

BENTLEY'S FARM

895 Salt River Road

Cranbrook WA

Conservation planning for native remnant vegetation management



Remnant Vegetation Survey Report



September 2023

This project received funding through the Koorabup Trust with additional assistance provided by Green Skills and Gondwana Link.



ACKNOWLEDGEMENTS

Green Skills Inc. gratefully acknowledges permission and support from the landholders, the Bentley's, to be able to undertake this survey as part of planning for the conservation and restoration of the Gondwana Link landscape: <http://www.gondwanalink.org/>

This report was prepared by Melissa Howe B.Sc. (Environmental Management) with input from Green Skills Project Officer, Basil Schur. Maps for the report were designed by Basil Schur and prepared by Maren Heckel.

All photos within the report were taken by Basil Schur and Melissa Howe unless otherwise noted.



A view of the Stirling Range, known as 'Koi Kyenunu-ruff' to the local Koreng people of the Noongar nation lies to the southeast of the property.

Photo: Basil Schur, August 2023

Acknowledgement of Country

Green Skills and the authors of this report would like to acknowledge the Noongar/Nyungar Traditional Custodians of the land on which we live, work, research and enjoy. We wish to pay our respects to the ancestors and Elders and to others for the continuing culture and care of this land.

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1. SUMMARY

A snapshot survey of remnant native vegetation on the Horrocks' property at 895 Salt River Road, Cranbrook WA was undertaken on 22nd August 2023 to identify and prioritise future conservation works and recommend management actions for the property as part of Green Skills and Gondwana Link Program.

A number of areas of remnant vegetation were considered to have high biodiversity and habitat values for native fauna, including the likely occurrence of some nationally threatened species such as Carnaby's Cockatoo, Baudin's Cockatoo and Forest Red-tailed Black-cockatoo (Department of Climate Change, Energy the Environment and Water (DOCCEW), 2023). It should be noted that targeted on-ground surveys for black-cockatoos were not conducted.

The condition of the native remnant vegetation remaining on the property ranged from very degraded to very good (see Appendix 1: Vegetation Condition Scale). A preliminary assessment for the presence of intact areas of Eucalypt Woodlands of the Western Australian (WA) Wheatbelt, a nationally-protected threatened ecological community (TEC), was also undertaken on the property using national criteria (Department of Environment, 2015).

Although no areas of native remnant vegetation met the criteria for this TEC, the remaining woodlands that occur on the property provide vital habitat for many unique native plants and animals.

A preliminary assessment for the presence of Proteaceae Dominated Kwongkan Shrublands of the southeast coastal floristic province of Western Australia ecological community (also known as kwongkan or kwongan), was also undertaken on the property using national criteria (Department of Environment, 2014). Kwongkan Shrubland is a nationally-protected threatened ecological community (TEC) listed as 'endangered'. Patches of Kwongkan Shrubland that would likely satisfy the threshold criteria were identified on the property during this survey.

The native remnant vegetation on the property is worthy of protective conservation management and considered a priority for biodiversity protection because it incorporates areas of native remnant vegetation in good to very good condition, some having good connectivity or close proximity to other areas of native remnant vegetation.

The native remnant vegetation occurring forms part of an important eco-link pathway in the Forest to Stirlings section of Gondwana Link between the Stirling Range National Park in the east to the Walpole Wilderness Area in the west. Connected bushland habitat provides for the movement of many species of native fauna across the landscape, thus preventing loss of biodiversity in conservation reserves and native remnant vegetation connected to these ecological links.

This report recommends that protective conservation works be undertaken on the property to improve the vegetation condition and vegetation and wildlife habitat connectivity in the area. Proposals for conservation and restoration works are provided in Section 8: Conservation and Restoration Project Proposals.

2. SURVEY TEAM

- Basil Schur – Green Skills Inc. Project Manager
- Melissa Howe (BSc Environmental Management) – Ecologist, contracted by Green Skills Inc.



Ecologist, Melissa Howe getting amongst a very good condition patch of shrubland.

Photo: Basil Schur, August 2023.

3. PROPERTY CONTEXT

A snapshot survey of remnant native vegetation on the Bentley's property was undertaken on 22nd August 2023 to identify and prioritise future conservation and eco-restoration works and recommended management actions for the property as part of Green Skills and Gondwana Link Program:

<https://greenskills.org.au/> and <http://www.gondwanalink.org/>

The Bentley's property is situated in the locality of Cranbrook, Western Australia within the Shire of Cranbrook and is located on one land title on 895 Salt River Road, Cranbrook. The surveys took place on Lot 3388 on Deposited Plan 079809 which is 404.6856 hectares.

The property is comprised of numerous separate native remnant vegetation areas, ranging from 0.7 hectares to 55.7 hectares in size. Fourteen native remnant vegetation areas on the property were surveyed totalling 109.55 hectares which incorporated the majority of the native remnant vegetation on the property and some areas of restoration planting. Of the land surveyed, approximately 27% of the property area was native remnant vegetation (*see Section 6: Map 1*).

The property and the land use on the property are currently sheep grazing, cropping and pasture. The property is situated north of Salt River Road and is adjacent to private property farmland to the east, west and south.

The property has a direct linkage to native remnant vegetation on neighbouring property (Horrock's) to the east and some areas of remnant vegetation have direct or close proximity (approximately 100 metres) to other areas of remnant native vegetation to the west. The Stirling Range National Park (R 14792) is an 113,374.4921-hectare area of native remnant vegetation that occurs approximately 3.5 kilometres to the east-south-east of the property (see *Section 6: Map 2*).

Besides these reserves, the land surrounding the property is predominantly farmland with variable sized areas of native remnant vegetation, wetlands and waterways. The survey area for this report lies between approximately 270 and 353 metres above sea level in the Cranbrook-Toolbrunup catchment area in the North Stirling Basin.

The catchment has predominantly been cleared for agricultural activities. In 2018, it was estimated that 35.42% (115,991 hectares) pre-European vegetation remained in the Shire of Cranbrook (Government of Western Australia, 2018) and even less protected in formal reserves. The condition of much of this remaining vegetation, wetlands and waterways is not known or formally protected in reserves from the impacts of clearing, grazing and other agricultural activities.



The Stirling Range, 'Koi Kyenunu-ruff' as seen from the Bentley's property.

Photo: Basil Schur, August 2023

4. VEGETATION

The property is within the Avon Wheatbelt Interim Biogeographic Regionalisation for Australia (IBRA) region and Wheatbelt P2 (Katanning) IBRA sub-region (Australian Government, 2022).

Seven broad land category systems incorporating twenty-six vegetation associations have been classified in the Shire of Cranbrook (Government of Western Australia, 2018).

Vegetation types were defined in based on dominant flora species as follows:

- Jarrah (*Eucalyptus marginata*) woodland
- Jarrah (*Eucalyptus marginata*) – Wandoo (*Eucalyptus wandoo*) woodland: dominated by Jarrah
- Wandoo (*Eucalyptus wandoo*) – Jarrah *Eucalyptus marginata*) woodland: dominated by Wandoo
- Jarrah (*Eucalyptus marginata*) – Moit/Redheart (*Eucalyptus decipiens*) woodland
- Yate (*Eucalyptus occidentalis*) – Wandoo (*Eucalyptus wandoo*) woodland
- Riparian Flat-topped Yate (*Eucalyptus occidentalis*) woodland
- Wandoo (*Eucalyptus wandoo*) woodland (small patches)
- Flooded Gum (*Eucalyptus rudis*) woodland
- Kwongkan Shrubland, patches that may qualify as a threatened ecological community

There were patches of remnant vegetation on the Bentley's property that may satisfy the threshold criteria to be considered part of the 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia' (Kwongkan Shrubland), a nationally-protected threatened ecological community listed as 'endangered.'

Kwongkan Shrublands are a type of heathland found on the coastal plains of Western Australia. The name is derived from the language of the Noongar people and means 'sand' or 'sandplain.' The ecological community is dominated by flowering shrub species from the Proteaceae family such as *Adenanthos*, *Banksias*, *Grevilleas*, *Hakeas*, *Petrophiles*, *Isopogons* and *Lambertias*. The Proteaceae species present within the ecological community vary considerably across its range and comprises shrublands, sometimes with a mallee woodland canopy present.

Further vegetation surveys to determine the extent of these areas on the property would be warranted. Sandiford (2012) undertook comprehensive surveys for Proteaceous rich vegetation in the Forest to Stirlings section of Gondwana Link and some of the vegetation units occurring adjacent to the Bentley's property were part of this survey.

Additional vegetation units based on the descriptions of Sandiford (2012) were identified as follows:

- Wandoo/Jarrah over *Banksia sessilis* Tall Open Shrubland
- Wandoo (*Eucalyptus wandoo*) and/or Jarrah (*Eucalyptus marginata*) Woodland to Low Open Woodland over *Banksia armata* Low Shrubland

An assessment of the presence of patches of Eucalypt Woodlands of the WA Wheatbelt was undertaken. They are currently listed as a Threatened Ecological Community (TEC) classified as 'critically endangered' and protected under Australia's national environment law, the Environment Protection and Biodiversity Conservation (EPBC) Act 1999, effective from the 4th December 2015 (Department of Environment, 2015).

There were no areas of remnant native vegetation on the property that satisfied the national criteria to be identified as part of the Eucalypt Woodlands of the WA Wheatbelt, a nationally protected threatened ecological community. The patches that were identified as Wandoo woodland were too small and/or degraded to meet threshold conditions for this community (Department of Environment, 2015).

This report includes recommendations for all remnant native vegetation areas to be retained to provide ecological linkages with adjacent remnant native vegetation within the Forest to Stirlings section of Gondwana Link between the Stirling Range National Park in the east to the Walpole Wilderness Area in the west (see *Section 8: Conservation and Restoration Project Proposals*).



This patch within the 55.7-hectare remnant vegetation site is rich in proteaceous species likely to qualify as part of the Kwongkan Shrubland, a nationally-protected Threatened Ecological Community listed as 'endangered'.

Photo: Basil Schur, August 2023.



This patch of Wandoo (*Eucalyptus wandoo*) woodland is in degraded condition and would not qualify as part of the nationally-protected Eucalypt Woodlands of the WA Wheatbelt, listed as a critically endangered Threatened Ecological Community. Photo: Basil Schur, August 2023.

Table 1: Remnant Vegetation by area and perimeter

MAP ID	AREA (ha)	PERIMETER (m)	PROPOSED FENCING (m)
1	55.7	3386	1637
2	2	566	492
3	14.5	2672	2672
4	1	443	277
5	0.9	414	414
6	5.7	1189	1189
7	2.9	805	507
8	2.7	936	936
9	0.7	361	361
10	0.8	367	367
11	1	378	378
12	2.4	746	480
13	18	1966	1633
14	1.25	540	540
TOTAL	109.55 hectares	14,769 metres	11,883 metres



WA Christmas Tree (*Nuytsia floribunda*) is known as ‘moodjar’ to the Noongar people. It is a semi-parasitic plant relying on the nutrients of other plant species for its survival.

Photo: Basil Schur, August 2023.

5. SURVEY METHODS

A snapshot vegetation survey was undertaken on the Bentley's property in the locality of Cranbrook assessing a range of core attributes for numerous remnant native vegetation sites. Thirteen native remnant vegetation sites were surveyed on the property.

Core attributes selected and assessed included vegetation type, vegetation condition, size and perimeter of the remnant native vegetation, presence of Threatened or Priority Ecological Communities, Threatened, Specially Protected and/or Priority flora and fauna species (if known), presence of wetlands or waterways, connectivity to other vegetation and observed or potential disturbances and threats.

The sites containing remnant native vegetation were assessed for their vegetation condition. The vegetation condition assessment was adapted from the Keighery Condition Scale (Keighery, 1994) based on a rating of 1 (*Very degraded*) to 5 (*Excellent*) (see *Appendix 1: Vegetation Condition Scale*).

Vegetation types were assigned based on Beard vegetation associations (Beard et al, 2013b) with more detailed identification using dominant vegetation, as well as an assessment for the presence of Eucalypt Woodlands of the WA Wheatbelt using national criteria developed by the Department of the Environment (2015).

Subsequently, a priority rating was assigned to each site ranging from *High* to *Low* for future conservation and restoration works and management actions based on a subjective review of each site's overall core attributes.

Management recommendations and reasons for priority ratings were attributed to each site (see *Section 7: Summary of Survey results and Management recommendations & Section 8: Conservation and Restoration Project Proposals*). Thirteen remnant native vegetation areas on the property were mapped (see *Section 6: Map 1*). Photos were taken for each site assessed and included in *Section 7: Summary of Survey results and Management recommendations*.

Data collected was recorded on vegetation survey sheets developed by Green Skills and consultants for this assessment (see *Appendix 2: Vegetation Snapshot Survey - 2023 Site Data Form*).

Fencing projects have been proposed for protective conservation management works on the property, ranked from high to low priority depending on their attributes (see *Section 8: Conservation and Restoration Project Proposals*).



Kwongkan Shrubland assessed as being in very good condition. Photo: Basil Schur, August 2023.

6. MAPS

MAP 1: BENTLEY'S PROPERTY MAP - REMNANT NATIVE VEGETATION SITES ASSESSED



MAP 2: BENTLEY'S PROPERTY (1) & NEARBY RESERVES



7. SUMMARY OF RESULTS & MANAGEMENT RECOMMENDATIONS

SITE 14: WANDOO-YATE-MELALEUCA WOODLAND & RESTORATION PLANTINGS

Date: 22/08/2023

Recorder/s: Melissa Howe & Basil Schur

Photo numbers

40-43

Connectivity to other bushland (Y/N)

N

Remnant Vegetation

Y

Y/N

Coordinates

E

Restoration/Revegetation

Y

Zone: 50

N

Site Vegetation

Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X	X	
Ground	X				X	X	

Land Formation

Cross box

Level

X

Gentle

Moderate

Cross box

Steep

Very steep

Precipitous

Wetlands/creek present (describe)

Disturbance/Threats

Tick boxes

Animal paths

Y

Stock grazing

N

Flooding

N

Erosion

N

Recent fire (<5 yrs)

N

Weeds

Y

Salinity

Dieback disease

uninterpretable

Other notes

FLORA - DOMINANT SPECIES

Eucalyptus wandoo (Wandoo), *Eucalyptus occidentalis* (Flat-topped Yate), *Melaleuca cuticularis* (Saltwater Paperbark), *Acacia species*, *Gahnia ancistrophylla* (Hooked-leaf Saw Sedge)

FAUNA SPECIES

Brown Falcon, Western Ringneck (28)

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
14	1.25 ha/540 m	Wandoo-Yate-Melaleuca woodland	2 (Degraded)	Low

PHOTOS & DESCRIPTOR



Some restoration planting has been done around Wandoo-Yate-Melaleuca woodland remnant vegetation.



This 1.25-hectare area is a mix of native remnant vegetation and planted local native flora species.



A mature Eucalyptus wandoo (Wandoo) on the edge of the site provides valuable habitat and a source of food for native fauna.



Brown Falcon perching on standing dead (stag) tree within the area of restoration-remnant vegetation.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 14

Fencing: Fenced

Vegetation condition: Degraded (2)

Invasive weed species: Weed species are prevalent within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: Not evident due to lack of susceptible flora species.

Connectivity: No direct connectivity to other areas of native remnant vegetation.

Management recommendations: LOW PRIORITY

NO FENCING PROJECTS PROPOSED AS ALREADY FENCED.

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 13: JARRAH-WANDOO WOODLAND

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	44-66; 159-160	Connectivity to other bushland (Y/N)	Y Neighbouring

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid							
Lower	X				X		
Ground	X				X		

Land Formation Cross box	Level		Gentle		Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)		No, rocky substrate.				

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	Y	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N (historical)	Weeds	Y
	Salinity	N	Dieback disease	Unsure		
Other notes						

FLORA - DOMINANT SPECIES
Eucalyptus marginata (Jarrah), *Eucalyptus wandoo* (Wandoo), *Nuytsia floribunda* (Moodjar/WA Christmas Tree), *Eucalyptus thamnoides* (Brown Mallee), *Banksia sessilis* (Parrot Bush), *Banksia armata* (Prickly Dryandra), *Melaleuca thymoides*, *Hibbertia subvaginata*, *Leptospermopsis erubescens* (Roadside Teatree), *Cryptostylis ovata* (Slipper Orchid), *Chamaescilla corymbosa* (Blue Squill), *Diuris corymbosa* (Common Donkey Orchid), *Drosera* species (Sundew), *Cotula turbinata* (Funnel Weed*), *Hypochaeris radicata* (Flat Weed*), introduced pasture grasses.
 *introduced

FAUNA SPECIES
 Regent Parrot (flyover), Western Ringneck (28), Australian Magpie, Australian Shelduck, Rabbits (scats)

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
13	18 ha/1,966 m	Jarrah-Wandoo woodland	1 (Very degraded) to 2 (Degraded)	Low

PHOTOS & DESCRIPTOR



This 18-hectare Jarrah-Wandoo woodland was assessed as being in very degraded condition due to grazing impacts.



There is minimal understorey flora species remaining within the remnant vegetation.



Stirling Range rocky substrate underlies this Jarrah-Wandoo remnant vegetation.



The hollowed buttress of this old growth Jarrah (*Eucalyptus marginata*) shows evidence of historical fire damage.



This Jarrah-Wandoo woodland remnant vegetation still provides valuable habitat for native fauna.



A very interesting hollow formation in this Jarrah (*Eucalyptus marginata*) tree.



There is some attrition of *Xanthorrhoea* species in the remnant vegetation, potentially due to grazing impacts.



Common Donkey Orchid (*Diuris corymbosa*) occurring amongst the rocky substrate.



Melissa Howe identifying *Melaleuca thymoides* within the Jarrah woodland.



Documenting dominant flora species and the condition of the remnant vegetation.



Hibbertia subvaginata within the Jarrah-Wandoo remnant vegetation.



WA Christmas Tree (*Nuytsia floribunda*) is known as 'moodjar' to the Noongar people. It is a semi-parasitic plant relying on the nutrients of other plant species for its survival.



Old growth Jarrah (*Eucalyptus marginata*) is an important native habitat tree in the remnant vegetation.



Wandoo (*Eucalyptus wandoo*) woodland remnant vegetation.



Mature Wandoo (*Eucalyptus wandoo*) provides very important habitat for native fauna.



Very degraded understory within Wandoo woodland remnant vegetation.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 13

Fencing: The majority of the remnant vegetation was unfenced, although a fence runs through some parts of the site.

Vegetation condition: Very degraded (1) to Degraded (2).

- Some good condition mature Jarrah (*Eucalyptus marginata*) and Wandoo (*Eucalyptus wandoo*) with hollows
- Some standing dead (stag) trees which can provide valuable habitat, perching and resting sites
- Heavily grazed with minimal understory flora species remaining
- Evidence of historical fire damage
- Evidence of dead *Xanthorrhoea* species

Invasive weed species: Weed species are prevalent within the remnant vegetation, predominantly introduced pasture grass species.

Pest species: Evidence of rabbits (scats)

Plant disease: Evidence of dead *Xanthorrhoea* species does not necessarily indicate the presence of dieback as if these species are heavily grazed, it can also lead to their decline and death.

Connectivity: Direct connectivity with a smaller area of remnant vegetation on the neighbouring property to the west.

Management recommendations:

LOW PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 10: FLOODED GUM WOODLAND & ACACIA SPECIES PLANTINGS

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	67-68	Connectivity to other bushland (Y/N)	N

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation	Y		Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid							
Lower							
Ground	X				X	X	

Land Formation Cross box	Level	X	Gentle		Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	Y	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	N		
Other notes						

FLORA - DOMINANT SPECIES
Eucalyptus rudis (Flooded Gum), planted Acacia species.

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
10	0.8 ha/367 m	Flooded Gum woodland Acacia species plantings	1 (Very degraded)	Low

PHOTOS & DESCRIPTOR



Mature remnant Flooded Gum (*Eucalyptus rudis*) and planted Acacia species.



This site was assessed as being in very degraded condition.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 10

Fencing: Unfenced

Vegetation condition: Very degraded (1)

- Some good condition mature Flooded Gum (*Eucalyptus rudis*) provide valuable habitat for native fauna.

Invasive weed species: Weed species are prevalent within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: Not evident due to lack of susceptible species.

Connectivity: No direct connectivity with other areas of remnant vegetation.

Management recommendations:

LOW PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation.

See Section 8: Conservation and Restoration Project Proposals.

SITE 11: JARRAH-WANDOO-YATE WOODLAND (assessed remotely)

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	70-71; 155-156	Connectivity to other bushland (Y/N)	N

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation

Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid							
Lower	X				X		
Ground	X				X	X	

Land Formation Cross box	Level		Gentle	X	Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats Tick boxes	Animal paths	presumed	Stock grazing	Y	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	Not evident		
Other notes						

FLORA - DOMINANT SPECIES

Eucalyptus wandoo (Wandoo), *Eucalyptus marginata* (Jarrah), *Eucalyptus occidentalis* (Flat-topped Yate).

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
11	1 ha/378 m	Jarrah-Wandoo woodland	2 – Degraded	Low

PHOTOS & DESCRIPTOR



Site 11 is a small 1-hectare area of remnant vegetation with no direct connectivity to other areas of remnant vegetation.



Jarrah-Wandoo woodland remnant vegetation assessed as being in degraded condition.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 11 (assessed remotely)

Fencing: Unfenced

Vegetation condition: Degraded (2)

- Some good condition mature Wandoo (*Eucalyptus wandoo*), Flat-topped Yate (*Eucalyptus occidentalis*) and Jarrah (*Eucalyptus marginata*)

Invasive weed species: Weed species are prevalent within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: Not evident due to lack of susceptible species.

Connectivity: No direct connectivity with other areas of remnant vegetation.

Management recommendations:

LOW PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation.

See Section 8: Conservation and Restoration Project Proposals.

SITE 3: JARRAH-WANDOO WOODLAND & JARRAH-MOIT WOODLAND

Date: 22/08/2023 **Recorder/s:** Melissa Howe & Basil Schur

Photo numbers	73-92; 132-138; 152	Connectivity to other bushland (Y/N)	N Close proximity to Site 5
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Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation

Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X	X	
Ground	X				X	X	

Land Formation	Level	X	Gentle	X	Moderate	
Cross box	Steep		Very steep		Precipitous	

Wetlands/creek present (describe)

Disturbance/Threats	Animal paths	Y	Stock grazing	Y	Flooding	N
Tick boxes	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	N		

Other notes
Rocky substrate
Priority 4 flora species, *Acacia imparilis* documented as occurring.

FLORA - DOMINANT SPECIES

Eucalyptus wandoo (Wandoo), *Eucalyptus marginata* (Jarrah), *Eucalyptus decipiens* (Moit/Redheart), *Eucalyptus ?thamnoides* (Brown Mallee), *Banksia armata* (Prickly Dryandra), *Banksia sessilis* (Parrot Bush), *Banksia grandis* (Bull Banksia), *Nuytsia floribunda* (Moodjar/WA Christmas Tree), *Allocasuarina humilis* (Dwarf Sheoak), *Acacia chrysocephala*, ***Acacia imparilis* (Priority 4 flora)**, *Hibbertia subvaginata*, *Diuris corymbosa* (Common Donkey Orchid), *Drosera pallida* (Pale Sundew), *Drosera erythrorhiza* (Red Ink Sundew), *Leucopogon obovatus* subsp. *revolutus*, *Leptospermopsis erubescens* (Roadside Teatree), *Hemiandra pungens* (Snakebush),

FAUNA SPECIES

Fan-tailed Cuckoo

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
3	14.5 ha/2672 m	Jarrah-Wandoo woodland Jarrah-Moit woodland	3 (Good) – 4 (Very good)	High

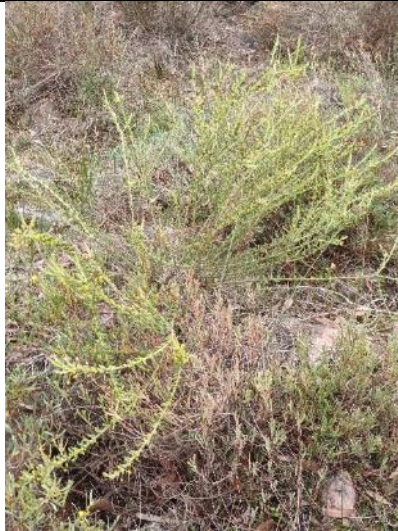
PHOTOS & DESCRIPTOR



View to the Stirling Range National Park from Site 3.



Acacia imparilis, was documented as occurring within this remnant vegetation. It is listed as a Priority 4 species which means it is rare, near threatened or a species in need of monitoring. Photo: B.R. Maslin



Acacia imparilis, was observed growing in Jarrah-Wandoo woodland and is listed as a Priority 4 species. Photos: Melissa Howe



Small area of remnant vegetation (not assessed) and dam to the southwest of Site 3.



Small area of remnant vegetation (not assessed) and dam to the southwest of Site 3.



This Jarrah woodland remnant vegetation had a very rocky substrate.



Some deaths of *Xanthorrhoea* species observed, possibly from heavy grazing.



Native shrub species, *Hibbertia subvaginata*.



Very good cover of native shrub and ground layer species occurring in this section of Jarrah woodland.



Moodjar or WA Christmas Tree (*Nuytsia floribunda*).



Dead branches and logs on the ground can provide valuable habitat and cover for native fauna.



Unidentified Mallee (*Eucalypt*) species occurring within the remnant vegetation.



Prickly Dryandra (*Banksia armata*) is a dominant understorey species in this remnant vegetation.



Wandoo (*Eucalyptus wandoo*) woodland is in a more degraded condition in this area.



Flock of sheep sheltering under Jarrah (*Eucalyptus marginata*) trees adjacent to Site 3.



Moit or Redheart (*Eucalyptus decipiens*) has a low open spreading habit and is in very good condition within this site.



The majority of trees had healthy canopies within this remnant vegetation.



The shape of Site 3 has a high edge to area ratio with a 14.5-hectare size and 2,672 metre perimeter.



This section of remnant vegetation in Site 3 has a more degraded understorey.



Some areas within the site have less species diversity in the understorey, although Prickly Dryandra (*Banksia armata*) is prevalent.



A mature Bull Banksia (*Banksia grandis*) in relatively healthy condition is a good indicator that dieback is not present (or not expressing).

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 3

Fencing: Unfenced

Vegetation condition: Degraded (2) to Good (3) to Very good (4)

- **Priority 4 flora:** *Acacia imparilis*, was documented as occurring within this remnant vegetation. It is listed by the Department of Biodiversity, Conservation and Attractions (DBCA) as a Priority 4 species which means it is rare, near threatened or a species in need of monitoring.
- Some very good condition mature Jarrah (*Eucalyptus marginata*), Wandoo (*Eucalyptus wandoo*) and *Eucalyptus decipiens* (Moit/Redheart).
- Some standing dead (stag) trees which can provide valuable habitat, perching and resting sites.
- Good condition understorey of native shrub and ground cover species.
- Evidence of dead Xanthorrhoea species

Invasive weed species: Weed species are moderate within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: Evidence of dead Xanthorrhoea species does not necessarily indicate the presence of dieback as if these species are heavily grazed, it can also lead to their decline and death. A mature Bull Banksia (*Banksia grandis*) in relatively healthy condition is a good indicator that dieback is not present (or not expressing).

Connectivity: No direct connectivity with other areas of remnant vegetation although it has close proximity to Site 5 (<50 metres) on the east side.

Management recommendations:

HIGH PRIORITY FOR FENCING PROJECT

Fencing is recommended to protect native remnant vegetation.

See Section 8: Conservation and Restoration Project Proposals.

SITE 1: KWONGKAN SHRUBLAND & JARRAH-WANDOO WOODLAND			
Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	93-116	Connectivity to other bushland (Y/N)	Y

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper		X				X	X
Mid		X				X	X
Lower		X				X	X
Ground		X				X	X

Land Formation Cross box	Level	X	Gentle	X	Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)		No, upslope.				

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	N Possibly historical	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	Unsure		
	Other notes					

FLORA - DOMINANT SPECIES
Lambertia ericifolia (Heath-leaved Honeysuckle), *Petrophile squamata*, *Daviesia incrassata*, *Hakea prostrata* (Harsh Hakea), *Hakea ambigua*, *Hakea ?preissii* (Needle Hakea), *Melaleuca spathulata* (Pom-pom Honey Myrtle), *Xanthorrhoea platyphylla*, *Banksia sphaerocephala* (Round-fruit Banksia), *Stirlingia latifolia* (Blueboy), *Boronia nematophylla*, *Cyanothamnus ramosus*, *Leporella fimbriata* (Hare Orchid), *Isotropis cuneifolia* (Granny Bonnets), *Exocarpos sparteus* (Broom Ballart), *Hakea corymbosa* (Cauliflower Hakea), *Hakea trifurcata* (Twoleaf Hakea), *Adenanthos cuneatus* (Coastal Jugflower), *Haemodorum spicatum* (Mean/Bloodroot), *Verticordia species*, *Banksia blechnifolia*, *Mesomelaena tetragona* (Semaphore Sedge), *Caladenia reptans* (Little Pink Fairy Orchid), *Pyrorchis nigricans* (Red Beaks), *Xanthosia huegelii* (Heath Xanthosia), *Petrophile species*, *Leucopogon species*.

FAUNA SPECIES
 Bronzewing Pigeon, Regent Parrot, small burrow in sand.

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
1	55.7 ha/3,386 m	Kwongkan shrubland (TEC) Jarrah-Wandoo woodland	4 (Very good)	Low

PHOTOS & DESCRIPTOR



Melissa Howe taking in the very high flora species diversity within this very good condition remnant vegetation.



A view through proteaceous rich remnant vegetation to the Stirling Range in the south-east.



Ecologist, Melissa Howe identifying *Boronia nematophylla* in remnant vegetation.



The light blue-green serrate-leaved Banksia with a ground habit was identified as *Banksia blechnifolia*.



Parrot Bush (*Banksia sessilis*) can provide a valuable nectar source for native fauna, including honey possums, pygmy possums and black-cockatoos.



Kwongkan Shrubland assessed as being in very good condition.



Round-fruit Banksia (*Banksia sphaerocarpa*).



A small rubbish refuse site occurs within the remnant vegetation.



View to the Stirling Range National Park to the south-east.



Jarrah (*Eucalyptus marginata*) with medium-sized tree hollows for native fauna habitat.



Heath-leaved Honeysuckle (*Lambertia ericifolia*) is often a good indicator plant to identify proteaceous rich Kwongkan Shrubland remnant vegetation.



Proteaceous rich patches within this remnant vegetation are likely to be part of the nationally-protected Kwongkan Shrubland threatened ecological community.



Little Pink Fairy Orchid (*Caladenia reptans*) occurs within the remnant vegetation.



A large Hakea (possibly Needle Hakea/*Hakea ?preissii*) and healthy specimens of *Xanthorrhoea platyphylla* in the remnant vegetation.



A small burrow (not suspected to be a rabbit) could potentially belong to a native burrowing mammal.





Good fencing surrounds this area of remnant vegetation.



Cauliflower Hakea (*Hakea corymbosa*) is putting on a bright display of yellow flowers.



A very good condition patch of shrubland within the remnant vegetation.



Melissa standing in Kwongkan Shrubland remnant vegetation with a mix of proteaceous and myrtaceous species dominating.



Melissa getting amongst the shrubland documenting flora species and assessing its potential as Kwongkan Shrubland TEC.



Another potential patch within Sie 1 that could qualify as being part of the Kwongkan Shrubland TEC.



Good fencing surrounds this area of remnant vegetation.



A view to the Stirling Range and the neighbouring Horrocks' property who operate a free range piggery.



The neighbouring native remnant vegetation has very close connectivity to Site 1.



This neighbouring fenced native remnant vegetation is within approximately 100 metres of Site 1.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 1

✦ Patches of Kwongkan Shrubland threatened ecological community potentially identified

Fencing: Fenced

Vegetation condition: Very good (4)

- Likely to qualify threshold criteria to be considered part of the Kwongkan Shrubland, nationally-protected Threatened Ecological Community due to the prevalence of proteaceous rich species.
- Threatened flora, Cranbrook Bell (*Darwinia meeboldii*) occurs on the neighbouring property.
- Healthy *Xanthorrhoea platyphylla* specimens within the remnant vegetation.

Invasive weed species: Weed species are minimal within the remnant vegetation, predominantly introduced pasture grass species confined to the edges or bare patches.

Plant disease: No evidence of dieback was noted, although a more thorough assessment would be warranted due to the presence of highly susceptible species.

Connectivity: Direct connectivity to an approximately 80-hectare area of native remnant vegetation on the neighbouring property (Horrock's) to the east and close proximity (approx. 100 metres) to other areas of remnant native vegetation to the west.

Management recommendations: LOW PRIORITY

NO FENCING PROJECTS PROPOSED AS ALREADY FENCED.

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 2: JARRAH WOODLAND

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	117-123	Connectivity to other bushland (Y/N)	N Close proximity to Site 1, Site 3 & neighbouring remnant vegetation

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X	X	
Ground	X				X	X	

Land Formation Cross box	Level		Gentle	X	Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)		No				

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	Y	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	Unsure		
Other notes						

FLORA – DOMINANT SPECIES
Eucalyptus marginata (Jarrah), *Eucalyptus wandoo* (Wandoo), *Banksia sessilis* (Parrot Bush), *Leptospermopsis erubescens* (Roadside Teatree), *Melaleuca spathulata* (Pom-Pom Honey Myrtle), *Acacia pulchella* (Prickly Moses), *Jacksonia ?furcellata* (Grey Stinkwood), *Hibbertia subvaginata*, *Diuris corymbosa* (Common Donkey Orchid), *Boronia albiflora*, *Chamaescilla corymbosa* (Blue Squill), *Drosera ?macrantha/?pallida* (Sundew).

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
2	2 ha/566 m	Jarrah-Wandoo woodland	3 (Good) to 4 (Very good)	Medium

PHOTOS & DESCRIPTOR



Site 2 in the background behind the Green Skills troopie.



Unfenced 2-hectare area of Jarrah-Wandoo woodland remnant vegetation.



Native shrub species, Prickly Moses (*Acacia pulchella*) is prickly and relatively unpalatable to stock.



There is a good population of Common Donkey Orchid (*Diuris corymbosa*) occurring within the remnant vegetation.



Good condition mature Jarrah (*Eucalyptus marginata*) trees.



Parrot Bush (*Banksia sessilis*) occurs as a tall native understorey species within the remnant vegetation.



Boronia albiflora is a pale pink or white-flowered shrub species up to 1.5 metres tall occurring within the remnant vegetation.



A small patch of *Boronia albiflora* with Acacia in the understorey of this Jarrah-Wandoo woodland.



Observed death of *Xanthorrhoea* species amongst myrtaceous rich native understorey species such as Roadside Teatree (*Leptospermopsis erubescens*).



Boundary road between Site 2 and the neighbouring property to the east.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 2

Fencing: Unfenced

Vegetation condition: Good (3) to Very good (4)

- Good condition mature Jarrah (*Eucalyptus marginata*) and Wandoo (*Eucalyptus wandoo*) trees
- Good recruitment of Eucalypt species
- Diverse native understorey flora species
- Rocky substrate and good leaf litter cover
- Death of *Xanthorrhoea* species observed

Invasive weed species: Weed species are minimal within the remnant vegetation, predominantly introduced pasture grass species confined to the edges.

Plant disease: The death of *Xanthorrhoea* species were observed, although this does not necessarily indicate the presence of dieback as they are also susceptible to death by heaving grazing and damage by the Western Ringneck (28).

Connectivity: No direct connectivity with other areas of remnant vegetation although it has close proximity to Site 1 to the north (<100 metres), Site 3 to the southwest (<150 metres) and a small area of remnant vegetation on the neighbouring property to the east (approx. 50 metres).

Management recommendations:

MEDIUM PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation.

See Section 8: Conservation and Restoration Project Proposals.

SITE 4: JARRAH WOODLAND & KWONGKAN SHRUBLAND

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	124-129	Connectivity to other bushland (Y/N)	Y Neighbouring remnant vegetation (Horrocks')

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X	X	
Ground	X				X	X	

Land Formation	Level	X	Gentle	X	Moderate	
Cross box	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)	No					

Disturbance/Threats Tick boxes	Animal paths	Presumed	Stock grazing	N historical	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y edges
	Salinity	N	Dieback disease	Not evident		
Other notes						

FLORA - DOMINANT SPECIES
 Jarrah (*Eucalyptus marginata*), *Allocasuarina huegeliana* (Rock Sheoak), *Nuytsia floribunda* (Moodjar/WA Christmas Tree), *Banksia sessilis* (Parrot Bush), *Lambertia ericifolia* (Heath-leaved Honeysuckle).

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
4	1 ha/443 m	Jarrah woodland Kwongkan heath (small patch)	3 (Good) – 4 (Very good)	Low

PHOTOS & DESCRIPTOR



Site 4 has direct connectivity to a larger area of remnant vegetation on the neighbouring property to the east (Horrocks').



The small 1-hectare area of native remnant vegetation is fenced.



A small patch of Kwongkan Shrubland was identified within the remnant vegetation.



Native tree species, Rock Sheoak (*Allocasuarina huegeliana*) was identified as occurring within the remnant vegetation.



There is some good recruitment of understorey species at the edge of the remnant vegetation.



Access track adjacent to the small area of remnant vegetation.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 4

- A small patch of Kwongkan Shrubland threatened ecological community potentially identified

Fencing: Fenced.

Vegetation condition:

- Further assessment of a small patch of Kwongkan Shrubland would be required to determine if it would satisfy threshold criteria to be considered part of the nationally-protected Threatened Ecological Community
- Good condition mature Jarrah (*Eucalyptus marginata*) trees
- Some good recruitment of understorey species at the edge of the remnant vegetation

Invasive weed species: Weed species are minimal within the remnant vegetation, predominantly introduced pasture grass species confined to the edges.

Plant disease: No evidence of dieback was noted, although a more thorough assessment would be warranted due to the presence of highly susceptible species.

Connectivity: Direct connectivity to a larger area of remnant vegetation on the neighbouring property to the east (Horrocks').

Management recommendations: LOW PRIORITY

NO FENCING PROJECTS PROPOSED AS ALREADY FENCED.

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 5: JARRAH WOODLAND (assessed remotely)

Date: 22/08/2023 **Recorder/s:** Melissa Howe & Basil Schur

Photo numbers 130-131 **Connectivity to other bushland (Y/N)** N
Close proximity to Site 3

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation

Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower							
Ground	X				X	X weeds	

Land Formation	Level	X	Gentle	X	Moderate	
Cross box	Steep		Very steep		Precipitous	

Wetlands/creek present (describe) No

Disturbance/Threats Tick boxes	Animal paths	Presumed	Stock grazing	Y	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	unsure		

Other notes

FLORA - DOMINANT SPECIES

Eucalyptus marginata (Jarrah), weedy understorey

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
5	0.9 ha/414 m	Jarrah woodland	2 (Degraded)	Low

PHOTOS & DESCRIPTOR



An unfenced, small 0.9-hectare area of Jarrah woodland remnant vegetation was assessed in degraded condition.



A view to the Stirling Range to the southeast of Site 4.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 5 (assessed remotely)

Fencing: Unfenced

Vegetation condition: Degraded (2)

- Good condition mature Jarrah (*Eucalyptus marginata*) provide valuable habitat for native fauna.

Invasive weed species: Weed species are prevalent within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: Unsure as assessed remotely.

Connectivity: No direct connectivity with other areas of remnant vegetation although it has close proximity to Site 3 (<50 metres) on the east side.

Management recommendations:

LOW PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation.

See Section 8: Conservation and Restoration Project Proposals.

SITE 7: WANDOO-JARRAH WOODLAND

Date: 22/08/2023

Recorder/s: Melissa Howe & Basil Schur

Photo numbers	147	Connectivity to other bushland (Y/N)	Y Neighbouring remnant vegetation to the west
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Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower							
Ground	X				X	X	

Land Formation	Level		Gentle	X	Moderate	X
Cross box	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	unsure	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	unsure		
Other notes						

FLORA - DOMINANT SPECIES
Eucalyptus marginata (Jarrah), *Eucalyptus wandoo* (Wandoo), *Eucalyptus decipiens* (Moit/Redheart), *Banksia armata* (Prickly Dryandra), *Banksia sessilis* (Parrot Bush), *Hibbertia subvaginata*, native sedges and rushes, introduced pasture grasses

FAUNA SPECIES
 Western Ringneck (28)

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
7	2.9 ha/805 m	Jarrah-Wandoo woodland	2 (Degraded) – 3 (Good)	Medium (if unfenced)

PHOTOS & DESCRIPTOR



Fence line associated with Site 7



Good condition mature Wandoo trees provide excellent habitat and food sources for native fauna.



Good medium to large hollow in mature Wandoo (*Eucalyptus wandoo*) tree.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 7

Fencing: Unsure if unfenced or partially fenced with Site 6

Vegetation condition: Degraded (2) to Good (3)

- Good condition mature Wandoo (*Eucalyptus wandoo*) trees, some with medium to large hollows, provide excellent habitat and food sources for native fauna.
- Some proteaceous rich understorey species provide an important nectar source to native fauna.

Invasive weed species: Weed species are moderate within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: No evidence of dieback was noted, although a more thorough assessment would be warranted due to the presence of some susceptible species.

Connectivity: Direct connectivity with a similar-sized area of remnant vegetation on neighbouring property to the west.

Management recommendations:

MEDIUM PRIORITY FOR FENCING PROJECT (IF UNFENCED).

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 6: JARRAH-WANDOO WOODLAND

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	93-94; 148-151	Connectivity to other bushland (Y/N)	N Close proximity to Site 7 & Site 9

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X	X	
Ground	X				X	X	

Land Formation Cross box	Level	X	Gentle	X	Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats Tick boxes	Animal paths	Y	Stock grazing	N historical	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y edges
	Salinity	N	Dieback disease	Not evident		
Other notes						

FLORA - DOMINANT SPECIES
Eucalyptus marginata (Jarrah), *Eucalyptus wandoo* (Wandoo), *Eucalyptus decipiens* (Moit/Redheart), *Eucalyptus pleurocarpa* (Tallerack/Blue Mallee), *Eucalyptus species* (mallee), *Banksia armata* (Prickly Dryandra), *Hakea lissocarpha* (Honey Bush), *Exocarpos sparteus* (Broom Ballart), *Leptospermopsis erubescens* (Roadside Teatree), *Hibbertia subvaginata*, *Bossiaea eriocarpa* (Common Brown Pea), *Acacia chrysocephala*, *Stypandra glauca* (Blind Grass), *Caustis dioica*, *Drosera pallida* (Pale Sundew), *Gompholobium knightianum*, *Haemodorum laxum* (Koortinj), *Diuris corymbosa* (Common Donkey Orchid), *Neurachne alopecuroidea* (Foxtail Mulga Grass), *Disa bracteata* (South African Orchid).

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
6	5.7 ha/1,189 m	Jarrah-Wandoo woodland	3 (Good) – 4 (Very good)	High (if unfenced)

PHOTOS & DESCRIPTOR



There is some canopy decline of tree species within this remnant vegetation, but the cause is unknown.



Fenceline surrounding Site 6?



A diverse mix of species occurs within this remnant vegetation, including Tallerack also known as Blue Mallee (*Eucalyptus pleurocarpa*).



Prickly Dryandra (*Banksia armata*) was flowering and produces a good source of nectar for native fauna.



A bloodroot known as 'koortinj' to the Koreng people (*Haemodorum laxum*) has an underground bulb that is like a bush chilli.



Pale Sundew (*Drosera pallida*) is a carnivorous plant and has white flowers.



An unidentified Eucalypt (Mallee) tree species occurring within the remnant vegetation.



An interesting Wattle species, *Acacia chrysocephala* has finished flowering and gone to seed.



Broom Ballart (*Exocarpos sparteus*) is a semi-parasitic small tree.



Honey Bush (*Hakea lissocarpa*) provides a valuable nectar source for native fauna.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 6

Fencing: Not sure if fully fenced.

Vegetation condition: Good (3) to Very good (4)

- A diverse number of tree species occur within this area of remnant vegetation
- Good number of mature Jarrah (*Eucalyptus marginata*) and Wandoo (*Eucalyptus wandoo*) trees
- Highly biodiverse understorey flora species, including proteaceous species that provide a rich source of nectar.

Invasive weed species: Weed species are moderate within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: There is some canopy decline of tree species within this remnant vegetation, but the cause is unknown.

Connectivity:

Management recommendations:

HIGH PRIORITY FOR FENCING PROJECT (IF UNFENCED).

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 8 & 9: WANDOO – JARRAH WOODLAND (assessed remotely)

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	Site 8: 158 Site 9: 153-154 Revegetation (west): 157	Connectivity to other bushland (Y/N)	N Site 8: Close proximity to neighbouring remnant vegetation.

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	?				?	?	
Ground	X				X	X	

Land Formation	Level	X	Gentle	X	Moderate	X
Cross box	Steep	X	Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats	Animal paths	Y	Stock grazing	Site 8: ? Site 9: Y	Flooding	N
Tick boxes	Erosion	N	Recent fire (<5 yrs)	N	Weeds	Y
	Salinity	N	Dieback disease	Not evident		
Other notes						

FLORA - DOMINANT SPECIES

Eucalyptus marginata (Jarrah), *Eucalyptus wandoo* (Wandoo)

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
8 & 9	Site 8: 2.7 ha/936 m Site 9: 0.7 ha/361 m	Wandoo-Jarrah woodland	Site 8: 3 (Good) Site 9: 2 (Degraded)	Site 8: High (if unfenced) Site 9: Low

PHOTOS & DESCRIPTOR



Site 8 (assessed remotely). Good condition Wandoo-Jarrah woodland with a moderate slope.



Site 9 (assessed remotely): Small 0.7-hectare unfenced area of native remnant native vegetation. Assessed as a low priority for fencing project due to degraded condition and small size.



View to Site 3 and the Stirling Range from Site 9.



Revegetation site to the west of Site 9.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 8 & 9

Fencing:

Site 8 (assessed remotely): possibly fenced?

Site 9: Unfenced

Vegetation condition:

Site 8: Good (3)

Site 9: Degraded (2) to Good (3)

Invasive weed species:

Site 8: Not assessed

Site 9: Weed species are moderate within the remnant vegetation, predominantly introduced pasture grass species.

Plant disease: No evidence of dieback was noted, although a more thorough assessment would be warranted in Site 8 due to the remote assessment and presence of some susceptible species.

Connectivity: No direct connectivity with other areas of remnant vegetation although Site 8 has close proximity to Site 7 to the north (<100 metres) and Site 9 to the northeast (<100 metres) and a neighbouring area of remnant vegetation on the west side.

Management recommendations:

SITE 8: HIGH PRIORITY FOR FENCING PROJECT (IF UNFENCED)

Site 9: LOW PRIORITY FOR FENCING PROJECT

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

SITE 12: FLAT-TOPPED YATE WOODLAND (assessed remotely)

Date: 22/08/2023		Recorder/s: Melissa Howe & Basil Schur	
Photo numbers	161-164	Connectivity to other bushland (Y/N)	Y Direct connectivity to neighbouring remnant vegetation

Remnant Vegetation	Y	Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper	X				X		
Mid	X				X		
Lower	X				X		
Ground	X				X	X	

Land Formation Cross box	Level		Gentle	X	Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)		Possibly				

Disturbance/Threats Tick boxes	Animal paths	presumed	Stock grazing	?	Flooding	N
	Erosion	N	Recent fire (<5 yrs)	N	Weeds	?
	Salinity	N	Dieback disease	Not interpretable		
Other notes						

FLORA - DOMINANT SPECIES

Eucalyptus occidentalis (Flat-topped Yate)

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH
12	2.4 ha/746 m	Flat-topped Yate woodland	3 (Good) to 4 (Very good)	High (if unfenced)

PHOTOS & DESCRIPTOR



Site 12 is low-lying within the foreground with a view to the neighbouring remnant vegetation and rises.



This Flat-topped Yate (*Eucalyptus occidentalis*) woodland remnant vegetation has direct connectivity to an area of neighbouring remnant vegetation.



Very good condition Flat-topped Yate (*Eucalyptus occidentalis*) in a low-lying area on the property.



View of the Stirling Range from the property near Site 12.

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY

SITE 12 (assessed remotely)

Fencing: **Unsure if fenced?**

Vegetation condition: Good (3) to Very good (4)

- Very good condition Flat-topped Yate (*Eucalyptus occidentalis*)

Invasive weed species: Not assessed

Plant disease: Not interpretable as assessed remotely

Connectivity: Direct connectivity to an area of neighbouring remnant vegetation to the east.

MANAGEMENT RECOMMENDATIONS:

HIGH PRIORITY FOR FENCING PROJECT (IF UNFENCED)

Retain native remnant vegetation and maintain fences in stock-proof condition to protect conservation values.

See Section 8: Conservation and Restoration Project Proposals.

8. CONSERVATION AND RESTORATION PROJECT PROPOSALS

This report has made recommendations for protective conservation management for areas of native remnant native vegetation occurring on the property that are in good to very good ecological condition and have very high biodiversity values, including the known and likely occurrence of threatened fauna species such as Carnaby's Cockatoo (endangered), Baudin's Cockatoo (endangered) and Forest Red-tailed Black-cockatoo ('vulnerable') and protected under national and WA State legislation. Furthermore, the property has been deemed to have suitable habitat for other threatened flora and fauna species, recorded within a 5-kilometre radius of the property (DCCEEW, 2023).

We recommend that remnant vegetation protection be undertaken on the property through the construction and replacement of any areas of dilapidated fencing to improve the vegetation condition, habitat and wildlife connectivity and ecological links in the area. Connected bushland habitat provides for the movement of many species of native fauna across the landscape, thus preventing loss of biodiversity in conservation reserves and native remnant vegetation connected to these ecological links.

All of these areas form part of an important eco-link pathway in the Forest to Stirlings section of Gondwana Link between the Stirling Range National Park in the east to the Walpole Wilderness Area in the west. These proposals are set out in Table 1 below.



Acacia imparilis, was documented as occurring within this remnant vegetation. It is listed as a Priority 4 species which means it is rare, near threatened or a species in need of monitoring. Photo : Melissa Howe, August 2023.

TABLE 1: CONSERVATION AND RESTORATION PROJECT PROPOSALS

PROJECT PROPOSAL	AREA OF CONSERVATION	PROJECT SUMMARY	PROJECT PRIORITY
PROJECT MAP ID 1	55.7 hectares native remnant vegetation	Project Map ID 1: Fenced, No project proposed	LOW
PROJECT MAP ID 2	2.0 hectares native remnant vegetation	Project Map ID 2: Proposed 492 metres of new fencing to protect 2.0 hectares of existing remnant vegetation	MEDIUM
PROJECT MAP ID 3	14.5 hectares native remnant vegetation protection	Project Map ID 3: Proposed 2,672 metres of new fencing to protect 14.5 hectares of existing remnant vegetation	HIGH
PROJECT MAP ID 4	1.0 hectares native remnant vegetation	Project Map ID 4: Fenced, No project proposed	LOW
PROJECT MAP ID 5	0.9 hectares native remnant vegetation	Project Map ID 5: Proposed 414 metres of new fencing to protect 0.9 hectares of existing remnant vegetation	LOW
PROJECT MAP ID 6	5.7 hectares native remnant vegetation	Project Map ID 6: Proposed 1,189 metres of new fencing to protect 5.7 hectares of existing remnant vegetation	HIGH (if unfenced?)
PROJECT MAP ID 7	2.9 hectares native remnant vegetation	Project Map ID 7: Proposed 507 metres of new fencing to protect 2.9 hectares of existing remnant vegetation	MEDIUM (if unfenced?)
PROJECT MAP ID 8	2.7 hectares native remnant vegetation	Project Map ID 8: Proposed 936 metres of new fencing to protect 2.7 hectares of existing remnant vegetation	HIGH (if unfenced?)
PROJECT MAP ID 9	0.7 hectares native remnant vegetation	Project Map ID 9: Proposed 361 metres of new fencing to protect 0.7 hectares of existing remnant vegetation	LOW
PROJECT MAP ID 10	0.8 hectares native remnant vegetation & Acacia plantings	Project Map ID 10: Proposed 367 metres of new fencing to protect 0.8 hectares of existing remnant vegetation	LOW
PROJECT MAP ID 11	1.0 hectares native remnant vegetation	Project Map ID 11: Proposed 378 metres of new fencing to protect 1.0 hectares of existing remnant vegetation	LOW
PROJECT MAP ID 12	2.4 hectares native remnant vegetation	Project Map ID 12: Proposed 480 metres of new fencing to protect 2.4 hectares of existing remnant vegetation	HIGH (if unfenced?)
PROJECT MAP ID 13	18 hectares native remnant vegetation	Project Map ID 13: Proposed 1,633 metres of new fencing to protect 18 hectares of existing remnant vegetation	MEDIUM
PROJECT MAP ID 14	1.25 hectares native remnant vegetation & restoration plantings	Project Map ID 14: Fenced, No project proposed	LOW

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APPENDIX 1: VEGETATION CONDITION SCALE

VERY DEGRADED - 1	DEGRADED - 2	GOOD - 3	VERY GOOD - 4	EXCELLENT - 5
<p>The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.</p>	<p>Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires; the presence of very aggressive weeds; partial clearing; dieback; & grazing.</p>	<p>Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires; the presence of some very aggressive weeds at high density; partial clearing; dieback; & grazing.</p>	<p>Vegetation structure altered; obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires; the presence of some more aggressive weeds; dieback; logging; & grazing.</p>	<p>Vegetation structure intact; disturbance affecting individual species; weeds are non-aggressive species.</p>

Note: Condition scale adapted from Keighery Condition Scale (Keighery, 1994 and Casson et al., 2009).

Five central scores are mainly used from “VERY DEGRADED” (1) to “EXCELLENT” (5). At either side of these could be “ALIENATED” (A) and “PRISTINE” (P). In general, it is unlikely that “A” will apply because it refers to the built environment or land that is under agriculture or horticulture, which lacks any native plants and most other native organisms. In general, it is likely that “P” will not commonly be used because there are very few places that have not been subject to feral animal grazing (rabbits, camels, goats, etc) or that have remained unaffected by exacerbated wind-borne dust deposition, or emissions (Casson et al., 2009).



This patch of Kwongkan shrubland was identified as being in very good condition and is likely to satisfy threshold criteria to be defined as a threatened ecological community.

Photo: Basil Schur, August 2023.

APPENDIX 2: VEGETATION SNAPSHOT SURVEY - 2023 SITE DATA FORM

SITE			
Date:		Recorder/s:	
Photo numbers		Connectivity to other bushland (Y/N)	

Remnant Vegetation		Y/N	Coordinates	E
Restoration/Revegetation			Zone: 50	N

Site Vegetation							
Cross box	Woodland	Shrubland	Mallee Heath	Heath	Open	Mid dense	Closed
Upper							
Mid							
Lower							
Ground							

Land Formation Cross box	Level		Gentle		Moderate	
	Steep		Very steep		Precipitous	
Wetlands/creek present (describe)						

Disturbance/Threats Tick boxes	Animal paths		Stock grazing		Flooding	
	Erosion		Recent fire (<5 yrs)		Weeds	
	Salinity		Dieback disease			
Other notes						

FLORA - DOMINANT SPECIES

FAUNA SPECIES

SITE NO.	AREA (hectares)/ PERIMETER (metres)	VEGETATION TYPE	VEGETATION CONDITION 1-VERY DEGRADED TO 5-EXCELLENT	PRIORITY FOR MANAGEMENT LOW, MEDIUM, HIGH, VERY HIGH

PHOTOS & DESCRIPTOR

MANAGEMENT RECOMMENDATIONS AND/OR REASON FOR PRIORITY