

NOVEMBER 2021



# RALSTON ROAD SURVEY REPORT

## FLORA AND VEGETATION SURVEY

DYLAN COPELAND AND MALCOLM HARPER

WHEATBELT REVEGETATION AND CARBON

[wheatbeltrevegetation.com.au](http://wheatbeltrevegetation.com.au)

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## EXECUTIVE SUMMARY

The Shire of Tammin have a clearing permit application (CPS 9281/1) under assessment with the Department of Water and Environmental Regulation (DWER). The application covers 0.36 hectares of native vegetation alongside Ralston Road. The area included in the application exceeds the proposed clearing area that was indicated onsite utilising pink flagging tape by Fabian Houbrechts, Shire of Tammin's Manager Works and Services.

An area of 6.025 hectares, encompassing the area under application, was searched by two surveyors. The surveyors discovered three plants (two *Conospermum* and one *Guichenotia*) that superficially matched potential DRF, although only one (the *Guichenotia*) of these occurred in the area under application. Ultimately, none of these plants were examples of the DRF species.

Neither Declared Rare Flora (DRF) nor Threatened Ecological Communities (TECs) were observed in the survey area.

## INTRODUCTION

In May 2021, the Shire of Tammin applied for a clearing permit (CPS 9281/1) to clear 0.36 hectares of native vegetation, ostensibly alongside Ralston Road. However, because the constructed road does not perfectly align with the gazetted road reserve, the proposed clearing area extends into Charles Gardner Reserve. It also impacts on the road reserve of Gardner Reserve Road at its intersection with Ralston Road.

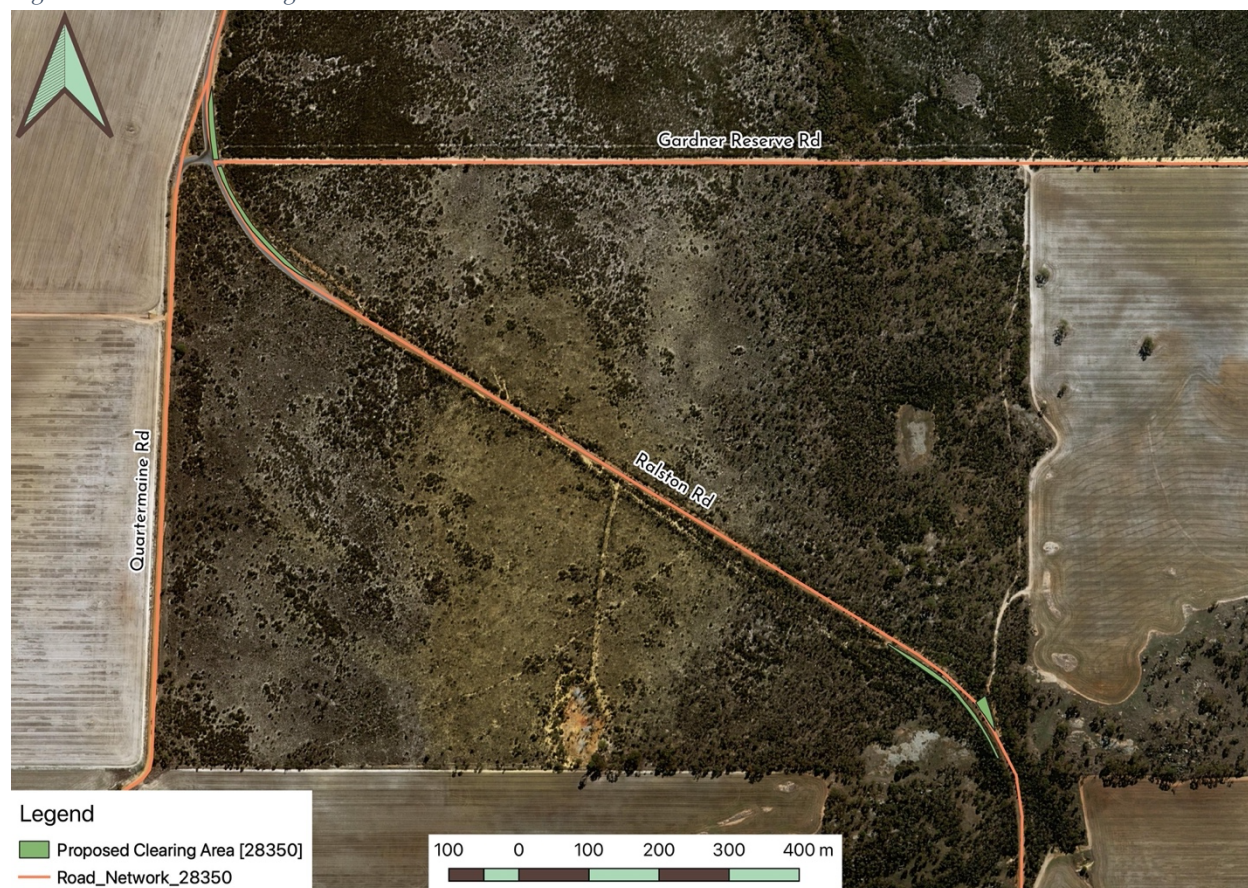
The proposed clearing is for improved sightlines around two curves (one at either end of the reserve) and for a well-defined track entering Charles Gardner Reserve, ultimately accessing adjacent farmland. This track is currently utilised by a school bus for the purposes of turning around.

In correspondence from the Department of Water and Environmental Regulation dated 13 November 2019, the Shire was informed that a flora and vegetation survey was required to confirm the presence/absence of several DRF species known to occur within 10 kilometres of the application area.

The Shire of Tammin engaged Dylan Copeland and Malcolm Harper to undertake this work.

This survey was consistent with the EPA's *Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessment (December 2016)*.

Figure 1. General Clearing Areas and Road Network



## BACKGROUND

### Scope

Wheatbelt Revegetation and Carbon was engaged by the Shire of Tammin to conduct a targeted flora survey to establish the presence of any threatened and/or priority flora to be impacted by the proposed clearing of 0.36 hectares of native vegetation under CPS 9281/1.

The area to be surveyed is notionally alongside Ralston Road between SLKs 13.40 and 15.20, although there is a large straight between the two curves where no clearing is proposed to be undertaken. However, because the road is not perfectly aligned with the road reserve, the clearing area does enter Charles Gardner Reserve (Lot 24441 on Deposited Plan 216064). The clearing area also occurs on the road reserve for Gardner Road at the intersection Ralston Road.

Wheatbelt Revegetation and Carbon engaged the services of Malcolm Harper as Botanist for the survey.

The survey consisted of two site visits: the first on 20 September 2021 and the second on 24 September 2021.

Figure 2. Proposed Clearing Areas and Survey Area



## Catchment Landscape Context

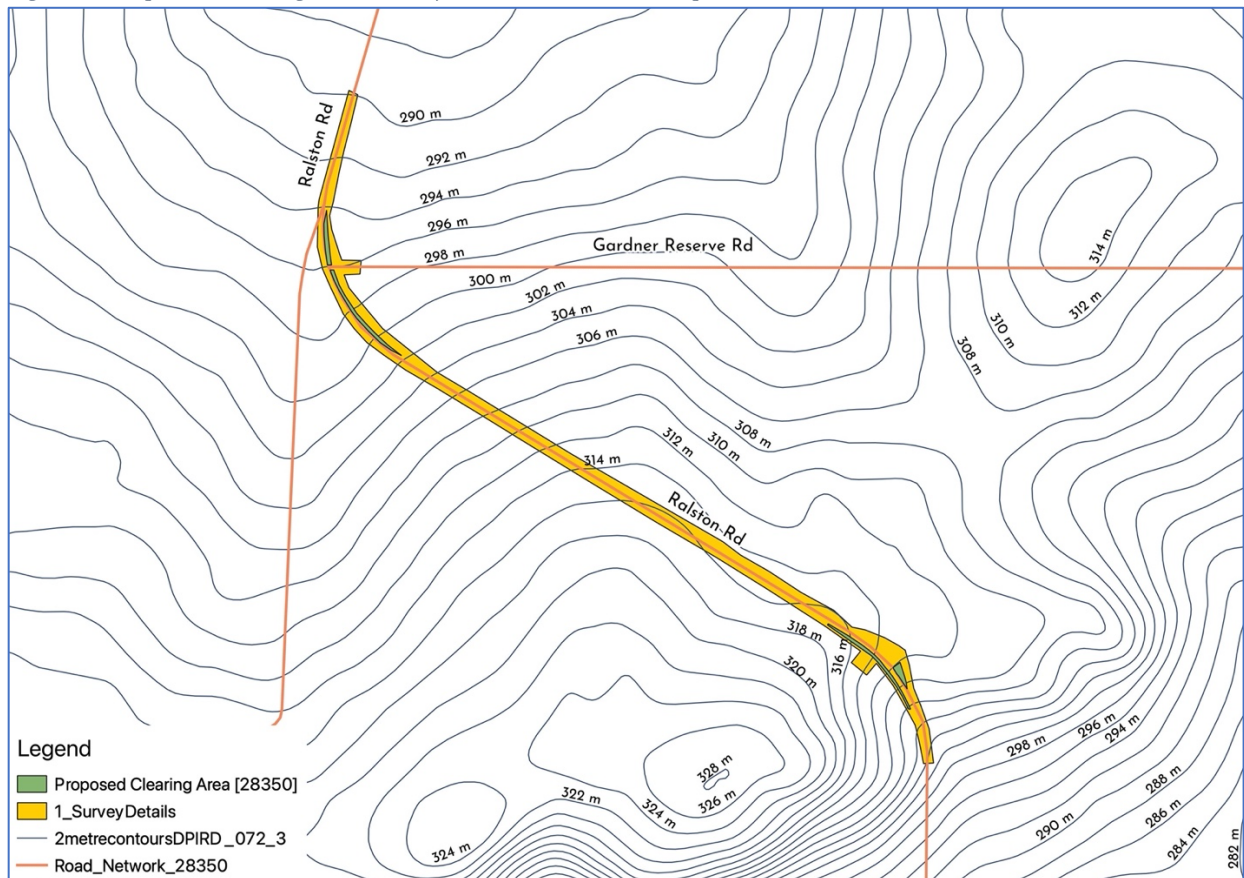
### Elevation

The survey area is quite high in the catchment. The valley floor to the north is approximately 3.7 km away and the valley floor to the east is approximately 6.5 km away.

The survey area starts at an elevation of 290 m at the north-western end (SLK 13.40) and climbs steadily as the road heads south-east towards a granite outcrop on the southern side of the road. At approximately SLK 14.41 the road begins to follow the contour at an elevation of 316 m. As the road moves past the granite outcrop, it begins to decline relatively steeply before reaching an elevation of 304 m at the end of the survey area.



Figure 3. Proposed Clearing Area, Survey Area, and Contour Map



## Climate

According to the Köppen climate type, this section of Ralston Road is situated in the cold semi-arid region, though virtually at the intersection of that region, the hot semi-arid, and the hot-summer Mediterranean.

The survey area is between two Bureau of Meteorology weather stations. The closest weather station is at Telenning Hill (Station number 010122) and is approximately 3.9 km to the south-southeast and has a long-term average annual rainfall of 329.6 mm.

The other weather station is approximately 6.5 km to the northeast. Glenavon (Station number 010289) has a long-term average annual rainfall of 333.7 mm.



## Geology

The survey area is located in Northern Zone of Rejuvenated Drainage, which “lies on a basement of granitoid rock at the western edge of the Yilgarn Craton.”<sup>1</sup> The geologic description is, “Colluvium over granitic rocks.”<sup>2</sup>

## Soils

The survey area crosses three different soil types. Most of the area is on undulating sandplain and gravel, but to south-eastern end there is some soil associated with the base of granitic outcrops and the duplex loams that enter as the soil deepens. See the results of the desktop study for further discussion of the site’s soils.

## Vegetation

The site consists of the following Beard pre-European vegetation associations:

1. 694: Mixed heath with scattered tall shrubs: *Acacia* sp., Proteaceae and Myrtaceae.
2. 1041: Low woodland; *Allocasuarina huegeliana* and Jam,
3. 1049: Medium woodland; wandoo, York gum, salmon gum, morrel, and gimlet.

See the results of the desktop study for further discussion of the site’s vegetation.

## Land Use

Outside of both sides of the road reserve where most of the survey area is situated is Charles Gardner Reserve. Charles Gardner Reserve is a significant remnant in a landscape that has otherwise been widely cleared for broadacre agricultural purposes, predominantly cropping (predominantly wheat, although also barley, lupins, canola, etc.) and livestock (predominantly sheep, but potentially cattle as well).

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<sup>1</sup> Department of Primary Industries and Regional Development. HydrologicalZonesofWesternAustraliaDPIRD\_069. Shapefile. Last modified 05-12-2018. <https://catalogue.data.wa.gov.au/dataset/hydrological-zones-of-western-australia>.

<sup>2</sup> Ibid.



## METHODOLOGY

### Desktop Study

A desktop study of existing geospatial information was undertaken prior to the site visit. This involved using Geographical Information System (GIS) to review existing site digital orthophotos, geology, elevation profiles, soil type, native and planted vegetation, IBRA classification, Threatened Flora (TF), Priority Flora (PF) and Threatened Ecological Communities (TECs).

State and Commonwealth database searches for potential DRF, PF, and Threatened Ecological Communities (TEC), within a ten-kilometre buffer of the survey sites was undertaken as part of the desktop study.

Results of interest produced from the above were cross-referenced with FloraBase.

The Shire of Tammin also provided a copy of correspondence from DWER dated 14 July 2021. This was reviewed and its discussion around DRF was incorporated into both the desktop studies and field investigation methodologies.

Visits to the Merredin Branch of the Wildflower Society of Western Australia's herbarium and to the herbarium at DBCA's Merredin office were undertaken on 20 September 2021 to assess the availability of information regarding potential DRF species.

### Field Investigation

An initial site visit was undertaken 20 September 2021. After the herbaria had been visited, and the availability of information on the DRF species had been assessed, the site visit was undertaken to identify any potential gaps in information.

For the initial visit, given the good visibility and narrow width of the survey areas, two surveyors walked a traverse along the roadside of the survey areas with occasional incursions into the survey area, as warranted. Observations were recorded and photographs taken.

The section of road between the survey areas was driven slowly several times as the surveyors searched the immediate roadsides for flora of interest.

On 24 September 2021, the surveyors returned to the site to conduct a targeted survey. Traverses were walked in and around the survey areas and again the surveyors drove slowly between the farthest areas. Observations were recorded and photographs taken.





## RESULTS

### Desktop Study

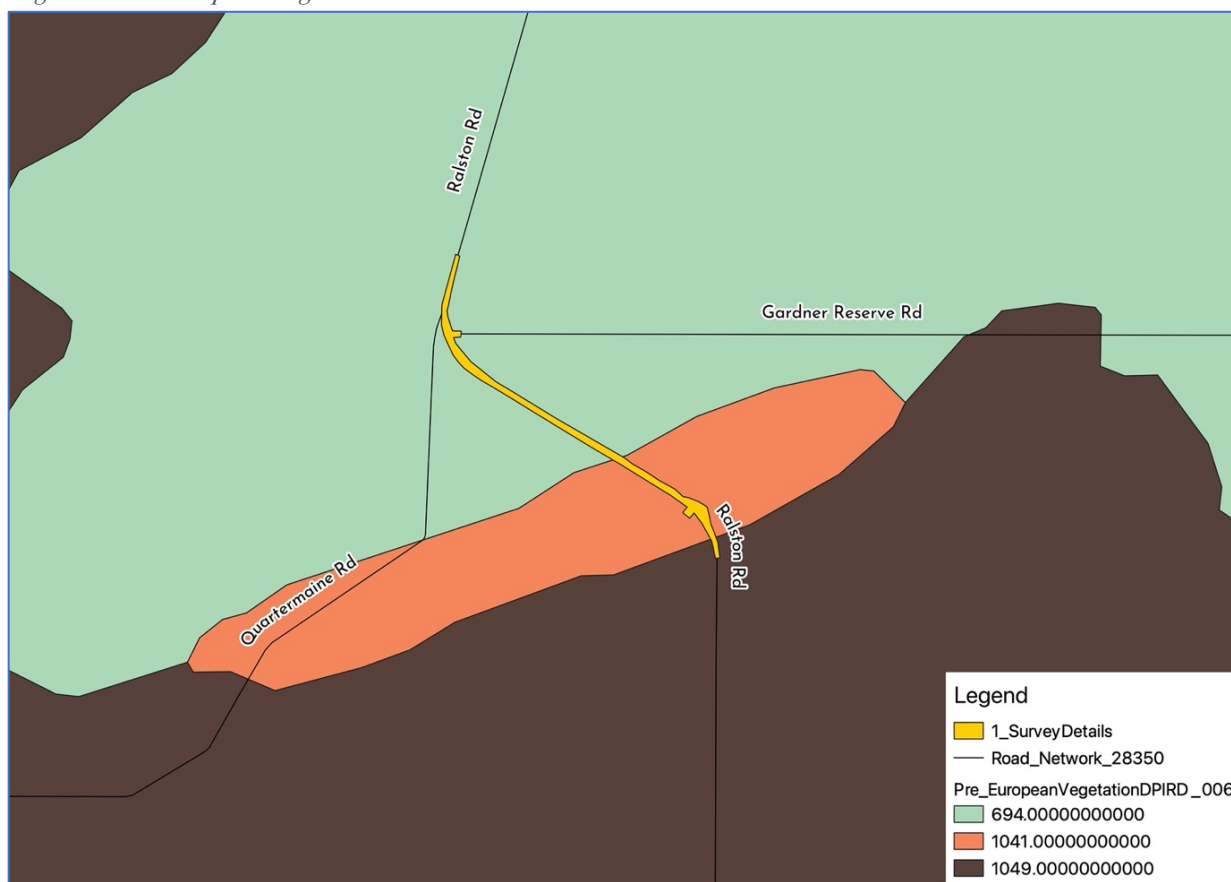
#### Vegetation

Cross-referencing the *Pre\_EuropeanVegetationDPIRD\_006* shapefile with the spreadsheet, *Vegetation\_Statistics\_Statewide\_2018\_Full\_report*, indicates that the proposed clearing area affects three vegetation associations. From *Figure 1* (below), it appears that the south-eastern extent of the survey area extends into a vegetation association (1049) that is potentially consistent with the ‘Eucalypt Woodlands of the Western Australian Wheatbelt’ TEC. An examination of the aerial imagery indicates that this is possible, though unlikely given the proximity of granite outcrops.

*Table 1. Percentages Remaining of Pre-European System and Vegetation Associations*

<b>IBRA Region</b>	<b>IBRA Subregion</b>	<b>System Association</b>	<b>Vegetation Association</b>	<b>Description</b>	<b>Remaining % (System / Vegetation)</b>
Avon Wheatbelt	Katanning	Meckering	694	Shrublands; scrub-heath on yellow sandplain banksia-xylomelum alliance in the Geraldton Sandplain & Avon-Wheatbelt Regions	39.29 / 20.90
			1041	Low woodland; Allocasuarina huegeliana & Jam	23.16 / 24.63
			1049	Medium woodland; wandoo, York gum, salmon gum, morrel & gimlet	3.60 / 4.45

Figure 4. Pre-European Vegetation Associations



## Soils

Reviewing the *SoilLandscapeMapping\_BestAvailableDPIRD\_027* shapefile shows broad alignment with the Pre-European Vegetation Associations—with the exception of the south-eastern end of the survey area. The description for that area is, “Crests and irregularly undulating slopes comprising rock outcrop and skeletal soils surrounding outcrops. Rock Sheoak and Jam vegetation.”<sup>3</sup> Given that the aerial imagery indicated that there are granitic outcrops in close proximity, the likelihood is that this description is representative of the site.

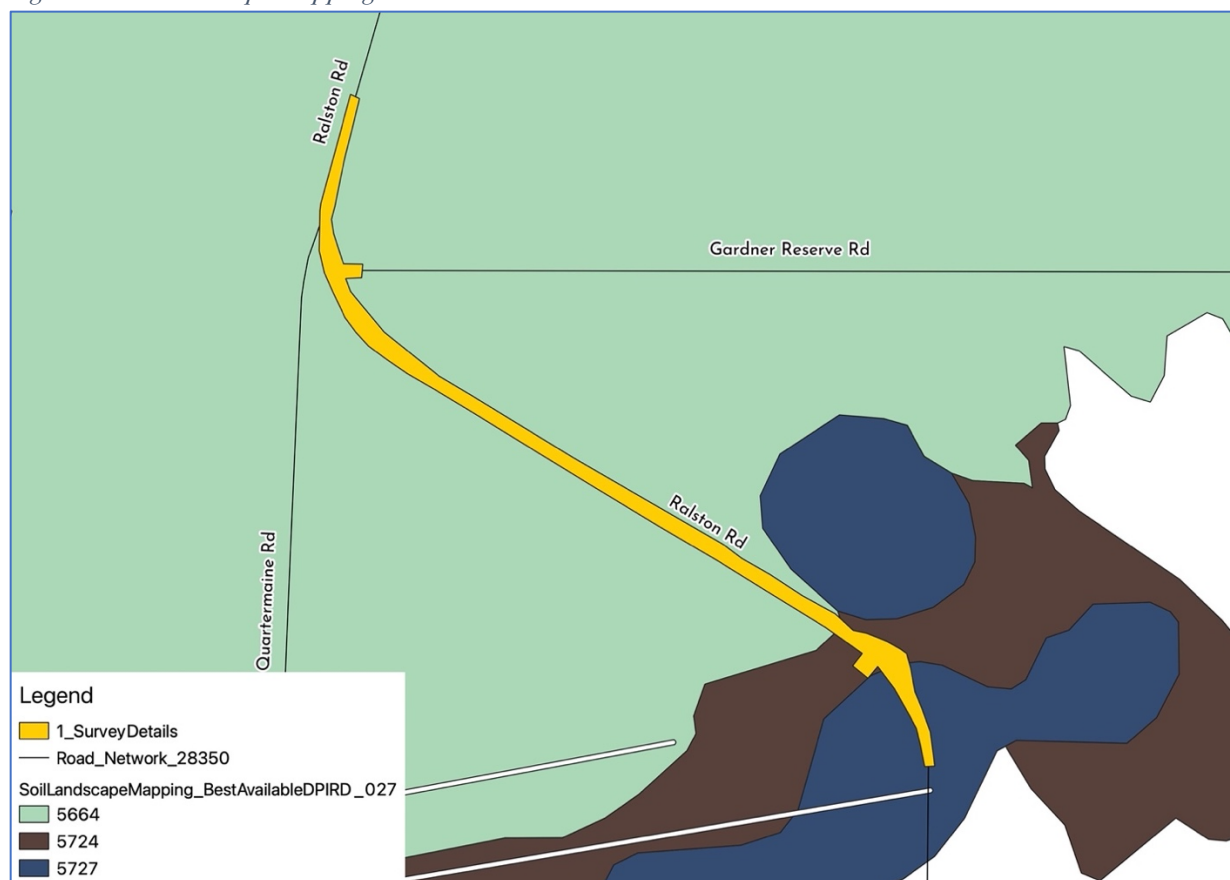
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<sup>3</sup> Department of Primary Industries and Regional Development.  
*SoilLandscapeMapping\_BestAvailableDPIRD\_027*. Shapefile. Last modified 02-08-2019.  
<https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-best-available>.

Table 2. Soil Type by System and Description

System ID	System Name	System Description
5664	Morbinning 1 Subsystem	Gently undulating gravelly sandplain remnants and areas of reforming laterite with gravels and sandy gravels, vegetated by proteaceous heath with minor Powderbark Wandoo.
5724	Greenhills 3 granite Phase	Irregularly undulating terrain with granitic soils (gritty sands, sandy and loamy duplexes) under Wandoo, York Gum and Jam woodlands.
727	Greenhills 3 rock Phase	Crests and irregularly undulating slopes comprising rock outcrop and skeletal soils surrounding outcrops. Rock Sheoak and Jam vegetation.

Figure 5. Soil Landscape Mapping





### **Rare and Priority Flora**

Correspondence from DWER to the Shire of Tammin listed several Declared Rare Flora species. These are listed in two tables in the appendices (one for “Threatened” and one for “Priority” flora species). Also included in the tables are some brief notes on the characteristics of each species that were used as identification aids in the field. All information in these tables, unless otherwise noted, was obtained from FloraBase.

### **TECs**

The Federal Government’s Protected Matters Search Tool indicates that the “Eucalypt Woodlands of the Western Australian Wheatbelt” TEC is likely to occur within 10 kilometres. As mentioned above, the Pre-European Vegetation layer indicates that the south-eastern edge could support vegetation representative of this TEC, however that is contra-indicated by the aerial imagery and the soil type mapping.

### **Environmentally Sensitive Areas**

The only identified Environmentally Sensitive Areas (ESAs) are likely to be related to the presence of DRF.

### **Field Flora Survey**

#### **Rare and Priority Flora**

No rare or priority flora were observed.

#### **TECs**

No TECs were observed. The desktop survey indicated that the south-eastern end of the survey area had the potential to include vegetation representative of the “Eucalypt Woodlands of the Western Australian Wheatbelt” TEC, but the vegetation is dominated by *Allocasuarina* and *Acacia* species.

#### **Environmentally Sensitive Areas**

The only likely ESAs would be in relation to DRF, and no DRF were observed.

### **Discussion**

The area proposed to be cleared is regrowth, with the exception of area 4 (as identified in *Figure 1*), although the vegetation immediately along the roadside is regrowth. Most of the specified DRF species that are likely to occur in this area would be below waist height, of which there are very few species in the regrowth areas.



In the older vegetation of area 4, the understorey is predominantly agricultural weeds, including *Briza maxima* (blowfly grass). The native understorey species include *Austrostipa elegantissima*, *Dianella revoluta*, *Stackhousia* sp., and pink and white everlastings (*Lawrencella rosea*?).

The taller vegetation is overwhelmingly *Acacia lasioaclyx*, *Acacia acuminata*, and *Allocasuarina huegeliana*. There are several *Grevillea hookeriana*. On balance, areas 3 and 4 show a similar species breakdown, but 3 probably has more *A. lasiocalyx* than *A. acuminata*, and vice versa for 4.

The surveyors located one *Guichenotia* although it was identified in the field as being definitively not *Guichenotia seorsiflora* by having more than one flower per inflorescence.

Photograph 1. *Guichenotia micrantha*





The surveyors also located two *Conospermum* plants, although neither were in the proposed clearing areas. Neither were an example of *C. eatoniae* as the examples had white flowers, not blue. The northern-most example (*Photograph 3*) was nearly 1.8 m tall—taller than the “ca 0.9 m” listed on the FloraBase entry for *Conospermum galeatum*. The flowers of the second example (*Photograph 4*) are also solely white, not “predominantly white with a blue upper lip. . . [However] The leaves distinguish it from other local *Conospermum* species and are about 30 to 60 mm long by 0.2 to 0.8 mm wide, slender, thread-like and slightly incurved.”<sup>4</sup> Unfortunately, the below photographs are not perfect for the purpose, but it can still be discerned that the leaves are the longer and thicker ones occurring on *Conospermum stoechadis*.

The regrowth in areas 1 and 2 is dominated by *Leptospermum erubescens*. Several examples of *Acacia merinthophora* and *Grevillea hookeriana* were evident, along with native grasses (*Austrostipa* sp.) and agricultural weeds.

*Photograph 2. Leptospermum erubescens at the Gardner Reserve Road intersection*



<sup>4</sup> Department of Biodiversity, Conservation and Attractions, “*Conospermum galeatum* Interim Recovery Plan. Interim Recovery Plan No. 389” (Western Australia: Department of Biodiversity, Conservation and Attractions, 2020), 7.



Photograph 3. Common smokebush 1





Photograph 4. Common smokebush 2

WGS84  $\pm 5m$  50s 543509 6482782  $\Delta$   $m_{\pm 10m}$  298  $\nabla$   $^{\circ}T_{\pm 18}$  NE68



24Sep21 13:53 Shire of Tammin  
Ralston Road, South Tammin WA 6409, AU © 24/9/21, 1:53 pm





## CONCLUSION

Charles Gardner Reserve is a significant remnant in a highly cleared area. The reserve is rich in biodiversity. However, the previously cleared areas relating to road reserves lack the richness of species to be found only a few metres away. The same few pioneer species were seen time and again, i.e., *Acacia acuminata*, *Acacia lasiocalyx*, *Allocasuarina huegeliana*, and *Leptospermum erubescens*.

The proposed clearing is restrained and modest, proposing to mostly clear regrowth, with a small, triangular section of vegetation wedged between Ralston Road and a well-defined track entering the reserve.

There were no DRF species observed in the survey area, neither in the proposed clearing areas themselves nor in any adjacent areas. The authors conclude that the proposed clearing is extremely unlikely to affect any DRF species.



## REFERENCES

- Collins, Joel. *Threatened Flora of the Western Central Wheatbelt*. Perth, W.A.: Department of Environment and Conservation, 2009.
- Department of Biodiversity, Conservation and Attractions. “*Conospermum galeatum* Interim Recovery Plan. Interim Recovery Plan No. 389.” Western Australia: Department of Biodiversity, Conservation and Attractions, 2020.
- Lullfitz, Ben, Ankur Konnur, Jack Alderton, David Jolliffe, and Mary Squire. *Threatened and Poorly Known Flora of the Yilgarn Region*. Perth, W.A.: Department of Environment and Conservation, 2008.
- Western Australian Herbarium (1998–). FloraBase—the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed September–November 2021).

### GIS Databases

- SoilLandscapeMapping\_BestAvailableDPIRD\_027
- HydrologicalZonesofWesternAustraliaDPIRD\_069
- 2metrecontoursDPIRD\_072
- ibra7\_regions
- ibra7\_subregions
- Pre\_EuropeanVegetationDPIRD\_006
- ESRI Satellite



## APPENDICES

### Appendix A – Table of Threatened Flora Species

Species	Habit	Height	Soil Type	Flower Colour	Flower Period	Comment
<i>Acacia ataxiphylla</i> subsp. <i>magna</i>	Spreading to ascending shrub	0.3–0.6 m (To 0.3 m <sup>5</sup> )	Sandy soils. Lateritic ironstone rises, flats.	Yellow	June–July	Flat curved leaves
<i>Acacia subflexuosa</i> subsp. <i>capillata</i>	Rounded shrub	0.25–1.0 m	Laterite.	Yellow		
<i>Allocasuarina fibrosa</i>	Dioecious shrub	0.5–1.5 m	Sand over laterite. Low ridges, quartz outcrops.	Red	July–August	
<i>Conospermum galeatum</i>	Open shrub	to 0.9 m	Yellow sand.	White	August–September	The perianth is predominantly white, with blue upper lip. Slender, thread-like leaves. <sup>6</sup>
<i>Guichenotia seorsiflora</i>	Multi-stemmed shrub	to 0.6 m	Sandy clay with lateritic gravel. Breakaways.	pink/pink-cream	July–September	One inflorescence per stalk (Collins 2009)
<i>Hakea aculeata</i>	Lignotuberous shrub (with several erect or ascending stems)	To 3.0 m	loam or clay	Yellow	October	Distinctive habit
<i>Thomasia glabripetala</i>	Open shrub	to 1.5 m	Yellow/brown sand.	Pink-purple	Sept to Oct	

Noted in correspondence from DWER but absent from the NatureMap report produced as part of the desktop study.

<sup>5</sup> Joel Collins, *Threatened Flora of the Western Central Wheatbelt* (Perth, W.A.: Department of Environment and Conservation, 2009), 14.

<sup>6</sup> Ben Lullfitz et al., *Threatened and Poorly Known Flora of the Yilgarn Region* (Perth, W.A.: Department of Environment and Conservation, 2008), 76.



## Appendix B–Table of Priority Flora Species

Species	Habit	Height	Soil Type	Flower Colour	Flower Period	Comment
<i>Acacia campylophylla</i> (P3)	Dense, rigid, spreading shrub	0.1-0.6 m	Lateritic gravelly soils	Yellow	July–August	Round leaves
<i>Acacia phaeocalyx</i> (P3)	Intricately branched, sprawling or compact, pungent shrub	0.3-0.6(-0.8) m	Yellow or white sand, often over laterite. Flats, hillsides.	Yellow	April–June	Spiky looking spade shaped leaves
<i>Baekkea</i> sp. <i>Tammin</i> (P3)	Compact shrub	To 0.5 m	Light brown sandy clay or loam, silty yellow-grey sand, orange brown sand or loam, gravel.	Cream/white/pink	August–October	No photo
<i>Banksia horrida</i> (P3)	Upright, lignotuberous shrub	0.6–1.6 m	Sand, sometimes with gravel.	Yellow-orange	Apr to Jun or Aug	Stiff branch, with offset pairs of spikes
<i>Banksia splendida</i> subsp. <i>splendida</i> (P2)	Bushy, non-lignotuberous shrub	0.6–2(-3) m	Sandy & loamy soils with lateritic gravel.	Yellow/orange-red	Jul to Sep.	Bell shaped, downward facing flower
<i>Calothamnus brevifolius</i> (P4)	Erect, spreading shrub	0.3-0.6(-0.8) m	White/grey or yellow sand.	Red	Jan to Feb or Apr	



<i>Conospermum eatoniae</i> (P3)	Spreading, intricately branched shrub	0.3-1 m	Deep white sand, sandy clay loam.	Blue	August–October	
<i>Cryptandra dielsii</i> (P3)	Intricately branched, spreading shrub	0.2–0.6 m	Sand, often over laterite. Sandplains.	White	July–September	Tightly packed, spherical flower
<i>Cryptandra polyclada</i> subsp. <i>polyclada</i> (P3)	Mat-forming or upright shrub	0.1–0.7 m	Sand. Sandplains.	White/cream	Jan to May or Aug or Oct.	No photo
<i>Daviesia nudiflora</i> subsp. <i>drummondii</i> (P3)	Bushy shrub	0.3–1.5 m	White or grey sand. Undulating low rises.	Orange/yellow & red	Jul to Aug	No Photo
<i>Daviesia oxylobium</i> (P4)	Glaucous shrub	0.5–1 m	Sandy lateritic soils. Undulating plains.	Yellow & red & pink	Jul to Aug	Gastrolobium type flowers. Round leaves with a spike on the end.
<i>Daviesia uncinata</i> (P3)	Intricate, many-stemmed shrub	0.2–0.7 m	Gravelly lateritic sand, loamy sand. Undulating plains.	Yellow and brown	December or January	Stiff and spiky looking
<i>Drosera albonotata</i> (P2)						No photo or description.
<i>Eucalyptus erythronema</i> subsp. <i>inornata</i>						No photo or description.
<i>Gonocarpus intricatus</i>	Erect to decumbent, woody perennial, herb	0.2–0.4 m	Sand. Granite	Yellow-red/green		No photo



			outcrops & hills.			
<i>Jacksonia rubra</i> (P2)	Tangled dwarf shrub	0.2 m	Clayey sand.	Orange	October	Pea flower with five leaves(?) directly underneath.
<i>Melaleuca manglesii</i> (P1)	Upright shrub	To 1.2 m	White sand	Purple	September	No photo
<i>Scholtzia eatoniana</i> (P1)	Diffuse, prostrate shrub	0.15 m	—	White-pink	Nov to Dec	No photo
<i>Stylidium pseudosacculatum</i> (P2)	Creeping perennial, herb	0.04–0.15 m	Sand over laterite. Gentle hillslopes. Allocasuarin a heath.	White	Oct to Nov	Flower looks pinkish to me. Arranged like butterfly wings.
<i>Synaphea tamminensis</i> (P2)				Yellow	August or September	
<i>Thysanotus tenuis</i> (P3)	Perennial, herb (with tuberous roots)	To 0.2 m	Clay, sandy clay, sand.	Purple	Sep to Oct	Fringed lily type flowers. Oh, it is related.

Not noted in correspondence from DWER but present in the NatureMap report produced as part of the desktop study.