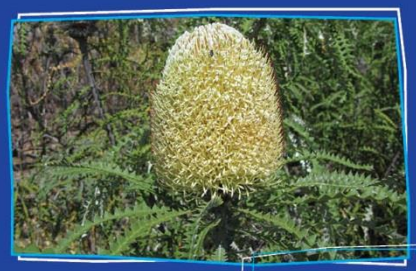
Vegetation, Flora, Fauna and Environmental Considerations, and Targeted Flora Report



Site C – Grass Patch Rd Reconstruction

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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 Shire of Esperance's '2020 Strategic Purpose Permit' application to the Department of Water and Environmental Regulations (DWER). The 'Site C – Grass Patch Rd Reconstruction' proposes the clearing of 4.49 ha of native vegetation for the purpose of road reconstruction, increasing the width of Grass Patch Rd from single lane to double lane bitumen.

2 Introduction

The Shire of Esperance manages the largest road network of any local government in Western Australia, encompassing a total of 4 593 km of road. The Shire of Esperance endeavors to maintain a high level of road safety and is progressively upgrading major haulage routes to safely accommodate road train traffic. Grass Patch Rd has been identified as a key transport route that does not meet current safety standards, being single lane bitumen road in poor condition. The Shire of Esperance has progressively been widening the road to double lane, which involves clearing of native vegetation immediately adjacent to the running road surface of up to 2 m on either side of the current cleared footprint. The total road footprint will then become a width of 26 m.

The area included in 'Site C – Grass Patch Rd Reconstruction' is located ~70 km north of Esperance, and 18.5 km west of the Grass Patch town-site. Specifically, it is located from standard line kilometres (SLK; Main Roads 2019) 18.92 to 23.12, from approximately 2 km west of Bishops Rd intersection to 6.3 km west. Overall, proposed works include clearing of 4.49 ha of native vegetation within a 11.04 ha area, along 4.2 km of roadside. A point within the site is 359444 X, 6322228 Y (UTM Zone 51H, GDA94).

Figure 1. Location of proposed clearing permit 'Site C – Grass Patch Rd Reconstruction' on Grass Patch Rd, approximately 18.92 km to 23.12 km west of Grass Patch town-site.

3 Environmental Background

3.1 Scope

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

Possible impacts include;

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

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

3.2 Catchment

The site is located in the northern area of the Lort River catchment.

3.3 Climate

The Esperance climate is categorized as Mediterranean, with cool wet winters and dry warm summers. The area receives an average annual rainfall of 380 mm (BoM 2019).

3.4 Geology

'Site C – Grass Patch Rd Reconstruction' consists of a single geological unit (Schoknecht et al. 2004), described as Tertiary marine sediments with Aeolian carbonate rich deposits in places.

3.5 Soils and Topography

Topography of 'Site C – Grass Patch Rd Reconstruction' is dominated by level to gently undulating plain with areas of gilgai micro relief, as described by Schoknecht et al. (2004). Drainage is generally poorly developed and usually internal. The soil substrate is described as mainly alkaline grey shallow sandy duplex soils, with associated pale deep sands and minor deep sandy duplexes, ironstone gravel soils and non-cracking clays. The soil is part of Scaddan 1 subsystem.

3.6 Vegetation

The site is located within the Eastern Mallee (Mal01) Interim Biogeographic Regionalisation of Australia (Thackway & Cresswell 1995) region. The MaL01 is described as "the south-eastern of Yilgarn Craton is gently undulating, with partially occluded drainage. Mainly Mallee over Myrtaceous-Proteaceous heaths on duplex (sand over clay) soils. Melaleuca shrublands characterize alluvia, and Halosarcia low shrublands occur on saline alluvium. A mosaic of mixed Eucalypt woodlands and Mallee occur on calcareous earth plans, and sandplains overlying the Eocene Limestone strata in the East. Semi-arid (dry) and warm Mediterranean".

Beard (1973) mapped two vegetation associations (VA) within the 'Site C – Grass Patch Rd Reconstruction' area - VA 924 and 512 (Table 1). VA 924 has relatively higher levels of pre-European extent remaining, with >30% in the IBRA MAL01 region and the Shire of Esperance (DPaW 2017; LGMap 2019). It is also well conserved within the International Union for Conservation Nature (IUCN)

estate. Association 512 meanwhile, has relatively low levels of pre-European vegetated extent remaining, with <30% remaining in the IBRA MaL01 and Shire of Esperance areas. It is poorly represented within the IUCN system.

Since 2016, significant illegal clearing by private landowners has occurred in the Grass Patch-Scaddan area. It has been observed that VA 512 has been drastically cleared, and further reducing the pre-European vegetated extent. Recently, Reserve 26912 "Roberts Swamp" which contains a large area of VA 512 has been offered as a conservation offset for CPS 8608/1 to DBCA, increasing the area of VA 512 within the IUCN system. This is currently pending DPLH approval.

Table 1. Vegetation associations mapped by Beard (1973) within the 'Site C – Grass Patch Rd Reconstruction', and statistics on pre-European remaining areas.
Nt. Acronyms used include Interim Biogeographic Regionalisation of Australia (IBRA), Eastern Mallee bioregion (MaL01), local government area (LGA) and International Union of Conservation Nature (IUCN).

Vegetation Association	**924**	**512**
Name	Salmon Gums	Lort
Description	Shrublands – Mallee scrub, *Eucalyptus eremophila* and red Mallee species, consisting of Eucalypt shrubland of *E. eremophila, Eucalyptus redunca* and other Eucalyptus species.	Shrublands – Mallee scrub, *Eucalyptus eremophila* & Forrest's Marlock, *Eucalyptus forrestiana.* Forming a Eucalyptus open Mallee shrubland, Melaleuca open shrubland and Halgania sp. mixed open heathland.
Area mapped within site (ha)	7.43	3.62
Pre-European extent in IBRA region MaL01 (%)	56.46	26.41
Pre-European extent in LGA (%)	56.47	20.14
Current extent conserved in IUCN area (%)	39.39	9

3.7 Land use

'Site C – Grass Patch Rd Reconstruction' area is within vegetated Grass Patch Rd road reserve, which is managed by the Shire of Esperance. It exists at various widths along the proposed clearing permit area, ranging from 40 m, 120 m to 200m. Currently a single lane bitumised road with wider road shoulders is present, consisting of a total footprint of 18 m. The surrounding land use is heavily dominated by broad acre cropping. The area is within rural land zoning.

4 Methodology

4.1 Desktop study

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

- Existing site digital orthophotos, as sourced from LandGate (Scaddan 2015 & Lort 2015).
- Western Australian Local Government Association's (WALGA) 'Local Government Mapping (LGMap 2019)' 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 October 2019 was used to assess threatened flora (TF), priority flora (PF) and threatened (TEC) and priority (PEC) ecological communities. Specifically, spatial data included;
    - WAHerb extract (DBCA 2019i).
    - Threatened and Priority Reporting (TPFL; DBCA 2019g).
    - Esperance District Threatened Flora (DBCA 2019b).
    - TEC and PEC 'Likely to Occur' buffer and boundary areas (DBCA 2019 h).
- NatureMap was used to assess fauna records within a 20km buffer from the centre of the site (122˚38'29'' E, 33˚44' 50''S; DBCA & WAM 2020).

4.2 Field investigation: Possible ecological impacts

The assessment of vegetation communities and condition occurred on 05/09/2019 by Julie Waters and Katie White, Shire of Esperance's Environmental Officers. An assessment of possible ecological impacts included historical clearing, artificial water way construction, 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 were defined and described by structure and composition. 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 the number of dead or dying plants, weed cover and other forms of degradation. Additionally, possible environmentally sensitive areas, such as wetlands or granite, were noted. Observations of fauna presence, such as call sounds, footprints and scats were also noted, and the area assessed for suitability of Carnaby's Black Cockatoo, *Calyptorhynchus latirostris,* feeding, roosting and nesting habitat. Overall, an assessment of environmental impacts to Department of Water and Environmental Regulation's (DWER) biodiversity values were inspected and valued.

4.3 Field investigation: Assessing Threatened and Priority Ecological Communities

The vegetation community of 'Site C – Grass Patch Rd Reconstruction' was assessed for presence of a TEC or PEC, specifically the Environmental Protection and Biodiversity Conservation Act 1999 listed TEC 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)'. Kwongkan was identified using diagnostic characteristics as 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 28 (DBCA 2019f)' 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, between 05/09/2019 and 11/09/209 by Katie White and Julie Waters, Shire of Esperance's Environmental Officers. 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 four meters from the edge of the existing road's back-slope was assessed to accurately cover the 26 m width proposed clearing permit area. Suitable associated habitat for TF or PF identified in the desktop study were particularly focused on, and extensively searched. A follow up survey was conducted on 16/01/2020 by Katie White and Julie Waters to specifically target the identification and counting of priority four species, *Eucalyptus dolichorhyncha.* Lastly, a final survey of the entire road reconstruction area was conducted by Katie White on 07/04/2020 to count and map priority three species, *Eremophila chamaephila*.

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 2019d), manuals and Esperance District Herbarium, to ensure no TF or PF were missed. Material was collected under Katie White's Regulation 61, Biodiversity Conservation Regulations 2018 Licence for Flora Taking, FT61000029. Any species that were unable to be identified were submitted to the WA Herbarium for identification.

Over the course of the 2019 wildflower season, surveyors re-familiarised themselves with key taxonomic indicators and associated habitat, by visiting verified populations of *Darwinia polycephala* (P4), *Daviesia pauciflora* (P3), *Eremophila lactea* (TF) and *Eucalyptus merrickiae* (TF). For other 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 Panasonic FS-G1 Toughpad with the program ROAM or a GPS Garmin GPS64. Specimens were then lodged with the WA Herbarium for formal verification. When PF were confirmed, TPFL forms were completed and submitted to the DBCA's district Conservation Officer, and Species and Communities Branch.

5 Results and Discussion

5.1 Ecological Impact

5.1.1 Vegetation Communities

Two vegetation communities were identified within the 'Site C – Grass Patch Rd Reconstruction', as defined by structure and composition (Table 2). It is believed that the Beard (1973) vegetation associations identified in Section 3.6 are an appropriate match for the two vegetation types observed.

The incidental flora list identified a total of 76 species across both vegetation communities. This is relatively low, as expected of Mallee and Mallet communities of the area.

Table 2. Vegetation communities identified within proposed 'Site C – Grass Patch Rd Reconstruction' project area.

Type	Description	Figure	Beard Vegetation Association	Area (ha)
1	Scattered Eucalyptus Mallee trees, with thick and diverse Melaleuca under-story	3	512; Mallee scrub, *Eucalyptus eremophila* & Forrest's Marlock, *Eucalyptus forrestiana.* Forming a Eucalyptus open Mallee shrubland, Melaleuca open shrubland and Halgania sp. mixed open heathland	3.84 in 9.336 area
2	Dense Eucalyptus Mallet trees, with scattered *Melaleuca cucullata* and low chenopod under-story	4	924; Mallee scrub, *Eucalyptus eremophila* and red Mallee species, consisting of Eucalypt shrubland of *E. eremophila, Eucalyptus redunca* and other Eucalyptus species.	0.651 in 1.508 area

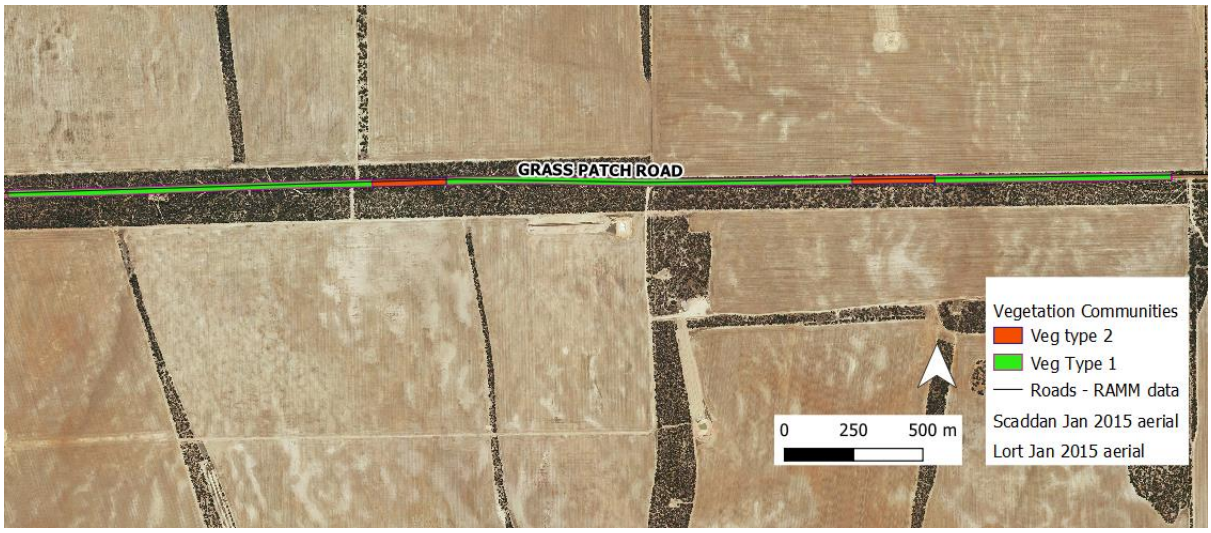

Figure 2. Vegetation types within the 'Site C - Grass Patch Rd Reconstruction' area, from SLK 18.92 km to 23.12 along Grass Patch Rd. These include vegetation type one, described as "scattered Eucalyptus Mallee trees, with thick and diverse Melaleuca under-story", and vegetation type two described as "dense Eucalyptus Mallet trees, with scattered *Melaleuca cucullata* and low chenopod under-story".

Figure 3. Vegetation type 1 within 'Site C – Grass Patch Rd Reconstruction', described as "scattered Eucalyptus Mallee trees with thick and diverse Melaleuca under-story"

Figure 4. Vegetation type 2 within 'Site C – Grass Patch Rd Reconstruction', described as "Dense Eucalyptus Mallet trees, with scattered *Melaleuca cucullata* and low chenopod under-story.

5.1.2 Vegetation Condition

All vegetation along 'Site C – Grass Patch Rd Reconstruction' is long unburnt and in excellent condition, with low weed burden. It was noted that previous road reconstructions along Grass Patch Rd, to the east of this site, had introduced extensive agricultural weeds. 'Site C – Grass Patch Rd Reconstruction' is currently weed free. There is concern that proposed works will degrade roadside vegetation, by spreading the weeds on the adjacent previous road reconstruction or introduce through new vectors. Weed management strategies are currently being discussed operationally, such as spraying material stockpiles in agricultural private property prior to use and periodic spraying of road verges for a 12 month period after road construction.

No environmentally sensitive areas, such as granite or wetland communities were observed within 'Site C – Grass Patch Rd Reconstruction'. It is unlikely proposed works will impact natural hydrological regimes of the area. It is also highly unlikely acid sulphate soils will develop, being the incorrect soil type present. Whilst no signs of feral animals were present, it is highly likely that the surrounding agricultural lands support populations of foxes, cats and rabbits. *Phytophthorra cinnamomi* is unlikely to be present within the region, with unsuitable susceptible species and insufficient annual rainfall (DIDIMS; GAIA Resources, State NRM & SCNRM 2020).

5.2 Threatened and Priority Ecological Communities

No threatened (TEC) or priority (PEC) ecological communities were identified in the desktop study as directly located within 'Site C – Grass Patch Rd Reconstruction' area (DBCA 2019h). Within a 20 km buffer of the site, there are recorded locations of the federally Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 listed TEC 'Proteaceae Dominated Kwongkan Shrublands of the South-east Coastal Floristic Province of Western Australia (Kwongkan)'.

The field survey confirmed the site did not meet the definitions of Kwongkan TEC (CoA 2014). Additionally, it did not meet descriptions of any PEC's, with notably no *Eucalyptus occidentalis* dominated yate swamps or granite outcrops (DBCA 2019f).

5.3 Threatened and Priority Flora

Two known populations of TF and PF were present within 'Site C – Grass Patch Rd Reconstruction' area directly. Priority three species, *Eremophila chaemophila*, was present on the western area within a disused and historical gravel pit (DBCA 2019b, DBCA 2019g, DBCA 2019i). 200 m from the western end of the road reconstruction, a known population of TF *Eremophila lactea* is present. Existing yellow markers used to delineate areas of no impact from routine maintenance activities are present.

Three species of threatened flora (TF) and 26 species of priority flora (PF) were recorded within a 20 km radius of the proposed impact site (Table 3; DBCA 2019b, DBCA 2019g, DBCA 2019i). Thirteen of these are deemed likely to occur due to associated habitat being present within 'Site C – Grass Patch Rd Reconstruction'.

Table 3. Threatened and priority flora identified within a 20 km radius of the 'Site C - Grass Patch Road Reconstruction' area, using Esperance District Flora (DBCA 2019b), Threatened and Priority Reporting (TPFL; DBCA 2019g) and WA Herbarium (DBCA 2019i) spatial datasets.
Nt. Acronyms used within the table include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2016, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, critically endangered (CR), endangered (EN) and vulnerable (VU).

Taxon	Conservation Status	Likelihood of occurring	Flowering time	Habitat Description	Taxonomic Description
Acacia amyctica	P2	Yes	Aug to Sept	Associated with Eucalyptus Mallee on well drained loam soils.	Curly pods. Wide and boat shaped phyllodes.
Acacia bartlei	P3	No	June to Oct	Associated with Yate swamps.	
Acacia diminuta	P1	Possible	Recorded Oct to Jan	Distribution mainly occurring to the west of Grass Patch Rd. Associated with sandy clay Mallee scrub.	
Acacia diaphana	P1	No	Sept to Dec	Associated with low-lying depression and Yate Swamps.	
Acacia glaucissima	P3	Yes	Aug to Sept	Grows on sand clay flats, and associated with low Mallee woodland.	Similar physical form to *Acacia myrtifolia.*
Adenanthos ileticos	P4	Yes	Random flowering recorded	Grows on sandy soil with open Eucalyptus woodland.	Distinctive shaped hairy leaves.
Aotus sp. Dundas	P2	Yes	Spring	Recorded extensively in surrounding area, across a range of soil types and vegetation communities.	
Astroloma sp. Grass Patch	P2	No	June to Aug	Occurs on margins of salt lakes.	
Conospermum sigmoideum	P2	Possible	Aug to Sept	Grows on yellow sand.	
Conostephium marchantiorum	P3	Unlikely	Random flowering time recorded.	Associated with *Banksia media* sandplain. Distribution recorded in the Scaddan region.	
Cyathostemon sp. Salmon Gums	P3	Yes	Random flowering	Grows on orange sand, white sand, sandy clay over	Erect, compact shrub, that grows up to 3 m

			time recorded.	granite, light brown clay with gypsum, saline soils. Associated with flats, dry river beds, and near clay pans.	high. Flower colour is White.
Darwinia polycephala	P4	No	Mar to Sept	Associated with salt lakes	Small, grey foliage.
Daviesia pauciflora	P3	No	October to January	Associated with Proteaceae-dominated Kwongkan sandplain.	Reed like leaves.
Dicrastylis archeri	P1	Yes	Nov to Dec	Associated with open Mallee woodland.	Erect, spindly shrub, that grows to 0.4-1 m high; inflorescence with scale-like indumentum; upper leaf surface glabrous; usually 4 stamens; Flowers are cream-white.
Eremophila chamaephila	P3	Yes	Nov to Dec	Grows on sandplain and clay. Associated with Eucalyptus woodland	Needle leaves. Small shrub.
Eremophila compressa	P3	Yes	Oct to Mar	Associated with flat sand and woodlands. Recorded in the immediate area.	Bright green. Can be spindly shrub.
Eremophila lactea	TF – CR under BC Act 2016 and EN under EPBC Act 1999	Yes	Sept - Nov	Recorded in the immediate area. Associated with disturbed areas in Eucalyptus Mallee of the Grass Patch area.	
Eucalyptus dolichorhyncha	P4	Yes	Jan to May	Grows on flats, with yellow sand.	Looks similar to *Eucalyptus forrestiana.* Distinguished by four winged buds, beaked operculum and square cross section
Eucalyptus merrickiae	TF – VU under BC Act 2016 and EPBC Act 1999	No	Aug to Dec	Grows on the margins of salt lakes	Bright red bud caps.
Goodenia laevis subsp. *laevis*	P3	Yes	Aug to Dec	Grows on disturbed sandy loam or laterite.	Described as erect, woody shrub, 0.1-0.25 m high, largest leaves

					15-25 x 1-3 mm, entire. Flowers are yellow
Grevillea aneura	P4	Yes	Winter to late spring	Associated with Mallee scrub on yellow sand or laterite.	Leaves have puzzle-like structure. Toothbrush grevillea structure
Grevillea baxteri	P4	No	May to Dec, Feb	Associated with Sandplains. Mainly occurs in Eastern area.	Toothbrush Grevillea.
Halgania sp. Peak Eleanora	P2	Unlikely	Aug to Nov	Recorded on the sand plains below Peak Eleanora.	Very viscid plant
Hydrocotyle papilionella	P2	No	Recorded in Sept	Associated with swamps and low-lying depressions.	Previoulsy known as *Hydrocotyle* sp. Vigintimilia
Leucopogon rugulosus	P1	Yes	May to Nov	Recorded along Rollonds Rd and Fields Rd area. Associated with open Mallee.	Described as small woody shrub, <1 m height. Leaves are glossy on surface, and revolute on base half/lower margins.
Marianthus aquilonaris	TF – CR under BC Act 2016 and not listed under EPBC Act 1999	No	October	Recorded in the Bremer Range.	
Melaleuca viminea subsp. *appressa*	P2	No	Sep - Oct	Grows on shallow sand over clay. Associated near creeks or wet depressions	Described as spreading shrub, of 1.3-4.5 m high. Flowers are white-cream colour.
Persoonia spathulata	P2	Yes	Dec or Jan	Associated with sand	Described as erect, spreading shrub, 0.2-0.6 m high. Flowers yellow.
Pityrodia chrysocalyx	P3	Yes	Aug to Oct	Distributed more in the Salmon Gums area. Recorded along firebreaks and road reserve	Down hooked leaves.

In total, 76 flora species were identified during the targeted flora survey of the proposed clearing permit area (Appendix 8.1, Table 6). One TF species, *Eremophila lactea* (Section 5.3.1), was identified within the clearing footprint. In addition, three priority species were identified, *Eucalyptus dolichorhyncha* (P4; Section 5.3.2), *Eremophila chamaephila* (P3; Section 5.3.4) and *Goodenia laevis* subsp. *laevis* (P3; Section 5.3.3). Queries of spatial datasets were requested specifically for these species, to interrogate impact of proposed works on species sustainability (DBCA 2019c; DBCA 2019e; DBCA 2020). Both *E. dolichorhyncha* and *G. laevis* subsp. *laevis* 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 145 species recorded as priority three or four conservation status within the

Shire of Esperance boundaries. It was noted that additional information on both species was located on file.

Numerous non-threatened species were closely examined and debated, being very similar to PF. *Acacia dermatophylla* was confirmed to not be the priority three species, *Acacia glaucissima* by a pod width of 8-10 mm, opposed to 2-3 mm width for *Acacia glaucissima*. Similarly, *Acacia mutabilis* subsp. *mutabilis*, was collected and extensively examined to determine was not the similar priority two species, *Acacia amyctica*. The distinct midrib confirmed the specimen was *A. mutabilis* subsp. *mutabilis.*

5.3.1 *Eremophila lactea,* threatened flora

A single plant of *Eremophila lactea* was identified within the proposed clearing permit area (Figure 5). *E. lactea* is ranked as critically endangered under the Biodiversity Conservation (BC) Act 2016 and endangered under the EPBC Act 1999. The single plant was found within a spoon drain in the northern road reserve of Grass Patch Rd. This single plant was fully mature and beginning to senesce, likely from old age.

The plant within 'Site C – Grass Patch Rd Reconstruction' was not previously known, extending the previously known population area of occupancy to the east by 650 m, listed as population three on the threatened and priority reporting forms (TPFL). The single plant was found outside of the markers. Shire of Esperance's Environmental Officer's extended the threatened flora markers to surround this area. No formal collection was taken, as an existing population had been previously verified. A TPFL form was submitted to DBCA's Esperance District Flora Conservation Officer (Appendix 8.3). Recent surveys conducted in September 2019 showed 17 mature plants were present within population three, that had not been impact by the Scaddan 2015 bushfires (Appendix 8.3.2). Plants within population three were within the active road footprint, and will likely be impacted during standard maintenance activities under approved permit to take TFL 97-1920 (Appendix 8.2).

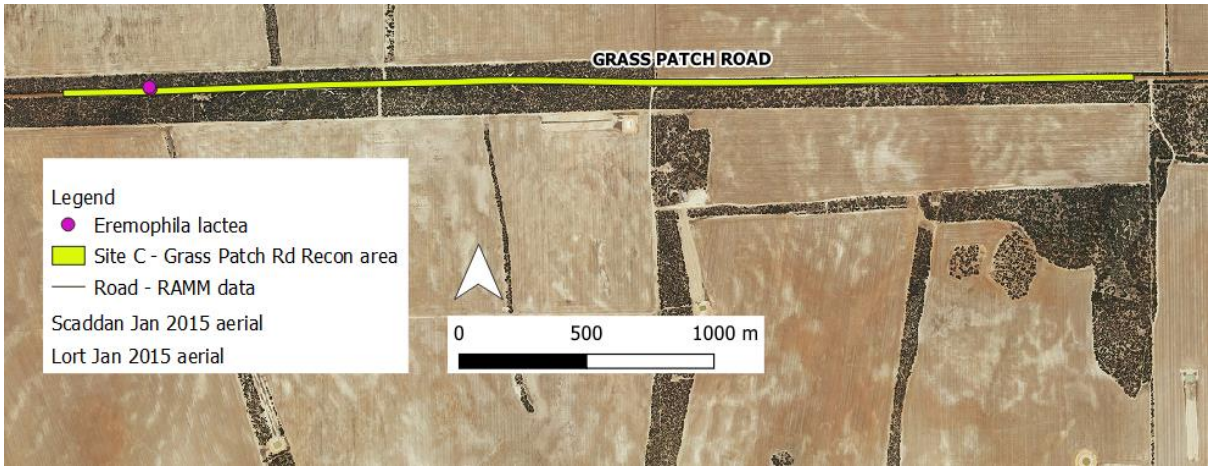

Figure 5. Location of threatened flora, *Eremophila lactea* within the 'Site C – Grass Patch Rd Reconstruction' area.

Following a bushfire event in November 2015, a dramatic germination event occurred and the total population of *E. lactea* increased from less than 50 plants to over 40 000 plants. The single plant is proposed to be cleared as part of this project, and is not considered a significant impact. A permit 'to take or disturb' *E. lactea* for this specific plant was approved on 15/11/2019 by the Department of Biodiversity Conservation and Attractions (TFL 97-1920, DBCA 2019a; Appendix 8.2).

5.3.2 *Eucalyptus dolichorhyncha,* priority four

The priority four species *Eucalyptus dolichorhyncha* was found scattered continuously along the clearing permit area (Figure 6). The nearest record of *E. dolichorhyncha* is 7.4 km away, and so these plants are considered a new population (DBCA 2019b; DBCA 2019g; DBCA 2019i). Two specimens were collected, from either ends of the road reconstruction to cover the full distribution of the population (KW018, KW019, Accession #8178 with specimens not retained). One of these specimens had a large elongated bud cap and was confirmed as *E. dolichorhyncha*. The advice from WA Herbarium was to check all plants for budcaps, being the distinguishing feature from the non-threatened *Eucalyptus forrestiana,* which occupies the same distribution and range. Every single plant that could be *E. dolichorhyncha* or *E. forrestiana* was re-surveyed on 16/01/19 by Shire of Esperance's Environmental Officers, confirming all plants had an elongated budcap, and thus were identified as *E. dolichorhyncha.* In total, 35 *E. dolichorhyncha* plants will be impacted upon. An additional 25 plants were observed outside the area of clearing within the adjacent road reserve. However, only plants that could be seen from the road edge were counted, so it is likely that the total population at this location would extend into private property/reserves in area and be much greater than 60 plants. A TPFL form was sent to DBCA's District Flora Conservation Officer on 16/12/2019 (Appendix 8.3).

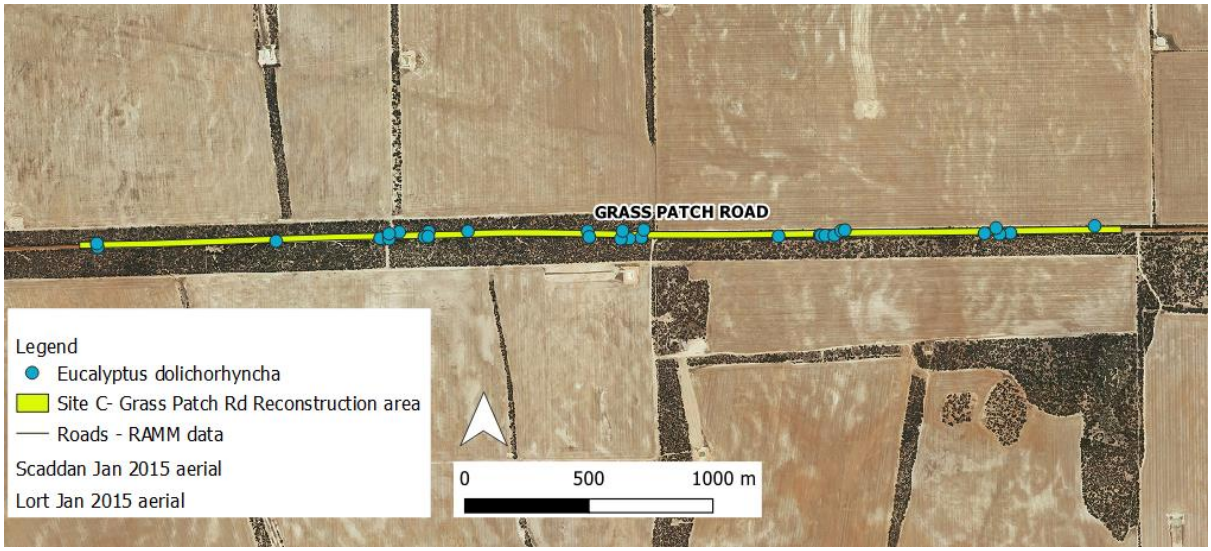

Figure 6. Location of priority four species, *Eucalyptus dolichorhyncha* within the 'Site C – Grass Patch Rd Reconstruction' area.

To evaluate impact of proposed works on the sustainability of *E. dolichorhyncha,* spatial data bases were interrogated (DBCA 2019c). No data for this species was available on the TPFL database, with reasons discussed above (Section 5.3). A summary from WAHerb and DBCA district summary was compiled (Appendix 8.4, Table 7; Appendix 8.5, Table 8). All data was collected prior to 2008. There are 45 records of *E. dolichorhyncha,* distributed across 80 km (north-south distribution; Figure 7). Numerous populations recorded in Table 7 and Table 8 have been recorded in conservation estates and believed to be secure. These include:

- Bishops Nature Reserve (Reserve 29012).
- Mt Burdett Nature Reserve (Reserve 27384).
- Unallocated Crown Land around Peak Charles National Park (Proposed addition to Peak Charles National Park).

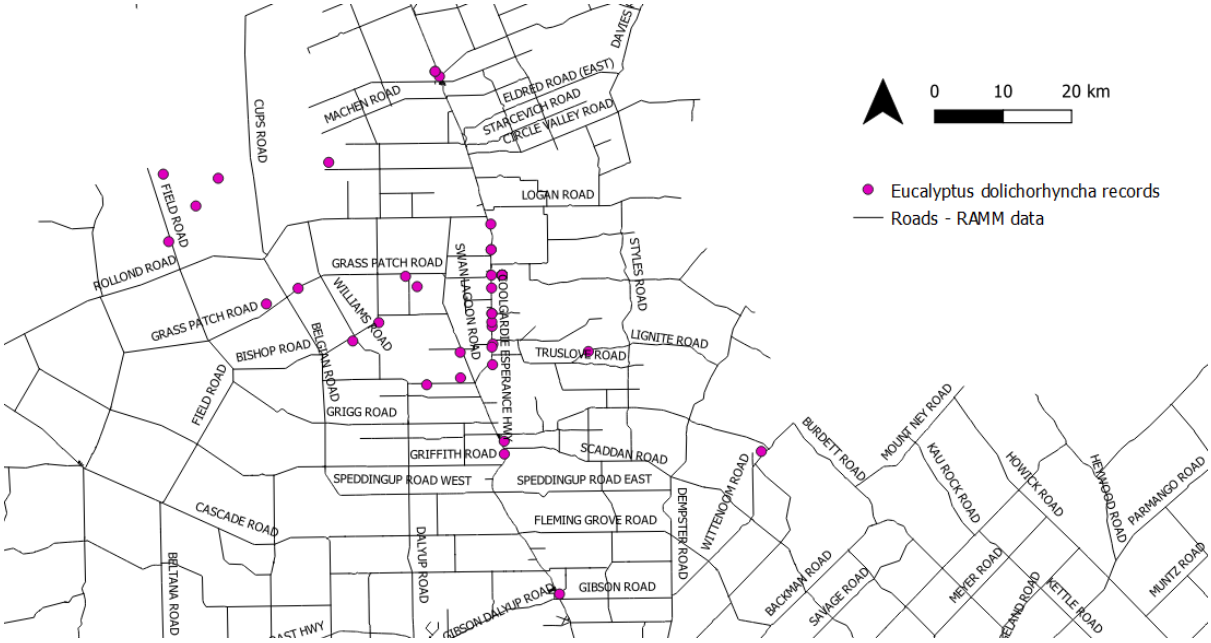

Figure 7. Known distribution of priority four species, *Eucalyptus dolichorhyncha*, using district threatened flora data and WA Herbarium records (DBCA 2019c).

However, it is known that formally recorded population data of *E. dolichorhyncha* is not complete. Ecoscape recently completed extensive flora surveys for the 'State Barrier Fence Extension, Public Environmental Review (Strategen 2017)'. Ten populations, all previously unknown, were recorded during field surveys, consisting of approximately 435 individual plants in total. There were no specimens ever lodged through the course of these surveys, and therefore are not captured during database searches. Additionally, discussions with DBCA's District Flora Conservation Officer indicates there are other populations of *E. dolichorhyncha* in Truslove Nature reserve (Reserve 27985). Shire of Esperance staff have also observed, but not formally surveyed, large populations on Williams Rd, within the Grass Patch Townsite, Swan Lagoon road, and Coolgardie-Esperance Highway and Reserve 19967. It is therefore believed unlikely that the removal of 25 plants, from a population of at least 60 plants, is not going to have a significant impact on the conservation of this species.

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

More than 50 plants of priority three species, *Goodenia laevis* subsp. *laevis* were identified within the 'Site C – Grass Patch Rd Reconstruction' footprint (Figure 8, Figure 9). All plants were located within the disturbed active road footprint, along the recently graded road shoulder. Therefore, due to there being no legal obligations to conserve priority species, all plants will be impacted upon during next routine maintenance activities. A specimen was collected on 16/01/20 and lodged with the WA Herbarium for formal confirmation of identification (KW059, Accession #8334 with specimen not retained). A TPFL form was submitted to DBCA's District Conservation Officers and Species and Communities Branch on 04/03/2020 (Appendix 8.3).

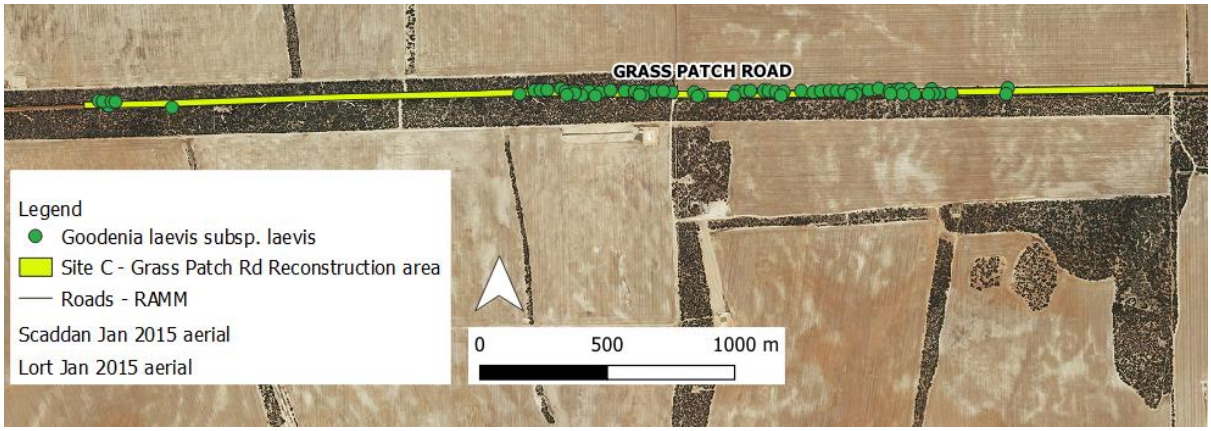

Figure 8. Location of priority three species, *Goodenia laevis* subsp. *laevis* within the 'Site C – Grass Patch Rd Reconstruction' area.

Figure 9. The perennial priority three herb, *Goodenia laevis* subsp. *laevis,* plants observed within with 'Site C – Grass Patch Rd Reconstruction' footprint.

During the spring 2019 flora season there was five new populations of *G. laevis* subsp. *laevis* discovered by Shire of Esperance's Environmental Officers. At all sites, the plants were present in the road active footprint that is regularly graded or in dam catchments – all sites with a high level of disturbance (Table 4). It could therefore be inferred that the presence of *G. laevis* subsp. *laevis* in the disturbed road footprint on Grass Patch Rd is due to disturbance.

Table 4. Additional population of priority three species, *Goodenia laevis* subsp. *laevis* discovered by the Shire of Esperance's Environmental Officers during the spring 2019 flora season.

Location	Number of plants	Evidence of disturbance	Likelihood of impact
Intersection of Norwood and Dempster Rd, on the historic road footprint.	100 to 150	Yes; located within an old road footprint, that was ripped when the road was realigned.	No
Cascade town-site, on Wilhaust St.	15	Yes; located on backslopes of a road that is regularly graded.	Yes; during routine road maintenance activities.
Neds Corner Rd, approximately 2.4 to 3.5 km north of Cascade Rd	82	Yes; all plants located within the backslopes of the road that is regularly graded.	Yes; proposed road reconstruction. Site E in the Shire of Esperance's '2020 Strategic Purpose Permit'
Central Grass Patch town-site, in Reserve 19624	3	Yes; located in a vehicle parking bay and storage area. Evidence of previous disturbance, as intact bushland was lacking under-story.	Yes; proposal to clear to increase area for turn-around bay and storage for road maintenance activities. Currently pending CPS 7548/1.
Old dam on the intersection of Dalyup and Rasyk Rd.	200 to 250	Yes; historically cleared and ripped area to provide catchment for the old dam.	Yes; proposal to clear vegetation to re-instate catchment area as a water source. Application under CPS 7548/1 will be developed.

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

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

5.3.4 *Eremophila chamaephila*, priority three species

Six plants of priority three species, *Eremophila chamaephila* were found in 'Site C – Grass Patch Rd Reconstruction (Figure 10). Of these, five plants will likely be impacted during proposed road activities. Two plants are currently within the active road footprint, and will be impacted upon during routine maintenance activities. All plants were located in the immediate surrounds of Specimen 04669169 (Figure 12). The description of Specimen 04669169 indicates the population previously extended into the disused limestone pit. However, extensive searching only found one plant and three large dead,

senesced plants. A typical generic trait for Eremophila's is a relatively short lived mature period, with disturbance required for germination and persistence in the landscape. It's possible the population was more extensive following the disturbance of the gravel pit, and plants have now senesced. No specimen was formally collected, due to the population already been verified (Specimen 04669169; Figure 12). A TPFL form was submitted to DBCA's District Conservation Officer and Species and Communities Branch on 07/04/2020 (Appendix 8.3).

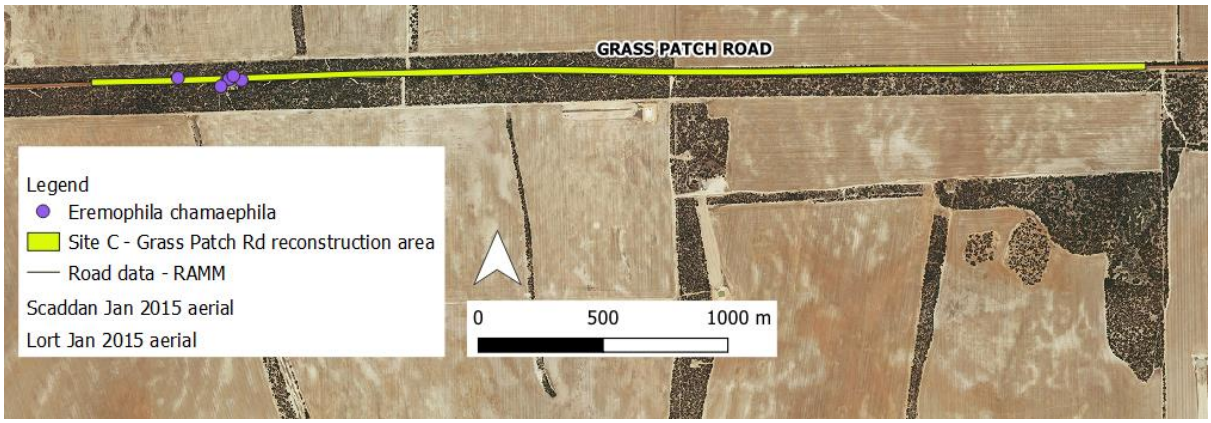

Figure 10. Location of priority three species, *Eremophila chamaephila* within the 'Site C – Grass Patch Rd Reconstruction' area.

PERTH 04669169

Eremophila chamaephila
Scrophulariaceae

Plant Description, Notes: Low dwarf shrub to 30 cm tall by 50 cm wide. Young plants have bright green leaves, older plants have reddish tinge to leaves. Aromatic leaves.
Vegetation: Woodland over heath with Eucalyptus spp., Acacia sp., Melaleuca sp., Goodenia sp.
Site Description: Low undulating plain. White clay sand over laterite.
Locality: 2.5 km W of Williams Road on Grass Patch West Road, road verge population that extends into disturbed disused gravel pit
Location: -33.229°, 121.479° (GDA94)
Location (DMS): 33° 13′ 43.4″ S 121° 28′ 44.3″ E (GDA94)
State: WA
Collector: Cochrane, J.A. **Coll No:** JAC 2294
Collection Date: 30 January 1997
Conservation Code: 3

Origin: PERTH
Record Basis: PreservedSpecimen

Figure 11. Specimen 04669169 record, *Eremophila chamaephila* present within the 'Site C – Grass Patch Rd Reconstruction'.

Through conversations with the district Conservation Officer at DBCA, *E. chamaephila* is known to be common throughout the local area from Salmon Gums to Grass Patch, occurring across a variety of soil types and Eucalyptus woodlands (Adams 2012; Adams 2020). An extract of data from the WA Herbarium

and TPFL spatial datasets was received from DBCA 19/12/2019 (DBCA 2020). There is 16 recorded populations, of which 13 sites were visited prior to 2000. Description of tenure is poor, so it is unknown whether populations are likely to have persisted despite the old data. It has been recorded across a variety of soil types, such as sands, clay, gravel, and clay loam, and landforms, such as sandplains, plains, hilly areas and wetlands. Associated vegetation remains continuous across the vast majority of records, consisting of Eucalyptus open Mallee woodlands.

It is believed that known and captured records of *E. chamaephila* is under-representative of true conservation status. As discussed above, low priority species are generally not actively monitored and managed due to their prevalence in the landscape. Additionally, it is likely that *E. chamaephila* would not be recorded unless actively searching for this species, due to its similarity to non-threatened and widespread species, *Westringia rigida* (Figure 12). The most distinctive difference when not flowering is the scent of foliage when crushed.

Figure 12. Comparison to show similarity of physiological features of priority three species, *Eremophila chamaephila* (left) and non-threatened species, *Westringia rigida* (right).

5.4 Fauna

Within a 20 km radius of the 'Site C – Grass Patch Road Reconstruction' 144 fauna species were recorded (DBCA & WAM 2020). Of these, six species of threated, priority or special fauna were identified (Table 5). Numerous species, including Inland Western Rosella (*Platycercus icterotis* subsp. *xanthogenys*), Carnaby's Black Cockatoo (*Calyptohynchus latirostris*), Chuditch (*Dasyurus geoffroii),* and Peregrine Falcon (*Falco peregrinus),* possibly habituate the area, meeting suitable habitat requirements. It is considered that even if 'Site C – Grass Patch Rd Reconstruction' is frequented by the Chuditch or Peregrine Falcon, impact would be low due to the nomadic nature of the species.

The large mallet trees present in vegetation type two are potential roosting and nesting habitat for Carnaby's Black Cockatoos. No direct hollows were incidentally observed within the trees, but were not actively surveyed. It is unlikely to be well used by the Cockatoos, as there are no Proteaceae dominated shrublands in the near vicinity, and hence foraging grounds.

It's possible that the Inland Western Rosella frequents the surrounding area of 'Site C – Grass Patch Rd Reconstruction'. However, its distribution tends to be further north towards Salmon Gums and it's likely the site is on the periphery of the species natural range (DEC 2009). Vegetation across the entire site provides roosting and foraging grounds for the species, described as foraging in leaf litter in open Eucalyptus woodland and adjacent pastoral grass crops. It is unlikely that proposed works would have a significant impact, as the remaining vegetated road reserve would supply sufficient foraging grounds.

Table 5. Threatened, priority and specially protected fauna identified to be present within a 20 km radius of 'Site C - Grass Patch Rd Reconstruction' area, using NatureMap (DBCA & WAM 2020). Nt. Acronyms used included priority (P), threatened (T), and specially protected fauna (S).

Taxon	Conservation Status	Common name	Habitat description	Likelihood to occur
Thinornis rubricollis	P4	Hooded Plover, Hooded Dotterel	Recorded on sandy ocean beaches and open edges of inland salt lakes.	Low; no suitable habitat within permit area.
Platycercus icterotis subsp. *xanthogenys*	P4	Western Rosella (inland)	Associated with open Eucalypt forest and timbered areas, including cultivated land and orchards. Recorded in drier woodland, with a heath under-story.	Possible; suitable habitat.
Calyptorhynchus latirostris	T	Carnaby's Black Cockatoo; White-tailed or Short-billed Black Cockatoo	Known to forage in Proteaceous woodlands and shrub-lands, and nest in the hollows of live or dead Eucalypts, primarily the smooth-barked Salmon Gum and Wandoo.	Possible
Dasyurus geoffroii	T	Chuditch, Western Quoll	Recorded in Jarrah (*Eucalyptus marginata*) forests and woodlands in the south-west corner of WA. Along the south coast and east to Ravensthorpe area recorded in woodlands, Mallee shrublands and heaths. There are also occasional records from drier woodland and Mallee shrubland in the Wheatbelt and Goldfields Regions.	Possible; although unlikely to be significantly impacted upon due to nomadic lifestyle.
Falco peregrinus	S	Peregrine Falcon	Not confined to a specific habitat.	Possible; although

				unlikely to be impacted upon due to low population densities and wide range.
Leipoa ocellata	T	Malleefowl	Associated with semi-arid to arid shrublands and low woodlands, especially those dominated by Mallee and/or acacias. A sandy substrate and abundance of leaf litter are required for breeding.	Low; due to small area of remnant and resultant vulnerability to predators, such as cats and foxes.

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

The 'Site C – Grass Patch Rd Reconstruction' project may be at variance to some of the clearing principles that the Department of Water and Environmental Regulations (DWER) assess applications to clear native vegetation, as listed under Schedule 5 of the Environmental Protection Act 1986 (DWER 2019). Despite impacting upon one species of threatened flora (TF), *Eremophila lactea* and three priority flora (PF) species, *Eucalyptus dolichorhyncha* (P4), *Eremophila chamaephila* (P3) and *Goodenia laevis* subsp. *laevis* (P3), proposed clearing of native vegetation is believed unlikely to have significant impact to the sustainability of species of TF or PF. The total road reserve width in the western portion of the site is 200 m wide, and the total road reserve width in the eastern portion is 100 m wide. Widening Grass Patch road to total of 26m still provides a significant width of vegetation corridor for fauna movement and to have a buffer from windblown agricultural weeds. The main environmental management priority at this site will be ensuring road building material sourced from within agricultural paddocks is treated pre and post road construction to prevent weed invasion into the excellent condition roadside vegetation.

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8 Appendix

8.1 Incidental species list

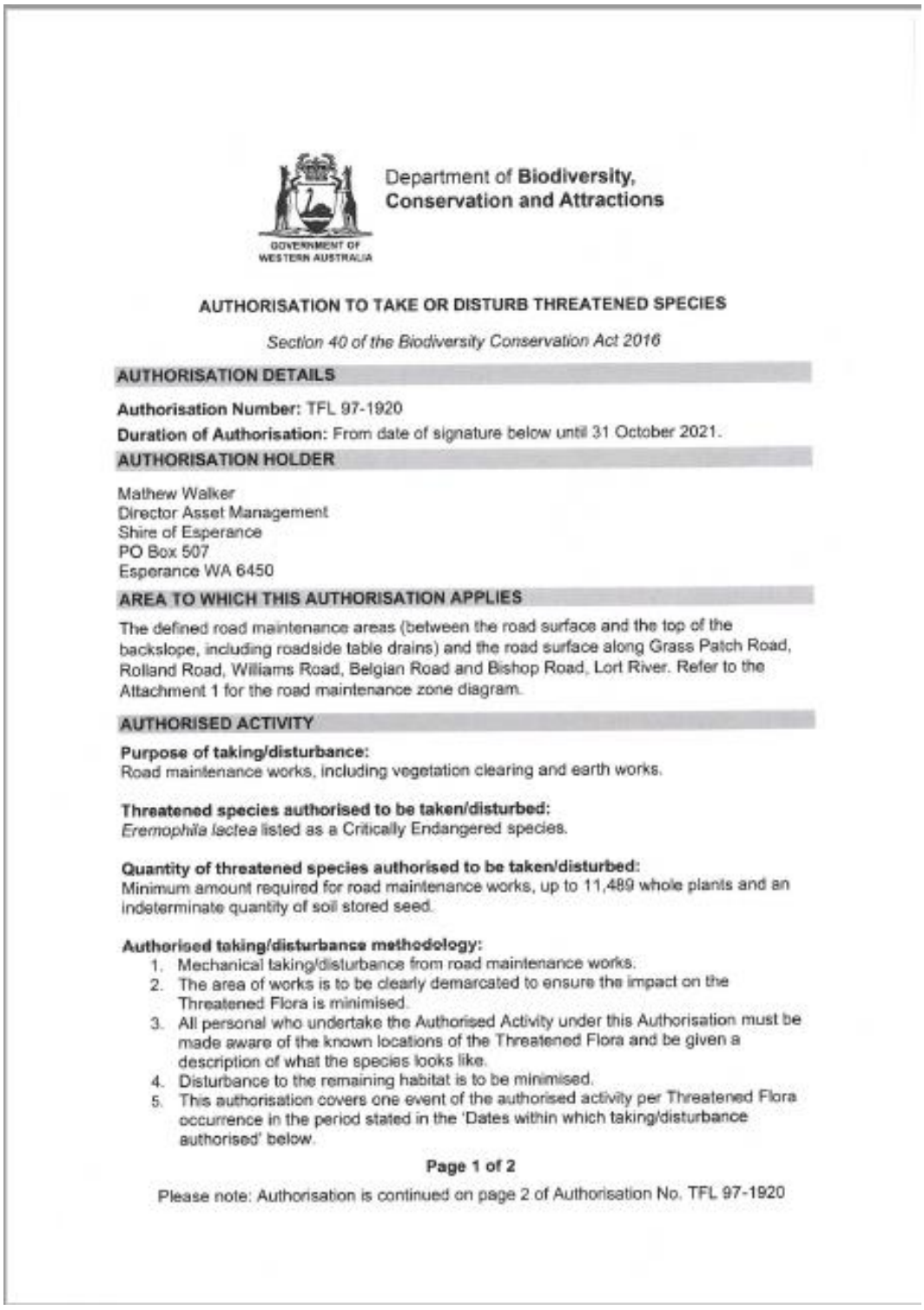
Table 6. Flora species recorded within the 'Site C – Grass Patch Rd Reconstruction' application area. Nt. Acronyms included in the table are priority flora (P), threatened flora (TF), critically endangered (CR), endangered (EN), Biodiversity Conservation (BC) Act 2016, and Environmental Protection and Biodiversity Conservation (EPBC) Act 1999.

Family	Genus	Species	Common name	Invasive	Conservation Status
Aizoaceae	*Carpobrotus*	*modestus*	Inland Pigface		
Asphodelaceae	*Asphodelus*	*fistulosus*	Onion weed		
Asteraceae	*Asteridea*	*athrixioides*			
Asteraceae	*Brachyscome*	*ciliaris*			
Asteraceae	*Olearia*	*muelleri*	Goldfields Daisy		
Asteraceae	*Podolepis*	*rugata*	Pleated Podolepis		
Boraginaceae	*Halgania*	*lavandulacea*	Blue Bush		
Chenopodiaceae	*Atriplex*	sp.			
Chenopodiaceae	*Atriplex*	*codonocarpa*	Flat topped Salt Bush		
Chenopodiaceae	*Enchylaena*	*tomentosa*	Barrier Salt Bush		
Chenopodiaceae	*Maireana*	*radiata*			
Chenopodiaceae	*Rhagodia*	*crassifolia*	Fleshy Salt Bush		
Convolvulaceae	*Wilsonia*	*humilis*	Silky Wilsonia		
Dilleniaceae	*Hibbertia*	*psilocarpa*	Australian Butter Cup		
Fabaceae	*Acacia*	*profusa*			
Fabaceae	*Acacia*	*crassuloides*			
Fabaceae	*Acacia*	*dermatophylla*			
Fabaceae	*Acacia*	*brachyclada*			
Fabaceae	*Acacia*	*mutabilis* subsp. *angustifolia*			
Fabaceae	*Acacia*	*mutabilis* subsp. *mutabilis*			
Fabaceae	*Aotus*	sp. Southern Wheatbelt			
Fabaceae	*Daviesia*	*aphylla*			
Fabaceae	*Daviesia*	*scoparia*			
Fabaceae	*Dillwynia*	*uncinata*	Silky Parrot Pea		
Fabaceae	*Pultenaea*	*purpurea*			
Goodeniaceae	*Goodenia*	*laevis* subsp. *laevis*			P3; Verified by WA Herbarium on 04/03/2020. Accession #8334. Collectors #KW059.
Goodeniaceae	*Scaevola*	*bursariifolia*			

Lamiaceae	*Westringia*	*rigida*	Stiff Westringia		
Lauraceae	*Cassytha*	sp.	Dodder Laurel		
Loganiaceae	*Logania*	*stenophylla*			
Myrtaceae	*Cyathostemon*	*ambiguus*			
Myrtaceae	*Eucalyptus*	*dolichorhyncha*	Fuschia Gum		P4; Verified by WA Herbarium on13/11/2019. Accession #8178. Collector #KW018 and #KW020.
Myrtaceae	*Eucalyptus*	*eremophila*	Tall Sand Mallee		
Myrtaceae	*Eucalyptus*	*diptera*	Two-winged Gimlet		
Myrtaceae	*Eucalyptus*	*indurata*			
Myrtaceae	*Eucalyptus*	*flocktoniae* subsp. *hebes*	Merrit		
Myrtaceae	*Eucalyptus*	*calycogona*	Square-fruited Mallee		
Myrtaceae	*Eucalyptus*	*oleosa*	Red Morell		
Myrtaceae	*Eucalyptus*	*cylindrifolia*	White mallee		
Myrtaceae	*Eucalyptus*	*alipes*			
Myrtaceae	*Eucalyptus*	*extensa*			
Myrtaceae	*Eucalyptus*	*flocktoniae* subsp. *flocktoniae*	Merrit		
Myrtaceae	*Eucalyptus*	*falcata*			
Myrtaceae	*Eucalyptus*	*incrassata*	Ridge-fruited Mallee		
Myrtaceae	*Eucalyptus*	*suggrandis* subsp. *suggrandis*			
Myrtaceae	*Eucalyptus*	*uncinata*	Urn Eucalyptus		
Myrtaceae	*Eucalyptus*	*urna*	Merrit		
Myrtaceae	*Eucalyptus*	*valens*			
Myrtaceae	*Melaleuca*	*cucullata*			
Myrtaceae	*Melaleuca*	*sapientes*	Silver Mallee		
Myrtaceae	*Melaleuca*	*podiocarpa*			
Myrtaceae	*Melaleuca*	*bromelioides*			
Myrtaceae	*Melaleuca*	*societatis*	Soccer Ball Melaleuca		
Myrtaceae	*Melaleuca*	*uncinata*	Broom Bush		
Myrtaceae	*Melaleuca*	*acuminata*			
Myrtaceae	*Melaleuca*	*eleuterostachya*			
Myrtaceae	*Melaleuca*	*teuthidoides*			
Myrtaceae	*Melaleuca*	*thyoides*			
Orchidaceae	*Pterostylis*	*sanguinea*			

Orchidaceae	*Pterostylis*	*mutica*	Midget Greenhood		
Pittosporaceae	*Billardiera*	*coriacea*			
Poaceae	*Austrostipa*	*elegantissima*			
Polygalaceae	*Comesperma*	*spinosum*	Spiny Milk Wort		
Proteaceae	*Grevillea*	*pectinata*	Comb-leaved Grevillea		
Proteaceae	*Grevillea*	*oligantha*			
Proteaceae	*Grevillea*	*huegelii*			
Rhamnaceae	*Pomaderris*	*rotundifolia*			
Rhamnaceae	*Spyridium*	*minutum*			
Rutaceae	*Boronia*	*inornata*	Desert Boronia		
Rutaceae	*Boronia*	*baeckeacea* subsp. *baeckeacea*			
Rutaceae	*Microcybe*	*pauciflora*	Yellow Microcybe		
Santalaceae	*Leptomeria*	*pachyclada*			
Sapindaceae	*Dodonaea*	*stenozyga*			
Sapindaceae	*Dodonaea*	*bursariifolia*			
Scrophulariaceae	*Eremophila*	*lactea*	Milky Emu Bush		TF – CR under BC Act 2018 and EN under EPBC Act 1999; Specimen not collected due to single plant being present, and likely significant impact.
Scrophulariaceae	*Eremophila*	*dichroantha*	Bale-hooked Eremophila		

8.2 Approved Permit to Take



GOVERNMENT OF WESTERN AUSTRALIA

Department of **Biodiversity, Conservation and Attractions**

AUTHORISATION TO TAKE OR DISTURB THREATENED SPECIES

Section 40 of the Biodiversity Conservation Act 2016

AUTHORISATION DETAILS

Authorisation Number: TFL 97-1920

Duration of Authorisation: From date of signature below until 31 October 2021.

AUTHORISATION HOLDER

Mathew Walker
Director Asset Management
Shire of Esperance
PO Box 507
Esperance WA 6450

AREA TO WHICH THIS AUTHORISATION APPLIES

The defined road maintenance areas (between the road surface and the top of the backslope, including roadside table drains) and the road surface along Grass Patch Road, Rolland Road, Williams Road, Belgian Road and Bishop Road, Lort River. Refer to the Attachment 1 for the road maintenance zone diagram.

AUTHORISED ACTIVITY

Purpose of taking/disturbance:
Road maintenance works, including vegetation clearing and earth works.

Threatened species authorised to be taken/disturbed:
Eremophila lactea listed as a Critically Endangered species.

Quantity of threatened species authorised to be taken/disturbed:
Minimum amount required for road maintenance works, up to 11,489 whole plants and an indeterminate quantity of soil stored seed.

Authorised taking/disturbance methodology:

1. Mechanical taking/disturbance from road maintenance works.
2. The area of works is to be clearly demarcated to ensure the impact on the Threatened Flora is minimised.
3. All personal who undertake the Authorised Activity under this Authorisation must be made aware of the known locations of the Threatened Flora and be given a description of what the species looks like.
4. Disturbance to the remaining habitat is to be minimised.
5. This authorisation covers one event of the authorised activity per Threatened Flora occurrence in the period stated in the 'Dates within which taking/disturbance authorised' below.

Page 1 of 2

Please note: Authorisation is continued on page 2 of Authorisation No. TFL 97-1920

Dates within which taking/disturbance authorised:
From date of signature below until 31 October 2021.

PERSONS AUTHORISED TO TAKE THREATENED SPECIES UNDER THIS AUTHORISATION

The Authorisation Holder, employees of the Shire of Esperance and contractors working for the Shire of Esperance under the direction of the Authorisation Holder.

CONDITIONS

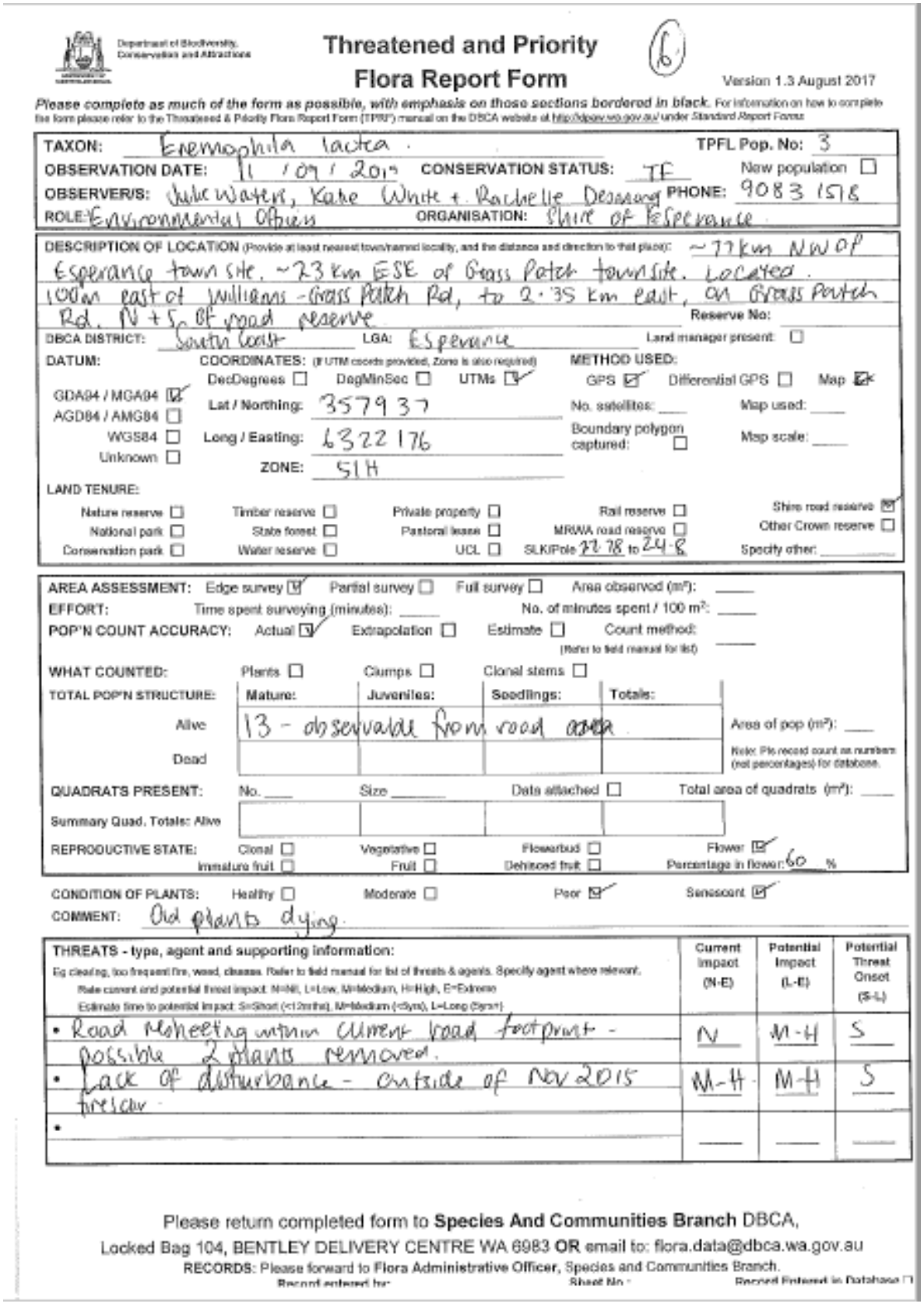
1. There shall be no additional impacts (which includes no introduction or spread of weeds or disease) to Threatened Flora habitat.
2. The Authorisation Holder must contact the Flora Conservation Officer at DBCA's Esperance District office (Ph. 9083 2100) at least 1 week prior to undertaking the Authorised Activity to advise of the date of the proposed works.
3. The Authorisation Holder must maintain the following records for activities done pursuant to this Authorisation:
   a. the location where the taking/disturbance occurred [recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees];
   b. the date that the taking/disturbance occurred;
   c. the species and quantity taken;
   d. actions taken to avoid any impacts in accordance with condition 1 of this Authorisation (including actions taken to minimise the risk of the introduction and spread of weeds and disease).
4. The Authorisation Holder must complete a Threatened and Priority Flora Report Form and provide the Report, and the records required under condition 3 of this Authorisation to the CEO upon completion of the Authorised Activity, or the expiry of this Authorisation, whichever comes first, or when requested by the CEO.
5. No material taken under this Authorisation shall be used for purposes other than that specified above.
6. The location of Threatened Flora populations shall be treated as confidential and under no circumstances disclosed to other persons without the written permission of the CEO.
7. The Authorisation Holder or any Authorised Persons undertaking the Authorised Activity shall produce this Authorisation and any land owner/occupier's consent to access the land, whenever requested to do so by a Wildlife Officer.

NOTES

1. Before undertaking the Authorised Activity, permission must be obtained from: (a) the owner or occupier of private land; or (b) the Department or Authority controlling Crown land, on which the Threatened Flora occur.

Dr Margaret Byrne
Executive Director of Biodiversity and Conservation Science
AS DELEGATE OF THE MINISTER
DATE: ...5../...11...../2019

8.3 Threatened and Priority Report Forms



Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form (6)

Version 1.3 August 2017

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

TAXON: Eremophila lactea. TPFL Pop. No: 3

OBSERVATION DATE: 11 / 09 / 2019 CONSERVATION STATUS: TF New population ☐

OBSERVER/S: Julie Waters, Kate White + Rachelle Dessaing PHONE: 9083 1518

ROLE: Environmental Officers ORGANISATION: Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~77km NW of Esperance town site. ~23 km ESE of Grass Patch townsite. Located 100m east of Williams - Grass Patch Rd, to 2.35 km east, on Grass Patch Rd. N + S of road reserve. Reserve No:

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

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

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

Lat / Northing: 3579377 Long / Easting: 322176 ZONE: 51H

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 22.78 to 24.8 Shire road reserve ☑ Other Crown reserve ☐ Specify other: ____

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

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

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

WHAT COUNTED: Plants ☐ Clumps ☐ Clonal stems ☐

TOTAL POP'N STRUCTURE:	Mature:	Juveniles:	Seedlings:	Totals:
Alive	13 - observable from road area			
Dead				

Area of pop (m²): ____ Note: Pls record count as numbers (not percentages) for database.

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

Summary Quad. Totals: Alive				

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

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

COMMENT: Old plants dying.

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 reshaping within current road footprint - possible 2 plants removed.	N	M-H	S
• Lack of disturbance - outside of Nov 2015 fire scar	M-H	M-H	S
•			

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

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

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

VEGETATION CLASSIFICATION*:
1. Semi open Eucalyptus woodland w Melaleuca
2. Shrubland.
3.
4.

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

ASSOCIATED SPECIES: Eucalyptus eremophila, Eucalyptus urna, Acacia murrayana,

Other (non-dominant) spp: Melaleuca brevifolia, Melaleuca pentacarpa,

* 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: Outside of Nov 2015 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: 2 Added marker to new plant found on northern road reserve

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

Did not collect specimen for new plant found on northern road reserve, as was not flowering.

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

SPECIMEN: Collectors No: WA Herb. ☐ Regional Herb. ☐ District Herb. ☐ Other:

ATTACHED: Map ☑ Mudmap ☐ Photo ☑ GIS data ☐ Field notes ☑ Other: Permit to take Application.

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

Submitter of Record: Kahe White Role: Environmental officer Signed: Date: 19/12/2019

Please return completed form to **Species And Communities Branch** DBCA,
Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983 **OR** email to: flora.data@dbca.wa.gov.au
RECORDS: Please forward to **Flora Administrative Officer**, Species and Communities Branch.
Record entered by: Sheet No: Record Entered in Database ☐

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

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

TAXON: Eucalyptus dolichorhyncha — TPFL Pop. No:

OBSERVATION DATE: 05/09/2019 — CONSERVATION STATUS: P4 — New population ☒

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

ROLE: Environmental Officers — ORGANISATION: Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~ 75 km NNW of Esperance townsite. 2.1 km W of Grass Patch townsite. Scattered 1.9 to 3 km E of Grass Patch - Williams Rd intersection on Grass Patch Rd on both sides of road reserve

Reserve No:

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

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

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

Lat / Northing: 6135495

Long / Easting: 632201 E

ZONE:

METHOD USED: GPS ☐ Differential GPS ☐ Map ☑

No. satellites: ___ Map used: Whatmaps

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 16.92 to 23.12 Shire road reserve ☑ Other Crown reserve ☐ Specify other:

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

EFFORT: Time spent surveying (minutes): 6hr 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	~~84~~ 60			
Dead				

Area of pop (m²): along 4 km Rd

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:

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 (5yr+)	Current Impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• Road reconstruction to double width bitumen - clearing 35 plants possible.	N	M-H	S
•			
•			

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

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

Department of Biodiversity, Conservation and Attractions

Threatened and Priority Flora Report Form

Version 1.3 August 2017

HABITAT INFORMATION:

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

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

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

1. Semi-open Eucalyptus Woodland w closed/dense
2. Melaleuca Shrubland.
3.
4.

ASSOCIATED SPECIES: (Other (non-dominant) spp)

Melaleuca cucullata, Melaleuca sapientes, Dodonaea stenozyga, Melaleuca lanceolata, Acacia crassuloides

* 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.)

Only surveyed what was observable for road footprint, likely extends further to private property / adjacent reserve.

1x sample (KW20) confirmed as Euc dolichorhyncha. ~~Revisited + resampled w budcaps~~. Confirmed w Ken Mills (EWS) + Emma Massenbauer that E. dolichorhyncha does not co-occur w Euc [illegible]

DRF PERMIT/ LICENCE No: KW019, KW020. Note if only observing plants (i.e. no specimens or plant material is taken) then no permit/licence is required. For further information on permit and licensing requirements see the Threatened Flora and Wildlife Licensing pages on DBCA's website. Any actions carried out under licence/permit should be recorded above in the OTHER COMMENTS section.

SPECIMEN: Collectors No: FT 100039 WA Herb. ☒ Regional Herb. ☐ District Herb. ☐ Other: ____________

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

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

Submitter of Record: Katie White Role: Environmental Officer Signed: [signature] Date: 16 / 12 / 2019

Department of Environment and Conservation
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Threatened and Priority Flora Report Form

Version 1.0 January 2010

Please complete as much of the form as possible, with emphasis on those sections bordered in black. previously recorded

TAXON: Goodenia laevis ssp laevis **TPFL Pop. No:** w/ TPFL ...
OBSERVATION DATE: 16/10/2020 **CONSERVATION STATUS:** P3 New population ☐
OBSERVER/S: Katie White + Julie Waters **PHONE:** 90831518
ROLE: Environmental officers **ORGANISATION:** Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~70 km N of Esperance. Located on Grass Patch Rd, ~2 km W of Bishop Rd

Reserve No:

DEC DISTRICT: South Coast **LGA:** Esperance Land manager present: ☐

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

COORDINATES: (If UTM coords provided, Zone is also required) DecDegrees ☐ DegMinSec ☐ UTMs ☑
Lat / Northing: 361328.4
Long / Easting: 6322224.5
ZONE: 51H

METHOD USED: GPS ☐ Differential GPS ☐ Map ☑
No. satellites: ____ Map used: QGIS
Boundary polygon captured: ☐ Map scale: [illegible]

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): 1 hr. 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	50 #			
Dead				

Area of pop (m²): ____
Note: Pls record count as numbers (not percentages) for database.

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

Summary Quad. Totals: Alive				

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

CONDITION OF PLANTS: Healthy ☑ Moderate ☐ Poor ☐ Senescent ☐
COMMENT:

THREATS - type, agent and supporting information: Eg clearing, too frequent fire, weed, disease. Refer to field manual for list of threats & agents. Specify agent where relevant. Rate current and potential threat impact: N=Nil, L=Low, M=Medium, H=High, E=Extreme. Estimate time to potential impact: S=Short (<12mths), M=Medium (<5yrs), L=Long (5yrs+)	Current Impact (N-E)	Potential Impact (L-E)	Potential Threat Onset (S-L)
• Road widening of Grass Patch Rd - plants counted only what will be impacted on. Did not count in surrounding road reserve.	M	M-H	S
•			
•			

Department of Environment and Conservation
Our environment, our future

Threatened and Priority Flora Report Form

Version 1.0 January 2010

HABITAT INFORMATION:

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

Specific Landform Element: (Refer to field manual for additional values) ________

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

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

1. Dense Melaleuca shrubland w closed/dense
2. Eucalyptus woodland
3.
4.

ASSOCIATED SPECIES: Other (non-dominant) spp
Eucalyptus eremophila, Melaleuca brevifolia
Melaleuca teretifolia, Acacia dermatophylla

* 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.)

Not all plants present in existing road footprint + will be impacted upon during next routine grading maintenance. All plants located in disturbed footprint.

Verified by WA Herbarium (Mike Hislop) 04/03/20. Accession # 8334. Under licence FT 61000029.

SPECIMEN: Collectors No: KWD59 WA Herb. ☑ Regional Herb. ☐ District Herb. ☐ Other: ________

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

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

Submitter of Record: Kate White. Role: Environmental Officer Signed: [signature] Date: 04/03/20

Please return completed form to DEC, Locked Bag 104, BENTLEY DELIVERY CENTRE WA 6983

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

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

8.4 Table 7. Population Summary of priority four species, *Eucalyptus dolichorhyncha*, provided by DBCA's district conservation officer (DBCA 2019c).

Pop #	LOCATION	Tenure	Last Survey /plants	Date Surveyed	Threats	TPFL entered	Notes	Markers Installed Y/N
1	Rolland Rd. 4.2km west of Swan Lagoon Rd	Shire Road Reserve	2019 = 100+	5/11/2019	Road maintenance	YES		N
2.	Grass Patch Rd. 11km west of Grass Patch	Shire Road Reserve	1983 = common	10/9/1983	Road maintenance	NO	WA Herb record	N
3.	Grass Patch Rd. 1.9-3.0km west of townsite.	Shire Road Reserve	2019 = 60	5/9/2019	Road maintenance	YES		N
4.	Grass Patch townsite. Located on Richardson St. 60m N and S of intersection with Shephard St.	Shire road reserve	2019 = 9	11/9/2019	Road maintenance	YES		N
4.	Grass Patch Rd, between Williams and Belgian Rd.	Shire Road Reserve	2007 = UNK (A. Cochrane)	7/12/2007	Road maintenance	NO	WA Herb record	N
5.	Grass Patch Rd, west of Belgian Rd (10km SSW of Roberts Swamp)	Shire Road Reserve	1983 = UNK		Road maintenance	NO	WA Herb Record	N
6.	18km west of Roberts Swamp (Rolland Rd??).	Shire Rd Reserve?	1980 = UNK			NO	WA Herb Record	N
7.	7.5km north of Rollands Rd along track which is 4km east of Fields Rd.	UCL?	1999 = occasional (M. French)	11/1999		NO	WA Herb Record	N
8.	14.7km north along Fields Rd, then east along gridline 1.9km.	UCL?	1999 = frequent (M. French)	11/1999		NO	WA Herb Record	N
9.	On edge of Lort River, 11.5km north of Rolland Rd.	UCL?	1999 – occasional 9M. French)	11/1999		NO	WA Herb Record	N
10.	Corner of Williams Rd and Bishop Rd.	Shire Rd Reserve? PP?	1981 = 21 (CJ Robinson)	22/01/1981		NO	WA Herb Record	N
11.	Bishop Rd. 1.1km south of Arnold Rd. Bishops NR29012. Long term monitoring plot 02VA	Shire Rd Reserve/NR	2005 = UNK (M. French)	04/2005		NO	WA Herb Record	N

12.	Thomas Rd. 7km south of Truslove NR.	?MRWA Shire?	1981 = UNK (CJ Robinson)	21/1/1981		NO	WA Herb Record	N
13.	35 miles (56km) south of Salmon Gums	MRWA?	1962 = UNK	5/11/1962		NO	WA Herb Record	N
14.	Esperance-Coolgardie Hwy. 5km north of Truslove Rd	MRWA?	2005 = UNK 9M. French)	10/2005		NO	WA Herb Record	N
15.	Esperance Coolgardie Hwy, 9km N of Scaddan	MRWA?	1998 = abundant (R.Cranfield)	04/1998		NO	WA Herb Record	N
16.	Esperance-Coolgardie Hwy, 7.3km south of Grass Patch, 1.3km S of Sime Rd.	MRWA	2002 = UNK (M. French)	06/2002		NO	WA Herb Record	N
17.	Esperance-Coolgardie Hwy. 30/34km? south of Salmon Gums.	MRWA	1968 = UNK	1/4/1968		NO	WA Herb Record	N
18.	Grass Patch townsite	Shire?	1957 = UNK	16/3/1957		NO	WA Herb Record	N
19.	Esperance-Coolgardie Hwy. 2 miles (3.2km) south of Red Lake.	MRWA?	1953 = UNK	18/4/1953		NO	WA Herb Record	N
20.	Main road south of Salmon Gums (Esperance-Coolgardie Hwy?)	MRWA?	1976 = UNK	18/9/1976		NO	WA Herb Record	N
21.	Salmon Gums	?	1924!	17/7/1924		NO	WA Herb Record	N
22.	14.5km NE of Scaddan (Lignite Rd?)	Shire Rd Reserve?	2008 = UNK (J. Williams)	14/8/2008		NO	WA Herb Record	N
23.	Wittenoom Hills.	?	1975 = UNK	08/1975		NO	WA Herb Record	N

8.5 Table 8. Population dynamics from WA Herbarium Database Extract of priority four species, *Eucalyptus dolichorhyncha* (DBCA 2019c).

Sheet	Plant_Desc	Site	Vegetation	Notes	Locality	Date
5253624	Shrub 3 ft.	Sandy clay loam with gravel over heavy clay.			Esperance to Ravensthorpe	1/04/1968
4340280		Clay soil.			Wittenoom Hills, 35 miles N of Esperance,	/08/1975
1364189					Scaddan	/12/1938
1161881	Tree 3 m tall.				15.2 km S of Grass Patch	30/12/1979
1364197	Mallee 5 m high with smooth grey bark.	Sandy soil.			Grass Patch - near hotel	16/03/1957
1364685	Tree. Leaves medium to dark green with a semi-gloss surface.				Main road S of Salmon Gums	18/09/1976
4393600	Erect mallee 5 m x 4 m, juvenile fruits and buds red, anthers yellow.	Slightly raised, stony white clayey sand, calcrete.	Open mallee woodland.	Abundance: abundant, railway reserves.	9 km N/NE of Scaddan	29/08/1995
1161334	Marlock, 20 ft high. Fruit large, red long operculum.		In mallee.		545 mile peg, ca 35 miles S of Salmon Gums	5/11/1962
1161342	Dense shrub. Flowers red, 2 - 3 m high, operculum long.	Sand.			Esperance - Kalgoorlie 538 mile peg. [44 km S of Salmon Gums on the Coolgardie Esperance Highway.]	13/01/1972
1161350	Mallee 3 m high. Flower yellow, calyx red. Grey flaky bark.				10 km SSW of Roberts Swamp, on Grass Patch Road	/03/1983
1161369	Mallee to 3 m. Mainly in bud.	On road verge, in sandy clay.	Mallee-woodland, E. kellessii, E. occidentalis, E. leptocalyx.	Abundance: > 100 plants.	6.7 km W along Hawkey Road from highway	14/11/1987
1161377	Fruits brown.				Near Grass Patch	31/01/1935
1161806	Mallee, frutex erectus usque 4 m altus, cortex laevis; alabastris scarletinis; filamentis sulphereis.	In argillaceis.			Prope Grass Patch (meridionalem versus) [S of Grass Patch]	10/02/1966
1161814	Upright-spreading, moderately dense tree 2.5 - 3.0 m x 2.0 - 3.0 m.	Well-drained sandy loam. Moderately exposed,	In Eucalyptus forrestiana Low Woodland B (Muir, 1977).	Abundance: common.	18 km W of Roberts Swamp, ca 50 km W of Grass Patch	14/11/1980

		almost flat plain.				
1161822	Mallee 6 - 10 ft, calyx scarlet; filaments yellow.	Grey clay.			Grass Patch	22/05/1924
1161830	Mallee, calyx scarlet; filaments yellow.	Grey clay.			Grass Patch	22/05/1924
1161849	Mallee 10 - 18 ft, calyx scarlet; filaments yellow.	Grey sandy loam or clay.			Grass Patch	22/05/1924
1161903	Mallee 5 m tall.	Flat. Grey sandy clay, very sticky when wet.	Open mallee with shrubs.	Abundance: common.	11 km W of Grass Patch	10/09/1983
1162322	Small trees 1.5 m.	White clay.		Abundance: population 23.	18 km W on Ravenswood Road, which is 14 km S of Salmon Gums on Highway	22/01/1981
1162365	Small tree 1 - 2 m.	Clay soil.		Abundance: population 18.	Thomas Road, 7 km S of Truslove Reserve	21/01/1981
1162446	Small trees 1.2 m. Intergrade.	White clay soil.		Abundance: population 21.	Williams Road, NE corner of Block No. 1837 on litho 402/80	22/01/1981
1161784	Mallee 6 - 8 ft.				2 miles S of Red Lake	18/04/1953
1161792	Mallee 8 ft tall.	Loamy sandy soil.			Gibson North, N of Esperance	11/06/1969
1161865	Tree 8 - 15 ft. flowers yellow.				Near Grass Patch	31/01/1935
1161873	Mallee 12 ft, bark smooth grey stripping to light brown.	In yellow-grey loam.		infrequent.	18.7 miles S of Salmon Gums	13/03/1967
1162314	Mallee, 1.5 m tall, grey stems.				13.7 miles S of Salmon Gums	15/02/1970
1162330	Dense shrub 3 ft.				532 mile peg on Norseman - Esperance road. [34 km S of Salmon Gums on the Coolgardie - Esperance Highway]	1/04/1968
1162349					Grass Patch, prope Esperance [near Esperance]	22/05/1924
1162373					Salmon Gums	17/07/1924
1162381	Tree 8 - 15 ft, flowers yellow, calyx scarlet.	Subsaline soil.			Near Grass Patch	31/01/1935
1162403					Grass Patch	6/08/1959
1162411	Mallee 1.5 m tall, grey stems.				13.7 miles S of Salmon Gums	15/02/1970
1162438					Salmon Gums	17/07/1924
1166166	Mallee 5 m high. Bark smooth, grey.	Sandy soil.			Grass Patch townsite,	16/03/1957

1162357	Shrub 4 - 6 ft tall, fruit bright red.			Checked in W.E. Blackall's collecting book 1070. - M.A. Lewington 24.06.2014.	Grass Patch, between Salmon Gums and Esperance	10/10/1931
6975348	Erect, perennial mallee to 4 m.	Flat plain with yellow sand.	Open mallee woodland with Melaleuca understorey; Eucalyptus forrestiana, Melaleuca pentagona, Eucalyptus eremophila.		Long term monitoring plot 02VA, 1.1 km S from NW corner of Bishops Nature Reserve (Gazetted Reserve 29012) along Bishops Road, 200 m E from road edge	4/09/2001
7020570	Mallee to 7 m, dull leaves, erect trunks with stripping bark, red fruits and hooked opercula.	Flat; clay.	Woodland.		5 km N of Truslove Road on road to Norseman	18/12/2004
5590302	Small tree 2 m high, crown 1.5 m wide; bark smooth, peeling at base, grey; foliage semi-glossy, bluish green; buds and fruit.	Very gently undulating, white sand over granite.	Assoc. vegetation: Eucalyptus eremophila and Melaleuca sp.	frequent. Average stand height: 2 m. Average stand health: good.	On grid line 1.9 km E from Fields Road, 14.7 km N of Rollands Road	11/11/1999
5762170	Small tree 7 m high x 4 m crown width. Buds, fruit. Glossy green foliage. Smooth grey bark.	Flat. White sand.	Assoc. vegn.: Melaleuca spp. and Eucalyptus uncinata.	occasional. Average stand height: 7 m. Average stand health: good.	On N-S track, 7.5 km N of Rollands Road, 5 km E of Fields Road,	15/11/1999
5762243	Small tree 2 m high x 2 m crown width. Buds, flowers, fruit. Glossy green foliage. Peeling grey bark.	Edge of drainage line. White sand.	Associated vegetation: Eucalyptus angustissima subsp. angustissima, Melaleuca sp.	occasional. Average stand height: 2 m. Average stand health: good.	On edge of Lort River, ca 11.5 km N of Rolland Road	11/11/1999
5937892	Tree to 5 m. Slender trunk and branches. Bark not persistent. Branches silvery grey. Flowers golden yellow.	White clay loam over light brown clay loam; limestone present.	With Acacia sp., Davesia sp., Melaleuca sp. and various grasses.		W side of Esperance - Coolgardie Highway, 7.3 km S of Grass Patch, 1.3 km S of Sime Road, Roe District,	17/04/2000
5766214	Tree to 5 m tall with dense canopy. Lignotuberous. Trunk usually single with bark smooth grey. Leaves narrow to	Flat. Yellow-brown clay loam.	Woodland. Associated species: Eucalyptus spp., Melaleuca sp.	100's of plants.	10.8-11 km W of Grass Patch West Road on N and S road verges, almost pure stands extend for several kms	2/03/2001

	broad lanceolate. Buds 4-sided, bright red with beaked operculum. Fruit 4-sided and pear-shaped. Seeds black.					
7905637		Sandy clay.	Mallee shrubland with Eucalyptus sp. mallee.		Grass Patch Road, between Williams and Belgian, W of Grass Patch	7/12/2007
7934254			Eucalyptus woodland.		14.5 km NE of Scaddan	14/08/2008
1161857	Single stemmed trees 3 - 4 m.	White/grey sandy clay.		Abundance: Population 18.	4.8 km N of Truslove Reserve on Esperance Highway. litho 402/80	22/01/1981