Technical Memorandum

To:	Annie Delandro	**From:**	Simon Colwill
Company:	Kimberly Ports Authority	**SLR Consulting Australia**	
		Date:	5 November 2024
		Project No.	675.072463.00002

RE: **Kimberley Ports Authority Lot 619**
Targeted Flora and Vegetation Survey

1.0 Introduction

SLR Consulting Australia Pty Ltd (SLR) was commissioned by Kimberley Ports Authority (KPA) to undertake a targeted flora and vegetation survey of Lot 619, Broome Hwy. The Survey Area is a roughly 10m strip of remnant vegetation bordering the existing cleared lot (Figure 1). 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:

- Undertake a targeted flora and vegetation survey of the Survey Area.
- Determine if native vegetation represents any threatened or priority ecological communities (TECs or PECs).
- 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 assess if the Survey Area constituted either of the significant communities of the Area, this was able to be achieved without limitation.
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	No	The timing of the survey was not a limitation for the vegetation survey as assessment of the communities does not rely on rainfall or season. Some annual species may not be present due to the season, however this does not impact the survey results.
Life Forms Sampled	No	The Survey Area was traversed on foot and representative sites of the vegetation was sampled. 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 flora and vegetation survey.

4.2 Vegetation of the Survey Area

Only a single vegetation type was considered to be present in the Survey Area, which occurred on the slope and swale of the large foredune (Plate 1, Plate 2). The vegetation was dense, with the following species noted in each stratum:

Upper Storey:

Terminalia petiolaris, Gyrocarpus americanus subsp*. americanus, Corymbia opaca*

Tall Shrubs:

Ficus aculeata subspp*., Flueggea virosa* subsp*. melanthesoides, Sersalisia sericea, Santalum lanceolatum, and Atalaya hemiglauca*

Grasses:

*Triodia spp., *Cenchrus ciliaris, *Cenchrus setiger*

Vines:

Jacquemontia paniculata, Tinospora smilacina, Passiflora foetida var*. hispida, Cassytha filiformis, Abrus precatorius*

Plate 1 Vine Thicket Vegetation

Plate 2 Vine Thicket Vegetation

4.3 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, *Vincetoxicum 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 (Beard & Kenneally K.F., 1993). **Species in bold were recorded within the Survey Area.**

  - The vegetation of the Survey area is considered analogous to this TEC, and assessed further below.

- ***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 does **not** constitute this PEC.
- **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.
  - The vegetation of the Survey Area does **not** constitute this PEC.

The vegetation of the Survey Area was assessed against the conservation advice for the Dampier Monsoon Vine Thickets TEC (DSEWPC, 2013) (Table 2)

Table 2 Assessment Against the Key Diagnostic Characteristics of the TEC

Key Diagnostic	Assessment
Distribution occurs within the Dampierland Bioregion – mostly on the Pindanland subregion DL2	Yes
The ecological community is mainly restricted to the deep white or grey calcareous sands of the coastal Holocene dunes of the Dampier Peninsula.	Sand in Survey Area is not white or grey, however is still deep calcareous sand on a coastal Holocene dune.
The ecological community mainly occurs within the swales and on the leeward side of the coastal dunes and occasionally on the crests of these dunes and other coastal landforms such as: beach fronts, sand-spit headlands and storm ridges with intertidal flats	Yes, occurs on leeward side of large coastal dune.
The overstorey typically ranges from three to nine metres tall and may consist of trees, tall shrubs and/or climbers/vines.	Yes

Key Diagnostic	Assessment
The tree canopy composition is variable but the most common species are typically one or more of the taxa ***Lysiphyllum cunninghammi***[1] (jigal, joomoo), *Celtis philippensis* (goolnji), *Diospyros humilis* (ebony wood), *Exocarpos latifolius* (jarnba, mistletoe tree), ***Grewia breviflora*** (goolmi, currant/coffee fruit), *Mallotus nesophilus* (yellow ball flower), *Mimusops elengi* (joongoon, mamajen), ***Sersalisia sericea*** (mangarr), *Terminalia ferdinandiana* (gabiny, gubinge, kabiny) and ***Terminalia petiolaris*** (blackberry tree, marool, narwulu).	Yes, bolded species recorded in the Survey Area
The understorey shows the following features: Shrub and small tree species when present include: *Breynia cernua*, *Bridelia tomentosa*, *Caesalpinia majo*r (goolyi), *Croton habrophyllus* (ankoolmarr), *Dodonaea platyptera*, snowball bush and ***Santalum lanceolatum*.**	Yes, bolded species recorded in the Survey Area
The ground layer is generally sparse to absent but may contain a variety of herbaceous species depending on seasonal conditions, site characteristics and canopy density.	Not defined, poor season with little to no ground cover
Native grass species are uncommon but may occur on the edges of vine thicket patches or in open groves. When present they typically include annual species (Appendix B, Table B1) such as *Perotis rara* (comet grass) and *Setaria apiculata* (pigeon grass).	Not limiting, Weed grasses dominant
Vines and creepers are often, but not always, present in the overstorey and/or understorey and when present include the following: crab's eye bean, *Adenia heterophylla* subsp. *australis*, ***Capparis lasiantha*** (ngoorla, bush caper), ***Jacquemontia paniculata***, ***Jasminum didymum***, ***Tinospora smilacina*** (oondal, snake vine) and ***Vincetoxicum cinerascens*** (oystercatcher bill).	Yes, bolded species recorded in the Survey Area
The following genera/species often present in other rainforest/vine thicket types in northern Australia, are typically absent or uncommon in the ecological community: *Albizia lebbeck*, *Bombax ceiba, Cryptocarya cunninghamii*, *Elaeodendron melanocarpum*, *Ganophyllum falcatum*, *Vitex acuminata* and *Ziziphus quadrilocularis*. The understorey of other northern vine thicket patches also contain shrub species that are absent from the ecological community, such as those from the genera *Alectryon*, *Denhamia*, *Micromelum*, *Murraya*, *Strychnos*, *Trema* and *Wrightia*.	All species absent

Due to the above assessment, the vegetation is considered to be analogous to the Dampier Monsoon Vine Thickets TEC.

4.4 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 **Passiflora foetida*). A small part of the Survey Area has been historically cleared (existing industrial lot). No native vegetation was present on this cleared area and the vegetation boundary is a clear and distinct line (Plate 3, Plate 4). Vegetation condition is not considered to be a limiting factor in defining the Dampier Monsoon Vine Thickets TEC.

[1] Taxonomic names updated to be current.

Plate 3 Vegetation Boundary and existing clearing

Plate 4 Vegetation Boundary

4.5 Flora Composition

The survey recorded a total of 25 taxa from 22 genera across 18 families (Table 2).

Table 3: Vascular Flora taxa recorded within the Survey Area

Family	Taxon	Status
Apocynaceae	*Carissa lanceolata*	
	Vincetoxicum ?cinerascens	
Capparaceae	*Capparis ?lasiantha*	
Combretaceae	*Terminalia petiolaris*	
Convolvulaceae	*Jacquemontia paniculata*	
Fabaceae	*Abrus precatorius*	
	Crotalaria cunninghamii subsp. *sturtii*	
	Lysiphyllum cunninghamii	
Hernandiaceae	*Gyrocarpus americanus* subsp. *pachyphyllus*	
Lauraceae	*Cassytha filiformis*	
Malvaceae	*Grewia breviflora*	
	Waltheria indica	
Menispermaceae	*Tinospora smilacina*	
Moraceae	*Ficus aculeata* var. *aculeata*	
	Ficus aculeata var. *indecora*	
Myrtaceae	*Corymbia opaca*	
	Corymbia sp. indet	
Oleaceae	*Jasminum didymium* subsp. *?lineare*	
Passifloraceae	*Passiflora foetida* var. *hispida*	Introduced (weed)
Phyllanthaceae	*Flueggea virosa* subsp. *melanthesoides*	
Poaceae	*Cenchrus ciliaris*	Introduced (weed)

Family	Taxon	Status
	Cenchrus setiger	Introduced (weed)
Santalaceae	*Santalum lanceolatum*	
Sapindaceae	*Atalaya hemiglauca*	
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. No DBCA listed Priority flora taxa were recorded during the survey.

5.0 Conclusions and Recommendations

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

- No Threatened or Priority flora species pursuant to the EPBC Act and/or gazetted as Threatened pursuant to the BC Act, or DBCA listed, were recorded during the survey.
- The native vegetation present was considered analogous to the Monsoon vine thickets TEC. All native vegetation present in the Survey Area was considered to be a part of this community, which extends both north and south of the surveyed area.
- An existing defined line between native vegetation and historical clearing is present, with no native vegetation present in the cleared area.
- Any works in this cleared area are not expected to impact the adjacent native vegetation any further. This area is already utilised with infrastructure (sheds and transportable offices), and vehicle movement.

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 location and Results

6.0 References

Beard, J. S., & Kenneally K.F. (1993). Dry coastal ecosystems of Northern Australia. In *Ecosystems of the World 2B. Dry Coastal Ecosystems: Africa, America, Asia and Oceania* (pp. 239–258). Elsevier, Netherlands.

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

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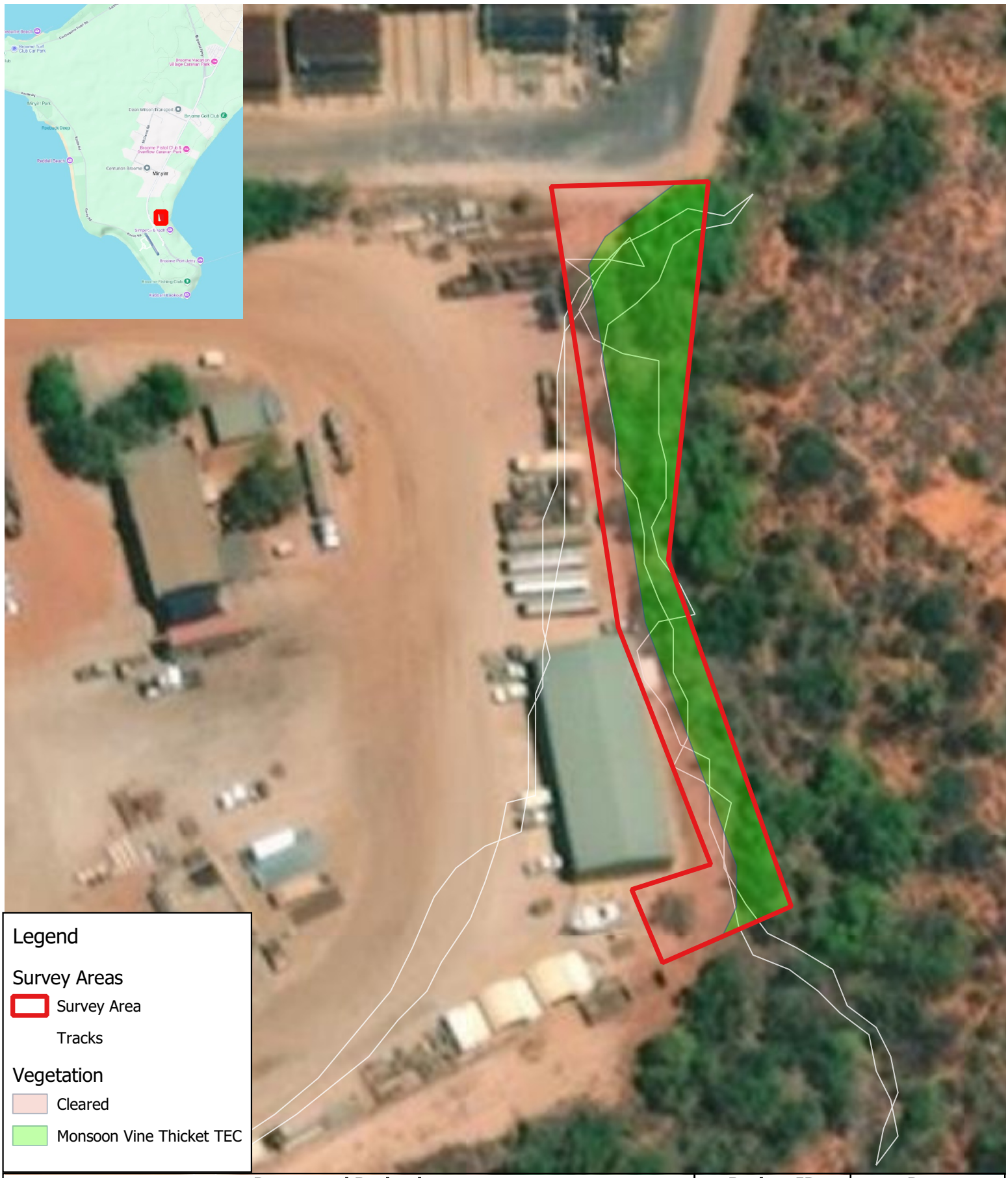
DSEWPC. (2013) *Approved conservation Advice for the Monsoon vine thickets on the coastal sand dunes of Dampier Peninsula. http://www.environment.gov.au/biodiversity/threatened/communities/pubs/105-conservation-advice.pdf*



Datum and Projection	Project ID	Date
GDA94 MGA Zone 50	675.072463	5/11/2024

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Scale: 1:600

0 10 20 30 40 50 m

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Lot 619 Targeted Flora and Vegetation Survey

Figure 1