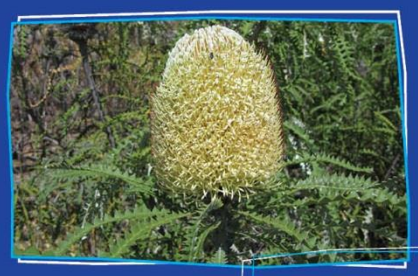
Vegetation, Flora, Fauna and Environmental Considerations, and Targeted Flora Report

Shire of Esperance Strategic Purpose Permit 2021/22
Site F – Wharton Road Widening



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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 the application to the Department of Water and Environmental Regulations (DWER) to clear 2.28ha of native vegetation for the purpose of line of sight mulching during a road widening project.

2 Introduction

The Shire of Esperance endeavors to maintain a high level of road safety, being proactive in identifying high risk road designs and progressively upgrading them. 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. The Shire of Esperance is submitting 'Site F - Wharton Road Widening' project as Site F under the '2021/22 Strategic Purpose Permit' (Figure 1), for the purpose of road widening.

The proposed works are located approximately 65km east of Esperance, within the Shire of Esperance managed Wharton Road reserve. Specifically, it is located immediately south of Orleans Bay Rd, at straight line kilometre (SLK) 0.00 to 3.01 (Main Roads 2021). A point within the proposed clearing permit area is -33.915430 S, 122.579929 E or 6247141 m N, 461168 m E (UTM Zone 51 H, GDA94). Road widening is required to widen the single lane bitumen road to dual lanes as this is a main access road to the Orleans Bay Caravan Park which had 155 vehicles per day in April 2012. Road upgrades will be completed within the current road footprint and vegetation may be mulched to improve sightlines. Mulch and vegetation will be managed in-situ. The road widening will include a 7m seal with up to 5.5m of road shoulder and mulched vegetation on each side of the road. A maximum of 2.28ha of vegetation will be mulched for the project, however mulched areas of vegetation are anticipated to be less than this figure.

Figure 1. Location of 'Site F - Wharton Road Widening' clearing permit in yellow

3 Environmental Background

3.1 Scope

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

Possible impacts include;

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

Assessing these impacts involves two approaches; desktop study and field survey. The desktop study gathered 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.

3.2 Catchment

'Site F - Wharton Road Widening' is present within the Esperance Coastal catchment area. It is located approximately 100m from the coastline.

3.3 Climate

The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2020). The area receives an average annual rainfall of 618 mm.

3.4 Geology

Two geological units were identified within 'Site F - Wharton Road Widening', by Schoknecht et al. (2004). It is described as 'Quaternary coastal sands deposited over Tertiary sediments' and 'Tertiary marine sediments of the Pallinup formation, and overlying deposits of Quaternary sands'.

3.5 Soils

The soil of 'Site F - Wharton Road Widening' is broadly defined as deep sand (Schnoknecht et al. 2004). Within the area, there has been two soil types recorded. These include:

- Merivale 5 Subsystem; Pale deep sands and grey shallow sandy duplex soils
- Tooregullup 6 Subsystem; Pale deep sand and associated calcareous deep sand

3.6 Topography

During the field survey, topography was observed to be dominated by a gently undulating plain. Using Schnoknect et al. (2004), the project topography is mapped at a fine scale, traversing two topographic areas. These include:

- Gently inclined scarp about 40m relief covered by dunes and sand sheets
- Gently undulating plain and gently inclined scarp with sheets and dunes

3.7 Vegetation

The site is located within the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) Esperance Plains/Recherche region (ESP02). "The Esperance Plains/Recherche region is described as "Proteaceae Scrub and Mallee heaths on sandplain overlying Eocene sediments, rich in endemics.
Herbfields and heaths (rich in endemics) on abrupt granite and quartzite ranges that rise from the plan. Eucalyptus woodlands occur in gullies and alluvial foot-slopes".

Beard (1973) mapped two vegetation associations (VA) within the 'Site F - Wharton Road Widening' (Table 1). VA 42 is described as "Shrublands; mallee & acacia scrub on south coastal dunes" the second, VA6048 is described as "Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region".

Esperance Plains (VA42) has a high level of its original extent intact with 94.56% of its original extent within the IBRA region being intact but only 94.87% of its extent with the Shire of Esperance retained, half (53%) of its current extent is currently within conservation areas.

Esperance Plains (VA6048) is poorly conserved, with only 14.16% of its original extent within the IBRA region being intact and only 14.21% of its original extent within the Shire of Esperance intact and only 0.87% of its current extent within conservation areas.

Table 1. Vegetation associations mapped by Beard (1973) within the 'Site F - Wharton Road Widening', and statistics on pre-European remaining areas.
Nt. Acronyms used include Interim Biogeographic Regionalisation of Australia (IBRA), Esperance Plains/ Recherche (ESP02), local government area (LGA) and International Union of Conservation Nature (IUCN).

Vegetation Association	Esperance Plains (VA 42)	Esperance Plains (VA 6048)
Description	Shrublands; mallee and acacia scrub on south coastal dunes	Shrublands; banksia scrub-heath on sandplain in the Esperance Plains Region

Area mapped within site (ha)	2.68ha	1.90ha
Pre-European extent in IBRA region ESP2 (%)	94.56%	14.16%
Pre-European extent in LGA (%)	94.87	14.21%
Current extent conserved in IUCN area (%)	53.73%	0.87%

3.8 Land use

The area directly included in the clearing permit application 'Site F - Wharton Road Widening' is a currently intact and vegetated 60m wide road reserve, managed by the Shire of Esperance. The current road footprint occupies an average of 10m wide. The surrounding land use is R41097 an unnamed C class recreation reserve proposed to be named "Tjaltjraak Boodja Park", with a commercially run caravan park located adjacent to the project area. The area is within rural zoning.

4 Methodology

4.1 Desktop study

A desktop study was completed prior to any site visit. Geographical Information System (GIS) review existing

- Existing site digital orthophotos, as sourced from LandGate (Esperance to Alexander Bay Coastline 2019).
- Western Australian Local Government Association's (WALGA) 'Local Government Mapping (LGMap 2020)' program was used to assess spatial information of geology, topography, soil profiles, 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 July/August 2020 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 2020f).
    - Threatened and Priority Reporting (TPFL; DBCA 2020d).
    - Esperance District Threatened Flora (DBCA 2020a).
    - TEC and PEC 'Likely to Occur' buffer and boundary areas (DBCA 2020e).
    - Department of Agriculture, Water and the Environment Protected Matters Search Tool
    - Index of Biodiversity Surveys for Assessment (IBSA).
- To assess fauna, the following databases were searched with a 20km buffer from the center of the site (122.579052, -33.91924);
    - Department of Biodiversity, Conservation and Attractions (DBCA) and Western Australian Museum (WAM) NatureMap data portal
    - DBCA Threatened and Priority Fauna database
    - BirdLife Australia's Atlas and Birdata datasets
    - Department of Agriculture, Water and the Environment Protected Matters Search Tool

- Atlas of Living Australia database
- Index of Biodiversity Surveys for Assessment (IBSA).

4.2 Field investigation: possible ecological impacts

The site was initially inspected on 7 October 2021, by Katherine Walkerden and Mary Hoggart the Shire of Esperance's Environmental Officers. An assessment of possible ecological impacts 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.

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. Overall, an assessment of environmental impacts to Department of Water and Environmental Regulation's (DWER) biodiversity values were inspected and valued.

Only a very basic fauna survey was conducted as per EPA (2020) guidelines. Observations of fauna presence, such as call sounds, footprints and scats were also noted, and the area assessed for suitability of endangered Carnaby's Black Cockatoo (*Calyptorhynchus latirostris)* feeding, roosting and nesting habitat.

4.3 Field investigation: Assessing Threatened and Priority Ecological Communities

The vegetation community of 'Site F - Wharton Road Widening' was assessed for the presence a TEC or PEC (DBCA 2018, 2021X), 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. 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.

PEC's do not have published approved conservation advice. Comparison of the vegetation community occurred using 'Priority Ecological Communities for Western Australia Version 31 (DBCA 2021)' definitions.

4.4 Field Investigation: Targeted flora survey

The targeted flora survey was undertaken following the Environmental Protection Authority's (EPA) 'Technical Guidance, Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2016)'. The entirety of the proposed impact area was surveyed on foot in mid-spring, on 7 October 2021 by Shire of Esperance Environmental Officers, Katherine Walkerden and Mary Hoggart. Due to the timing, the majority of species were flowering, decreasing the likelihood of missing species. The road was used as a continuous transect. Vegetation up to 10 meters from the edge of the existing road's back-slope was assessed to accurately cover the 18m width proposed clearing permit area. Suitable associated habitat for TF or PF identified in the desktop study were particularly focused on, and extensively searched.

Due to the high diversity and complexity of Esperance's flora, all species were recorded to compile an incidental species list (Appendix 8.1, Table 6). All species unknown in the field were collected and identified exsitu, using keys, WA Herbarium's Florabase (DBCA 2021), manuals and Esperance District Herbarium, to ensure no TF or PF were missed. Material was collected under Katherine Walkerden's and Mary Hoggart's Regulation 61, Biodiversity Conservation Regulations 2018 Licences for Flora Taking, FT61000788 and FT61000280-2. Any species that were unable to be identified or were priority species were submitted to the WA Herbarium for identification.

PF or TF species identified in the desktop survey as possible to occur, scans of pressed specimens from the local Esperance District Herbarium were taken into the field. Any flora thought to be TF or PF was formally collected, counted and mapped using a 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.

5 Results and Discussion

5.1 Ecological Impact

5.1.1 Vegetation Communities

Four vegetation communities were identified within the 'Site F - Wharton Road Widening', as defined by structure and composition (Table 2). The incidental flora list identified a total of 176 species across all vegetation communities, of which 163 were native. The species richness was particularly high given the relatively short section (3km) of the road surveyed. It is believed that the Beard (1973) vegetation associations identified in Section 3.6 are an appropriate match for four vegetation types observed. Vegetation A matched VA4801 well with Nuytsia present throughout most of this veg type (exceptions being the winter waterlogged areas). Vegetation B was the result of weed invasion spreading out from from the Duke of Orleans Caravan Park which had significant plantings of eastern states Eucalypts, Acacias and Melaleucas, it is unclear which Beard Vegetation association it matches. Vegetation type C matched Beard Vegetation association VA42 well, though coastal mallees were fairly sparse within the vegetation type. Vegetation type D matched VA6048 to an extent however dominance of Banksia species was limited, though this is potentially due to dieback presence in the area.

Table 2. Vegetation communities identified within proposed 'Site F - Wharton Road Widening' project area.

Type	Description	Figure	Closest Matching Beard Vegetation Association	Area (ha)
A	Scattered *Nuytsia floribunda* over *Taxandria callistachys* dominated mixed heath over Cyperaceae and Restionaceae understorey	3	VA4801 Shrublands; heath with scattered Nuytsia	0.743
B	Introduced Eucalypts over mixed low shrubs	4	Too disturbed to accurately assign to any particular VA, although likely to be VA42 Shrublands; mallee and acacia scrub on south coastal dunes	0.155

C	*Acacia saligna* and mixed Melaleuca dominated shrubland	5	VA42 Shrublands; mallee and acacia scrub on south coastal dunes	0.383
D	Scattered *Banksia speciosa* over *Taxandria callistachys* dominated mixed heath with Cyperaceae and Restionaceae understorey	6	VA6048 Shrublands; Banksia scrub-heath on sandplain in the Esperance Plains region	0.904

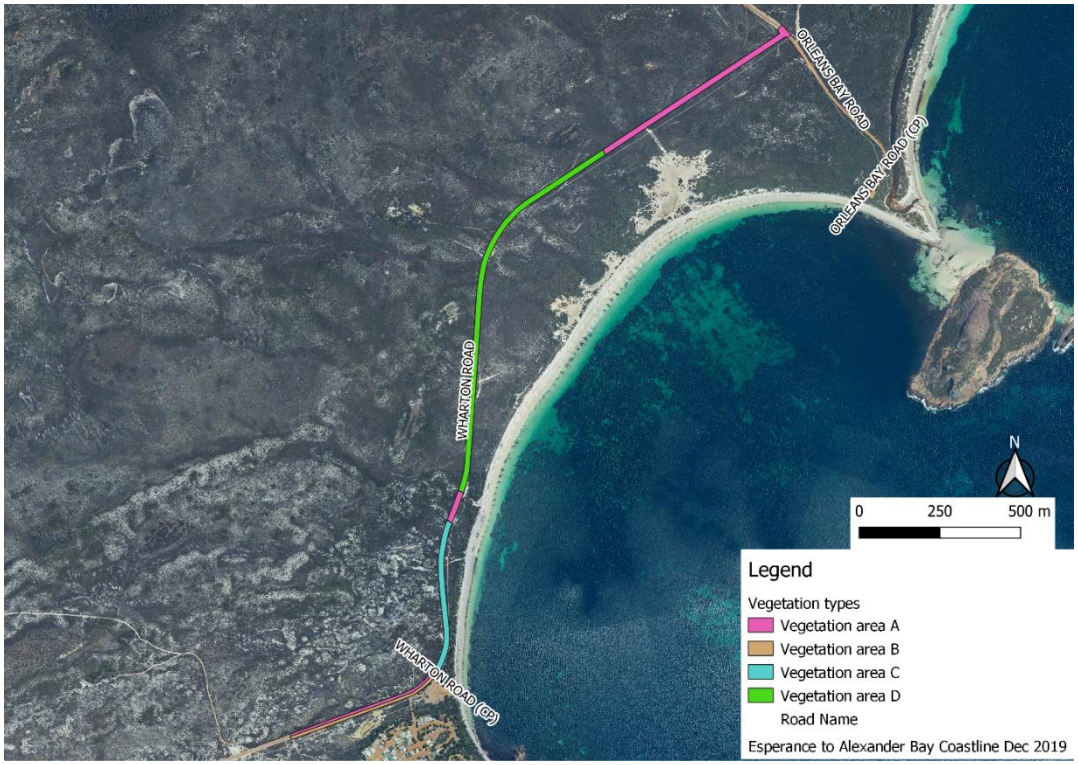


Figure 2. Vegetation types within the 'Site F - Wharton Road Widening' area, from SLK 0.00 km to 3.01 along Wharton Road.

Figure 3. Vegetation type A identified in 'Site F - Wharton Road Widening' project, described as 'Scattered *Nuytsia floribunda* over *Taxandria callistachys* dominated mixed heath over Cyperaceae and Restionaceae understorey'

Figure 4. Vegetation type B identified in 'Site F - Wharton Road Widening' project, described as 'Introduced Eucalypts over mixed low shrubs'.

Figure 5. Vegetation type C identified in 'Site F - Wharton Road Widening' project, described as '*Acacia saligna* and mixed Melaleuca dominated shrubland'

Figure 6. Vegetation type D identified in 'Site F - Wharton Road Widening' project, described as 'Scattered *Banksia speciosa* over *Taxandria callistachys* dominated mixed heath with Cyperaceae and Restionaceae understorey'

5.2 Vegetation Condition

A large majority of the site was in an excellent condition with little to no weed burden present. The only patch where vegetation structure has been significantly altered is outside of the caravan park and boat ramp. Significant plantings of eastern states Eucalypts, Acacias and Melaleucas have occurred in and adjacent to this area, historic clearing has also occurred outside of the built facilities.

Quantifying vegetation condition, there is:

- 2.124 ha of vegetation within a 2.278 ha clearing area (93.23%) is in excellent condition,
- 0.073 ha of vegetation within a 2.278 ha clearing area (3.20%) is in very good condition,
- 0.082 ha of vegetation within a 2.278 ha clearing area (3.60%) is in good condition

Figure 7. Vegetation condition across 'Site F - Wharton Road Widening' project, ranging from good to excellent condition, due to primarily to degradation from invasive species.

There was minimal weed invasion across the entirety of the proposed 'Site F - Wharton Road Widening' area. Overall, 11 invasive species were identified within the project area (Appendix 8.1). Of these, the most extensive and of serious concern were *Leptospermum laevigatum* (Victorian Tea Tree) and *Melaleuca armillaris*, both of these weeds had spread out from the caravan park. Significant control of *Leptospermum laevigatum* has occurred within the road reserve over 2019 and 2020 with only small scattered seedlings (max 30cm height) present. It is likely that proposed works will increase the distribution of weeds and degrade vegetation along the entire road reserve where works occur. Additional control activities of *Leptospermum laevigatum* and *Melaleuca armillaris* are planned in the immediate future. Ideally, regular wash downs during the course of works to remove weed seeds or follow up herbicide control of invasive species needs to occur. However, this will be extremely expensive to employ contractors and mobilise equipment, which may not be feasible with given budgets

5.3 *Phytophthora* Dieback

Dieback Information Delivery and Management System (DIDMS; GAIA Resources, SCNRM & State NRM 2021) data shows no positive or negative *Phytophthora cinnamomi* or other *Phytophthora* sp. Dieback sample results in the immediate area. There was several confirmed samples of Phytophthora Dieback 3-4km from the proposed works, in addition the Dieback Hazard Dispersion Model (GAIA Resources, State NRM & SCNRM, 2021) indicates that the entire proposed works site is at risk of dieback infection. During the flora survey several patches with dead mature *Banksia speciosa* were observed, potentially indicating dieback presence within the site.

Based on Dieback Management Plans prepared for Shire of Esperance road construction and management projects. Proposed works will be conducted using appropriate hygiene measures to limit spreading of the disease, including mulching in dry conditions and clean down of vehicles and machinery before entering the site. However, there is always a possibility that proposed works will spread *P. cinnamomi* dieback along Wharton Road due to proposed works.

Figure 8. Dead *Banksia speciosa*, a species known for its susceptibility to *Phytophthora cinnamomi*

5.4 Threatened and Priority Ecological Communities

The desktop study identified the Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened ecological community (TEC) 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' within 'Site F - Wharton Road Widening' project area. The EPBC listed 'Subtropical and temperate coastal saltmarsh' TEC was also within the 20km buffer of the site. No other TEC's or priority ecological communities (PEC) were identified by the desktop study as being within 'Site F - Wharton Road Widening' or within a 20 km buffer of the site.

Vegetation type D described as 'Scattered *Banksia speciosa* over *Taxandria callistachys* dominated mixed heath with Cyperaceae and Restionaceae understorey' meets the Knowgkan TEC guidelines due to the area not having fully recovered after fire and having two or more diagnostic species which are likely to make up a significant vegetation component. A total of 10 diagnostic species occurred in the project area. Banksia speciosa also makes up to 30% or greater of Vegetation type D's overstorey. The project constitutes a total of 0.904 ha of Kwongkan being impacted.

Figure 9. Map of 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC occuring within 'Site F - Wharton Road Widening'.

5.5 Threatened and Priority Flora

Four threatened flora (TF) and 28 priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Table 3; DBCA 2021a, DBCA 2021d, DBCA 2021f). Of these, 13 PF and one TF species had suitable known associated habitat that corresponded with vegetation communities and soil type of 'Site F - Wharton Road Widening' project. Confirmed records, indicating known populations, of *Astartea eobalta* were directly located within the clearing permit area, there was also an incorrectly mapped historic population record of *Leucopogon apiculatus* within the survey area that was identified in desktop datasets.

Table 3. Threatened or priority flora identified by the desktop study to be present within a 20 km radius of 'Site F - Wharton Road Widening' project area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2021d), WA Herbarium (DBCA 2021f) and Esperance District Threatened Flora (DBCA 2021a). Nt. Acronyms used in the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2018, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, critically endangered (CN) and endangered (EN).

Species	Conservation Status	Associated Habitat	Likely to occur
Acacia nitidula	P3	Granitic sandy gravelly soils. Amongst granite boulders.	No
Acacia euthyphylla	P3	Grey/white sand, clay loam. Margins of salt lakes & marshes, seasonal swamps.	No

Acrotriche parviflora	P4	Upland flats and slopes, hillcrests, near creek lines, adjacent to salt lakes, base of breakaways.	No
Alyogyne sp. Great Victoria Desert	P3	Black soil fresh water swamp	Yes
Anigozanthos bicolor subsp. minor	T	Condingup area. Sand. Well-watered sites.	Yes
Astartea eobalta	P2	Low shrubland. Grey, grey brown sand. Seasonally inundated depression and on embankments of depressions.	Known to grow in project area
Caladenia exstans	P4	Brown or red loam, granite. Yate flats, shallow soil pockets on coastal granite outcrops.	No
Caladenia longicauda subsp. insularis syn Caladenia longicauda subsp. Duke of Orleans Bay	P1	Shallow soil in coastal heath on low granite outcrops	Yes
Comesperma calcicola	P3	Calcareous or semi-saline clay loams, limestone. Areas around saline water.	No
Comesperma lanceolatum	P2	White sand. Marine plains, sand dunes, quartzite ridges. Specimen known in Duke of Orleans Bay.	Yes
Conostylis lepidospermoides	T	Grey or yellow-brown sand over laterite. Low Mallee woodland	Unlikely as incorrectly mapped location all known population west of Esperance
Daviesia pauciflora	P3	White or grey sand over laterite or limestone. Flats.	No
Eucalyptus balanopelex (taxon removed from census. Considered now to be a hybrid with E. kesselli subsp. eugnosta x E. semiglobosa	P1	Grey sand, sandy loam. Low wet areas.	Yes
Eucalyptus ligulata subsp. ligulata	P4	Cape Le Grande and Cape arid. Proteaceous shrublands. Dunes white yellow sand	Possible
Eucalyptus missilis x	P4	Sand over limestone or granite. Coastal sites.	Known to grow in immediate area
Eucalyptus insularis subsp. continentalis	T	Health near granite outcrops, Loam soils. Cape Le Grande	No
Grevillea baxteri	P4	Sand. Sandplains. Mallee woodlands, Shrubalnds.	Yes

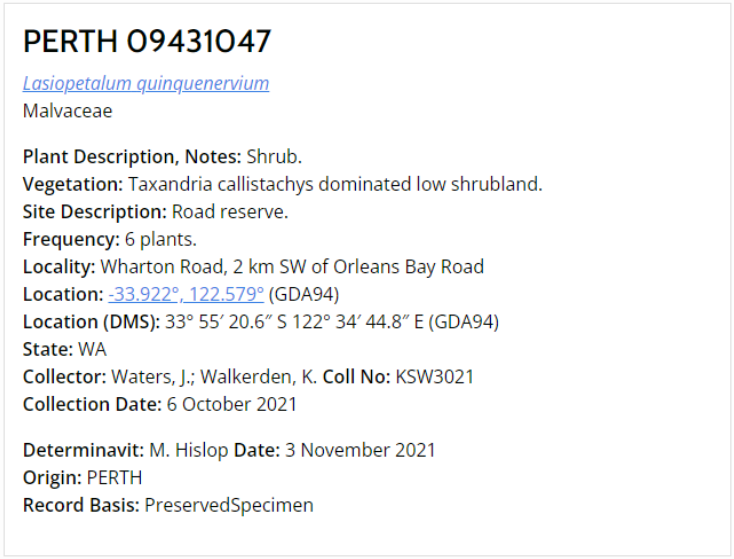
Hibbertia hamata	P3	Granite. Inland outcrops, nearby granite outcrops. Cape Arid, Condingup.	No
Lambertia echinata subsp. echinata	T	Gravelly Sandy Loam	No
Lasiopetalum maxwellii	P2	Sandy soils. Granite slopes.	Yes
Lepidium pseudotasmanicum	P4	All natural populations growing at Cape Le Grande. Gravelly sandy loam, brown sandy loam, white-grey sand, granite, laterite. Below & between rock outcrops, slopes, hill crests.	No
Leucopogon apiculatus	P3	Skeletal sandy or stony soils over quartzite or granite. Granite outcrops & hills, quartzite ridges, rocky slopes.	Known to grow in project area
Leucopogon florulentus	P3	White/grey or yellow sand, sandy clay, gravelly lateritic soils. Sandplains, gentle slopes.	No
Microtis quadrata	P4	Seasonally wet depressions and in swampy mounds in near coastal areas.	Yes
Myoporum velutinum	T	Sandy soils. Creek banks. Condingup, Cape Le Grande & Nuytsland Nature Reserve	Yes
Myriophyllum petraeum	P4	Aquatic. Ephemeral rock pools on granite outcrops.	No
Patersonia inaequalis	P2	Sandy clay, lateritic or granitic sand. Cape Le Grande, Helms Arboretum.	Yes
Persoonia scabra	P3	White sand or sandy loam. Mallee Woodland/ shrubland. Condingup Cape Le Grande.	No
Platysace haplosciadia	P2	Sandy clay over ironstone. Seasonally wet areas. Cape Le Grande, Duke of Orleans Bay.	Yes
Rumicastrum chamaecladum	P2	Clay loam. Winter-wet creek edges. Condingup. Low shrubland.	No
Styphelia rotundifolia	P3	Eucalyptus mallee with mixed Myrtaceous and Fabaceae shrubland. Wide variety of habitats. Often associated with gravel.	Known to grow in the Duke of Orleans Bay
Utricularia helix	P2	In shallow water 5-15 cm deep. Seasonal swamps. Cape Le Grande	No
Utricularia oppositiflora	P3	Shallow seasonal swamps and depressions, and creek lines in heathlands. Cape Le Grande	No
Utricularia westonii	P2	Wet soils. Swamps, small shallow pools. Cape Le Grande	No

Verticordia verticordina	P3	Sand, clay. Heathland. Cape Le Grande, Condingup, Duke of Orleans Bay, Cape Arid.	Known to grow in immediate area

No TF species were identified within the clearing footprint, however, the targeted flora survey identified four PF species. *Leucopogon corymbiformis* (P2), *Astartea elobata* (P2) and *Leucopogon apiculatus* (P3), were all found within the proposed clearing permit footprint (Figure 11). Four *Patersonia inaequalis* (P2) plants were found very close to, but not within the clearing footprint area.

Queries of spatial datasets were requested specifically for these species, to interrogate impact of proposed works on species sustainability (DBCA 2021g). *Leucopogon apiculatus* and *Leucopogon corymbiformis* were not recorded on the 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 136 species recorded as priority three or four conservation status within the Shire of Esperance boundaries (DBCA 2021). It's noted that specific information on *Astartea eobalta* was on file due to the Shire of Esperance discovering three populations in 2019.

Numerous specimen's unknown to surveyors were collected and verified at the WA Herbarium as non-threatened species, such as *Lasiopetalum quinquenervium* (Accession #9190; KSW3021, specimen retained PERTH09431047), which was sent to the WA herbarium due to its similarity to *Lasiopetalum maxwellii*.



PERTH 09431047

Lasiopetalum quinquenervium
Malvaceae

Plant Description, Notes: Shrub.
Vegetation: Taxandria callistachys dominated low shrubland.
Site Description: Road reserve.
Frequency: 6 plants.
Locality: Wharton Road, 2 km SW of Orleans Bay Road
Location: -33.922°, 122.579° (GDA94)
Location (DMS): 33° 55′ 20.6″ S 122° 34′ 44.8″ E (GDA94)
State: WA
Collector: Waters, J.; Walkerden, K. **Coll No:** KSW3021
Collection Date: 6 October 2021

Determinavit: M. Hislop **Date:** 3 November 2021
Origin: PERTH
Record Basis: PreservedSpecimen

Figure 10. Extract from Florabase (DBCA 2021) of non-threatened *Lasiopetalum quinquenervium*, located directly within the proposed 'Site F - Wharton Road Widening' area.

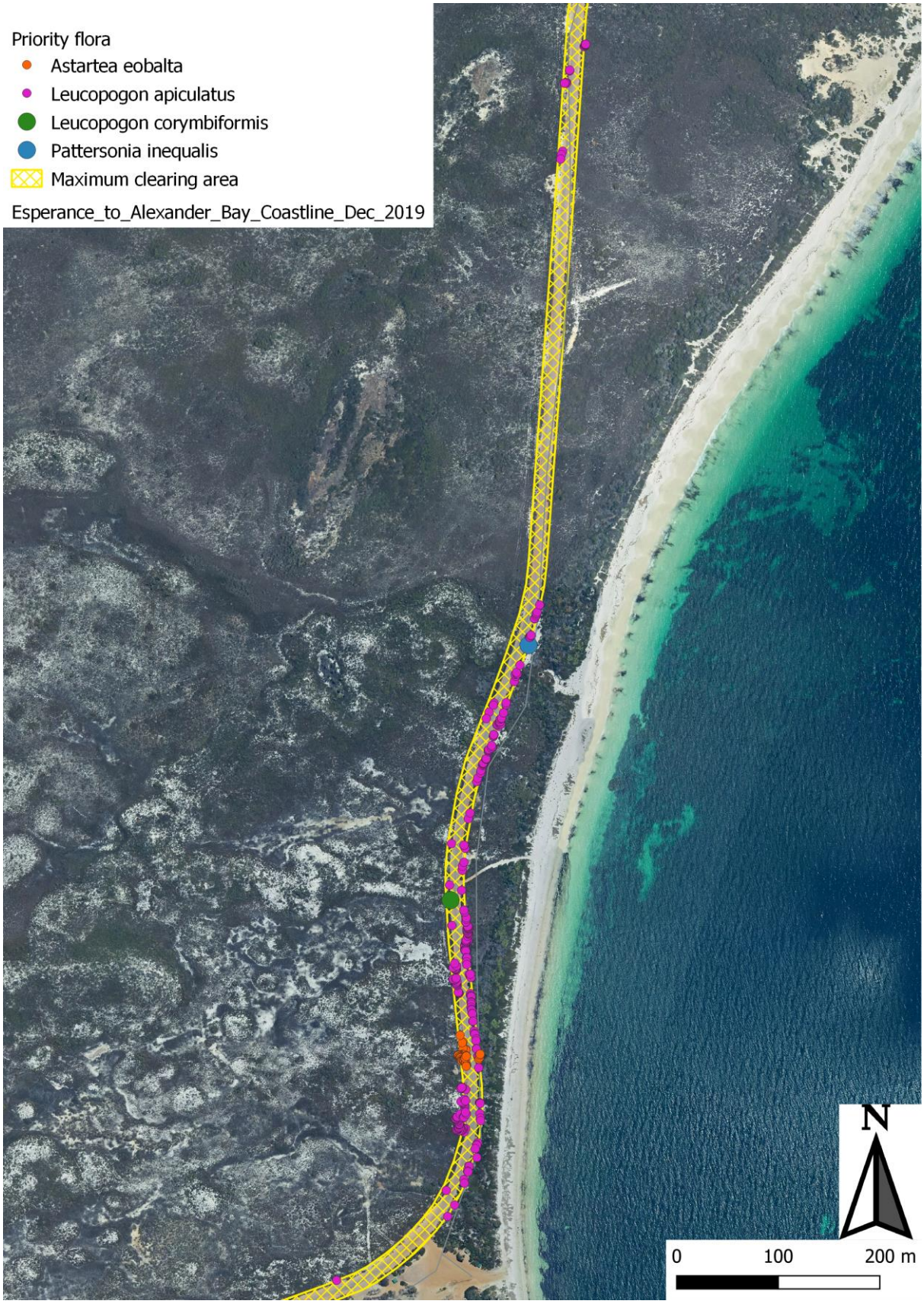


Figure 11. Location of P2 and P3 species within and immediately surrounding the 'Site F - Wharton Road Widening' project.

5.5.1 *Astartea eobalta*, Priority 2

A specimen of *Astartea eobalta* was sent to the WA Herbarium for identification confirmation (KSW 5121; Accession #9306 with specimen not retained). It was confirmed as *Astartea eobalta* by Michael Hislop from DBCA on 30/12/2021. This corresponded to the same location as PERTH 09196390. A Threatened and Priority Reporting Form (TPFL) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 13/01/2021 (Appendix 2). If proposed works occur, 26 plants will be impacted upon, from a population total of 36.

There is little population information on *A. eobalta* population dynamics available (DBCA 2021g). Only four TPFL records were present for the species, three from the Shire of Esperance and a fourth by Mary Hogart representing the pre-existing population on this site. There were eight known records of *A. eobalta* in the WA Herbarium, with the herbarium records being the primary source for population dynamics (Table 4). Records span across a geographic range of 83 km (Table 4). Five populations are located within National Parks.

An additional population of Astartea eobalta (KSW0722 Accession #9405 with specimen retained) was located 150 Metres North of Nares Island Road within R41097 (*Tjaltjraak Boodja Park) by Katherine Walkerden on the 22/01/2022, this new population was 1.1km from the Wharton Road population.

It is likely that known and recorded populations of *A. eobalta* are extremely under-representative of true population numbers and don't reflect the true conservation status of the species. Due to it being a recently formed new species (Rye, 2013), no monitoring by DBCA or other parties has been completed. *A. eobalta* also has a cryptic element to identification, with extremely similar physiological features as non-threatened *Astartea asteroides* and growing in close association with this species. This was observed at the new population discovered along 'Site F – Wharton Road Widening' project, with clumps of *A. eobalta* and *A. asteroides* growing together. Additionally, *A. eobalta* will always be under-represented in collections, flowering outside of spring when the vast majority of flora surveys are conducted. Lastly, observed suitable habitat of *A. eobalta* consisted of periphery of ephemeral swamps, of which there are large amounts of suitable habitat along the Esperance coastline.

Some of the specimens within the impact area were growing within the current road shoulders and appear to have resprouted from their stems or germinated since the last road grading, this was also previously noted by Shire of Esperance in their 2020 "CPS 8884 Site D - Cape Le Grande Blackspot – Flora and Environmental Considerations Report". It is expected that the impacted plants will resprout from stems if mulched.

PERTH 09196390

Astartea eobalta
Myrtaceae

Plant Description, Notes: Graceful perennial multi-stemmed shrub, 1.4 m high x 1.5 m wide.
Vegetation: Low shrubland with mixed bare areas, dominated by sedges with Melaleuca cuticularis, M. globifera, Astartea astarteoides, Verticordia minutiflora, Leptocarpus crebriculmis, Gahnia trifida and Baumea juncea.
Site Description: In road reserve, extends into UCL. Seasonally wet sand below coastal sand dunes. Grey sand.
Frequency: 17 plants seen.
Nearest Named Place: Condingup
State: WA
Collector: White, K. **Coll No:** KW 055
Collection Date: 16 December 2019
Conservation Code: 2

Origin: PERTH
Record Basis: PreservedSpecimen

Figure 12. Extract from Florabase (DBCA 2021) of *Astartea eobalta*, P2, located directly within the proposed 'Site F - Wharton Road Widening' area.

Figure 13. Photo of *Astartea eobalta* within the 'Site F - Wharton Road Widening' project'. Photo taken by Katherine Walkerden on 24/11/2021.

Table 4. Compiled population data of priority two species *Astartea eobalta* and new populations discovered by the Shire of Esperance (DBCA 2021g).

Site Description	New population	Population Count and date	Sheet no. / Specimen no.
150 Metres North of Nares Island Road along closed 4WD track. Within R41097.	X	~ Dozen (2022). Population is likely to expand as it recolonises closed 4WD track.	KSW0722 Accession #9405 with specimen retained
Cape Le Grand Rd, located 4.4 km south of Merivale Rd intersection	X	13 - 3 will be taken as part of this project (2019).	KW039 Accession #8281. *Specimen not retained by WA Herbarium.
Farm laneway on private property, located east of Duke of Orleans Bay Rd at ~8 km south of Merivale Rd intersection.		21 to 50 plants (2005). Site was revisited in 2019 to gain familiarity with species. Population remained undisturbed from original survey, and at least 8 plants were observed incidentally. A full survey was not conducted.	07484518
Cape Le Grand Rd, 6.7 km north of National Park sign, 3.2 km south of Merivale Rd intersection		1 plant (2003). 0 plants (2019).	06586228
Orleans Bay Rd, ~ 8.9 km south of Merivale Rd intersection. Located within approved CPS 7188/2 clearing permit area.	X	80 plants – 40 plants will be impacted by proposed impacts under CPS 7188/2 (2019).	KW040 Accession #8281
Cape Le Grand National Park. Inland from western side of road to Le Grand beach, and 0.5 km south from its junction with the Frenchman's Peak turnoff.		No data on population (1994).	06172598
Dolphin Cove, Cape Arid National Park.		Common to dominant in area (1989).	03369714
Along Le Grand Rd, located 6 km north of border to Cape Le Grand National Park.		No data on population (1983).	06172601
8.6 miles from Cape Le Grand on Esperance Road.		No data on population (1966).	06172628
Cape Le Grand Rd, 25.5 miles from Esperance.		No data on population (1962).	06172636
New Orleans Bay		No data on population (1944).	03428451

5.5.2 *Leucopogon corymbiformis*, Priority 2

A specimen of *Leucopogon corymbiformis* was sent to the WA Herbarium for identification confirmation (KSW 3121; Accession #9190 with specimen retained). It was confirmed as *Leucopogon corymbiformis* by Michael Hislop from DBCA on 3/11/2021. A Threatened and Priority Reporting Form (TPFL) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) district Flora Conservation Officer and Species and Communities Branch on 6/12/2021 (Appendix 4). If proposed works occur, four plants will be impacted upon, from a population total of four.

There is little population information on *L. corymbiformis* population dynamics available (DBCA 2021a). No data was available in the TPFL dataset, likely due to this species only recently being taxonomically described in 2014 by Michael Hislop (Hislop, 2014) after being known as *Leucopogon* sp. Cape Arid. Inferences on the population will need to be drawn purely from WA Herbarium data (DBCA, 2021g), There were 12 herbarium records from between 1962 to 2013. The specimens with accurate location data are from Helms Forestry Reserve and Cape Arid National Park, several of the specimens lacking accurate location details are also potentially from Helms Forestry Reserve. The species spans a known range of 113km. Due to the recent species description, there is potentially additional populations that are undiscovered between Helms Forestry Reserve and Cape Arid National Park, this was also noted in Hislop (2014), however the lack of specimens from the well surveyed Cape Le Grand National Park reduces the likelihood of other populations in between Helms and Cape Arid.

The vegetation described in previous Herbarium records of *L. corymbiformis* is frequently *Banksia speciosa* woodlands/ shrublands, Melaleuca dominated heaths are also mentioned in a Cape Arid record. Large areas within the surrounding R41097 is potentially suitable for the species being dominated by *Banksia speciosa* woodlands and shrublands and further populations possibly exist in the surrounding area and other coastal reserves.

Table 5. Compiled WA Herbarium data of priority 2 species *Leucopogon corymbiformis* (DBCA 2020x).

Site Description	Tenure	Population Count	Date	Sheet no. / Specimen no.
20 km E of Esperance	No accurate location	Common on N and NE slopes.	2013	8611602
Cape Arid National Park, environs of DBCA campground at Yokinup Bay	National Park	locally common.	2012	8382085
Cape Arid National Park, environs of DBCA campground at Yokinup Bay	National Park	locally common.	2012	8382093
Cape Arid National Park, track to Dolphin Cove, 3 km S of Thomas River Road	National Park	locally common.	2012	8382077
Track at end of Fox Road, Helms Arboretum; Esperance Airport	Misc. Reserve		2006	7424957
Helms Arboretum, Agroforestry block, southern end of Fox Road near a small lake east of Fox Road (track)	Misc. Reserve	2-5 plants.	2006	7424949
Quadrat 1, Dolphin Cove Road Tank, Cape Arid National Park	National Park		2004	6870856
On W side of Fox Road, 2.6 km S of Brockway Road. Helms Arboretum, c.	Miscellaneous Reserve		2000	6597343

16 km NNW of Esperance. [Plot - ES01]				
2 km NW of Ranger's house on track to Esperance Road, Cape Arid National Park	National Park	common.	1982	3039641
5 miles S of Gibson	No accurate location		1966	8238707
24 km N of Esperance, Eyre District	No accurate location		1964	8236259
Esperance	No accurate location		1962	8238693

Figure 17. Scan of KSW3121 Accession# 9190 *Leucopogon corymbiformis* specimen collected on 6/12/2021

Figure 18. Extract from Florabase (DBCA 2021) of Priority 2 *Leucopogon corymbiformis,* record of Specimen KSW3121 Accession# 9190, located directly within the proposed 'Site F - Wharton Road Widening' area.

5.5.3 *Patersonia inaequalis*, Priority 2

A specimen of *Patersonia inaequalis* was sent to the WA Herbarium for identification confirmation (KSW 3221; Accession #9190 with specimen retained). It was confirmed as *P. inaequalis* by Michael Hislop from DBCA on 3/11/2021. A Threatened and Priority Reporting Form (TPFL) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 6/12/2021 (Appendix 5). If proposed works occur, none of the four observed plants will be impacted upon as the closest specimen to the road was just outside of the impact area, the three other plants were several metres further away from the impact area.

There is little population information on *P. inaequalis* population dynamics available (DBCA 2021a). Only two TPFL forms were available both representing specimens collected by Coral Turley (2021g). There was a total of 12 herbarium records with both TPFL forms corresponding with a herbarium record. A majority of specimens were collected at Cape Le Grand with a single specimen collected in Gibson, Coomalbigup and the Recherche Archipelago. 10 of the 12 prior records are within Cape Le Grand National Park or the Recherche Archipelago Nature Reserve providing a high level of protection for these populations.

Past Herbarium records have emphasized that *P. inaequalis* was growing in granite hillsides, shallow soil over granite and gravelly soils, this is not reflected in exposed sandy soils along Wharton Rd, other areas within R41097 would be far more suitable for the species, and the population found within 'Site F - Wharton Road Widening'is potentially part of a larger population within R41097 at more suitable locations.

To avoid accidental impact on the plants each plant will be flagged out and the roads crew briefed on its location, description and priority status.

Table 6. Compiled WA Herbarium and TPFL data of priority two species *Patersonia inaequalis* (DBCA 2021g).

Site Description	Tenure	Population Count	Date	Sheet no.
1.5 km WNW of Hellfire Bay carpark, 1.9 km SE of Mt Le Grand summit, 6.2 km W of Lucky Bay campsite, Cape Le Grand National Park, 29 km SE of Esperance township, Esperance Plains IBRA bioregion	National Park	occasional, 1 plant seen.	2011	8994692
Slightly SE of Frenchmans Peak in Cape Le Grand National Park,	National Park		2001	5949025
High slope of large granite topped hill, NW of Lucky Bay camp site area, Lucky Bay area within Cape Le Grand National Park,	National Park	occasional.	2000	5799910
Coomalbidgup Swamp, 60 km W of Esperance,	Shire Reserve	occasional.	1998	5303400
Gibson	No accurate location or other information given		1996	4614399
Coastal trail from Le Grand Beach to Mount Le Grand, NNW facing slope of 1st granite dome, Cape Le Grand National Park	National Park	2 plants	1992	3026779
Mount Le Grande, Cape Le Grand, 50 km E of Esperance	National Park	common.	1986	1126644
N side of Mount Le Grand	National Park		1971	2095645
NE and E side of Frenchman's Cap [Peak], Cape Le Grand National Park	National Park	Occasional.	1971	1126601
Cape Le Grand National Park, E of Esperance	National Park		1969	1126628
Mount Le Grand	National Park		1960	1126598
Mondrain Island, Recherche Archipelago	Nature Reserve	an apparently rare and very distinctive species.	1950	1126636

PERTH 09431039

Patersonia inaequalis
Iridaceae

Vegetation: Taxandria callistachys dominated low shrubland.
Site Description: Road reserve.
Frequency: 4 plants.
Nearest Named Place: Condingup
State: WA
Collector: Waters, J.; Walkerden, K. **Coll No:** KSW3221
Collection Date: 6 October 2021
Conservation Code: 2

Determinavit: M. Hislop **Date:** 3 November 2021
Origin: PERTH
Record Basis: PreservedSpecimen

Figure 19. Extract from Florabase (DBCA 2021) of Priority 2 *Patersonia inaequalis*, record of Specimen KSW3221 Accession# 9190, located immediately outside the proposed 'Site F - Wharton Road Widening' area.

Figure 20. Location of *Patersonia inaequalis*, P2 specimen KSW3221 Accession# 9190 immediately surrounding the 'Site F - Wharton Road Widening' project.

Figure 21. Scan of *Patersonia inaequalis* specimen KSW3221 Accession# 9190

5.5.1 *Leucopogon apiculatus*, Priority 3

A specimen of *Leucopogon apiculatus* was sent to the WA Herbarium for identification confirmation (KSW 2921; Accession #9306 with specimen not retained). It was confirmed as *Leucopogon apiculatus* by Michael Hislop from DBCA on 3/11/2021. A Threatened and Priority Reporting Form (TPFL) was completed and sent to Department of Biodiversity, Conservation and Attractions (DBCA) District Flora Conservation Officer and Species and Communities Branch on 13/01/2021 (Appendix 3). If proposed works occur, a maximum of 157 plants will be impacted upon, from a population greater than 282. The whole population was much larger than the 282 plants counted with the population extending into R41097. The population was first discovered in 1992 by Gill Craig with the specimen retained as PERTH 03026833. The original herbarium listed a total of 2 plants and the known size of the population has significantly expanded due to this survey.

There is a total of 56 Herbarium specimens in the WA Herbariums collection (Appendix 6). Herbarium specimens were over a 173km range starting at Cape Le Grand to Mount Esmond in Nuytsland Nature Reserve (Figure 10). 40 of the Herbarium specimens were within National Parks and an additional eight specimens were within Nature reserves. There are also four other known populations of *Leucopogon apiculatus* within R41097 ensuring that the species within R41097 will not be significantly impacted. The species has a wide range and extensive known populations within national parks and nature reserves, the species is unlikely to be significantly impacted by the project.

PERTH 03026833

Leucopogon apiculatus
Ericaceae

Plant Description, Notes: Large dense shrub 1-2 m tall with many terminal, flowering racemes. Flowers with a strong perfume. Abundance: 2 plants
Vegetation: Associated withy Banksia speciosa and Agonis sp.
Site Description: Deep white-grey sand.
Nearest Named Place: not available
State: WA
Collector: Craig, G.F. **Coll No:** 2310
Collection Date: 9 October 1992
Conservation Code: 3

Origin: PERTH
Record Basis: PreservedSpecimen

Figure 14. Extract from Florabase (DBCA 2021) of *Leucopogon apiculatus,* P3, record of Specimen PERTH 03026833, located directly within the proposed 'Site F - Wharton Road Widening' area.

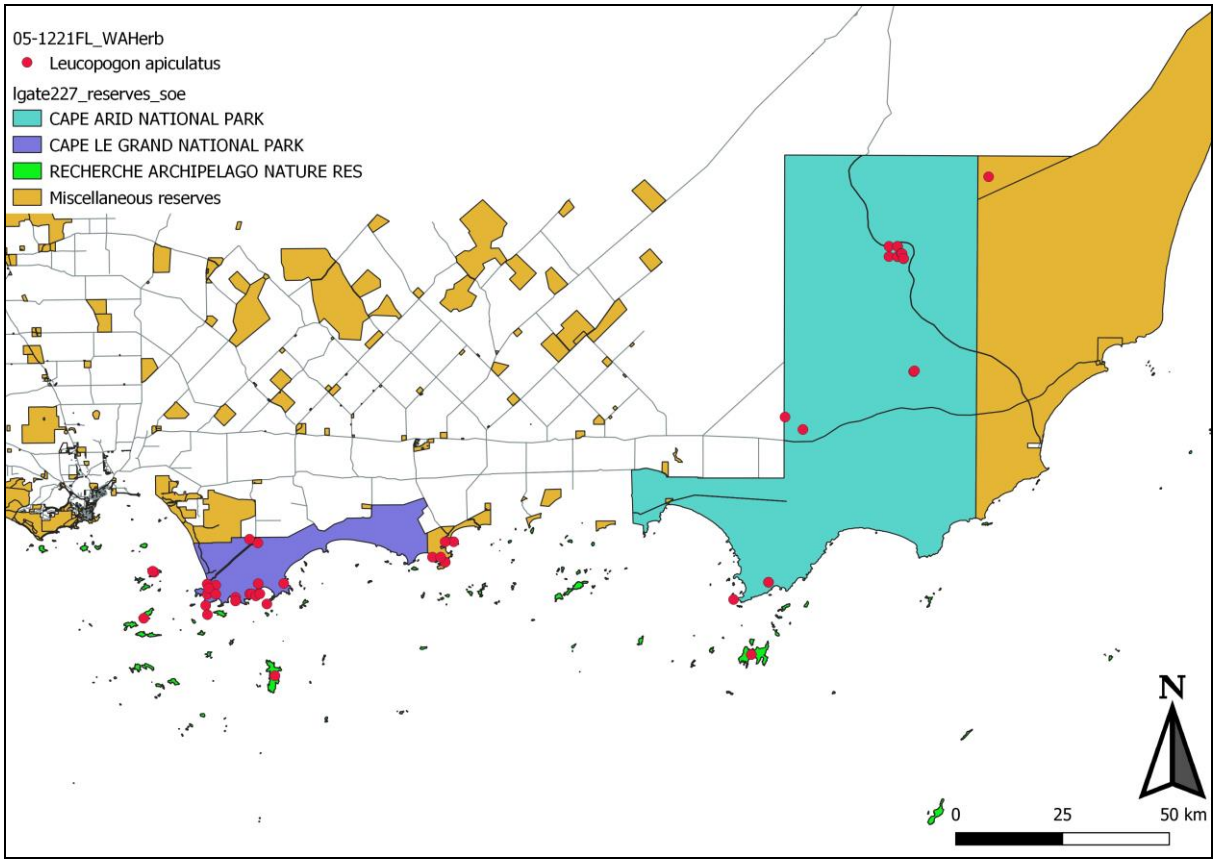


Figure 15. Map showing extract from WA Herbarium of priority 3 species, *Leucopogon apiculatus* and corresponding reserves, east of Esperance.

Figure 16. Scan of *Leucopogon apiculatus* specimen KSW2921 Accession #9190 collected on 6.10.2021

5.5.2 *Eucalyptus x missilis,* Priority 4

A population of the Priority 4, *Eucalyptus x missillis* was discovered by Mary Hogart in September 2014 (PERTH 08779937) within the Wharton road reserve, this population was 20 metres outside of the current road footprint. This population will not be impacted by the mulching, and no new *Eucalyptus x missilis* were discovered during the flora survey.

PERTH 08779937

Eucalyptus x missilis
Myrtaceae

Plant Description, Notes: Compact dwarf mallee 1.2m x 2m, flowers cream, bark grey-brown, young branchlets red, bud caps green, conical, turning red prior to shedding. Flowering for previous 3 weeks. Numerous very small plants. No shedding bark available for collection.
Vegetation: Open heath with Eucalyptus angulosa, E. occidentalis, Melaleuca scabra, M. pulchella, M. incana subsp. tenella, Hakea varia, H. sulcata, Gahnia trifida, Anarthria laevis, Leucopogon sp.
Site Description: Seasonally wet plain, brown sandy loam, UCL.
Frequency: 21-50 plants.
Nearest Named Place: Duke of Orleans Bay
State: WA
Collector: Hoggart, M. **Coll No:** 1/914
Collection Date: 26 September 2014
Conservation Code: 4

Confirmavit: M.E. French **Date:** *Jul 2017*
Origin: ESP.
Duplicates to: AD CANB
Record Basis: PreservedSpecimen

Figure 22. Extract from Florabase (DBCA 2021) of *Eucalyptus x missilis,* P4, record of Specimen PERTH 08779937, located directly within the proposed 'Site F - Wharton Road Widening' area.

5.5.3 Styphelia rotundifolia, Priority 3

Two *Styphelia rotundifolia* specimens were listed as being within the impact area by WA Herbarium data (DBCA 2021g). Both of these specimens (PERTH 01016695 & PERTH 01016725) were from a single sampling event in 1982, the nearest place listed was the Duke of Orleans bay and the records made no references to Wharton Rd, the GPS points associated with the records were entered manually and are unlikely to be accurate.

No *Styphelia rotundifolia* specimens were found during the survey and due to the geographic uncertainty of the records it is highly unlikely that this species exists within the survey area.

5.6 Fauna

Within a 20 km radius of the 'Site F - Wharton Road Widening', 120 fauna have previously been recorded. Of these, 15 species are threatened fauna, priority fauna and fauna protected under international agreement have been recorded (Table 7). Four species have suitable habitat within the proposed clearing permit area, including *Actitis hypoleucos* (Common Sandpiper). A number of marine mammals and fish species were also listed, however were excluded due to the clearing area being terrestrial.

Table 7. Potential threatened, priority and protected under international agreement fauna recorded within a 20 km radius of the proposed 'Site F - Wharton Road Widening'.
Nt. Acronyms used include priority (P), threatened (T), and protected under international agreement (IA) (Naturemap, 2021).

Scientific Name	Common Name	Conservation Status	Likelihood of occurring	Associated habitat
Actitis hypoleucos	Common Sandpiper	IA	Records on Wharton Rd	Found in coastal or inland wetlands, both saline and fresh, mainly on muddy edges or rocky shores.
Atelomastix longbottomi	Longbottom's atelomastix millipede	T	Low	Mountain ranges, islands, granite outcrops, or fragments of wet forests.
Atelomastix melindae	Moir's atelomastix millipede	T	Low	Mountain ranges, islands, granite outcrops, or fragments of wet forest
Calidris alba	Sanderling	IA	No	Found on open sandy beaches at the edge of the waves, no sandbars and spits.
Calidris ruficollis	Red-necked Stint	IA	No	Found on the coast, in sheltered inlets, bays, lagoons, estuaries, intertidal mudflats and protected sandy shores.
Calidris ruficollis	Long-toed Stint	IA	No	Prefer shallow freshwater or brackish wetlands including lakes, swamps, river floodplains, streams, lagoons and sewage ponds.
Calyptorhynchus latirostris	Carnaby's Black-Cockatoo	T	Low	Native woodlands dominated by eucalypts such as Wandoo and Salmon Gum, as well as nearby heathlands.
Cereopsis novaehollandiae	Cape Barren Goose	T	Records on Wharton Rd	During breeding season (May-June), found in grassy areas, tussock

				grass of bushes. During rest of year, found on beaches, coastal pastures and on the shores of brackish lakes.
Hydroprogne caspia	Caspian Tern	IA	Records on Wharton Rd	Usually forages in open wetlands, including lakes and rivers.
Numenius phaeopus	Whimbrel	IA	No	Found mainly on the coast, on tidal and estuarine mudflats, especially near mangroves.
Pezoporus flaviventri	Western Ground Parrot	T	Low	Inhabits low, dry or swampy near-coastal heathland.
Puffinus tenuirostris	Short-tailed Shearwater	IA	No	Found in coastal waters
Thalasseus bergii	Greater Crested Tern	IA	No	They may rest on the surface of the sea in calm weather but during storms, shelter behind dunes, rocks and vegetation.
Thinornis rubricollis	Hooded Plover	P4	No	Inhabits ocean beaches and the edges of near-coastal and inland salt-lakes.
Tringa stagnatilis	Marsh Sandpiper	IA	Possible	Commonly seen singly, or in small to large flocks in fresh or brackish (slightly salty) wetlands.

During the field survey the there was no evidence of invasive fauna such as rabbits, foxes or cats.
During the Field survey several species of native fauna were seen or evidenced, none of these species were Priority Threatened or Listed under international agreements (Table 8).

Table 8. Fauna observed within the proposed 'Site F - Wharton Road Widening'.

Scientific Name	Common Name	Conservation status	Observation type
Macropus fuliginosus	Western Grey Kangaroo	NT	Scat & tracks
Stipiturus malachurus	Southern Emu Wren	NT	Sight tentative
Hirundo neoxena	Welcome Swallow	NT	Sight
Phaps chalcoptera	Common Bronzewing	NT	Sight
Phylidonyris novaehollandiae	New Holland Honeyeater	NT	Sight

5.6.1 Caspian Tern, *Hydroprogne caspia*, T

A confirmed record of the Caspian Tern was present along Wharton road (ALA, 2021). Some of the winter wet areas along Wharton road provide potentially suitable foraging grounds for the Caspian Tern with large areas of vegetation type A being seasonally inundated or waterlogged, this would provide suitable insect species for predation. The nearby Dailey River provides much more suitable foraging grounds for the species, providing both the insect life and small fish that the species is known to predate upon.

The Recherche Archipelago is a known breeding site for the species. Members of the species prefer islands as breeding sites, however have been known to breed in coastal sites with low shrubland, with vegetation type A potentially providing potentially suitable breeding habitat, however the nearby Recherche archipelago providing a range of excellent breeding habitat for the species.

There is a range of processes threatening the species:

- Habitat loss & degradation through invasion of exotic plants
- Predation of chicks by natural & invasive predators
- Exposure to and bioaccumulation of contaminants
- Weather events that damage breeding sites
- Sea level rises impacting breeding habitat

5.6.2 Cape Barren Goose, *Cereopsis novaehollandiae*, T

A confirmed record of the Cape Barren Goose was present along Wharton road (ALA, 2021). Cape Barren Geese are known for feeding on grasses and herbs and some seeds, species such as *Rhagodia baccata* which is known to be fed upon by Cape Barren Geese were present at the site, however total forage suitable to the species is likely to be low in the area, nearby pasture areas along Orleans Bay road are likely to provide excellent forage opportunity with high levels of introduced grasses and legumes which the species is known to forage. Cape Barren Geese are known to breed and roost on Islands within the Recherche Archipelago and are not known to breed or roost on the mainland.

Climate change appears to be the biggest current threat to the species with significant population reductions in the Recherche Archipelago after a period of extremely hot and dry weather in 1991 which caused significant die-off of vegetation and subsequent starvation in the Cape Barren Geese.

5.6.3 Common Sandpiper, *Actitis hypoleucos*, IA

A confirmed record of the Common Sandpiper was present along Wharton road (ALA, 2021). Some of the winter wet areas along Wharton road provide potentially suitable foraging grounds for the Common Sandpiper with large areas of vegetation type A being seasonally inundated or waterlogged, this would provide suitable insect species for predation. The edges of the nearby Dailey River provides much more suitable foraging grounds for the species, providing both the insects, Molluscs and Crustaceans that the species predates upon. The species is migratory and breeds in Europe and Asia.

There is a range of processes threatening the species:

- Habitat loss – particularly in in its Asian flyways
- Reduction in quality and quantity of water
- Sea level rises impacting breeding habitat

5.6.4 Carnaby's Black Cockatoo, *Calyptorhynchus latirostris*, threatened fauna

Carnaby's Black Cockatoo's are unlikely to nest within the 'Site F - Wharton Road Widening' project area, as no large trees are present with hollows to provide roosting grounds, areas north of the project area, along Orleans Bay road routinely provide roosts with large pine trees planted along farm fence lines as wind breaks, Mary Hogart has regularly observed Carnaby's Black Cockatoo feeding on Pine

trees along Orleans Bay rd. 'Site F - Wharton Road Widening' has a moderate amount of Proteaceae species, such as Banksias and Hakeas providing moderate amounts of potential forage. Other areas within the Duke of Orleans Bay have much higher proportions of proteaceous species, with areas along Nares Island road having dense shrublands dominated by *Banksia speciose*.

6 Conclusion; assessment of Department of Water and Environmental Regulations clearing principles

The 'Site F - Wharton Road Widening' project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) assess applications, as listed under Schedule 5 of the Environmental Protection Act 1986 (DWER 2019).

Table 9. Shire of Esperance Assessment against Clearing Principles of the proposed 'Site F - Wharton Road Widening'.

Assessment against Clearing Principles	Conclusion
Principle (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	Biodiversity at this site is high with 163 native species recorded over four vegetation types.
Principle (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	The vegetation contains moderate foraging habitat for Carnaby's Black Cockatoo due to the presence of Proteaceous species. No nesting or roosting habitat is present. The surrounding area and landscape provides dense foraging habitat. Two Threatened bird species and one species protected under international agreement had records each of these species could potentially use the project area for foraging grounds but more suitable foraging areas were close by. A range of fauna was seen to be utilising the site during the flora survey.
Principle (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	Four priority species was observed in the project area. All of these four have other populations within conservation estate and none on the species survival would be dependent on the populations located within Site F - Wharton Road Widening'. *Leucopogon apiculatus* had a large and healthy population both inside and outside of the impact area, most of these populations are within conservation areas. *Leucopogon corymbiformis* had a limited distribution with no known specimens in close proximity to the Duke of Orleans. *Astartea eobalta* had a fairly limited distribution surrounding Cape Le Grand and The Duke of Orleans Bay.

	Patersonia inaequalis also has a fairly limited distribution mainly restricted to Cape Le Grand, however mulching is not going to impact upon this species.
Principle (d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.	Vegetation area D met the criteria to be considered the Kwongkan TEC, including a total area of 0.904ha. No other TEC or PEC were present in the area.
Principle (e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	The immediate surroundings of the site were native vegetation in an excellent or pristine condition and are part of the 2939ha R41097 vested for recreation.
Principle (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	Much of the vegetation was growing in winter wet areas particularly on depressions on the eastern portion of 'Site F - Wharton Road Widening'. The eastern part of 'Site F - Wharton Road Widening' is also within 370m of the Dailey River, but does not constitute riparian vegetation.
Principle (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Due to the large extent of pristine and excellent condition native vegetation surrounding the project area the project is unlikely to have any significant impact.
Principle (h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The closest conservation reserves to the project is R 22796 an island reserve 1km from the project, R22795 part of Cape Le Grand National Park is 3km from the project area, given the significant extent of Excellent and pristine condition native veg between the project and these reserves there will be no impact.
Principle (i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	Due to the large extent of pristine and excellent condition native vegetation surrounding the project area the project is unlikely to have any significant impact.
Principle (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	Due to the large extent of pristine and excellent condition native vegetation surrounding the project area the project is unlikely to have any significant impact.

7 References

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8 Appendix

8.1 Appendix 1 - Incidental species list

Family	Taxon Name	Common Name	Weed	Cons Stat	Herbarium Reference
Aizoaceae	*Tetragonia implexicoma*	Bower Spinach			
Anarthriaceae	*Anarthria laevis*				
Anarthriaceae	*Anarthria prolifera*				
Anarthriaceae	*Anarthria scabra*				
Anarthriaceae	*Lyginia imberbis*				
Apiaceae	*Xanthosia huegelii*				
Araliaceae	*Trachymene pilosa*	Native parsnip			
Asparagaceae	*Thysanotus patersonia*	Twining Fringe Lily			
Asteraceae	*Olearia axillaris*	Coastal Daisybush			
Asteraceae	*Podotheca angustifolia*	Sticky Longheads			
Asteraceae	*Pseudognaphalium luteoalbum*	Jersey Cudweed			
Asteraceae	*Senecio pinnatifolius*	Variable Groundsel			
Brassicaceae	*Brassica tournefortii*	Mediterranean Turnip	x		
Campanulaceae	*Monopsis debilis*				
Casuarinaceae	*Allocasuarina humilis*	Dwarf Sheoak			
Casuarinaceae	*Allocasuarina lehmanniana subsp. Ecarinata*				
Centrolepidaceae	*Centrolepis aristata*	Pointed Centrolepis			
Centrolepidaceae	*Centrolepis polygyna*	Wiry Centrolepis			
Chenopodiaceae	*Leschenaultia formosa*	Red Leschenaultia			
Chenopodiaceae	*Leschenaultia tubiflora*	Heath Leschenaultia			
Chenopodiaceae	*Rhagodia baccata*	Berry Salt Bush			
Cyperaceae	*Baumea juncea*	Bare Twigrush			
Cyperaceae	*Chaetophora curvifolia*				
Cyperaceae	*Gahnia trifida*	Coast Saw-sedge			
Cyperaceae	*Lepidosperma squamata*				
Cyperaceae	*Mesomelaena stygia*				
Cyperaceae	*Mesomelaena tetragona*	Semaphore Sedge			
Cyperaceae	*Schoenus laevigatus*				
Cyperaceae	*Schoenus subbarbatus*				KSW4521 ACC# 9240
Cyperaceae	*Tricostularia aphylla*	Medusa Sedge			
Dilleniaceae	*Hibbertia andrewsiana*				
Dilleniaceae	*Hibbertia gracilipes*				
Dilleniaceae	*Hibbertia racemosa*	Stalked guinea flower			
Dilleniaceae	*Hibbertia ulicifolia*				
Dilleniaceae	*Hibbertia verrucosa*				
Ericaceae	*Andersonia parviflora*				

Ericaceae	*Brachyloma geissoloma*				
Ericaceae	*Leucopogon apiculatus*			P3	KSW2921 ACC# 9190
Ericaceae	*Leucopogon carinatus*				
Ericaceae	*Leucopogon obovata*	Coastal Beard Heath			
Ericaceae	*Leucopogon sp. Coujinup*				
Ericaceae	*Leucopogon corymbiformis*			P2	KSW3121 ACC# 9190
Ericaceae	*Needhamiella pumilio*				
Ericaceae	*Oligarrhena micrantha*				
Ericaceae	*Styphelia woodsii*				
Euphorbiaceae	*Euphorbia paralias*	Sea Spurge			
Euphorbiaceae	*Ricinocarpos megalocarpus*				
Fabaceae	*Acacia cochlearis*	Rigid Wattle	x		
Fabaceae	*Acacia cyclops*	Coastal Wattle			
Fabaceae	*Acacia myrtifolia*				
Fabaceae	*Acacia saligna*	Orange Wattle			
Fabaceae	*Acacia subcaerulea*				
Fabaceae	*Acacia nigricans*				
Fabaceae	*Aotus sp. Esperance*				
Fabaceae	*bossiaea praetermissa*				
Fabaceae	*Eutaxia inuncata*				
Fabaceae	*Gompholobium baxteri*				
Fabaceae	*Gompholobium Knightianum*				
Fabaceae	*Gompholobium scabrum*				
Fabaceae	*Gompholobium tomentosum*	Hairy Yellow Pea			
Fabaceae	*Gompholobium cyaninum*				
Fabaceae	*Jacksonia spinosa*				
Fabaceae	*Jacksonia viscosa*				
Fabaceae	*Templetonia retusa*				
Geraniaceae	*Pelargonium capitatum*	Rose Pelargonium			
Goodeniaceae	*Dampiera fasciculata*	Bundle-leaf Dampiera			
Goodeniaceae	*Dampiera parvifolia*	Many-bracted Dampiera	x		
Goodeniaceae	*Goodenia pterigosperma*				
Goodeniaceae	*Goodenia scapigera*				
Goodeniaceae	*goodenia trinervis*				
Haemodoraceae	*Conostylis seorsiflora*				
Hemerocallidaceae	*Agrostocrinum scabrum*	Blue Grass Lily			
Hemerocallidaceae	*Johnsonia acaulis*				
Iridaceae	*Patersonia inaequalis*	Unequal Bract Patersonia		P2	KSW3221 ACC# 9190
Iridaceae	*Patersonia lanata*	Woolly Patersonia			
Iridaceae	*Patersonia occidentalis*	Purple Flag			

Lauraceae	*Cassytha glabella*	Tangled Dodder Laurel			
Lauraceae	*Cassytha racemosa*	Dodder Laurel			
Lentibulariaceae	*Utricularia tenella*				
Loganiaceae	*Logania micranthera*				
Loganiaceae	*Orianthera serpyllifolia*				
Loranthaceae	*Nuytsia floribunda*	Munji, Christmas Tree			
Malvaceae	*Lasiopetalum quinquenervium*				KSW3021 ACC# 9190
Malvaceae	*Lasiopetalum rosmarinifolium*				
Menyanthaceae	*Ornduffia parnassifolia*				
Myrtaceae	*Agonis baxteri*				
Myrtaceae	*Agonis flexuosa*				
Myrtaceae	*Astartea astarteoides*				
Myrtaceae	*Astartea eobalta*		x	P2	KSW5121 ACC# 9306
Myrtaceae	*Baeckea sp. Esperance*				
Myrtaceae	*Beaufortia empetrifolia*	South Coast Beaufortia			
Myrtaceae	*Calothamnus gracilis*				
Myrtaceae	*Calothamnus quadrifidus*	One-sided Bottlebrush			
Myrtaceae	*Calytrix decandra*	Pink Starflower			
Myrtaceae	*Calytrix hirta*				
Myrtaceae	*Conothamnus aureus*				
Myrtaceae	*Cyathostemon ambiguus*				
Myrtaceae	*Darwinia diosmoides*				
Myrtaceae	*Darwinia vestita*	Pom-pom Darwinia			
Myrtaceae	*Eucalyptus extrica*				
Myrtaceae	*Eucalyptus incrassata*				
Myrtaceae	*Eucalyptus lehmannii*	Bushy Yate			
Myrtaceae	*Eucalyptus platypus*	Moort			
Myrtaceae	*Eucalyptus cladocalyx*				
Myrtaceae	*Eucalyptus occidentalis*				
Myrtaceae	*Leptospermum laevigatum*	Victorian Tea Tree	x		
Myrtaceae	*Leptospermum spinosum*				
Myrtaceae	*Melaleuca armillaris*		x		
Myrtaceae	*Melaleuca calycina*				
Myrtaceae	*Melaleuca cuticularis*	Salt Water Paperbark	x		
Myrtaceae	*Melaleuca globifera*				
Myrtaceae	*Melaleuca incana subsp. Tenella*	Soft Paper Bark			
Myrtaceae	*Melaleuca pulchella*	Crab Claw Melaleuca			
Myrtaceae	*Melaleuca scabra*	Rough Honey myrtle			
Myrtaceae	*Melaleuca striata*				
Myrtaceae	*Melaleuca thymoides*				
Myrtaceae	*Phymatocarpus maxwellii*				

Myrtaceae	*Rinzia dimorphandra*	Esperance Rinzia			
Myrtaceae	*Taxandria Callistachys*				
Myrtaceae	*Taxandria marginata*				
Myrtaceae	*Taxandria spathulata*				
Myrtaceae	*Verticordia sieberi*				
Myrtaceae	*Verticordia vicinella*				
Orchidaceae	*Caladenia decora*	Esperance King Spider Orchid			
Orchidaceae	*Disa bracteata*	South African Weed Orchid	x		
Orchidaceae	*Elythranthera brunonis*	Purple Enamel Orchid			
Orchidaceae	*Pterostylis sp. Esperance*				
Orchidaceae	*Thelymitra benthamiana*	Leopard Orchid			
Orchidaceae	*Thelymitra crinita*	Blue Lady Orchid			
Phyllanthaceae	*Poranthera microphylla*	Small Poranthera			
Pinaceae	*Pinus Pinaster*	Pinaster Pine Tree	x		
Pittosporaceae	*Billardiera fusiformis*	Australian Blue Bell			
Poaceae	*Briza maxima*	Blowfly grass	x		
Poaceae	*Eragrostis curvula*	African Rye Grass	x		
Polygalaceae	*Comesperma ciliatum*		x		
Polygalaceae	*Comesperma virgatum*	Milkwort	x		
Polygalaceae	*Muehlenbeckia adpressa*	Climbing Lignum			
Primulaceae	*Lysimachia arvensis*	Pimpernel			
Proteaceae	*Adenanthos cuneatus*	Coastal Jugflower			
Proteaceae	*Banksia nivea*	Honeypot Dryandra	x		
Proteaceae	*Banksia nutans*	Nodding Banksia			
Proteaceae	*Banksia obovata*	Wedge-leaved Dryandra			
Proteaceae	*Banksia pulchella*	Teasel Banksia			
Proteaceae	*Banksia repens*	Creeping Banksia			
Proteaceae	*Conospermum distichum*				
Proteaceae	*Conospermum teretifolium*	Spider Smokebush			
Proteaceae	*Hakea cinerea*	Ashy Hakea			
Proteaceae	*Hakea corymbosa*	Cauliflower Hakea			
Proteaceae	*Hakea obliqua*	Needles and Corks			
Proteaceae	*Hakea sulcata*	Furrowed Hakea			
Proteaceae	*Hakea varia*	Variable-leaved Hakea			
Proteaceae	*Isopogon polycephalus*	Clustered Conehead			
Proteaceae	*Isopogon trilobus*	Barrel Coneflower			
Proteaceae	*Petrophile teretifolia*				
Proteaceae	*Stirlingia anethifolia*				
Proteaceae	*Synaphea media*				
Proteaceae	*Synaphea oligantha*				
Restionaceae	*Chordifex laxus*				
Restionaceae	*Chordifex sphacelatus*				
Restionaceae	*Hypolaena exsulca*				

Restionaceae	*Hypolaena fastigiata*				
Restionaceae	*Leptocarpus crebriculmis*				
Rhamnaceae	*Spyridium globulosum*	Basket Bush			
Rhamnaceae	*Spyridium majoranifolium*				
Rubiaceae	*Opercularia hispidula*	Hispid Stinkweed			
Rutaceae	*Boronia albiflora*				
Rutaceae	*Boronia tetrandra*				
Rutaceae	*Boronia spathulata*				
Rutaceae	*Cyanothamnus ramosus sbsp. anethifolia*				
Santalaceae	*Leptomeria axillaris*				
Scrophulariaceae	*Myoporum insulare*	Blueberry Tree			
Stylidiaceae	*Levenhookia pusilla*	Midget Stylewort			
Stylidiaceae	*Levenhookia stipitata*	Common Stylewort			
Stylidiaceae	*Stylidium preissii*	Lizard Triggerplant			
Thymelaeaceae	*Pimelea drummondii*				

8.2 TPFL Forms

8.2.1 Appendix 2 - *Astartea eobalta*

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Astartea eobalta **TPFL Pop. No:**

OBSERVATION DATE: 24/11/2021 **CONSERVATION STATUS:** P2 **New population** ☐

OBSERVER/S: Katherine Walkerden, Mary Hogart **PHONE** 0416558774

ROLE: Environmental officer **ORGANISATION:** SOE

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

Growing on both sides of Wharton Rd between SLK 2.29 -2.33

Growing on embankments around witner wet depressions and in winter wet depressions

Reserve No:

DBCA DISTRICT: Esperance **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: 6246614

Long / Easting: 461071

ZONE: 51

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: ____ Map used: ____

Boundary polygon captured: ☐ Map scale: ____

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): 3 Hours 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	15	10	9	
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: Several depressions outside the projectarea were also searched but no additional specimens were found.

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	N	M	3-6 months
•			

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by: ____ **Sheet No.:** ____ **Record Entered In Database** ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 (M.tetragona)

Acacia saligna and mixed Melaleuca dominated shrubland

3.

4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Taxandria spathulata, Taxandria Callistachys, Taxandria marginata, Melaleuca pulchella, Melaleuca scabra, Melaleuca striata, Mesomolaena stygia, Mesomalaena tetragona, Lepidosperma squamata

* 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: Area was inundated when first surveyed in early October, soil was still waterlogged in mid November when resurveyed

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.)

FLORA AUTHORISATION / LICENCE No: FT1000788 Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licening requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: KSW5121 ACC Collectors No: WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: _____

LODGEMENT: WA Herb Lodgement No: _____

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

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

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: _____ Date: 10/11/2021

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by: _____ **Sheet No.:** _____ **Record Entered In Database** ☐

8.2.2 Appendix 3 - *Leucopogon apiculatus*

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Leucopogon apiculatus **TPFL Pop. No:**

OBSERVATION DATE: 6/10/2021 **CONSERVATION STATUS:** P3 **New population** ☐

OBSERVER/S: Katherine Walkerden, Mary Hogart **PHONE** 0416558774

ROLE: Environmental officer **ORGANISATION:** SOE

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

Growing along the both sides of Wharton Rd over a 2km stretch

Reserve No:

DBCA DISTRICT: Esperance **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: 6246400
Long / Easting: 461083
ZONE: 51

METHOD USED:
GPS ☒ Differential GPS ☐ Map ☐
No. satellites: ____ Map used: ____
Boundary polygon captured: ☐ Map scale: ____

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): 3 Hours 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	283+			
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: ____%

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

COMMENT: 283 plants were mapped inside the survey area, dozens of plants were clearly visible outside of survey area

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	N	M	3-6 months
•			

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by: ____ **Sheet No.:** ____ **Record Entered In Database** ❑

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 (M.tetragona)

Banksia speciosa over Taxandria Callistachys dominated mixed low shrubland with mixed Cyperaceae and Restionaceae understorey

Acacia saligna and mixed Melaleuca dominated shrubland

Banksia speciosa over Taxandria Callistachys dominated mixed low shrubland with mixed Cyperaceae and Restionaceae understorey

4.

ASSOCIATED SPECIES:
Other (non-dominant) spp

Taxandria spathulata, Taxandria Callistachys, Taxandria marginata, Melaleuca pulchella, Melaleuca scabra,

Melaleuca striata, Mesomolaena stygia, Mesomalaena tetragona, Lepidosperma squamata

* 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.)

FLORA AUTHORISATION / LICENCE No: FT1000788 Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licening requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: KSW3221 Acc9190 WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: _____

LODGEMENT: WA Herb Lodgement No: _____

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

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

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: _____ Date: 10/11/2021

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by: _____ **Sheet No.:** _____ **Record Entered In Database** ❑

8.2.3 Appendix 4 - *Leucopogon corymbiformis*

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Leucopogon corymbiformis **TPFL Pop. No:**

OBSERVATION DATE: 6/10/2021 **CONSERVATION STATUS:** P2 **New population** ☒

OBSERVER/S: Katherine Walkerden, Mary Hogart **PHONE** 0416558774

ROLE: Environmental officer **ORGANISATION:** SOE

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

Growing along the West side of Wharton Rd

Reserve No:

DBCA DISTRICT: Esperance **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: 6246814

Long / Easting: 461071

ZONE: 51

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured: ☐ Map scale:

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): 3 Hours 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	4			
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: ____%

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

COMMENT: Only 3 plants were seen during the survey

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	N	M	3-6 months
•			

Please return completed form to **Species And Communities Program** 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 Program.

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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*: Banksia speciosa over Taxandria Callistachys dominated mixed low shrubland with mixed Cyperaceae and Restionaceae understorey

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

3.

4.

ASSOCIATED SPECIES: Taxandria spathulata, Taxandria Callistachys, Taxandria marginata, Melaleuca pulchella, Melaleuca scabra, Melaleuca striata, Mesomolaena stygia, Mesomalaena tetragona, Lepidoserpma squamata

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.)

FLORA AUTHORISATION / LICENCE No: FT1000788 Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: KSW3221 Acc9190 WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other:

LODGEMENT: WA Herb Lodgement No:

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

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

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: Date: 10/11/2021

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by:_____ Sheet No.:_____ Record Entered in Database ☐

8.2.4 Appendix 5 - *Patersonia inaequalis*

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants

TAXON: Patersonia inaequalis **TPFL Pop. No:**

OBSERVATION DATE: 6/10/2021 **CONSERVATION STATUS:** P2 **New population** ☐

OBSERVER/S: Katherine Walkerden, Mary Hogart **PHONE** 0416558774

ROLE: Environmental officer **ORGANISATION:** SOE

EMAIL: Katherine.Walkerden@esperance.wa.gov.au

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place):

East Side of Wharton Rd Reserve between SLK 1.87-1.9

1 plant was growing at the top of an embankment, 2 plants were growing at the bottom of an embankment where significant erosion had occured

Reserve No:

DBCA DISTRICT: Esperance **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: 461148.15

Long / Easting: 6246866.12

ZONE: 51

METHOD USED: GPS ☒ Differential GPS ☐ Map ☐

No. satellites: Map used:

Boundary polygon captured: ☐ Map scale:

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): 3 Hours 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: 100%

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

COMMENT: 3 plants were found immediately outside of the survey area, all were just finishing flowering

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	N	L	3-6 months
•			

Please return completed form to **Species And Communities Program** 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 Program.

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.4 March 2021

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 (M.tetragona)

Banksia speciosa over Taxandria Callistachys dominated mixed low shrubland with mixed Cyperaceae and Restionaceae understorey

ASSOCIATED SPECIES:
Other (non-dominant) spp

Taxandria spathulata, Taxandria Callistachys, Taxandria marginata, Melaleuca pulchella, Melaleuca scabra, Melaleuca striata, Mesomolaena stygia, Mesomalaena tetragona, Lepidosperma squamata

* 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.)

FLORA AUTHORISATION / LICENCE No: FT1000788 Note if only observing plants (i.e. no specimens or plant material is taken) then no authorisation/licence is required. For further information on authorisation and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under authorisations/licences should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: KSW3221 Acc9190 WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: ____

LODGEMENT: WA Herb Lodgement No: ____

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

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

Submitter of Record: Katherine Walkerden Role: Environmental Officer Signed: ____ Date: 10/11/2021

Please return completed form to **Species And Communities Program** 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 Program.
Record entered by:____ Sheet No.:____ Record Entered in Database ☐

8.3 Appendix 6 - *Leucopogon apiculatus* Herbarium extract

Compiled WA Herbarium data of Priority 2 species *Leucopogon apiculatus* (DBCA 2021g).

Tenure	Locality	Frequency	Date
Nature Reserve	Woody Island, summit walk trail, at summit		24/08/2010
National Park	The Diamonds Hill	over 50 plants.	24/09/2007
National Park	Cape Le Grand National Park, ca 1.3 km W of Cape Le Grand Road on N boundary	over 50 plants.	29/08/2007
Recreation Reserve	Mount Belches, near Duke of Orleans Bay, E of Esperance	locally common.	17/08/2007
National Park	Track to Lucky Bay from Thistle Cove, Cape Le Grand National Park. Eyre Botanical District	not common in area.	7/10/2003
Nature Reserve	Mondrain Island		21/12/2002
Nature Reserve	Slope down to coast from second look out, Woody Island off Esperance	scattered.	3/12/2002
National Park	Mount Ragged, Cape Arid National Park		14/10/2002
National Park	The Diamonds Hill, Cape Arid National Park	locally common.	1/09/2002
National Park	Lucky Bay, Cape Le Grand National Park,	very common.	12/09/2000
National Park	Mount Ragged, Tower Peak, 170 km NE of Esperance, 99 km NE of Condingup	locally common.	3/10/1999
Recreation Reserve	Wharton Beach, W of Duke of Orleans Bay at existing carpark area and proposed carpark area,		25/05/1999
Nature Reserve	Woody Island, Recherche Archipelago, central upland,	occasional.	18/11/1998
National Park	Thistle Cove, small valley below path, Cape Le Grand National Park,		19/10/1997
Nature Reserve	Mount Esmond, western slope of the northern end, 172 km NE of Esperance	< 10 plants noted.	20/09/1995
National Park	Mount Baring, Cape Arid National Park		25/04/1993
National Park	Walk trail, W slope of Mount Ragged, Cape Arid National Park		23/04/1993
Recreation Reserve	Duke of Orleans Bay, 100 m S of turnoff to Wharton Beach and caravan park, W side of road (Esperance Shire Reserve)		9/10/1992
National Park	Cape Le Grand National Park, c. 400 m W of principal ranger's residence		8/10/1992
National Park	Hellfire Bay, 200 m E of carpark on walk trail, Cape Le Grand National Park		7/10/1992
National Park	Heritage walking trail from Lucky Bay to Thistle Cove, c. 200 m from start, Cape Le Grand National Park		6/10/1992
National Park	Coastal trail from Le Grand Beach to Mount Le Grand, NNW facing slope of 1st granite dome, Cape Le Grand National Park		6/10/1992
National park	Le Grand National Park, SW of Lucky Bay along walk to Thistle Cove		14/10/1991
National Park	Mount Ragged	very few seen.	28/09/1991
Recreation Reserve	Nares Island Beach area, Duke of Orleans Bay,	locally occasional.	1/08/1986

National park	Coastal trail from Rossiter Beach to Lucky Bay, Cape Le Grand National Park,		31/07/1986
National Park	Saddle between peaks of Mount Ragged	locally frequent.	24/11/1985
National Park	Slopes of Mount Arid	occasional.	23/11/1985
National Park	Slopes of Mount Arid, SE side		23/11/1985
National Park	Hellfire Bay, Cape Le grand National Park		24/09/1985
National Park	Cape Le Grand National Park, track from Thistle Cove to Lucky Bay		17/08/1985
National Park	Foot track at base of Mount Ragged, Roe District		8/09/1983
National Park	Cape Le Grand National Park: by Thistle Cove		7/11/1982
National Park	Walking track from Lucky Bay to Thistle Cove, Cape Le Grand National Park		19/07/1982
Recreation reserve	Duke of Orleans Bay	locally common.	18/07/1982
Recreation reserve	High Island, Duke of Orleans Bay		18/08/1980
National Park	Summit of Tower Peak		17/08/1980
Uncertain	Ca 58 km W of Point Malcolm		20/09/1976
Nature Reserve	West and Southwestern Ridge, Middle Island, Recherche Archipelago	rare.	14/11/1974
National Park	Mount Ragged (summit)		24/11/1973
Nature Reserve	Middle Island		22/11/1973
National Park	Cape Le Grand, Cape Le Grand National Park		13/11/1971
National Park	N side of Mt Le Grand		11/09/1971
Recreation Reserve	Israelite Bay, W face of Mt Ragged to near summit		3/10/1970
National park	Cape Le Grand National Park, Esperance		21/10/1969
National Park	Mount Ragged, E of Esperance		27/10/1967
National Park	Mount Le Grand,		7/10/1966
National Park	Cape Le Grand, on hill c. 25 km SE of Esperance		6/10/1966
National Park	Lucky Bay (E of Esperance)		10/09/1966
National Park	N side of Mount Le Grand		12/12/1960
National Park	S end of Mount Ragged,		7/12/1960
National Park	Cape Arid		23/10/1960
Nature Reserve	Sandy Hook Island, Recherche Archipelago		10/11/1950
National Park	Summit of Mount Ragged		26/10/1931
National Park	Summit of Mount Ragged		22/10/1931
National Park	Top of Mount Ragged, E of Esperance		22/10/1931