

**TARGETED FLORA SURVEY -
LOT 130 ON DEPOSITED PLAN 36979,
MUCKENBURRA**



09 September 2019

PREPARED FOR

Soilzone

on behalf of

Do Huynh 1 Property Holdings
Pty Ltd

PREPARED BY



Woodgis
ENVIRONMENTAL
ASSESSMENT &
MANAGEMENT



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ACKNOWLEDGEMENTS

Woodgis wishes to acknowledge the input of the following in contributing to this document:

ACRONYMS and ABBREVIATIONS

DBCA	Department of Biodiversity, Conservation and Attractions (Western Australia)
DWER	Department of Water and Environmental Regulation
km	kilometre

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SUMMARY

A targeted survey for was undertaken on 27/07/2019 for *Grevillea evanescens* (Priority 1) and *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) across 25.6 hectares within Lot 130 on Deposited Plan 36979, Muckenburra.

The timing was appropriate, as both target species were in flower at previously recorded nearby sites.

The site was surveyed along traverses at 50 metre spacing, which equated to a minimum of 58 % of the site being directly searched, based on the minimum distance the targeted plants would have been visible (if present).

No *Grevillea* species were observed onsite, and no species that appropriately qualified and experienced personnel would consider 'similar' were present.

Two *Leucopogon* species were present onsite, one of which was *Leucopogon squarrosus* subsp. *trigynus* (Priority 2). The identification of the taxon was confirmed from specimens by Mike Hislop at the Western Australian Herbarium. Mike Hislop was the person responsible for the formal description of the taxon.

Within the property, *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) was largely restricted to a small open depression, with vegetation indistinct from that throughout the remainder of the survey area. Most plants (20 plants) were within a 30 metre x 30 metre area, with only 1 plant outside this area, 220 metre north on the firebreak.

Whilst the property was comprehensively surveyed, the population not comprehensively surveyed. *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) was abundant to the south and east of the survey area. There were hundreds of plants immediately south of Quin Rd (extending more than 100 metres south and east) in Gngangara-Moore River State Forest. Recruitment had occurred south of Quin Road with many small (but flowering) plants. The trigger for this recruitment was unclear as there was no evidence of recent fire, and the plants were not restricted to depressions as they were in the survey area.

Leucopogon squarrosus subsp. *trigynus* is a local endemic, with confirmed records over a range of approximately 30 km north-south by 30 km east-west. There were previously 8 locations of *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) within 15 km of the property, with the taxon recorded as locally abundant/common at the 4 locations where abundance / frequency was noted.

1. INTRODUCTION

1.1. Scope

Soilzone, on behalf of Do Huynh 1 Property Holdings Pty Ltd, engaged Woodgis to survey for *Grevillea evanescens* (Priority 1) and *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) within Lot 130 on Deposited Plan 36979, Muckenburra. 'Priority' categories are defined in Appendix 1.

This was in response to a request to do so in an email regarding Clearing Permit Application - CPS 7698/1 from Ray Carvalho (Environmental Officer, Native Vegetation Regulation, DWER) on 11/10/2018.

1.2. Survey Site

The property is located on the northern boundary of the Gngangara-Moore River State Forest, on the northeast corner of the intersection of Military and Quin Roads, approximately 20 km west of Gingin, as shown in Figure 1.

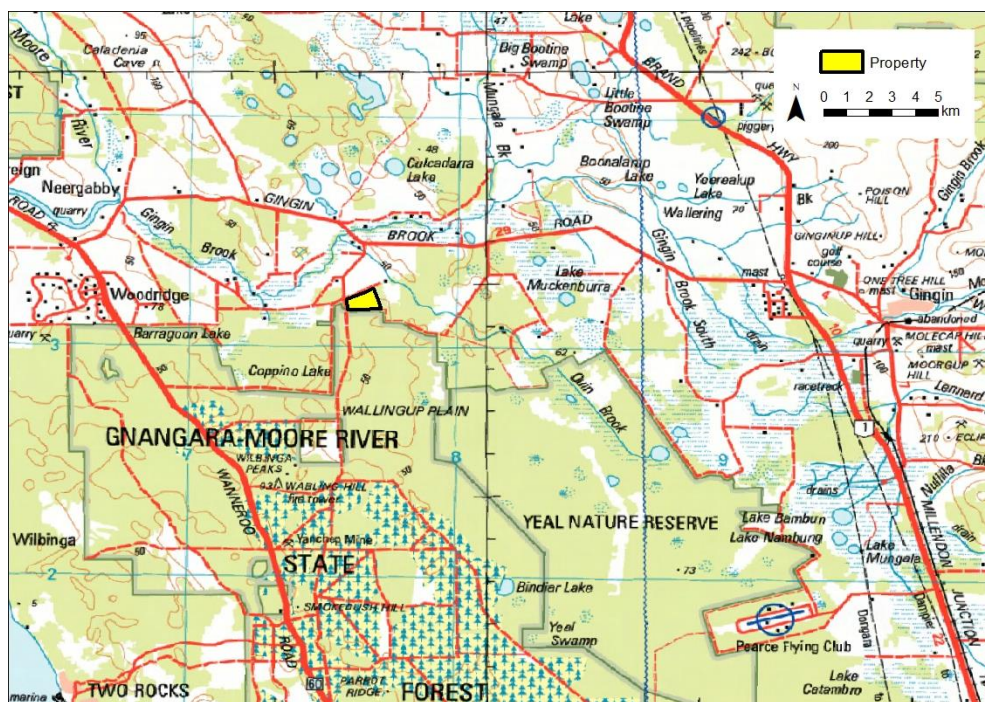


Figure 1: Location of Property

The 25.6 hectare survey area, within Lot 130 on Deposited Plan 36979, Muckenburra is shown in Figure 2.

It is noted that the most recent aerial image available from Landgate is used in this report, but the western portion of the property has been developed for market gardening since that image was captured in December 2017.

The vegetation onsite had previously been described by DWER (2017) as comprising ‘scattered *Banksia menziesii*, *Banksia attenuata* and *Eucalyptus tottiana* over *Xanthorrhoea preissii*, *Adenanthos cygnorum*, *Jacksonia* sp., *Stirlingia latifolia*, *Hibbertia hypericoides*, *Conostephium pendulum* and weed species. Other areas in a completely degraded (Keighery, 1994) condition comprise of scattered *Jacksonia* sp., and *Xanthorrhoea preissii* over weeds’. This description is appropriate for the site, and supported by Photos 1-8, taken at Point A-H in Figure 2.

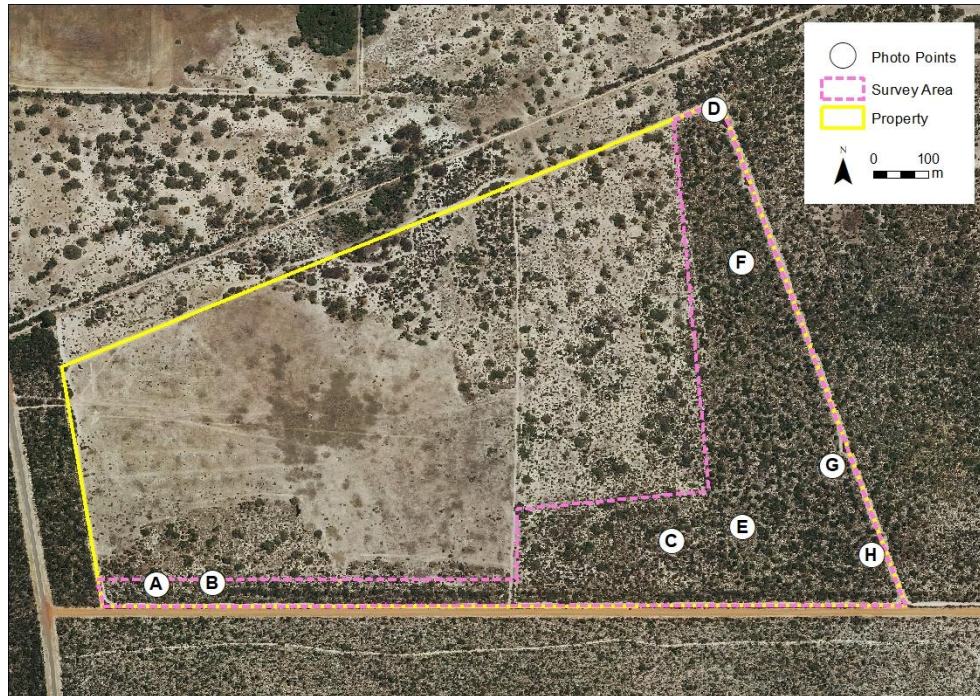


Figure 2: Photo Points in Survey Area



Photo 1: Point A



Photo 5: Point E



Photo 2: Point B



Photo 6: Point F



Photo 3: Point C



Photo 7: Point G



Photo 4: Point D



Photo 8: Point H

2. METHOD

2.1. Survey Timing

The survey was undertaken on 27/07/2019. The timing was appropriate as both target species were in flower at previously recorded nearby sites, as shown for *Grevillea evanescens* (Priority 1) in Photo 9 and Photo 10, and *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) in Photo 11.



Photo 9: *Grevillea evanescens* (Priority 1) flowering 27/07/19 on Gingin Brook Road



Photo 10: *Grevillea evanescens* (Priority 1) flowering 27/07/19 on Military Road



Photo 11: *Leucopogon squarrosus* subsp. *trigynus* flowering 27/07/19 on Eldorado Road

2.2. Survey Intensity

The site was surveyed along traverses at 50 metre spacing. This constitutes a minimum of 58 % of the site being directly searched as at the time of the survey the targeted plants would have been visible (if present) from a minimum of 10 metres in the survey area (Figure 3).

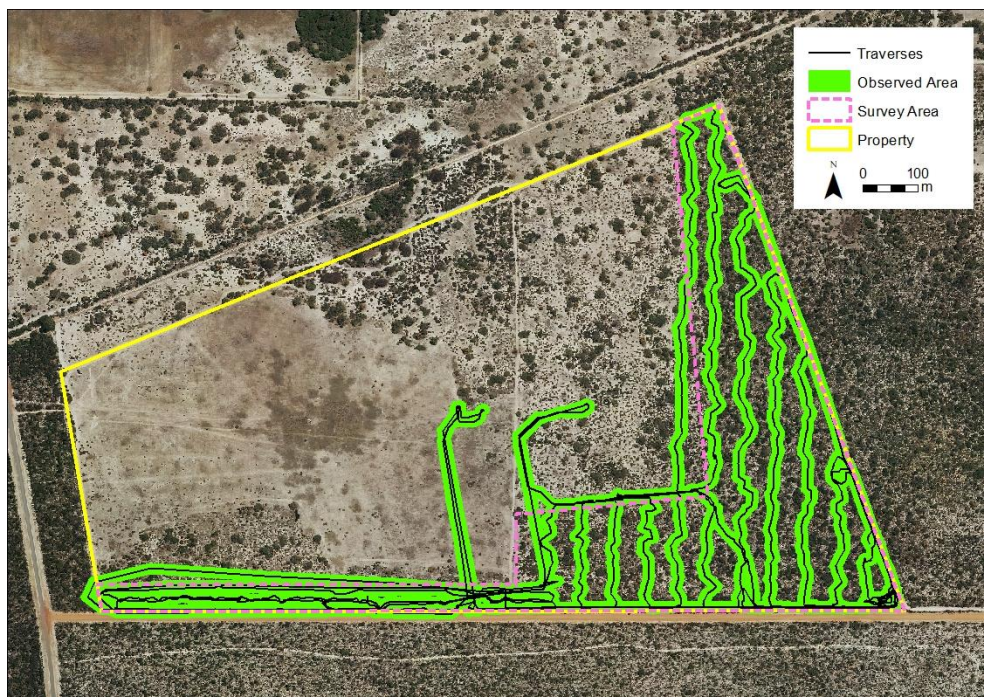


Figure 3: Survey Traverses

2.3. Personnel

The personnel involved in this survey were appropriately qualified and experienced. The qualifications, experience and roles of the personnel involved are summarised in Table 1.

2.4. Results

No *Grevillea* species were observed onsite, and no species that appropriately qualified and experienced personnel would consider 'similar' were present.

Two *Leucopogon* species were present onsite, one of which was *Leucopogon squarrosus* subsp. *trigynus* (Priority 2), and the other was *Leucopogon conostephioides* s. str.

There are two subspecies of *Leucopogon squarrosus* recognised, which vary mainly in small differences in flowers (locule number and style length) (Hislop, 2011). The identification of the taxon was confirmed from four specimens by Mike Hislop (2019) at the Western Australian Herbarium. Mike Hislop was the author of the formal description of the taxon in *New, locally endemic taxa in Leucopogon (Ericaceae: Styphelioideae: Styphelieae) from the Perth and midwest regions of Western Australia* (Hislop, 2011).

A copy of the *Threatened and Priority Flora Report Form* to be submitted to DBCA is provided in Appendix 2 and specimen 'AKW2019001' was formally lodged with the Western Australian Herbarium.

The co-ordinates of the 21 plants of *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) are listed in Table 2.

Table 2: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Co-ordinates

Number of Plants	Specimens	Latitude	Longitude	Easting (GDA94, MGA50)	Northing (GDA94, MGA50)
1	AKW2019001	-31.3431	115.7082	377117	6531657
1	AKW2019002	-31.341	115.7077	377065	6531881
2	AKW2019003	-31.343	115.7084	377137	6531666
6	AKW2019004	-31.3432	115.7083	377125	6531641
3		-31.3431	115.7082	377113	6531656
4		-31.3431	115.7085	377140	6531648
4		-31.3431	115.7083	377126	6531655

The population within the property was largely restricted to a small open depression, with vegetation indistinct from that throughout the remainder of the survey area. Most plants (20 plants) were within a 30 metre x 30 metre area, with only 1 plant outside this area, 220 metres north on the firebreak Figure 4.

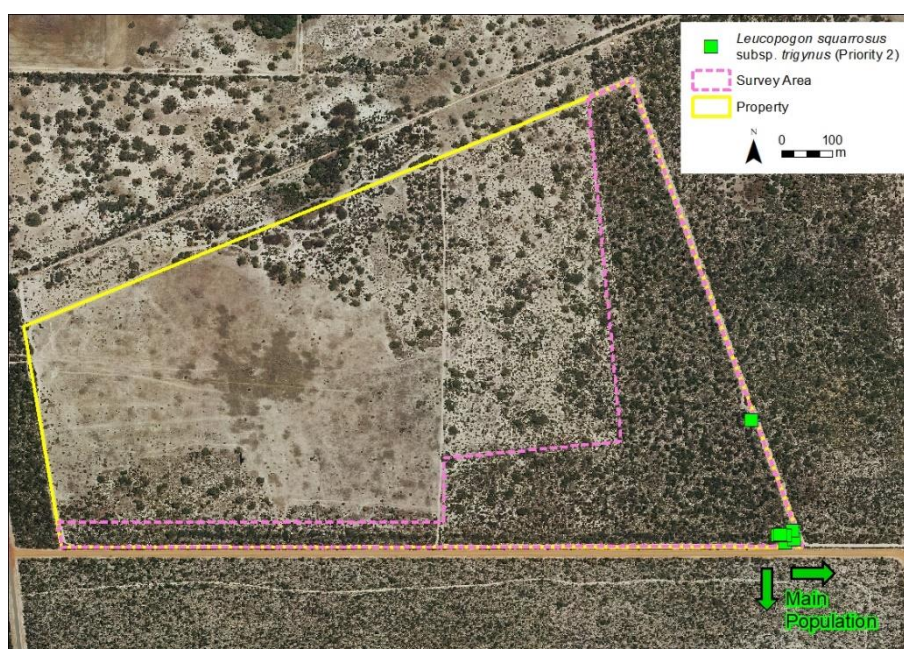


Figure 4: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Occurrences in Property

Whilst the property was comprehensively surveyed, the population not comprehensively surveyed. *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) was abundant to the south and east of the survey area. There were hundreds of plants immediately south of Quin Rd (extending more than 100 metres south and east) in Gngara-Moore River State Forest. Recruitment had occurred south of Quin Road with many small (but flowering) plants. The trigger for this recruitment was unclear as there was no evidence of recent fire, and the plants were not restricted to depressions as they were in the survey area.

The habitat (part of which was disturbed and part of which was not disturbed), habit, flowering and a specimen are shown in Photo 12 to Photo 15.



Photo 12: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Habitat



Photo 13: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Habit



Photo 14: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Flowers



Photo 15: *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) Specimen AKW2019001

Leucopogon squarrosus subsp. *trigynus* (Priority 2) is a local endemic, with confirmed records over a range of approximately 30 km north-south by 30 km east-west. There were previously 8 locations of *Leucopogon squarrosus* subsp. *trigynus* (Priority 2) within 15 km of the property's centroid recorded in DBCA's Threatened and Priority Flora database and the Western Australian Herbarium Specimen database (DBCA, 2019). The taxon was recorded as locally abundant/common at the 4 locations where abundance / frequency was noted. The taxon is abundant adjacent to the survey area in the Gngangara-Moore River State Forest.

REFERENCES

- DBCA. (2019). *Request for Threatened and Priority Flora Information: 19-0719FL*. Perth: Species and Communities Program: Department of Biodiversity, Conservation and Attractions.
- DWER. (2017). *Site Inspection Report for Clearing Permit Application CPS 7698/1. Site inspection undertaken 1 August 2017 (DWER Ref A1517742)*. Perth: Department of Water and Environmental Regulation.
- Hislop, M. (2011). New, locally endemic taxa in *Leucopogon* (Ericaceae: Styphelioideae: Styphelieae) from the Perth and midwest regions of Western Australia. *Nuytsia*, 21(2), 75-89.
- Hislop, M. (2019). *FW: Leucopogon squarrosus subsp. trigynus P2*. Identification Botanist, WA Herbarium, DBCA: email, 06/09/2019.

APPENDIX 1: DBCA FLORA SIGNIFICANCE CODES

Threatened Flora (Declared Rare Flora - Extant Taxa)

Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.

Presumed Extinct Flora (Declared Rare Flora – Extinct)

Taxa which have been adequately searched for and there is no reasonable doubt that the last individual has died, and have been gazetted as such.

Priority One: Poorly-known taxa

Taxa that are known from one or a few collections or sight records (generally less than five), all on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, Shire, Westrail and Main Roads WA road, gravel and soil reserves, and active mineral leases and under threat of habitat destruction or degradation. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes.

Priority Two: Poorly-known taxa

Taxa that are known from one or a few collections or sight records, some of which are on lands not under imminent threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. Taxa may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes.

Priority Three: Poorly Known taxa

Taxa that are known from collections or sight records from several localities not under imminent threat, or from few but widespread localities with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Taxa may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and known threatening processes exist that could affect them.

Priority Four: Rare, Near Threatened and other taxa in need of monitoring

(a) Rare. Taxa that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.

(b) Near Threatened. Taxa that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.

(c) Taxa that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Priority Five: Conservation Dependent taxa

Taxa that are not threatened but are subject to a specific conservation program, the cessation of which would result in the taxa becoming threatened within five years.

APPENDIX 2: THREATENED AND PRIORITY FLORA REPORT FORM

Attached next two pages



Threatened and Priority Flora Report Form

Version 1.3 August 2017

Please complete as much of the form as possible, with emphasis on those sections bordered in black. For information on how to complete the form please refer to the Threatened & Priority Flora Report Form (TPRF) manual on the DBCA website at <http://dpaw.wa.gov.au/> under *Standard Report Forms*

TAXON: <u>Leucopogon squarrosus subsp. trigynus</u>	TPFL Pop. No: _____
OBSERVATION DATE: <u>27/07/2019</u>	CONSERVATION STATUS: <u>P2</u> New population <input checked="" type="checkbox"/>
OBSERVER/S: <u>Andrew Waters</u>	PHONE: <u>0403318284</u>
ROLE: <u>Ecologist</u>	ORGANISATION: <u>Woodgis</u>

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): <u>Lot 130 on Deposited Plan 36979, Muckenburra</u> <u>approx. 15 metres north of Quin Road, approx. 1.3 km east of Military Rd</u>	
Reserve No: _____	
DBC DISTRICT: <u>Swan Coastal</u>	LGA: <u>Shire of Gingin</u> Land manager present: <input type="checkbox"/>
DATUM: GDA94 / MGA94 <input checked="" type="checkbox"/> AGD84 / AMG84 <input type="checkbox"/> WGS84 <input type="checkbox"/> Unknown <input type="checkbox"/>	COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees <input checked="" type="checkbox"/> DegMinSec <input type="checkbox"/> UTM <input type="checkbox"/> Lat / Northing: <u>-31.343061</u> Long / Easting: <u>115.70822</u> ZONE: _____
METHOD USED: GPS <input checked="" type="checkbox"/> Differential GPS <input type="checkbox"/> Map <input type="checkbox"/> No. satellites: _____ Map used: _____ Boundary polygon captured: <input checked="" type="checkbox"/> Map scale: _____	
LAND TENURE: Nature reserve <input type="checkbox"/> Timber reserve <input type="checkbox"/> Private property <input checked="" type="checkbox"/> Rail reserve <input type="checkbox"/> Shire road reserve <input type="checkbox"/> National park <input type="checkbox"/> State forest <input type="checkbox"/> Pastoral lease <input type="checkbox"/> MRWA road reserve <input type="checkbox"/> Other Crown reserve <input type="checkbox"/> Conservation park <input type="checkbox"/> Water reserve <input type="checkbox"/> UCL <input type="checkbox"/> SLK/Pole _____ to _____ Specify other: _____	

AREA ASSESSMENT: Edge survey <input type="checkbox"/> Partial survey <input type="checkbox"/> Full survey <input checked="" type="checkbox"/>	Area observed (m²): <u>256,000</u>												
EFFORT: Time spent surveying (minutes): <u>360</u>	No. of minutes spent / 100 m²: _____												
POP'N COUNT ACCURACY: Actual <input checked="" type="checkbox"/> Extrapolation <input type="checkbox"/> Estimate <input type="checkbox"/>	Count method: <u>Individuals</u> (Refer to field manual for list)												
WHAT COUNTED: Plants <input checked="" type="checkbox"/> Clumps <input type="checkbox"/> Clonal stems <input type="checkbox"/>													
TOTAL POP'N STRUCTURE:													
Alive	<table border="1"> <tr> <th>Mature:</th> <th>Juveniles:</th> <th>Seedlings:</th> <th>Totals:</th> </tr> <tr> <td><u>21</u></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Mature:	Juveniles:	Seedlings:	Totals:	<u>21</u>							
Mature:	Juveniles:	Seedlings:	Totals:										
<u>21</u>													
Dead	<table border="1"> <tr> <th>Mature:</th> <th>Juveniles:</th> <th>Seedlings:</th> <th>Totals:</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </table>	Mature:	Juveniles:	Seedlings:	Totals:								
Mature:	Juveniles:	Seedlings:	Totals:										
QUADRATS PRESENT: No. _____ Size _____ Data attached <input type="checkbox"/>	Total area of quadrats (m²): _____												
Summary Quad. Totals: Alive													
REPRODUCTIVE STATE: Clonal <input type="checkbox"/> Vegetative <input type="checkbox"/> Flowerbud <input type="checkbox"/> Flower <input checked="" type="checkbox"/> Immature fruit <input type="checkbox"/> Fruit <input type="checkbox"/> Dehiscent fruit <input type="checkbox"/>	Percentage in flower: <u>100%</u>												

CONDITION OF PLANTS: Healthy ☒ Moderate ☐ Poor ☐ Senescent ☐

COMMENT: _____

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	Current impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• clearing - property subject to clearing application			
Impact rated low as majority of population is outside property to be cleared, in adjacent state forest - see other comments below	L	L	S
•			
•			

Please return completed form to **Species And Communities Branch DBCA**,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.



Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM:	ROCK TYPE:	LOOSE ROCK:	SOIL TYPE:	SOIL COLOUR:	DRAINAGE:
Crest <input type="checkbox"/>	Granite <input type="checkbox"/>	(on soil surface; eg gravel, quartz fields)	Sand <input checked="" type="checkbox"/>	Red <input type="checkbox"/>	Well drained <input checked="" type="checkbox"/>
Hill <input type="checkbox"/>	Dolerite <input type="checkbox"/>		Sandy loam <input type="checkbox"/>	Brown <input type="checkbox"/>	Seasonally inundated <input type="checkbox"/>
Ridge <input type="checkbox"/>	Laterite <input type="checkbox"/>	0-10% <input type="checkbox"/>	Loam <input type="checkbox"/>	Yellow <input type="checkbox"/>	Permanently inundated <input type="checkbox"/>
Outcrop <input type="checkbox"/>	Ironstone <input type="checkbox"/>	10-30% <input type="checkbox"/>	Clay loam <input type="checkbox"/>	White <input type="checkbox"/>	Tidal <input type="checkbox"/>
Slope <input type="checkbox"/>	Limestone <input type="checkbox"/>	30-50% <input type="checkbox"/>	Light clay <input type="checkbox"/>	Grey <input checked="" type="checkbox"/>	
Flat <input type="checkbox"/>	Quartz <input type="checkbox"/>	50-100% <input type="checkbox"/>	Peat <input type="checkbox"/>	Black <input type="checkbox"/>	
Open depression <input checked="" type="checkbox"/>	Specify other: _____		Specify other: _____	Specify other: _____	
Drainage line <input type="checkbox"/>					
Closed depression <input type="checkbox"/>					
Wetland <input type="checkbox"/>					

Specific Landform Element: Lower Slope / Open Depression
(Refer to field manual for additional values)

CONDITION OF SOIL: Dry ☐ Moist ☒ Waterlogged ☐ Inundated ☐

VEGETATION CLASSIFICATION*:

Eg: 1. Banksia woodland (B. attenuata, B. ilicifolia);
2. Open shrubland (Hibbertia sp., Acacia spp.);
3. Isolated clumps of sedges (Mesomelaena tetragona)

1. Open Woodland (Banksia menziesii, Banksia attenuata and Eucalyptus tottiana)
2. Open Shrubland (Xanthorrhoea preissii, Adenanthos cygnorum, Jacksonia floribunda)
3. Open Heathland (Stirlingia latifolia, Hibbertia hypericoides, Conostephium pendulum)
- 4.

ASSOCIATED SPECIES:

Other (non-dominant) spp

Patersonia occidentalis, Dasypogon bromelifolius, Scholtzia involucreta, Petrophile linearis
Lomandra preissii, Lyginia imberbis, Gastrolobium linearifolium, Bossiaea eriocarpa

* Please record up to four of the most representative vegetation layers (with up to three dominant species in each layer). Structural Formations should follow 2009 Australian Soil and Land Survey Field Handbook guidelines – refer to field manual for further information and structural formation table.

CONDITION OF HABITAT: Pristine ☐ Excellent ☒ Very good ☐ Good ☐ Degraded ☐ Completely degraded ☐

COMMENT:

FIRE HISTORY: Last Fire: Season/Month: _____ Year: _____ Fire Intensity: High ☐ Medium ☐ Low ☐ No signs of fire ☒

FENCING: Not required ☒ Present ☐ Replace / repair ☐ Required ☐ Length req'd: _____

ROADSIDE MARKERS: Not required ☒ Present ☐ Replace / reposition ☐ Required ☐ Quantity req'd: _____

OTHER COMMENTS: (Please include recommended management actions and/or implemented actions - include date. Also include details of additional data available, and how to locate it.)

Veneer of bleached white sand over grey sand at site - possibly some seasonal saturation

Complete survey in property but population not comprehensively surveyed

20 plants on property within 30 m x 30m, with 1 plant on firebreak 220 m north

Specimens examined by Mike Hislope at WA Herbarium

100s of plants immediately south of Quin Rd (extends > 100 metres south and east) in Gngangara-Moore River State Forest

Recruitment has occurred south of Quin Road with many small (but flowering) plants - though NO evidence of recent fire

Population south of road not restricted to depression as it was in survey area

ID confirmed by Mike Hislop

DRF PERMIT/ LICENCE No: FB2000073 Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: AKW 2019 201 WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: Report

ATTACHED: Map ☒ Mudmap ☐ Photo ☒ GIS data ☒ Field notes ☐ Other: _____

COPY SENT TO: Regional Office ☐ District Office ☐ Other: _____

Submitter of Record: Andrew Waters Role: Ecologist Signed: _____ Date: 05/08/2019

Please return completed form to **Species And Communities Branch DBCA**,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 OR email to: flora.data@dbca.wa.gov.au

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