

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA North Dandalup Dam - Pipeline road SITE NUMBER NTDNØ1

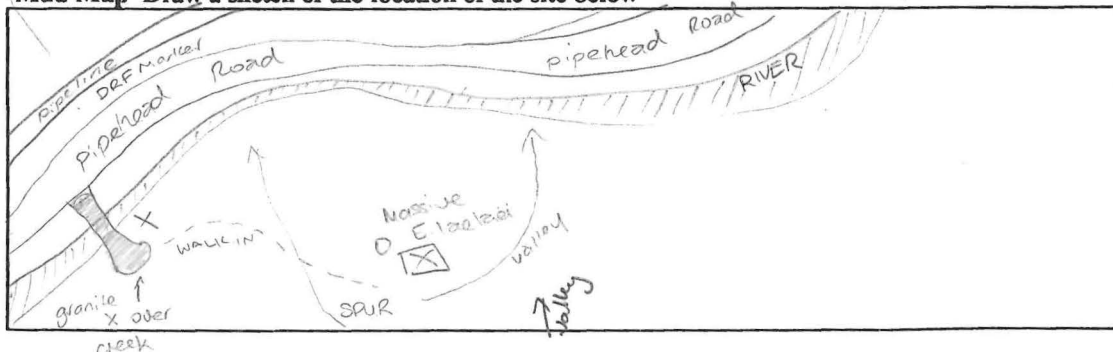
DATE TRIP 15.11.96 RECORDERS AM MT CM

DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



Road Location Pipeline Access Road - off Lower Pipehead Dam

Geographic Location Latitude 32 31 30.5 S Longitude 116 00 48.2 E Altitude 120m
GPS not fix Accuracy _____
Map Sheet Dwellingup - old map

Photograph Name _____ Number 29 # Roll # 4

Topographic Position (Circle the correct response)
Upland _____ Lower slope _____
Upper slope _____ Valley _____
Midslope - lower mid slope Washline _____
Valley midslope 8

2. SITE DATA Circle the correct response

Slope flat gentle steep _____ Aspect N (NE) E SE S SW W NW

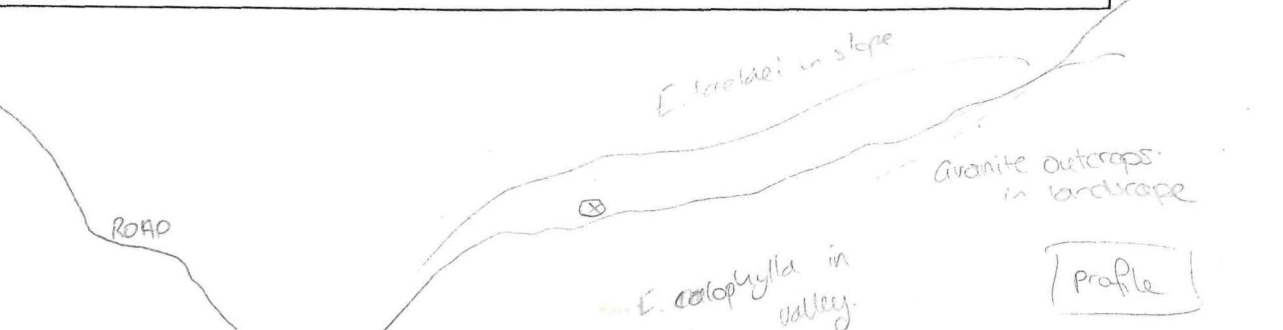
Surface Soil bony clay clayey loam Depth to Rock 7m Colour dark brown

Exposed Rock type _____ % surface cover _____ size range _____

Litter >80 % surface cover near 95% Depth (cm) 10-20cm

Bare Ground 0 % surface cover 0

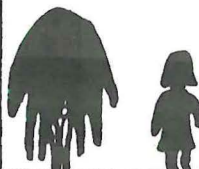
Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008



BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class					
	2-10%	10-30%	30-70%	over 70%	
TREES					
	over 15m	5-15m	under 5m	MALLEES over 8m	under 8m
LIFE FORM					
	30-70% 10-30%	30-70%			
COVER CLASS (%)					
	<i>E. laevis</i> (one tree)	<i>E. laevis</i> <i>E. scopophylla</i>			
DOMINANT SPECIES					
SHRUBS					
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	SHRUBS under 0.5m
LIFE FORM					
COVER CLASS (%)		2-10%		30-70%	30-70%
		<i>Viminaria parvifolia</i> <i>Acacia</i> sp. <i>Carthamus. quad.</i>		<i>Thamnia foliosa</i> <i>H. lissocarpa</i>	<i>D. citriodora</i> <i>T. foliosa</i> <i>Phy. cal.</i>
DOMINANT SPECIES					
GRASSES					
	HERBS		SEDGES	over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)			2-10%		
			<i>Lomandra micrantha</i> <i>Lomandra</i> <i>Desmodium aspera</i>		
DOMINANT SPECIES					

4. VEGETATION CONDITION

Comments

S/S. Some weeds from adjacent activities
dam activity.
• Rich, thick wet sclerophyll forest on
steep valley slopes. V. thick leaf litter.

15

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA NTN SITE NUMBER NTDN02

DATE TRIP 15.11.96 RECORDERS AM CM MT

DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



Road Location

Geographic Location Latitude 32° 31' 32.1 S Longitude 116° 00' 39.0 E Altitude 160m
GPS Accuracy
Map Sheet Pwelling up -

Photograph Name Number

Topographic Position (Circle the correct response)
Upland ☐ Lower slope ☒
Upper slope ☐ Valley ☒ - creekline
Midslope ☐ Washline ☐ 10

2. SITE DATA Circle the correct response

Slope flat ☐ gentle ☒ steep ☐ Aspect N NE E SE S SW W NW ☒ 320°

Surface Soil clayey loam Depth to Rock 0-30cm Colour Brown

Exposed Rock type granite % surface cover 1% size range 40-60cm

Litter 780 % surface cover 10-20cm (4-5 layers) Depth (cm) 20cm

Bare Ground 3 % surface cover

Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008

Panaivama
East: 407100
NH: 6400925

No
Fix

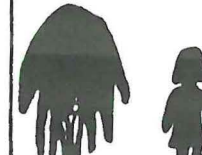
BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below), and dominant species in each layer.

Cover Class	2-10%	10-30%	30 - 70%	over 70%
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TREES				MALLEES	
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)	2-10%	10-30%	10-30% 30-70%		
DOMINANT SPECIES	<i>G. laevis</i>	<i>E. calophylla</i> <i>E. laevis</i>	<i>Grevillea</i> sp. 10-30%		

SHRUBS				SHRUBS	
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)		10-30%		20-40%	
DOMINANT SPECIES		<i>Calo. quad</i>	<i>H. pinn.</i>	<i>Phy. cal</i> <i>Phy. hirs.</i>	

GRASSES		HERBS	SEDGES	over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)		2-15%			
DOMINANT SPECIES		<i>Phy.</i>			<i>Lomandra</i> sp.

GPS $\rightarrow$ 32 31 31.2 116 00 34.5
ION ± 300

4. VEGETATION CONDITION

Comments 5/5 - neckline saggy
v. thick.

Corel 2.

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA Nth. Dandalup Dam SITE NUMBER NTDN#3

DATE TRIP 15.11.96 RECORDERS AM MT CM

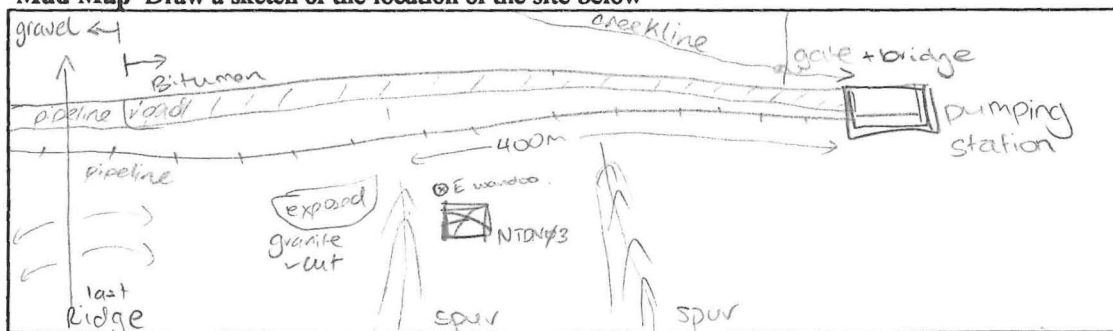
DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

D. armata visible from road

Mud Map Draw a sketch of the location of the site below



Road Location

Geographic Location Latitude 32 31 55.6 S Longitude 115 59 54.4 E Altitude 120m
GPS Accuracy ±300 Map Sheet Dwellingup 4SATS

Photograph Name _____ Number #32 Roll #4

Topographic Position (Circle the correct response)
Upland _____ Lower slope _____
Upper slope _____ Valley _____
Midslope 3 Washline _____

2. SITE DATA Circle the correct response

Slope flat _____ gentle steep _____ Aspect N NE E SE S SW W NW

Surface Soil loamy clay Depth to Rock 0-60 cm Colour dk brown

Exposed Rock type granite % surface cover 8% size range 20cm-1.5m

Litter 70% % surface cover _____ Depth (cm) 15-20cm

Bare Ground / % surface cover _____

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class					
	2-10%	10-30%	30-70%	over 70%	
TREES					
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)	2-10%	10-30%			
DOMINANT SPECIES	<i>E. calophylla</i>	<i>E. laetae</i>			
SHRUBS					
	over 2m	2m - 1.5m	1.5 - 1m	1-0.5m	SHRUBS under 0.5m
LIFE FORM					
COVER CLASS (%)		2-10%	2-10%	30-70%	30-70%
DOMINANT SPECIES		<i>X. preissii</i>	<i>H. undulata</i> <i>H. lissocarpa</i> <i>X. p. Daviesii</i>	<i>Try. ledifolium</i> <i>Astroloma</i> sp. <i>H. lissocarpa</i>	<i>Hibb. hypericoides</i> <i>Hybanthus</i> <i>Hemigenia</i>
GRASSES		HERBS	SEDGES	over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)		2-10%			
DOMINANT SPECIES		<i>Styl. bulbiferum</i> <i>Lagerflera hugghii</i> <i>Trifolium</i> <i>Slackhousea</i> sp.			

4. VEGETATION CONDITION

Comments

4 1/2 - 5 / 5 some weeds. otherwise good condition. Mid slope *E. laetae*. *E. wardii* on lower slopes of valley. *E. laetae* & *E. calophylla* open tall woodland. Tall emergent *X. preissii*

NB: *lobelia* in NTDN 02
No *X. preissii*
just *X. axillaris*

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA 4km Open wandoo forest Nth Dandalup - off Hines Rd SITE NUMBER NTDN 04

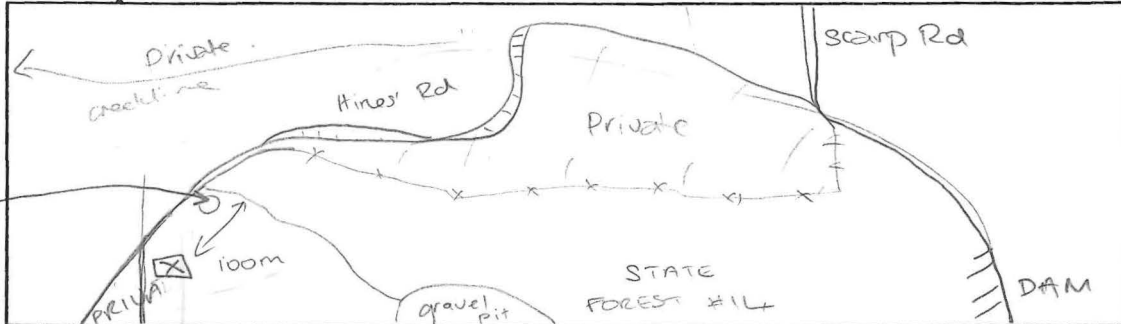
DATE TRIP 20.11.96 RECORDERS AM

DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



Road Location Hines Rd

Geographic Location Latitude 32 30 50.3 S Longitude 116 00 15.2 E Altitude 140m
GPS No Fix Map Sheet Fix

Photograph Name _____ Number #4 + #5 Roll #5

Topographic Position (Circle the correct response)
Upland _____ Lower slope
Upper slope _____ Valley
Midslope - MIDSLOPE 2 Washline _____
Loaded as low slope

2. SITE DATA Circle the correct response

Slope 1.5 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100
Slope flat gentle steep Aspect N NE E SE S SW W NW

Surface Soil gritty loamy clay Depth to Rock 0-60cm Colour red-orange +

Exposed Rock type Dolerite % surface cover 5% size range 2-25cm

Litter 30 % surface cover Depth (cm) 0-50cm 2-5cm

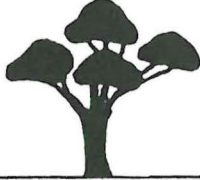
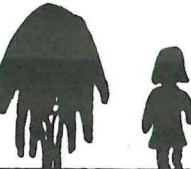
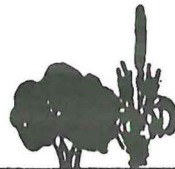
Bare Ground 5 % surface cover)

Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class					
	2-10%	10-30%	30-70%	over 70%	
TREES					
	over 15m	5-15m	under 5m	MALLEES	
				over 8m	under 8m
LIFE FORM					
					30m
					10m
COVER CLASS (%)		2-10%			
DOMINANT SPECIES		E. wandoo			
SHRUBS					
	over 2m	2m - 1.5m	1.5 - 1m	1-0.5m	SHRUBS under 0.5m
LIFE FORM					
					2m
					1m
COVER CLASS (%)				10-30	30-70% 10-30%
DOMINANT SPECIES				Y. preissii H. eulachna Kunzea sp.	Kunzea sp. Grevillea ptiliifera Baeckea carphor.
GRASSES		HERBS	SEDGES	over 0.5m	under 0.5m
LIFE FORM					
					1m
COVER CLASS (%)	2-10%	10-30 2-10%			10-30%
DOMINANT SPECIES	N. alopecuroides Stipa sp. Danthonia sp.	Pteris occidentalis Styl. bulbiferum Poa sphacelata			Lep. gracilis/longistylis L. halmia? sp. Schoenus sp. black bog

4. VEGETATION CONDITION

Comments

3 1/2 / 5. Uncertain as to grazing + logging history.
Weed invasion from adjacent pasture.
Dolerite-derived soils. Poorly drained.

2-
(2.5)

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA Nth Dindigudi Wp Jam ML **SITE NUMBER** NTDN05
Firebreak south of
→ Behind DAM wall of Dindigudi river

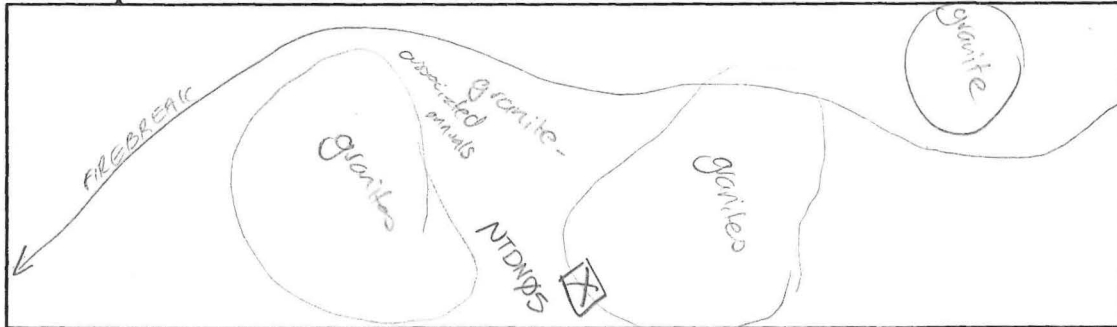
DATE TRIP 21.11.96 **RECORDERS** AM

DATE TRIP _____ **RECORDERS** _____

DATE TRIP _____ **RECORDERS** _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



Road Location

Geographic Location **Latitude** 32 31 38.7 S **Longitude** 116 00 49.2 E **Altitude** 1300m
GPS ✓ **Accuracy** ±300 GSATS
Map Sheet Pinjawa / Dwellingup

Photograph **Name** #6 + #7 **Roll** #5

Topographic Position (Circle the correct response)
Upland 4 **Lower slope**
Upper slope **Valley**
Midslope **Washline**

2. SITE DATA Circle the correct response

Slope flat gentle steep **Aspect** (N) NE E SE S SW W NW

Surface Soil gully silt **Depth to Rock** 0-100m **Colour** Grey

Exposed Rock type granite % surface cover 65% size range 2cm - 1.5m

Litter 20 % surface cover **Depth (cm)** 1-3 cm

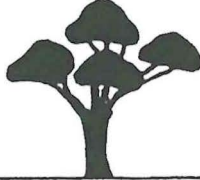
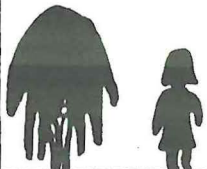
Bare Ground 50 % surface cover

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class	2-10%	10-30%	30-70%	over 70%
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TREES				MALLEES	
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)					
DOMINANT SPECIES					
SHRUBS			SHRUBS		
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)	2-10%	10-30%	10-30%	10-30%	10-30%
DOMINANT SPECIES	<i>A. onicophylla</i>	<i>A. onicophylla</i>	<i>H. petiolaris</i> <i>A. onicophylla</i>	<i>V. adersa</i> <i>Dodonaea sp.</i> <i>V. plumosa</i>	<i>Baeckea campar.</i> <i>Conospermum. longiflorum</i> <i>V. plumosa</i>
GRASSES		HERBS		SEDGES	
	over 0.5m			under 0.5m	
LIFE FORM					
COVER CLASS (%)					
DOMINANT SPECIES				<i>dep. tuberculatum</i>	

4. VEGETATION CONDITION

Comments: S/S. Isolated granite outcrop. Few, if any weath. in the Dandalup valley. *A. onicophylla* scrub with *H. petiolaris*, *Dodonaea* & *Verticordia* spp. w/ strong Exposed. Annuals already lost.

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA 11th Dardalup Dam SITE NUMBER NTDN06

DATE TRIP 21.11.96 RECORDERS AM

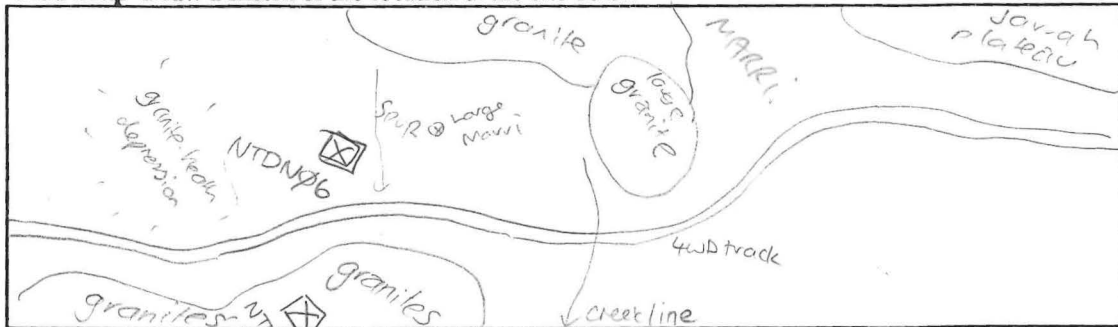
DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

in Manti-dominated glacial spur

Mud Map Draw a sketch of the location of the site below



Road Location Fivebreak south of dam & River -

Geographic Location Latitude 32 31 44.0 S Longitude 116 00 50.0 E Altitude 250m
GPS ☒ Accuracy ± 300 Map Sheet Pinjara / Dwellingup 6 SAR

Photograph Name _____ Number # 8 Roll # 5

Topographic Position (Circle the correct response)
Upland _____ Lower slope _____
Upper slope 4 Valley _____
Midslope _____ Washline _____

2. SITE DATA Circle the correct response

Slope flat gentle steep 2 Aspect (N) NE E SE S SW W NW 6°

Surface Soil gitty loam Depth to Rock 0-30cm Colour grey - dk p *dark brown*

Exposed Rock type granite % surface cover 15% size range 3-70cm

Litter 70 % surface cover Depth (cm) 5-10 cm

Bare Ground 8 % surface cover

100% rocks

Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008

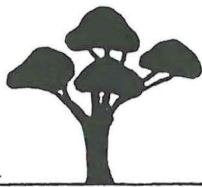
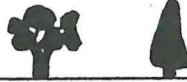
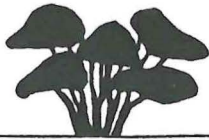
1km SSE Pipehead dam.

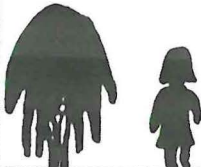
BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below), and dominant species in each layer.

Cover Class	2-10%	10-30%	30 - 70%	over 70%
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		TREES			MALLEES	
		over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM						
COVER CLASS (%)		2-10%	10-30%			
DOMINANT SPECIES		<i>E. calophylla</i>	<i>E. calophylla</i>			

SHRUBS				SHRUBS	
over 2m		2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)			2-10%	10-30%	7-70%
DOMINANT SPECIES			<i>H. undulata</i>	<i>H. lissocarpa</i>	<i>D. citriodora</i>
			<i>H. viridicarpa</i>	<i>A. pulchella</i>	<i>Leucopogon</i> sp.
			<i>M. brabra</i>		<i>Hib. hypericoides</i>

GRASSES		HERBS	SEDGES	over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)					
DOMINANT SPECIES					

4. VEGETATION CONDITION

Comments S/S. Good condition upper slope mainly
with granite-influenced ulstorey -
Between granite outcrops.
- 'Deeper soil.

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA Nth. Dandalup DAM - Southern Firebreak SITE NUMBER NTDN 07

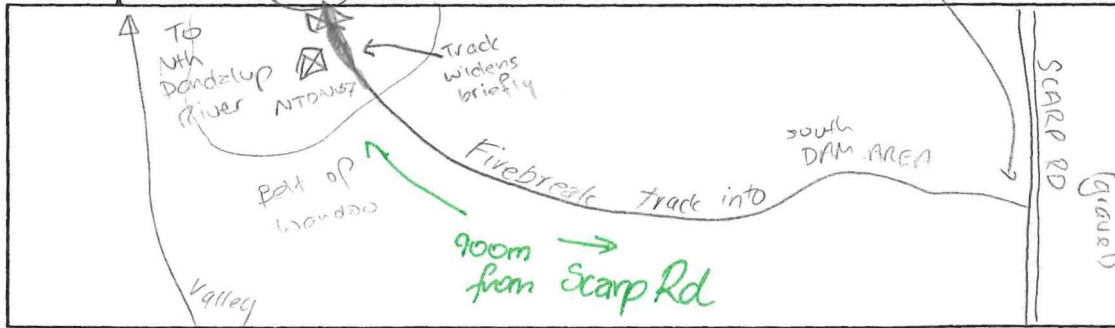
DATE TRIP 21.11.96 RECORDERS AM

DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



Road Location

Geographic Location Latitude 32 32 14.4 S Longitude 116 00 26.7 E Altitude 240m
GPS Accuracy ±300 (SSATS)
Map Sheet

Photograph Name Number #9 + #10 Roll #5

Topographic Position (Circle the correct response)
Upland Lower slope
Upper slope Valley
Midslope - into valley Washline

2. SITE DATA Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

Surface Soil gravelly clay Depth to Rock → 60cm Colour orange

Exposed Rock type derelict gravel % surface cover 1% size range 10-60cm

Litter 60 % surface cover Depth (cm) 10-20

Bare Ground 8 % surface cover (100 tracks)

Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008

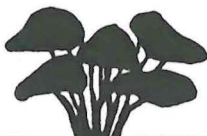
2km SSW pipehead dam

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Muir)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below), and dominant species in each layer.

Cover Class 2-10% 10-30% 30-70% over 70%

TREES			MALLEES		
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)	10-30%				
DOMINANT SPECIES	E. wandoo				
SHRUBS			SHRUBS		
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)			2-10%	10-30%	10-30%
DOMINANT SPECIES			Xan. preslii H. undulata	M. neidlii H. sp. Try. ledi Acacia pulchella DAUNIA sp	Hibb. hypericoides Phy. cal H. liss. H. lissocarpus
GRASSES		HERBS	SEDGES	over 0.5m	
				under 0.5m	
LIFE FORM					
COVER CLASS (%)		2-10%		10-30%	
DOMINANT SPECIES		Mixed weeds. Not a strong weed layer present		Doronicum preissii? Dorocarya flexuosa	

4. VEGETATION CONDITION

Comments 3/5. V. poor condition. History of hot fire, logging & grazing? Rich clay soil subject to weed invasion. Emergent H. trifurcata. Heavy voo grazing pressure. Poor condition. Annual weeds. Sparse ulstorey.

3

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA North Dandalup Dam SITE NUMER NTDN08

DATE TRIP 24.11.96 RECORDERS AM

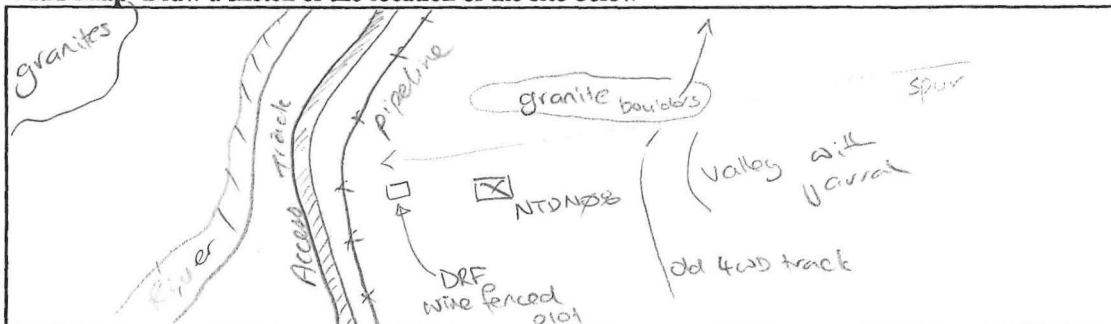
DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

NTDN07 - 900m from
scrub to

Mud Map Draw a sketch of the location of the site below



Road Location Pipeline Access Track

Geographic Location Latitude 32° 31' 27.2 S Longitude 116° 00' 32.1 E Altitude 195m
GPS Accuracy ±300
Map Sheet Pigjima / Dwellingup (USATS)

195m
200m

Photograph Name _____ Number # 11 Roll # 5

Topographic Position (Circle the correct response)
Upland _____
Upper slope _____
Midslope 6
Lower slope 3
Valley 4
Washline _____
Mid-lower slope _____
Valley Midslope = 8

2. SITE DATA Circle the correct response

Slope flat gentle steep 3 Aspect N NE E (SE) S SW W NW

Surface Soil gritty clayey loam Depth to Rock 0 - >60cm Colour brown

Exposed Rock type granite % surface cover 5% size range 60-100cm

Litter >80 % surface cover Depth (cm) 20-30cm

Bare Ground 6 % surface cover

BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class					
	2-10%	10-30%	30-70%	over 70%	
TREES					
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)	2-10%	30-70%			
DOMINANT SPECIES	<i>E. marginata</i>	<i>E. calophylla</i> <i>E. marginata</i>			
SHRUBS					
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)			2-10%	10-30	10-30%
DOMINANT SPECIES			<i>X. preissii</i>	<i>M. reidii</i> <i>Hibbertia sp. (large)</i> <i>tl. angustifolia</i>	<i>Hibb. hypericoides</i> <i>Xan. g.</i>
GRASSES		HERBS	SEDGES	over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)		2-10%	2-10%		2-10%
DOMINANT SPECIES		<i>Abutilon sp.</i> <i>Arthropodium sp.</i> <i>Opecularia sp.</i>	<i>lep - sword sedge</i> <i>lep. totale</i>		<i>lep - sword sedge</i>

Scorola sp
Xanthoxia cordata

4. VEGETATION CONDITION

Comments Mid-lower slope Jarrah in deeper soils between exposed granite boulders & silt/rubble. & *E. leakei*. History of v. hot fire ~ 10 y.a

4/5

2

BUSHLAND PLANT SURVEY RECORDING SHEET 1 - use pencil only

BUSHLAND AREA 140 Doodalup SITE NUMBER NTDN09
of Hines Rd
Behind NTDN04

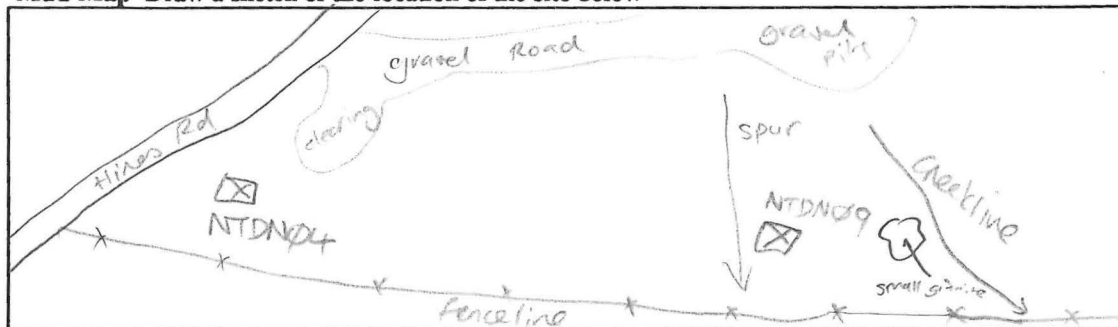
DATE TRIP 24.11.96 RECORDERS AM

DATE TRIP _____ RECORDERS _____

DATE TRIP _____ RECORDERS _____

1. LOCATION of the QUADRAT

Mud Map Draw a sketch of the location of the site below



in belt of Kingia ... Edge of Dieback clearing

Road Location Hines Road

Geographic Location Latitude 32 30 57.1 S Longitude 116 05 00.0 E Altitude 145m
 GPS Accuracy ± Map Sheet Pinjara SSAT

Photograph Name _____ Number #124#13 Roll #5

Topographic Position (Circle the correct response)
 Upland _____
 Upper slope _____
Midslope _____
 Lower slope _____
 Valley _____
 Washline _____
 - ironstone scree slope
2

2. SITE DATA Circle the correct response

Slope flat gentle steep Aspect N NE E SE S SW W NW

Surface Soil loamy sandy gravel Depth to Rock 0-30cm Colour grey

Exposed Rock type laterite % surface cover 80 size range 1cm - 3cm

Litter 60 % surface cover Depth (cm) 5-15cm

Bare Ground 5 % surface cover

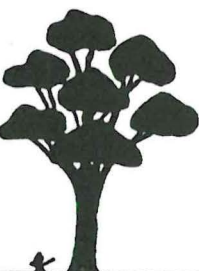
Adapted from 'Bushland Plant Survey' written by B. Keighery (1994) and published by Wildflower Society of WA (Inc). PO Box 64 Nedlands WA 6008

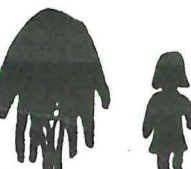
BUSHLAND PLANT SURVEY RECORDING SHEET 2 (Mulr)- use pencil only

3. VEGETATION STRUCTURE AND COVER

For each layer record - appropriate life form, cover class (see below) and dominant species in each layer.

Cover Class 2-10% 10-30% 30-70% over 70%

TREES				MALLEES	
	over 15m	5-15m	under 5m	over 8m	under 8m
LIFE FORM					
COVER CLASS (%)		10-30%	2-10%		
DOMINANT SPECIES		<i>P. marginata</i> <i>E. calophylla</i>	<i>E. calophylla</i>		

SHRUBS			SHRUBS		
	over 2m	2m - 1.5m	1.5 - 1m	1 - 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)	2-10%		2-10%	10-30%	30-70%
DOMINANT SPECIES	<i>Kingia australis</i>		<i>Xan. preissii</i> <i>H.</i>	<i>Dry. gimela</i> <i>H. stenocarpa</i> <i>Acacia drummondii</i>	<i>Baeckha. camphorosmae</i> <i>Dry. nixon</i> <i>Beaufortia sp.</i> <i>Hibb. hypericoides</i>

GRASSES		HERBS		SEDGES	
				over 0.5m	under 0.5m
LIFE FORM					
COVER CLASS (%)		2-10%		2-10%	
DOMINANT SPECIES		<i>Opuntia hispidula</i> <i>Dampiera spp.</i> <i>Stylidium spp.</i>		<i>Uria scariosa</i>	<i>Horroba fasciculata</i> <i>Urtica</i> <i>Domandia spp.</i>

4. VEGETATION CONDITION

Comments: 4/5 - 11 3 1/2 - 4/5 Heavy Briza infestation & ADS Dieback
lower jarrah on ironstone with water upstorey & large Kingia australis.

205

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN 81

Date 15.11.96

Record on Sheet

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

HERB ID SHEET

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus laevis</i>	✓	✓	✓ _R	<i>Macbratnia viedii</i>	✓		✓ _R	<i>Lomandra brittenii</i> (moder)	✓		✓ _R
<i>Eucalyptus calophylla</i>	✓	✓	✓ _R	<i>Xanthorrhoea preissii</i>	✓			<i>Lomandra micrantha</i>	✓	✓	✓ _R
								<i>Paterosia</i> sp.			✓ _R
								<i>Thysanotus</i> sp.			✓
								<i>Arthropodium capillipes</i>	✓		✓
MALLEES				<i>Dichelachne ciliata</i>	✓	✓	✓				
				GRASSES							
				<i>Aira caryophylla</i>	✓		✓				
				<i>Danthalia</i> sp.	✓	✓	✓ _R				
				<i>Vulpia bromoides</i> (NO)	✓	✓	✓ _R				
SHRUBS				<i>Poa drummondiana</i>	✓	✓	✓				
<i>Hibbertia hypoleuca</i>	✓	✓	✓ _R	<i>Tetraria laevis</i>	✓	✓	✓	SEDGES			
<i>Tymalium ledifolium</i> var <i>revivifolium</i>	✓	✓	✓ _R	<i>Mitrasacme stipoides</i>	✓	✓	✓ _R	<i>Desmodium aspera</i>	✓	✓	✓ _R
<i>Gompholobium polymorphum</i>	✓	✓	✓ _R	<i>Vulpia hirsuta</i> (NO)	✓	✓	✓				
<i>Phyllanthus calycinus</i>	✓	✓	✓ _R	<i>Stipa pectinatifolia</i>	✓	✓	✓				
<i>Prostanthera fraseri</i> var <i>fraseri</i>	✓	✓	✓ _R	<i>Poa</i> sp "stender"	✓	✓	✓				
<i>Hibbertia communata</i>	✓	✓	✓ _R	HERBS							
<i>Halimolobos lissocarpa</i>	✓	✓	✓ _R	<i>Anagallis arvensis</i>	✓	✓	✓ _R				
<i>Hypocalymma angustifolium</i>	✓	✓	✓ _R	<i>Dampiera alata</i>	✓	✓	✓ _R				
<i>Gompholobium marginatum</i>	✓	✓	✓ _R	<i>Tetraria elatior</i>	✓	✓	✓ _R				
<i>Calothamnus quadrifidus</i>	✓	✓	✓ _R	<i>Oreilanthus australis</i>	✓	✓	✓ _R				
<i>Thomasia foliosa</i>	✓	✓	✓ _R	<i>Stachys monogyna</i>	✓		✓ _R				
<i>Darwinia ciliolata</i>	✓	✓	✓ _R	<i>Thysanotus marginatus</i>	✓	✓	✓				
<i>Hovea visperma</i>	✓	✓		<i>Centaurea cyathifera</i>	✓	✓	✓ _R				
<i>Hibbertia rhadinopoda</i>	✓	✓	✓ _R	<i>Senecio diachides</i>	✓	✓	✓ _R				
<i>Leucopogon capitellatus</i>	✓	✓	✓	<i>Oxalis perennans</i>	✓	✓	✓ _R				
<i>Daviesia hirsuta</i>	✓	✓	✓ _R	<i>Xanthosia candida</i>	✓	✓	✓ _R				
<i>Viminaria juncea</i>	✓	✓	✓ _R	<i>Cassipoua racemosa</i>	✓	✓	✓ _R				
<i>Acacia dentifera</i>	✓	✓	✓ _R	<i>Conostylis aculeata</i> sp <i>preissii</i>	✓	✓	✓				
<i>Acacia pulchella</i> var <i>pulchella</i>	✓	✓	✓ _R								
<i>Conostylis</i>											

Wungah valley - 17.10.96 *Stachys monogyna*

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No

NTDN 01

Record on Sheet

Date

15.11.96

• Column 1

plant name

• Column 2

plant number

• Column 3

flowering time- TICK if species flowering

• Column 4

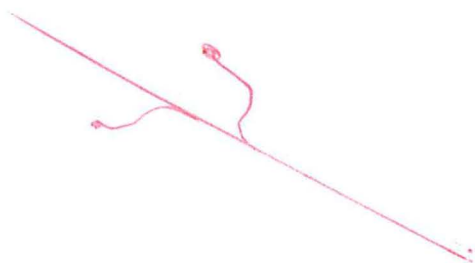
identification check

ADS
X. preissii

Rescore

16.12.96

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
E. laetaei	✓		✓	Hippocalymma argenteifolia	✓		✓	Cassytha p. (sp.)	✓		✓
E. calophylla	✓		✓	Drosera divergens/divaricata	✓		✓	Oxalis sp.	✓		✓
				Hibb. commutata	✓		✓	Drosera pallida			
SHRUBS				Acacia pulchella	✓		✓	Comptosium - trifolium			✓
H. lissocarpa	✓		✓	Serica sp. R			✓	Trifoliate leaves yellow fls			✓
Thymus foliosa	✓		✓	Paspalum alaba R			✓	Arthropodium capillipes	✓		✓
MALLEES								Tricoryne			✓
Viridaria/Jacksonia	✓		✓					Scaevola of Paspalum (sp.)			✓
Macrozamia reidii	✓		✓	GRASSES				Buzardia congesta			✓
Phyllanthus californicus	✓		✓	un-ID'd grass - tall			✓	Small flowering Hibbertia			✓
				small annual grass			✓	Cinchylis sp. (n.f.)			✓
SHRUBS				Neurachne?			✓	Haemodorum sp.			✓
Hibb. hypericoides	✓		✓	un-ID'd grass long narrow leaves			✓	L. NF			✓
Davuria alviodora	✓		✓	Slipa			✓	SEDGES			
Calothamus quadrifidus	✓		✓	Macleania brown			✓	Lorocarya flexuosa	✓		✓
Hypomyrtus angustifolia	✓		✓	Tetrachena laevis (R)			✓	Lomandra preissii - Microstema	✓		✓
Comptosium marginata	✓		✓	Hairy-leaved grass	R		✓	L. fine haired Lomandra	✓		✓
Xanthosia candida	✓		✓	Danthonia sp.	R		✓	3rd Lomandra sp?			✓
Pittosporum				HERBS				(thin but not hairy leaves)			
Tricoryne elatior	R		✓	Ellardina 2 fl. scandum	✓		✓	Hibbertia sp. small			✓
Tam Acacia sp.			✓	Stackhausia sp.	✓		✓	H. rhadinopoda			✓
A. dentifera			✓	Chailanthes ovastensifolia	✓		✓	NOT seen			
				Astroloma sp. - Leucopogon sp.			✓	Rescore			
				Anandalis arvensis	✓		✓	Opp-leaved pink flowers	R		✓
				Aera canophyllae			✓	Centaurium erythraea			✓
				Haemodorum sp.	✓		✓				
				Briza minor			✓				
				terete-leaf Thymus			✓				
				x. fine-leaf Lomandra			✓				
				Timalium ledifolium			✓				
				Dampiera alata	✓		✓				



BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN 02

Record on Sheet

Date 15/1/96

16/12/96 (R)

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus laevis</i>	✓		YR					<i>Arthropodium capillipes</i> (Bidiopogon)	✓		✓
<i>Eucalyptus calophylla</i>	✓		YR					<i>Styracandra glauca</i>	✓		YR
								<i>Cheilanthes australensis</i>	✓		YR
								<i>Thysanotus marginatus</i> / <i>pateronii</i>	✓		✓
								<i>Burchardia congesta</i>	✓	✓	✓
								<i>Caesia micrantha</i>	✓	✓	✓
MALLEES				<i>Tetarrhena laevis</i>	✓	✓	✓	<i>Isodora hypocrateriformis</i>	✓	✓	YR
<i>Calothamnus quadrifidus</i>	✓		YR	<i>Poa chromola</i>	✓	✓	✓	<i>Rhodanthe corymbosa</i>	✓	✓	✓
				GRASSES				<i>Thysanotus dichotomus</i>	✓	✓	✓
				<i>Aira caryophylla</i>	✓	✓	YR	<i>Xanthosia candida</i>	✓	✓	✓
				<i>Biza minor</i>	✓		✓	<i>Cassutha glabella</i>	✓	✓	✓
SHRUBS				<i>Biza maxima</i>	✓	✓	✓	<i>Cassutha racemosa</i>	✓	✓	✓
<i>Xanthorrhoea gracilis</i>	✓		YR	<i>Drosera setacea</i>	✓	✓	✓	<i>Romulea rosea</i>	✓	✓	YR
<i>Tymalium ledifolium</i> var. <i>roundifolium</i>	✓		YR	<i>Stipa spicata</i>	✓	✓	✓	SEDGES			
<i>Podocarpus ceratocarpa</i>	✓		YR	<i>Microcalamagrostis</i>	✓	✓	✓	<i>Isoplepis nodosa</i>	✓		
<i>Tymalium floribundum</i> flor	✓		YR	<i>Poa drummondiana</i>	✓	✓	✓	<i>Desmodium aspera</i>	✓		YR
<i>Gonolobium marginatum</i>	✓	✓	YR	<i>Vulpia myuros</i>	✓	✓	✓				
<i>Hibbertia hypericoides</i>	✓	✓	YR	<i>Anthipogon</i> sp. <i>indat</i>	✓	✓	✓				
<i>Phyllanthus calycinus</i>	✓	✓	YR	HERBS				<i>Lomandra brittanii</i>	✓	✓	✓
<i>Darwinia citriodora</i>	✓	✓	YR	<i>Centropus drummondiana</i>	✓	✓	YR	<i>Lomandra sericea</i>	✓	✓	✓
<i>Hibbertia rhadinopoda</i>	✓	✓	YR	<i>Centropus aristata</i>	✓	✓	YR	<i>Lomandra micrantha</i>	✓	✓	YR
<i>Acacia pulchella</i> var. <i>pulchella</i>	✓	✓	YR	<i>Wahlenbergia preissii</i>	✓	✓	YR	ADS: Haemodorum discolor	✓	✓	
<i>Acacia dentifera</i>	✓	✓	YR	<i>Centaurium anthracae</i>	✓	✓		<i>Haemodorum laxum</i>	✓	✓	
<i>Acacia extensa</i>	✓	✓	YR	<i>Ponchusa decarceus</i>	✓	✓	✓	<i>Conostylis aculeata</i> spp. <i>preissii</i>	✓	✓	YR
<i>Grevillea diversifolia</i> ssp. <i>diversifolia</i>	✓	✓	YR	<i>Galium divaricatum</i>	✓	✓	✓				
<i>Hakea lissocarpa</i>	✓	-	YR	<i>Opuntia vaginatum</i>	✓	✓	✓				
<i>Macrogamia viedtii</i>	✓	-	YR	<i>Anagallis arvensis</i>	✓	✓	YR				
<i>Xanthorrhoea preissii</i>	✓	-	YR	<i>Homaloxiadum homaloxarpum</i>	✓	✓	✓				
				<i>Poranthera microphylla</i>	✓	✓	✓				
				<i>Dampiera alata</i>	✓	✓	YR				
				<i>Stylidium bulbiferum</i> (unconf)	✓	✓	YR				
				<i>Burchardia congesta</i>	✓	✓	✓				

WO	3/0	-	4/0	1/0	-
ZU	-	-	-	3/1	-

The results of the March 1996 session are summarised in Table J2. While 62 (24.9%) of the 249 species-records from the 61 quadrats re-sampled in March 1996 were new species for their quadrats, the foraging component of our sampling effort was biased towards gaps. Even so, the average improvement in the quadrat species lists was only 6% (see Table QR), so we concluded that further field sampling effort would not be cost-effective. Clearly, our inventory was not exhaustive; even on the last day of field effort, an additional species was detected at 23 of the 63 quadrats (Figure AA).

Table J2. Number of herpetofaunal species recorded during the March 1996 sampling session / number of species that were new records for the quadrat.

Campsites	Quadrat					
	1	2	3	4	5	6
BB	4/1	3/1	1/0	9/1	5/1	
BO	3/0	3/2	12/2	10/5	5/1	
CU	3/1	7/0	3/0	4/1	7/2	6/0
EL	-	-				
GJ	3/1	5/2	6/1	3/1	3/0	
KE	5/1	1/1	1/0	2/0	3/0	
MD	8/1	9/2	3/0	8/1	4/1	
MR	5/1	7/5	9/1	8/2	7/2	
NA	0/0	3/0	5/2	2/0	1/0	
NE	1/1	2/1	1/0	0/0	3/1	
PE	0/0	6/0	2/1	2/0	4/2	
WO	7/1	7/4	3/2	3/1	7/4	
ZU	1/0	0/0	2/1	2/0	0/0	

Goph. marginatus in NTDN01

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN02

Record on Sheet

Date 15.11.96

1. Record

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
E. laetleii	✓			Haemodorum sp.	✓			Timonium ledifolium	✓		
E. calophylla	✓			Hairy-leaved grass	✓			Loxocarpus flexuosus	✓		
SHRUBS				Xanthorrhoea teretifolia	✓			Arctostaphylos			
C. glabra quadrifida	✓			gracilis	✓			Acacia mangrove	✓		
Phy. calycinus	✓			Acacia - long phyllodes	R			Castalopia arida	✓		
MALLEES				as in NTDN01				Walteria sp. std. type	✓		
Dodonaea sp. Ceraucarpa	✓			A. extensa				Arthropodium capillipes			
Croton sp. glabrata	✓			GRASSES				Carytha (maybe 2)			
Dorvillea citriodora	✓			Tetrachloa laevis	✓			Is. hydromorpha			
Halca tessocarpa	✓			Nicotiana sp. (poa??)	✓			sm. Euphorb			
SHRUBS				Briza minor	✓			Leek orchid leaf			
Libertia hypericoides	✓			Briza maxima	✓			Opercularia lasiocarpa	?		
Macropia reidii	✓			long-leaved grass (Poa?)	✓			SEDGES			
Grass sp.				Neurotheca Amphipogon	✓			Leonardra procurrens	✓		
Phyllanthus calycinus	✓			long-leaved grass	✓			Is. sp. sedge Lepidosperma?			
Charanthus (fern)	✓			Shrub?	R			sm. sedge unl. 2. Did. Leonardra?			
Acacia sp. long broad leaf	✓			HERBS				Stipa			
Acacia pulchella	✓			Conostylis aculeata	✓			Is. leaved Leonardra			
Gompholobium marginatum	✓			Myrsine dichotoma	✓			flat-leaved sedge			
Acacia, terete leaved	✓			Timonium floribundum	✓			Labelis sp. (white)	R		
Chorizanthe acuminata	✓			Dorvillea citriodora	✓			Is. sp.			
Conostylis aculeata	R			Andropogon aeneus	✓			Castalopia andropogon	R		
T. dichotomus				unl'd. Asteraceae Rhodanthus				Dampiera alata			
Small Hibbertia sp.	R			Sonchus oleraceus				Ronula rosea	R		
rhadinopoda				Xanthocarpus sp.				Am. sp.			
				Castalia micrantha				Hairy-leaved grass	R		
				Burardia congesta	✓						
				Stylidium glaucum	✓						
				Stylidium bulbiferum	✓						
				Lepidosperma sp. (terete)	✓						

Carytha glabella? (2 spp?)

Tetrachloa laevis

L. R. D. ... 1st site

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN03

Record on Sheet

Date 15.11.96

16.12.96 R

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

HERB
ID
DATA
SHEET

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus calophylla</i>	✓		✓	<i>Xanthorrhoea gracilis</i>	✓	-	✓	<i>Ursinia anthemoides</i>	✓		✓
<i>Eucalyptus laevis</i>	✓		✓	<i>Tonduzia biloba</i>	✓	✓	✓	<i>Chamaecilla conyososa</i>	✓	✓	✓
				<i>Halkea trihucata</i> (seedling)	✓	-	✓	<i>Lagerflera huegelii</i>	✓	✓	✓
SHRUBS				<i>Halkea linocarpha</i>	✓	-	✓	<i>Centropus aristata</i>	✓	✓	✓
				<i>Halkea undulata</i>	✓	-	✓	<i>Stylidium brunonianum</i>	✓	✓	✓
<i>Hibbertia rhadinopoda</i>	✓	✓	✓	<i>Xanthorrhoea preissii</i>	✓	-	✓	<i>Centropus drummondiana</i>			
<i>Hibbertia c. compacta/orata</i>	✓	✓	✓	<i>Macaranga viedlii</i>	✓	-	✓	<i>Cassytha racemosa</i>	✓	✓	✓
<i>Acacia nervosa</i>	✓	✓	✓	<i>Melaleuca aff. scabra</i>	✓	✓	✓	<i>Crassulea pedicellata</i>	✓		✓
<i>Petrophile striata</i>	✓	✓	✓	GRASSES				<i>Hypochaeris glabra</i>	✓	✓	✓
<i>Hemigenia incana</i>	✓	✓	✓	<i>Biza maxima</i>	✓	✓	✓	<i>Tetradlea nuda</i>	✓	✓	✓
<i>Leucopogon capitellatus</i>	✓	✓	✓	<i>Aira canyphylla</i>	✓	✓	✓	<i>Monaderia bracteata</i>	✓	✓	✓
<i>Aspidophora ciliatum</i>	✓	✓	✓	<i>Danthonia setacea</i>	✓	✓	✓	<i>Craspedia variabilis</i>	✓	✓	✓
<i>Grevillea pilulifera</i>	✓	✓	✓	<i>Stipa pumostachya</i>	✓	✓	✓	<i>Lomandra nigricans</i>	✓	✓	✓
<i>Darwinia citriodora</i>	✓	✓	✓	<i>Tetradlea laevis</i>	✓	✓	✓	SEDGES			
<i>Hibbertia hypericoides</i>	✓	✓	✓	<i>Microdania stipoides</i>	✓	✓	✓	<i>Mesomelaena tetragona</i>	✓	✓	✓
<i>Hypocalymma angustifolium</i>	✓	✓	✓	<i>Dichelachne crinita</i>	✓	✓	✓	<i>Tetradlea capillaris</i>	✓	✓	✓
<i>Aspidoloma pallidum</i>	✓	✓	✓	<i>Biza minor</i>	✓		✓	<i>Tetradlea octandra</i>	✓	✓	✓
<i>Gompholobium marginatum</i>	✓	✓	✓	HERBS				<i>Lomandra micrantha</i>	✓	✓	✓
<i>Isopogon asper</i>	✓	✓	✓	<i>Petersia occidentalis</i>	✓	✓	✓	<i>Orobanche minor</i>	✓	✓	✓
<i>Phyllanthus calycinus</i>	✓	✓	✓	<i>Burchardia congesta</i>	✓	✓	✓	<i>Conostylis setosa</i>	✓	✓	✓
<i>Daviesia horrida</i>	✓	✓	✓	<i>Xanthosia candida</i>	✓	✓	✓	<i>Xanthosia huegelii</i>	✓	✓	✓
<i>Acacia pulchella</i>	✓	✓	✓	<i>Opercularia vaginatum</i>	✓	✓	✓	<i>Cassytha glabella</i>	✓	✓	✓
<i>Olearia paucidentata</i>	✓	✓	✓	<i>Dampiera alata</i>	✓	✓	✓	<i>Lomandra purpuracea</i>	✓	✓	✓
<i>Hemigenia incana</i>	✓	✓	✓	<i>Aquastocinium scabrum</i>	✓	✓	✓	ADS: <i>Haemodorum discolor</i>	✓		✓
<i>Petrophile biloba</i>	✓	✓	✓	<i>Genocarpus cordiger</i>	✓	✓	✓	<i>Drosera merriesii</i>	✓	✓	✓
<i>Gompholobium polymorphum</i>	✓	✓	✓	<i>Stachnusia marogyna</i>	✓	✓	✓	<i>Drosera sp. lindet</i>	✓	✓	✓
<i>Dyandra lindleyana</i> subsp. <i>lindleyana</i>	✓	✓	✓	<i>Thysanotus manglerianus</i>	✓		✓	<i>Lomandra caespitosa</i>	✓	✓	✓
<i>Typhalium ledifolium</i> subsp. <i>rosmarinifolium</i>	✓	✓	✓	<i>Centaurium erythraea</i>	✓	✓	✓	<i>Haemodorum sp. sterile</i>	✓		✓
<i>Baeckea camphorosmae</i>	✓	✓	✓	<i>Wahlenbergia preissii</i>	✓	✓	✓	<i>Romulea rosea</i>	✓	-	✓
<i>Hibbertia mullnei</i>	✓	✓	✓	<i>Levanthodia pusilla</i>	✓	✓	✓	<i>Anthropodium capillipes</i>	✓		✓
<i>Acacia lateriflora</i>	✓	✓	✓	<i>Stylidium hispidum</i>	✓	✓	✓	<i>Lomandra britanica</i>	✓	✓	✓
<i>Kunzea micrantha</i>	✓	✓	✓								

ok
to
enter

Opercularia apiciflora 16.12.96 ✓

Thelymitra aff. macrophylla 15.11.96 ✓

		WO5, ZU4,5	
<i>N. fulvus</i>	coastal CAR	--	includes <i>N. centralis</i> and <i>N. sp.</i> (Gnarloo) records from Storr & Harold (1980, 1990).
--		GJ2,3,5	<i>N. sp_B</i> & <i>N. sp_D</i> , are entirely sympatric
<i>Pseudophryne guentheri</i>	South-west Province (incl. GS)	MD3, ZU1	range extension
<i>P. occidentalis</i>	COO, YAL, MUR, south edge of CAR	--	
<i>Cyclorana maini</i>	CAR, eastern MUR, ASH, PIL	GJ2-5, MD3, MR2,3	closed gap in range
<i>C. platycephala</i>	CAR, YAL, MUR, ASH	MR2	closed a gap in north-western part of range
<i>Limnodynastes spenceri</i>	CAR, ASH, PIL, north and east MUR	GJ1-3,5, MD3	closed gap in range
<i>Uperoleia russelli</i>	CAR, PIL, north MUR	GJ1,5, MD3	closed gap in range
<i>Litoria rubella</i>	CAR, ASH, PIL, north MUR, Kimberley	GJ5, MD3	closed gap in range
<i>Heleioporus albopunctatus</i>	South-west Province to 27°30'S	--	range limit is south of ZU
<i>Ranidella pseudinsignifera</i>	South-west Province to 27°30'S	--	range limit is south of ZU

* Geographical range in Western Australia is described in terms of IBRA Bioregions (Thackway & Cresswell 1995): GS = Irwin, CAR = Carnarvon, ASH = Ashburton, MUR = Murchison, YAL = Yalgoo, COO = Coolgardie and PIL = Pilbara.

Table PR. Reptiles recorded in the Irwin-Carnarvon study area (from Storr & Harold 1980, 1984, 1990, Storr 1991a, 1991b, 1991c, Kendrick 1989, Western Australian Museum collection, and our field sampling program). P = not recorded on quadrats during our 1994-6 survey. N = new species-records for the study area from our quadrats (also see Aplin *et al.*, this publication).

GECKOS	
<i>Crenadactylus ocellatus</i>	
<i>Diplodactylus alboguttatus</i> A	
<i>D. alboguttatus</i> B	N
<i>D. conspicillatus</i>	
<i>D. michaelsoni</i>	
<i>D. ornatus</i>	
<i>D. pulcher</i> A	
<i>D. pulcher</i> B	N
<i>D. rankini</i>	
<i>D. spinigerus</i>	
<i>D. squarrosus</i>	
<i>D. stenodactylus</i>	P
<i>D. strophurus</i>	

<i>Gehyra punctata</i>	
<i>G. variegata</i>	
<i>Heteronotia binoei</i>	
<i>Neprurus levis</i>	
<i>Phyllodactylus marmoratus</i>	P
<i>Rhynchoedura ornata</i>	
<i>Underwoodisaurus milii</i>	P
PYGOPIDS	
<i>Aprasia fusca</i>	
<i>A. haroldi</i>	
<i>A. smithi</i>	
<i>Aclys concinna</i>	P*
<i>Delma australis</i> A	
<i>D. australis</i> B	N

<i>D. butleri</i>	
<i>D. nasuta</i>	
<i>D. fraseri</i>	P
<i>D. tinctoria</i>	P
<i>Lialis burtonis</i>	
<i>Pletholax gracilis</i>	
<i>Pygopus lepidopodus</i>	
<i>P. nigriceps</i>	
DRAGONS	
<i>Ctenophorus badius</i>	
<i>C. caudicinctus</i>	
<i>C. clayi</i>	
<i>C. femoralis</i>	
<i>C. inermis</i>	
<i>C. maculatus</i>	

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN03
 Date 15.11.96
Rescore 16.11.96

Record on Sheet

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

Mesomelaena tetragona (R) ▲

Agrostis scabra (R) ▲

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
E. calophylla	✓			Trimalium ledifolium	✓			Haemodorum sp. strobilif	✓		
B. laetia	✓			Minute Hibbertia sp.				Cassytha sp.	✓		
Hakea N. furcata seedling	✓			Marrubium laetia	✓			Prostanche Mima			
SHRUBS				Arctostaphylos				Opercularia argentea	✓		
Kunzea sp.	✓			Melaleuca scabra	✓			Xan. gracilis	✓		
Acacia pulchella	✓			Petrophile striata	✓			Chenopodium coccineum			
MALLEES				Phyllanthus calycinus	✓			Gonocarpus cordiger	✓		
Hakea lissocarpa	✓			Dampiera alata (R)				Thysanotus climbing			
Hemigenia ? incana	✓			GRASSES				Leucopogon pulchellus ?			
Hibbertia hypoleuca	✓			Stipa (R)	✓			Petrophile biloba	✓		
Hibbertia commutata	✓			Briza maxima	✓			Walthergia			
SHRUBS				Drosera sp. climbing				Levenhookia			
Petrophile biloba	✓			Haiku-leaved grass	✓			Centropus aristata			
Isopogon asper	✓			Tetraria laevis	✓			SEDGES			
Dryandra nivea	✓			terete rough leaved sp.				Lomandra sp. preissi	✓		
Hypocalymma angustifolium	✓			Small Dactyloctenium	✓			Tet. octandra	✓		
Hakea undulata	✓			Briza minor				un-ID'd orchid			
Daviesia divergens	✓			fine leaf grass	✓			Xanthorrhoea preissii	✓		
Xanthorrhoea ? candida	✓			HERBS				Damia citrator			
Tetraria ? sp. nuda	✓			Burchardia congesta	✓			Olaria paucidentata	✓		
Gompholobium marginata	✓			Stylidium bulbiferum	✓			Dampiera alata			
Grevillea ptilulifera	✓			Stylidium humifusum	✓			Monarda bracteosa			
H. mylnei	✓			Lagenifera huegii	✓			Stipa	✓		
Acacia drummondii A. lateriflora	✓			Stockhausia sp.	✓			Romulea rosea	✓		
Gompholobium bifoliate leaves, yellow flower	✓			Olaria paucidentata	✓			Apia canyophyllae			
Xanthorrhoea huegii	✓			Stylidium bulbiferum	✓			Cranula			
Xanth. preissii	✓			Xanthorrhoea candata	✓			Ursinia amplexoides			
Stackhouseia (R)				Lepidosperma smooth, terete	✓			Conostylis setosa (f)			
Astroloma sp. (encl) (R)				Astroloma palidum				Templetonia bilobata			
				Tetraria capillipes				Arthropodium capillipes			
				Tetraria octandra	✓			Petrophile striata	✓		
				Dicot weed, opposite leaves	✓			fine leaf Lomandra	✓		

N.B. rescore - check Isopogon asper noted instead of Hakea lissocarpa (both in plot) OK.

Centaurium erythraea pink fl.

Bakea camphor ✓
 Broad leaf Lomandra sp (R) - L. purpurea ▲

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

SITE No NTDN 0.4

Date 20.11.96

Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus wandoo</i>	✓	-	1/2	Lomandra sp. Inlet	✓			Stylidium bulbiferum (uncat)	✓	✓	1/2
				<i>Lomandra suaveolens</i> sp. Skille	✓	✓	✓	<i>Boronia sphaerocephala</i>	✓	✓	1/2
				<i>Lomandra caespitosa</i> (Skille)	✓	✓	✓	<i>Anthropodium capillipes</i>	✓	✓	✓
				ADS: <i>Phytolobus manglesianus</i>	✓	✓			✓		
				<i>Avena barbata</i>	✓	✓	✓	<i>Tolpis barbata</i>	✓	✓	✓
MALLEES				<i>Amphipogon setaceus</i>				<i>Romulea rosea</i>	✓	✓	1/2
				<i>Newadine alopecuroides</i>	✓	✓	✓	<i>Hypochaeris glabra</i>	✓	✓	✓
				GRASSES				<i>Perituchella patibilia</i>	✓	✓	✓
				<i>Biza maxima</i>	✓	✓	1/2	<i>Hypoxis occidentalis</i>	✓	✓	✓
				<i>Biza minor</i>	✓	✓	1/2	<i>Lotus suaveolens</i>	✓	✓	
				<i>Biza campophylla</i>	✓	✓	1/2	<i>Aphelia cyperoides</i>	✓	✓	
SHRUBS				<i>Amphipogon strictus</i>	✓	✓	✓	SEDGES			
<i>Gnaphalium marginatum</i>	✓	✓	1/2	<i>Danthonia selacea</i>	✓	✓	✓	<i>Rhoenus unispiculatus</i>	✓	✓	1/2
<i>Scaevola glandulifera</i>	✓	✓	1/2	<i>Vulpia myurus</i> (NG)	✓	✓	✓	<i>Crathochaeta avenacea</i>	✓	✓	1/2
<i>Grevillea pilulifera</i>	✓	✓	1/2	<i>Amphipogon delavii</i>	✓	✓		<i>Cyperus tenuellus</i>	✓	✓	
<i>Dampiera alata</i>	✓	✓	1/2	<i>Bromus hordeaceus</i>	✓	✓	✓	<i>Juncus capitatus</i>	✓	✓	
<i>Baeckea conchocoma</i>	✓	✓	1/2	<i>Lolium perenne</i>	✓	✓	✓	ADS: <i>Rhoenus subflavus</i>	✓	✓	
<i>B. pilulifera</i> seedling	-	✓		HERBS				<i>Juncus bufonius</i>	✓	✓	
<i>Halca limocarpa</i>	✓	✓		<i>Centaurea erythraea</i>	✓	✓	1/2	<i>Loxocarya fasciculata</i>	✓	✓	1/2
<i>Kunzea micrantha</i>	✓	✓	1/2	<i>Trichostema spathulatum</i>	✓	-		<i>Moerchia erecta</i>	✓	✓	
<i>Leucopogon pulchellus</i>	✓	✓		<i>Dampiera linearis</i>	✓	-	1/2	<i>Trifolium ligusticum</i>	✓	✓	1/2
<i>Phyllanthus calycinus</i>	✓	✓		<i>Caesia micrantha</i>	✓	✓		<i>Trifolium dubium</i>	✓	✓	1/2
<i>Acacia nervosa</i>	✓	✓	1/2	<i>Barbisia mixago</i>	✓	✓	1/2	<i>Cassytha glabella</i>	✓	✓	1/2
<i>Halca cinerea</i>	-	-	1/2	<i>Goodenia caerulea</i>	✓	-	1/2	<i>Cassytha paniculata</i>	✓	✓	1/2
<i>Petrophile biloba</i>	✓	✓	1/2	<i>Velleia vinervis</i>	✓	-	1/2	<i>Monadenia bracteosa</i>	✓	✓	
<i>Xanthorrhoea preissii</i>	✓	✓	1/2	<i>Opuntia vaginatum</i>	✓	✓	1/2	<i>Haemodorum simplex</i>	✓	✓	1/2
<i>Dryandra lindleyana</i> lindleyana	✓	✓	1/2	<i>Pteris occidentalis</i>	✓	-	1/2	<i>Haemodorum laxum</i>	✓	✓	1/2
<i>Pimelea sp</i>			1/2	<i>Centropus aristata</i>	✓	✓	1/2	<i>Coreostylis setosa</i>	✓	✓	
				<i>Anagallis arvensis</i>	✓	-	1/2	<i>Dampiera alata</i>	✓	-	1/2
				<i>Ursinia anthemoides</i>	✓	✓	1/2	<i>Chamaecilla cymbosea</i>	✓	-	1/2
				<i>Tricoryne elatior</i>	✓	✓	1/2				

NE * *D. ...*

HERB ID: H. 1350

sheet of wire mesh (10 mm square holes) designed to minimise accidental vertebrate deaths.

A representative collection of specimens, including frozen tissues, has been lodged in the Western Australian Museum with register numbers: R????? - R?????. Species nomenclature in this report follows Aplin *et al.* (this publication).

3. Data quality

A sub-set of the quadrats were re-sampled in Nov 1995 to ground-test the robustness of the sampling. Using pit-fences, we re-sampled 23 of the 63 quadrats for two nights each (BB2, GJ2, GJ3, GJ5, KE2-5, MD1-5, MR3, NA1, NA3, NA5, PE2, PE5, WO1, WO3, WO4, ZU4). We also searched by hand for reptiles on 18 quadrats (BB1-3, BB5, GJ2, GJ3, GJ5, KE2-5, NA1, NA5, NE2, NE3, WO1, WO3 and WO4). These sub-sets included 18 of the 20 quadrats where there appeared to be "gaps" in the expected community structure, i.e. widespread genera of dragons, skinks or geckoes (e.g. *Diplodactylus*, *Lerista* or *Ctenophorus*) had not been detected.

- If the only new lizards from the quadrats were our hypothesised "gaps", then we would treat the sampling as otherwise robust.
- If, on average, <10% of the "total lizard species" recorded were new non-"gap" species, we would assume that the sampling was robust enough, unless some consistent pattern emerged.
- If, on average, >10%, of the "total lizard species" recorded were new non-"gap" species, then we would re-sample all quadrats in March 1996.

Further sampling was carried out at all quadrats (except for the two on Edel Land) in March 1996 (Table HH), with particular emphasis on those that had still yielded few if any reptiles. The total number of drift-fence-nights completed at each quadrat over the entire sampling program is tabulated in McKenzie *et al.* (this publication), as is the overall trapping effort by trap-type (except for the 150 tub-nights/quadrat described in the previous section).

Species accumulation curves were used to assess the results of the sampling programme. A curve was plotted for each of the 63 quadrats showing the increase in species-records per day during the course of the sampling programme. In compiling each curve, we excluded days when no frogs or reptiles at all were recorded. This occurred if the weather was too cold for herpetofaunal activity and/or if hand-searching effort was focussed on other quadrats. By excluding such days from a curve, we could minimise spurious trends in sampling-return. Also, records derived from the invertebrate pits are excluded from the species accumulation curves because these traps were not checked daily.

4. Historical Review

Lists of the species previously captured in the study area were extracted from existing literature and the WA Museum's zoological register.

5. Analysis

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

SITE No *NTDN04*

Date *20.11.96*

Rescore 16.12.96

Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

Wahlenbergia
or
Stylidium sp
→ pink small

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>E. wardoo</i>	✓			<i>Pimelea</i> sp	✓			<i>Cassytha</i> sp	✓		
				<i>Astriloma</i> sp				<i>White</i> <i>Scaevola</i>	✓		
SHRUBS				<i>Acacia</i> ? <i>nervosa</i>	✓			<i>Op. centaurium <i>eruthraea</i></i>	✓		
<i>H. erinacea</i>	✓			<i>Adneta</i> <i>brizula</i>	✓			<i>Aira</i> <i>coryphillae</i>	✓		
<i>Kunzea</i> sp.	✓			<i>Scaevola</i> sp	✓			<i>Microtis</i> sp	✓		
<i>Petrophile</i> <i>biloba</i>	✓			<i>Uulpia</i> sp				<i>Cynodon</i> ? <i>brizoides</i> ?			
MALLEES				Small tufted blackbase <i>Schoenus</i> sp				<i>Chenopodia</i> <i>corymbosa</i>			
<i>Dampiera</i> <i>linearis</i>				<i>Prosera</i> <i>pergrua</i>				<i>Tri</i> <i>Goodenia</i> <i>Debarrea</i>	✓		
<i>Xanthorrhoea</i> <i>pauciflora</i>	✓			GRASSES				<i>Wahlenbergia</i> sp			
<i>Dryandra</i> <i>nivea</i>	✓			<i>Neurochloa</i> <i>alopecurioides</i>	✓			<i>Andropogon</i> / <i>trifolium</i>			
SHRUBS				<i>Danthonia</i> sp	✓			<i>Arthropodium</i> sp			
<i>ursinia</i> <i>anthemoides</i>	✓			<i>Braea</i> <i>minor</i>	✓			<i>Heliotropium</i> <i>barbata</i> NEEP			
<i>Romulea</i> <i>rosea</i>	✓			<i>Braea</i> <i>maxima</i>	✓			Small annual <i>Schoenus</i>			
<i>Centropogon</i> <i>aristata</i>	✓			<i>Centropogon</i> <i>aristata</i> (R)				SEDGES			
<i>Baeckea</i> <i>camphorosmae</i>	✓			<i>Tribrachium</i> / <i>Haemodorum</i>				<i>Lep. angustatum</i> / <i>gracile</i> sp	✓		
<i>Tripterocarpus</i> (H.F.)				<i>Hypoxis</i> ?				<i>Andropogon</i> <i>barbata</i> ?			
<i>Grevillea</i> <i>pilulifera</i>	✓			wid. <i>Epacrid</i>				<i>Lomandra</i> sp			
→ <i>Opelocodia</i> sp <i>echinophylla</i>	✓			HERBS				Tufted <i>Stylidium</i> <i>Gray</i>	✓		
<i>Conostylis</i> <i>serotina</i>	✓			<i>Velleia</i> ? <i>Goodenia</i>				<i>Loxocarya</i> <i>fasciculata</i>	✓		
				<i>Tricoryne</i> ? <i>elatic</i> (Def <i>Tricoryne</i>)				<i>Haemodorum</i> sp. small	✓		
Wid hill Annual sedge				<i>Petersenia</i> <i>occidentalis</i>	✓			<i>Haemodorum</i> sp. large	✓		
<i>Stipa</i> sp.	✓			<i>Stylidium</i> <i>bulbiferum</i>	✓			Large wid sedge <i>Scleria</i> ?			
<i>Damp. alata</i>	✓			<i>Polygon</i> <i>sphaerocephalus</i>	✓			<i>Lep. Teet</i> small. smooth			
<i>Comph. marginatum</i>	✓			wid. grass -				<i>Lep. Teet</i> largish smooth			
<i>Barb. ?</i>				<i>Amphipogon</i> sp.				<i>Komarovia</i> <i>caespitosa</i> ?			
<i>Anagallis</i> <i>arvensis</i>	✓							Wid. smooth sedge			
<i>Avena</i> <i>fatua</i>	✓			<i>Boan Fortia</i> / <i>Kunzea</i> ? ? & ? ? (P)				in wet patches			
				<i>Kunzea</i> <i>micrantha</i> NE				<i>Cyathochaeta</i> sp.			
<i>X2</i> - Succulent <i>Peperomia</i> sp								<i>Lomandra</i>			
<i>S. gladiifera</i> ?								Large <i>Lep. angustatum</i>			

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIFIC PRESENCE Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

[illegible]

* *Acacia ongicnophylla* subsp.?

day 10 in Figure AA). In addition, the November 1995 ground-test of the field sampling detected a total of 89 species-records from the 29 quadrats that we re-sampled, and 18 (20%) of these were new species for their quadrats (Table JJ). Four of these new species records were identified gaps (Table GG): two species at NE3 (*Lerista macropisthopus* & *Ctenophorus scutulatus*), and one at BB1 (*Ctenophorus reticulatus*) and GJ5 (*Gehyra variegata*). Thus, 78% (14 of the 18) were new non-gap species-records, which exceeded the arbitrary 10% threshold (see Methods), so we re-sampled all quadrats in March 1996.

Table GG. Quadrats that had not yielded any *Ctenophorus* (C), *Diplodactylus* (D), *Gehyra* (G), large *Lerista* (L), or small skink, such as a small *Lerista* (S) species, during the Spring 1994 and May 1995 sampling sessions.

Campsite	Quadrats					
	1	2	3	4	5	6
BB	C	S	S	-	C	
BO	-	-	-	-	-	
CU	-	-	-	-	-	-
EL	-	-				
GJ	-	-	-	-	G	
KE	-	D	CD	D	-	
MD	-	-	-	D	D	
MR	-	-	-	-	-	
NA	?	-	-	-	C	
NE	-	L	CL	-	-	
PE	-	C	C	-	-	
WO	CD	-	C	-	-	
ZU	-	-	-	?	D	

Table JJ. Number of herpetofaunal species recorded during the November 1995 sampling session / number of species that were new records for the quadrat.

Campsites	Quadrat					
	1	2	3	4	5	6
BB	2/2	5/1	0/0	-	0/0	
BO	-	-	-	-	-	
CU	-	-	-	-	-	-
EL	-	-				
GJ	-	3/0	3/0	-	10/5	
KE	-	5/1	2/0	3/1	0/0	
MD	7/0	6/0	3/0	6/0	5/1	
MR	-	-	3/0	-	-	
NA	1/0	1/1	2/0	-	4/2	
NE	-	1/0	6/3	-	-	
PE	-	0/0	-	-	0/0	

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN/5 Record on Sheet

Date 21.11.96

Rescore 16.12.96

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

Apholla brigata?

TREES	SHRUBS	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Acacia anicophylla</i>	✓			✓	<i>Borua sphaerocephala</i>	✓		✓	Small annual <i>Schoenus</i>			✓
<i>Dodonaea ceratocarpa</i>	✓			✓	<i>Romulea rosea</i>			✓	<i>Helotia</i> sp.			✓
<i>Verticordia acerosa</i>	✓			✓	<i>Diosora odida</i> / <i>maerula</i>			✓	<i>Actinotus</i> sp.	✓		✓
<i>Melaleuca scabra</i>	✓			✓	Small, alternate <i>Diosora</i>			✓	<i>Hypoxis</i> ?			✓
<i>Hakea petiolaris</i>	✓			✓	<i>Phy. calycinus</i>			✓	<i>Tirachymene pilosa</i>			✓
<i>Hemigenia incana</i>	✓			✓	<i>Romulea rosea</i>			✓	<i>Centropus distata</i>			✓
MAVERES									Small annual grass			✓
<i>Baeckea camphorosmae</i>	✓			✓					<i>Pterostylis</i> sp.			✓
<i>Trumalum ladiolum</i>	✓			✓	GRASSES				<i>Hydrocotyle</i> sp.			✓
<i>Cenchrus ciliaris</i>	✓			✓	<i>Neurachne alopecuroides</i>	✓		✓	<i>Progasia densa</i>			✓
<i>Verticordia pinnosa</i>	✓			✓					<i>Homma homma</i>			✓
SHRUBS									<i>Aira caryophyllae</i>			✓
<i>Verticordia</i> sp. - like <i>Saedba</i>				✓					<i>Tricoma calva</i> / <i>Wahlenbergia</i>			✓
<i>Pinellia</i> sp. - <i>Baniline</i>	✓			✓					SEDGES			✓
<i>Tripterocarpus</i> <i>Woronis</i>	✓			✓					<i>Phyllanthium padoxa</i>			✓
<i>Hibiscus</i> sp. "spicate"				✓					<i>Lepidosperma tuberculatum</i>			✓
<i>acerosa?</i>				✓					Mid. small sedge			✓
<i>Gomph. marginatum</i>				✓	<i>Woodonia</i>	R		✓	<i>Quinora</i> sp.			✓
<i>Aibania spinosissima</i>				✓	HERBS				<i>Meischneria</i> sp.	✓		✓
Unid. <i>Antares</i> - glandular leaves				✓	<i>Hypoxis</i> <i>contula</i> (Rhodantha)	✓		✓	<i>Billardiera</i> sp.			✓
<i>Verticordia huegiana</i>				✓	<i>Synodinium bulbiferum</i>	✓		✓	? <i>Ischaemum alata</i> // <i>Platysaceae</i>			✓
<i>Darwinia citrifolia</i>				✓	<i>Velutia?</i> <i>Goodeniaceae</i>	✓		✓	<i>Hypocheris</i> <i>glabra</i>			✓
				✓	<i>Haematomum</i> sp.	✓		✓	<i>cassida</i> sp.			✓
				✓	<i>devenhookii</i> sp. - large pink <i>scaberrima?</i>	✓		✓	Sword-sedge	R		✓
				✓	<i>devenhookii</i> <i>pinnata</i>	✓		✓	<i>L. det. tuberculatum</i>			✓
				✓	<i>Proser. marginii</i>			✓	dep. taste rough	R		✓
				✓	<i>Thysanotus</i> <i>petersenii</i>			✓				✓
				✓	<i>Waigia paniculatum</i>	✓		✓				✓
				✓	White <i>Scrophs.</i>			✓				✓
				✓	<i>Gnaphalium congesta</i>			✓				✓
				✓	<i>Opuntia</i> sp.	✓		✓				✓
				✓	<i>Styphelia</i> sp.			✓				✓

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTON06

Record on Sheet

Date 16.12.96 (R)

21.11.96

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus calophylla</i> ✓			✓R	<i>Borriacea eriocarpa</i> ✓	✓		✓	<i>Xanthosia candida</i> ✓	✓		✓
				<i>Hibbertia commutata/ovata</i> ✓	✓			<i>Opercularia vaginatum</i> ✓	✓		✓R
SHRUBS				<i>Hakea undulata</i> ✓	-	-	✓R	<i>Stylidium hispidum</i> ✓	✓		✓R
				<i>Xanthorrhoea gracilis</i> ✓	✓	-	✓R	<i>Stylidium bulbiferum (unid)</i> ✓	✓		✓R
				<i>Grevillea bipinnatifida</i> ✓	-	-	✓R	<i>Comesperma ciliatum</i> ✓	✓		✓
				<i>Hakea limocarpa</i> ✓	-	-	✓R	<i>Oleavia paucidentata</i> ✓	✓		✓
<i>Dryandra lindleyana lindleyana</i> ✓			✓R	<i>Borriacea wawoona (NG)</i> ✓	✓	✓		<i>Lobelia gibbosa</i> ✓	✓		✓
<i>Pimelea brevistylis subsp brevistylis</i> R								<i>Levenhookia stipitata</i> ✓	✓		✓
<i>Trymalium ledifolium var rosmarinifolium</i> R				GRASSES				<i>Cassytha racemosa</i> ✓	✓		✓
<i>Hibbertia hypericoides</i> ✓	✓	✓	✓R	<i>Danthonia setacea</i> ✓	✓			<i>Cassytha glabella</i> ✓	✓		✓
<i>Petrophile striata</i> ✓	✓		✓R	<i>Neuracme alpestrumidea</i> ✓	✓			<i>Cassytha poriformis</i> ✓	✓	✓	✓
<i>Hibbertia rhadinopoda</i> ✓	✓	✓	✓R					<i>Conostylis androstemon</i> ✓	✓		✓
<i>Hakea trifurcata</i> ✓	✓		✓R								
<i>Darwinia citriodora</i> ✓			✓R					SEDGES			
<i>Verticordia acerosa subsp acerosa</i> ✓			✓R					<i>Tetralia capillaris</i> ✓	✓		✓R
<i>Pimelea brevistylis subsp brevistylis</i> ✓			✓R					<i>Tetralia octandra</i> ✓	✓		✓R
<i>Hypocalymma angustifolium</i> ✓	✓		✓R								
<i>Grevillea pilulifera</i> ✓	✓		✓R	HERBS							
<i>Acacia stenoptera</i> ✓	✓		✓R	<i>Dampiera linearis</i> ✓	✓	✓	✓R				
<i>Leucopogon capitellatus</i> ✓	✓		✓R	<i>Chamaescilla corymbosa</i> ✓	✓	✓	✓R				
* <i>Dryandra bipinnatifida</i> ✓			✓	<i>Goodenia caerulea</i> ✓	✓	✓	✓R	<i>Lomandra hermaphrodita</i> ✓	✓		✓
* <i>Phyllanthus calycinus</i> ✓	✓		✓R	<i>Stylidium amoenum</i> ✓		✓	✓R	<i>Lomandra brittanii</i> ✓	✓		✓
<i>Acacia pulchella var pulchella</i> ✓			✓R					<i>Thelymitra crinita</i> ✓	✓		✓
<i>Acacia laterica</i> ✓	✓		✓R	<i>Xanthosia twegellii</i> ✓	✓		✓	<i>Drosera menglesii</i> ✓	✓		✓
<i>Petrophile biloba</i> ✓	✓		✓R	<i>Pterochaeta paniculatum</i> ✓	✓		✓R				
<i>Leucopogon gracillimus</i> ✓	✓	✓	✓R	<i>Trachymene pilosa</i> ✓	✓		✓				
<i>Synaphea gracilima</i> ✓	✓		✓R	<i>Chamaescilla corymbosa</i> ✓	✓	✓	✓R				
<i>Baeckea camphorosmae</i> ✓	✓		✓R	<i>Stylidium brunonianum</i> ✓	✓		✓				
<i>Gomphobium marginatum</i> ✓	✓		✓R	<i>Stylidium calcaratum</i> ✓	✓		✓				
<i>Acacia stenoptera</i> ✓	✓			<i>Millotia ? sp (? tenuifolia sterile)</i> ✓	✓						
<i>Melaleuca sp scabra</i> ✓	✓		✓R	<i>Burchardia congesta</i> ✓	✓		✓				

* Sheet labelled NTON05.

<i>C. reticulatus</i>	
<i>C. rubens</i> A	
<i>C. rubens</i> B	N
<i>C. scutulatus</i>	
<i>Diporiphora winneckeii</i>	
<i>Gemmatophora longirostris</i>	
<i>Moloch horridus</i>	
<i>Pogona minor</i>	
<i>Tympanocryptis parviceps</i>	
<i>T. adelaidensis</i>	
<i>T. butleri</i>	P
SKINKS	
<i>Cryptoblepharus carnabyi</i>	
<i>C. plagiocephalus</i>	
<i>Ctenotus alleni</i>	
<i>C. calurus</i>	N
<i>C. fallens</i>	
<i>C. hanloni</i> A	
<i>C. hanloni</i> B	N
<i>C. iapetus</i>	
<i>C. leonhardii</i>	P
<i>C. lesueuri</i>	
<i>C. mimetes</i>	
<i>C. pantherinus</i>	
<i>C. piankai</i>	N
<i>C. rufescens</i>	
<i>C. saxatilis</i>	
<i>C. schomburgkii</i>	
<i>C. severus</i>	
<i>C. uber</i>	
<i>C. youngsoni</i>	P
<i>C. zasticus</i>	P
<i>Cyclodomorphus celatus</i>	
<i>C. melanops</i>	
<i>Egernia bos</i>	P
<i>E. depressa</i>	
<i>E. formosa</i>	P
<i>E. inornata</i>	P
<i>E. kingii</i>	P
<i>E. stokesii (badia)</i>	
<i>Eremiascincus fasciolatus</i>	
<i>E. richardsonii</i>	P
<i>Lerista bipes</i>	
<i>L. connivens</i>	
<i>L. decora</i>	

<i>L. elegans</i>	
<i>L. gascoynensis</i>	
<i>L. haroldi</i>	
<i>L. humphriesi</i>	
<i>L. kendricki</i> A	
<i>L. kendricki</i> B	N
<i>L. kennedyensis</i>	
<i>L. lineopunctulata</i> A	
<i>L. macropisthopus</i>	
<i>L. maculosa</i>	P
<i>L. muelleri</i> A	
<i>L. muelleri</i> B	N
<i>L. muelleri</i> C	N
<i>L. muelleri</i> D	N
<i>L. petersoni</i>	P
<i>L. planiventralis</i>	
<i>L. praepedita</i> A	
<i>L. praepedita</i> B	N
<i>L. uniduo</i>	
<i>L. varia</i>	
<i>Menetia amaura</i>	
<i>M. greyi</i> A	
<i>M. greyi</i> B	N
<i>M. greyi</i> C	N
<i>M. surda</i> A	
<i>M. surda</i> B	N
<i>Morethia butleri</i>	
<i>M. lineoocellata</i>	
<i>M. obscura</i>	
<i>M. ruficauda</i>	
<i>Notoscincus ornatus</i>	
<i>Tiliqua multifasciata</i>	
<i>T. occipitalis</i>	
<i>T. rugosus</i>	
GOANNAS	
<i>Varanus brevicauda</i>	
<i>V. caudolineatus</i>	
<i>V. eremius</i>	
<i>V. gouldii</i>	
<i>V. giganteus</i>	P*
SNAKES	
<i>Acanthophis pyrrhus</i>	
<i>Aspidites ramsayi</i>	P
<i>Demansia calodera</i>	
<i>D. psammophis</i>	
<i>Denisonia fasciata</i>	
<i>Rhinoplocephalus monarchus</i>	P
<i>Furina ornata</i>	

<i>Morelia perthensis</i>	
<i>M. stimsoni</i>	P*
<i>Pseudochis australis</i>	
<i>Pseudonaja modesta</i>	
<i>P. nuchalis</i>	
<i>Ramphotyphlops australis</i>	
<i>R. grypus</i> A	
<i>R. grypus</i> B	N
<i>R. grypus</i> C	N
<i>R. hamatus</i>	
<i>R. leptosoma</i>	P
<i>R. waitii</i>	P
<i>Vermicella approximans</i>	P
<i>V. bertholdi</i>	
<i>V. bimaclata</i>	
<i>V. fasciolata</i>	P
<i>V. littoralis</i>	
<i>V. multifasciata</i>	N

gltty clayed turn grey-brown - waxy

Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet

- Column 1 plant name

- Column 2 plant number

• Column 3 flowering time- TICK if species flowering

- **Column 4** **identification** **check**

ng strap leaf Haemodorum

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>E. calophylla</i>	✓			<i>Acacia willboldiana</i> 2770	✓			<i>Conyza</i> sp.	✓		
				<i>Strobilomyces</i> // <i>Styphelia</i> - low cap.	✓			<i>Dampiera</i> sp - fireraised	✓		
SHRUBS				<i>Burchardia</i> longista				<i>Chaenactis</i> corymbosa	✓		
<i>H. trifurcata</i>	✓			<i>Olearia paucidentata</i>	✓			<i>Hibbertia</i> sp - tiny	✓		
<i>H. undulata</i>	✓			<i>Xan. huegeliana</i>				lost			
<i>Petrophile striata</i>	✓			<i>Conostylis androstemon</i>				NTDAD1			
MAKES				<i>Besleria eriocarpa</i>				<i>Ipomoea paniculatum</i>	✓		
<i>Dryandra nivea</i>	✓							<i>Tradescantia pilosa</i>			
<i>Metaleuca scabra</i>	✓			GRASSES				<i>Spidium calcivatum</i>			
<i>Darwinia citriodora</i>	✓			<i>Danthonia</i> sp	✓			<i>Xanthosia candida</i>			
<i>Acacia pulchella</i>	✓			<i>Neurachne alopecuroides</i>	✓			<i>Melilot</i> sp.			
SHRUBS				<i>lobelia</i> sp 2 blue							
<i>Gomph. marginatum</i>	✓			3 petals				SEDGES			
<i>Trumellum ledifolium</i>	✓			<i>Prosera</i> sp - Multicauline				<i>Tet. beryllaria</i>	✓		
<i>Pimelia</i> sp (Pangine)	✓			+ smole				<i>Tet. oxandra</i>	✓		
<i>Xan. pumila</i> gracilis	✓							<i>Comespermon vaginatum</i>			
<i>Hypocalymma angustifolium</i>	✓							<i>Rillardiera bicolor</i>			
<i>Hibb. hypericoides</i>	✓			HERBS				<i>Lomandra caespitosa</i>			
<i>Leucopogon gracilis</i> (the last)	✓			<i>Haemodorum</i> sp.	✓			<i>Lom. pinnatifida</i>			
<i>Dryandra bignoniifolia</i>	✓			<i>Stylidium piliferum</i>	✓			dep. terete stark rough			
<i>Hevelia bignoniifolia</i>	✓			<i>Stylidium brunneum</i>				dep. angustum?			
<i>H. fissocarpa</i>	✓			<i>doventaria</i> - large pink				<i>Chaenactis</i> sp	R		
<i>Phy. caliginosa</i>	✓			<i>Stylidium bulbiferum</i>	✓			<i>Synapha</i> ? <i>guttulifolia</i>	R		
<i>Baeckea amphioxys</i>	✓			<i>Thelymitra alba</i>				dep. <i>Olearia paucidentata</i>	R		
<i>Petrophile biloba</i>	✓			<i>Opercularia vaginata</i>	✓						
<i>Synapha</i> sp.	✓			<i>Dampiera linearis</i>	R						
<i>Verkeldia acerosa</i>	✓										
<i>Croton pilulifera</i>	✓			<i>Stylidium</i> - <i>amoenum</i> ?	R						
<i>Acacia lateralis</i>					R						

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

SITE No NTDN7

Date 21-11-96

Rescore 16.12.96

Label each plant with plants number, site code, date and plant's name or working name if required

Record on Sheet

• Column 1 plant name

• Column 2 plant number

• Column 3 flowering time- TICK if species flowering

• Column 4 identification check

clude Aiva species

pink flw opp-leaved herb (R)

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
E. Wandoo	✓			Scaevola sp	✓			Vulpia? sp			
				Unid grass spp.				Pink large Levenhookia			
SHRUBS				Tricoryne elatior				Ann. Schoenus			
Hibbertia hypericoides				Caesia micrantha				Centrolepis aristata			
Grevillea ptiliifera	✓			Tricoryne-like Dampiera				Small Scroph			
Hakea undulata	✓			Craspedia sp.				Lagenifera huestlii	✓		
MALLEES Hakea trifurcata	✓			Cassipoua sp	✓			Aragatis arvensis			
Daveora dioricaea	✓							Gaulth (chickweed)			
Tymalium floribundum	✓			GRASSES				Oxalis sp.			
Hakea rissocarpa	✓			Hairy-leaved grass	✓			Triangular-calyx Dactyloctenium			
Coastalis acutifolia				Briza maritima minor	✓			Levenhookia pusilla			
SHRUBS				Aiva myrtilloides	✓			Daucus glaucioides			
Phyllanthus calycinus	✓			Drosera rotundifolia				Pimelia sp			
Macleayia neidii	✓			Neurachne alopecuroides	✓			SEDGES			
Xanth. oreisii	✓			Tetrasphaera laevis				Loxocarya flexuosa			
Gomph. marginatum	✓			Stipa sp.				Lomandra micrantha	✓		
Acacia pulchella	✓							dep. angustatum??			
Dampiera alata → a. uliginosa	✓							dep. terete smooth	✓		
Dampiera linearis				HERBS				Hypochaeris large white	✓		
Crucigerum sp. pinnatifidum				Senecio sp.	✓			Small Lomandra			
Conostylis aculeata				Olearia praeclatata	✓			Isoboma hypochaerifolia	✓		
Velutia?	?			Xanthosia candidans	✓			Daucus glaucioides			
Trinacria filioza	✓			Hydrocotyle sp 11 → Hom. hom.				Acacia pulchella	✓		
				Arthropodium sp.				Hypochaeris angustifolia	✓		
↓ Bexiala prismatica				E. calobrylla (seedling)	✓			Stylidium piliferum			
= ADS				Agrostoidium scabrum				Gardenia caerulea	R		
				Orobancha minor				Panthoria sp	R		
				Hibbertia commutata	✓			Aiva sp	R		
lots of small				Gomph. marginatum	R			Asteroma pallidum	R		
Caesia-like herbs - unid											
No fls											

*prob yellow-fl. herb
Linum trigynum*

*No Neurachne
on record!*

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN067

Record on Sheet

Date 21.11.96

16.12.96 (Rescore)

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus wandoo</i>	✓		✓R	<i>Dimalea</i> sp?	✓			<i>Dampiera alata</i>	✓	✓	✓R
<i>Eucalyptus calophylla</i> (seedling)	✓		✓R					<i>Stylidium hispidum</i>	✓	✓	✓R
								<i>Goodenia caerulea</i>	✓	✓	✓R
								<i>Caesia micrantha</i>	✓	✓	✓R
								<i>Dampiera linearis</i>	✓	✓	✓R
								<i>Lagenifera huegelii</i>	✓	✓	✓R
								<i>Chamaecilla conyrosa</i>	✓	✓	✓R
								<i>Scaevola calyptera</i>	✓	✓	✓R
				GRASSES				<i>Xanthoxia candida</i>	✓	✓	✓R
				<i>Aira canophyllea</i>	✓	✓	✓R	<i>Orobanch minor</i>	✓	✓	✓R
				<i>Briza minor</i>	✓	✓	✓R	<i>Eragrostis pinnatifidum</i>	✓	✓	✓R
				<i>Dantharia setacea</i>	✓	✓	✓R	<i>Hypochaeris glabra</i>	✓	✓	✓R
<i>Grevillea pilulifera</i>	✓		✓R	<i>Vulpia bromioides</i>	✓	✓					
<i>Astragalus pallidum</i>	✓	✓		<i>Microlaena stipioides</i>	✓	✓	✓R	SEDGES			
<i>Haakea lissocarpa</i>	✓		✓R	<i>Stipa pycnostachya</i>	✓	✓	✓R	<i>Tetraria octandra</i>	✓	✓	
<i>Daviesia horrida</i>	✓		✓R	<i>Dicholoma crinita</i>	✓	✓		<i>Desmodium aspera</i>	✓	✓	
<i>Gomphidium marginatum</i>	✓		✓R	<i>Neorachne alpeceumboides</i>	✓	✓					
<i>Homocidus foliosa</i>	✓		✓R								
<i>Tymalium ledifolium</i> var <i>rosmarinifolium</i>	✓		✓R	HERBS							
<i>Hibbertia hypericoides</i>	✓	✓	✓R	<i>Centaurium erythraea</i>	✓	✓	✓R	<i>Isotoma hypocrateriformis</i>	✓	✓	✓R
<i>Phyllanthus calycinus</i>	✓		✓R	<i>Conostylis aculeata</i> subsp <i>preissii</i>	✓	✓	✓R	<i>Lomandra spartea</i> ?	✓	✓	
<i>Hypocalymma angustifolium</i>	✓		✓R	<i>Acanthophrasinum scabrum</i>	✓	✓	✓R	<i>Cassipourea glabella</i>	✓	✓	✓R
<i>Haakea undulata</i>	✓	-	✓R	<i>Picorhiza elatior</i>	✓	✓	✓R	<i>Lomandra brittanii</i>	✓	✓	✓R
<i>Haakea trifurcata</i>	✓	-	✓R	<i>Olearia paucidentata</i>	✓	✓	✓R	<i>Lomandra micrantha</i>	✓	✓	✓R
<i>Macraemia viedii</i>	✓	-	✓R	<i>Centropus aristata</i>	✓	✓	✓R	<i>Senecio diaschideus</i>	✓	✓	✓R
<i>Xanthorrhoea preissii</i>	✓	-	✓R	<i>Daucus glaberrimus</i>	✓	✓	✓R	<i>Craspedia variabilis</i>	✓	✓	✓R
<i>Acacia pulchella</i>	✓		✓R	<i>Levenhookia pusilla</i>	✓	✓	✓R	<i>Vellaea trinervis</i> ?	✓	✓	✓R
<i>Hibbertia communata</i>	✓		✓R	<i>Centropus drummondiana</i>	✓	✓	✓R	<i>ADS: Bossiaea eicarpa</i>	✓	✓	✓R
				<i>Galium divaricatum</i>	✓	✓	✓R	<i>Prosera stolonifera</i>	✓	✓	✓R
				<i>Amagalis anensis</i>	✓	✓	✓R	<i>Arthropodium capillipes</i>	✓	✓	✓R
				<i>Homaloscadium homalocarpium</i>	✓	✓	✓R	<i>Levenhookia stipitata</i>	✓	✓	✓R
				<i>Phalangium paradoxia</i>	✓	✓	✓R	<i>Parentucellia latifolia</i>	✓	✓	✓R
								<i>Oralis peruviana</i>	✓	✓	✓R

21.11.96

Allowing for the 4.3:1 ratio in trapping effort (10688:2476, from Table RR1), the tubes were more effective than the buckets in capturing frogs, geckos, pygopids, skinks and goannas, but buckets were better for dragons and snakes. A species-by-species comparison (Appendix TT), didn't reveal many strong biases in capture rates (by a factor of three or more after correction for differences in trapping effort):

- ♦ 14 species favoured tubes (*Arenophryne rotunda*, *Cyclorana maini*, *Litoria rubella*, *Neobatrachus wilsmorei*, *Diplodactylus pulcher*, *Gehyra variegata*, *Nephrurus levis*, *Rhynchoedura ornata*, *Lerista uniduo*, *L. muelleri*, *Ctenotus schomburgkii*, *C. iapetus*, *C. hanloni* & *C. hanloni*).
- ♦ 5 species favoured buckets (*Ctenophorus femoralis*, *Lerista elegans*, *L. planiventralis*, *Menetia greyi* & *Demansia calodera*).

Because the tubs were used in May 1995 only, and were un-fenced, we can make no valid comparison with tubes, buckets or invertebrate pits. However, considering their small installation-effort (1.5 person-hours per quadrat) compared with the time spent hand-foraging (an average of 9 hours per quadrat), the tubs yielded a surprisingly high return in small *Ctenotus* and *Lerista* species, and in sub-adult dragons (Appendix TT).

Overall, hand-foraging added only 21 species to the 114 species derived from the trapping program (16% of the 135 species total), and most of those were snakes or pygopids: no dragons, no goannas, one frog (8% of 12 species), two geckos (12%), five skinks (9%), four pygopids (36%) and nine snakes (50%) (Appendix TT). [?? WHAT %'S OF QUADRAT SPECIES-RECORDS].

Historical Review

Prior to our field survey, 144 herpetofaunal species were known from the study area (Tables PF and PR). We found 79% of these extant on our quadrats (114 of 144 species). Our quadrat-based sampling methods were more effective for dragons (94%, 15 of the previous list of 16 species), skinks (82%, 46 of 56), goannas (80%, 4 of 5), geckos (78%, 15 of 18) and pygopids (77%, 10 of 13), than for frogs (71%, 10 of 14) and snakes (68%, 15 of 22).

Table PF. Frogs recorded in the Irwin-Carnarvon study area prior to our survey (from Tyler *et al.* 1994).

Species	Range in W.A.*	1994-6 Survey	Comments
<i>Arenophryne rotunda</i>	northern coastal GS, and Dirk Hartog I.	EL1, ZU1-5	
<i>Neobatrachus sutor</i>	coastal CAR but not west of Lake MacLeod, YAL, southern MUR	BO4, BB5	as N. sp_C
<i>N. pelobatoides</i>	South-west Province (incl. GS), YAL, COO	ZU5	
<i>N. wilsmorei</i>	MUR, YAL, CAR	BB2,4, GJ2-5, MD1,2,4,5,	closed gaps in western part of range

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN 88

Record on Sheet

Date 16.12.96 - Rescore

24.11.96

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus calophylla</i>	✓	-	✓	<i>Hibbertia communata</i>	✓	-	✓	<i>Lomandra nigricans</i>	✓	✓	✓
<i>Eucalyptus marginata</i>	✓	✓	✓	<i>Macroparia riedlii</i>	✓	-	✓	<i>Lomandra hermaphrodita</i>	✓	✓	✓
				<i>Xanthorrhoea preissii</i>	✓	-	✓	<i>Lomandra brittanii</i>	✓	✓	✓
SHRUBS				<i>Xanthorrhoea gracilis</i>	✓	-	✓	<i>Lomandra preissii</i>	✓	✓	✓
				<i>Davea haridii</i>	✓	✓	✓	<i>Lomandra micrantha</i>	✓	✓	✓
				<i>Halca amplexicaulis</i>	✓	-	✓	<i>Lagerflera huegelii</i>	✓	✓	✓
				<i>Synaphea gracillima</i>	✓	✓	✓	<i>Pentapetris belligera</i>	✓	✓	✓
								<i>Thelymitra cinnata</i>	✓	✓	✓
				GRASSES				<i>Haemodorum</i> sp. <i>indef.</i>	✓	✓	✓
				<i>Microseris stipoides</i>	✓	✓	✓	<i>Billardiera parviflora</i> ssp. <i>guttata</i>	✓	✓	✓
<i>Synphelia tenuifolia</i> ?	✓	-	✓	<i>Tetrachena laevis</i>	✓	✓	✓	(sterile, incl. hairs only) - <i>conf.</i>	✓	✓	✓
<i>Opercularia echinocephala</i>	✓	R	✓	<i>Pantheria setacea</i>	✓	✓	✓	SEDGES			
<i>Leucopogon capitellatus</i>	✓	R	✓	<i>Poa homomalla</i>	✓	✓	✓	<i>Tetraria capillaris</i>	✓	✓	✓
<i>Hibbertia amplexicaulis</i>	✓	✓	✓	<i>Dianthus</i> sp.	✓	✓	✓				
				<i>Dichelachne crinita</i>	✓	✓	✓				
<i>Darwinia citriodora</i>	✓	✓	✓								
<i>Halca leucocarpa</i>	✓	✓	✓	HERBS							
<i>Gymnallium ledifolium</i> var. <i>romarinifolium</i>	✓	✓	✓	<i>Dampiera alata</i>	✓	✓	✓				
<i>Hebea coccinea</i>	✓	✓	✓	<i>Senecio leucoglossus</i>	✓	✓	✓				
<i>Isopogon sphaerocephalus</i>	✓	✓	✓	<i>Stylidium amoenum</i>	✓	R	✓				
<i>Leucopogon verticillatus</i>	✓	✓	✓	<i>Orbanchae minor</i>	✓	✓	✓				
<i>Hibbertia hypericoides</i>	✓	✓	✓	<i>Scervola calliptera</i>	✓	✓	✓				
<i>Arctia urophylla</i>	✓	✓	✓	<i>Stachowia monogyna</i>	✓	✓	✓				
<i>Hibbertia hypericoides</i>	✓	✓	✓	<i>Xanthosia candida</i>	✓	✓	✓				
<i>Lopichia pulchra</i>	✓	✓	✓	<i>Dichopogon capillipes</i>	✓	✓	✓				
<i>Hardenbergia comptoniana</i>	✓	✓	✓	<i>Opercularia echinocephala</i>	✓	✓	✓				
<i>Pimelea suaveolens</i>	✓	✓	✓	<i>Paucus gladiolatus</i>	✓	✓	✓				
<i>Xanthorrhoea gracilis</i>	✓	✓	✓	<i>Trichocline spathulatum</i>	✓	✓	✓				
<i>Anthocercis gracilis</i>	✓	✓	✓	<i>Hypochaeris glabra</i>	✓	✓	✓				
<i>Hibbertia mylnei</i>	✓	✓	✓	<i>Stylidium trichomanum</i>	✓	✓	✓				

Stylidium bulbosum (small) 20.11.96

2. Trap design

Appendix TT lists the methods by which the frog and reptile species were captured. It is summarised in Table RR1.

The five invertebrate pits set on each quadrat for one year (ca. 114 000 trap-nights) yielded a total of 150 frog and 1312 reptile specimens (10 frog and 79 reptile species). In comparison, 99 frog and 1653 reptile specimens (9 frog and 91 reptile species) were captured by the vertebrate pit-trap arrays set on the same set of quadrats (excluding tub captures) with 11% of the trapping-effort (13164 tube+bucket-nights). Overall, the invertebrate pits were less effective than the vertebrate pit arrays. Even so, they contributed an average of 1.5 +/- 0.2 (s.e.) species to the quadrat lists.

Relatively few species were captured more commonly by the invertebrate pits than the vertebrate traps (Appendix TT), and nearly all of those were small. For instance, *Arenophryne rotunda* (110 from invertebrate pits : 28 from vertebrate arrays) and *Uperoleia russelli* (6:0) are the smallest of the study area's frogs (snout-vent length less than 33mm). Similarly, *Lerista decora* (10:1), *L. bipes* (7:0), *L. elegans* (159:32), *L. gascoynensis* (10:0), *L. humphriesi* (4:0), *L. kendrickiA* (18:3), *L. lineopunctulataA* (30:9), *Menetia greyiA* (45:18), *M. greyiB* (46:9) and *M. sp_C* (5:0) are amongst the smallest skinks. Considering their relatively large mass, *Ctenotus severus* (5:0) and *Rhamphotyphlops grypusA* (10:2) were exceptions. In terms of their body diameter however, all of these species could pass through the 10mm holes in the wire mesh that covered the invertebrate buckets. The larger species captured by the invertebrate pits were sub-adults, or had forced their way past the edge of the wire mesh. After allowing for the difference in trapping effort (9:1), no species was captured more efficiently by the invertebrate pits.

Table RR1. Number of specimens (and species) of each herpetofaunal group captured by each method. Total trapping effort is listed in terms of trap-nights.

	Tubes	Buckets	Tubes plus Buckets*	Tubs	Invert. Pits	Foraging	Not Specified	Total Species
Frogs	98 (9)	1 (1)	99 (9)	2 (2)	150 (10)	5 (4)	10 (3)	12
Geckos	415 (15)	50 (14)	564 (15)	15 (5)	135 (15)	310 (14)	27 (7)	17
Pygopids	15 (6)	2 (2)	18 (7)	0	3 (2)	15 (7)	0	11
Dragons	258 (14)	75 (12)	357 (15)	45 (9)	85 (9)	176 (15)	22 (6)	16
Skinks	441 (37)	83 (29)	628 (43)	101 (22)	1055 (42)	749 (39)	106 (25)	57
Goannas	43 (4)	7 (3)	58 (4)	1 (1)	3 (2)	16 (3)	1 (1)	4
Snakes	15 (6)	6 (6)	28 (7)	0	31 (7)	51 (14)	3 (1)	18
Totals	1285 (91)	224 (67)	1752 (100)	164 (39)	1462 (87)	1322 (96)	169 (43)	135
Trap-nights	10688	2476	13164	9450	114000			

* The sum of columns_1 and _2 is usually less than the value in column_3 because one of the three field teams did not distinguish between the tubes and the buckets in recording captures by the vertebrate trap arrays during the October 1994 sampling session, and there were occasional lapses by others.

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDNG 9

Record on Sheet

Date 24.11.96

16.12.96 - reserve

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
<i>Eucalyptus marginata</i>	✓		✓	<i>Acacia teretefolia</i>	✓		✓	<i>Paterersonia rudis</i>	✓		✓
<i>Eucalyptus calophylla</i>	✓		✓	<i>Acacia obovata</i>	✓		✓	<i>Paterersonia occidentalis</i>	✓		✓
				<i>Acacia lateriticola</i>	✓		✓	<i>Gonocarpus cordiger</i>	✓		✓
				<i>Pimelea</i> sp.	-			<i>Milldia knuifolia</i> ssp <i>tenuifolia</i>	✓		✓
				<i>Sphaerolobium medium</i>	✓		✓	<i>Cassynia glabella</i>	✓		✓
				<i>Hypocalymma robustum</i>	✓		✓	<i>Cassynia paniciformis</i>	✓		✓
SHRUBS								<i>Lomandra brittanii</i>	✓		✓
<i>Lingia australis</i>	✓		✓					<i>Lomandra nigricans</i>	✓		✓
<i>Xanthorrhoea preissii</i>	✓		✓	GRASSES				<i>Lomandra caespitosa</i>	✓		✓
<i>Dryandra amata</i>	✓		✓	<i>Biza maxima</i>	✓		✓	<i>Lomandra preissii</i>	✓		✓
<i>Xanthorrhoea gracilis</i>	✓		✓	<i>Biza minor</i>	✓		✓	<i>Stylidium carnosum</i>	✓		✓
<i>Gompholobium knightianum</i>	✓		✓	<i>Aira canophylla</i>	✓		✓	<i>Ronulea rosea</i>	✓		✓
<i>Baeckea camphorosmae</i>	✓		✓	<i>Dantharia setacea</i>	✓		✓	<i>Thelymitra viridiflora</i>	✓		✓
<i>Hakea nuscifolia</i>	✓		✓	<i>Dantharia</i> sp.				SEDGES			
<i>Gonocarpus cordiger</i>	✓		✓	<i>Vulpia myuros</i>	✓		✓	<i>Mesomelaena tetragona</i>	✓		✓
<i>Opercularia vaginata</i>	✓		✓					<i>Loxocarya fasciculata</i>	✓		✓
<i>Stylidium brunnianum</i>	✓		✓					<i>Mesomelaena graciliceps</i>	✓		✓
<i>Gompholobium knightianum</i>	✓		✓	HERBS				<i>Haemodorum discolor</i>	✓		✓
<i>Acacia caliptera</i>	✓		✓	<i>Corostylis setosa</i>	✓		✓	<i>Haemodorum laxum</i>	✓		✓
<i>Goodenia caerulea</i>	✓		✓	<i>Thysanotus thursoides</i>	✓		✓	<i>Desmodadus aspera</i>	✓		✓
<i>Dampiera alata</i>	✓		✓	<i>Paterersonia pygmaea</i>	✓		✓	<i>Leptocarya octandra</i>	✓		✓
<i>Hakea stenocarpa</i>	✓		✓	<i>Hypochaeris glabra</i>	✓		✓	<i>Lagenifera meegellii</i>	✓		✓
<i>Thymallium ledifolium</i> var <i>rosmarinifolium</i>	✓		✓	<i>Laxmannia squarrosa</i>	✓		✓	<i>Lomandra spartea</i>	✓		✓
<i>Petroplite striata</i>	✓		✓	<i>Stylidium bulbiferum</i> (uncor.)	✓		✓	<i>Schoenus</i> sp	✓		✓
<i>Hibbertia lupulicoides</i>	✓		✓	<i>Lechonaultia biloba</i>	✓		✓	<i>Lomandra? odida?</i>	✓		✓
<i>Beaufortia macrostemon</i>	✓		✓	<i>Dampiera linearis</i>	✓		✓	<i>Centaurium erythraea</i>			
<i>Kunzea micrantha</i>	✓		✓	<i>Chaenactis linearis</i>	✓		✓				
<i>NE Davea horrida</i>				<i>Stylidium brunonianum</i>	✓		✓				
<i>Dryandra lindleyana</i> <i>lindleyana</i>	✓		✓	<i>Stylidium hispidum</i>	✓		✓				
<i>Andersonia lehmanniana</i>	✓		✓	<i>Stylidium amoenum</i>	✓		✓				
<i>Hibbertia acerosa</i>	✓		✓	<i>Stylidium diuroides</i>	✓		✓				
<i>Sphaerolobium medium</i>	✓		✓								

32 30 55.0 116 00 01.7 4SAT 32 30 56.8 56.4
57.1 00.3 +300 115 59 58.3 58.9 58.3

BUSHLAND PLANT SURVEY RECORDING SHEET 3 - use pencil only

5. SPECIES PRESCENCE

Label each plant with plants number, site code, date and plant's name or working name if required

SITE No NTDN09

Record on Sheet

Date 24.11.96

- Column 1 plant name
- Column 2 plant number
- Column 3 flowering time- TICK if species flowering
- Column 4 identification check

32 30 56.2
115 59 58.3 +300
4SAT

Revised 16.12.96

Lomandra le spartea

TREES	No	FI	ID	SHRUBS (cont.)	No	FI	ID	HERBS (cont.)	No	FI	ID
E. marginata	✓			Miconia dendroidea	✓			Haemodorum sp.	✓		
E. calophylla	✓			Chaenactis sp.				Hypochaeris glabra			
				Petrophile striata				Romulea rosea			
SHRUBS				Dampiera alata	✓			Melilot sp.			
Kingia australis	✓			Gompholobium sp. - knightianum				Aira canyaphyllae			
Hakea strobilacea	✓			6 or leaf				Mulpha?			
MALLEES				Terele-leaf thysanotus sp.				Dampiera alata			
Xan. preissii	✓			Trymallum ledifolium				Cassutha sp.	✓		
Dampiera annata	✓			GRASSES				Thelymitra crinita			
U. Beauportia?	✓			Bred. maxima	✓			Xan. gracilis			
Hibbertia hypericoides	✓			Neurachne doerpcunoides	✓			Lagenia hughii			
SHRUBS				Briza minor	✓			Acacia teretifolia			
Hakea nuscifolia	✓			Andropogon? (NF)				Narrow strap leaf Haemodorum sp.			
A. obovata	✓			Danthonia sp.	✓			SEDGES			
Acacia - sp. under leaf	✓			Gonocarpus cordiger (R)				Tet. octandra	✓		
Acacia latericicola	✓			Andersonia sp. - lehmanniana				Lorocaul fusiculata	✓		
Lechea ulmia biloba	✓							domandra preissii/hemiphradite			
Pterocarpus pygmaea	✓			HERBS				Small domandra sp.			
Luxmannia squarrosa	✓			Dytilidium bulbiferum	✓			Lop. angustatum	✓		
Boeckleria cantharostoma	✓			Styl. pyramidalis	✓			Small Schoenus sp.			
Gompholobium marginatum	✓			Astyl. piliferum	✓			unident thin sedge			
Dryandra nivea	✓			Conostylis setosa				Terele-leaved domandra sp.	✓		
Gomph. knightianum	✓			Gonocarpus cordiger				Mesomelaena tetragona	✓		
Scaevola sp.	✓			Opercularia fragrantum							
Pterisania nudis	✓			Stylidium sp. - yellow whorles	✓			Stylidium antherum/juncum			
Xan. gracilis	✓			Stylidium carnosum				Sphaerolobium median			
Hibb. acerosa								Lomandra sp. - narrow			
Pteris sp.	✓							leaves-			
Linza sp											
				Goodenia caerulea (R)							
				Conostylis setosa (R)							
				Mesomelaena graciliiceps (R)							

-S. median in plot
NTDN06 - (not complete)