Technical Memorandum

To:	Annie Delandro	**From:**	Simon Colwill
Company:	Kimberly Ports Authority	**SLR Consulting Australia**	
		Date:	5 November 2024
		Project No.	675.072463.00001

RE: **Kimberley Ports Authority Murakami Rd Targeted Flora and Vegetation Survey**

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) was commissioned by the Kimberly Ports Authority (KPA) to undertake a targeted survey of Murakami Road in Broome, targeting significant flora and Threatened and Priority Ecological Communities (TECs and PECs). The Survey consists of two parallel sections ~360m in length parallel to Murakami road. The first (Roadside) is roughly 6m wide, and the second (BTAP Immediate) is a further ~12m wide (Figure 1), collectively referred to as the Survey Area. The Survey Area is located in the port district of Broome in the Dampierland bioregion of Western Australia.

2.0 Scope of Work

The specific objectives of the assessment were to:

- Conduct a targeted flora survey for significant flora.
- Undertake an assessment of the vegetation in the lot, to determine if it aligns with known existing significant communities.
- Provide a technical memorandum of the results and assessment of the communities.

3.0 Methods

3.1 Field Survey

A targeted survey was undertaken by Principal Botanist Simon Colwill (Flora Licence: FB62000037-2) on 17 October 2024. Simon has 14+ years experience conducting flora surveys across the state. A handheld Fulcrum mobile data collection device was used to record data, and mapping notes, opportunistic flora collections and photographs were also taken where required.

Dominant species were recorded in the area, and the locations of any significant flora were recorded.

3.1.1 Opportunistic Flora

Any flora taxa observed opportunistically around the flora sites or while traversing on foot within the Survey Area were also recorded. Where populations of significant flora taxa, Declared Pests (DPs) or Weeds of National Significance (WoNS) were encountered, a GPS location and a count of the individuals present was recorded.

3.2 Taxonomy and Nomenclature

Where field identification of plant taxa was not possible, specimens were collected for identification using resources of the Western Australian Herbarium (WAH). Identification of flora collections were completed at the WAH by Simon Colwill.

The finalised species list was checked against FloraBase (WAH, 2024) to determine the conservation status and known distribution of each taxon. Introduced species were compared against the current Biosecurity and Agriculture Management (BAM) Act 2007 Declared Plants list the WoNS list to determine their control status (DPIRD, 2024).

4.0 Results

4.1 Limitations

Limitations and constraints of the vegetation survey are detailed below in Table 1.

Table 1: Limitations and Constraints Associated with the Survey

Variable	Degree of Limitation	Potential Constraints on Survey Outcomes
Survey Scope	No	The scope of the survey was to target significant flora, and assess if the Survey Area constituted either of the significant communities of the Area.
Availability of Data	No	All data required to complete the scope of works including regional and local contextual information was available.
Site Access	No	The entirety of the Survey Area was able to be accessed on foot.
Survey Intensity and Resources	No	Sufficient time was allocated to the vegetation survey, given the size and complexity of the Survey Area.
Experience	No	The flora and vegetation survey and identification of flora collections was undertaken by Principal Botanist Simon Colwill, Simon has over 14 years of experience conducting surveys of similar scope across Western Australia.
Timing, weather, season	Partial	The survey was conducted out of season for the region, which would impact presence of annual and cryptic flora species. However, this was not a limitation on assessment of communities.
Life Forms Sampled	No	The Survey Area was traversed on foot. All dominant life forms within the Survey Area were sampled.
Mapping Reliability	No	The Survey Area was mapped using high resolution aerial imagery and all of the area was accessible to confirm on ground.
Disturbances (fire, flood etc.)	No	No disturbances occurred during any of the surveys.
Completeness	No	The survey was considered complete for a targeted survey.

4.2 Vegetation of the Survey Area

Only a single vegetation type was considered to be present in the Survey Area, occurring on pindan plains typical of the region (Plate 1, Plate 2). The vegetation was diverse, with the

following species noted in each stratum (Table 2). Almost all native vegetation appeared to occur within the BTAP Immediate Survey Area, as the Roadside Survey Area was recently cleared prior to the survey.

Table 2: Vegetation strata of the Survey Area

Upper Storey
Mixed open woodland of *Terminalia petiolaris, Lysiphyllum cunninghamii, Gyrocarpus americanus* subsp*. pachyphyllus, Corymbia opaca, C. paractia* (P2)*, C. zygophylla, Erythrophleum arenarium*
Tall Shrubs
Tall shrubland of *Acacia colei* var*. colei, A. tumida* var*. kulparn, A. eriopoda, A. monticola, Ficus aculeata* var. *indecora, Gardenia pyriformis* subsp*. keartlandii, Persoonia falcata, Hakea macrocarpa, Ehretia saligna,* and *Sersalisia sericea*
Low Shrubs
Low shrubland of *Trichodesma zeylanicum* var. *zeylanicum*, *Sida* sp. Pindan (B.G. Thomson 3398), *Waltheria indica*, *Grewia breviflora*, **Mesosphaerum suaveolens, Goodenia panduriformis*
Grasses
Low hummock/tussock grassland of *Triodia ?pungens, Triodia ?schinzii, *Cenchrus ciliaris, *Cenchrus setiger, Aristida holathera,* and *Aristida latifolia*
Vines
Tinospora smilacina, and *Cassytha filiformis*

Plate 1 Native Vegetation

Plate 2 Native Vegetation

Vegetation within existing industrial infrastructure (parking lots) appeared planted, and consistent with native species of the greater Dampierland region (ie; *Terminalia* spp. *Melaleuca* spp. *Allocasuarina* spp., and assorted ornamental shrubs). No *C. paractia* (P2) were recorded within existing developed lots. Although outside the Survey Area, trees on the eastern side of Murakami Road were surveyed and no further *C. paractia* was present. A small section of remnant degraded vegetation was present in the southern extent of the BTAP Immediate Survey Area, which was not considered to represent the PEC.

4.3 Vegetation Condition

Vegetation condition within the Survey Area was considered 'Good', due to adjacent clearing, rubbish, and minor incursion of weed species (**Cenchrus* spp., and **Mesosphaerum suaveolens*).

A strip of approximately 5 m of vegetation adjacent to Murakami road was recently cleared prior to the survey, as inferred by freshly disturbed soil, and dead vegetation still retaining dried leaves. Some larger shrubs directly adjacent to the curb (*Erythrophleum arenarium*) were avoided in this clearing. This strip appears to align directly with the Roadside Survey Area, so this area is considered to be cleared of native vegetation already. No recent aerial imagery is available to illustrate this in Figure 1.

Plate 3 Damaged vegetation next to Murakami rd

Plate 4 Cleared strip and remnant tall shrubs next to Murakami rd

4.4 Vegetation of Significance

Three significant communities were considered to potentially occur in the Survey Area:

- **Monsoon vine thickets on the coastal sand dunes of Dampier peninsula (Threatened – Endangered)**
    - This vegetation is described as: Semi-deciduous vine thicket communities on leeward slopes of coastal sand dunes on Dampier Peninsula. Occur as discontinuous but discrete pockets of dense vegetation, ranging from a few trees to around 60 ha in size. Patches tend to be larger with increasing dune system size and are generally better developed in structure and higher in species diversity at the northern end of the peninsula. The principal upper-storey tree species include: *Elaeodendron melanocarpum*, *Celtis strychnoides*, *Diospyros humilis*, *Ficus virens*, *Melaleuca cajuputi*, *M. dealbata*, *M. viridiflora*, *Mimusops elengi*, ***Sersalisia sericea***, and ***Terminalia petiolaris***. The understorey comprises shrub species such as: *Croton tomentellus*, *Dodonaea platyptera, Exocarpos latifolius; Pandanus spiralis*, *Plumbago zeylanica, Santalum lanceolatum*, and *Flueggea virosa* subsp. *melanthesoides*. Vine species include: *Abrus precatorius*, *Adenia heterophylla*, *Caesalpinia major*, *Gymnanthera nitida*, *Jacquemontia paniculata*, *Marsdenia cinerascens*, *Passiflora foetida* and ***Tinospora smilacina***. Soils are deep dune sands, white except for a superficial dark grey organic layer, and covered by leaf litter up to 6 cm in depth. - **Species in bold were recorded within the Survey Area.**
    - The Survey Area does not occur on the correct landform, nor is it dominated by any of the key species, and therefore does **not** constitute this TEC.

- ***Corymbia paractia* dominated community on dunes (P1)**
    - *Corymbia paractia* behind dunes, Broome township area. Dampier Peninsula. Transition zone where coastal dunes (with vine thickets) merge with Pindan (desert) vegetation.
    - The vegetation of the Survey Area occurs ~100m inland of the coastal dune (with vine thickets) occurs, and has isolated pockets of *C. paractia* (P2) throughout the remnant pindan vegetation. **The vegetation is considered to be analogous to this community, covering 0.16 ha of the area.**
- **Dwarf Pindan heath community of Broome coast (P1)**
    - Recorded on pindan with thin sand overlay with no dunal protection from winds, dominated by ***Acacia tumida* var. *kulparn*** and *Grevillea pyramidalis* with scattered ***Corymbia paractia*** and ***Gyrostemon tepperi*****,** *Dodonaea hispidula, Solanum cunninghamii,* ***Persoonia falcata****, Dolichandrone heterophylla*, ***Gardenia pyriformis*** and *Terminalia ferdinandiana* over ***Triodia schinzii*** with other species such as ***T. pungens****, Eragrostis eriopoda* and *Eriachne* sp. Occurs between the racecourse and Gantheame Point lighthouse. Insufficient survey outside of Broome townsite area to determine full extent. **Species in bold were recorded within the Survey Area**
    - Although many species in this PEC were recorded within the Survey Area, the vegetation of the Survey Area is not representative of a dwarf heath, and has protection from the western dune landform, therefore does not constitute this PEC.

The patch of remnant native vegetation covering 0.16 ha of the BTAP Immediate Survey Area is considered analogous to the “Corymbia paractia dominated community on dunes (P1)” PEC. Historic survey across the greater Broome area (Reynolds, et al, 2018) estimate over 419 ha of *C. paractia* habitat, occurring predominantly behind the coastal dunes, where the Survey Area is situated.

4.5 Flora Composition

The survey recorded a total of 37 taxa from 30 genera across 18 families (Table 2).

Table 3: Vascular Flora Taxa Recorded within the Survey Area

Family	Taxon	Status
Boraginaceae	*Ehretia saligna* var. *saligna*	
Convolvulaceae	*Distimake aegyptius*	
Euphorbiaceae	*Microstachys chamaelea*	
Fabaceae	*Acacia eriopoda*	
	Acacia monticola	
	Crotalaria medicaginea var. *neglecta*	
	Erythrophleum chlorostachys	
	Lysiphyllum cunninghamii	
	Stylosanthes hamata	
Goodeniaceae	*Goodenia panduriformis*	
Gyrostemonaceae	*Codonocarpus cotinifolius*	
	Gyrostemon tepperi	
Hernandiaceae	*Gyrocarpus americanus* subsp. *pachyphyllus*	

Family	Taxon	Status
Lamiaceae	*Mesosphaerum suaveolens*	Introduced (weed)
Lauraceae	*Cassytha filiformis*	
Malvaceae	*Adansonia gregorii*	
	Corchorus sp.	
	Sida sp. Pindan (B.G. Thomson 3398)	
	Waltheria indica	
Menispermaceae	*Tinospora smilacina*	
Moraceae	*Ficus aculeata* var. *aculeata*	
	Ficus aculeata var. *indecora*	
Myrtaceae	*Corymbia opaca*	
	Corymbia paractia	Priority 2
	Corymbia zygophylla	
	Melaleuca sp.	
Passifloraceae	*Passiflora foetida* var. *hispida*	Introduced (weed)
Poaceae	*Aristida holathera* var. *holathera*	
	Aristida latifolia	
	Cenchrus ciliaris	Introduced (weed)
	Cenchrus setiger	Introduced (weed)
	Triodia ?epactia	
	Triodia ?schinzii	
Proteaceae	*Hakea macrocarpa*	
	Persoonia falcata	
Rubiaceae	*Gardenia pyriformis* subsp. *keartlandii*	
Sapotaceae	*Sersalisia sericea*	

4.6 Flora of Conservation Significance

No Threatened flora taxa pursuant to the *Environment Protection and Biodiversity Conservation* (EPBC) *Act 1999* and/or gazetted as Threatened pursuant to the *Biodiversity Conservation* (BC) *Act 2016* were recorded during the survey.

One DBCA listed priority species was recorded during the survey: *Corymbia paractia* (P2).

A total of one individual of *C. paractia* (P2) was recorded within the BTAP Immediate Survey Area. A further nine individuals were recorded adjacent to the Survey Area, and numerous additional individuals were noted to occur further to the west closer to the coast within the continuous vegetation (Figure 1). No individuals occurred within the Roadside Survey Area.

Corymbia paractia (P2) is a ghost gum tree growing to 8 m tall. It is distinguished by the combination of low-growing habit, narrow green glabrous adult leaves, moderately to strongly pedicellate buds and fruit, and its precise habitat (Plate 5, Plate 6).

Plate 5

Plate 6

Although it cannot be confirmed whether any individuals of *C. paractia* (P2) occurred in the strip of recently cleared vegetation (~5 m) directly abutting the road (Roadside Survey Area), larger shrubs of *Erythrophleum arenarium were* retained, and *C. paractia* (P2) is unlikely to have occurred in this strip given the surrounding vegetation.

Historically *Seringia exastia* has been recorded nearby the Survey Area and was considered to be Threatened (Critically Endangered) under the EPBC Act (1999). However, this species was found to be analogous the much more common *S. elliptica* due to genetic review, and the two species were merged, retaining the name and status of the species described first (*S. exastia*). *Seringia exastia* still retains its Threatened status under the EPBC Act. However, has been removed from listing under the BC Act (2016), is not considered Threatened by the DBCA (WAH, 2024), and will be removed from federal listing in due course. It is not considered significant for the purpose of this survey.

5.0 Conclusions and Recommendations

The following key outcomes from the flora and vegetation survey can be concluded:

- No Threatened flora taxa pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the BC Act, were recorded during the survey.
- One DBCA listed Priority 2 species (*Corymbia paractia*) was recorded during the survey, with one individual recorded from the southern corner of the Survey Area.
- Further individuals were noted outside of the Survey Area, both immediately adjacent to it, and further west in the contiguous vegetation as the landform transitions to coastal dune.
- The vegetation present was considered analogous to the "Corymbia paractia dominated community on dunes (P1)" PEC due to occurring in close proximity to the coastal dune, in a transition zone to more stabilised pindan plains, with isolated dominant *Corymbia paractia*.
- Vegetation condition in the BTAP Immediate Survey Area was considered to be Good, with degradation due to weeds, adjacent road infrastructure, and recent clearing.
- Existing clearing of the roadside has been recently undertaken (~5 m). It is not expected that any individuals of *C. paractia* (P2) would have occurred in this strip.
- The Roadside Survey Area is predominantly cleared of native vegetation and it is expected no further clearing would be required for any ground works.
- The BTAP Immediate Survey Area includes a patch of the "*Corymbia paractia* dominated community on dunes (P1)" PEC covering 0.16 ha and a single individual of *C. paractia*.

We trust this meets your requirements. Should you have any questions or require further action please do not hesitate to contact the undersigned on (08) 9422 5900.

Regards,

SLR Consulting Australia

Simon Colwill
Principal Botanist – Ecology and Biodiversity

Attachments Figure 1: Survey Area and Results

6.0 References

DPIRD. (2024). *Declared plants*. https://www.agric.wa.gov.au/

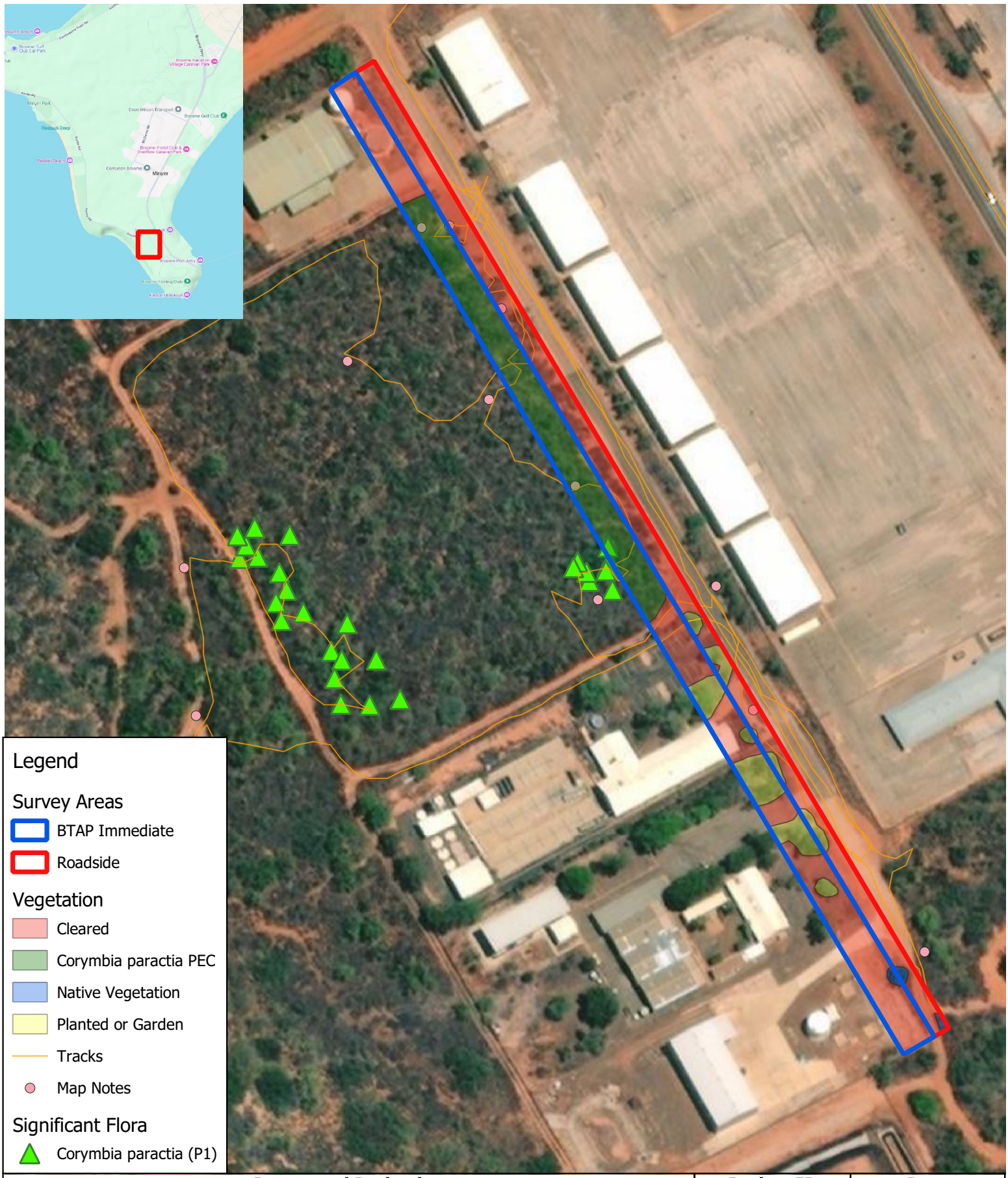
EPA. (2016). *Technical Guidance - Flora and vegetation surveys for environmental impact assessment*. https://www.epa.wa.gov.au/

Keighery, B., Keighery, G., Longman, V. M., & Clarke, K. A. (2012). *Weed and native flora quadrat data compiled between 1990 - 1996 for the Southern Swan Coastal Plain*. https://library.dbca.wa.gov.au

Reynolds, S. Beames, L. Willing, T. Parker, C. (2018). *Distribution, ecology and cultural importance of Gunurru or Cable Beach Ghost Gum Corymbia paractia in the Broome area, Western Australia*

Threatened Species Scientific Committee. (2016). *Approved Conservation Advice (incorporating listing advice) for the Banksia Woodlands of the Swan Coastal Plain ecological community*. http://www.environment.gov.au/biodiversity/threatened/communities/pubs/131-conservation-advice.pdf

WAH. (2024). *Florabase - the Western Australian Flora*. https://florabase.dbca.wa.gov.au/



Datum and Projection	Project ID	Date
GDA94 MGA Zone 50	675.072463	01/11/2024

Client	Author
Annie Delandro Kimberley Ports Authority	S. Colwill SLR Consulting Australia

A: Level 1/500 Hay St, Subiaco WA 6008
B: +61 9422 5900
C: www.slrconsulting.com

Scale: 1:1,300

0 20 40 60 80 100 m

Kimberley Ports Authority

Murakami Road Survey

Figure 1