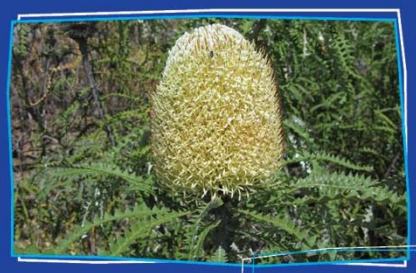
Vegetation, Flora, Fauna and Environmental Considerations Report, and Targeted Flora report

Site F - Richardson St Reconstruction, Grass Patch



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1 Executive Summary

This survey 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)'. Environmental surveys are being conducted as part of the application to the Department of Water and Environmental Regulations (DWER) to clear 0.22 ha of native vegetation within a 0.68 ha footprint, for the purpose of reconstructing Richardson St, in the Grass Patch town-site.

2 Introduction

The Esperance Shire Council approved the budget in the 2019/2020 financial year to reconstruct and seal a 290 m section of Richardson St, in the rural satellite town of Grass Patch. The total area is 0.68 ha, with proposed works involving clearing of 0.22 ha of native vegetation. Currently, Richardson St is a 7 m width road that services the small satellite township. It has been identified as needing a reseal, and thus road reconstruction, due to the large number of re-occurring pot holes.

The project was previously submitted on 16/09/2019 under CPS 7548/1, a strategic purpose permit for minor constructions impacting less than one hectare of native vegetation. However, on 23/10/2019, the Shire of Esperance received advice from Department of Water and Environmental Regulation (DWER) that "given the proposed clearing may be at variance/is at variance to two of the clearing principles, in accordance with condition 5(a)(i) of CPS 7548/1, clearing is not authorised under this Permit". The presence of priority four species, *Eucalyptus dolichorhyncha* within the project area and vegetation association 512 (Beard 1973) present being highly cleared in the local landscape were the reasons the project was not approved under CPS 7548/1. The Shire of Esperance is therefore submitting 'Richardson St Reconstruction' as Site F under the '2020 Strategic Purpose Permit'.

'Site F – Richardson St Reconstruction' is located in the Richardson St road reserve, which is managed by the Shire of Esperance. It is located within the Grass Patch town-site, between Townsend St and undeveloped road reserve of Giles St. Specifically, the road reconstruction is occurring from the intersection of Townsend St to 320 m south, at straight line kilometres (SLK) 0.37 to 0.04 (Main Roads 2020). A point within the clearing permit area is -33.228809 S, 121.714622 E (GDA 94).

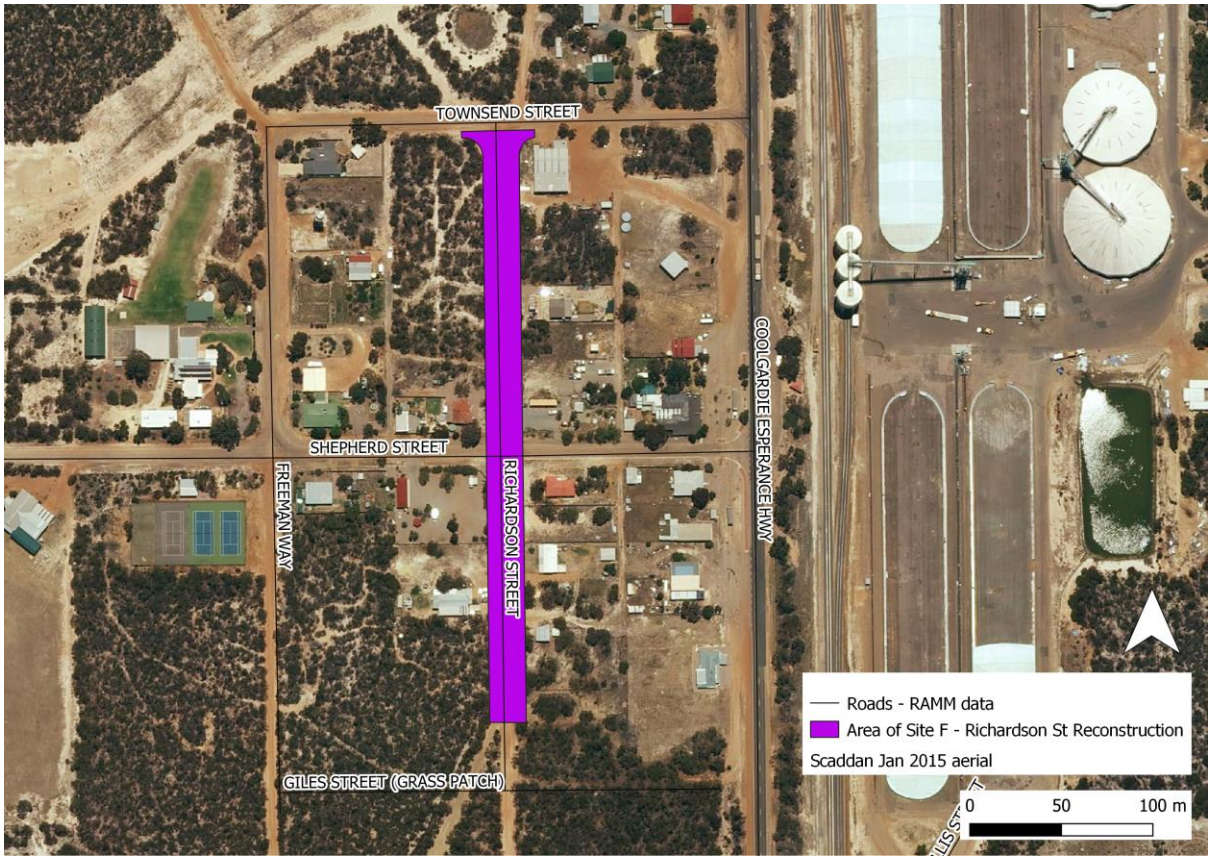

Figure 1. Location of proposed 'Site F - Richardson St Reconstruction', in the Grass Patch town-site.

3 Environmental Background

3.1 Scope

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

Possible impacts include;

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

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

3.2 Catchment

The 'Site F – Richardson St Reconstruction' is on the far northern periphery of Bandy Creek catchment.

3.3 Climate

The Esperance climate is described as Mediterranean, characterised by cool wet winters and dry warm summers (BoM 2019). The area receives an average annual rainfall of 500 mm.

3.4 Geology, Soils and Hydrological regimes

The geology of 'Site F – Richardson St Reconstruction' is mapped as various units (Schnoknecht et al. 2004). Including:

- colluvium, sheetwash, and talus;
- gravel piedmonts and aprons over and around bedrock;
- clay-silt-sand with sheet and nodular kankar;
- alluvial and aeolian sand-silt-gravel in depressions and broad valleys in Canning Basin;
- local calcrete, with reworked laterite.

Soil types of 'Site F – Richardson St Reconstruction' are mapped as Scaddan 1 Subsystem (246Sc_1; Schnoknecht et al. 2004), described as Alkaline solonetzic duplex soils. There are a number of internally drained salt lakes within the broad area, but none of these lakes are close to the clearing area. The closest lake is 2.2 km away.

3.5 Vegetation

The site is located within the Interim Biogeographic Regionalisation for Australia (IBRA; Thackway & Cresswell 1995) Mallee (MAL01) bioregion and Eastern Mallee sub-region. The MAL01 is described as "the south-eastern part of Yilgarn Craton is gently undulating, with partially occluded drainage. Mainly Mallee over Myrtaceous-Proteaceous heaths on duplex (sand over clay) soils. Melaleuca shrublands characterise alluvia, and Halosarcia low shrublands occur on saline alluvium. A mosaic of mixed Eucalypt Woodlands and Mallee occur on calcareous earth plains and sandplains overlying Eocene limestone strata in the east. Semi-arid (Dry) Warm Mediterranean."

The vegetation of 'Site F – Richardson St Reconstruction' is mapped by Beard (1973) as vegetation association (VA) 512, described as 'Shrublands; mallee scrub, *Eucalyptus eremophila* & Forrest's marlock (*E. forrestianna*)'. 26.41% of VA 512 of the pre-European extant remains within MAL01 IBRA bioregion and 20.14% within the Shire of Esperance area (DPaW 2017). 9% of pre-European distribution is formally conserved within the International Union for Conservation of Nature (IUCN) reserve system across Western Australia.

3.6 3.4 Land Use

'Site F – Richardson St Reconstruction' is directly located within Richardson St road reserve, which is managed by the Shire of Esperance. The area directly surrounding the site is a gazetted town-site and an existing residential street. Grass Patch is a small satellite town-site. Houses and undeveloped residential lots surround the area.

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).
- 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 within 20 km radius of the site. Specifically, spatial data included;
    - WAHerb extract (DBCA 2019h).
    - Threatened and Priority Reporting (TPFL; DBCA 2019f).
    - Esperance District Threatened Flora (DBCA 2019b).
    - TEC and PEC 'Likely to Occur' buffer and boundary areas (DBCA 2019g).
- NatureMap was used to assess fauna records within a 20km buffer from the centre of the site (121 ° 42'53'' E, 33 ° 13' 43''S; DBCA & WAM 2020).

4.2 Field investigation: Ecological Impacts

A field survey was conducted by Julie Waters, Shire of Esperance's Environmental Officer, on 02/09/2019. The entire area was traversed by foot, completing 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.

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.

4.3 Field Investigation: Targeted Flora Survey

The targeted flora survey was also conducted on 02/09/2019 by Julie Waters. Due to the high diversity and complexity of the flora in the Esperance region, all species were recorded to compile an incidental species list (Appendix 8.1, Table 3). Species not identifiable in the field were collected under Julie Water's Regulation 61 Flora Taking Licence FB62000139, and identified existu, using local botanical knowledge, DBCA's Esperance District Herbarium, Florabase (DBCA 2019d) and other guides. Any species that were unable to be identified were submitted to the WA Herbarium for identification. This ensured no PF or TF were overlooked during the targeted flora survey.

Over the course of the 2019 wildflower season, surveyors re-familiarised themselves with key taxonomic indicators and associated habitat by visiting verified known populations *Daviesia pauciflora* (P3), *Darwinia polycephala* (P4), *Eremophila lactea* (TF) and *Eucalyptus merrickiae* (TF), as PF or TF species identified in the desktop survey as present within a 20 km radius. For other TF and PF identified in the desktop survey as possible to occur, scans of pressed specimens from the local Esperance District Herbarium were scanned and taken into the field. Any flora thought to be TF or PF was formally collected, counted and mapped using a Panasonic FS-G1 Toughpad with the program ROAM or a GPS Garmin GPS64. Specimens were then lodged with the WA Herbarium for formal verification. When PF were confirmed, TPFL forms were completed and submitted to DBCA's district Conservation Officer, and Species and Communities Branch.

A follow up targeted flora survey was conducted on 15/01/20 by Julie Waters, specifically for counting, mapping and confirmation of identification of priority four species, *Eucalyptus dolichorhyncha* within the footprint area.

4.4 Field Investigation: assessing Threatened and Priority Ecological Communities

The vegetation community of 'Site F – Richardson St Reconstruction' was assessed for the presence a TEC or PEC, specifically the Environmental Protection and Biodiversity Conservation Act 1999 listed 'Proteaceae Dominated Kwongkan Shrublands of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' TEC. The presence 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 28 (DBCA 2019e)' definitions.

5 Results

5.1 Ecological Impact

Vegetation structure and composition was identified as a single continuous unit, described as dominated by *Eucalyptus eremophila,* over Melaleuca shrubland (Figure 2). The under-story consists of chenopod shrubland and weeds. The observed vegetation during the field survey is a suitable match for the Beard (1973) vegetation mapping of vegetation association (VA) 512. This vegetation unit has been highly cleared in within a 10 km radius of the site, but less so over the Shire of Esperance and IBRA subregion as a whole (Section 3.5). However, this VA is poorly protected within the formal conservation reserve system, with less than 10% of the pre-European extent in International Union for Conservation of Nature (IUCN) reserves (DPaW, 2017). Overall, biodiversity was low at the site, typical of Mallee woodland area, with only 21 species identified (Table 3, Appendix 8.1).

Since the Scaddan 2015 bushfire event, significant unauthorized clearing of VA 512 has occurred by private landowners in the Grass Patch-Scaddan area, further reducing the extent of this vegetation association. Recently, Reserve 26912 'Roberts Swamp', which contains a large area of VA 512, has been offered as a conservation offset to DBCA, which will increase the area of VA 512 within the IUCN conservation estate.

Figure 2. Vegetation community, described as *Eucalyptus eremophila* woodland, with Melaleuca and Chenopod shrubland, within the proposed 'Site F -, Richardson St Reconstruction,' Grass Patch town-site. Photo taken at 33 13'41.5" S 121 42' 52.368" E (GDA94), by Julie Waters facing in a northerly direction.

Vegetation condition is mostly in poor to degraded condition, consisting of 0.17 ha (77 %) native vegetation within a 0.55 ha footprint (Figure 3). Degradation of vegetation is due to the high number of weeds in the area, mostly due to Treasure flower (*Gazania linearis)*. A small area in the southern portion of the road reconstruction is in good condition, consisting of 0.05 ha (23%) native vegetation within a 0.11 ha footprint. The disturbed nature of the roadside vegetation is likely due to being present within a town-site. One of the weeds, African Boxthorn (*Lycium ferocissimum*) is a weed of national significance and the Shire of Esperance will undertake control of this species prior to works commencing.

Vegetation is mostly not susceptible to *Phytophthorra cinnamomi* Dieback. There were no field observations of plants under stress from plant pathogens. No formal testing has been conducted for *P. cinnamomi* Dieback within the Grass Patch town-site, and it is thus unknown if infected (DIDMS, GAIA Resources, State NRM & SCNRM 2020). No other environmental concerns were identified in the field survey – erosion will be limited due to the seal bitumen end use, unlikely to develop acid sulfate soils in such a dry climate, no environmentally sensitive areas were present and the natural hydrological regime is unlikely to be affected by proposed works.

Figure 3. Vegetation condition within the 'Site F - Richardson St Reconstruction' area.

5.2 Threatened Ecological Communities

The desktop survey identified two threatened (TEC) and priority (PEC) ecological communities present within a 20 km radius of the permit area (DBCA 2019g). The area itself was not mapped as 'likely to or known occurrence' or a PEC or TEC.

The 'Proteaceae Dominated Kwongkan Shrubland of the Southeast Coastal Floristic Province of Western Australia (Kwongkan)' is listed as endangered under the federal Environmental Protection and Biodiversity Conservation (EPBC) Act 1999 and priority three under the Biodiversity Conservation (BC) Act 2016. As minimal dominant or diversity of Proteaceae species were identified within the field survey, this site does not meet Kwongkan requirements (Commonwealth of Australia 2014).

The priority three community, 'Granite outcrop pools with endemic aquatic fauna' listed under the BC Act 2016, was also identified within the 20 km radius survey. However, no granite was present within 'Site F – Richardson St Reconstruction' area, and thus does not meet criteria for this PEC (DBCA 2019e).

5.3 Threatened Flora

No direct records of threatened (TF) or priority (PF) flora have been previously recorded within proposed 'Site F – Richardson St Reconstruction' site. 36 PF and two TF species were identified within 20 km of the proposed clearing permit area (Table 1; DBCA 2019b, DBCA 2019f, DBCA 2019h). Of these, 15 species habitat requirements correspond with 'Site F - Richardson Street Reconstruction' vegetation community.

The targeted flora survey identified a total of 21 species from the site, indicating low diversity. 5 species of weeds were also identified. One species of conservation significance was present, priority four *Eucalyptus dolichorhyincha*.

Table 1. Desktop study identifiying threatened or priority flora recorded to be present within a 20 km radius of 'Site F - Richardson Street Reconstruction', Grass Patch area, using Threatened and Priority Flora Reporting (TPFL; DBCA 2019f), WA Herbarium (DBCA 2019h) and local Esperance District Threatened Flora (DBCA 2019b).
Nt. Acronyms used in Table 1 include priority flora (P), threatened flora (TF), Biodiversity Conservation (BC) Act 2016, Environmental Protection and Biodiversity Conservation (EPBC) Act 1999, vulnerable (VU), endangered (EN), and critically endangered (CR).

Species	Conservation Status	Flowering period	Possible to occur at site	Comment
Acacia bartlei	P3	June - Oct	Unlikely	Yate swamps.
Acacia glaucissima	P3	Aug - Sept	Possible	Described as dense, bushy shrub, that grows to 0.3 - 1.5 m high. Yellow flowers. Recorded to grow in sand or clay, on flats, and low-lying areas.
Acacia improcera	P3	Aug	Possible	Described as spreading, spiny shrub, that grows to 0.15 - 0.4 m high. Yellow flowers. Associated with sand, loamy clay, and clay, on undulating plains, and flats.
Adenanthos ileticos	P4	Random Flowering times	Possible	Has distinctive shaped hairy leaves. Grows on sandy soil with open woodlands.

Astroloma sp. Grass Patch	P2	June - Aug	Unlikely	Associated with fine white sand margins of salt lakes.
Aotus sp. Dundas	P2	Spring	Possible	Recorded across a variety of habitats, including open Mallee woodlands, clay, loam, limestone and on the periphery of salt lakes.
Caladenia voigtii	P4	Aug - Oct	Possible	Wide variety of habitats, from granite, salt lakes and shrubland.
Conostephium marchantiorum	P3	Mar, July, Nov	Unlikely	Associated with *Banksia media* sandplain shrublands.
Conostephium uncinatum	P2		Unlikely	Grows on deep sandy soils, edges of salt lakes, undulating plains, and clay pans.
Cyathostemon sp. Esperance	P1	October	Unlikely	Only one record from 1967. Recorded on sandy gravel.
Darwinia polycephala	P4	Mar - Sept	Unlikely	Associated with salt lakes. Distinguishable by small, grey foliage.
Daviesia pauciflora	P3	Oct - Jan	Unlikely	Associated with Kwongkan sand plain vegetation communities.
Eremophila chamaephila	P3	Nov - Dec	Possible	Grows in Eucalypt or Mallee woodland.
Eremophila compressa	P3	Oct - Mar	Possible	Grows on flat sand and woodlands. Recorded in the area.
Eremophila lactea	TF - CR under EPBC Act 1999 and EN under BC Act 2016.	Sept - Nov	Possible	Well surveyed, and only recorded occurs west of site.
Eucalyptus dolichorhyncha	P4	Jan - May	Possible	Looks similar to *Eucalyptus forrestiana*, distinguished by four winged buds, beaked operculum and square cross section. Grows in association with Eucalyptus Mallee.
Eucalyptus merrickiae	TF - VU under EPBC Act 1999 and BC Act 2016.	Aug - Dec	Unlikely	Salt lake margins.
Goodenia laevis subsp. *laevis*	P3	Aug- Dec	Possible	Wide distribution, associated habitat and soil types.
Grevillea aneura	P4	Winter to late spring	Unlikely	Grows on Mallee scrub, on yellow sand or laterite. Toothbrush grevillea flower structure.
Grevillea baxteri	P4	May - Dec, Feb	Unlikely	Toothbrush banksia, that grows on sandplain. Mostly recorded to the east of Esperance and the site.
Haegiela tatei	P2	Aug - Nov	Unlikely	Ascending to erect annual herb that grows to 0.02 - 0.08 m high. Recorded on clay, sandy loam, gypsum. Saline habitats.
Hydrocotyle sp. Truslove	P1	Oct	Unlikely	Inconspicuous herb, that grows to less than 5 cm tall. Associated with salt lakes.

Isopogon alcicornis	P3	Oct - Feb	Possible	Mallee shrubland.
Kunzea salina	P3	Dec – Feb	Unlikely	Salt lakes.
Melaleuca fissurata	P4	Jul - Aug	Possible	Shrub Mallee or woodland.
Persoonia cymbifolia	P3	Dec - Jan	Possible	Wide distribution, across the Mallee woodland area.
Pityrodia chrysocalyx	P3	Aug to Oct	Possible	North, Salmon Gums area. Along firebreaks/road reserve. Down hooked leaves
Trachymene anisocarpa var. *trichocarpa*	P3	Oct to Nov	Possible	Upright, spreading annual herb, grows to 0.3 - 1.5 m high, with peduncles up to 140 mm long. distinguished by hair-like bristles on the fruits.

5.3.1 *Eucalyptus dolichorhyncha,* Priority four

The proposed clearing activities at 'Site F – Richardson St Reconstruction' will impact on three plants of priority four species *Eucalyptus dolichorhyncha.* There were at least an additional six plants observable in the immediate vicinity that will not be impacted upon. The nearest known record is ~650 m south-east of site, in the road reserve of Coolgardie-Esperance Hwy. It is likely scattered plants are present from the record to 'Site F – Richardson St Reconstruction' to the previously known population location, and plants found are an extension of a known population (DBCA 2019c). A specimen was collected for verification by the WA Herbarium (KW019; Accession Number 8178 with specimen not retained). Correspondence from taxonomist Michael Hislop indicated the specimen was unidentifiable from non-threatened species *Eucalyptus forrestiana* without operculum (DBCA 2019a). A subsequent collection conducted on 15/1/2020 of bud caps found directly below *E. dolichorhyncha* plants confirmed identification, with further communication with via e mail Micheal Hislop confirming (Figure 5; DBCA 2019a). A Threatened and Priority Report Form (TPFL) was sent to the Department of Biodiversity, Conservation and Attractions (DBCA) district Flora Conservation officer, Emma Massenbauer, on 16/12/2019 (Appendix 8.2). It is believed proposed works at 'Site F – Richardson St Reconstruction' involving the removal of three plants of *E. dolichorhyncha* is unlikely to have a significant impact on the conservation of this species.

Figure 4. Scanned image of priority four species, *Eucalyptus dolichorhyncha,* bud caps to distinguish from the non-threatened *Eucalyptus forrestiana*, within the 'Site F – Richardson St Reconstruction'.

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. Being a low priority species, data is therefore limited on *E. dolichorhyncha* and no data is present on the TPFL database (DBCA 2019f). According to available databases, there are 42 records of *E. dolichorhyncha* within Western Australia, with 20 of these occurring within a 10 km radius of the proposed clearing area (DBCA 2019c; Figure 5; Appendix 8.3, Table 4). However, many of these records are not recent, with eight records from the 1920s and 1930s, and all data collected prior to 2008. Only two records are described as being within secure tenure. Other records in the local area appear to be in paddocks or within other road reserves, and so it cannot be assumed that populations still exist.

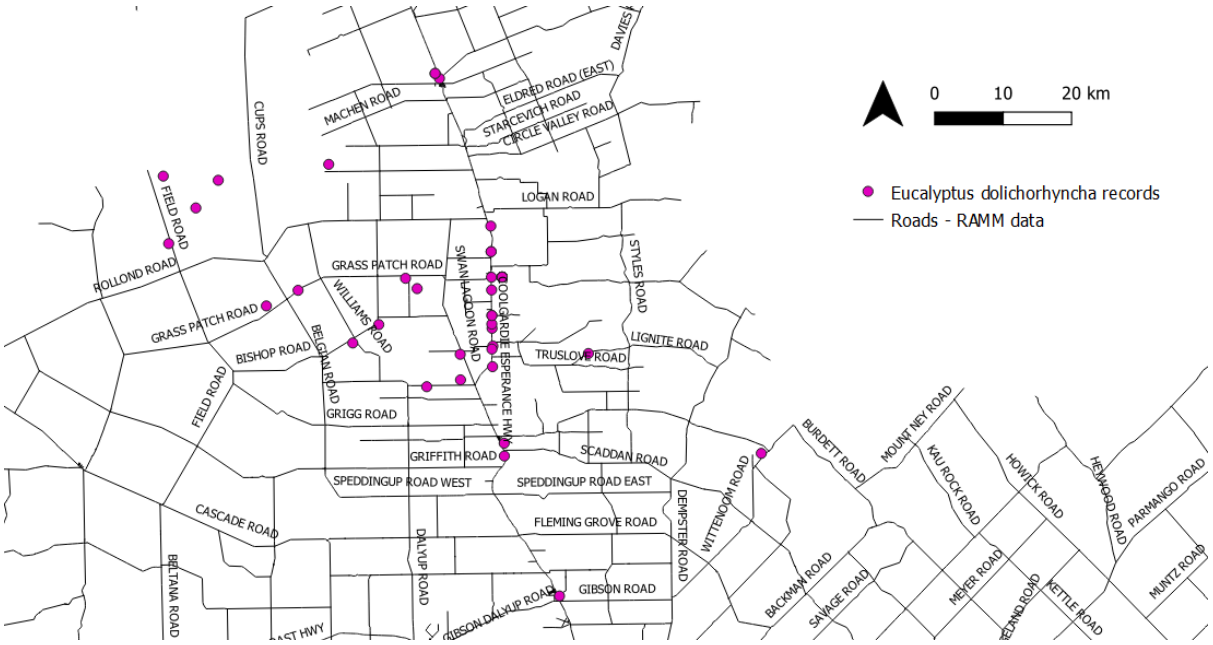

Figure 5. Known distribution of priority four species, *Eucalyptus dolichorhyncha*, using district threatened flora data and WA Herbarium records (DBCA 2019c).

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.

5.4 Fauna

Within a 20km radius of the site, 207 species have been recorded (DBCA & WAM 2020). Of these, six species of threatened fauna were identified as potentially occurring. Of these, the Peregrine Falcon is likely to be found in this habitat. Due to the large home range of these birds and the small area of impact, there is unlikely to be any significant impact.

Additionally, it's possible that the Inland Western Rosella frequents the surrounding area of 'Site C – Richardson St 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 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 if Inland Western Rosella's do frequent the site, due to the surrounding disturbing nature of the town-site and opportunistic fruit orchards in private gardens.

Table 2. Threatened, priority and specially protected fauna identified to be present within a 20 km radius of 'Site F – Richardson St 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
Calyptohynchus latirostris	T	Carnaby's 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.	Unlikely; no Proteaceae species or trees with large enough hollows for nesting.
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.	Unlikely; vegetation is not dense enough to support a population and
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.	Unlikely; not suitable substrate and disturbance of adjacent town-site will deter animals.
Platycercus icterotis	P4	Inland Western	Associated with open	Possible;

subsp. *xanthogenys*		Rosella	Eucalypt forest and timbered areas, including cultivated land and orchards. Recorded in drier woodland, with a heath under-story.	suitable habitat.
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.

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

The 'Site F – Richardson St 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). Overall, the site has minimal environmental issues that are at variance to clearing principles, with no threatened or priority ecological communities, environmentally sensitive areas, low biodiversity, unlikely to be significant habitat for threatened fauna, and minimal risk of degradation through *Phytophthorra cinnamomi* Dieback, and altering natural hydrological regimes. The vegetation is described as Vegetation Association 512 (Beard 1973), which is highly cleared in the landscape and poorly protected within the conservation estate. However, the majority of vegetation within 'Site F – Richardson St Reconstruction' is in poor and degraded quality. Lastly, three plants from an observed population of nine of priority four species, *Eucalyptus dolichorhyncha*, are proposed to be impacted. Due to being understudied, similarity to non-threatened species *Eucalyptus forrestiana,* and broad distribution, it is believed proposed works are not a threat to the sustainability of the species.

7 References

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8 Appendix

8.1 Table 3. Incidental species list of species present within the proposed clearing permit area 'Site F - Richardson St Reconstruction', Grass Patch

Family	Species	Common Name	Invasive	Conservation Status
Asteraceae	*Gazania linearis*	Treasure Flower	X	
Asteraceae	*Olearia muelleri*	Goldfields Daisy		
Brassicaceae	*Rapistrum rugosum*	Turnip Weed	X	
Chenopodiaceae	*Atriplex codonocarpa*	Old Man's Salt Bush		
Chenopodiaceae	*Echylaena tomentosa*	Barrier Salt Bush		
Chenopodiaceae	*Rhagodia crassifolia*	Berry Salt Bush		
Ericaceae	*Lissanthe rubicunda*			
Fabaceae	*Acacia crassuloides*			
Myrtaceae	*Cyathostemon ambiguus*			
Myrtaceae	*Eucalyptus eremophila*	Tall Sand Mallet		
Myrtaceae	*Eucalyptus dolychorincha*	Fushia Gum		P3
Myrtaceae	*Melaleuca bromelioides*			
Myrtaceae	*Melaleuca cucullata*			
Myrtaceae	*Melaleuca podiocarpa*			
Myrtaceae	*Melaleuca sapientes*	Silver Melaleuca		
Myrtaceae	*Melaleuca uncinata*	Broom Bush		
Oxalidaceae	*Oxalis pes-caprae*	Sour Sob	X	
Poaceae	*Neurachne alopecuroidea*	Foxtail Mulga Grass		
Poaceae	*Avena fatua*	Wild Oat	X	
Rutaceae	*Boronia baeckeacea* subsp. *baeckeacea*			
Solanaceae	*Lycium ferocissimum*	African Boxthorn	X	

8.2 Threatened and Priority Flora Report Forms

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 (TPFRF) manual on the DBCA website at http://dpaw.wa.gov.au/ under *Standard Report Forms*

TAXON: Eucalyptus dolichorhyncha **TPFL Pop. No:**

OBSERVATION DATE: 11 / 09 / 2019 **CONSERVATION STATUS:** P4 New population ☐ Pop 66 within 500m

OBSERVER/S: Julie Waters **PHONE:** 9083 1518

ROLE: Environmental Officer **ORGANISATION:** Shire of Esperance

DESCRIPTION OF LOCATION (Provide at least nearest town/named locality, and the distance and direction to that place): ~73 km N of Esperance townsite, within satellite town of Grass Patch. Located on Richardson St, ~60m N to S of intersection on Shepherd St.

Reserve No:

DBCA DISTRICT: Esperance - 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: 380229

Long / Easting: 6322699.

ZONE:

METHOD USED: GPS ☐ Differential GPS ☐ Map ☑

No. satellites: ____ Map used: Intramaps

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 0.07 to 0.36 Specify other: ____

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

EFFORT: Time spent surveying (minutes): 20min 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	9			
Dead				

Area of pop (m²): Surveyed 200m length mapped reserve

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: 0 %

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 reconstruction along Richardson St. Likely to take 3 plants	M	M	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: Crest ☐ Hill ☐ Ridge ☐ Outcrop ☐ Slope ☐ Flat ☑ Open depression ☐ Drainage line ☐ Closed depression ☐ Wetland ☐

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

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

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

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

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

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

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

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

1. Semi-open Eucalyptus eremophila woodland,
2. Over Melaleuca Shrubland.
3.
4.

ASSOCIATED SPECIES: Other (non-dominant) spp
Melaleuca brevifolia?, Eucalyptus eremophila, Melaleuca cucullata, Melaleuca podiocarpa, Melaleuca Sapientes

* 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 from road edge - highly likely surrounding population present in road reserve, private properties & reserve. KW019 not sufficient material (no budcaps) to distinguish from E.w. [illegible]. Resurveyed 02/12. Confirmed long budcaps present + was E.w. dolichorhyncha.

DRF PERMIT/ LICENCE No: KW019 ← 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: [illegible] 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: 12/08/19

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 ☐

8.3 Table 4. 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