		0
"	<i>Isolepis subtilissima</i>	<i>Scirpus subtilissimus</i>	)	#		0
"	<i>Isotoma fluviatilis</i> . <i>australis</i>		o	@		7
"	<i>Juncus australis</i>		"	k		k
"	<i>Juncus bufonius</i>		u	k		k
"	<i>Juncus falcatus</i>		o	k		k
"	<i>Juncus filicaulis</i>		u	k		k
"	<i>Juncus flavidus</i>	<i>Juncus procerus</i>	"			k
"	<i>Juncus fockei</i>		o	k		k
"	<i>Juncus holoschoenus</i>		K	k		k
"	<i>Juncus subsecundus</i>		7	k		k
"	<i>Juncus usitatus</i>		#	k		k
"	<i>Juncus vaginatus</i>		#	k		k

	o	v	o	#	v	8	o
..	<i>Kunzea ericoides</i>		<i>Leptospermum phyllicoides</i>	"		o	@
..	<i>Kunzea parvifolia</i>			†	M	o	@
..	<i>Lachnagrostis aemula</i>		<i>Agrostis aemula</i>	"		8	..
..	<i>Lachnagrostis filiformis</i>		<i>Agrostis avenacea</i> <i>avenacea</i>	"		8	..
..	<i>Laxmannia gracilis</i>			†	O	k	@
..	<i>Lepidium ginninderrense</i>			8	h	7	u
..	<i>Lepidosperma laterale</i>			†	o	o	..
..	<i>Leptorhynchus elongatus</i>			O	"	7	..
..	<i>Leptorhynchus squamatus</i> <i>squamatus</i>			o	"	7	@
..	<i>Leptospermum myrtifolium</i>			o	u	o	..
..	<i>Lespedeza juncea</i> . <i>sericea</i>			h	O	o	@
..	<i>Leucanthemum vulgare</i>			\	)	7	..
..	<i>Leucochrysum albicans</i> <i>albicans</i>		<i>Leucochrysum albicans</i> <i>tricolor, Helipterum albicans</i> <i>incanum</i>	=	o	7	k @
..	<i>Leucopogon fletcheri</i> <i>brevisepalus</i>		<i>Leucopogon fletcheri</i>	u	"	o	@
..	<i>Leucopogon fraseri</i>		<i>Leucopogon stuartii</i>	h	"	o	@
..	<i>Leucopogon microphyllus</i> <i>pilibundus</i>		<i>Leucopogon microphyllus</i>	=	"	o	..
..	<i>Leucopogon virgatus</i> . <i>virgatus</i>			#	"	o	@
..	<i>Levenhookia dubia</i>			=	o	7	..
..	<i>Linaria arvensis</i>			#	u	7	..
..	<i>Linaria pelisseriana</i>			h	u	7	..
..	<i>Linum marginale</i>			†	7	7	@
..	<i>Linum trigynum</i>			7	7	7	..
..	<i>Lissanthe strigosa</i> . <i>subulata</i>			h	=	o	..
..	<i>Lobelia gibbosa</i>		<i>Lobelia gibbosa</i> . <i>gibbosa</i>	†	O	7	..
..	<i>Lobelia pedunculata</i>		<i>Pratia pedunculata</i>	U	h	7	..
..	<i>Lobelia purpurascens</i>		<i>Pratia purpurascens</i>	†		7	..
..	<i>Logfia gallica</i>			V	#	7	..
..	<i>Lolium perenne</i>			h	k	8	..
..	<i>Lolium rigidum</i>			†	k	8	..
..	<i>Lomandra bracteata</i>			o	U	k	..
..	<i>Lomandra filiformis</i> . <i>coriacea</i>			†	U	k	..
..	<i>Lomandra filiformis</i> . <i>filiformi</i>			†	U	k	..
..	<i>Lomandra longifolia</i>			O	U	k	..
..	<i>Lomandra multiflora</i> <i>multiflora</i>			U	U	k	..
..	<i>Lomatia myricoides</i>			k	O	o	..
..	<i>Lotus australis</i> . <i>australis</i>			o	u	7	k @
..	<i>Luzula alpestris</i>			o		k	..
..	<i>Luzula australasica</i> x <i>Luzula novae-</i> <i>cambriae</i>			o		k	..
..	<i>Luzula australasica</i> . <i>dura</i>			o		k	..
..	<i>Luzula densiflora</i>			o		k	..
..	<i>Luzula flaccida</i>			h	†	k	..
..	<i>Luzula meridionalis</i>		<i>Luzula campestris</i>	7	†	k	..
..	<i>Luzula modesta</i>			"	†	k	..
..	<i>Luzula novae-cambriae</i>			#	†	k	..
..	<i>Luzula ovata</i>			o		k	..
..	<i>Lysimachia arvensis</i>		<i>Anagallis arvensis</i>	o	h	7	..
..	<i>Lythrum hyssopifolia</i>			=	O	7	..

	<i>Malva neglecta</i>		) U		7		..
	<i>Marrubium vulgare</i>		=		7		..
..	<i>Melaleuca paludicola</i>	<i>Callistemon sieberi</i>	k "		0		..
..	<i>Melichrus urceolatus</i>		y =		0		..
..	<i>Mentha diemenica</i>		o U		7		..
..	<i>Microlaena stipoides</i> . <i>stipoides</i>		‡ 8		8		..
..	<i>Microtis oblonga</i>		o \ \		7		..
..	<i>Microtis parviflora</i>		o \ \		7		@
..	<i>Microtis unifolia</i>	<i>Microtis</i> U) OK	# \ \		7		@
..	<i>Mirbelia oxylobioides</i>		U U		0		@
..	<i>Mitrasacme serpyllifolia</i>		u U		7		..
	<i>Modiola caroliniana</i>		k U		7		..
..	<i>Montia australasica</i>	<i>Neopaxia australasica</i>	‡ h		7		..
..	<i>Montia fontana</i> . <i>amporitana</i>	<i>Montia fontana</i> <i>intermedia</i>	‡		7		..
..	<i>Montia fontana</i> <i>chondrosperma</i>		‡		7		..
..	<i>Muehlenbeckia tuggeranong</i>		u O		†		u...
	<i>Nassella neesiana</i>	<i>Stipa neesiana</i>	# V		8)
	<i>Nassella trichotoma</i>		o u		8)..
..	<i>Opercularia hispida</i>		= o		7		..
..	<i>Ophioglossum lusitanicum</i>		° ° u		7		@
..	<i>Oreomyrrhis argentea</i>		o #		7		..
..	<i>Oreomyrrhis eriopoda</i>		° #		7		@
	<i>Orobanche minor</i>		# " O		7		..
	<i>Oxalis articulata</i>		o \		7		..
	<i>Oxalis corniculata</i>		' ‡		7		..
..	<i>Oxalis perennans</i>		V \		7		..
..	<i>Ozothamnus thyrsoideus</i>	<i>Helichrysum thyrsoideum</i>	o -		0		..
..	<i>Panicum effusum</i>		= h		8		..
	<i>Papaver somniferum</i>		\ h		7		..
	<i>Parentucellia latifolia</i>	<i>Parentucellia latifolia</i> <i>latifolia, Bartsia trixago</i>	k "		7		..
	<i>Paronychia brasiliana</i>		" ‡ # ‡		7		..
	<i>Paspalum dilatatum</i>		h		8		..
	<i>Paspalum distichum</i>		‡ #		8		..
..	<i>Patersonia sericea</i> . <i>sericea</i>	<i>Patersonia fragilis</i>	o h 7		7		..
..	<i>Pelargonium australe</i>		V h		7		@
..	<i>Pelargonium inodorum</i>		‡ 8		7		@
..	<i>Pellaea falcata</i>		o 7		7		..
..	<i>Pentapogon quadrifidus</i> . <i>quadrifidus</i>		7 o		8		..
..	<i>Persicaria prostrata</i>	<i>Polygonum prostratum</i>	# M		7		..
..	<i>Persoonia linearis</i>		V 8		0		..
..	<i>Persoonia rigida</i>		k 8		0		..
..	<i>Petalochilus carneus</i>	<i>Caladenia carneae</i>	h 7		7		..
..	<i>Petalochilus fuscatus</i>	<i>Caladenia fuscata</i>	) 7		7		..
	<i>Petrorhagia nanteuillii</i>		h h		7		..
	<i>Phalaris aquatica</i>		h u #		8		..
..	<i>Pimelea curviflora</i> . <i>acuta</i>		# k		7		@
..	<i>Pimelea curviflora</i> . <i>gracilis</i>		o # k		0		@

	o	V	o	#	V	8	o
..	<i>Pimelea glauca</i>			o	k	o	@
..	<i>Pimelea linifolia</i> . <i>caesia</i>			o	o	k	o
..	<i>Pimelea linifolia</i> . <i>linifolia</i>			o	k		o
..	<i>Pimelea pauciflora</i>			h	h		o
..	<i>Pinus radiata</i>			k	h	U	h
..	<i>Plantago antarctica</i>			u	h		7
..	<i>Plantago euryphylla</i>						7
..	<i>Plantago gaudichaudii</i>			V	h		7
..	<i>Plantago hispida</i>			=	h		7
..	<i>Plantago lanceolata</i>			k			7
..	<i>Plantago ia</i>			t	h		7
..	<i>Pleurosorus rutifolius</i>			"	7		7
..	<i>Poa annua</i>			"	h	†	8
..	<i>Poa bulbosa</i>			"	h		8
..	<i>Poa labillardierei</i> . <i>labillardierei</i>			u	8	k	u
..	<i>Poa meionectes</i>	<i>Poa exilis</i>		o			8
..	<i>Poa sieberiana</i> . <i>cyanophylla</i>			"	o		8
..	<i>Poa sieberiana</i> . <i>hirtella</i>			7	o		8
..	<i>Poa sieberiana</i> . <i>sieberiana</i>			o			8
..	<i>Poa trivialis</i>			k	U		8
..	<i>Podolepis hieracioides</i>			u	#	)	7
..	<i>Podolepis jaceoides</i>			o	#	)	7
..	<i>Polycarpon tetraphyllum</i>			7			7
..	<i>Polygala japonica</i>	<i>Polygala veronica</i>		U			7
..	<i>Polygonum aviculare</i>			†			7
..	<i>Polystichum proliferum</i>			U	o	7	7
..	<i>Pomaderris pallida</i>			h	h		o
..	<i>Pomax umbellata</i>			h			7
..	<i>Poranthera microphylla</i>			o	h		7
..	<i>Portulaca oleracea</i>			h			7
..	<i>Prasophyllum canaliculatum</i>			#	o	\	7
..	<i>Prasophyllum petilum</i>			u	o	\	7
..	<i>Prunella vulgaris</i>			o			7
..	<i>Pteridium esculentum</i>			#	"		7
..	<i>Pultenaea microphylla</i>			o	"		o
..	<i>Pultenaea procumbens</i>			=	"		o
..	<i>Pultenaea spinosa</i>	<i>Pultenaea cunninghamii</i>		h	"		o
..	<i>Pultenaea subspicata</i>			O	"		o
..	<i>Ranunculus inundatus</i>			k	"		7
..	<i>Ranunculus lappaceus</i>			"	"		7
..	<i>Ranunculus muricatus</i>			o	"		7
..	<i>Ranunculus papulentus</i>			O	k	"	7
..	<i>Ranunculus sessiliflorus</i> . <i>sessiliflorus</i>			o			7
..	<i>Rhodanthe anthemoides</i>	<i>Helipterum anthemoides</i>		#	o		7
..	<i>Rhytidosporum procumbens</i>	<i>Pittosporum procumbens</i>		†	k		o
..	<i>Rosa rubiginosa</i>			o	"		o
..	<i>Rubus parvifolius</i>			V	k		o
..	<i>Rumex brownii</i>			o	)		7
..	<i>Rumex crispus</i>			#	)		7
..	<i>Rumex dumosus</i>			†	)		7
..	<i>Rumex tenax</i>			V	)		7

	o	V	o	#	V	8	o
"	<i>Rutidosis leptorrhynchoides</i>		<i>Rutidosis leptorrhynchoides</i>	"	†	7	u@
"	<i>Rutidosis multiflora</i>					7	@
"	<i>Rytidosperma auriculatum</i>		<i>Austrodanthonia auriculata,</i> <i>Danthonia auriculata</i>	0	†	8	"
"	<i>Rytidosperma bipartitum</i>		<i>Austrodanthonia bipartita,</i> <i>Danthonia linkii . linkii</i>			8	"
"	<i>Rytidosperma caespitosum</i>		<i>Austrodanthonia caespitosa,</i> <i>Danthonia caespitosa</i>	k	†	8	"
"	<i>Rytidosperma carphoides</i>		<i>Austrodanthonia carphoides,</i> <i>Danthonia carphoides</i>	o	†	8	"
"	<i>Rytidosperma duttonianum</i>		<i>Austrodanthonia duttoniana,</i> <i>Danthonia duttoniana</i>	"	†	8	"
"	<i>Rytidosperma erianthum</i>		<i>Austrodanthonia eriantha,</i> <i>Danthonia eriantha</i>	=	†	8	"
"	<i>Rytidosperma fulvum</i>		<i>Austrodanthonia fulva,</i> <i>Danthonia linkii . fulva</i>			8	"
"	<i>Rytidosperma indutum</i>		<i>Austrodanthonia induta,</i> <i>Danthonia induta</i>	u	†	8	"
"	<i>Rytidosperma laeve</i>		<i>Austrodanthonia laevis,</i> <i>Danthonia laevis</i>	"	†	8	"
"	<i>Rytidosperma longifolium</i>		<i>Notodanthonia longifolia,</i> <i>Danthonia longifolia</i>	0	†	8	"
"	<i>Rytidosperma pallidum</i>		<i>Joycea pallida, Danthonia</i> <i>pallida</i>	k	†	8	"
"	<i>Rytidosperma penicillatum</i>		<i>Austrodanthonia penicillata,</i> <i>Danthonia penicillata</i>	o	†	8	"
"	<i>Rytidosperma pilosum</i>		<i>Austrodanthonia pilosa,</i> <i>Danthonia pilosa</i>	o	†	8	"
"	<i>Rytidosperma racemosum</i>		<i>Austrodanthonia racemosa</i> <i>. racemosa,</i> <i>Danthonia racemosa</i>	o	†	8	"
"	<i>Rytidosperma richardsonii</i>		<i>Austrodanthonia richardsonii,</i> <i>Danthonia richardsonii</i>	†	8	o	†
"	<i>Rytidosperma setaceum</i>		<i>Austrodanthonia setacea,</i> <i>Danthonia setacea</i>	o	†	8	"
"	<i>Rytidosperma tenuius</i>		<i>Austrodanthonia tenuior,</i> <i>Danthonia tenuior</i>	h	†	8	"
"	<i>Sanguisorba minor</i>		<i>Sanguisorba minor</i> <i>muricata</i>	o	"	7	"
"	<i>Saponaria officinalis</i>			o	"	7	"
"	<i>Schoenus apogon</i>			7	"	o	"
"	<i>Scleranthus biflorus</i>			#	"	7	"
"	<i>Scleranthus diander</i>			u	M	7	@
"	<i>Scleranthus fasciculatus</i>			u	M	7	"
"	<i>Scleranthus fasciculatus</i>			o	M	7	"
"	<i>Scutellaria humilis</i>			"	o	7	"
"	<i>Sebaea ovata</i>			'	o	7	@
"	<i>Senecio hispidulus</i>		<i>Senecio hispidulus</i> <i>hispidulus</i>	=	7	7	"
"	<i>Senecio macrocarpus</i>			7	8	7	"
"	<i>Senecio quadridentatus</i>			#	7	7	"
"	<i>Sida corrugata</i>			#	o	7	@
"	<i>Solanum cinereum</i>			V	"	o	"
"	<i>Solanum linearifolium</i>			U	M	o	"
"	<i>Solanum nigrum</i>		<i>Lycopersicon esculentum</i>	"	V	7	"
"	<i>Solenogyne dominii</i>			o	o	7	@
"	<i>Solenogyne gunnii</i>			=	o	7	@
"	<i>Sonchus asper</i>		<i>Sonchus asper</i> <i>. asper</i>	k	o	"	"
"	<i>Sonchus oleraceus</i>			#	o	7	"
"	<i>Sorghum leiocladum</i>			†	o	8	@

	o	v	#	v	8	o
..	<i>Spiranthes australis</i>	<i>Spiranthes sinensis</i>	O	u	7	@
..	<i>Sporobolus creber</i>		o	k 8	8	..
..	<i>Stackhousia monogyne</i>		#	#	7	@
..	<i>Stackhousia viminea</i>		o	o	7	..
..	<i>Stegostyla congesta</i>	<i>Caladenia congesta</i>	h	#	7	..
..	<i>Stegostyla cucullata</i>	<i>Caladenia cucullata</i>	O	#	7	..
..	<i>Stellaria angustifolia</i>		o	o	7	..
..	<i>Stellaria multiflora</i>		k	o	7	..
..	<i>Stellaria pungens</i>		h	o	7	..
..	<i>Stuartina hamata</i>		=	#	7	k @
..	<i>Stuartina muelleri</i>		o	#	7	@
..	<i>Stylidium despectum</i>		o	u	7	..
..	<i>Stylidium graminifolium</i>		8	u	7	@
..	<i>Stypantra glauca</i>		v	" O	7	@
..	<i>Styphelia triflora</i>		7		o	k
..	<i>Swainsona behriana</i>	<i>Swainsona oroboides hirsuta</i>	"	o	7	k @
..	<i>Swainsona monticola</i>		v	o	7	k @
..	<i>Swainsona oroboides</i>		M	) h	7	@
..	<i>Swainsona recta</i>		o	h h	7	u @
..	<i>Swainsona reticulata</i>		M	o	7	@
..	<i>Swainsona sericea</i>	<i>Swainsona oroboides swainsona</i>	o	o	7	u k @
..	<i>Tetradthea bauerifolia</i>		U	h	o	..
..	<i>Tetradthea ericifolia</i>				o	..
..	<i>Thelionema caespitosum</i>		u	" O	7	..
..	<i>Thelymitra arenaria</i>		7	o \	7	..
..	<i>Thelymitra brevifolia</i>		o	o \	7	..
..	<i>Thelymitra carnea</i>		u	o \	7	k
..	<i>Thelymitra cyanea</i>		t	o \	7	..
..	<i>Thelymitra juncifolia</i>		O	o \	7	..
..	<i>Thelymitra megalyptra</i>		o	o \	7	..
..	<i>Thelymitra nuda</i>		h	o \	7	k
..	<i>Thelymitra pauciflora</i>		o	o \	7	@
..	<i>Thelymitra peniculata</i>		u	o \	7	..
..	<i>Thelymitra rubra</i>		o	o \	7	k @
..	<i>Thelymitra simulata</i>	<i>Thelymitra decora, Thelymitra " U) OK</i>	#	o \	7	k
..	<i>Thelymitra sp. Gibraltar Falls (M.A.Clements 4701)</i>	<i>Thelymitra ixiooides</i>	o	o \	7	@
..	<i>Themeda triandra</i>	<i>Themeda australis</i>	M	8	8	@
..	<i>Thysanotus patersonii</i>		u	7 O	k	@
..	<i>Thysanotus tuberosus subsp. tuberosus</i>		7	O	k	@
..	<i>Tragopogon dubius</i>		8	"	7	..
..	<i>Tricoryne elatior</i>		'	k O	k	@
..	<i>Trifolium glomeratum</i>		#	#	7	..
..	<i>Trifolium striatum</i>		M	#	7	..
..	<i>Triptilodiscus pygmaeus</i>	<i>Helipterum australe</i>	#	o	7	@
..	<i>Utricularia dichotoma</i>	<i>Utricularia dichotoma uniflora</i>	7	"	7	..
..	<i>Velleia montana</i>		U	t	7	@
..	<i>Velleia paradoxa</i>		o	t	7	@
..	<i>Verbascum virgatum</i>		u	U	7	..

Appendices

Scientific Name	Synonyms	Common Name	Growth Form	Status
<i>Veronica calycina</i>		Forest Speedwell	Forb	
<i>Veronica gracilis</i>		Slender Speedwell	Forb	I
<i>Veronica perfoliata</i>	<i>Derwentia perfoliata</i>	Blue Veronica, Digger's Speedwell	Forb	
<i>Veronica plebeia</i>		Trailing Speedwell	Forb	
<i>Viola betonicifolia</i> subsp. <i>betonicifolia</i>		Showy Violet, Mountain Violet	Forb	I
* <i>Viola odorata</i>		Common Violet	Forb	
<i>Vittadinia cuneata</i> var. <i>cuneata</i>		Fuzzweed	Forb	
<i>Vittadinia gracilis</i>		New Holland Daisy	Forb	
<i>Vittadinia muelleri</i>		Narrow-leaved New Holland Daisy	Forb	
* <i>Vulpia bromoides</i>		Squirrel-tail Fescue	Grass	
* <i>Vulpia muralis</i>		Wall Fescue	Grass	
<i>Wahlenbergia communis</i>		Native Bluebell	Forb	
<i>Wahlenbergia gracilis</i>		Australian Bluebell	Forb	
<i>Wahlenbergia graniticola</i>		Granite Bluebell	Forb	
<i>Wahlenbergia stricta</i> subsp. <i>stricta</i>		Tall Bluebell	Forb	
<i>Westringia eremicola</i>	<i>Westringia eremicola</i> var. <i>eremicola</i>	Slender Westringia	Shrub	
<i>Wurmbea dioica</i> subsp. <i>dioica</i>	<i>Anguillaria dioica</i>	Early Nancy	Forb	I
<i>Xanthorrhoea australis</i>		Austral Grasstree	Tree	
<i>Xanthorrhoea glauca</i> subsp. <i>angustifolia</i>	<i>Drimys xerophila</i>	Grass Tree	Shrub	
<i>Xerochrysum subundulatum</i>		Alpine Everlasting	Forb	
<i>Xerochrysum viscosum</i>	<i>Xerochrysum bracteatum</i> , <i>Helichrysum viscosum</i>	Sticky Everlasting	Forb	
<i>Zornia dyctiocarpa</i> var. <i>dyctiocarpa</i>		A zornia	Forb	I

References

<http://www.anbg.gov.au/cpbr/ACT-census/>

<http://plantnet.rbgsyd.nsw.gov.au>, Royal Botanic Gardens and Domain Trust, Sydney.

Rehwinkel, R (2007) *A method to assess grassy ecosystem sites: using floristic information to assess a site's quality*. NSW Department of Environment and Climate Change, unpublished report to the Natural Temperate Grassland National Recovery Team.

Appendix D. Other condition assessment and monitoring

Native flora

Benchmark score

As described in Biometric 3.1 (DECCW 2011) a score is developed for data collected within plots in a vegetation zone. Each vegetation association has a value or set of values for each of ten attributes that have been collected from sites within the region where the vegetation is deemed to be in very good condition. The actual values for these attributes collected in other sites is compared to these benchmark values, and the site is scored against it. In this manual the data required to score the site against benchmarks are collected but the method for scoring them is not provided. More information on this can be found in DECCW (2011). The data collected by community will be analysed to include the score against benchmarks.

Department of Environment, Climate Change and Water NSW, 2011. Operational Manual for BioMetric 3.1.
Department of Environment, Climate Change and Water, NSW Sydney.

Floristic score

Grassland communities do not contain many of the attributes that are widely used to assess condition, including tree and shrub cover, regeneration, fallen timber and hollows used in benchmarking (DECCW 2011). Rehwinkel has developed a score that is given to species based on their rarity across a particular region within south-eastern NSW and ACT and based on the abundance of specimens within a 0.04 ha plot. These scores have been used in ACT and NSW to determine whether a site is in poor, moderate or good condition. The scores can be used to monitor the floristic diversity over time. It is possible to use the data within this manual (see Table 4.1) to assess the floristic score, but access to the spreadsheet and reference below is required (contact rainer.rehwinkel@environment.nsw.gov.au).

Rehwinkel, R (2007). A method to assess grassy ecosystem sites: using floristic information to assess a site's quality. NSW Department of Environment and Climate Change, unpublished report to the Natural Temperate Grassland National Recovery Team.

Native fauna

Native fauna surveys should be undertaken using standard survey methods and where possible link with existing survey programs. Examples of standard survey methods are given below:

General bird surveys and habitat assessment

Canberra Ornithologists Group uses the Birdlife Australia (BLA) preference for the *2-hectare, 20-min search* survey type, as it is readily repeatable given accurate coordinates for the centre of the site. Two hectares equates to 200 m x 100 m, 140 m x 140 m, or approx 80 m radius circle. Survey for 20 minutes exactly. Count all birds *within or overflying* the site and record an exact number if possible, otherwise give a conservative estimate. Avoid having a mix of 2 or more habitat types within your 2 ha site. If you intend to survey the same area regularly (for the BLA Atlas, quarterly surveys are required) tell COG's records officer, who will provide you with a BLA habitat form and seek a *BLA Site No.* on your behalf. You may of course survey the site as frequently as you wish but COG suggests that you put in an observation record fortnightly, supplemented by incidental records of notable sightings not observed on the record day (this applies equally to area searches).

<http://canberrabirds.org.au>.

Targeted bird surveys

The above methodology is not suitable for monitoring species with low rates of occupancy. Targeted surveys are suitable for threatened species or other species that are rare in terms of distribution and/or abundance. The method would involve repeated surveys of habitat in optimal time periods, to include population counts, habitat surveys and observations of movement corridors.

Appendices

Frogs

Frogwatch is a community frog monitoring program that aims to involve large numbers of volunteers of all ages to undertake frog monitoring and protect frog habitats. In National Water Week, the 3rd week of October each year, over 200 Frogwatch participants monitor frog populations at approximately 140 sites around the ACT and Region. This is when the majority of ACT frog species tend to be actively calling and mating. An annual report is produced that presents the results of each spring census. The report includes simple maps of presence / absence of frog species and estimate of abundance. Analysis of the data is currently limited to describing the occurrence and estimated abundance of each species for the first few years of the monitoring program. As a bank of information is built up, a more rigorous analysis of the data will be possible, and trends may be able to be identified.

The strength of the program lies in the data on the occurrence and estimated abundance of the species over the ACT and region, allowing for more rigorous analysis of trends over time (Mantle 2008). All Frogwatch recordings are verified by the Frogwatch coordinator or forwarded to expert frog ecologists. The existing program complements more detailed monitoring undertaken at various research institutions and the ACT Government. (<http://www.ginninderralandcare.org.au/frogwatch>)

Mantle B., 2008. Community Frogwatch Census Kit. Ginninderra Catchment Group, Canberra.

http://www.ginninderralandcare.org.au/sites/default/files/imported/res/File/PDFs/Frogwatch%20Kit/2008%20Frogwatch%20Kit/Frogwatch%20Census%20Kit%202008_PDF.pdf

Biomass management and ecosystem function

Landscape function

Landscape Function Analysis (LFA) provides a rapid, consistent assessment of soil health and biophysical soil processes across a widely variable set of sites that is repeatable and consistent (Tongway and Hindley 2004). The method involves assessing and scoring indicators of soil surface condition, which results in three indices of landscape function: stability, infiltration and nutrient cycling (Tongway and Hindley 2004). The technique has been used to compare the condition in terms of landscape function of 36 nature reserves in the ACT (Sharp 2011), and is also being used to monitor condition in a more intensive way at Mt Painter Nature Reserve (Tongway and Ludwig 2011). The technique can be compared over time in one site, for example to determine the impact of control burning on soil function (Sharp 2011) or impacts on soil condition of formal or informal access tracks in the Lower Molonglo Valley, or can be used to compare the condition of a range of sites within a single time period. The method is accompanied by detailed information on how to collect the data, spreadsheets for data entry that internally analyse the data, and information on how to interpret the data and it is available on a CD (Tongway and Hindley 2004).

Using the technique Landscape Function Analysis areas that are burnt frequently are to be monitored to ensure that landscape function is retained. Conservation Planning and Research and Territory and Municipal Services Directorate undertake monitoring in selected sites elsewhere in the ACT using this method.

Tongway D.J. and Hindley N.L., 2004. Landscape Function Analysis, Procedures for monitoring and assessing landscapes. CSIRO, Canberra.

Tongway D.J. and Ludwig J.A., 2011. Restoring Disturbed Landscapes: putting principles into practice. Island Press, Washington.

Ephemeral drainage line stability

Eight indicators are used to assess the stability of ephemeral drainage lines (including ephemeral creeks). Ephemeral drainage line assessment (EDA) involves assessing slope steepness, slope surface, ephemeral drainage line wall vegetation, ephemeral drainage line floor vegetation, ephemeral drainage line cross section, ephemeral drainage line longitudinal section, ephemeral drainage line wall erodability and ephemeral drainage line floor erodability (Tongway and Ludwig, 2011).

Tongway D.J. and Ludwig J.A., 2011. Restoring Disturbed Landscapes: putting principles into practice. Island Press, Washington.

Appendices

Riparian condition

Riparian condition can be monitored using Rapid Appraisal of Riparian Condition (RARC) Version 2 (Jansen *et al.* 2005). For standing water and drainage lines, Indicator 8, Waterbody Habitat Condition is more effective.

Jansen A., Robertson A., Thompson L., Wilson A., 2005. Rapid Appraisal of Riparian Condition (RARC) Version 2, River Management Technical Guideline No. 4A, Land and Water Australia, Canberra.

Remote sensing

Remotely sensed information can be used to measure gross changes to the landscapes through interpretation of aerial photography in Google, and comparison with previous images. Changes that can be detected using this technique include track establishment or damage, erosion, vegetation disturbance or changes to vegetation structure. It is recommended that aerial photography be interpreted at least every five years and analysed to review disturbances to vegetation, development of unofficial tracks, condition of tracks and open space.

Waterwatch and Waterbug community monitoring

Waterwatch is part of a national community water quality monitoring program that brings people together from all parts of the community to raise awareness, educate, monitor, restore and protect waterways. Through Waterwatch the water quality of local creeks, wetlands, lakes, rivers and stormwater drains is regularly monitored. Parameters measured include water temperature, turbidity and dissolved oxygen. The program is facilitated by an officer within the Environment and Sustainable Development Directorate, and there are coordinators within each of the ACT catchment groups.

Waterwatch: <http://www.act.waterwatch.org.au>