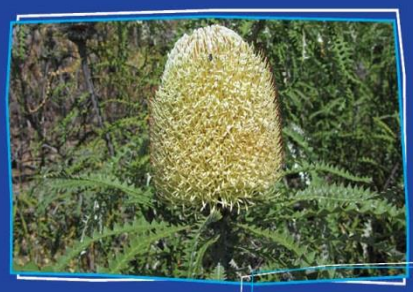
Vegetation, Flora, Fauna and Environmental Considerations, and Targeted Flora Report



Site E – Neds Corner Road Reconstruction – North of Cascade Rd

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1 Executive Summary

This 'Vegetation, Flora, Fauna and Environmental Considerations and Targeted Flora Report' has been undertaken in accordance with the 'Environmental Protection Authority (EPA) Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016)' as part of an application to the Department of Water and Environmental Regulations (DWER) to clear 3.61 ha of native vegetation in a 11.32 ha footprint, for the purpose of road widening.

2 Introduction

The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4 593 km of road. Of these, 830 km is sealed and the remaining 3763 km is unsealed. The Shire of Esperance endeavors to maintain a high level of road safety, and is progressively upgrading major haulage routes to safely accommodate road train traffic. Neds Corner Rd has been identified as a key transport route that does not meet current safety standards, being single lane bitumen road in poor condition. The Shire of Esperance has progressively been widening the road to double lane, which involves clearing of native vegetation immediately adjacent to the running road surface of up to 5 m on either side of the current cleared footprint. The total road footprint will then become a width of 28 m. The Shire of Esperance is submitting the site 'Neds Corner Road Reconstruction, north of Cascade Rd', as Site E under the '2020 Strategic Purpose Permit' for the purpose of road widening (Figure 1).

The proposed clearing permit area is located directly north of Cascades town-site and approximately 85 km north-west of Esperance, within a Shire of Esperance managed road reserve. Specifically, it is located on Neds Corner Rd, from the intersection to 3.8 km north of Cascade Rd. This extends from straight line kilometre's (SLK) 32.97 to 36.85. A point within the clearing permit area is -33.458437 S, 121.092604 E.

Figure 1. Location of the site 'Site E - Neds Corner Road Reconstruction, north of Cascades Road' area, submitted under the '2020 Strategic Purpose Permit' application.

2.1 Scope

The removal of native vegetation has the potential to affect multiple environmental factors.

Possible impacts include;

- Threatened flora (TF) and priority flora (PF).
- Threatened (TEC) and priority (PEC) ecological communities, specifically the Environmental Protection and Biodiversity Conservation (EPBC) 1999 Act listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC.
- Threatened fauna, specifically potential feeding, nesting and roosting habitat of endangered Carnaby's Black Cockatoo, *Calyptorhynchus latirostris.*

Assessing these impacts involves two approaches; desktop study and field survey. A desktop study will gather background information on the target area. The field survey allows for detailed understanding of vegetation communities, targeted flora surveys for possible TF or PF, environmental condition, presence of PEC and TEC, and overall potential impact of clearing.

2.2 Catchment

The 'Site E - Neds Corner Road Reconstruction, north of Cascades Road' is located within the Stokes Inlet catchment area.

2.3 Climate

The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2019). The area receives an average annual rainfall of 350 mm.

2.4 Geology

The geology of the site is described by Schoknecht et al (2004) as Tertiary marine sediments with aeolian carbonate rich deposits in places.

2.5 Soils and Topography

The soils of the site are described by Schoknecht et al (2004) as:

- Alkaline grey shallow and deep sandy duplex soils with associated calcareous loamy earths.
- Alkaline grey shallow sandy duplex soils with associated pale deep sands and minor deep sandy duplexes, ironstone gravel soils and non-cracking clays.

The topography of 'Site E – Neds Corner Road Reconstruction, north of Cascades Road' is described by Schoknecht et al (2004) as level to gently undulating plain, with areas of gilgai microrelief. Drainage is generally poorly developed and usually internal, forming gently undulating and undulating plains. Drainage changes to external in areas adjacent to the Lort River.

2.6 Vegetation

The site is located in the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) Mallee (Mal01) region and Eastern Mallee sub-region. The Mal01 sub-region is described as "'the south-eastern of Yilgarn Craton is gently undulating, with partially occluded drainage. Mainly Mallee over Myrtaceous-Proteaceous heaths on duplex (sand over clay) soils. Melaleuca shrublands characterize alluvia, and Halosarcia low shrublands occur on saline alluvium. A mosaic of mixed Eucalypt Woodlands and Mallee occur on calcareous earth plans, and sandplains overlying the Eocene Limestone strata in the East."

Two vegetation associations (VA), 929 and 512, are identified by Beard (1973) as present within 'Site E – Neds Corner Rd reconstruction, north of Cascade Rd'. VA 929 (Beard 1973) is described as 'low forest; moort (*Eucalyptus platypus*)'. 72.43% of the pre-European extent of this community remains within the Mal01 IBRA bioregion and 42.57% in the Shire of Esperance area (DPaW 2017). However, only 2.63% of VA 929's pre-European extent is formally conserved within International Union for Conservation of Nature (IUCN) reserves across Western Australia.

The remainder of the site is mapped as VA 512 (Beard 1973), described as 'shrublands; Mallee scrub, *Eucalyptus eremophila* & Forrest's marlock (*E. forrestianna*)'. Only 26% of pre-European extent remains within the Mal01 IBRA bioregion and 20.14% in the Shire of Esperance area (DPaW 2017). Less than 3% of its pre-European extent is formally conserved within IUCN reserves across Western Australia. Western Australian Local Government Association's (WALGA) 'Local Government Mapping (LGMap)' analyses percentage of remnant VA 512 remaining within a 10 km radius of the site as 19.63% of pre-European extent.

Since 2016, significant illegal clearing by private landowners has occurred in the Grass Patch-Scaddan area. It has been observed that VA 512 has been drastically cleared, further reducing the pre-European vegetated extent. Recently, Reserve 26912 "Roberts Swamp" which contains a large area of VA 512 has been offered as a conservation offset to DBCA, increasing the area of VA 512 within the IUCN system.

2.7 Land use

The area directly included in the clearing permit application 'Site E- Neds Corner Road Reconstruction, north of Cascades Road' is currently intact and vegetated 56 to 440 m wide road reserve. Within the road reserve, the road active road footprint varies from 20 to 28 m wide. The surrounding land use is predominately cleared agricultural cropping and sheep grazing land, unallocated crown land (UCL), and Shire of Esperance managed crown land, which is part of the Cascade town-site's untreated water supply.

According to WALGA's LGMap, the selected area is within 135 m of a waterway. There is a seasonal Yate swamp to the north of the site, within UCL.

3 Methodology

3.1 Desktop study

A desktop study was completed prior to the field survey. A Geographical Information System (GIS) review was conducted, included the following;

- Existing site digital orthophotos, as sourced from LandGate (Lort 2015).
- Western Australian Local Government Association's (WALGA) 'Local Government Mapping (LGMap)' program was used to assess spatial information of geology, topography, soil profiles (Schoknecht et al. 2004), native and planted vegetation, water bodies and Interim Biogeographical Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) classification system.
- Data provided by Department of Biodiversity, Conservation and Attractions (DBCA) and Western Australian Herbarium in October 2019 was used to assess threatened flora (TF), priority flora (PF) and threatened (TEC) and priority (PEC) ecological communities within 20 km radius of the site. Specifically, spatial data included;
    - WAHerb extract (DBCA 2019k).

    - Threatened and Priority Reporting (TPFL; DBCA 2019i).
    - Esperance District Threatened Flora (DBCA 2019b).
    - TEC and PEC 'Likely to Occur' buffer and boundary areas (DBCA 2019j).
- NatureMap was used to assess fauna records within a 20 km buffer from the centre of the site (122°38'29'' E, 33°44' 50''S; DBCA & WAM 2020).

3.2 Field investigation: possible ecological impacts

The site was inspected on 03/10/2019, by the Shire of Esperance's Environmental Officer's, Katie White and internship student completing a botanical science degree, Danika Penson. An assessment of possible ecological impacts was conducted included historical clearing, artificial water way constructions, impact of fire regimes, regeneration from disturbance, waterlogging, senescence, weeds, erosion, sedimentation, invasive fauna, *Phytophthora cinnamomi* Dieback, and illegal dumping of rubbish. Aerial photography was used as a guide to indicate possible differences in habitat and vegetation types.

Vegetation community was also assessed during the field survey. Broad vegetation types defined by structure and composition were recorded and described. Condition of vegetation was assessed using Keighery (1994) categories, as 'Excellent', 'Very Good', 'Good', 'Degraded' or 'Completely Degraded'. This illustrates how healthy vegetation is, determined by number of dead or dying plants, weed cover and other forms of degradation. Additionally, possible environmentally sensitive areas, such as wetlands or granite, were noted.

Observations of fauna presence, such as call sounds, footprints and scats were also noted, and the area assessed for suitability of Carnaby's Black Cockatoo, *Calyptorhynchus latirostris,* feeding, roosting and nesting habitat.

3.3 Field Investigation: Targeted flora survey

A targeted flora survey was conducted in mid-spring over four days, between 15/10/2019 and 25/10/2019, by Shire of Esperance's Environmental Officer's Julie Waters and Katie White. "Sufficiently covered" was guided by the proportion of even coverage of the area. Both sides of the road were surveyed on foot, acting as a continuous transect. Vegetation at least five m on either side of the road was surveyed. A follow-up survey was conducted on 09/12/2019 to map and count priority species *Persoonia cymbifolia* and *Goodenia laevis* subsp. *laevis.* As these species were not previously recognized as PF during the targeted flora survey, the entire transect was re-walked to ensure that no plants were missed. The *G. laevis* subsp. *laevis* were still flowering and the *P. cymbifolia* retained distinctive seed pods, so both species remained easily recognisable. Another follow up survey was carried out on 16/01/20 to assess Eucalypts as priority four species *Eucalyptus stoatei* or non-threatened species *Eucalyptus forrestiana*.

Due to the high diversity and complexity of the flora in the Esperance region, all species were recorded to compile an incidental species list (Appendix 7.2, Table 5). Species not identifiable in the field were collected under Katie White's Regulation 61 Flora Taking Licence FT61000029, and identified existu, using local botanical knowledge, DBCA's Esperance District Herbarium, Florabase (DBCA 2019c) and other guides. This ensured no PF or TF was overlooked. Any species that were unable to be identified were submitted to the WA Herbarium for identification. Due to the spring timing of the survey and follow up survey extending into summer, the majority of species were flowering, decreasing the likelihood of overlooking species.

Over the course of the 2019 wildflower season, surveyors refamiliarised themselves with key taxonomic indicators and associated habitat by visiting verified known populations of *Scaevola archeriana* (P1), *Conostephium* sp. Cascade (TF), *Conostylis lepidospermoides* (TF), *Hypocalymma* sp. Cascade (P2), *Leucopogon* sp. Cascade (P1), *Melaleuca similis* (P1) and *Daviesia pauciflora* (P3). For other TF and PF identified in the desktop survey as possible to occur, scans of pressed specimens from the local Esperance District Herbarium were scanned and taken into the field. Any flora thought to be TF or PF was formally collected, counted and mapped using a Panasonic FS-G1 Toughpad with the program ROAM or a GPS Garmin GPS64. Specimens were then lodged with the WA Herbarium for formal verification. When PF were confirmed, TPFL forms were completed and submitted to the DBCA's district Conservation Officer and Species and Communities Branch.

3.4 Field investigation: Assessing Threatened and Priority Ecological Communities

The vegetation community of 'Site E – Neds Corner Road Reconstruction, north of Cascades Road' was assessed for the presence a TEC or PEC, specifically the Environmental Protection and Biodiversity Conservation Act 1999 listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC and the Biodiversity Conservation Act 2016 listed PEC 'Swamp Yate, *Eucalyptus occidentalis,* woodlands in seasonally inundated clay basins of the South Coast (Yate Swamp)'.

The presence of Kwongkan was identified using diagnostic characteristics defined in the Approved Conservation Advice for Kwongkan (Commonwealth of Australia 2014) as;

> 2a) Characterised by Proteaceae species having 30% or greater cover of Proteaceae species across all layers where these shrubs occur (crowns measured as if they are opaque).
> And/or
> 2b) Two or more diagnostic Proteaceae species are present that are likely to form a significant vegetative component when regenerated.

The presence of the PEC Yate Swamp was identified using a comparison of the vegetation communities present within the proposed road widening footprint to the 'Priority Ecological Communities for Western Australia Version 28 (DBCA 2019g)' definitions, as PEC's do not have published approved conservation advice.

4 Results and Discussion

4.1 Ecological impact

4.1.1 Vegetation Communities

Eight distinct vegetation communities were identified in the 'Site E – Neds Corner Rd Reconstruction, north of Cascades Rd' project, based on structure and composition (Table 1; Figure 2; Appendix 7.1). It is believed that the Beard (1973) mapped vegetation association (VA) 512, described as 'Shrublands; Mallee scrub, *Eucalyptus eremophila* & Forrest's marlock (*E. forrestianna*)', is an appropriate match for vegetation type one, but is not mapped in the correct location. It is the largest and most reoccurring vegetation type within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'. However, VA 929, that was also identified within the proposed clearing permit area, described as 'Low forest; moort (*Eucalytpus platypus*)', did not match any vegetation communities identified within the footprint. For the remaining vegetation communities, an appropriate VA by Beard (1973) that is recorded within the Interim Biogeographic Regionalisation of Australia (IBRA; Thackway & Cresswell 1995) Mallee bioregion, was evaluated and assigned (Table 1; Table 2). Beard's (1973) descriptions are very broad,

and the decision to associate vegetation types within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' with a VA is subjective. Of these, all VA's have relatively high amounts of vegetation remaining, of >30% pre-European distribution. However, in general they are poorly protected in the conservation estate within Western Australia.

Vegetation type four is associated with a granite outcrop (Table 1). Additionally, vegetation type seven forms an ephemeral water body in the Yates swamp. Both of these communities would be considered environmentally sensitive.

Table 1. Vegetation communities identified in 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area.
Nt. Acronyms include threatened ecological community (TEC), Proteaceae Dominated Kwongkan Shrublands of the South-east Coastal Floristic Province of Western Australia (Kwongkan), and vegetation association (VA) of Beard (1973).

Number	Description	Associated species	Area (ha)	Diversity (species)	Met Kwongkan TEC criteria	VA	Photo (Figure in Appendix 7.1)
1	Mixed Mallee Eucalyptus with low diversity, dense Melaleuca shrubland under-story.	*Santalum acuminatum, Melaleuca podiocarpa,* and *Daviesia benthamiana*	0.723 in 3.492 area	108	No	512	15
2	Highly diverse shrubland, with scattered Acacia and Eucalyptus over-story. Mixed genera under-story.	*S. acuminatum, Calothamnus quadrifidus, Leptospermum erubescens,* and *Hakea marginata.*	0.133 in 0.276 area	56	Yes	2048	16
3	Acacia shrubland with *Melaleuca hamata* Broom Bush.		0.086 in 0.218 area	36	No	1413	17
4	Mixed granite shrubland. Periphery of road is Cape Weed and African Lovegrass.	*Melaleuca fulgens,* and *Melaleuca hamata.*	0.296 in 0.723 area	34	No	128	18
5	Closed shrubland of Broom Bush *Melaleuca hamata* and *Calothamnus quadrifidus*.		0.223 in 0.588 area	31	No	1413	19

6	Mixed Mallee Eucalyptus with low diversity, dense Melaleuca shrubland under-story, and dominant *Banksia media*.	*Banksia media, Melaleuca podiocarpa,* and *Daviesia benthamiana.*	0.573 in 1.531 area	102	Yes	1519	20
7	Yate Swamp	*Eucalyptus occidentalis*	0.649 in 0.917 area	26	No	931	21
8	*Banksia media* dominated shrubland, with highly diverse under-story.	*Hakea cinerea*	0.933 in 3.554 area	128	Yes	1519	

Table 2. Vegetation associations of Beard (1973) pre-European vegetation mapping that were evaluated to occur within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', that were not identified as present in the desktop survey.
Nt. Acronyms included in the table are Mallee bioregion (Mal01) under the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995), Shire of Esperance (SOE), International Union for Conservation of Nature (IUCN) and Western Australia (WA).

Vegetation Association	Description	Area remaining in Mal01 (%)	Area remaining in SOE (%)	Conserved in IUCN system in WA (%)
2048	Shrublands; scrub-heath in the Mallee region	49.39	100	7.65
1413	Shrublands; Acacia, Casuarina and Melaleuca thicket.	95.87	97.23	11.46
128	Bare areas; rock outcrops	65.93	87.33	14.83
1519	Shrublands; mallee scrub, *Eucalyptus eremophila* and Banksia	100	100	Unknown
931	Medium woodland; Yate	36.40	32.95	6.38

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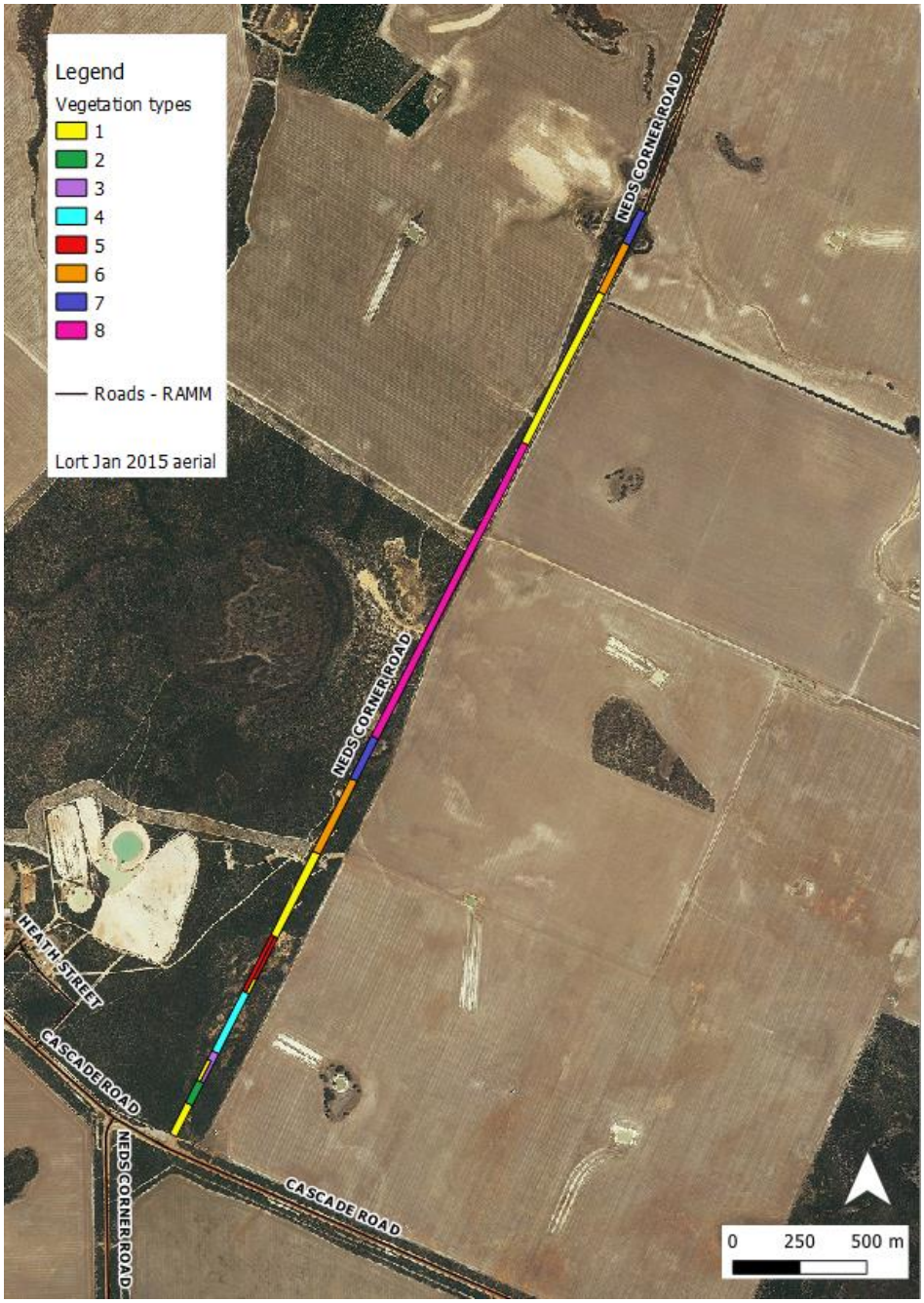


Figure 2. Vegetation communities identified within the 'Site E - Neds Corner Rd Reconstruction, north of Cascade Rd' area.

4.1.2 Vegetation Condition

The vegetation across the entirety of 'Site E - Neds Corner Road Reconstruction, north of Cascades Rd' is in very good to excellent condition. It is long unburnt, with no evidence of fire evident. Minimal weed infestation is present within 'Site E - Neds Corner Rd Reconstruction, north of Cascades Rd'. A minor African Love Grass (*Eragrostis curvula*) infestation was present in vegetation type two and four. In the far northern vegetation type seven area (Yate Swamp), where the proposed clearing activities concludes, Victorian Tea Tree (*Leptospermum laevigatum)*, African Love Grass and Onion Weed (*Asphodelus fistulosus*) is scattered along the periphery. No evidence of introduced fauna species were

directly observed. However, it is likely agricultural pests, such as cats and foxes, are widespread in the surrounding area.

There is satellite and localised previous disturbances present throughout 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd (Figure 2; Table 3). At two areas within the proposed clearing permit area, strategic firebreaks intersect. Additionally, scattered historical material extraction pits are present along 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'. Extraction pits are all observable in 2008 Lort imagery (Landgate) and have scattered shrubs throughout them, indicating are slowly self-rehabilitating.

Table 3. Disturbance through strategic fire breaks and historical material extraction pits along 'Site – Neds Corner Rd Reconstruction, north of Cascade Rd'.
Note. Acronyms included in the table include straight line kilometres (SLK; Main Roads 2020).

Disturbance	SLK	Coordinate	Vegetation Type
Material extraction pits	33.08	-33.476544 S, 121.081120 E	1
Material extraction pits	33.84	-33.470495 S, 121.084898 E	1 and 5
Material extraction pits	34.14	-33.468100 S, 121.086454 E	1 and 6
Material extraction pits	34.61	-33.464375 S, 121.088789 E	7
Material extraction pits	34.74	-33.463354 S, 121.089432 E	8
Material extraction pits	35.10	-33.460441 S, 121.091311 E	8
Strategic firebreak	34.21	-33.467530 S, 121.086777 E	6
Strategic firebreak	35.50	-33.457261 S, 121.093323 E	8

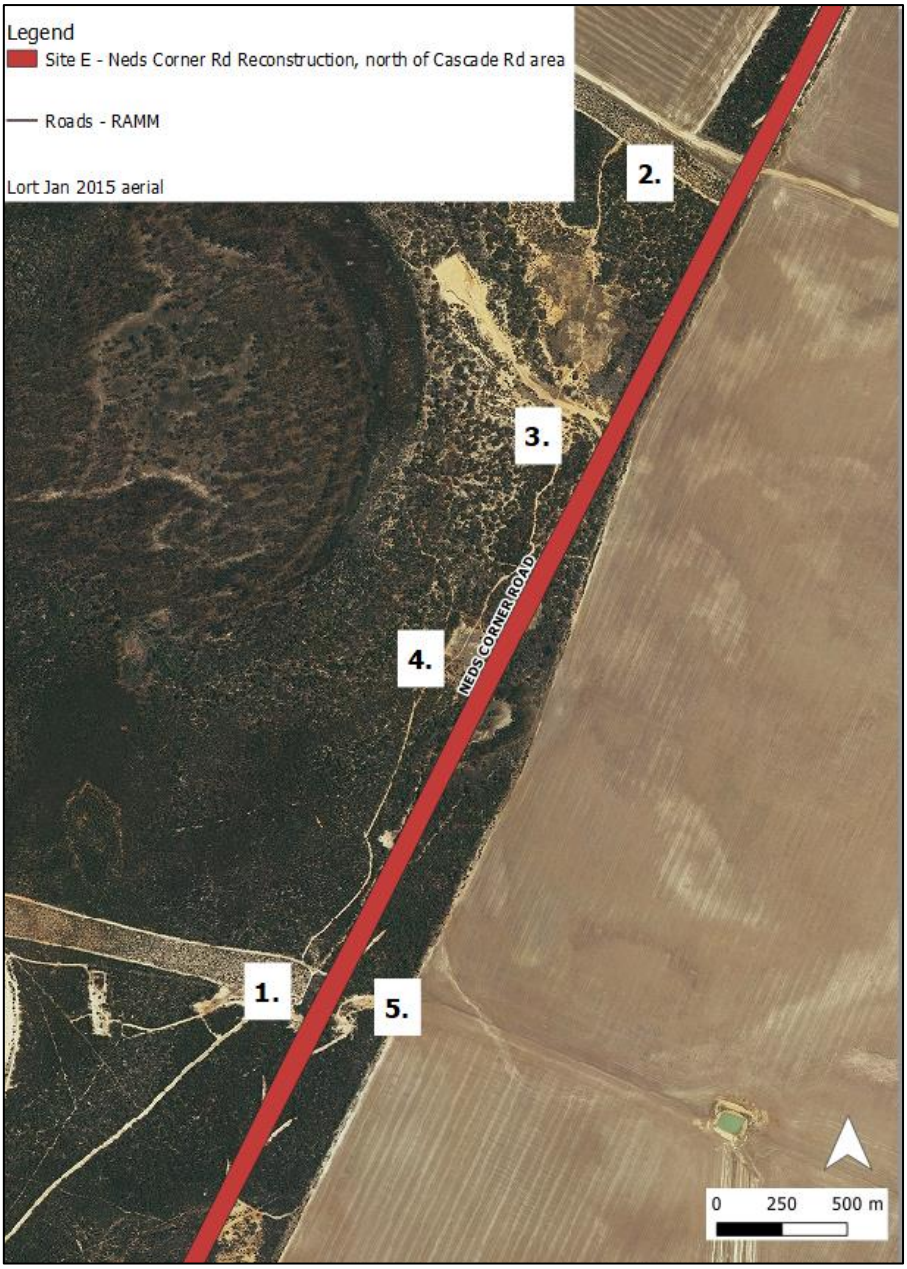


Figure 3. Strategic fire breaks intersecting (Site 1 and 2), and evidence of historical material extraction (Site 3, 4 and 5), within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'.

Vegetation types two, six and eight contain large amounts of vegetation that is *Phytophthora cinnamomi* Dieback susceptible, most notably dominated by Proteaceae species. Very limited data collection on the presence of *Phytophthora cinnamomi* Dieback has been conducted on roadsides in Western Australia. No positive or negative sample points are collated on the Dieback Information Delivery and Management System (DIDMS; GAIA Resources, State NRM & SCNRM 2020). However, during the field survey, a plant pathogen most likely to be *P. cinnamomi* Dieback was observed in vegetation type six and eight, as indicated by multiple dead *Banksia media* plants throughout the area (Figure 4). Appropriate hygiene measures will be employed to limit introduction of infection, including clearing in dry conditions and clean down of machinery. This aims to limit the likelihood that *P. cinnamomi* Dieback will spread, but there is always a possibility that introduction will occur during proposed activities.

Figure 4. Dead *Banksia media* plants within vegetation type six of 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', potentially indicating *Phytophthora cinnamomi* Dieback.

4.2 Threatened and Priority Ecological Communities

The desktop study indicates a 390 m section at the northern end of the site is mapped as 'likely to occur' for the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' (DBCA 2019j). There were no other occurrences of the PECs or TECs within the 20 km buffer of the site. The field survey confirmed the presence of Kwongkan TEC over a different geographic area (Figure 5; Table 1). In total 1.64 ha of native vegetation within a 5.36 ha area of 'Site E - Neds Corner Rd Reconstruction, north of Cascades Rd' met the criteria for the Kwongkan TEC, all in very good condition.

The priority ecological community (PEC) 'Swamp Yate, *Eucalyptus occidentalis*, woodlands in seasonally inundated clay basins of the South Coast (Yate)' is broadly described as "Yate woodlands with intact understorey and fringing vegetation" (DBCA 2019g). Vegetation type seven is similar to this description within 'Site E – Neds Corner Road Reconstruction, north of Cascades Road' (Table 1). However, due to a road dissecting the middle of the swamp resulting in lack of any under-story and weed infestation, it is unlikely to meet the definition of this PEC (DBCA 2019g).

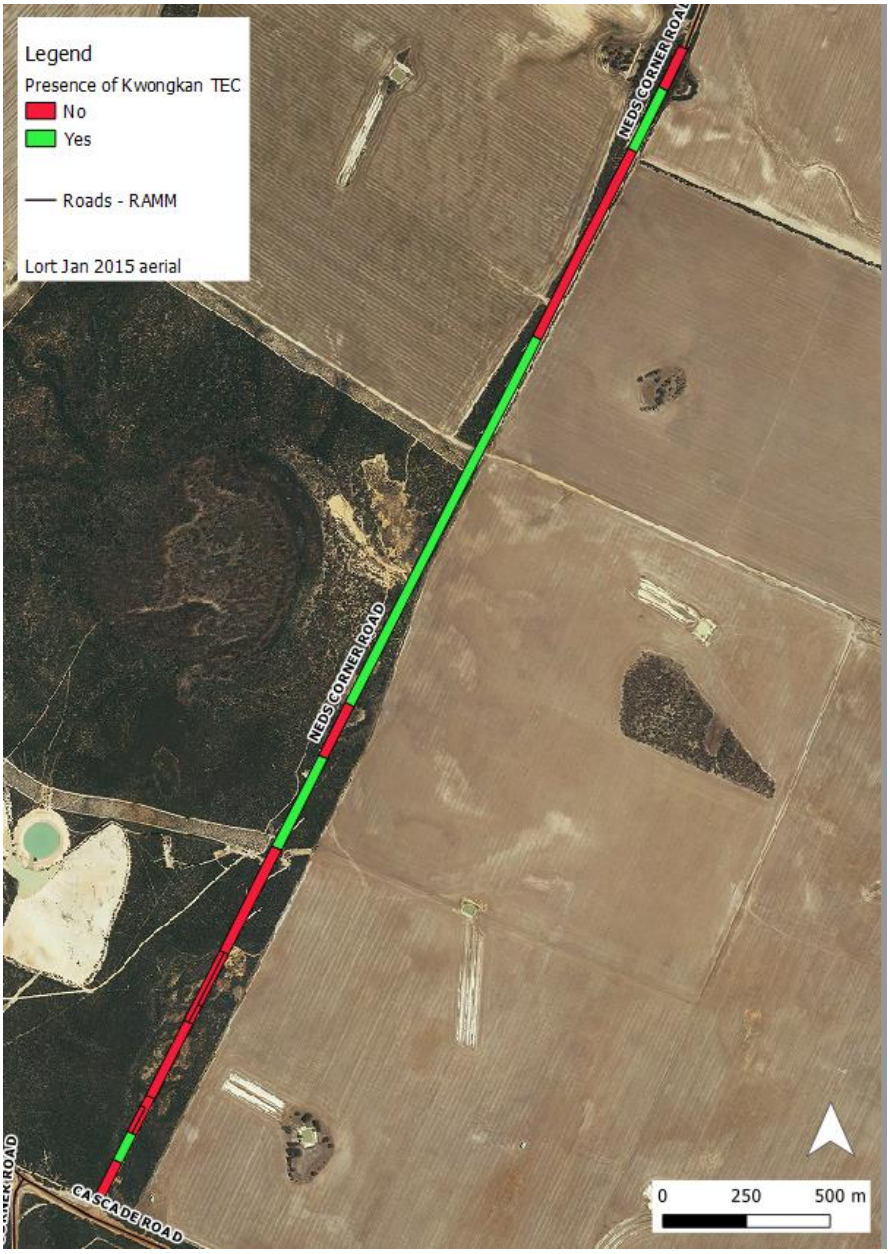


Figure 5. Vegetation within the 'Site E - Neds Corner Road, north of Cascades Road' meeting the threatened ecological community (TEC), 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia' thresholds.

4.3 Threatened and Priority Flora

Two records of threatened (TF) or priority (PF) flora have previously been recorded from the immediate 'Site E – Neds Corner Rd Reconstruction, north of Cascades Rd' area, including priority one *Scaevola archeriana* and priority one *Meleleuca similis*. One species of TF and 24 PF have been recorded within a 20 km radius of the site (Table 4; DBCA 2019b, DBCA 2019i, DBCA 2019k). An assessment on the likelihood to occur based on associated habitat was completed, with 20 of these species assessed to be likely or possible to occur.

Table 4. Desktop study identifying priority flora and threatened flora recorded within a 20 km radius of the clearing permit application 'Site E - Neds Corner Road Reconstruction, north of Cascades Road' survey results, using Threatened and Priority Flora Reporting (TPFL; DBCA 2019i), WA Herbarium (DBCA 2019k) and Esperance District Threatened Flora (DBCA 2019b).
Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2016, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, vulnerable (VU), endangered (EN), and critically endangered (CR).

Species	Conservation status	Likelihood to occur	Habitat description
Acacia amyctica	P2	Yes	Well drained loam and sandy clay plains in lowlands of *Eucalyptus flocktoniae* and open shrublands.
Acacia diminuta	P1	Yes	Mallee shrubland with *Darwinia* sp. Lake Cobham, *Melaleuca* sp., *Hakea scoparia, Acacia fragilis, Eucalyptus angustissima, Calothamnus quadrifidus, Hibbertia exasperata, Hypocalymma* sp. Cascade. Very few details known. Recorded on yellow/brown dry sand/loam, over shallow ironstone gravel or on Sandy-clay.
Bentleya diminuta	P2	Yes	Mostly recorded on disturbed road edges. Associated with Mallee of mixed composition. Recorded on various soil types, including sandy clay loam, gravel and limestone.
Bossiaea flexuosa	P3	Yes	Grows on sand and sandy loam, often near salt lakes. Associated with low open scrub, with emergent Eucalypts.
Conostephium sp. Cascade	P1 (has been nominated as TF)	Yes	Grows on yellow/brown gravelly sandy loam. Associated species include Mallee Eucalyptus, *Eucalyptus tetragona, Banksia media, Calothamnus gracilis*, and *Microcybe* sp.
Conostylis lepidospermoides	TF – VU under BC Act 2016 and EN under EPBC Act 1999	Yes	Associated with Proteaceous rich heathland.
Convolvulus sp. Cascades	P1	No	Described as prostrate, short-lived herb in that grows in recently burnt areas. Grows in gravelly, grey-brown sand, and clay depressions with seasonally wet clay. Associated species include *Eucalyptus tetragona*, and Eucalyptus Mallee shrubland.
Daviesia pauciflora	P3	Yes	Associated with Proteaceous rich heathlands over a variety of soil types.
Eremophila chamaephila	P3	Yes	Grows on light brown sandy clay loams in Eucalypt or Mallee woodland.
Eucalyptus litorea (previously *Eucalyptus famelica*)	P3	No	Inland from coastal dunes on low ground, existing originally as a freshwater swamp.
Eucalyptus stoatei	P4	Yes	Associated with Mallee and Eucalyptus woodland. Grows on sand over clay, gravelly clay, and sandy loam clay.

Goodenia laevis subsp. *laevis*	P3	Yes	Associated with Mallee, across a wide distribution.
Grevillea aneura	P4	Yes	Grows in heath or Mallee scrub, in yellow sand or sandy loam over laterite. Mostly recorded on rises.
Gyrostemon ditrigynus	P4	No	Recorded in recently burnt Mallee.
Hydrocotyle papilionella	P2	No	Grows on edge of area subject to inundation in sandplains, including grey sand, edge of salt lakes, and dark grey damp clay loam.
Hypocalymma sp. Cascade	P2	Yes	Associated with dense Melaleuca and Allocasuarina shrubland, with dominant *Eucalyptus forrestiana* thicket. Grows on soil gravel sand duplex.
Leucopogon sp. Cascade	P1	Yes	Associated with Mallee woodland over Proteaceous shrubland, with *Banksia media*. Grows on brown sandy loam.
Levenhookia pulcherrima	P3	Yes	Wide geographic distribution and associated range of vegetation and soil types.
Melaleuca dempta	P3	Yes	Associated with Mallee shrubland. Grows near salt lakes and winter wet depressions. Soil types recorded on are clay over laterite and loam.
Melaleuca similis	P1	Yes, record directly within the area	Associated with low shrubland on sandy loam, with *Eucalyptus forrestiana, Banksia media,* Melaleuca sp., Leucopogon sp. and Calothamnus sp.
Opercularia acolytantha	P3	Yes	Associated with *Eucalyptus occidentalis* (Yate) Swamps. Also recorded on sandplain, deep white sand, and yellow sandy gravelly loam over laterite. Broadly associated with *Eucalyptus tetragona* Mallee shrubland, sometimes after fire.
Opercularia nubicola	P2	No	Only recorded in the Stirling Ranges. This may be a database error or old record and probably relates to record above (*Opercularia acolytantha*).
Scaevola archeriana	P1	Yes, record directly within the area	Mostly recorded in disturbed areas. Associated with wide variety of soil types including yellow sand, limestone, plains near salt lakes, dry grey sand, sand-clay loam, and sandy soil after fire. Associated with Mallee shrubland.
Stachystemon vinosus	P4	Yes	Grows on sandy duplex gravelly soils in scrub heath in association with Eucalyptus sp*, Phymatocarpus maxwelli, Hakea cinerea, Banksia media, Melaleuca rigidifolia,* and *Beaufortia schaueri.*
Thysanotus brachiatus	P2	Yes	Associated with Mallee sandplain shrublands, consisting of *Eucalyputs tetragona,* and *Lambertia inermis.* Few details on specimen data.

In total, 233 flora species were identified during the targeted flora survey (Appendix 7.2, Table 5), showing the extremely high diversity of the site. It is believed that the area is on the periphery of intersecting bio-regions resulting in a unique combination of landscape conditions and species community composition. The field survey also identified numerous priority flora within the 'Site E – Neds

Corner Rd Reconstruction, north of Cascade Rd' area. These included *Scaevola archeriana* (P1; Section 4.3.1), *Melaleuca similis* (P1; Section 4.3.2), *Goodenia laevis* subsp. *laevis* (P3; Section 4.3.3) and *Persoonia cymbifolia* (P3; Section 4.3.4). Queries of spatial datasets were requested specifically for these species, to interrogate impact of proposed works on species sustainability (DBCA 2019h, DBCA 2019e, DBCA 2019d, DBCA 2019f). *G. laevis* subsp. *laevis* were not recorded on the threatened and priority reporting (TPFL) database. DBCA do not actively manage or monitor the majority of low priority species, due to their prevalence in the landscape relative to TF. There are 145 species recorded as priority three or four conservation status within the Shire of Esperance boundaries. It is therefore likely for both *G. laevis* subsp. *laevis* and *P. cymbifolia* that databases are not complete or prioritized to be updated.

There were a number of non-threatened species similar to TF or PF species that were also extensively examined. *Acacia dermatophylla* was collected and closely examined to confirm species as not priority three species *Acacia glaucissima*, due to having longer stipules. All *Eucalyptus forrestiana* plants within the proposed clearing permit area were thoroughly inspected to confirm were not priority four species' *Eucalyptus stoatei* or *Eucalyptus dolichorhyncha.* A single specimen verified (KW030, Accession #8218) from the site as *E. forrestiana* was used as reference material during inspections of all plants. The bud caps of all 250 plants were inspected, and were all lacking distinct ridges of *E. stoatei* and long bud caps of *E. dolichorhyncha* (DBCA 2019a). Lastly, numerous species could not be identified by resident botanists and were sent to WA Herbarium for formal identification (Table 5). They were all identified as non-threatened species.

Table 5. Non-threatened species identified within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area that were sent to WA Herbarium for formal identification.

Species	Collectors Number	Accession Number	Specimen retained by WA Herbarium	Notes
Comespermum scoparium	KW053	8281	Yes	Range extension for Esperance area. Not been recorded here.
Atriplex semibaccata	KW064 and KW065	8334	No	
Haloragis hamata	KW066	8334	No	
Atriplex acutibractea subsp. *karoniensis*	KW067	8334	No	
Dodonaea concinna	KW068	8334	No	
Aotus sp. Southern Wheatbelt	KW044, KW045, KW049	8281	No	

Eucalyptus forrestiana	KW030	8218	No	

4.3.1 *Scaevola archeriana*, priority one

A population of priority one species, *Scaevola archeriana,* was already known to occur and identified by the desktop survey in the 'Site E - Neds Corner Rd Reconstruction, north of Cascades Rd' (DBCA 2019b, DBCA 2019i, DBCA 2019k; Figure 8). It is listed as population one on TPFL. The population is located 2.1 km north of Cascade Rd intersection, at SLK 35.01 (Main Roads 2020), -33.461220 S, 121.09036 E (GDA94). During the field survey, an additional 14 plants were recorded within the 'Site E - Neds Corner Rd Reconstruction, north of Cascades Rd' footprint, which were an extension to the previously recorded population (Figure 6; Figure 7). All new plants are within existing spoon drains. Therefore, due to no legal obligation to avoid PF, all plants will be impacted upon by routine maintenance activities and cannot be avoided. Only one plant was flowering, and a specimen was collected to be verified by the Western Australian Herbarium (KW036, Accession #8218, specimen not retained). Species identification was confirmed by Michael Hislop 17/12/2019. A TPFL form was sent to the Department of Biodiversity, Conservation and Attractions (DBCA) District Conservation Officers and Species and Communities Branch on 18/12/2019 (Appendix 7.3.1). No new populations of *S. archeriana* were discovered outside of this area.

Figure 6. Location of newly located priority one species, *Scaevola archeriana,* plants within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', in comparison with population data from previous surveys conducted in 2017 and 2019.

Figure 7. Priority one species, *Scaevola archeriana*, plant growing within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'.

Both Shire of Esperance's Environmental Officers, Katie White and Julie Waters, are familiar with the existing population of *S. archeriana* on Neds Corner Rd. They were involved in the most recent survey of the species in January 2019, conducted with the Esperance Wildflower Society members Mary Hoggart and Noel Fleming, and DBCA's District Conservation Officer Emma Massenbauer. The survey built on previous surveys conducted in January 2017 (Figure 8), increasing the mapping of the distribution of plants within the road reserve and unallocated crown land immediately west of 'Site E - Neds Corner Rd Reconstruction, north of Cascades Rd' site (Figure 6). The known population has approximately 40 plants present. During the January 2019 survey every plant located was recorded with a handheld GPS unit. This data was checked to confirm no previously recorded plants were within the impact zone of proposed works.

PERTH 08935629

Scaevola archeriana
Goodeniaceae

Plant Description, Notes: Erect herb, 0.1 m high x 0.2 - 0.6 m wide. Flowers purple. Population structure: 100% flowering.
Vegetation: Tall shrubland. Associated species: Banksia media, Melaleuca pulchella, Acacia sp., Eucalyptus spp. and Anarthria laevis.
Site Description: Yellow sand. Old soil disturbance.
Frequency: 10 plants.
Locality: Neds Corner Road, 1.8 km N of Cascades Road, W road reserve
Location: -33.462°, 121.090° (GDA94)
Location (DMS): 33° 27' 43.4" S 121° 5' 22.6" E (GDA94)
State: WA
Collector: Massenbauer, E. **Coll No:** 741
Collection Date: 26 April 2017
Conservation Code: 1

ID by: R. Davis **Date:** 29 March 2018
Origin: PERTH
Record Basis: PreservedSpecimen

Figure 8. Specimen record from Florabase (DBCA 2019c) of known population of priority one species *Scaevola archeriana* within the 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'.

An extract from the WA Herbarium specimen records and TPFL spatial databases was received from DBCA (DBCA 2019h; Table 5) and used to assess if proposed impacts will have a significant impact on the species sustainability. The species is reliably present from four locations, that have recently been monitored. An additional three other sites have been verified but are old, with minimal information recorded. *S. archeriana* is widely geographically distributed, with records spanning 300 km (east-west distribution), and are present across a wide range of soil types, from salt lakes to deep sand. Most significantly of note, all records are described within proximity of a disturbance (Table 5). Two sites are present on historical sand pit locations, and four are adjacent to tracks or active road footprints. Whilst population numbers are not recorded comprehensively, relatively high number of individuals are present at each population. If proposed works went ahead, a known 120 plants would remain across the four reliable populations.

It is likely that many unknown populations of *S. archeriana* exist within the landscape. *S. archeriana* is cryptic in identification, looking like a very non-descript, reedy, small herb when not flowering, similar to many other non-threatened species. The flimsy nature of the plant also means that it can grow within the cover of other plants and be entirely unnoticeable. Flowers are small and sparse on plants, only occurring for a short period of time in January, when flora surveys are typically not being conducted. It is likely that the cryptic nature of physiological features has resulted in this species being under collected. However, *S. archeriana* has been of interest to the Shire of Esperance, DBCA and Esperance Wildflower Society for at least 3 years, and no incidental discovery of populations has occurred.

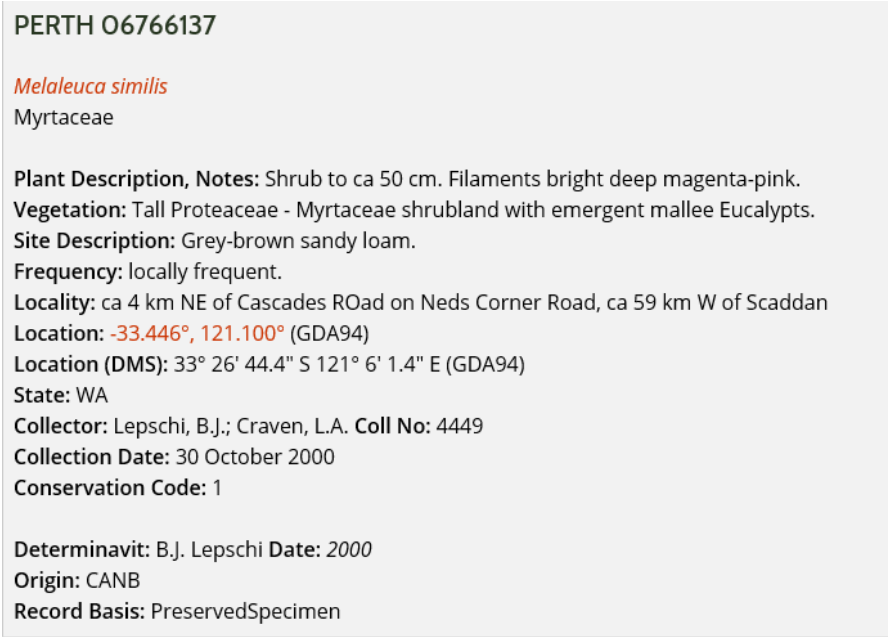
Table 5. Known populations of priority one species *Scaevola archeriana* (DBCA 2019h).

Location	Associated habitat	Number of plants	Evidence of disturbance	Date surveyed	Markers present	Likelihood of impact
On Neds Corner Rd, ~2.1 km north of	Mixed Eucalyptus Mallee woodland with scattered	~55 (40 in sandpit and 14 in	Yes; extends through a	2017, 2019 and 2020.	No	Proposed as 'Site E'. 14 plants likely to be

Cascade Rd intersection	*Banksia media,* and diverse shrubland. Deep yellow sands.	road reserve)	disused sand pit.			impacted. Remainder is unlikely.
On Norwood Rd, ~550 m east of Dempster Rd intersection	White rocky soils. Mallee shrubland (lacking Eucalyptus due to strategic firebreak).	~50	Yes; in existing road footprint and strategic firebreak.	2020	Yes	Possible if road maintenance required.
Ravensthorpe area. Edge of Beatty Rd, 0.3 km from Ravensthorpe-Lake King Rd.	Adjacent to salt like. Grey sandy clay.	Occasional	Yes; adjacent to road reserve	2004	No	Unknown
On Mt Heywood Rd, ~ 4km north of Karl Berg Rd intersection.	Limestone base. Plain near a salt lake. Grey sand. Low mixed shrubland, with Melaleuca , Eucalypt and Hakea.	20	Yes; adjacent to disturbed area from power line and a historical limestone pit.	2008	No	Possible, present near a powerline track. Unlikely to increase limestone pit.
Unallocated Crown Land, 3 km NNW of Mt Heywood.	Sand.	Unknown	Yes; located just off 4WD track	1992	No	Unlikely
Fisheries Rd, ~68 miles east of Esperance-Norseman Rd. Near Boyatup Hill.				1960	No	Unknown population.
Savages Rd, ~1 km south of ELD Rd.	Fine sand-clay loam.		Yes; all plants scattered within the road reserve.	1995	No	Unknown if still existing. Likely been impacted by road activities.

4.3.2 *Melaleuca similis*, priority one

A previously known population of priority one species, *Melaleuca similis,* was present within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' (DBCA 2019b, DBCA 2019i, DBCA 2019k; Figure 9), described as population two on TPFL database (DBCA 2019i). The field survey confirmed the existence of this population, with *M. similis* recorded in the Neds Corner Rd road reserve, from 1.1 km to 4 km north of Cascade road intersection, forming an extension to TPFL Population 2 (Figure 10; DBCA 2019i). 168 plants were observed, of which 99 (59%) individuals were within the proposed clearing footprint. A specimen was collected for identification verification by the WA Herbarium (KW031, Accession #8218, specimen not retained). Identification was confirmed as *M. similis* on 17/12/19 by Michael Hislop. A TPFL form was sent to DBCA's District Conservation Officer (Emma Massenbauer and Wayne Gill) and Species and Communities Branch on 18/12/2019 (Appendix 7.3.2). *M. similis* was flowering profusely at the end of October, when the targeted flora survey was conducted, making it easily identifiable. The species was locally common, growing on both sides of the road within 'Site E – Neds Corner Road Reconstruction, north of Cascades Road'. The survey was limited to what was observable using the road as a transect. There is substantial suitable habitat that was not surveyed in the adjacent unallocated crown land reserve and road reserve. Plants counted as part of the population that will not be impacted were easily observable from the edge of road, and were incidentally counted. During the survey it was observed that numerous *M. similis* plants were re-spouting following disturbance from grading of road shoulders, indicating a tolerance of the species to disturbance.



PERTH 06766137

Melaleuca similis
Myrtaceae

Plant Description, Notes: Shrub to ca 50 cm. Filaments bright deep magenta-pink.
Vegetation: Tall Proteaceae - Myrtaceae shrubland with emergent mallee Eucalypts.
Site Description: Grey-brown sandy loam.
Frequency: locally frequent.
Locality: ca 4 km NE of Cascades ROad on Neds Corner Road, ca 59 km W of Scaddan
Location: -33.446°, 121.100° (GDA94)
Location (DMS): 33° 26' 44.4" S 121° 6' 1.4" E (GDA94)
State: WA
Collector: Lepschi, B.J.; Craven, L.A. **Coll No:** 4449
Collection Date: 30 October 2000
Conservation Code: 1

Determinavit: B.J. Lepschi **Date:** *2000*
Origin: CANB
Record Basis: PreservedSpecimen

Figure 9. Previous record of priority one species, *Melaleuca similis*, within the 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area.

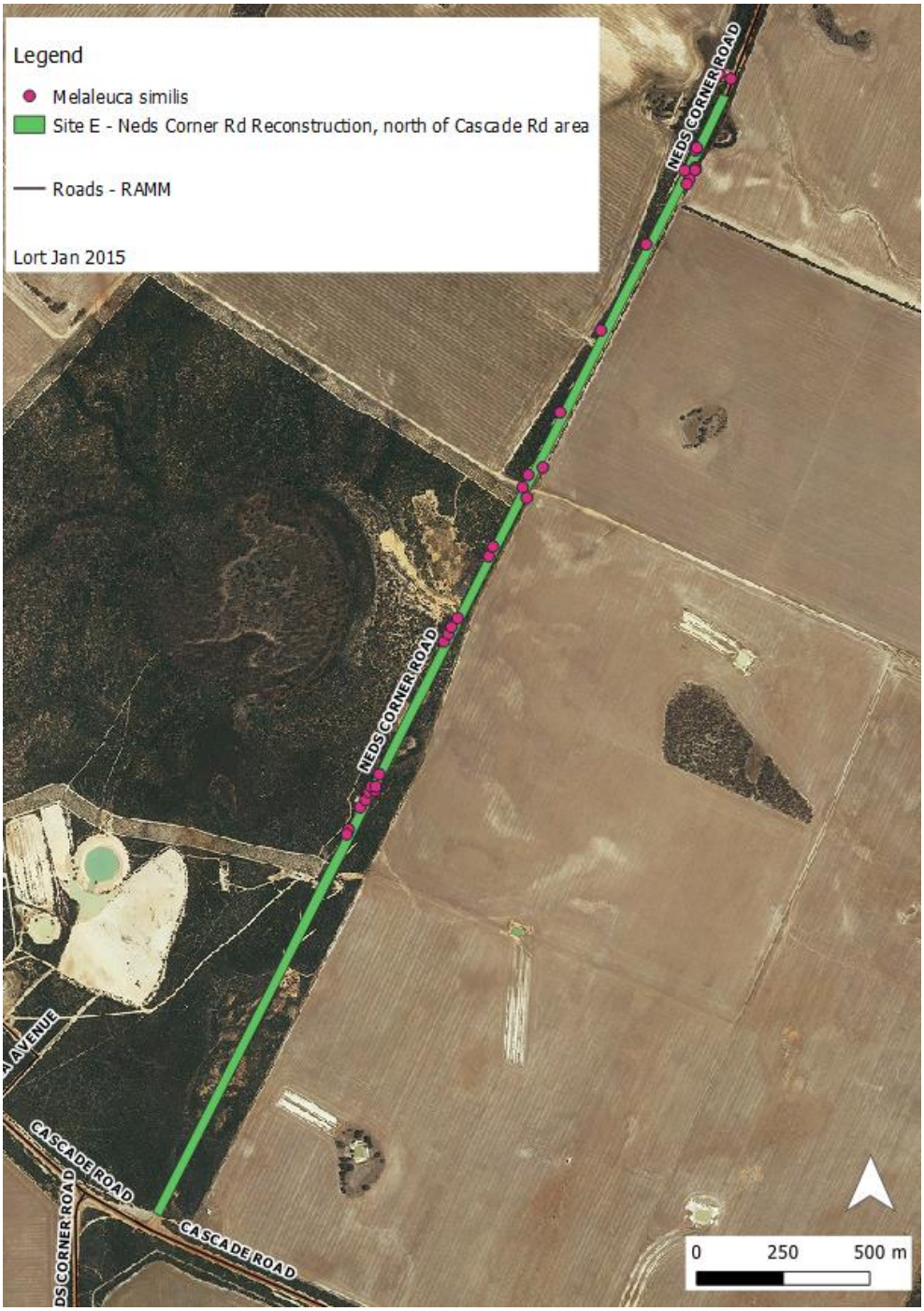


Figure 10. Location of priority one species, *Melaleuca similis,* within the 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area.

To evaluate impact of proposed works on the sustainability of *M. similis,* spatial data bases were interrogated (DBCA 2019e; Table 6). *M. similis* is restricted geographically to an area in the vicinity of Cascades, and is known from six populations over a range 110 km (north-south) by 60 km (east-west) (DBCA 2019e). Spatial queries have poor description on population dynamics or tenure, so for the vast majority of these locations it is population numbers are unknown. The vast majority of populations have been revisited recently. Given its similarity to other widespread and common species within the

Ravensthorpe-Esperance region, notably *Melaleuca plumea* and *Melaleuca stramentosa,* it may be under collected as perceived to be similar non-threatened species.

Table 5. Known populations of priority one species *Melaleuca similis* (DBCA 2019e).

Location	Associated habitat	Number of plants	Date of last survey	Likelihood of impact
Neds Corner Rd, ~1.1 to 4 km north of Cascade Rd	Eucalyptus open woodland with Melaleuca and diverse shrublands. Grows over variety of soil types.	168	2020	99 plants proposed impact
West Point Rd, ~9 km north of South Coast Hwy.	Eucalyptus Mallee with Melaleuca and mixed shrubland understory. Growing on white clay sand.	100	2012	
Rollonds Rd, 28 km NW of Cascade.	Mallee, over sandy loam.		2001	
South Coast Hwy, ~ 35 km NNW of Young River Crossing			2002	
40 km E of Ravensthorpe			2005	
On firebreak between Lake King-Norseman Rd and Hyden-Norseman Rd.	Growing on deep sandy duplpex, with Eucalyptus woodland and Melaleuca shrubland.	Common	2016	

4.3.3 *Goodenia laevis* subsp. *laevis*, priority three

Two new populations of priority three species, *Goodenia laevis* subsp. *laevis,* were observed within the 'Site E – Neds Corner Road Reconstruction, north of Cascades Road' (Figure 11; Figure 12). There is no previous record (DBCA 2019b, DBCA 2019i, DBCA 2019k) of *G. laevis* subsp. *laevis* within the immediate area, and hence considered as new populations. Both were located within the mapped vegetation one community, described as 'mixed Mallee Eucalyptus with low diversity, and dense Melaleuca shrubland'. One population was located 115 m north of Cascade Rd intersection on Neds Corner Rd, and consisted of two plants present in intact bushland, inside the clearing footprint. The other population of *G. laevis* subsp. *laevis* was located 2.8 to 3.5 km north of Cascades Rd, on Neds Corner Rd. 82 individuals were observed with this population. A specimen was collected and lodged at the WA Herbarium (KW043, Accession number 8281 with specimen not retained). *G. laevis* subsp. *laevis* was formally confirmed by Michael Hislop on 06/02/2020). 90% of individuals were located within the existing disturbed area of the roads active back slope of the drain, so will be impacted and cleared in the next routine grading activity. A TPFL form was submitted to DBCA's District Conservation Officers (Emma Massenbauer and Wayne Gill) and Species and Communities Branch 02/10/2020 (Appendix 7.3.3).

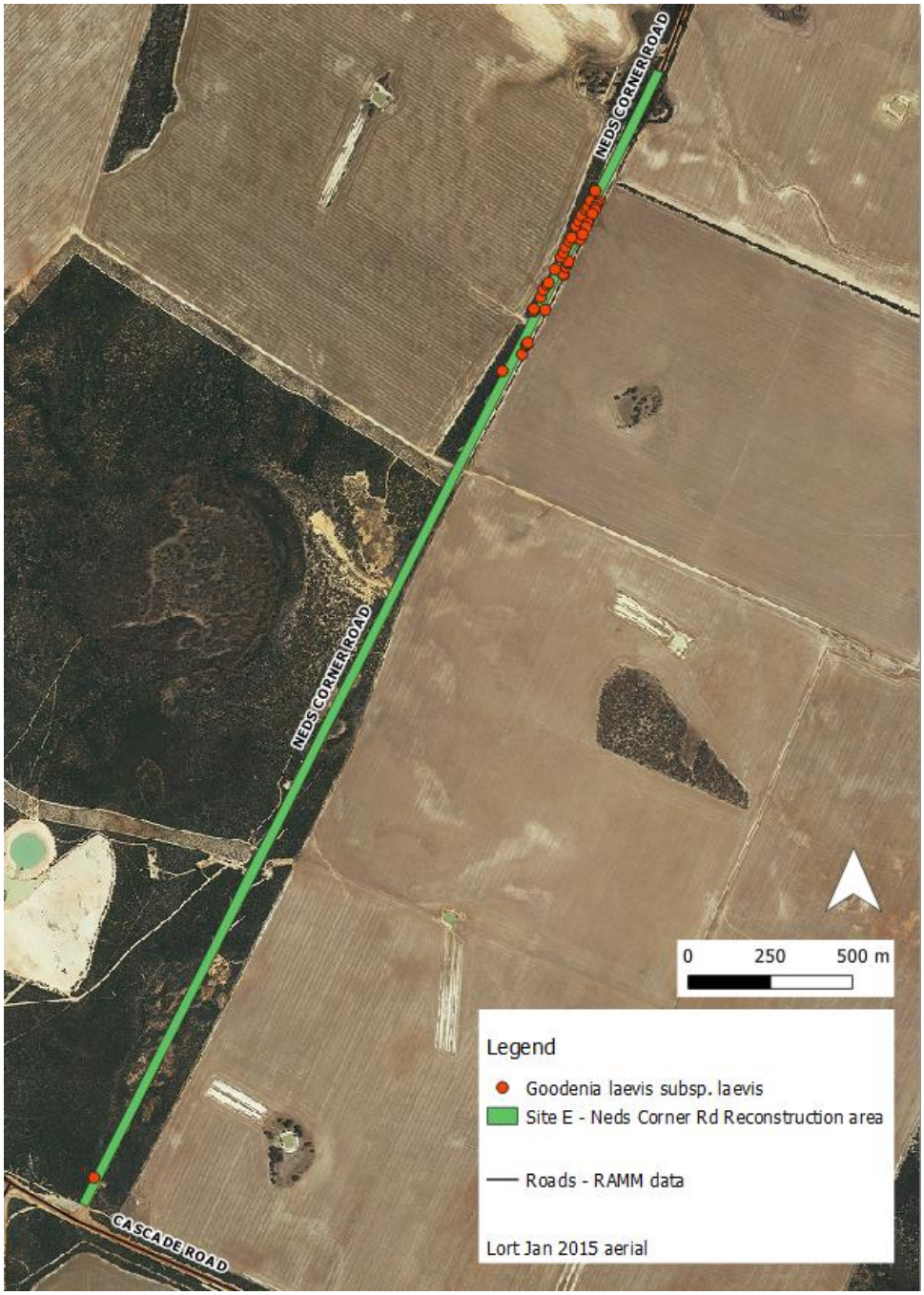


Figure 11. Location of priority three species, *Goodenia laevis* subsp. *laevis,* within the 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area.

Figure 12. Priority three species, *Goodenia laevis* subsp. *laevis*, plant growing within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd'.

During the spring 2019 flora season there was five new populations of *G. laevis* subsp. *laevis* incidentally discovered by Shire of Esperance's Environmental Officers. At all sites, the plants were present in the road active footprint that is regularly graded or in dam catchments – all sites with a high level of disturbance (Table 6). It could therefore be inferred that the presence of *G. laevis* subsp. *laevis* in the disturbed road footprint within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' is due to disturbance.

Table 6. Additional population of priority three species, *Goodenia laevis* subsp. *laevis* discovered by the Shire of Esperance's Environmental Officers during the spring 2019 flora season.

Location	Number of plants	Evidence of disturbance	Likelihood of impact
Intersection of Norwood and Dempster Rd, on the historic road footprint.	100 to 150	Yes; located within an old road footprint, that was ripped when the road was realigned.	No
Cascade town-site, on Wilhaust St.	15	Yes; located on back-slopes of a road that is regularly graded.	Yes; during routine road maintenance activities.
Grass Patch Rd, 2 km west of Bishops Rd	50+	Yes; all plants located within the back-slopes of the road that is regularly graded.	Yes; proposed road reconstruction. Site C in the Shire of Esperance's '2020 Strategic Purpose Permit'

Central Grass Patch town-site, in Reserve 19624	3	Yes; located in a vehicle parking bay and storage area. Evidence of previous disturbance, as intact bushland was lacking under-story.	Yes; proposal to clear to increase area for turn-around bay and storage for road maintenance activities. Currently pending CPS 7548/1.
Old dam on the intersection of Dalyup and Rasyk Rd.	200 to 250	Yes; historically cleared and ripped area to provide catchment for the old dam.	Yes; proposal to clear vegetation to re-instate catchment area as a water source. Application under CPS 7548/1 will be developed.

An extract of data from the WA Herbarium and TPFL spatial datasets was received from DBCA 19/12/2019 (DBCA 2019d). The below inferences could be drawn from spatial queries:

- *G. laevis* subsp. *laevis* is geographically restricted to the Esperance Mallee area, extending from Scaddan to Norseman, and the Cascade region to the edge of Cape Arid. In total this covers 17 797 km^2.
- Almost all associated vegetation is described as a variation of mixed Melaleuca shrubland with Eucalyptus woodland over-storey. Extensive areas of this vegetation type remain, providing likely habitat, with similar soil type and associated vegetation.
- 20 records of lodged specimens are recorded, with 10 records collected prior to 2000.
- Of the 20 recorded specimens, six records are directly described as being within a previously disturbed site, such as old limestone pits or along firebreaks.
- 11 sites are described as along a road and may have been impacted upon during road widening or maintenance. 5 sites are within reserves and likely remain intact. 5 sites cannot be determined tenure status and is unknown of potential impacts.

4.3.4 *Persoonia cymbifolia*, priority three

Two new populations of priority three species, *Persoonia cymbifolia,* were recorded in the survey area (Figure 13). No previous records of *P. cymbifolia* were present in the immediate area (DBCA 2019b, DBCA 2019i, DBCA 2019k), and hence sites were considered new populations. 14 plants of *P. cymbifolia* was recorded 2.4 km north of Cascade Rd, on Neds Corner Road, within vegetation type eight, described as '*Banksia media* shrubland dominated with highly diverse under-story'. Within this population six plants (30% of population) are present within the proposed impact zone, and will be cleared during activities. All six plants are present within intact vegetation, and not present within the current active road footprint. Material was collected for a specimen (KW042 Accession #8281, with specimen not retained) for WA Herbarium on a follow-up survey specifically targeting *P. cymbifolia,* on 9/12/2019. *P. cymbifolia* was formally confirmed on 06/02/20 by Michael Hislop. The surrounding road reserve was not surveyed, and is therefore possible the total population at this site is more than 14 plants. A TPFL form was submitted to DBCA's District Conservation Officers and Species and Communities Branch on 02/10/2020 (Appendix 7.3.4).

The other new population was recorded on a historic gravel pit, just outside of 'Site E – Neds Corner Road Reconstruction, north of Cascades Road' clearing permit footprint, at 1.8 km north of Cascade Rd, also in vegetation type eight. The three plants present will not be impacted upon. A specimen was lodged with the WA Herbarium for confirmation, and was confirmed on 06/02/2020 by Michael Hislop

(KW046, Accession #8281, with specimen not retained). A TPFL form was submitted to DBCA's District Conservation Officers and Species and Communities Branch on 02/10/2020 (Appendix 7.3.4).

Figure 13. Location of priority three species, *Persoonia cymbifolia,* within the 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd' area.

According to DBCA's databases, *P. cymbifolia* is known from 31 populations over a geographic range of 400 km, east to west distribution (DBCA 2019f; Figure 14). *P. cymbifolia* is recorded across a vast array of soil types, such as sand, clay, loams, gravels and landscapes, such as salt lakes, granite, coastal plains, sand dunes and valley floors. There is therefore likely to be extensive suitable habitat throughout the 400 km recorded distribution range. Abundance is poorly described in spatial databases, but at five sites it was described as being frequent or widespread, and at eight sites as having 3-5 plants present.

In addition to recorded populations, Shire of Esperance Environmental Officers incidentally discovered another population of *P. cymbifolia* during the 2019 flora season on Ashdale Rd, at the Lort River crossing. This population consisted of 10 plants re-sprouting in back slopes of the road footprint. Plants are located within yellow flora markers for recently discovered priority one species, *Persoonia flexifolia*, to delineate where machines cannot operate. Therefore, the 10 plants are protected within this area and are unlikely to be impacted. A specimen was collected and sent to the WA Herbarium for formal verification (KW047, Accession #8281, with specimen not retained). A TPFL form was sent to DBCA's district Conservation Officer's (Emma Massenbauer and Wayne Gill) and Species and Community Branch.

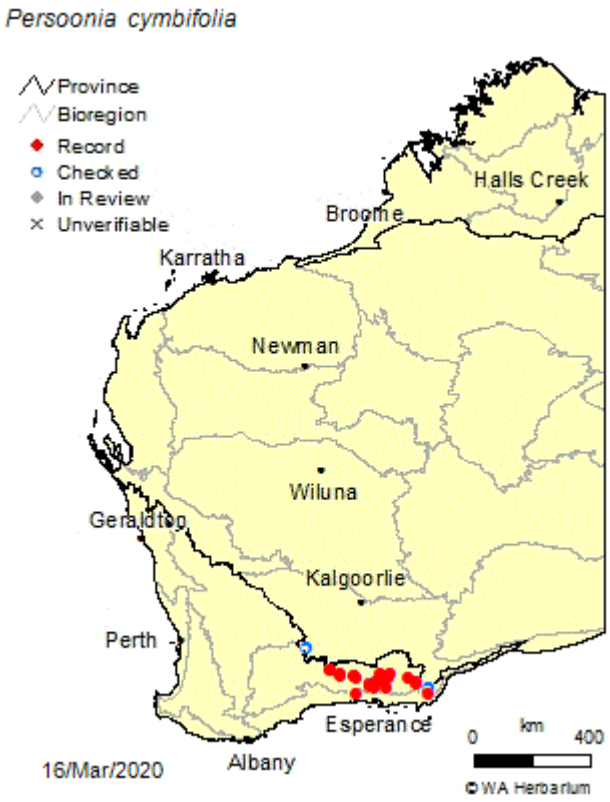


Figure 14. Distribution of priority three species, *Persoonia cymbifolia*, covering a large area of approximately 400 km east-west (DBCA 2019c).

4.4 Threatened Fauna

Within a 20 km radius of the 'Site E - Neds Corner Road, north of Cascades Road', 124 species of fauna have been recorded (DBCA & WAM 2020). Of these, only two threatened fauna were recorded, and both of these are possible to occur at this site. The presence of Kwongkan TEC and high Proteaceae cover resulting in a high prevalence of Hakea and Banksia species suggests this site is a potential Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, feeding habitat. Larger Eucalypts scattered regularly throughout proposed clearing permit area may be used as roosts. There is also thick Broom brush thicket present within vegetation types two, three and five, which could be potential Malleefowl, *Leipoa ocellata,* habitat.

5 Conclusion: assessment of Department of Water and Environmental Regulations clearing principles

The 'Site E - Neds Corner Road Reconstruction, north of Cascades Rd' may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) against which applications to clear are assessed are listed under Part 5 of the Environmental Protection Act (DWER 2019). Vegetation present is in very good to excellent condition, with very small amounts remaining of pre-European distribution in the Interim Biogeographical Regionalisation of Australia (IBRA) Esperance Plains region and the Shire of Esperance local government area. 1.64 ha of the vegetation within 'Site E - Neds Corner Rd, north of Cascades Rd' meets criteria as the threatened ecological community (TEC), 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coast Floristic Province of Western Australia (Kwongkan)'. There are numerous priority flora present within the proposed clearing permit area, including *Scaevola archeriana* (priority one), *Melaleuca similis*

(priority one), *Goodenia laevis* subsp. *laevis* (priority three) and *Persoonia cymbifolia* (priority three). Of these species, proposed clearing works are considered of conservation concern only for *S. archierana*. Lastly, the site contains potential feeding and roosting sites for threatened fauna Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, and potential Malleefowl, *Leipoa ocellata,* habitat.

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7 Appendix

7.1 Photos of vegetation communities identified in 'Site E – Neds Corner Rd Reconstruction, North of Cascade Rd'.

Figure 15. Vegetation type one within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', described as mixed Mallee Eucalyptus with low diversity, dense Melaleuca shrubland.

Figure 16. Vegetation type two in 'Site E - Neds Corner Rd Reconstruction, north of Cascade Rd', described as highly diverse shrubland, with scattered Acacia and Eucalyptus understorey. Mixed understorey of *Santalum acuminatum*, *Calothamnus quadrifidus, Leptospermum erubescens* and *Hakea marginata*.

Figure 17. Vegetation type three in 'Site E - Neds Corner Rd Reconstruction, north of Cascade Rd' area, described as Acacia Shrubland, with *Melaleuca hamata,* Broom Bush.

Figure 18. Vegetation type four in 'Site E - Neds Corner Rd Reconstruction, north of Cascade Rd' area, described as mixed granite shrubland. The periphery of road reserve has a Cape Weed and African lovegrass infestation.

Figure 19. Vegetation type five in 'Site E - Neds Corner Rd Reconstruction, north of Cascade Rd' area, described as Closed shrubland of *Melaleuca hamata* and *Calothamnus quadrifidus*.

Figure 20. Vegetation type six of 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', descibred as mixed Mallee Eucalyptus with low diversity, dense Melaleuca shrubland, and dominant *Banksia media* mid-story.

Figure 21. Vegetation type seven within 'Site E – Neds Corner Rd Reconstruction, north of Cascade Rd', described as a Yate Swamp.

7.2 Incidental species list

Table 5. Flora species recorded within the 'Site E - Neds Corner Road Reconstruction, north of Cascades Road' application area.
Nt. Acronyms included in the table are priority flora (P).

Family	Genus	species	Invasive	Cons Status	Common name	1	2	3	4	5	6	7	8
Aizoaceae	*Carpobrotus*	*modestus*			Inland Pig face	X				X	X		
Anarthriaceae	*Anarthria*	*scabra*							X				
Apiaceae	*Platysace*	*deflexa*			Youlk, Native Carrot	X					X		X
Apiaceae	*Trachymene*	*pilosa*			Native Parsnip					X			
Araliaceae	*Trachymene*	*ornata*			Spongefruit				X	X			
Asparagaceae	*Lomandra*	*collina*			Pale Mat Rush								X
Asparagaceae	*Lomandra*	*mucronata*			Mat Rush		X				X		X
Asparagaceae	*Thysanotus*	*patersonii*			Twining Fringe Lilly	X	X	X	X	X	X		X
Asphodelaceae	*Asphodelus*	*fistulosus*	X		Onion Weed		X		X			X	X
Asteraceae	*Arctotheca*	*calendula*	X		Cape Weed	X	X		X		X		X
Asteraceae	*Argentipallium*	*niveum*											X
Asteraceae	*Blennospora*	*drummondii*								X			
Asteraceae	*Brachyscome*	*ciliaris*											X
Asteraceae	*Carthamus*	*lanatus*	X		Saffron Thistle	X						X	X
Asteraceae	*Conzya*	sp.	x		Fleabane	X					X		
Asteraceae	*Gazania*	*linearis*	X		Treasure Flower								X
Asteraceae	*Hypochaeris*	*radicata*	X		Flat weed				X			X	
Asteraceae	*Olearia*	*muelleri*			Goldfields Daisy								X
Asteraceae	*Olearia*	*muricata*			Rough-leaved Daisy Bush	X							X
Asteraceae	*Ozothamnus*	*lepidophyllus*			Scaly-leaved Everlasting	X							
Asteraceae	*Pseudognaphalium*	*luteoalbum*			Jersey Cudweed						X		
Asteraceae	*Taraxacum*	sp.	X		Dandelion	X					X	X	
Asteraceae	*Ursinia*	*anthemoides*	X			X							X
Asteraceae	*Vittadinia*	*gracilis*									X		X
Asteraceae	*Vittadinia*	*gracilis*									X		
Asteraceae	*Waitzia*	*suaveolens*			Fragrant Waitzia				X	X			X
Boryaceae	*Borya*	*constricta*			Resurrection Pin Cushion				X				
Brassicaceae	*Raphanus*	*raphanistrum*	X		Wild Radish				X			X	
Casuarinaceae	*Allocasuarina*	*lehmanniana* subsp. *ecarinata*						X	X	X			
Casuarinaceae	*Allocasuarina*	sp.											X
Celastraceae	*Stackhousia*	*monogyna*			Creamy Candles		X	X	X	X			
Chenopodiaceae	*Atriplex*	*semibaccata*			Berry Salt Bush	X						X	X
Chenopodiaceae	*Atriplex*	*acutibractea* subsp. *karoniensis*			Salt Bush							X	

Chenopodiaceae	*Enchylaena*	*tomentosa*			Barrier Salt Bush	X							X
Chenopodiaceae	*Rhagodia*	*preissii* subsp. *preissii*			Berry Saltbush	X					X		X
Convolvulaceae	*Wilsonia*	*humilis*			Silky Wilsonia	X							
Cupressaceae	*Callitris*	*roei*			Roe's Cypress Pine					X			X
Cyperaceae	*Ficinia*	*nodosa*			Knotted Club Rush							X	
Cyperaceae	*Gahnia*	*drummondii*				X	X				X		X
Cyperaceae	*Juncus*	sp.										X	
Cyperaceae	*Lepidosperma*	affin. *longitudinale*				X	X	X	X		X		
Cyperaceae	*Lepidosperma*	*carphoides*						X	X	X	X		X
Cyperaceae	*Lepidosperma*	*leptostachyum*											X
Cyperaceae	*Lepidosperma*	sp. 3									X		
Cyperaceae	*Lepidosperma*	*squamatum*				X		X			X		X
Cyperaceae	sp. 1						X						
Cyperaceae	*Tricostularia*	*aphylla*			Curled Sedge	X							
Dilleniaceae	*Hibbertia*	*gracilipes*			Butter Cup	X	X			X	X		X
Dilleniaceae	*Hibbertia*	*hamulosa*									X		
Dilleniaceae	*Hibbertia*	*nutans*			Nodding Guinea Flower	X					X		X
Dilleniaceae	*Hibbertia*	*psilocarpa*									X		
Ericaceae	*Conostephium*	*drummondii*				X					X		
Ericaceae	*Leucopogon*	*cuneifolius*						X		X			
Ericaceae	*Styphelia*	*intertexta*				X	X				X		
Euphorbiaceae	*Beyeria*	*sulcata* var. *gracilis*			Turpentine Bush		X						
Euphorbiaceae	*Euphorbia*	*terracina*	X		Geraldton Carnation weed							X	
Euphorbiaceae	*Monotaxis*	*paxii*											X
Fabaceae	*Acacia*	*assimilis*					X	X	X	X	X		
Fabaceae	*Acacia*	*dermatophylla*				X							X
Fabaceae	*Acacia*	*flavipila* subsp. *flavipila*											X
Fabaceae	*Acacia*	*gonophylla*				X					X		X
Fabaceae	*Acacia*	*lasiocarpa* var. *bracteolata*									X		X
Fabaceae	*Acacia*	*maxwellii*											X
Fabaceae	*Acacia*	*patagiata*				X					X		X
Fabaceae	*Acacia*	*pravifolia*				X							X
Fabaceae	*Acacia*	*sphacelata*									X		X
Fabaceae	*Acacia*	*triptycha*											X
Fabaceae	*Acacia*	*unifissilis*				X							
Fabaceae	*Aotus*	sp. Esperance											X
Fabaceae	*Aotus*	sp. Southern Wheatbelt				X					X		X
Fabaceae	*Chorizema*	*aciculare*			Needle-leaved Chorizema	X	X	X			X		X
Fabaceae	*Daviesia*	*aphylla*				X					X		X

Fabaceae	*Daviesia*	*articulata*									X		X
Fabaceae	*Daviesia*	*lancifolia*				X					X		X
Fabaceae	*Daviesia*	*teretifolia*											X
Fabaceae	*Dillwynia*	*divaricata*				X							X
Fabaceae	*Eutaxia*	*lutea*				X							
Fabaceae	*Gompholobium*	*baxteri*			Baxter's Wedge Pea	X					X		X
Fabaceae	*Gompholobium*	*confertum*									X		
Fabaceae	*Hovea*	*pungens*			Devil's Pins								X
Fabaceae	*Kennedia*	sp. South Coast									X		X
Fabaceae	*Mirbelia*	*microphylla*					X	X		X			
Fabaceae	*Pultenaea*	*purpurea*				X							
Fabaceae	*Senna*	*artisimoides* subsp. *filifolia*											X
Fabaceae	*Templetonia*	*sulcata*			Centipede Bush	X					X		
Fabaceae	*Vicia*	sp.	X		Vetch							X	X
Goodeniaceae	*Anthotium*	*humile*			Dwarf Anthotium	X	X		X		X		
Goodeniaceae	*Coopernookia*	*polygalacea*				X		X					
Goodeniaceae	*Coopernookia*	*strophiolata*				X	X	X		X	X		X
Goodeniaceae	*Dampiera*	*lavandulacea*				X	X	X	X	X	X		X
Goodeniaceae	*Goodenia*	*affinis*			Silver Goodenia			X					X
Goodeniaceae	*Goodenia*	*krauseana*			Little Fan Flower					X			
Goodeniaceae	*Goodenia*	*laevis* subsp. *laevis*		P3		X							
Goodeniaceae	*Goodenia*	*pterigosperma*									X		
Goodeniaceae	*Goodenia*	*scapigera*			White Goodenia						X		
Goodeniaceae	*Goodeniaceae*	*concinna*			Elegant Goodenia						X		X
Goodeniaceae	*Scaevola*	*archierana*		P1									X
Goodeniaceae	*Scaevola*	*bursariifolia*				X					X		X
Goodeniaceae	*Velleia*	*trinervis*					X	X					X
Halgoraceae	*Glischrocaryon*	sp. 1			Globular Pop Flower								X
Halgoraceae	*Glischrocaryon*	sp. 2			Globular Pop Flower								X
Halgoraceae	*Haloragis*	*hamata*				X							
Hemerocallidaceae	*Dianella*	*brevicaulis*			Blueberry Lilly	X	X	X			X		X
Hemerocallidaceae	*Dianella*	*revoluta*			Blueberry Lilly		X		X	X	X		X
Iridaceae	*Patersonia*	*occidentalis*			Purple Flag		X		X				X
Juncaceae	*Juncus*	*aridicola*										X	
Lamiaceae	*Microcorys*	*glabra* subsp. *glabra*				X					X		X
Lamiaceae	*Prostanthera*	*serpyllifolia* subsp. *microphylla*				X							X
Lamiaceae	*Westringia*	*rigida*			Stiff Westringia	X							X
Lauraceae	*Cassytha*	sp.			Dodder Laurel	X	X	X	X		X		X
Loganiaceae	*Logania*	*stenophylla*				X	X	X			X		
Malvaceae	*Alyogyne*	*hakeifolia*			Red-centred Hibiscus				X				

Malvaceae	*Lasiopetalum*	*indutum*				X					X	X	
Malvaceae	*Lasiopetalum*	*rosmarinifolium*				X							X
Malvaceae	*Thomasia*	*angustifolia*			Narrow Leaved Thomasia			X					X
Malvaceae	*Thomasia*	*microphylla*				X							
Myrtaceae	*Baeckea*	*latens*				X					X		
Myrtaceae	*Beaufortia*	*micrantha*			Little Bottlebrush								X
Myrtaceae	*Beaufortia*	*schaueri*			Pink Beaufortia		X						
Myrtaceae	*Calothamnus*	*gibbosus*			Granite One-sided Bottle Brush	X					X		X
Myrtaceae	*Calothamnus*	*gracilis*			One-sided Bottlebrush								X
Myrtaceae	*Calothamnus*	*quadrifidus*			One-sided Bottlebrush		X	X	X	X			
Myrtaceae	*Calytrix*	*leschenaultii*			Purple Star Flower								X
Myrtaceae	*Chamelaucium*	*ciliatum*			Little Wax Flower						X		X
Myrtaceae	*Cyathostemon*	*ambiguus*				X	X				X		X
Myrtaceae	*Eucalyptus*	*brachycalyx*			Gilja, Chindoo Mallee						X		
Myrtaceae	*Eucalyptus*	*conglobata* subsp. *conglobata*			Port Lincoln Mallee, Cong Mallee	X				X	X		X
Myrtaceae	*Eucalyptus*	*conglobata* subsp. *perata*				X					X		X
Myrtaceae	*Eucalyptus*	*eremophila*			Sand Mallet						X		
Myrtaceae	*Eucalyptus*	*flocktoniae* subsp. *flocktoniae*			Merrit	X							
Myrtaceae	*Eucalyptus*	*forrestiana*			Fuchsia Gum	X					X		
Myrtaceae	*Eucalyptus*	*occidentalis*			Yate Swamp		X					X	
Myrtaceae	*Eucalyptus*	*perangusta*				X	X	X			X		X
Myrtaceae	*Eucalyptus*	*pleurocarpa*			Tallerack						X		X
Myrtaceae	*Eucalyptus*	*redunca*				X					X		
Myrtaceae	*Eucalyptus*	sp.					X						
Myrtaceae	*Eucalyptus*	sp.					X				X		X
Myrtaceae	*Eucalyptus*	sp.									X		
Myrtaceae	*Eucalyptus*	sp.									X		X
Myrtaceae	*Eucalyptus*	*suggrandis* subsp. *suggrandis*									X		
Myrtaceae	*Eucalyptus*	*goniocarpa*				X							X
Myrtaceae	*Kunzea*	*affinis*					X			X			
Myrtaceae	*Kunzea*	*jucunda*					X						
Myrtaceae	*Leptospermum*	*erubescens*			Roadside Tea Tree	X	X	X	X	X			
Myrtaceae	*Leptospermum*	*maxwellii*			Tea Tree	X					X		X
Myrtaceae	*Melaleuca*	*acuminata*											X
Myrtaceae	*Melaleuca*	*elliptica*			Granite Bottle Brush			X	X	X			
Myrtaceae	*Melaleuca*	*glaberrima*				X	X	X		X	X		X
Myrtaceae	*Melaleuca*	*hamata*			Broom Bush							X	
Myrtaceae	*Melaleuca*	*pauperiflora*			Boree	X					X		

Myrtaceae	*Melaleuca*	*podiocarpa*				X			X	X	X	X	
Myrtaceae	*Melaleuca*	*pulchella*			Claw Flower	X	X				X	X	X
Myrtaceae	*Melaleuca*	*rigidifolia*			Soccer Ball Melaleuca	X	X				X	X	
Myrtaceae	*Melaleuca*	*sapientes*			Silver Melaleuca								X
Myrtaceae	*Melaleuca*	*similis*		P1		X					X		
Myrtaceae	*Melaleuca*	*societatis*			Soccer Ball Melaleuca	X		X		X	X		X
Myrtaceae	*Melaleuca*	*subfalcata*				X					X		
Myrtaceae	*Melaleuca*	*thapsina*					X					X	X
Myrtaceae	*Melaleuca*	*uncinata*			Hooked Broom Bush	X	X	X	X	X	X	X	X
Myrtaceae	*Melaleuca*	*viminea*										X	
Myrtaceae	*Micromyrtus*	*imbricata*					X						X
Myrtaceae	*Micromyrtus*	*obovata*				X		X			X		
Myrtaceae	*Phymatocarpus*	*maxwellii*											X
Myrtaceae	*Rinzia*	*communis*			Mallee Rinzia								X
Myrtaceae	*Tetrapora*	*preissiana*				X		X			X		X
Myrtaceae	*Tetrapora*	*verrucosa*				X							
Myrtaceae	*Thryptomene*	*saxicola*					X						
Myrtaceae	*Verticordia*	*chrysantha*							X	X			
Onagraceae	*Oenothera*	*stricta*	X		Common Evening Primrose								X
Orchidaceae	*Caladenia*	*attingens* subsp. *gracillima*			Praying Mantis Orchid					X			
Orchidaceae	*Microtis*	*media* subsp. *mdia*			Tall Mignonette Orchid			X					
Orchidaceae	*Pterostylis*	sp.			Snail or Jug Orchid		X		X				
Orchidaceae	*Thelymita*	sp. 1			Sun Orchid	X	X						X
Pittosporaceae	*Billardiera*	*coriaceae*				X							X
Pittosporaceae	*Billardiera*	*fusiformis*			Australian Blue Bell						X		
Pittosporaceae	*Cheiranthera*	*filifolia*			Finger-flower	X	X				X		X
Poaceae	*Austrostipa*	*elegantissima*				X			X		X		X
Poaceae	*Avena*	*fatua*	X		Wild Oats	X			X				
Poaceae	*Ehrharta*	*calycina*	X		Perennial Veldt Grass					X		X	
Poaceae	*Eragrostis*	*curvula*	X		African Lovegrass		X		X		X	X	X
Poaceae	*Hordeum*	*vulgare*	X		Wild Barley								X
Poaceae	*Neurachne*	*alopecuroidea*			Foxtail Mulga Grass	X	X	X	X	X	X		X
Poaceae	*Pennisetum*	*clandestinum*	X		Kikuyu							X	
Poaceae	*Rytidosperma*	*setaceum*				X	X		X		X		X
Poaceae	*Rytidosperma*	*setaceum*									X		
Polygalaceae	*Comesperma*	*polygaloides*			Small milkwort		X						
Polygalaceae	*Comesperma*	*scoparium*			Broom Milkwort								X
Polygalaceae	*Comesperma*	*spinosum*			Spiny Milkwort	X							X
Polygonaceae	*Muehlenbeckia*	*adpressa*			Climbing Lignum						X		X
Primulaceae	*Lysimachia*	*arvensis*	X		Pimpernel		X	X	X	X		X	
Proteaceae	*Banksia*	*media*			Southern Plains Banksia	X					X		X

Proteaceae	*Banksia*	*obtusa*			Shining Honeypot								X
Proteaceae	*Grevillea*	*huegelii*				X					X		
Proteaceae	*Grevillea*	*nudiflora*											X
Proteaceae	*Grevillea*	*oligantha*				X					X		
Proteaceae	*Grevillea*	*pectinata*				X					X		X
Proteaceae	*Hakea*	*cinerea*			Ashy Hakea						X		X
Proteaceae	*Hakea*	*corymbosa*			Cauliflower Hakea								X
Proteaceae	*Hakea*	*laurina*			Pin Cushion Hakea		X						
Proteaceae	*Hakea*	*lissocarpha*			Honey Bush	X	X						
Proteaceae	*Hakea*	*marginata*				X		X					
Proteaceae	*Hakea*	*nitida*			Frog Hakea	X					X		X
Proteaceae	*Isopogon*	*polycephalus*			Clustered Cone Flower	X	X						X
Proteaceae	*Persoonia*	*cymbifolia*		P3									X
Proteaceae	*Persoonia*	*helix*						X					
Proteaceae	*Persoonia*	*teretifolia*									X		
Proteaceae	*Petrophile*	*fastigiata*					X	X					
Proteaceae	*Petrophile*	*squamata subsp. Northern*									X		X
Restionaceae	*Desmocladus*	*flexuosus*				X					X		
Restionaceae	*Desmocladus*	*parthenicus*											X
Restionaceae	*Hypolaena*	*fastigiata*											X
Restionaceae	*Hypolaena*	*humilis*				X					X		X
Rhamnaceae	*Cryptandra*	*minutifolia subsp. brevistyla*					X						X
Rhamnaceae	*Cryptandra*	*recurva*											X
Rhamnaceae	*Pomaderris*	*rotundifolius*				X							
Rhamnaceae	*Spyridium*	*minutum*				X					X		X
Rhamnaceae	*Spyridium*	*mucronatum subsp. mucronatum*				X					X		X
Rutaceae	*Boronia*	*baeckea* subsp. *baekeacea*				X					X		X
Rutaceae	*Boronia*	*coerulescens*											X
Rutaceae	*Boronia*	*inornata*			Desert Boronia	X	X						
Rutaceae	*Microcybe*	*pauciflora*				X					X		X
Rutaceae	*Phebalium*	*lepidotum*				X		X			X		
Santalaceae	*Exocarpus*	*aphyllus*			Leafless Ballart	X	X	X					
Santalaceae	*Exocarpus*	*sparteus*			Broom Ballart, Native Cherry	X							X
Santalaceae	*Leptomeria*	*pachyclada*			Currant Bush	X							
Santalaceae	*Leptomeria*	*pauciflora*			Sparse-flowered Currant Bush	X					X		X
Santalaceae	*Santalum*	*acuminatum*			Quandong	X					X		X
Sapindaceae	*Dodonaea*	*caespitosa*							X				

Sapindaceae	*Dodonaea*	*concinna*				X							
Solanaceae	*Atropa*	*belladonna*	X		Deadly Nightshade							X	
Solanaceae	*Cyphanthera*	*microphylla*				X							X
Solanaceae	*Solanum*	*hoplopetalum*	X		Thorny Solanum		X						
Stylidiaceae	*Stylidium*	*dichotomum*			Pins and Needles								

7.3 TPFL Forms

7.3.1 *Scaevola archeriana,* priority one

Department of Biodiversity, Conservation and Attractions

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: Scaevola archeriana **TPFL Pop. No:**

OBSERVATION DATE: 16 / 10 / 2019 **CONSERVATION STATUS:** P1 New population ☐ Extension - no pop'n on ship.

OBSERVER/S: Katie White + Julie Waters **PHONE:**

ROLE: Environmental officer **ORGANISATION:** Shire of Esperance 90831518

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~88 km NW of Esperance townsite. ~1.9 km NE of Cascade townsite. 2 km N of Cascade - Neds Corner Rd intersection, on Neds Corner Rd. On both sides of road reserve. Within Road Spoondrains **Reserve No:**

DBCA DISTRICT: South Coast LGA: Esperance Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 322560.9

Long / Easting: 6295944.1

ZONE: 51H

METHOD USED: GPS ☐ Differential GPS ☐ Map ☒ No. satellites: ___ Map used: Q615 Boundary polygon captured: ☐ Map scale: 1:385

LAND TENURE:

Nature reserve ☐ National park ☐ Conservation park ☐ Timber reserve ☐ State forest ☐ Water reserve ☐ Private property ☐ Pastoral lease ☐ UCL ☐ Rail reserve ☐ MRWA road reserve ☐ SLK/Pole ___ to ___ Shire road reserve ☒ Other Crown reserve ☐ Specify other: ___

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☒ Area observed (m²): ___

EFFORT: Time spent surveying (minutes): ___ No. of minutes spent / 100 m²: ___

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count method: ___ (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐ 4 new plants

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive	14			
Dead				

Area of pop (m²): ___

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size ___ Data attached ☐ Total area of quadrats (m²): ___

Summary Quad. Totals: Alive

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒ Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 7% (1 plant)

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)
• Road maintenance - grading of road	M	H	S
• Road widening - proposed widening of Neds Corner Road footprint.	L	H	S
• Lack of disturbance?			

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.

Record entered by: Sheet No.: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

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

Specific **Landform** Element: ____
(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. Mixed heathland (very diverse) + scattered Eucalyptus
2.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp: Melaleuca pulchella, Hakea cinerea

* 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.)

New plants discovered in spoon drain - not on recorded shp files from previous surveys. Did not survey ~~entire~~ ~~majority~~ rest of population

Confirmed by WA Herbarium 17/12/19, Accession # 8218.

DRF PERMIT/ LICENCE No: FTL10002 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: KW023 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: ____

ATTACHED: Map ☐ Mudmap ☐ Photo ☑ GIS data ☑ Field notes ☐ Other: ____

COPY SENT TO: Regional Office ☐ District Office ☑ Other: ____

Submitter of Record: Kate White Role: Environmental Officer Signed: [signature] Date: 22/10/2019

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

RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐

7.3.2 *Melaleuca similis*, priority one

Department of Biodiversity, Conservation and Attractions

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: Melaleuca Similis — TPFL Pop. No: Extension of Pop 2 - TPFL sup.

OBSERVATION DATE: 22 / 10 / 2019 — CONSERVATION STATUS: P1 — New population ☐

OBSERVER/S: Katie White + Julie Waters — PHONE: 90831518

ROLE: Environmental officers — ORGANISATION: Shire Of Esperance.

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~87km NW of Esperance townsite. ~1km NE of Cascade townsite. On Neds Corner Rd. From 1.11km to 4km north of Cascade Rd intersection. On both sides of road reserve

Reserve No:

DBCA DISTRICT: South Coast — LGA: Esperance — Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ ; AGD84 / AMG84 ☐ ; WGS84 ☐ ; Unknown ☐

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 322805.3

Long / Easting: 6296467.3

ZONE: 51H

METHOD USED: GPS ☒ Differential GPS ☐ Map ☒

No. satellites: ___ Map used: QGIS

Boundary polygon captured: ☐ Map scale: 1:2429

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☒
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole _____ to _____	Specify other: _____

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m²): ____

EFFORT: Time spent surveying (minutes): ____ No. of minutes spent / 100 m²: ____

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count method: ____ (Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:

	Mature:	Juveniles:	Seedlings:	Totals:
Alive	168			
Dead				

Area of pop (m²): ____

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ____ Size ____ Data attached ☐ Total area of quadrats (m²): ____

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☑ Flower ☑

Immature fruit ☑ Fruit ☑ Dehisced fruit ☑ Percentage in flower: 95%

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)
• Road widening - estimate of 99 plants impacted	M	H	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.

Record entered by: Sheet No: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

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

Specific Landform Element: ____
(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. Mixed veg types observed - Yate swamps +
2. Mixed melaleuca / Eucalyptus woodland
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

* 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.)

Did not survey surrounding area - counted any what observable from car/road.

Confirmed by WA Herbarium, 17/12/19, Accession #8218

DRF PERMIT/ LICENCE No: FT61000028 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: EW038 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: _____

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

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

Submitter of Record: Katie White Role: Environmental officer Signed: [signature] Date: 8/1/2019

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
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐

7.3.3 *Goodenia laevis* subsp. *laevis*, priority three

Department of Biodiversity, Conservation and Attractions

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: Goodenia laevis subsp. laevis — **TPFL Pop. No:**

OBSERVATION DATE: 7/09/12/2019 — **CONSERVATION STATUS:** P3 — New population ☒

OBSERVER/S: Katie White + Julie Waters — **PHONE:** 9083 1515

ROLE: Environmental Officers — **ORGANISATION:** Shire of Esperance.

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): 287km NW of Esperance townsite. 2.4 km NE of Cascade townsite. On Neds Corner Rd, from 2.86 to 3.5 km north of Cascade Rd. 2 plants also present 100m N of Cascade Rd.

Reserve No:

DBCA DISTRICT: South Coast — **LGA:** Esperance — Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ ; AGD84 / AMG84 ☐ ; WGS84 ☐ ; Unknown ☐

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6423120.0

Long / Easting: 6297073.4

ZONE: 51H.

METHOD USED: GPS ☐ Differential GPS ☐ Map ☒

No. satellites: ___ Map used: QGIS

Boundary polygon captured: ☐ Map scale: 1:2545.

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☒
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole 36.22 to Neds Corner Rd	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☒ Area observed (m²): ___

EFFORT: Time spent surveying (minutes): ___ No. of minutes spent / 100 m²: ___

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count method: ___ (Refer to field manual for list)

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	82			
Dead				

Area of pop (m²): Along ~1km of roadside veg

Note: PIs record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size ___ Data attached ☐ Total area of quadrats (m²): ___

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒ Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 95 %

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)
• Road widening - would likely impact on all plants discovered	L	H	S
• Road maintenance - all plants present in road active footprint (operation + batt slope).	M	H	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.

Record entered by: Sheet No: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

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

Specific Landform Element: (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. Mixed mallee Eucalyptus with low diversity Melaleuca
2. shrub land.
3.
4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Eucalyptus eremophila, Eucalyptus flocktoniae, Daviesia benthamiana, Melaleuca tuberculata, Melaleuca pediocarpa

* 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.)

All plants found within the graded active road footprint (Spoon drains + back slopes). Likely a disturbance specialist. Will be impacted upon during routine road maintenance activities.

Collected specimen 25/10/19. Confirmation by Mike Hislop 06/02/20. Accession #8281. Specimen not retained by WA Herb.

DRF PERMIT/ LICENCE No: FTP100027 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: KW043 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: _____

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

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

Submitter of Record: Katie White Role: Environmental Officer Signed: _____ Date: 13/12/2019.

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
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No.: Record Entered in Database ☐

7.3.4 *Persoonia cymbifolia,* priority three

Department of Biodiversity, Conservation and Attractions

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: Persoonia Cymbifolia. TPFL Pop. No:

OBSERVATION DATE: 10/12/2019 CONSERVATION STATUS: New population ☒

OBSERVER/S: Katie White + Julie Waters PHONE: 9083 1518.

ROLE: Environmental Officers ORGANISATION: Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~86 km NW of Esperance townsite. ~1.8 km NE of Cascade townsite. On Neds Corner Rd, 1.8 km N of Cascade Rd intersection. On NW side of road reserve only

Reserve No:

DBCA DISTRICT: South Coast LGA: Esperance Land manager present: ☐

DATUM: GDA94 / MGA94 ☒ AGD84 / AMG84 ☐ WGS84 ☐ Unknown ☐

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☒

Lat / Northing: 6322385.8 Long / Easting: 629578.5 ZONE: 51H.

METHOD USED: GPS ☐ Differential GPS ☐ Map ☒

No. satellites: ___ Map used: QGIS

Boundary polygon captured: ☐ Map scale: 1:424.

LAND TENURE:

Nature reserve ☐	Timber reserve ☐	Private property ☐	Rail reserve ☐	Shire road reserve ☒
National park ☐	State forest ☐	Pastoral lease ☐	MRWA road reserve ☐	Other Crown reserve ☐
Conservation park ☐	Water reserve ☐	UCL ☐	SLK/Pole 34.73 to Neds Corner Rd	Specify other:

AREA ASSESSMENT: Edge survey ☐ Partial survey ☒ Full survey ☐ Area observed (m²): ___

EFFORT: Time spent surveying (minutes): 20 No. of minutes spent / 100 m²: ___

POP'N COUNT ACCURACY: Actual ☒ Extrapolation ☐ Estimate ☐ Count method: ___ (Refer to field manual for list)

WHAT COUNTED: Plants ☒ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	3			
Dead				

Area of pop (m²): ___

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size ___ Data attached ☐ Total area of quadrats (m²): ___

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☒ Immature fruit ☐ Fruit ☐ Dehisced fruit ☐ Percentage in flower: 80 %

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)
• Extension of historical gravel pit - highly unlikely.	M	H	L
•			
•			

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.

Record entered by: Sheet No.: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

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HABITAT INFORMATION:

LANDFORM: Crest ☐ Hill ☐ Ridge ☐ Outcrop ☐ Slope ☐ Flat ☑ Open depression ☐ Drainage line ☐ Closed depression ☐ Wetland ☐

ROCK TYPE: Granite ☐ Dolerite ☐ Laterite ☐ Ironstone ☐ Limestone ☐ Quartz ☐ Specify other: Gravel

LOOSE ROCK: (on soil surface; eg gravel, quartz fields) 0-10% ☐ 10-30% ☑ 30-50% ☐ 50-100% ☐

SOIL TYPE: Sand ☐ Sandy loam ☐ Loam ☐ Clay loam ☑ Light clay ☐ Peat ☐ Specify other:

SOIL COLOUR: Red ☐ Brown ☑ Yellow ☑ White ☐ Grey ☐ Black ☐ Specify other:

DRAINAGE: Well drained ☑ Seasonally inundated ☐ Permanently inundated ☐ Tidal ☐

Specific **Landform** Element: (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. Banksia media scattered through dense mallee Eucalypt
2. woodland with diverse mixed understorey
3.
4.

ASSOCIATED SPECIES: Banksia Media, Melaleuca pulchella, Eucalyptus foreshana

Other (non-dominant) spp

* 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: On fringe of historical gravel pit that was not rehabilitated

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.)

Located in historical gravel edge. Gravel pit never been rehabilitated.

Confirmed by Mike Hislop on 06/02/20. Accession # 8261. Specimen not retained by herbarium.

DRF PERMIT/ LICENCE No: FM000021 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: KW046 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: _____

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

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

Submitter of Record: Katie White Role: Environmental Officer Signed: _____ Date: 18/12/2019

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
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

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: Persoonia Cymbifolia — TPFL Pop. No:

OBSERVATION DATE: 09/17/2019 — CONSERVATION STATUS: 3 — New population ☑

OBSERVER/S: Katie White + Julie Waters — PHONE: 90831578.

ROLE: Environmental Officers — ORGANISATION: Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~87 km NW of Esperance townsite. 2.4 km NE of Cascade townsite. On Neds Corner Rd, 2.4 km north of Cascade Rd. Frequent for 50m on Western Road reserve

Reserve No:

DBCA DISTRICT: South Coast — LGA: Esperance — Land manager present: ☐

DATUM: GDA94 / MGA94 ☑ ; AGD84 / AMG84 ☐ ; WGS84 ☐ ; Unknown ☐

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☑

Lat / Northing: 6322738-92

Long / Easting: 296318-92

ZONE: 51H

METHOD USED: GPS ☑ Differential GPS ☐ Map ☑

No. satellites: ___ Map used: Google Maps

Boundary polygon captured: ☐ Map scale: 1:318

LAND TENURE:

Nature reserve ☐ Timber reserve ☐ Private property ☐ Rail reserve ☐ Shire road reserve ☑

National park ☐ State forest ☐ Pastoral lease ☐ MRWA road reserve ☐ Other Crown reserve ☐

Conservation park ☐ Water reserve ☐ UCL ☐ SLK/Pole 35.41 to Neds Corner Rd. Specify other: ___

AREA ASSESSMENT: Edge survey ☐ Partial survey ☐ Full survey ☑ Area observed (m²): ___

EFFORT: Time spent surveying (minutes): ___ No. of minutes spent / 100 m²: ___

POP'N COUNT ACCURACY: Actual ☑ Extrapolation ☐ Estimate ☐ Count method: ___ (Refer to field manual for list)

WHAT COUNTED: Plants ☑ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	14			
Dead				

Area of pop (m²): ___

Note: Pls record count as numbers (not percentages) for database.

QUADRATS PRESENT: No. ___ Size ___ Data attached ☐ Total area of quadrats (m²): ___

Summary Quad. Totals: Alive				

REPRODUCTIVE STATE: Clonal ☐ Vegetative ☐ Flowerbud ☐ Flower ☑ Immature fruit ☐ Fruit ☑ Dehisced fruit ☑ Percentage in flower: 60 %

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)
• Road widening along Neds Corner Rd. ~~Estimate~~ 6 plants will be impacted upon.	M	M	S
•			
•			

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Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

LANDFORM: Crest ☐ Hill ☐ Ridge ☐ Outcrop ☐ Slope ☐ Flat ☑ Open depression ☐ Drainage line ☐ Closed depression ☐ Wetland ☐

ROCK TYPE: Granite ☐ Dolerite ☐ Laterite ☐ Ironstone ☐ Limestone ☐ Quartz ☐ Specify other: ____

LOOSE ROCK: (on soil surface; eg gravel, quartz fields) 0-10% ☐ 10-30% ☐ 30-50% ☑ 50-100% ☐

SOIL TYPE: Sand ☑ Sandy loam ☐ Loam ☐ Clay loam ☐ Light clay ☐ Peat ☐ Specify other: ____

SOIL COLOUR: Red ☐ Brown ☐ Yellow ☑ White ☐ Grey ☐ Black ☐ Specify other: ____

DRAINAGE: Well drained ☑ Seasonally inundated ☐ Permanently inundated ☐ Tidal ☐

Specific **Landform** Element: ____
(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. Banksia media mixed w dense Eucalyptus Mallee
2. Woodland and highly diverse understorey.
3.
4.

ASSOCIATED SPECIES: Eucalyptus flocktoniae, Acacia maxwellii, Isopogon polycephalus
Other (non-dominant) spp

* 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.)

Did not survey surrounding intact bushland - particularly reserve to the west. Highly likely possible habitat.

Confirmed by Mike Hislop on 06/02/20. Accession # 8281. Specimen not retained by WA Herbarium.

DRF PERMIT/ LICENCE No: FTH0002? 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 licening 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: KW042 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: ____

ATTACHED: Map ☐ Mudmap ☐ Photo ☐ GIS data ☐ Field notes ☐ Other: ____

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

Submitter of Record: Katie White Role: Environmental Officer Signed: [signature] Date: 13/12/2019

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
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐