



**Western
Botanical**

Flora of Ethno-Botanical Significance:
Winu Copper – Gold Project,
September 2023 V2

Prepared for: Rio Tinto Winu Pty Limited

Report Ref: WB1016



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5 Robinson Rd Mahogany Creek WA 6072
PO Box 294 Mundaring WA 6073
T: 0407 193 637 E: info@westernbotanical.com.au

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Client Name: Rio Tinto Pty Limited

Client Address: 152-158 St Georges Terrace, Perth WA 6000

Version	Prepared By	Approved for Issue	Issue Date
1	B. Jeanes	J. Paterson	1 st September 2023
2	J. Paterson	G. Cockerton	19 th September 2023

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1. Introduction

1.1. Project Background

Rio Tinto Winu Pty Limited plan to develop the Winu Copper – Gold Project which is located within the Nyangumarta Warrarn Indigenous Protected Area (IPA). The Nyangumarta Warrarn IPA is approximately 28,420 km² in size and encompasses over 100 km of Eighty Mile Beach, extending 310 km inland into the southern portion of the Great Sandy Desert (Nyangumarta Warrarn Aboriginal Corporation and Yamatji Marlpa Aboriginal Corporation, 2016).

Nyangumarta are the Traditional Owners and Native Title Holders of the land and waters within and surrounding the Nyangumarta Warrarn IPA (Nyangumarta Warrarn Aboriginal Corporation and Yamatji Marlpa Aboriginal Corporation, 2022). The biodiversity and cultural resources of the many habitats within the IPA are managed by the Nyangumarta Rangers. In order to record the Elders' traditional knowledge of the use of plants for medicine, food, ceremony, artefact and other purposes within the IPA, the Yamatji Marlpa Aboriginal Corporation organised two ethno-botanical field surveys involving both the Elders and Rangers along the Nyangumarta Highway (Kidson Track) and within Walyarta (Mandora Marsh) and along the coast line. Conducted by Vicki Long and Associates in 2014 and 2015 respectively, the results of these surveys were discussed with Elders (regarding agreed traditional name and use) before being summarised in an ethno-botanical booklet (Nyangumarta Warrarn Aboriginal Corporation and Yamatji Marlpa Aboriginal Corporation, 2016). In total, 69 flora and two fungi specimens were included (only two specimens were unable to be identified beyond genus level).

Between June 2022 and June 2023, Western Botanical was commissioned by Rio Tinto Winu to complete a number of botanical surveys of the Winu Copper – Gold Project area (hereafter referred to as the Project Area) with the objective of completing vegetation mapping and identifying any flora or ecological communities of Conservation significance. Western Botanical was commissioned by Rio Tinto Winu to undertake analysis of the floristic data collected during these as well as previous surveys with the objective of identifying the occurrence and distribution (within the Project Area) of culturally significant flora (i.e., those flora taxa presented in the ethno-botanical booklet).

1.2. How to use this Report

In total, 41 flora taxa identified within the ethno-botanical booklet were encountered within the Project Area – 36 of which were recorded within quadrat sampling sites (Western Botanical, 2023). A summary of each taxon is presented regarding its traditional Nyangumarta name and common name (locally common, if applicable), as sourced from Nyangumarta Warrarn Aboriginal Corporation and Yamatji Marlpa Aboriginal Corporation (2016). A floristic description provided by the Western Australian Herbarium (WAH) online database (FloraBase) is presented alongside distribution maps at both state and national scale (as sourced from Florabase and the Australasian

Virtual Herbarium (AVH) respectively), as well as individual maps depicting each taxon's approximate distribution across the Winu Project.

A list of the vegetation associations each taxon was recorded in within the Winu Project Area Flora Survey spatial extent is provided in addition to the area (hectares) covered by these associations within the current Winu Development Envelope (DE), as well as the total area (including areas mapped outside the DE). A map delineating the distribution of Vegetation Associations across the Project Area is presented in Figure 1.

To facilitate comparison of data between this report and the ethno-botanical booklet, the 41 taxa are grouped according to the same growth forms (e.g. tree, shrub) utilised in the booklet.

1.3. Summary of Results

All flora taxa of ethno-botanical significance recorded within the Project Area are considered to be both common and widespread. Distribution maps sourced from FloraBase and AVH similarly illustrate numerous records for each taxon recorded across the Great Sandy Desert bioregion and beyond, with many extending into surrounding bioregions and some further still, into central and eastern Australia.

Following analysis of floristic data, majority of the flora taxa of ethno-botanical significance encountered across Project Area were also considered common and widespread at the local scale. Approximately 65% (26) were recorded in five or more quadrat sites – with *Triodia schinzii* appearing to be the most prevalent, occurring in 89 of the 95 quadrat sampling sites.

A strong-positive correlation ($R^2 = 0.8874$) was found to exist between the number of quadrat sites and the number of Vegetation Associations flora taxa occur in across the Project Area. The greater the number of quadrat sites flora taxa occur in relates to a greater number of Vegetation Associations, and therefore, a greater extent across the Project Area. Increased total abundance is also inferred – however, has not been quantified.

Fifteen of the flora taxa occurred in none or very few quadrat sites. These taxa included *Corymbia opaca* (4 sites), *Ficus brachypoda* (1 site), *Acacia colei* (2 sites), *Grevillea pyramidalis* (0 sites), *Grevillea refracta* subsp. *refracta* (0 sites), *Melaleuca lasiandra* (1 site), *Acacia drepanocarpa* subsp. *drepanocarpa* (1 site), *Acacia melleodora* (1 site), *Carissa lanceolata* (0 sites), *Crotalaria cunninghamii* (0 sites), *Cullen martinii* (0 sites), *Santalum lanceolatum* (1 site), *Euphorbia australis* var. *subtomentosa* (0 sites), *Streptoglossa macrocephala* (1 site), *Chrysopogon fallax* (1 site). Each of these taxa have been recorded opportunistically across the Winu Project by either Western Botanical or previous consultants. These are discussed in detail in subsequent sections.

A summary of all results is presented in Table 1.

Table 1. Summary of Results

Growth Form	Species	Area (ha) Inside DE	Total Mapped Area (ha)	n Veg Associations	n Quadrat Sites	Vegetation Associations Taxon Recorded In
Tree Species	<i>Corymbia opaca</i>	394.1	394.1	3	4	P16, P17, P18
	<i>Corymbia zygophylla</i>	4,301.1	13,294.2	5	10	D3, P10, P11, P2, P8
	<i>Erythrophleum chlorostachys</i>	16,228.5	32,024.6	16	50	D1, D2, D3, P1, P2, P3, P4, P5, P6, P8, P9, P10, P11, P13, P14, P18
	<i>Ficus brachypoda</i>	0.2	0.2	1	1	R4
	<i>Gardenia pyriformis</i> subsp. <i>keartlandii</i>	6,328.2	14,958.8	9	14	D3, P3, P8, P9, P10, P11, P12, P13, R3
	<i>Owenia reticulata</i>	6,328.2	14,958.8	10	20	D1, D2, D3, P1, P2, P3, P4, P8, P13, P14
Low Shrub or Tree Species	<i>Acacia colei</i>	6,061.0	8,498.6	2	2	P1, R2
	<i>Codonocarpus cotinifolius</i>	13,461.8	24,308.5	10	17	D2, P1, P2, P3, P4, P9, P11, P18, R2, R3
	<i>Grevillea pyramidalis</i>	N/A	N/A	0	0	N/A
	<i>Grevillea refracta</i> subsp. <i>refracta</i>	N/A	N/A	0	0	N/A
	<i>Grevillea wickhamii</i>	8,486.2	18,036.8	11	17	D1, D3, P2, P3, P4, P7, P10, P11, P14, R3, R4
	<i>Hakea lorea</i> subsp. <i>lorea</i>	3,694.7	11,724.5	6	8	P2, P3, P8, P15, P16, P17
	<i>Hakea macrocarpa</i>	11,340.2	19,890.7	10	22	D1, P1, P2, P3, P4, P5, P6, P14, P15, P18
Shrub Species	<i>Melaleuca lasiandra</i>	N/A	N/A	1	1	P19
	<i>Acacia anaticeps</i>	4,545.9	7,446.6	5	16	D1, D2, D3, P10, P13
	<i>Acacia drepanocarpa</i> subsp. <i>drepanocarpa</i>	916.3	1,943.0	1	1	P11
	<i>Acacia drepanocarpa</i> subsp. <i>latifolia</i>	13,780.8	24,314.5	16	31	D2, P1, P2, P3, P4, P5, P6, P10, P14, P15, P16, P17, P18, P19, R2, R3
	<i>Acacia hilliana</i>	3,778.3	6,285.5	6	18	P5, P11, P12, R2, R3, R4
	<i>Acacia melleodora</i>	914.5	5,004.1	1	1	P8
	<i>Acacia monticola</i>	15,032.0	30,182.5	19	38	P1, P2, P3, P4, P5, P7, P8, P9, P10, P11, P12, P14, P15, P18, P19, R2, R3, R4, R6
	<i>Acacia orthocarpa</i>	6,031.6	12,451.3	13	22	P2, P3, P4, P5, P7, P11, P14, P15, P18, R1, R2, R5, R6
	<i>Acacia stellaticeps</i>	10,298.6	20,131.1	8	14	D3, P1, P3, P8, P10, P13, P16, R3
	<i>Carissa lanceolata</i>	N/A	N/A	0	0	N/A
	<i>Crotalaria cunninghamii</i>	N/A	N/A	0	0	N/A
	<i>Cullen martinii</i>	1,707.0	3,329.6	2	3	D3, R3
	<i>Grevillea stenobotrya</i>	3,993.2	6,820.2	4	15	D1, D2, D3, P3

	<i>Gyrostemon tepperi</i>	16,512.5	28,603.3	17	46	D1, D2, D3, P1, P2, P3, P4, P5, P9, P10, P13, P14, P16, P18, P19, R2, R3
	<i>Jacksonia aculeata</i>	3,694.7	11,724.5	19	53	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P10, P13, P14, P15, P16, R2, R3, R6
	<i>Santalum lanceolatum</i>	914.5	5,004.1	1	1	P8
	<i>Senna notabilis</i>	6,134.9	14,701.6	11	19	P4, P6, P7, P8, P9, P10, P11, P16, R1, R2, R3
Perennial Herb Species	<i>Cyanostegia cyanocalyx</i>	10,071.1	15,395.8	6	20	D1, D2, D3, P1, P10, P13
	<i>Euphorbia australis</i> var. <i>subtomentosa</i>	N/A	N/A	0	0	N/A
	<i>Solanum dioicum</i>	2,541.8	5,019.7	3	5	P11, R3, R4
	<i>Solanum diversiflorum</i>	5,677.6	12,130.5	9	10	P2, P3, P6, P7, P9, P10, P15, P16, R3
	<i>Streptoglossa macrocephala</i>	2,878.9	5,614.3	4	4	P7, P11, R1, R3
Vines and Creeper Species	<i>Cassytha capillaris</i>	18,244.1	34,800.6	20	68	D1, D2, D3, P1, P2, P3, P5, P7, P8, P9, P10, P11, P12, P13, P14, P16, P18, R2, R3, R6
	<i>Tinospora smilacina</i>	4,050.6	11,034.8	6	8	D3, P3, P8, P10, P11, P13
Grass Species	<i>Chrysopogon fallax</i>	5,525.3	7,949.2	1	1	P1
	<i>Eragrostis eriopoda</i>	19,225.4	36,743.7	25	75	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P13, P14, P15, P16, P18, P19, R1, R2, R3, R5, R6
	<i>Triodia epactia</i>	10,251.6	23,037.5	21	54	P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P14, P15, P17, P18, R1, R2, R3, R4, R5, R6
	<i>Triodia schinzii</i>	18,836.7	36,355.0	23	89	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P13, P14, P15, P16, P18, P19, R1, R2, R3

1.4. Limitations

It should be noted that no distinction is made as to the frequency or dominance of the 41 taxa within the individual Vegetation Associations as the original survey work was not designed or implemented to meet the later objective of this report. The information is based only on species presence/absence data within the surveyed quadrats.

A number of Vegetation Associations only contain one or two quadrat sites, whilst the overall extent of the Vegetation Associations they occur in have significantly larger extents across the Study Area. While there is some chance this could result in false positives - i.e., flora taxa of ethno-botanical significance being designated to particular Vegetation Associations they shouldn't be; the opposite is probably more likely – where due to the negligible size of the quadrat (50m x 50m) relative to the extent of the Vegetation Association, some species may not be getting designated to units they actually occur in. This is more likely the case for recent study areas, as adequate replication of sites within some units has not yet been achieved (see WB1010, Western Botanical 2023).

Considering the known occurrences of all of such taxa across the Great Sandy Desert bioregion and beyond (FloraBase 2023; AVH 2023), as well as across the Winu Project (based on field observations), this approach is deemed sufficient in providing reasonable information on the extent of culturally significant flora across the Project Area.

Figure 1. Consolidated Vegetation Mapping of the Winu Project, Including Quadrat Site Locations and Tracklogs.

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	AREH Quadrat (Biota)	Vegetation Mapping	P8	P11	Other	
Survey Track Log	WRAC Quadrat (WB)	Inter-dunal Sand Plains	P9	P12		Disturbed
WRAC Quadrat (Biota)		P2	P10	Stony Rises / Gentle Outcrop		
		P3		R3		

0 1 2km

Scale: 1:100,000
MGA94 (Zone 51)

Ref: a2923_WB1010_13

Date: Aug 2023 Rev: A A3

Western Botanical

Author: J. Paterson WB Ref: WB1010

Drawn: CAD Resources ~ www.cadresources.com.au

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Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023

Vegetation Mapping - Sheet 1 of 7

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	AREH Quadrat (Biota)	Vegetation Mapping	P11
Survey Track Log	Wallal Quadrat	Inter-dunal Sand Plains	P12
Helicopter Survey Track		P8	Stony Rises / Gentle Outcrop
		P9	R3

0 1 2km

Scale: 1:100,000
MGA94 (Zone 51)

Ref: a2923_WB1010_13

Date: Aug 2023 Rev: A A3

Author: J. Paterson WB Ref: WB1010

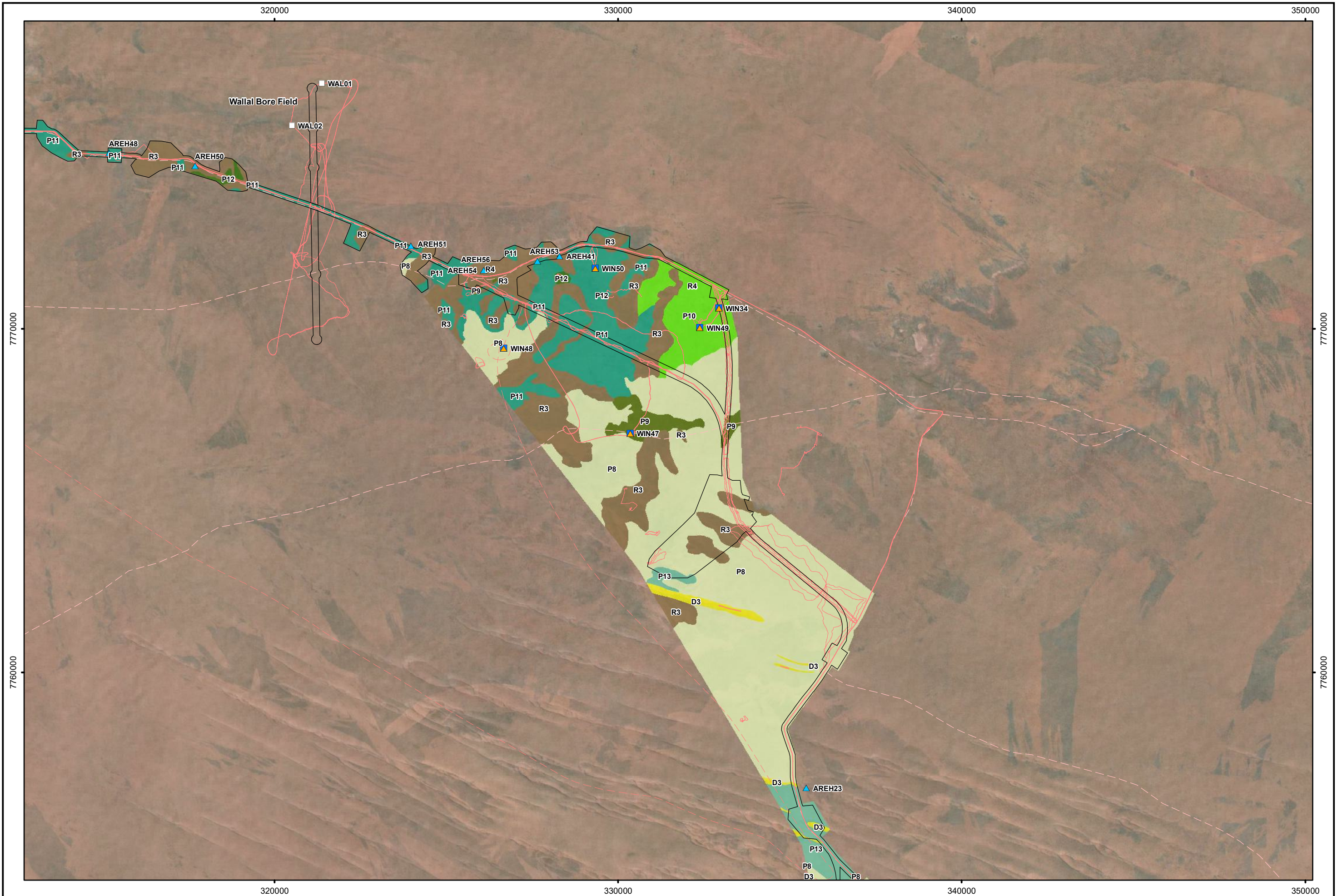
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Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023

Vegetation Mapping - Sheet 2 of 7

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	▲ WRAC Quadrat (Biota)	□ Wallal Quadrat	Inter-dunal Sand Plains	P11 Stony Rises / Gentle Outcrop
Survey Track Log	▲ AREH Quadrat (Biota)	Vegetation Mapping	P8	P12
Helicopter Survey Track	■ WRAC Quadrat (WB)	Sand Dunes / Associated Swales	P9	P13
		D3	P10	R3
				R4

0 1 2km

Scale: 1:100,000
MGA94 (Zone 51)

Ref: a2923_WB1010_13

Date: Aug 2023 Rev: A A3

Western Botanical

Author: J. Paterson WB Ref: WB1010

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Vegetation Mapping - Sheet 3 of 7

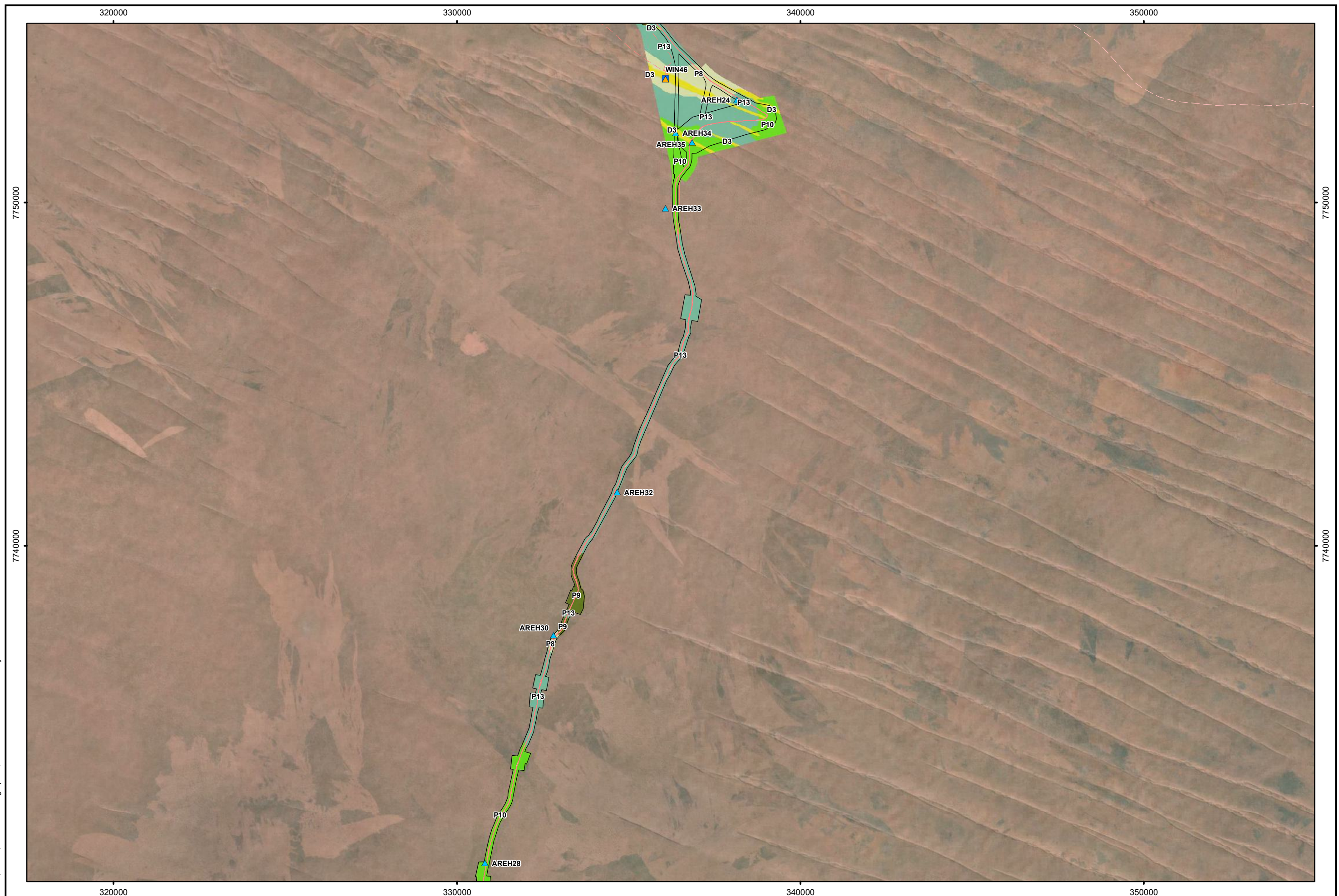
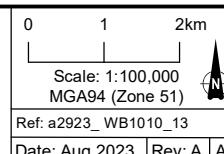


Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

Legend

- Legend:

 - Winu Development Envelope
 - Survey Track Log
 - Helicopter Survey Track
 - WRAC Quadrat (Biota)
 - AREH Quadrat (Biota)
 - WRAC Quadrat (WB)
 - Vegetation Mapping
 - Sand Dunes / Associated Swales
 - D3
 - Inter-dunal Sand Plains
 - P8
 - P9
 - P10
 - P13



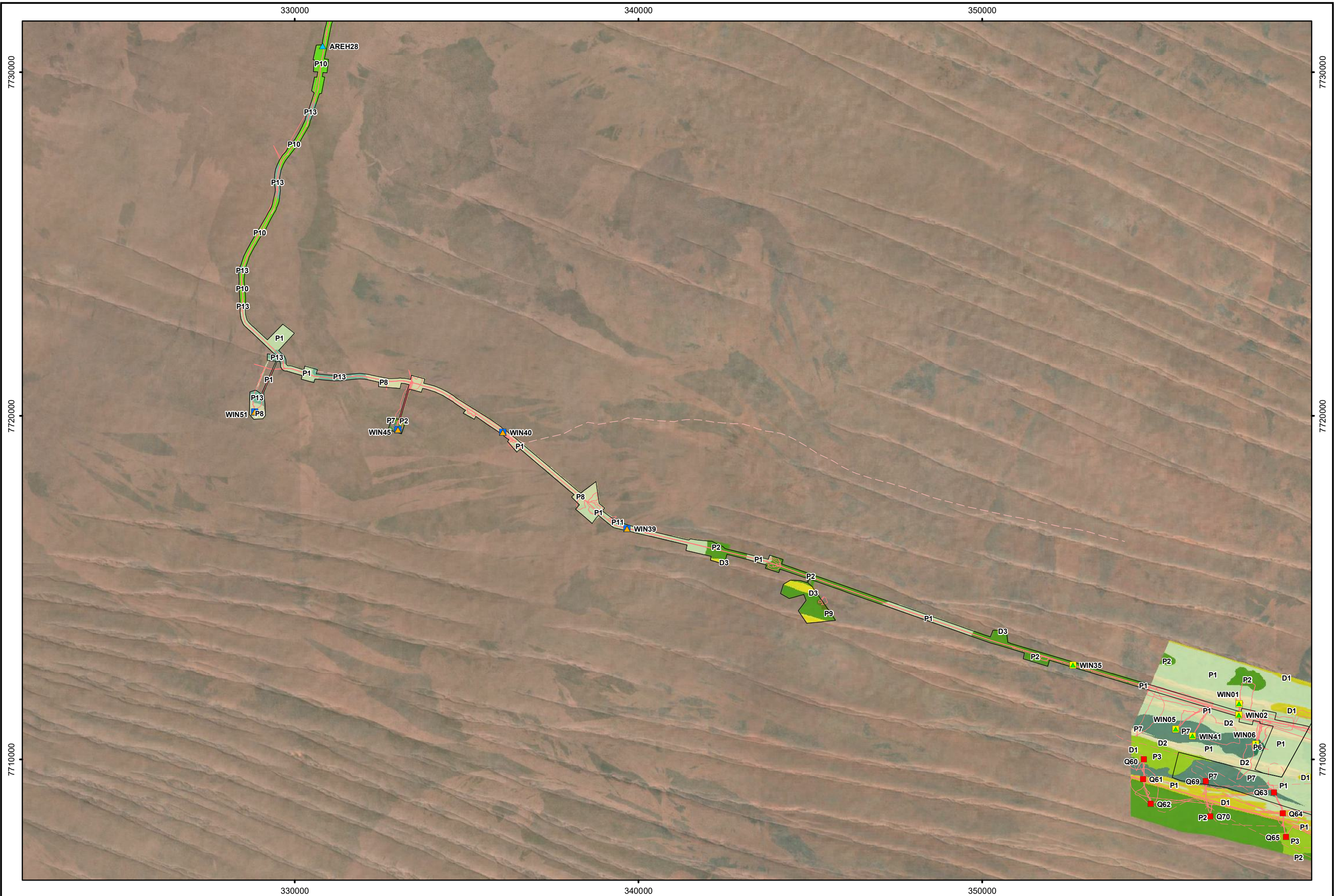
Author: J. Paterson

WB Ref: WB1010

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**Interim Consolidated Detailed Flora & Vegetation
Assessment of the Winu Project, September 2023
Vegetation Mapping - Sheet 4 of 7**

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope

Survey Track Log

Helicopter Survey Track

WRAC Quadrat (Biota)

AREH Quadrat (Biota)

WPA Quadrat (Biota)

WPA Quadrat (WB)

WRAC Quadrat (WB)

Vegetation Mapping

Sand Dunes / Associated Swales

Inter-dunal Sand Plains

D3

D1

D2

P3

P6

P7

P8

P9

P10

P11

P13

Scale: 1:100,000

MGA94 (Zone 51)

0 1 2km

Author: J. Paterson

WB Ref: WB1010

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A3

Interim Consolidated Detailed Flora & Vegetation

Assessment of the Winu Project, September 2023

Vegetation Mapping - Sheet 5 of 7

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	WPA Quadrat (Biota)	Vegetation Mapping	D3	P3	P6	Stony Rises / Gentle Outcrop	Other
Survey Track Log	WPA Quadrat (WB)	Sand Dunes / Associated Swales	D1	P4	P7	R1	Disturbed
Helicopter Survey Track	WPAE Quadrat (WB)		D2	P5	P14	R2	
				P2			

0 1 2km

Scale: 1:100,000
MGA94 (Zone 51)

Ref: a2923_WB1010_13

Date: Aug 2023 Rev: A A3

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Author: J. Paterson WB Ref: WB1010

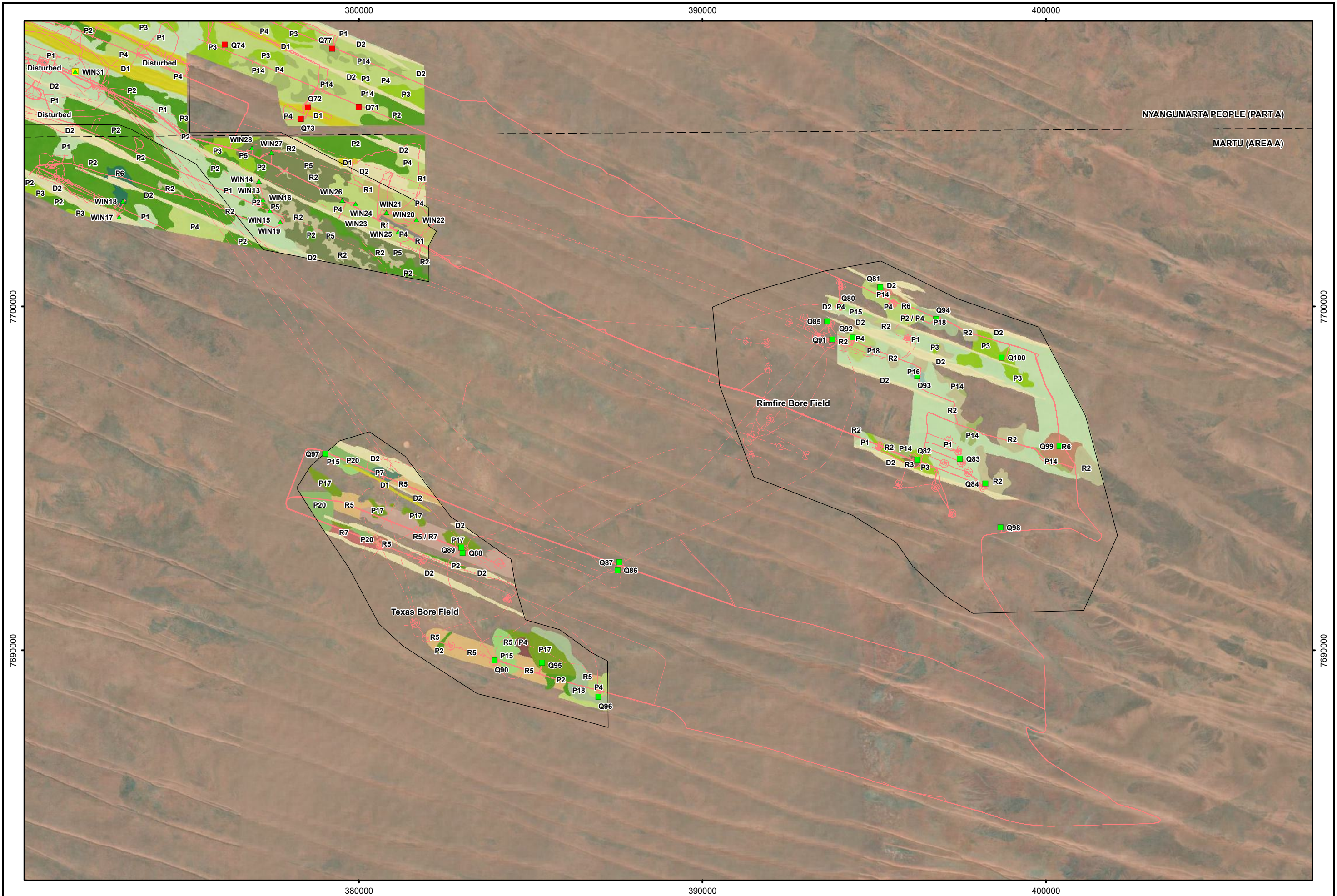
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Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023

Vegetation Mapping - Sheet 6 of 7

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	WPAE Quadrat (WB)	D2	P3	P14	P20	R5	Other
Survey Track Log	Rimfire / Texas Quadrat (WB)	Inter-dunal Sand Plains	P4	P15	Stony Rises / Gentle Outcrop	R6	Disturbed
Helicopter Survey Track	Vegetation Mapping	P1	P5	P16	R1	R7	
WPA Quadrat (Biota)	Sand Dunes / Associated Swales	P2	P6	P17	R2	R5 / P4	
WPA Quadrat (WB)	D1	P2 / P4	P7	P18	R3	R5 / R7	

0 1 2km

Scale: 1:100,000
MGA94 (Zone 51)

Ref: a2923_WB1010_13

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Vegetation Mapping - Sheet 7 of 7

2. Tree Species

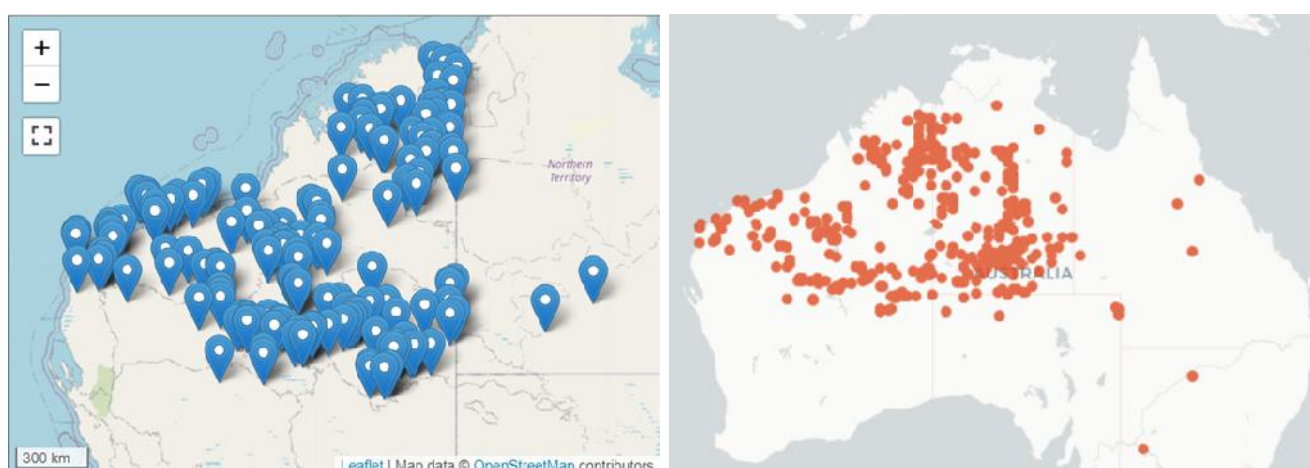
2.1. *Corymbia opaca*

Nyangumarta name: Juluku

Common name: Desert Bloodwood

Description: Tree, 3-15 m high, bark brown, flaky, tessellated. Flowers white-cream, April to August. Red sandy and loamy soils, powdery red earth. Sandplains, stony plains, drainage lines, low rises (WAH, 1998-).

Distribution:



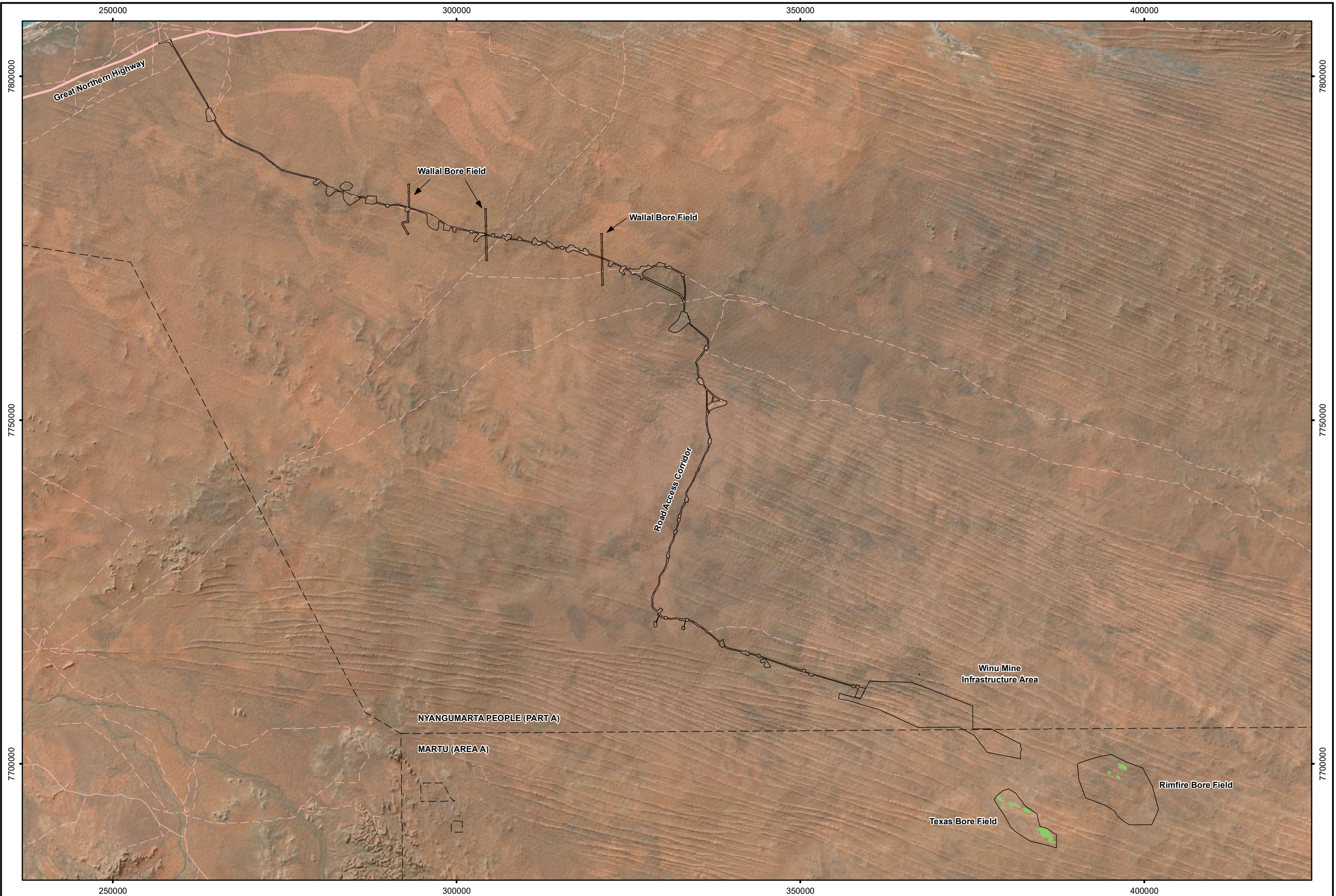
Distribution of *Corymbia opaca* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Corymbia opaca is associated with Inter-dunal Sandplains of the Texas and Rimfire Bore Fields. It occurs both as the dominant overstory species within the *Corymbia opaca* Open Woodland over *Triodia schinzii* (P18) Vegetation Association; and occasionally within the *Eucalyptus odontocarpa* Low Mallee Woodland over *Triodia schinzii* (P16), and *Eucalyptus victrix* Open Woodland over *Triodia epactia* Vegetation Association, amongst other surrounding vegetation associations occurring on similar landforms within the Rimfire and Texas Bore Fields. *Corymbia opaca* is considered regionally common, however, only has a limited extend across the Project Area.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Corymbia opaca</i>	P16, P17, P18	394.1	394.1

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Corymbia opaca</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_13 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Corymbia opaca</i>
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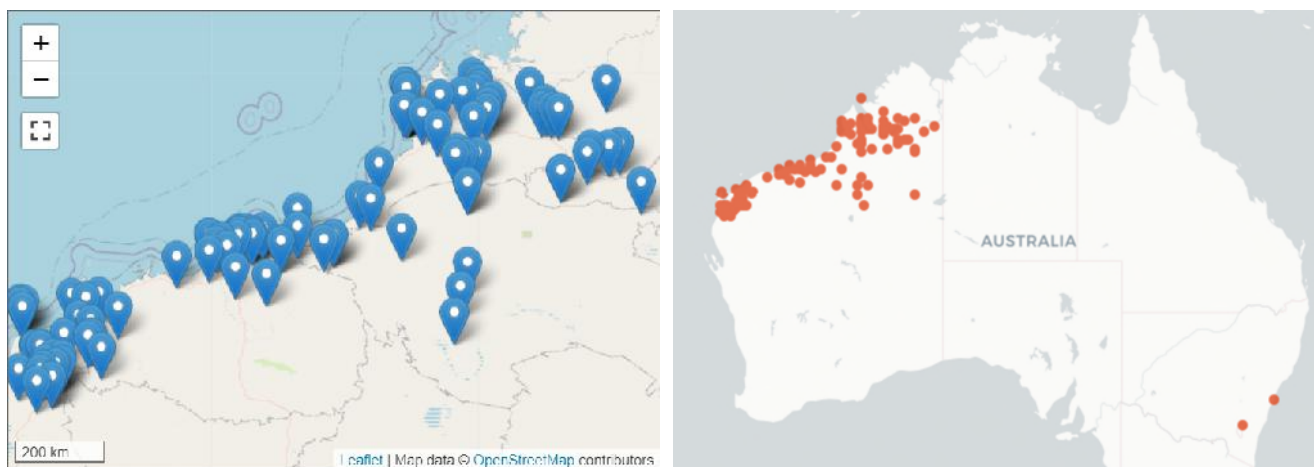
2.2. *Corymbia zygomphylla*

Nyangumarta name: Jukurtany

Common name: Bloodwood

Description: Straggly tree or (rarely mallee), (1-)3-9 m high, bark rough, tessellated. Flowers cream-white, December or January. Red sand. Dunes and sandplains (WAH, 1998-).

Distribution:



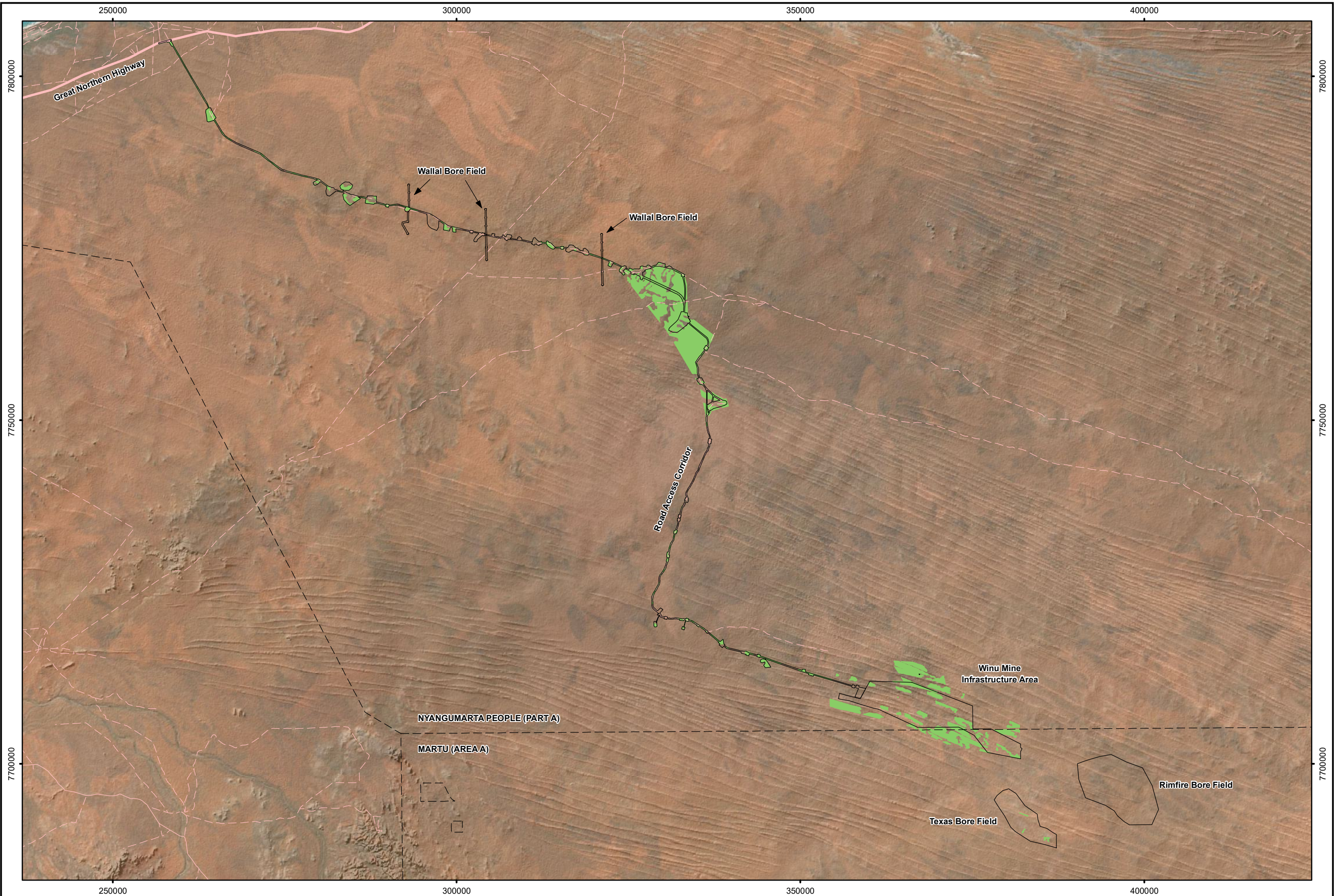
Distribution of *Corymbia zygomphylla* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Corymbia zygomphylla is associated with Inter-dunal Sandplains occurring around the RAC and Wallal Bore Fields. It occurs both as the dominant species within the *Corymbia zygomphylla* Scattered Low Trees over *Triodia schinzii* (P10) Vegetation Association, and occasionally within several surrounding Inter-dunal Sandplains Associations, as well as the *Grevillea stenobotrya*, *Grevillea wickhamii* & *Acacia anaticeps* Tall Shrubland over *Triodia schinzii* (D3) Association on Sand dunes and associated swales. *Corymbia zygomphylla* is considered both locally and regionally common.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Corymbia zygomphylla</i>	D3, P2, P8, P10, P11	4,301.1	13,294.2

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Corymbia zygophylla</i> - Principal Road - Minor Road - Track	0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_14 Date: Sep 2023 Rev: A A3	<table border="1"><tr><td>Author: J. Paterson</td><td>WB Ref: WB1010</td></tr><tr><td colspan="2">Drawn: CAD Resources ~ www.cadresources.com.au</td></tr><tr><td colspan="2">Tel: (08) 9246 3242 ~ Fax (08) 9246 3202</td></tr></table>	Author: J. Paterson	WB Ref: WB1010	Drawn: CAD Resources ~ www.cadresources.com.au		Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Corymbia zygophylla</i>
Author: J. Paterson	WB Ref: WB1010								
Drawn: CAD Resources ~ www.cadresources.com.au									
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202									

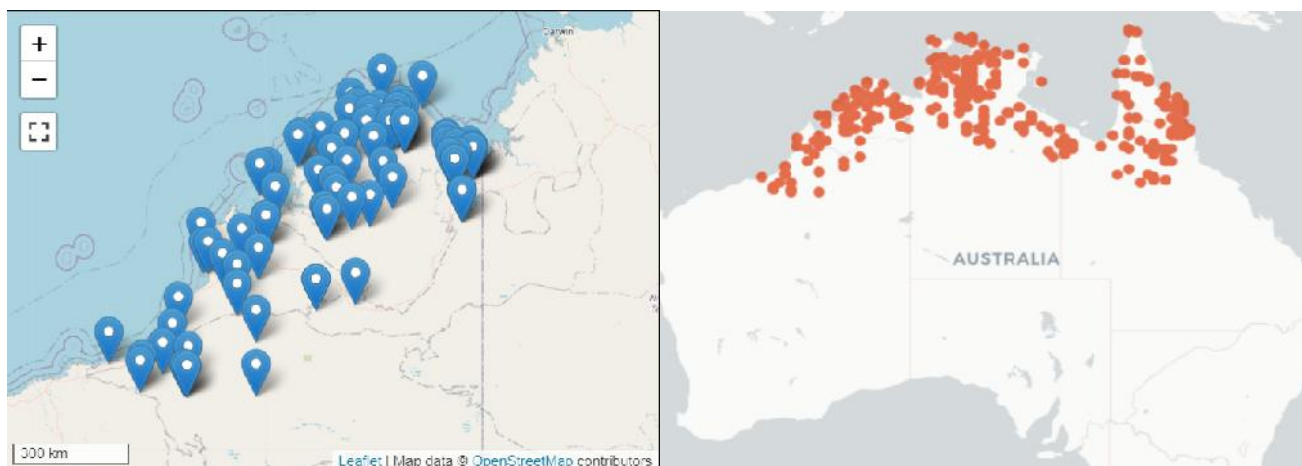
2.3. *Erythrophleum chlorostachys*

Nyangumarta name: Junyju

Common name: Ironwood

Description: Shrub or tree, 1-15 m high, bark tessellated. Flowers white-yellow-green, July to November. Variety of habitats (WAH, 1998-).

Distribution:



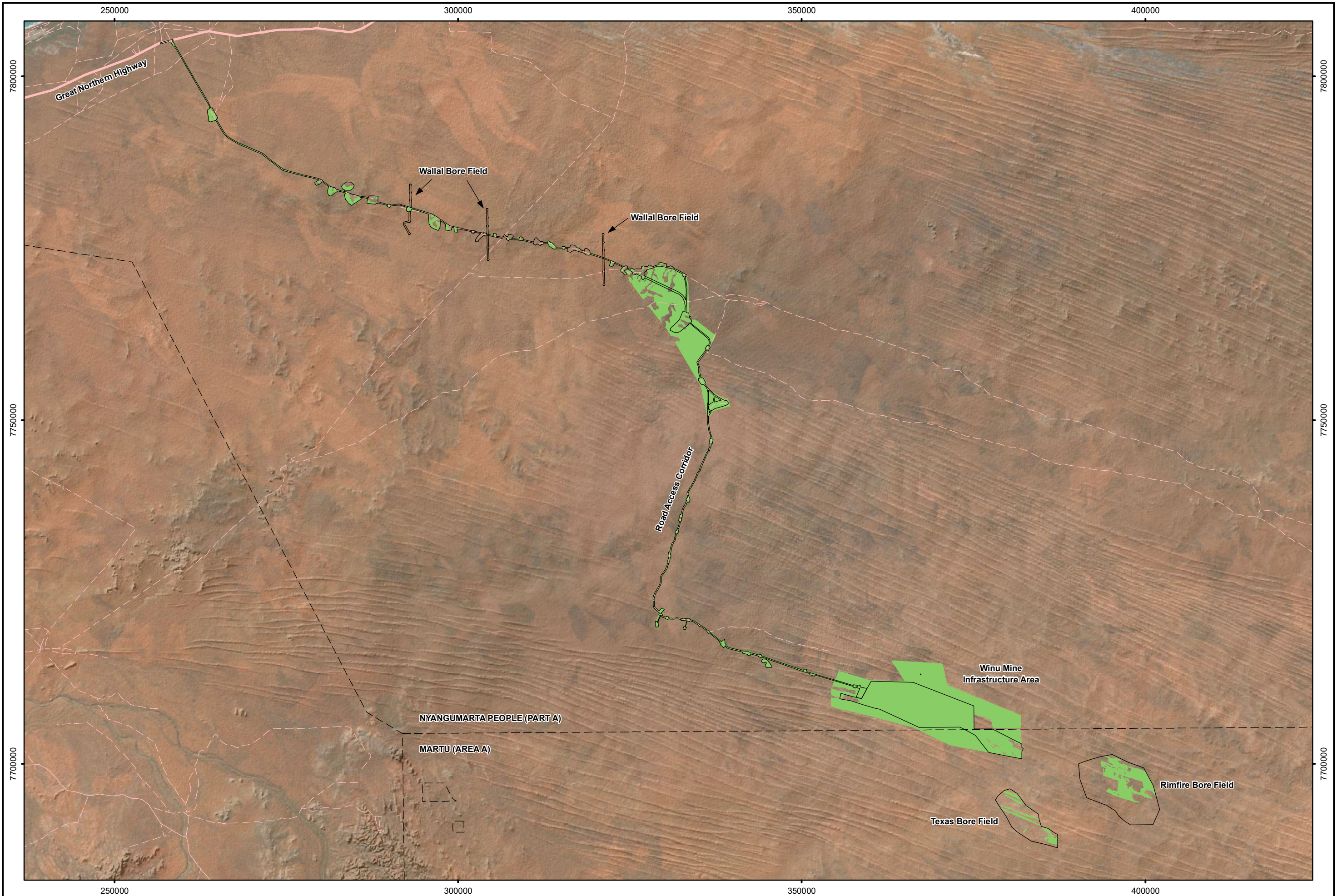
Distribution of *Erythrophleum chlorostachys* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Erythrophleum chlorostachys is common and widespread across the Winu Project, occurring as a mid-storey species in many of the Vegetation Associations on Sand Dunes and Associated Swales, and Inter-dunal Sand Plain landforms (i.e., areas of deeper sand).

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Erythrophleum chlorostachys</i>	D1, D2, D3, P1, P2, P3, P4, P5, P6, P8, P9, P10, P11, P13, P14, P18	16,228.5	32,024.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_18 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Erythrophleum chlorostachys</i>
Winu Development Envelope	Principal Road				
Distribution of <i>Erythrophleum chlorostachys</i>	Minor Road Track				

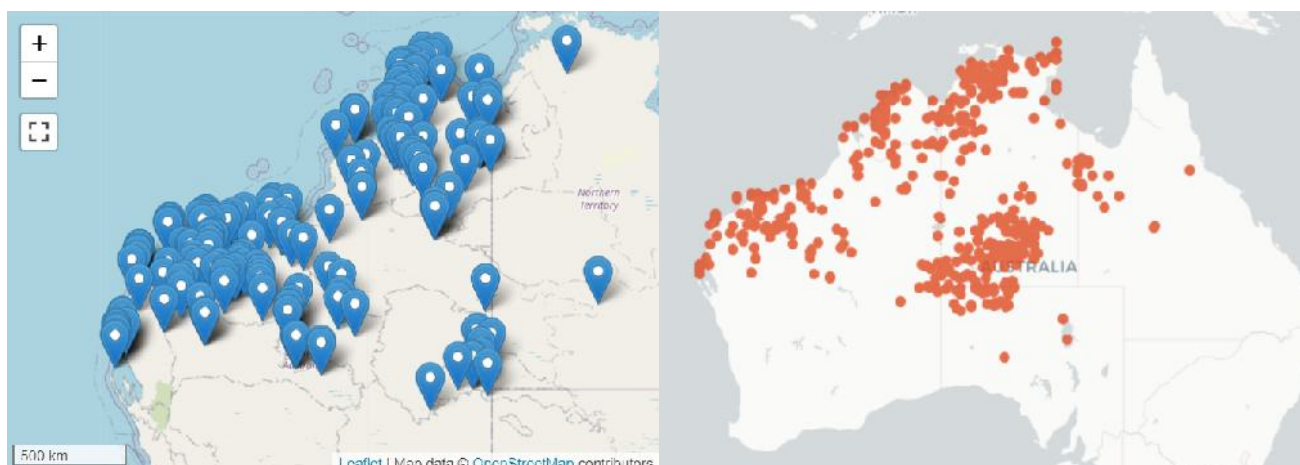
2.4. *Ficus brachypoda*

Nyangumarta name: Makartu/Lakurru

Common name: Rock Fig

Description: Erect, spreading tree or shrub, to 15(-30) m high. Flowers April to October. Red sand/clay, alluvium, skeletal soils, sandstone, granite, limestone. Rocky sites, screes, creek beds, along drainage lines (WAH, 1998-).

Distribution:



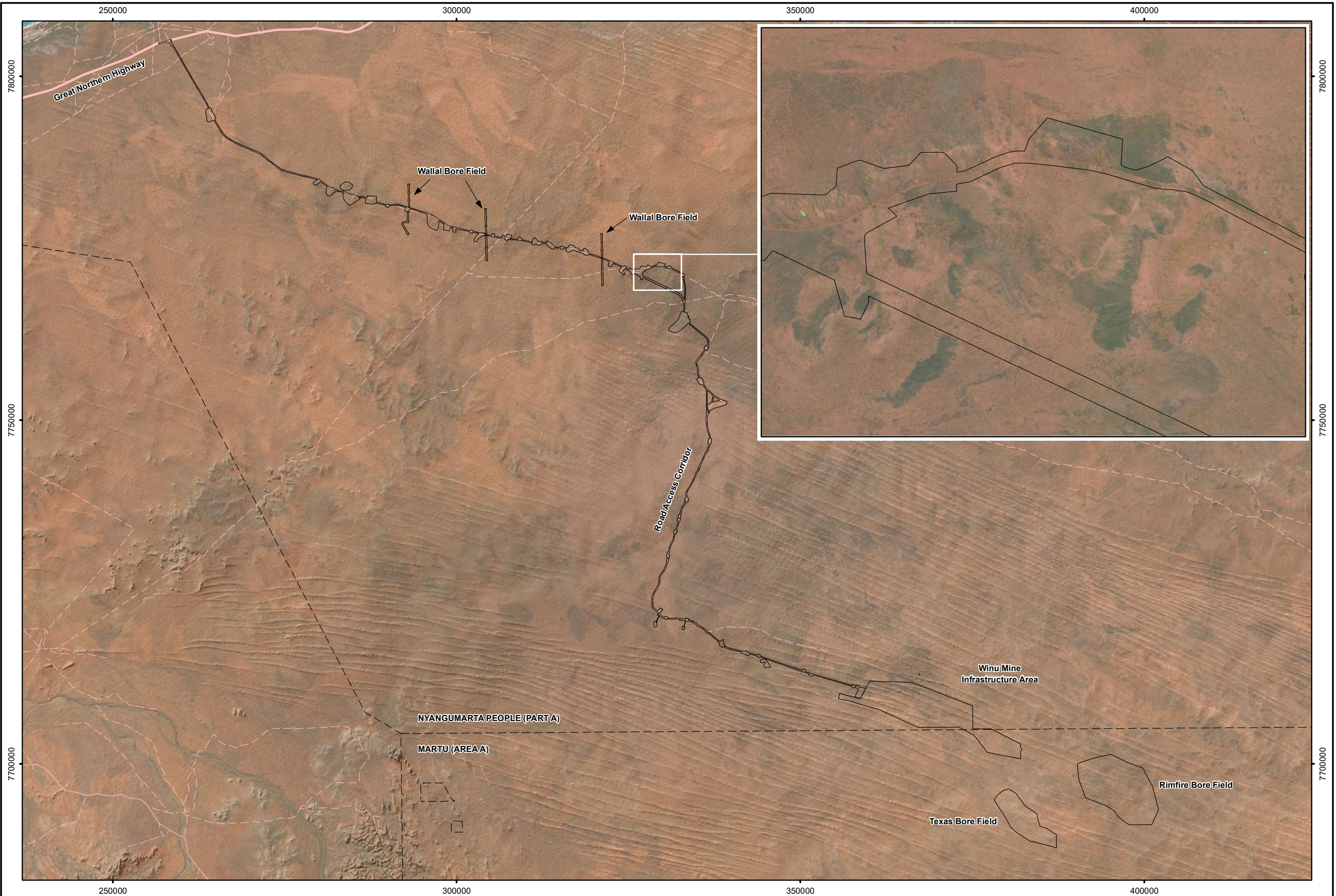
Distribution of *Ficus brachypoda* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Ficus brachypoda has a very restricted distribution across the Winu Project, occurring as the dominant species within the *Ficus brachypoda* Low Open Woodland over *Acacia monticola*, *Grevillea pyramidalis* & *Triodia epactia* (R4) Vegetation Association. The R4 Vegetation Association consists of isolated rocky outcroppings, occurring mostly around Section 2 of the RAC and the Wallal Bore Field.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Ficus brachypoda</i>	R4	0.2	0.2

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Ficus brachypoda</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_19 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Ficus brachypoda</i>
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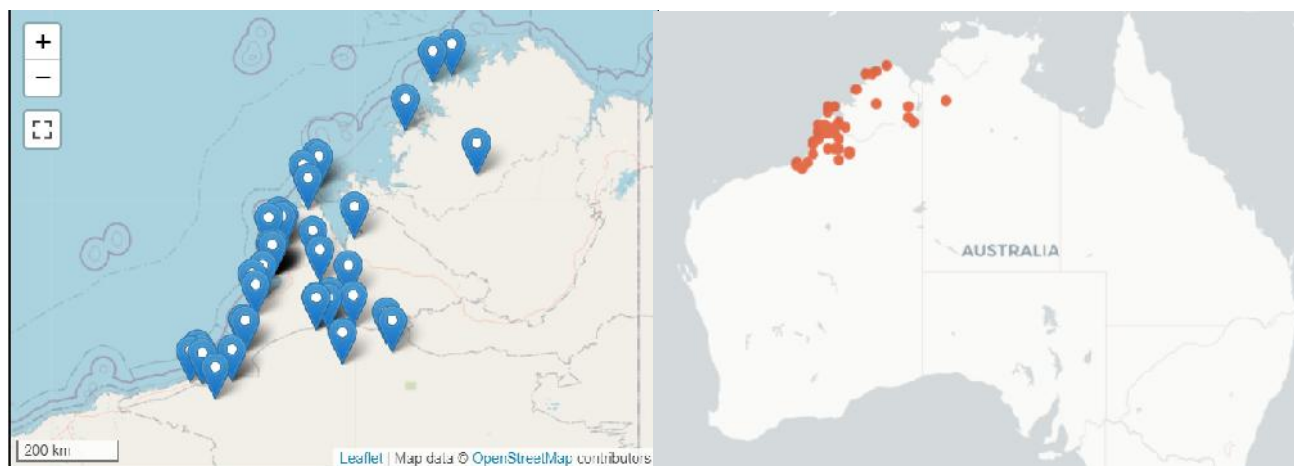
2.5. *Gardenia pyriformis* subsp. *keartlandii*

Nyangumarta name: Wurtarr

Common name: Turpentine Tree

Description: Tree or shrub, (0.3-)0.6-6 m high. Flowers white, February to May or September to October or December. Red sandy soils, sandstone. Dunes, sandplains, stony ridges. (WAH, 1998).

Distribution:



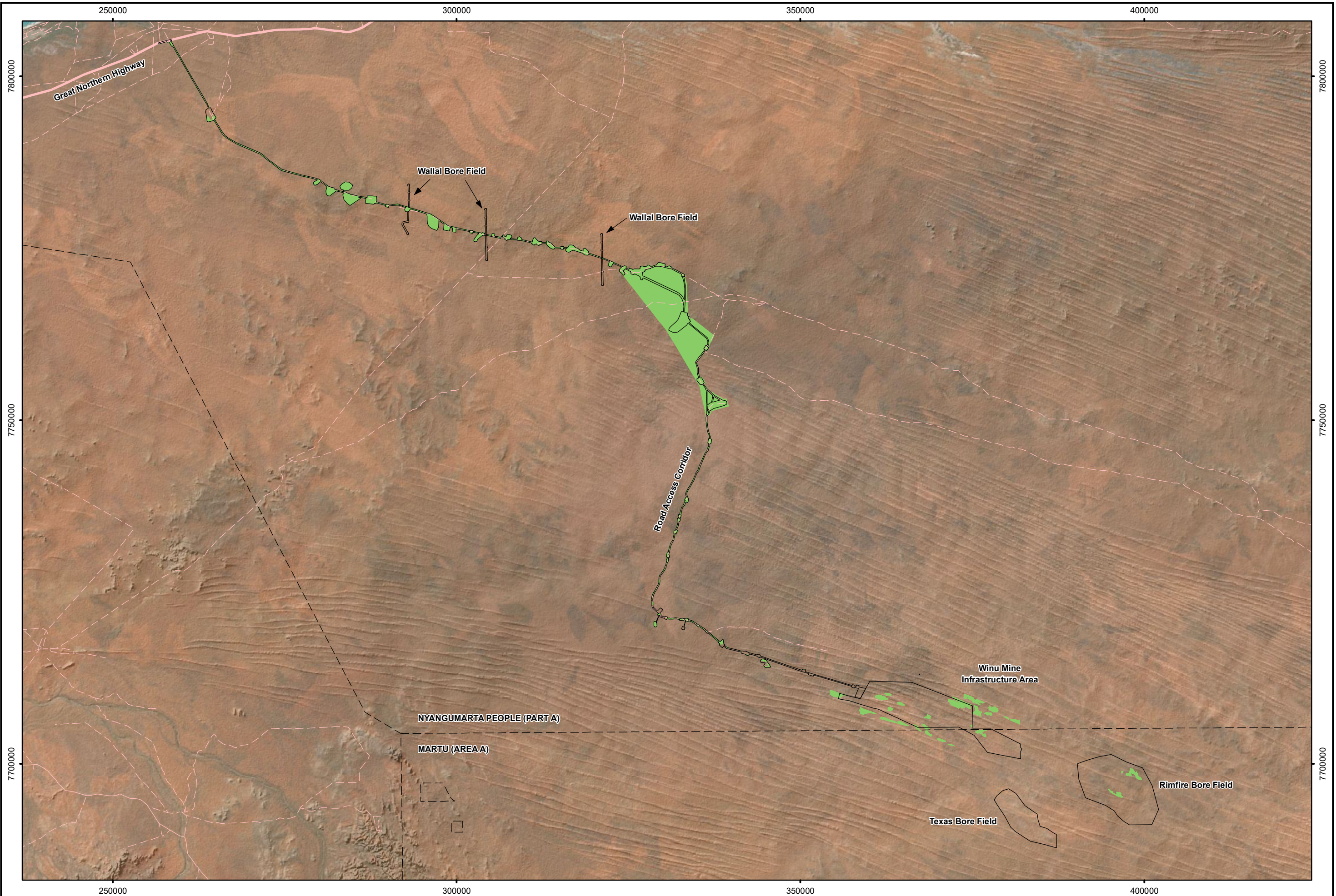
Distribution of *Gardenia pyriformis* subsp. *keartlandii* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Gardenia pyriformis subsp. *keartlandii* occurs as the dominant overstory species within the *Gardenia pyriformis* subsp. *keartlandii* Scattered Low Trees over *Triodia schinzii* (P13) Vegetation Association, and occasionally within other associations occupying Inter-dunal Sand Plains. Based on field observations, its distribution across the Study Area is not correctly depicted in the below map – rather, being restricted to the RAC and Wallal Bore Field and not the MIA or Texas and Rimfire Bore Fields. *Gardenia pyriformis* subsp. *keartlandii* is considered common and widespread, both regionally (within the Dampierland bioregion) and locally (within the north-western portions of the Winu Project).

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Gardenia pyriformis</i> subsp. <i>keartlandii</i>	D3, P3, P8, P9, P10, P11, P12, P13, R3	6,328.2	14,958.8

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Gardenia pyriformis</i> subsp. <i>keartlandii</i> - Principal Road - Minor Road - Track	 0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_20 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Gardenia pyriformis</i> subsp. <i>keartlandii</i>
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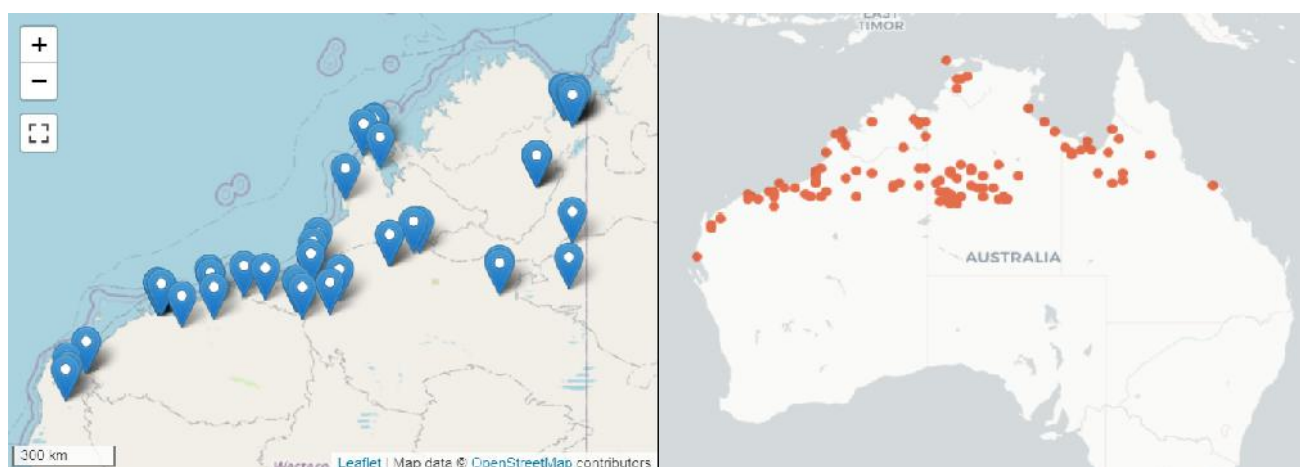
2.6. *Owenia reticulata*

Nyangumarta name: Parntarl

Common name: Desert Walnut

Description: Tree, 4-14 m high, bark often black and corky. Flowers white, May or October to November. Stony ridges, red sand dunes, plains (WAH, 1998).

Distribution:



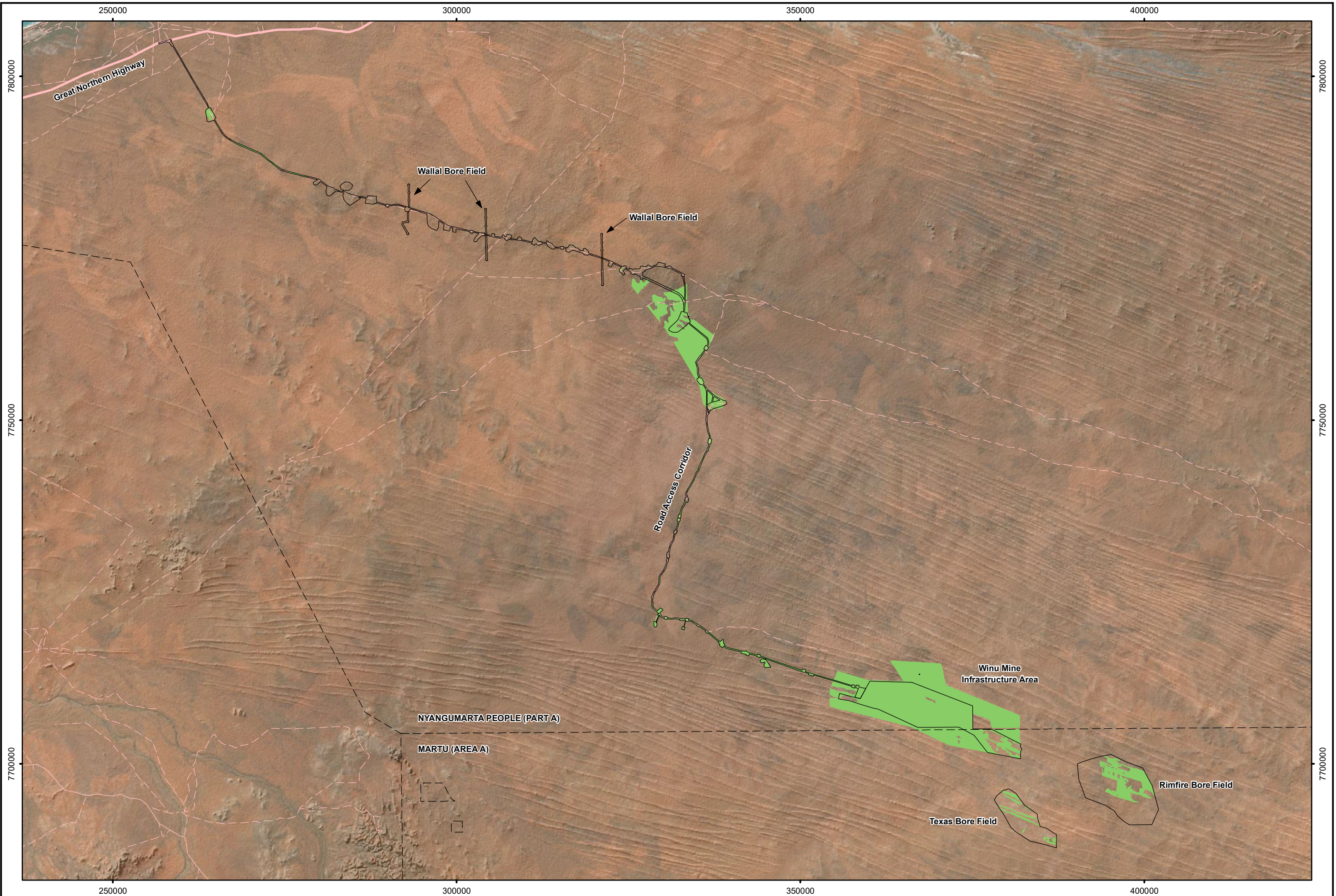
Distribution of *Owenia reticulata* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Owenia reticulata is common and widespread across the Winu Project, occurring as a consistent, although sparsely-spread, overstorey species in many of the Vegetation Associations on Sand Dunes and Associated Swales, and Inter-dunal Sand Plain landforms (i.e., areas of deeper sand).

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Owenia reticulata</i>	D1, D2, D3, P1, P2, P3, P4, P8, P13, P14	13,294.3	27,253.8

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Owenia reticulata</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_27 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Owenia reticulata</i>
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3. Low Shrub or Tree Species

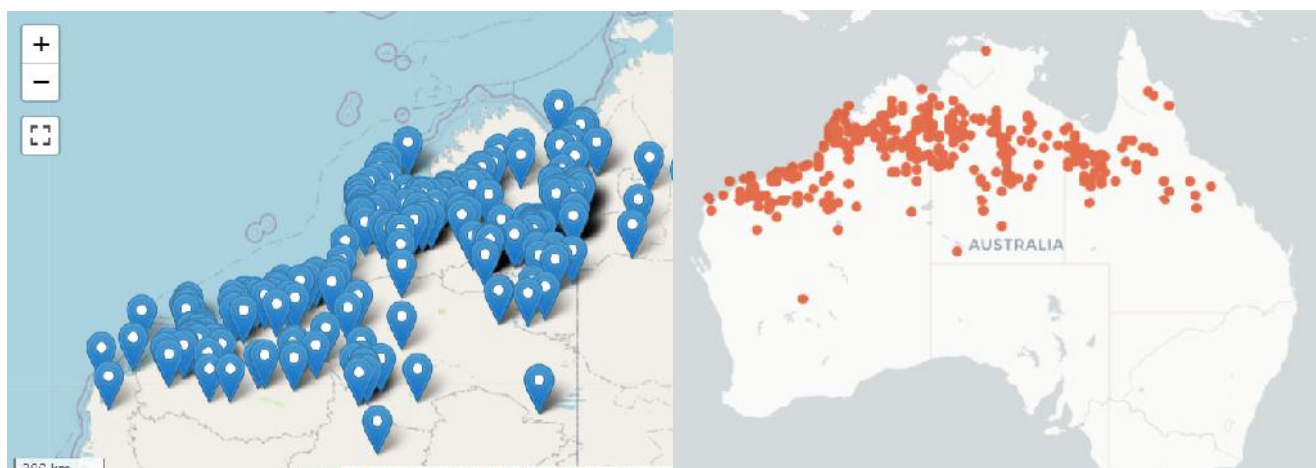
3.1. *Acacia colei*

Nyangumarta name: Lirringkin

Common name: Locally: River Tree or Soap Tree

Description: Erect, spreading shrub or tree, 1.5-9 m high. Flowers yellow, May to September. Stony soils, clay loam. Sandplains, stony ridges, floodplains, drainage lines (WAH, 1998).

Distribution:



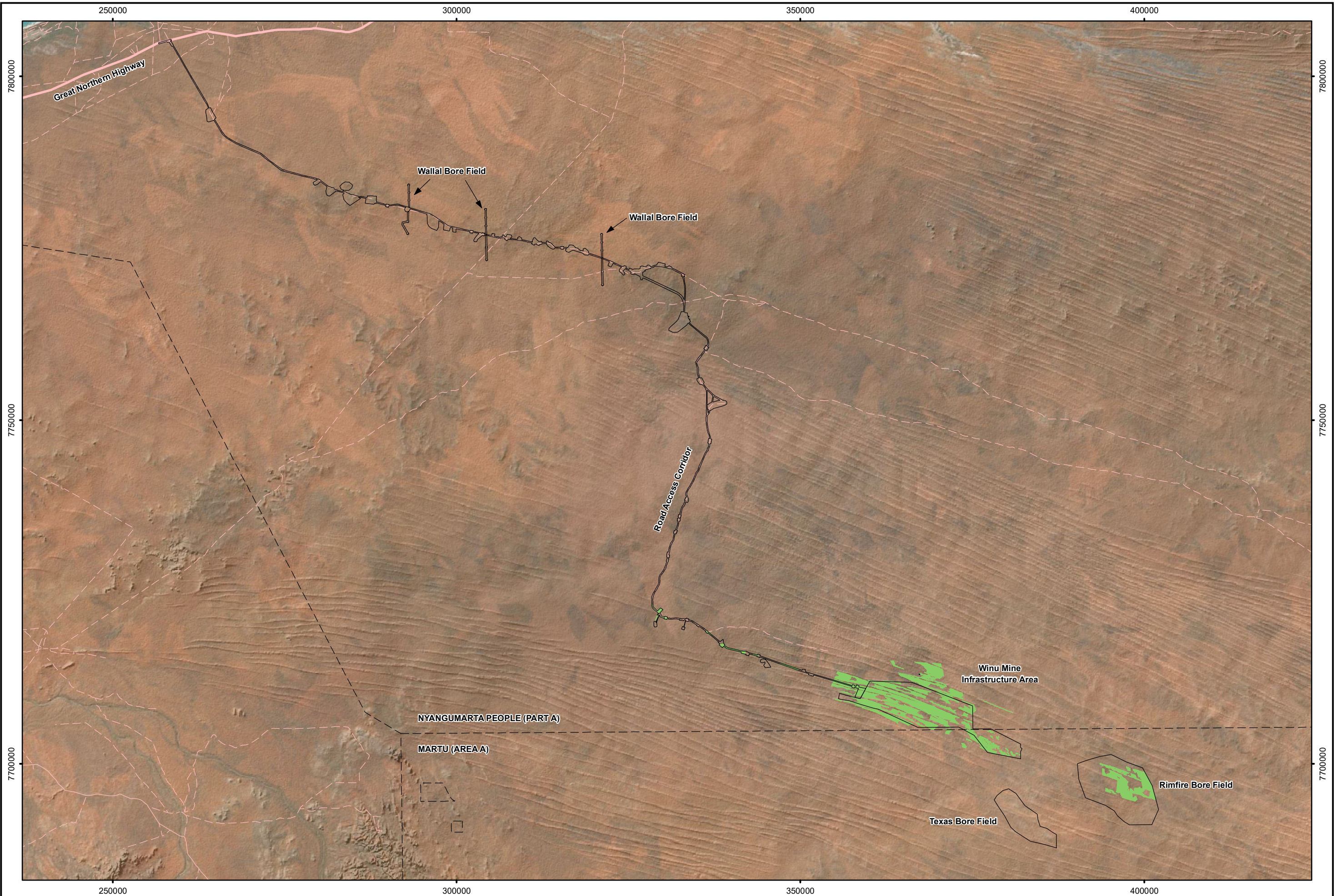
Distribution of *Acacia colei* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia colei is associated with Inter-dunal Sand Plains, occurring as a midstory shrub in *Corymbia/Eucalypt* woodlands and within the *Acacia platycarpa* (*Acacia tumida* var. *kulparn*) Open Shrubland over *Triodia schinzii* (P1) Vegetation Association. While it appears to occupy a large area of the Winu Project, this is a result of the large extent of the P1 association. *Acacia colei* occurs occasionally within this Association, thus, these results should be treated with caution.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia colei</i>	P1, P15, P16, P17, P18, R2	6551.1	9042.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Acacia coleii</i> - Principal Road - Minor Road - Track	0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_02 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia coleii</i>
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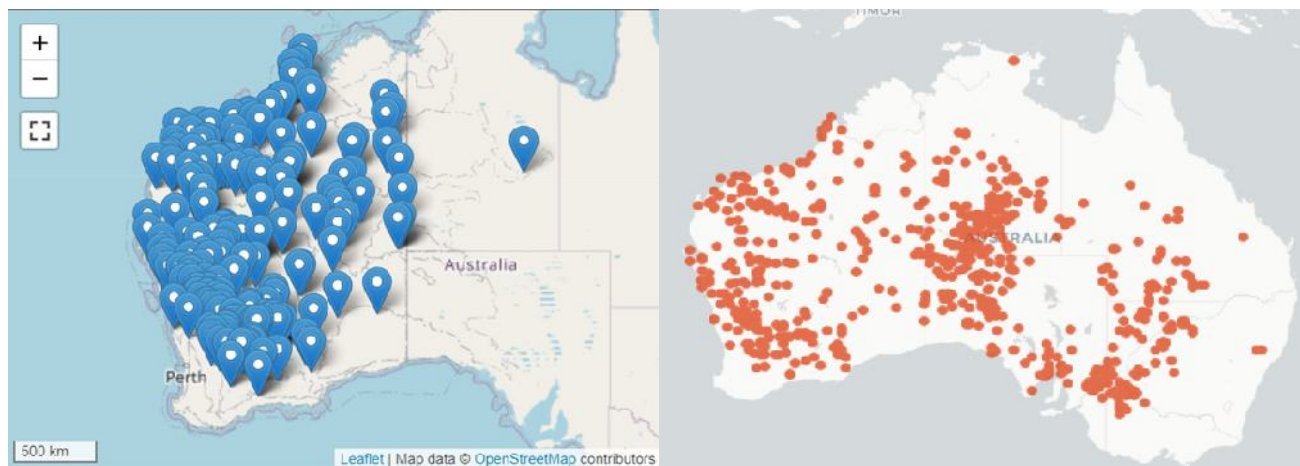
3.2. *Codonocarpus cotinifolius*

Nyangumarta name: Jimpirriny

Common name: Native Poplar, Desert Poplar

Description: Pyramidal shrub or tree, 2-10 m high. Flowers yellow-green, April to October. Red sand, loam or gravel. Plains, sand dunes, hills (WAH, 1998).

Distribution:



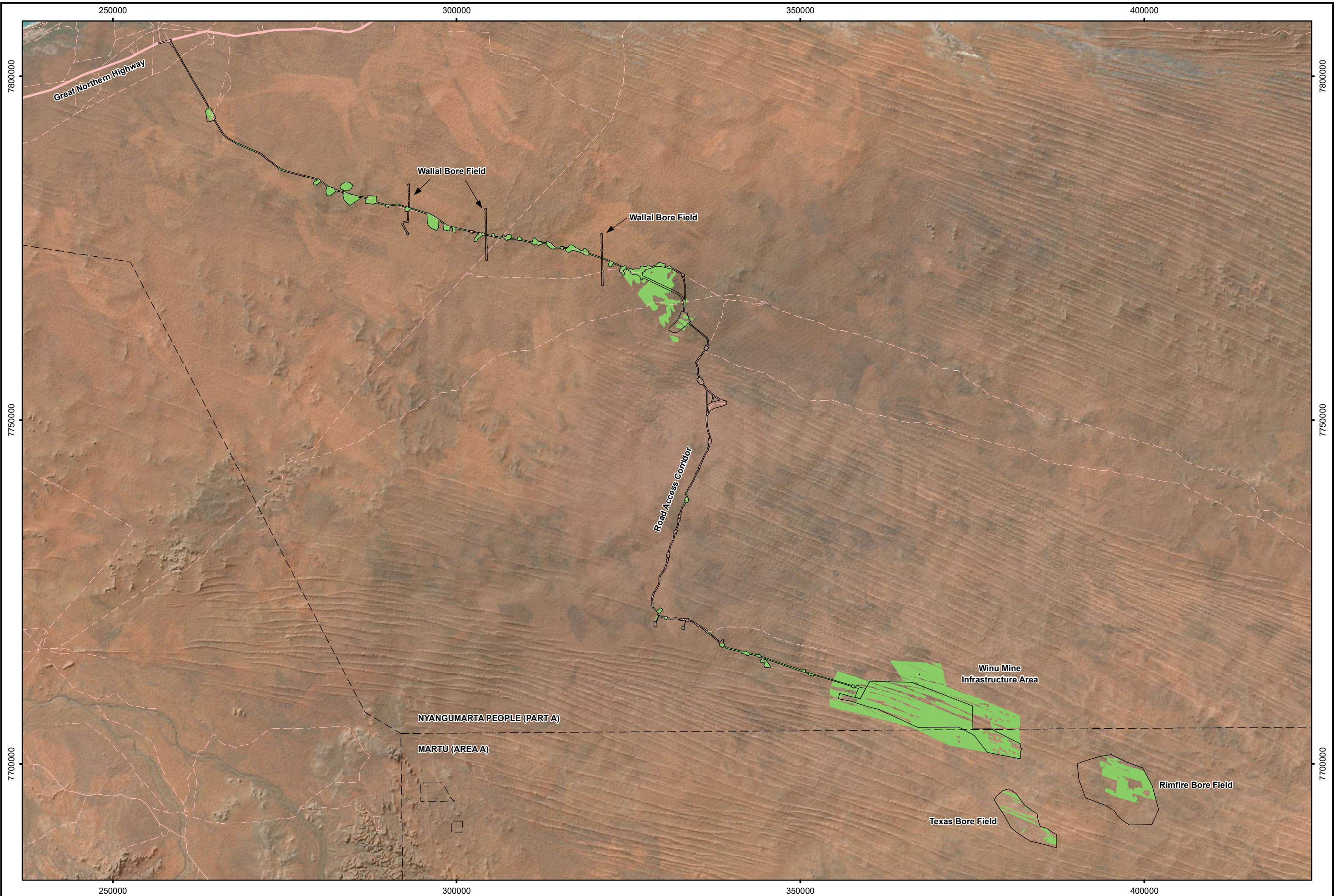
Distribution of *Codonocarpus cotinifolius* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Codonocarpus cotinifolius is considered common and widespread, both locally as well as regionally. It is recognised as a disturbance-opportunist, so the distribution and abundance for this taxon are elastic and largely dependent on fire, being prevalent in early-successional communities following fire disturbance and slowly dropping out of the system over time. *Codonocarpus cotinifolius* was encountered across a range of Vegetation Associations occupying all the major landforms.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Codonocarpus cotinifolius</i>	D2, P1, P2, P3, P4, P9, P11, P18, R2, R3	13,461.8	24,308.5

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_12 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Codonocarpus continentifolius</i>
Winu Development Envelope	Principal Road				
Distribution of <i>Codonocarpus continentifolius</i>	Minor Road Track				

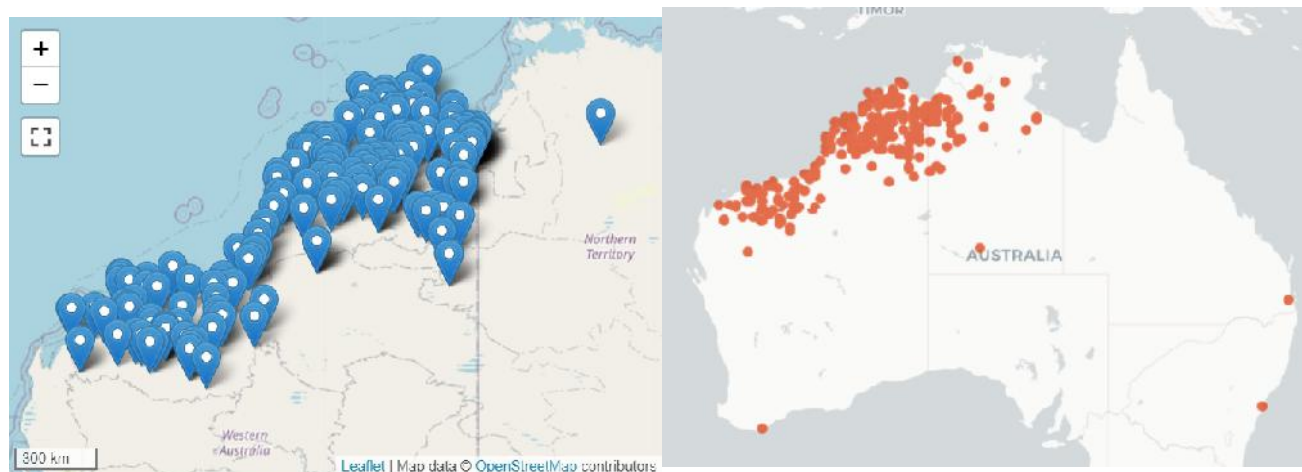
3.3. *Grevillea pyramidalis*

Nyangumarta name: Wirliny

Common name: Caustic Bush

Description: Tree or shrub, 2-6 m high. Flowers white-cream-yellow, May to Jul. Sand, gravel, loam, skeletal sandy soils on sandstone, laterite, granite (WAH, 1998).

Distribution:



Distribution of *Grevillea pyramidalis* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Grevillea pyramidalis was found to occur within the in the *Ficus brachypoda* Low Open Woodland over *Acacia monticola*, *Grevillea pyramidalis* & *Triodia epactia* (R4) Vegetation Association. This unit has a very restricted distribution across the Winu Project, consisting of isolated rocky outcroppings, occurring outside of Section 2 of the RAC and the Wallal Bore Field. Individuals were encountered during the reconnaissance survey of Wallal Bore Fields, but have since been excluded from the area calculations as they no longer fall within the Winu Development Envelope. Subsequent records have been reported as part of the AREH project around the same area.

Species	Vegetation Associations	Total Area (ha)
<i>Grevillea pyramidalis</i>	Unquantified	Unquantified

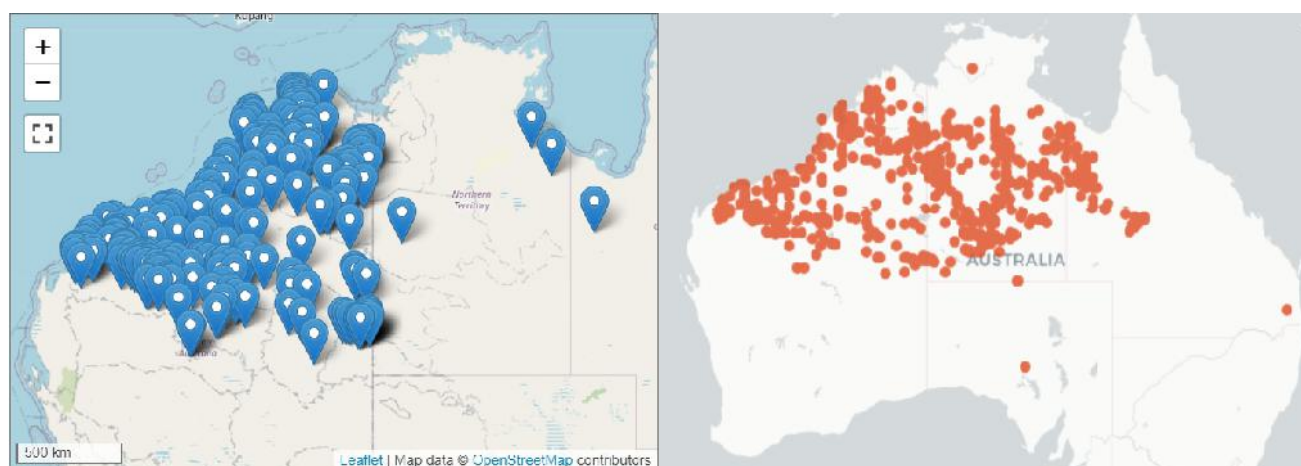
3.4. *Grevillea wickhamii*

Nyangumarta name: Ngalyanta

Common name: Wickham's Grevillea

Description: Erect shrub or tree, to 6 m high. Flowers red/pink/orange/yellow, April to October. Red sand or loam, stony or skeletal soils, laterite, sandstone, limestone, quartzite. Sand dunes, plains, rocky hills and gullies, cliffs or ridges, along creeklines (WAH, 1998-).

Distribution:



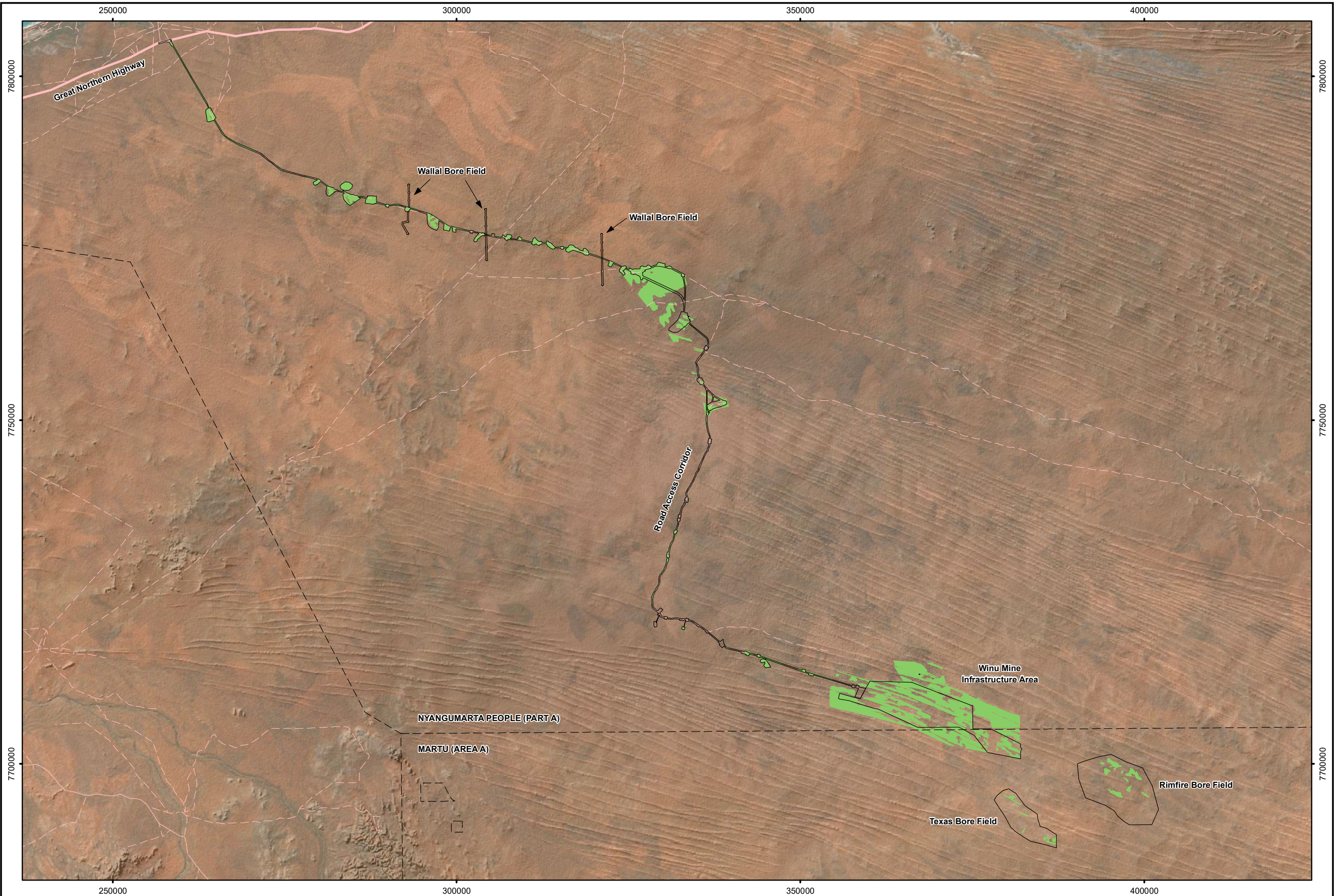
Distribution of *Grevillea wickhamii* within WA (WAH, 1998 -) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Three subspecies of *Grevillea wickhamii* have been recorded across the Winu Project, including subsp. *aprica*, subsp. *hispidula* and subsp. *macrodongta*. *Grevillea wickhamii* is considered common and widespread both regionally and locally, occurring in a number of Vegetation Associations occupying all major landforms within the Project Area.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Grevillea wickhamii</i>	D1, D3, P2, P3, P4, P7, P10, P11, P14, R3, R4	8,486.2	18,036.8

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Grevillea wickhamii</i>		Principal Road Minor Road Track	
		 Scale: 1:500,000 MGA94 (Zone 51)	
Ref: a2923_WB1010_10_22 Date: Sep 2023 Rev: A A3		 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	
Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Grevillea wickhamii</i>			

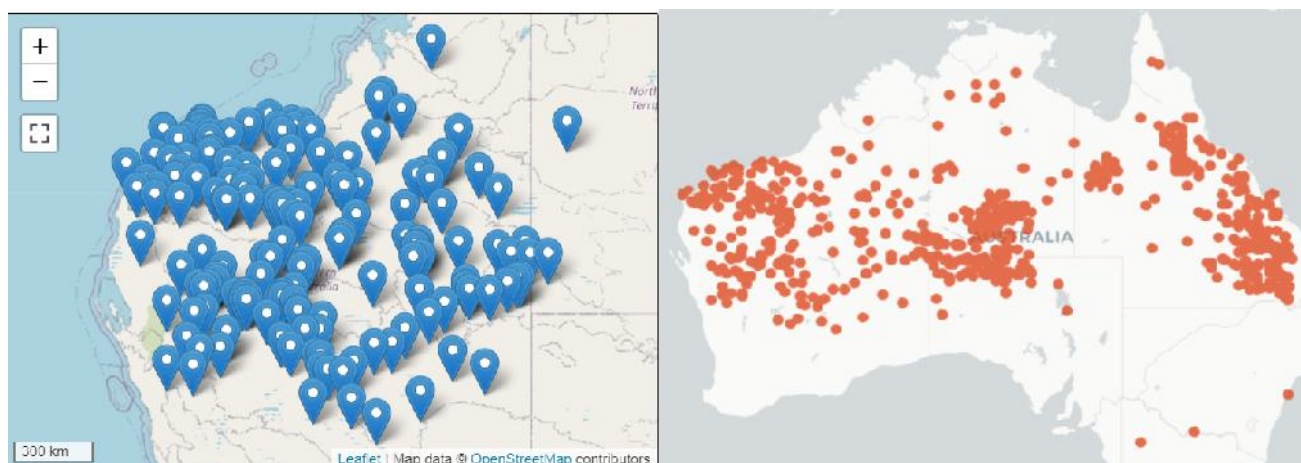
3.5. *Hakea lorea* subsp. *lorea*

Nyangumarta name: Kumpaly, Watamunga

Common name: Honey Hakea

Description: Multi-stemmed, small tree or shrub, to 9 m high, thick, corky, deep fissured, grey bark. Flowers green-cream-white-yellow-orange, May to October. Red sandy to clayey soils, sandstone, granite, basalt, laterite schist. Plains or in ranges, along drainage lines, claypans, stony sites (WAH, 1998-).

Distribution:



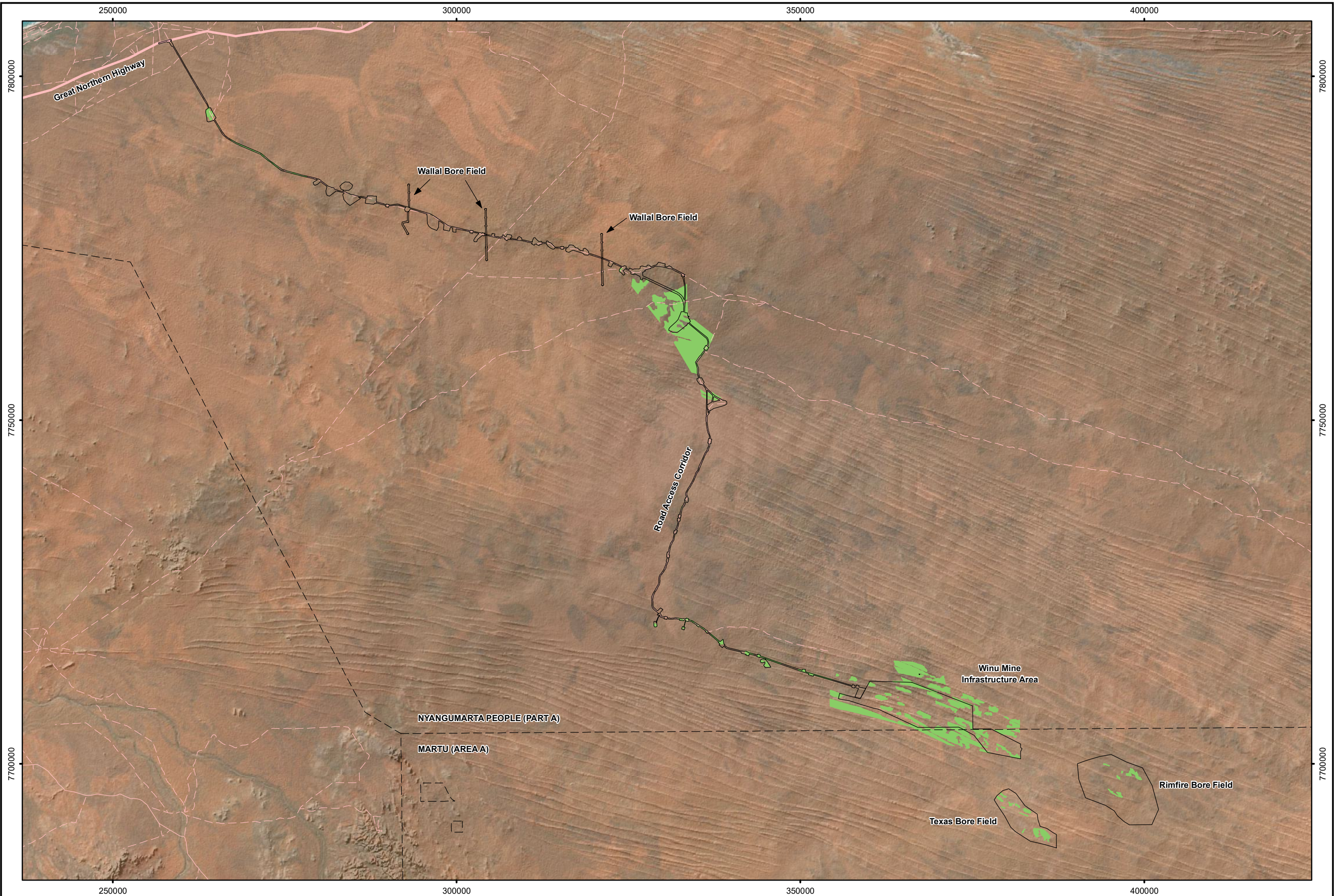
Distribution of *Hakea lorea* subsp. *lorea* within WA (WAH, 1998 -) and Australia (AVH, 2023).

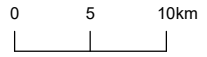
Occurrence within the Winu Project Area:

Hakea lorea subsp. *lorea* is associated with Inter-dunal Sand Plains, occurring occasionally within several Vegetation Associations. *Hakea lorea* subsp. *lorea* is considered common and widespread across Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Hakea lorea</i> subsp. <i>lorea</i>	P2, P3, P8, P15, P16, P17	3,694.7	11,724.5

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_24 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Hakea lorea</i> subsp. <i>lorea</i>
 Winu Development Envelope	 Principal Road				
 Distribution of <i>Hakea lorea</i> subsp. <i>lorea</i>	 Minor Road  Track				

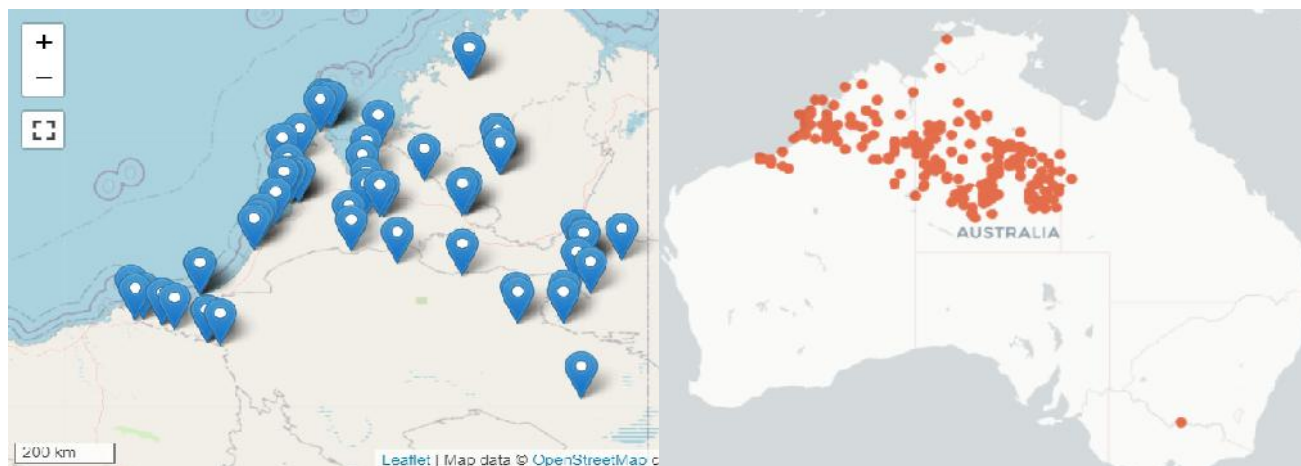
3.6. *Hakea macrocarpa*

Nyangumarta name: Kumpaly

Common name: Honey Hakea

Description: Tall shrub or tree, 1-6 m high. Flowers cream-green-yellow, May to August. Red sandy soils. Coastal sand dunes, rocky ridges, sandplains (WAH, 1998-).

Distribution:



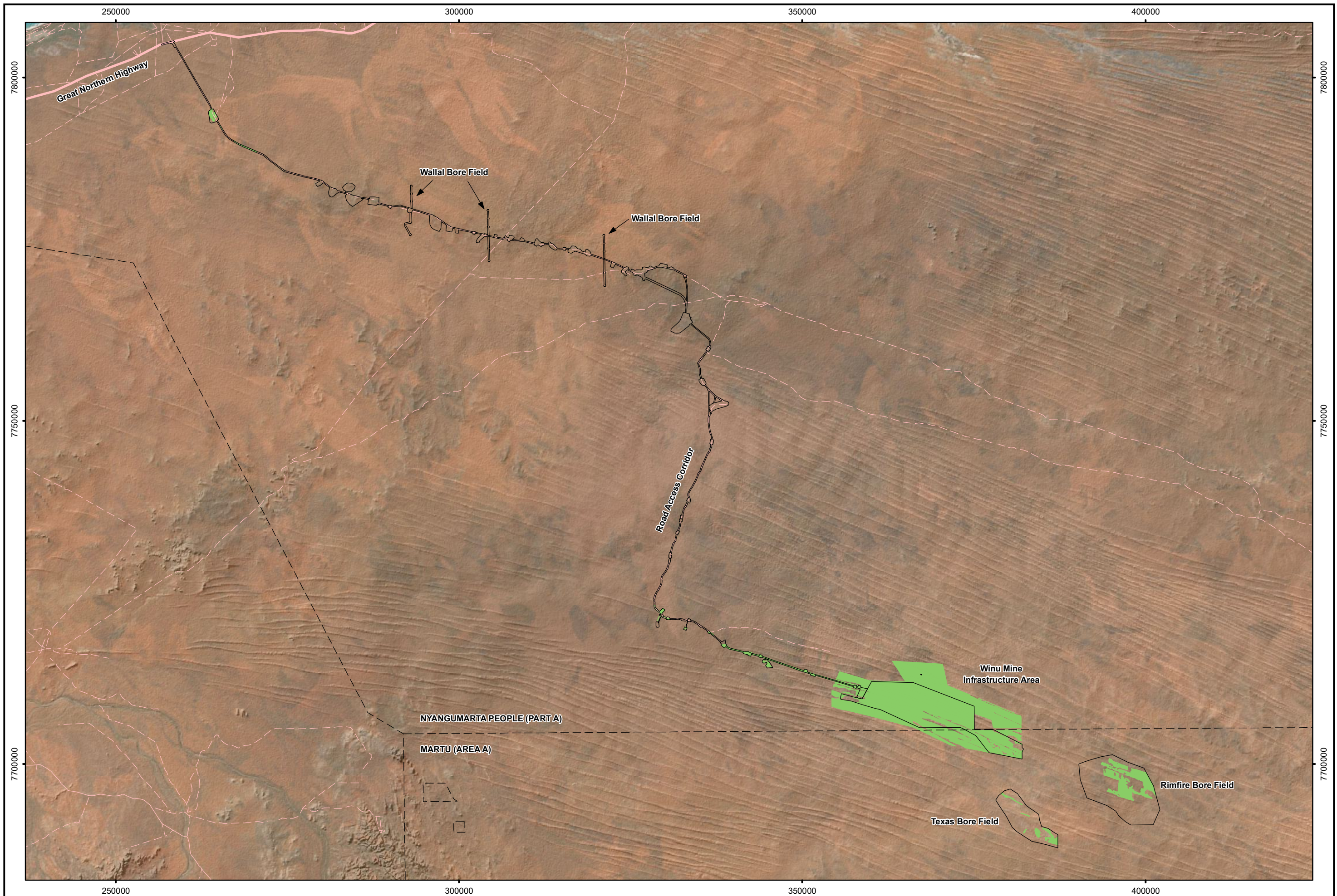
Distribution of *Hakea macrocarpa* within WA (WAH, 1998 -) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Hakea macrocarpa is associated with Inter-dunal Sand Plains, occurring within a number of Vegetation Associations. It is considered common and widespread, both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Hakea macrocarpa</i>	D1, P1, P2, P3, P4, P5, P6, P14, P15, P18	11,340.2	19,890.7

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Hakea macrocarpa</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_25 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Hakea macrocarpa</i>
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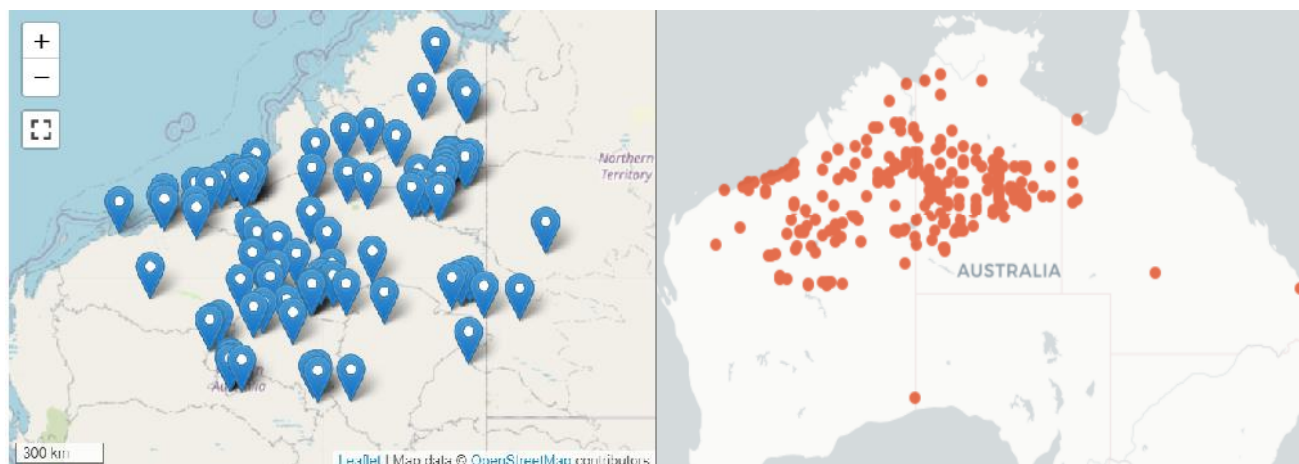
3.7. *Melaleuca lasiandra*

Nyangumarta name: Yurturl

Common name: Locally: Salt Tree

Description: Shrub or tree, 0.6-5 m high. Flowers white-cream, April to September or December. Red sand. Sandplains, swampy grounds, drainage lines (WAH, 1998-).

Distribution:



Distribution of *Melaleuca lasiandra* within WA (WAH, 1998 -) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Melaleuca lasiandra has a very restricted distribution across the Winu Project, found to occur in two currently un-mapped areas of the Rimfire and Texas Bore Fields. As these areas are currently unmapped, the total extent of this taxon could not be calculated. *Melaleuca lasiandra* is considered common and widespread across north-western Australia and the Northern Territory.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Melaleuca lasiandra</i>	P19	Unquantified	Unquantified

4. Shrub Species

4.1. *Acacia anaticeps*

Nyangumarta name: Warri Warri

Common name: Duck Headed Wattle; Sandfire Wattle

Description: Glabrous shrub or tree, 1-4 m high, bark fissured & corky. Flowers yellow, April to June. Red sand, sandy loam. Sand dunes, pindan plains (WAH, 1998-).

Distribution:



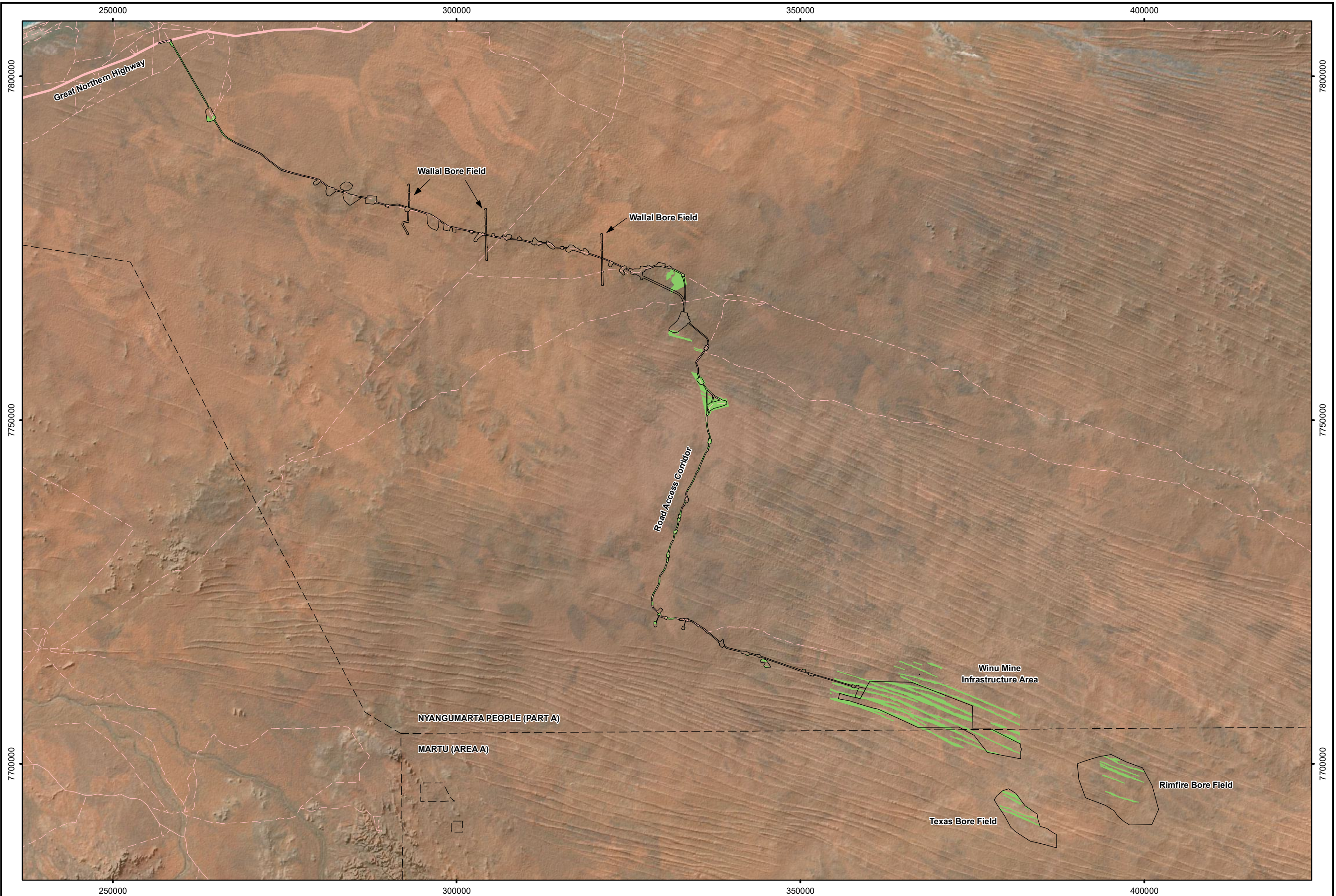
Distribution of *Acacia anaticeps* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia anaticeps is associated with Sand Dunes and Associated Swales, as well as the *Corymbia zygomphylla* Scattered Low Trees over *Triodia schinzii* (P10) and *Gardenia pyriformis* subsp. *keartlandii* Scattered Low Trees over *Triodia schinzii* (P13) Vegetation Associations. Within the Inter-dunal Sand Plains, it predominantly occurs around the RAC, however, is found on sand dunes across all sections of the Winu Project. *Acacia anaticeps* is considered common within the Great Sandy Desert bioregion.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia anaticeps</i>	D1, D2, D3, P10, P13	4,545.9	7,446.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Acacia anaticeps</i> Principal Road Minor Road Track		0510km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_01 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia anaticeps</i>
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4.2. *Acacia drepanocarpa* (variants)

Acacia drepanocarpa subsp. *drepanocarpa*

Nyangumarta name: Karlayin

Common name: None

Description: Spreading shrub, 0.9-1.2 m high, phyllodes linear, 50-85 mm long. Flowers yellow, June to August. Red sand. Pindan plains (WAH, 1998-).

Distribution:



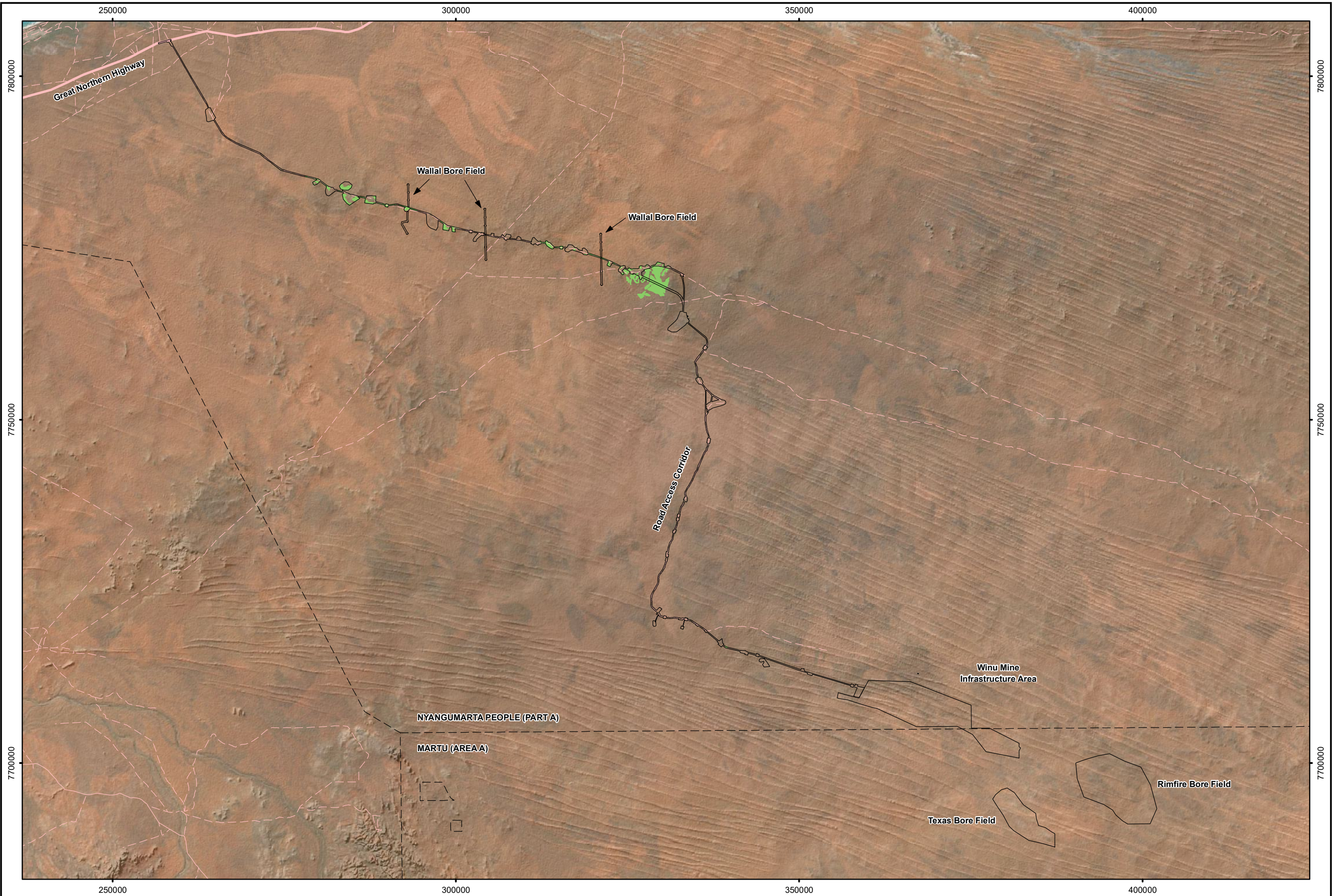
Distribution of *Acacia drepanocarpa* subsp. *drepanocarpa* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Two subspecies of *Acacia drepanocarpa* occur across the project, *Acacia drepanocarpa* subsp. *drepanocarpa* and *Acacia drepanocarpa* subsp. *latifolia*. The former has a more limited distribution, restricted to the *Grevillea refracta* (*Acacia ancistrocarpa* & *Acacia monticola*) Scattered Tall Shrubs over *Triodia epactia* (P11) Vegetation Association occurring along the RAC. It has also been observed to occur extensively within northern sections of the Wallal Bore Field, however, work remains unfinished in this areas so has not been included in the final calculation. The distribution of *Acacia drepanocarpa* subsp. *drepanocarpa* appears to be restricted to northern near-coastal regions of Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia drepanocarpa</i> subsp. <i>drepanocarpa</i>	P11	916.3	1,943.0

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community

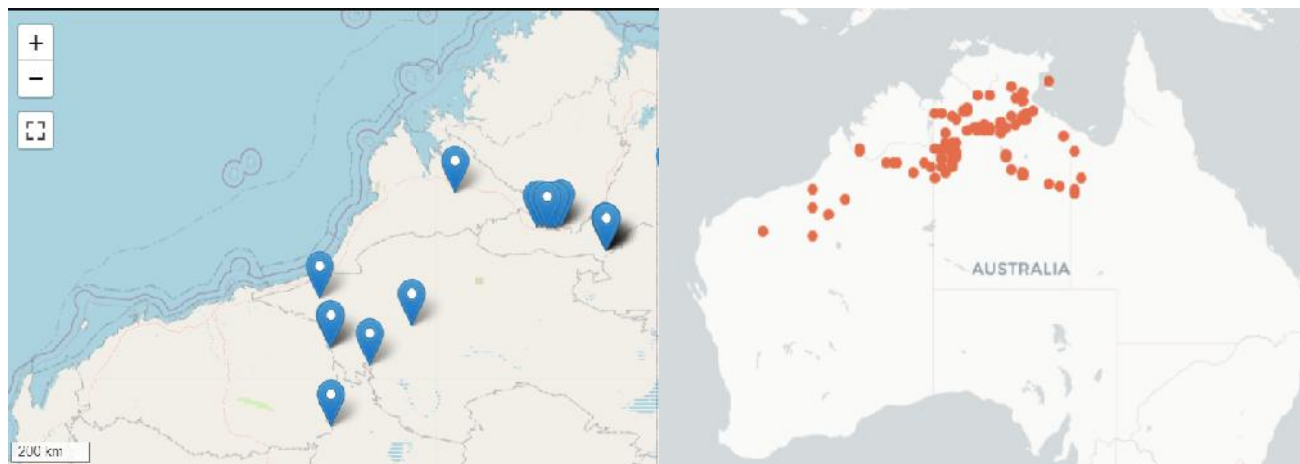


Legend Winu Development Envelope Distribution of <i>Acacia drepanocarpa</i> subsp. <i>drepanocarpa</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51)		
		Ref: a2923_WB1010_10_03	Author: J. Paterson	WB Ref: WB1010
		Date: Sep 2023 Rev: A A3	Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	

Interim Consolidated Detailed Flora & Vegetation
Assessment of the Winu Project, September 2023
Culturally Significant Species - *Acacia drepanocarpa* subsp. *drepanocarpa*

Acacia drepanocarpa* subsp. *latifolia**Nyangumarta name:** Karlayin**Common name:** None

Description: Spreading shrub, 1-4 m high, phyllodes narrowly elliptic, 35-65 mm long. Flowers yellow, May to August. Red and gravelly sand. Undulating plains (WAH, 1998-).

Distribution:

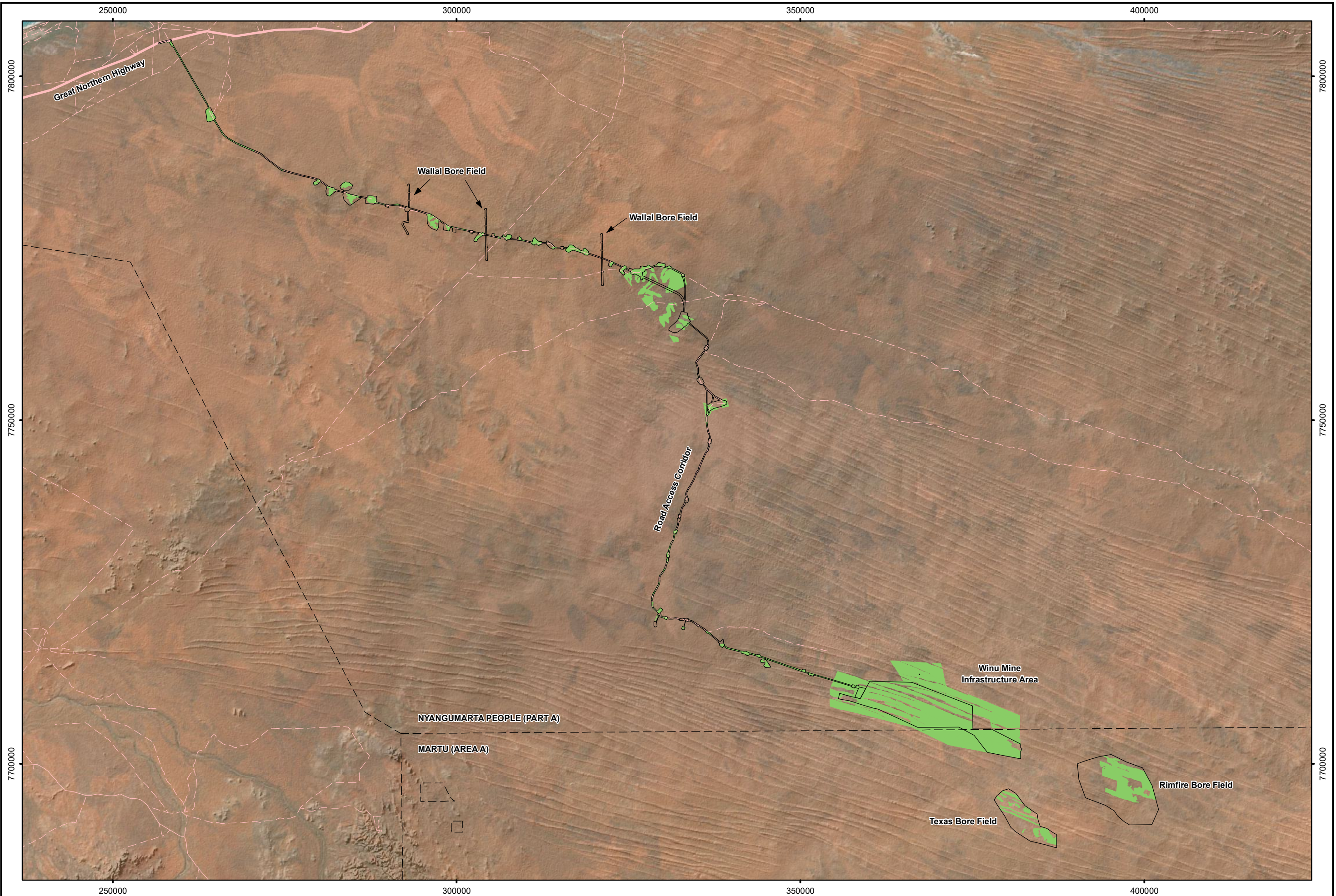
Distribution of *Acacia drepanocarpa* subsp. *latifolia* within WA (WAH, 1998-) and Australia (AVH, 2023).

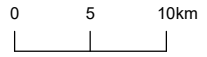
Occurrence within the Winu Project Area:

Contrasting from *Acacia drepanocarpa* subsp. *drepanocarpa*, *Acacia drepanocarpa* subsp. *latifolia* has a larger distribution across the Winu Project, occurring in multiple habitats, predominantly within Inter-dunal Sandplains, as well as Sand Dunes and Associated Swales and Stony Rises and Gentle Outcroppings. *Acacia drepanocarpa* subsp. *latifolia* is considered common and widespread, both locally and regionally – extending from north-western Australia into the NT.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia drepanocarpa</i> subsp. <i>latifolia</i>	D2, P1, P2, P3, P4, P5, P6, P10, P14, P15, P16, P17, P18, P19, R2, R3	916.3	1,943.0

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51)		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023	
 Winu Development Envelope	 Principal Road				Culturally Significant Species - <i>Acacia drepanocarpa</i> subsp. <i>latifolia</i>	
 Distribution of <i>Acacia drepanocarpa</i> subsp. <i>latifolia</i>	 Minor Road  Track					
Ref: a2923_WB1010_10_04		Author: J. Paterson		WB Ref: WB1010		
Date: Sep 2023 Rev: A A3		Drawn: CAD Resources ~ www.cadresources.com.au		Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

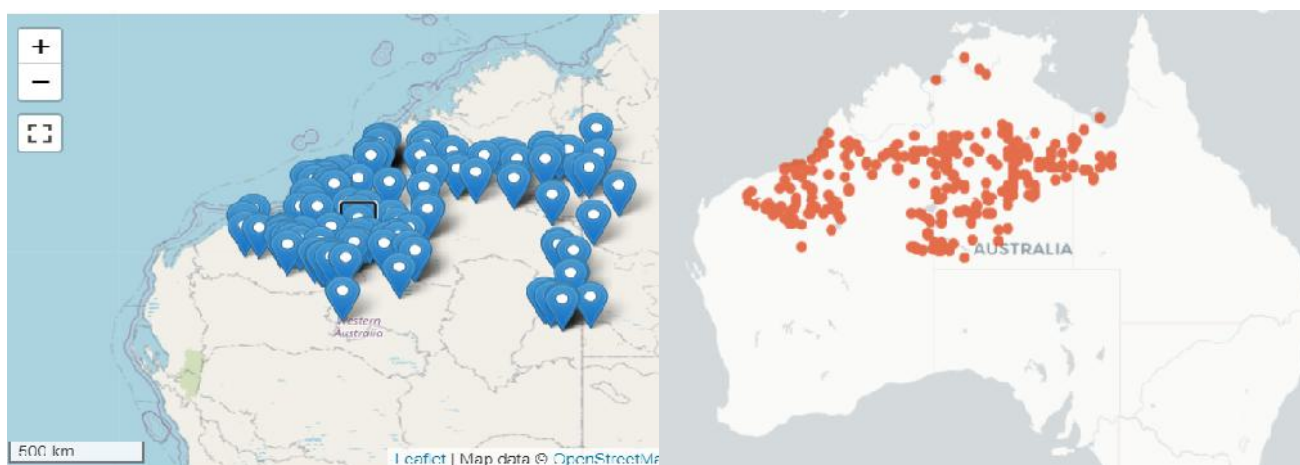
4.3. *Acacia hilliana*

Nyangumarta name: Purntakarnu

Common name: Hills Top Wattle

Description: Low spreading to sprawling or sometimes ascending, viscid shrub, 0.2-0.7(-1) m high, 0.75-5 m wide. Flowers yellow, March to October. Red sand, stony soils. Rocky hills and ranges, sand dunes, sandplains, rocky plateaus (WAH, 1998-).

Distribution:



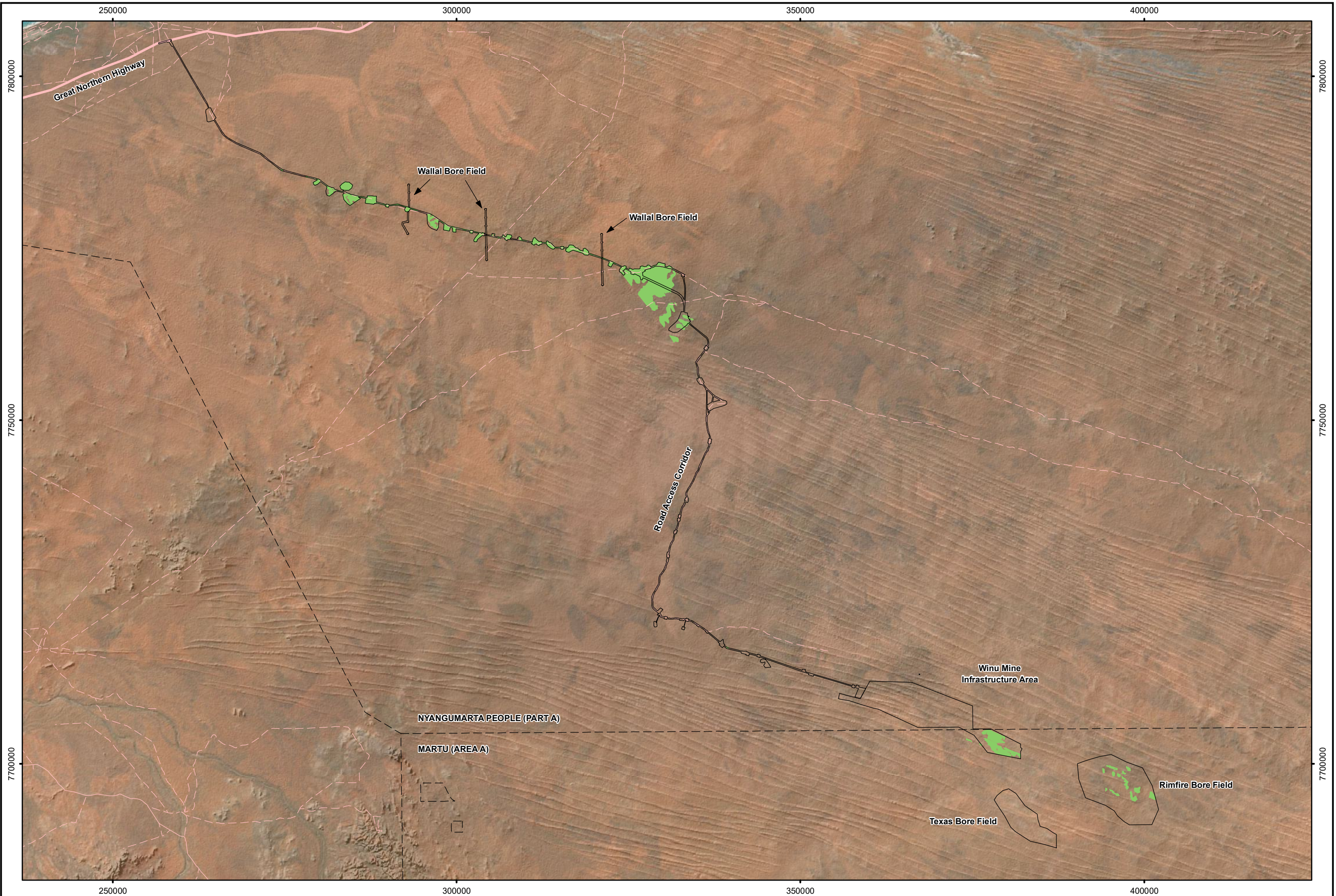
Distribution of *Acacia hilliana* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia hilliana is associated with Stony Rises and Gentle Outcroppings. It is considered common and widespread both locally and regionally, predominantly occurring in gravelly sections of the RAC and the Rimfire Bore Field, as well as the south-eastern portion of the MIA.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia hilliana</i>	P5, P11, P12, R2, R3, R4	3,778.3	6,285.5

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Acacia hilliana</i>	Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51)		Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202
			Ref: a2923_WB1010_10_05		
			Date: Sep 2023 Rev: A A3		

Interim Consolidated Detailed Flora & Vegetation

Assessment of the Winu Project, September 2023

Culturally Significant Species - *Acacia hilliana*

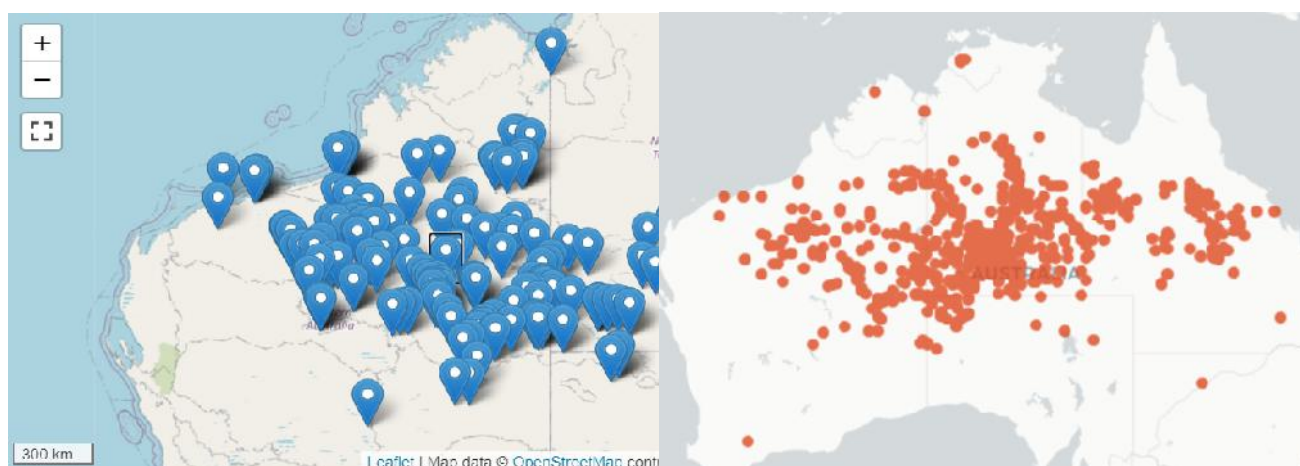
4.4. *Acacia melleodora*

Nyangumarta name: Palmangu

Common name: Waxy Wattle

Description: Shrub, to 3 m high, phyllodes coriaceous, stiff, straight, 3-4.5 cm long, (5-)7-10(-12) mm wide, heads globular. Flowers yellow, May to September. Red sand, laterite. Dunes, sandplains (WAH, 1998-).

Distribution:



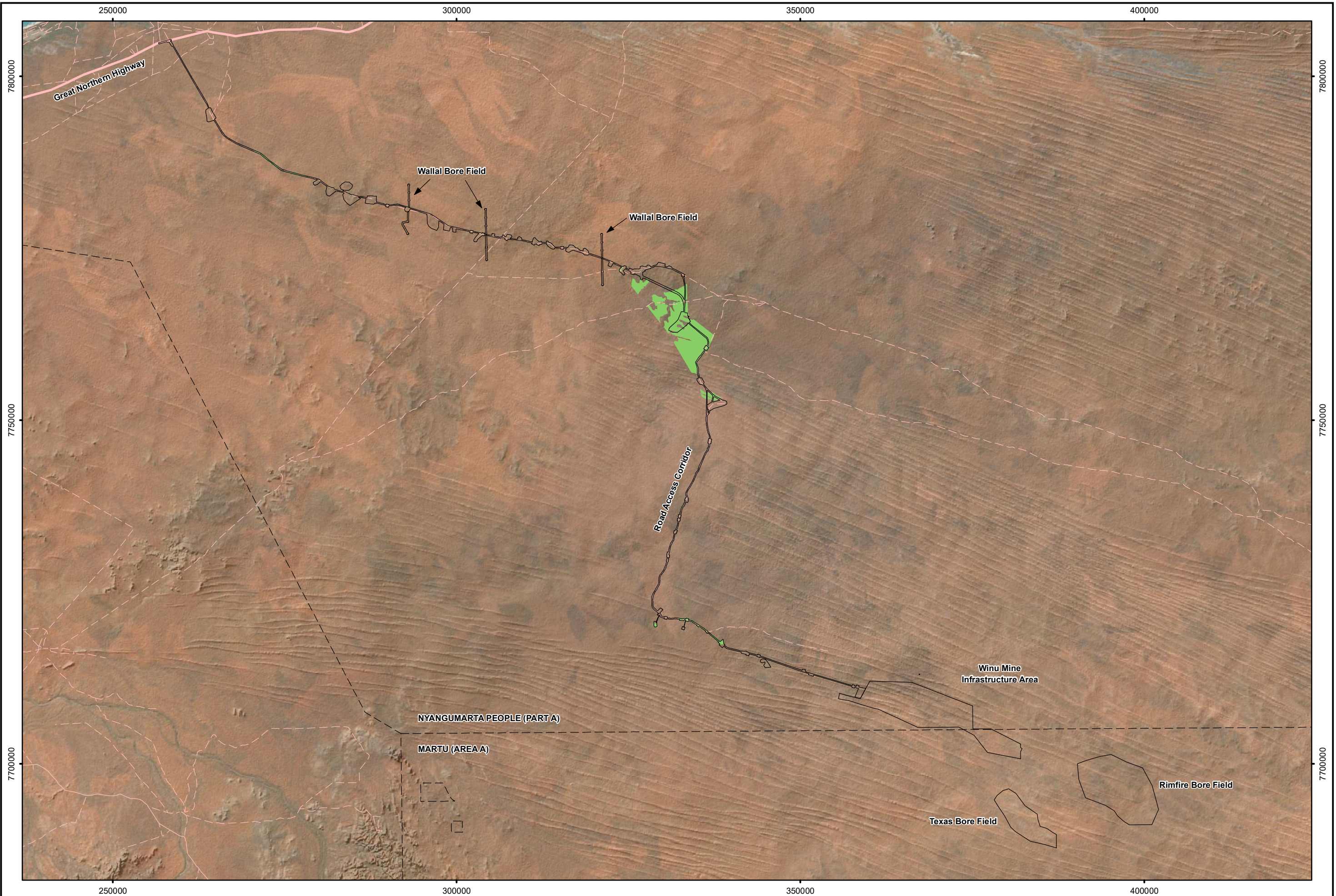
Distribution of *Acacia melleodora* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia melleodora appears to have a restricted distribution across the Study Area, occurring in the *Acacia eriopoda* & *Acacia sericophylla* Tall Open Shrubland over *Triodia schinzii* (*Triodia epactia*) (P8), as well as the *Melaleuca lasiandra* Low Open Shrubland over *Triodia schinzii* (P19) Vegetation Associations. This taxon is considered common and widespread across central Australia, however, appears to have a limited occurrence across the Winu Project.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia melleodora</i>	P8	914.5	5,004.1

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Acacia melleodora</i> - Principal Road - Minor Road - Track	 0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_06 Date: Sep 2023 Rev: A A3	 <table border="1"><tr><td>Author: J. Paterson</td><td>WB Ref: WB1010</td></tr><tr><td colspan="2">Drawn: CAD Resources ~ www.cadresources.com.au</td></tr><tr><td colspan="2">Tel: (08) 9246 3242 ~ Fax (08) 9246 3202</td></tr></table>	Author: J. Paterson	WB Ref: WB1010	Drawn: CAD Resources ~ www.cadresources.com.au		Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia melleodora</i>
Author: J. Paterson	WB Ref: WB1010								
Drawn: CAD Resources ~ www.cadresources.com.au									
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202									

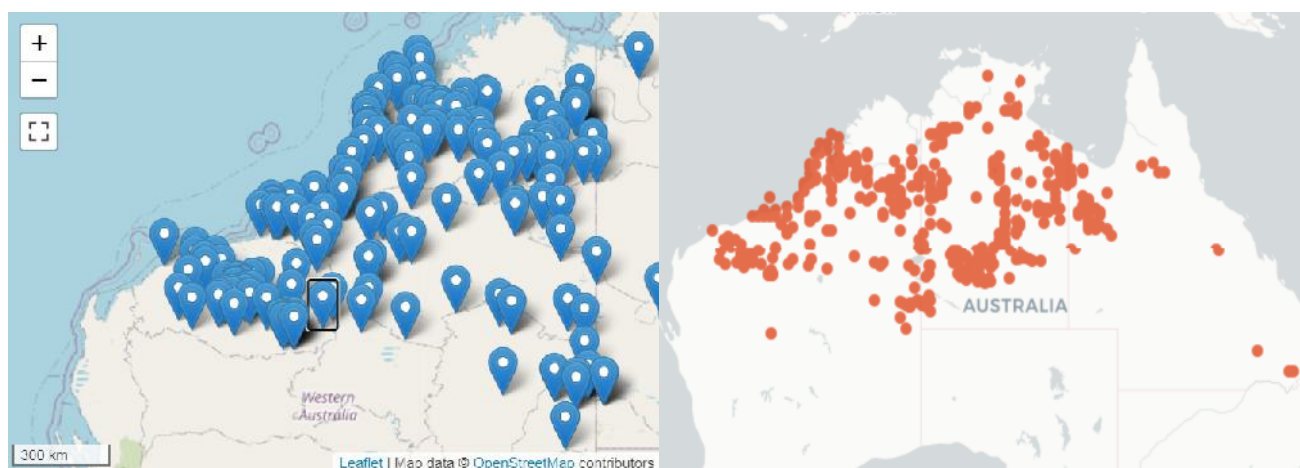
4.5. *Acacia monticola*

Nyangumarta name: Kawarr

Common name: Curly Bark Wattle

Description: Viscid shrub or tree, (0.6-)1-5(-7) m high, bark 'minni-ritchi'. Flowers yellow, April to August. Red sand, ironstone or lateritic soils, sandstone. Pindan plains, stony plains, low rocky ridges (WAH, 1998-).

Distribution:



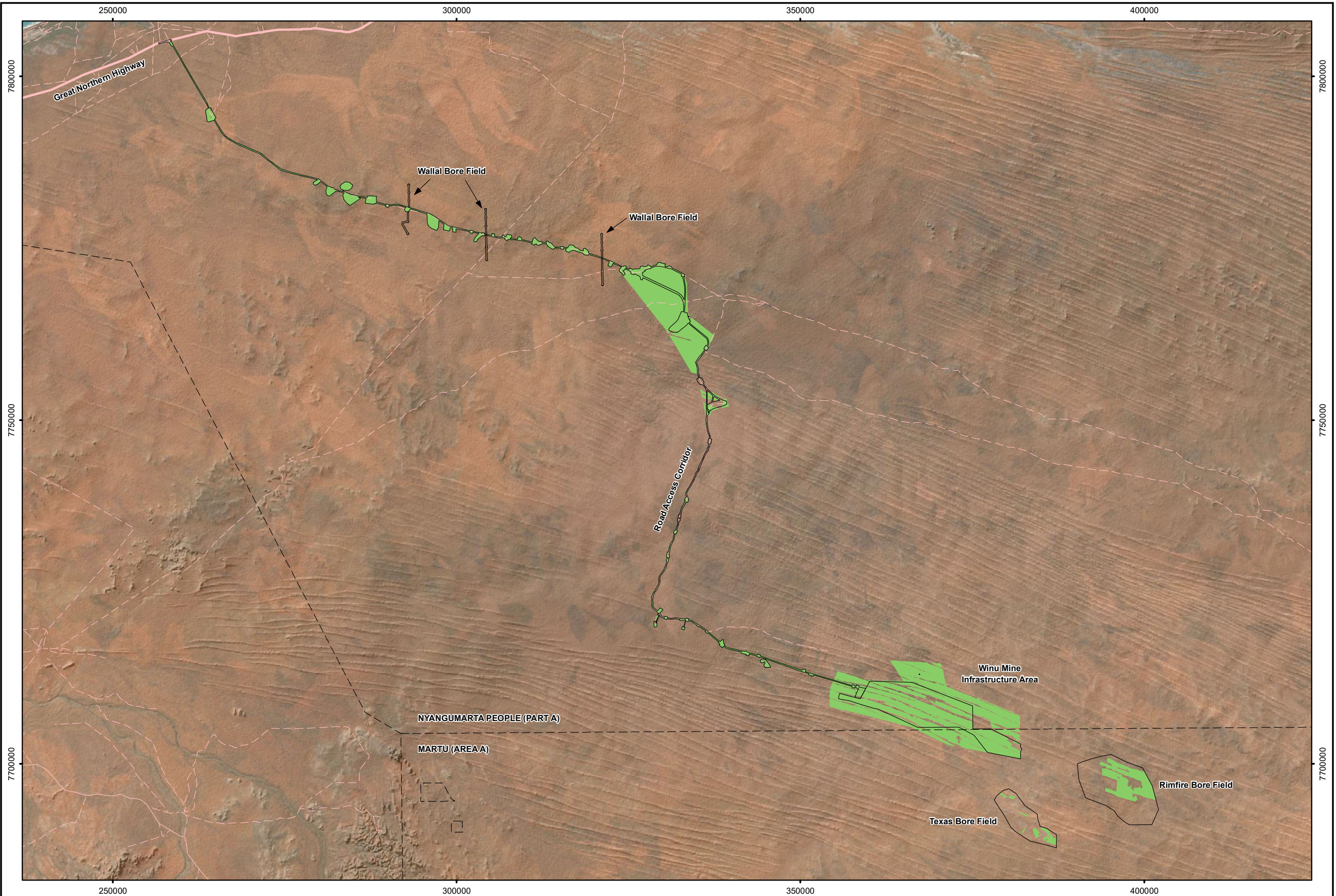
Distribution of *Acacia monticola* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia monticola is considered common and widespread both locally and regionally. It occurs frequently within numerous Vegetation Associations occupying Inter-dunal Sand Plains and Stony Rises and Gentle Outcroppings.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia monticola</i>	P1, P2, P3, P4, P5, P7, P8, P9, P10, P11, P12, P14, P15, P18, P19, R2, R3, R4, R6	15,032.0	30,182.5

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_07 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia monticola</i>
Winu Development Envelope	Principal Road				
Distribution of <i>Acacia monticola</i>	Minor Road Track				

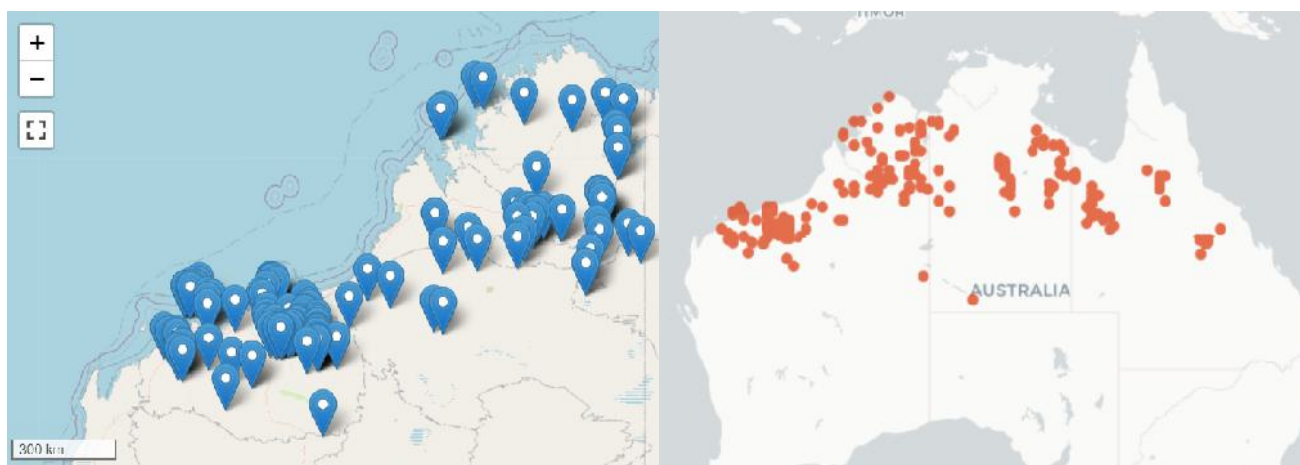
4.6. *Acacia orthocarpa*

Nyangumarta name: Wayalany

Common name: Needle-Leaf Wattle, Straight Podded Wattle, locally as Broom Wattle.

Description: Erect spreading or spindly shrub, 0.9-3(-4) m high. Flowers yellow, March to April or June to July or October. Sandy or stony soils, often over sandstone or ironstone. Rocky hills and rises, plains (WAH, 1998-).

Distribution:



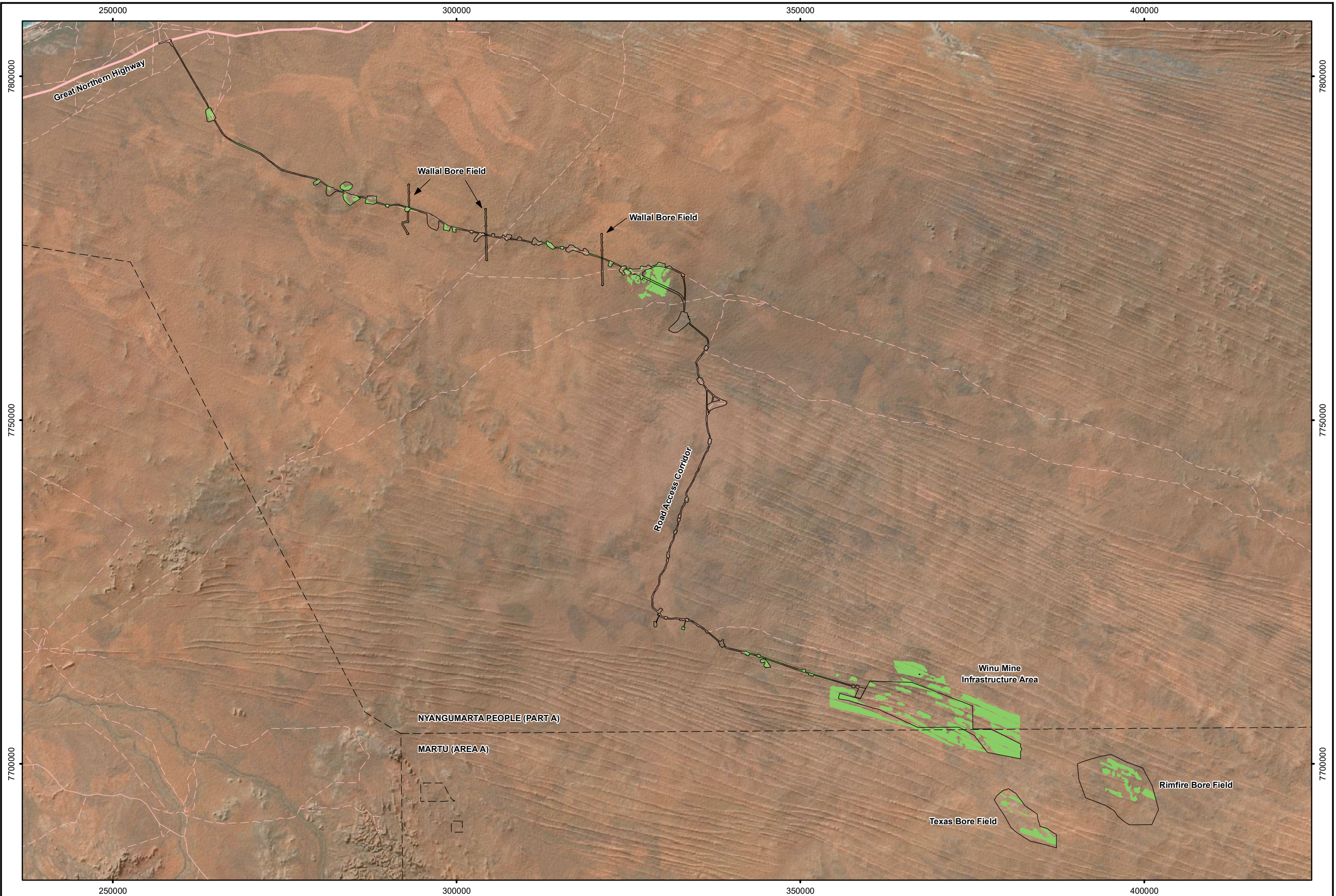
Distribution of *Acacia orthocarpa* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia orthocarpa is considered common and widespread both locally and regionally. It occurs frequently within numerous Vegetation Associations occupying Inter-dunal Sand Plains and Stony Rises and Gentle Outcroppings.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia orthocarpa</i>	P2, P3, P4, P5, P7, P11, P14, P15, P18, R1, R2, R5, R6	6,031.6	12,451.3

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Acacia orthocarpa</i> - Principal Road - Minor Road - Track	0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_08 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia orthocarpa</i>
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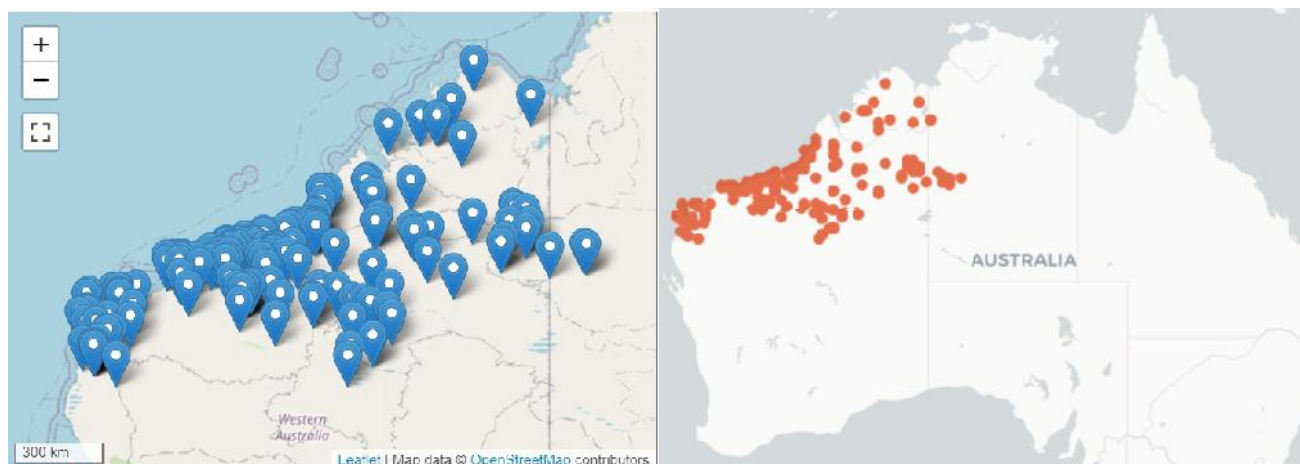
4.7. *Acacia stellaticeps*

Nyangumarta name: Pirrnyuru

Common name: Poverty Bush

Description: Low, dense shrub, to 1 m high. Flowers October to December or January to May. Red sand, stony sand, clay. Flats, sand ridges, plains, rubbish tip (WAH, 1998-).

Distribution:



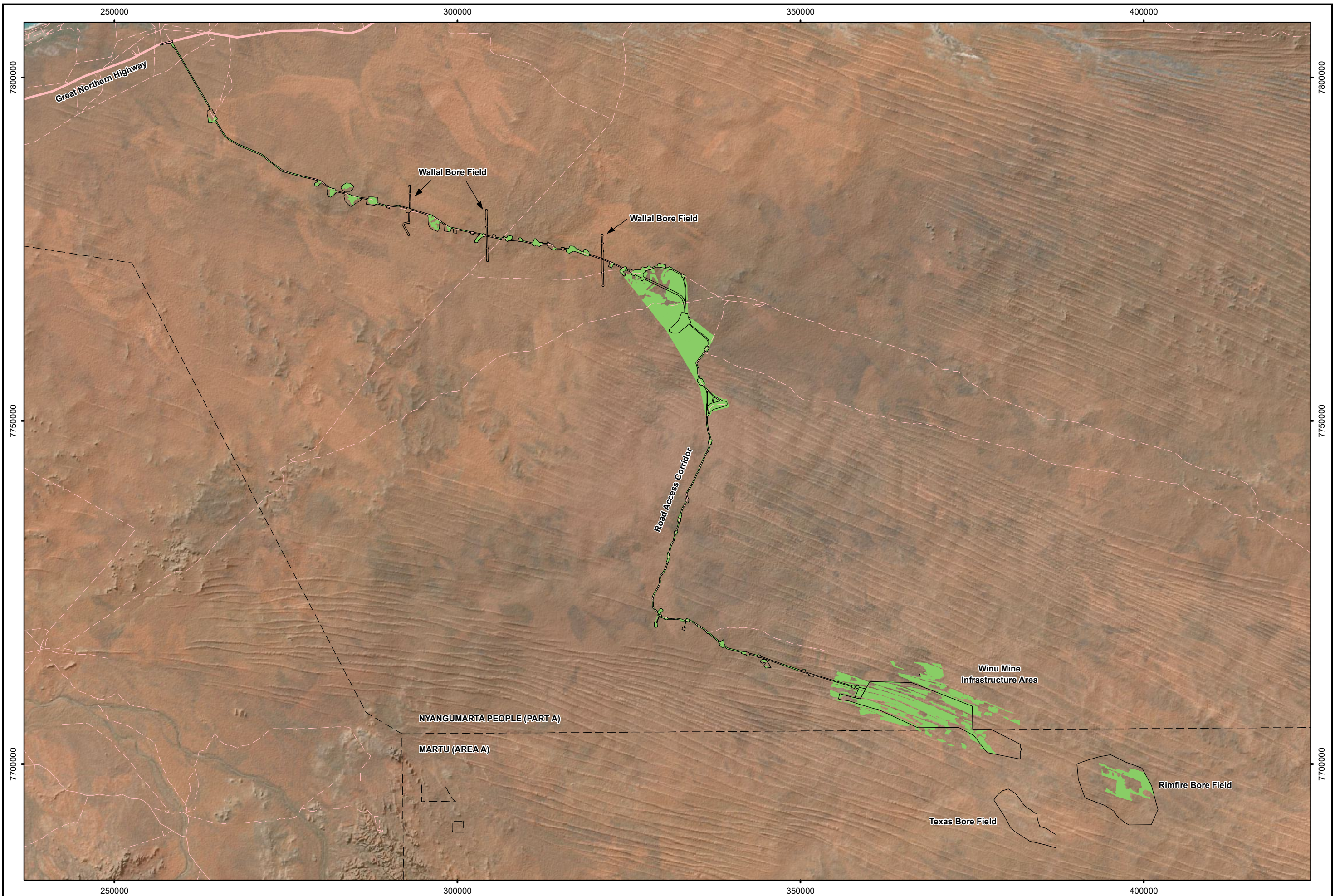
Distribution of *Acacia stellaticeps* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Acacia stellaticeps is associated with a range of habitats, however, mostly occurs within Inter-dunal Sand Plains. While it was found to occur within the *Acacia platycarpa* (*Acacia tumida* var. *kulparn*) Open Shrubland over *Triodia schinzii* (P1) Vegetation Association, its distribution across the Project Area is less than what is depicted in the map below. However, it occurs as a co-dominant species within the *Acacia bivenosa* (*Acacia stellaticeps*) Low Shrubland over *Triodia epactia* (R7), occurring in the Texas Bore Field – this area is yet to be calculated. *Acacia stellaticeps* is considered common and widespread within northern Western Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Acacia stellaticeps</i>	D3, P1, P3, P8, P10, P13, P16, R3	10,298.6	20,131.1

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend - Winu Development Envelope - Distribution of <i>Acacia stellaticeps</i> - Principal Road - Minor Road - Track	 0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_09 Date: Sep 2023 Rev: A A3	 <table border="1"><tr><td>Author: J. Paterson</td><td>WB Ref: WB1010</td></tr><tr><td colspan="2">Drawn: CAD Resources ~ www.cadresources.com.au</td></tr><tr><td colspan="2">Tel: (08) 9246 3242 ~ Fax (08) 9246 3202</td></tr></table>	Author: J. Paterson	WB Ref: WB1010	Drawn: CAD Resources ~ www.cadresources.com.au		Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Acacia stellaticeps</i>
Author: J. Paterson	WB Ref: WB1010								
Drawn: CAD Resources ~ www.cadresources.com.au									
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202									

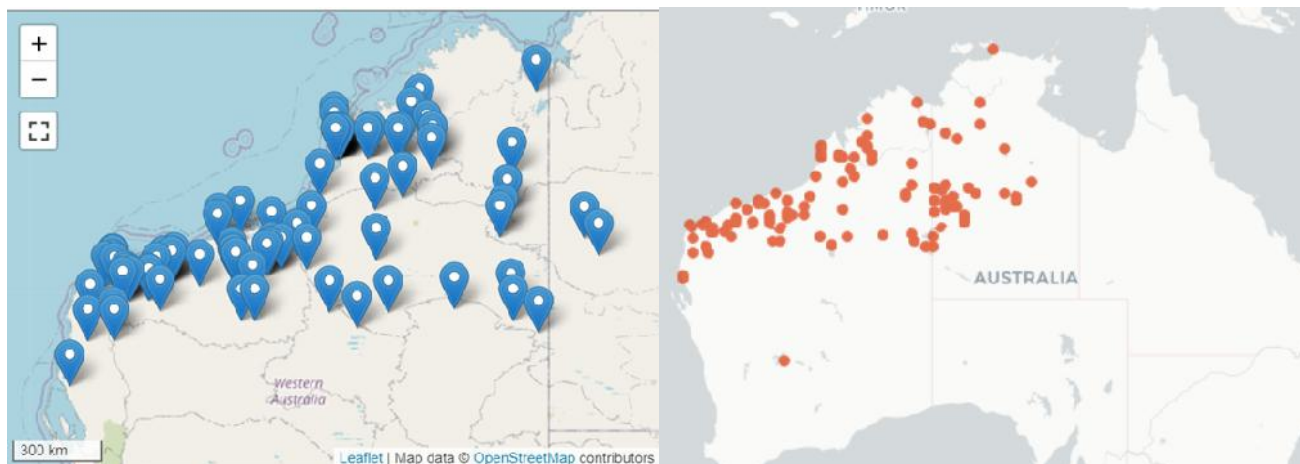
4.8. *Cullen martinii*

Nyangumarta name: Mangarr

Common name: None

Description: Erect shrub, 0.4-2.5 m high. Flowers blue-purple/blue, February, or April to November. Red sandy soils. Sand dunes (WAH, 1998-).

Distribution:



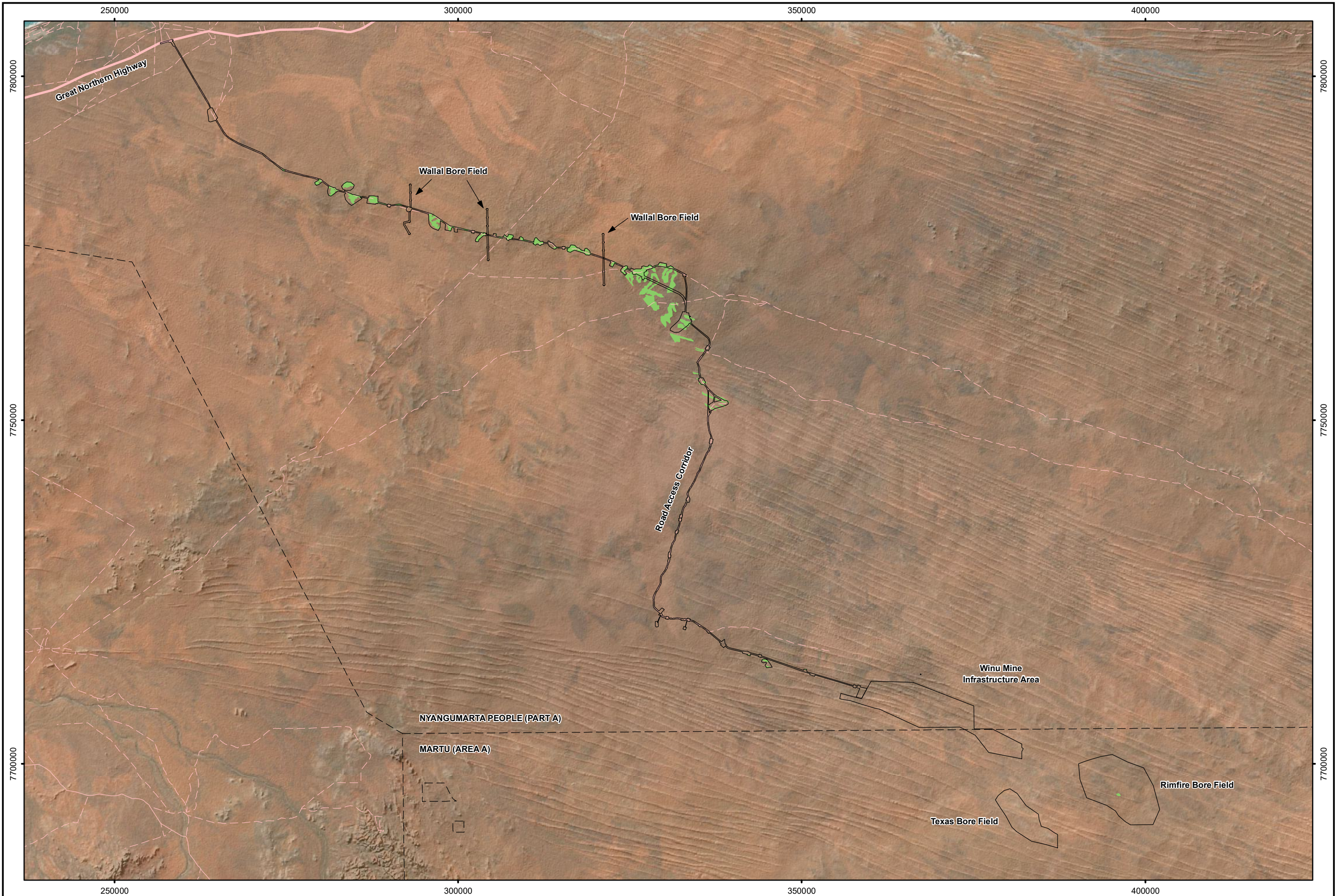
Distribution of *Cullen martinii* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Cullen martinii is associated with *Grevillea stenobotrya*, *Grevillea wickhamii* & *Acacia anaticeps* Tall Shrubland over *Triodia schinzii* (D3) and *Acacia hilliana* (*Acacia adoxa* var. *adoxa*) Low Open Shrubland over *Triodia epactia* (R3) Vegetation Associations. Its extent across the Winu Project is considered limited, however, has a larger regional distribution throughout north-Western Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Cullen martinii</i>	D3, R3	1,707.0	3,329.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Cullen martinii</i>	Principal Road Minor Road Track	N	0510 km Scale: 1:500,000 MGA94 (Zone 51)		Western Botanical	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Cullen martinii</i>	
			Ref: a2923_WB1010_10_15				
			Date: Sep 2023 Rev: A A3				
			Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202				

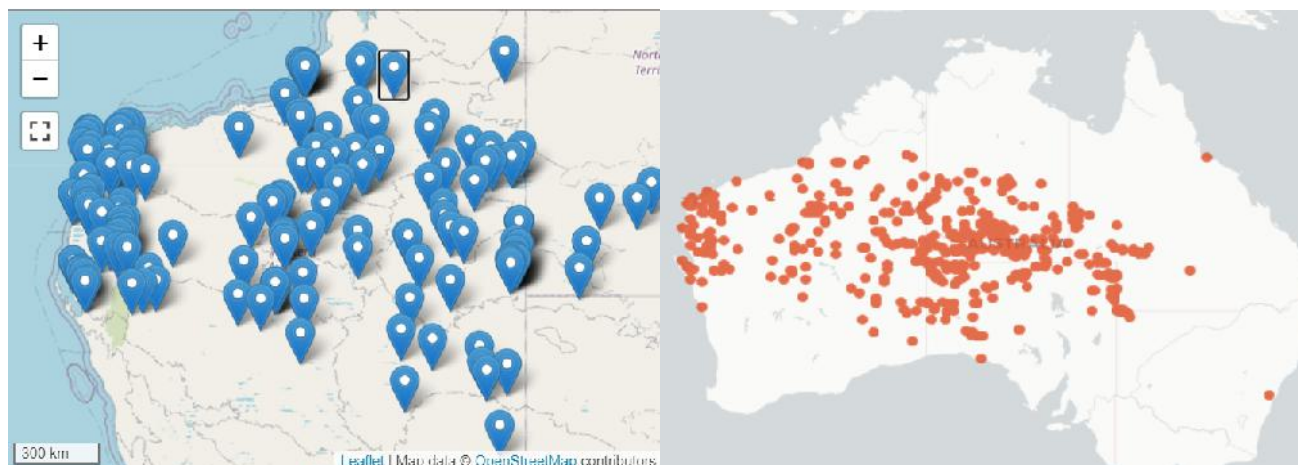
4.9. *Grevillea stenobotrya*

Nyangumarta name: Pirrpuku

Common name: Sandhill Spider Flower

Description: Erect or spreading shrub or tree, (1-)2-4(-6) m high. Flowers cream-white/yellow, April to November. Red sand. Sand dunes (WAH, 1998-).

Distribution:



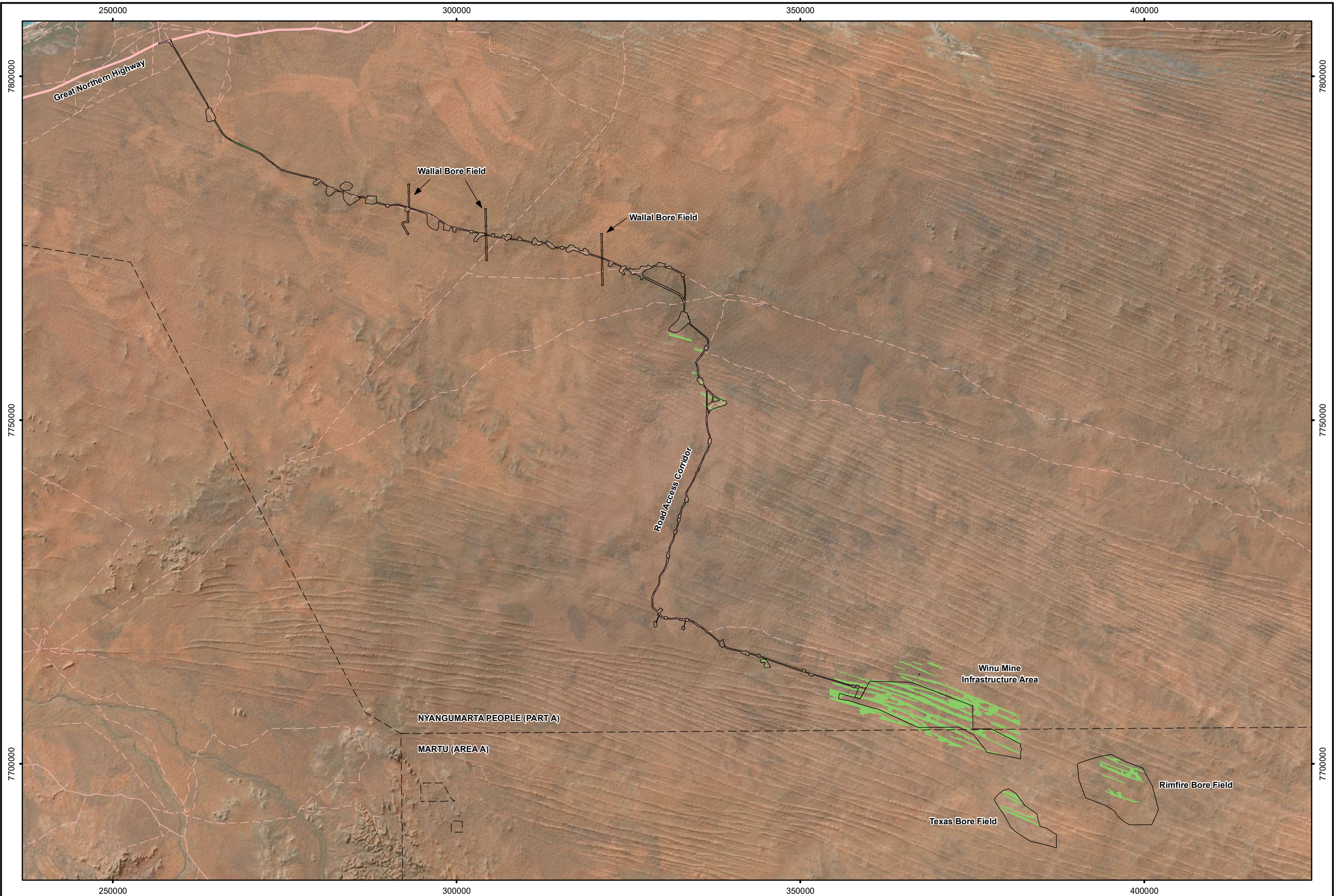
Distribution of *Grevillea stenobotrya* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Grevillea stenobotrya was commonly encountered in Sand Dune and Associated Swale habitats. Although it occurs occasionally with these units, it is still considered common and widespread across the Project, as well as regionally – with an extensive range across central Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Grevillea stenobotrya</i>	D1, D2, D3, P3	3,993.2	6,820.2

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Grevillea stenobotrya</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_21 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Grevillea stenobotrya</i>
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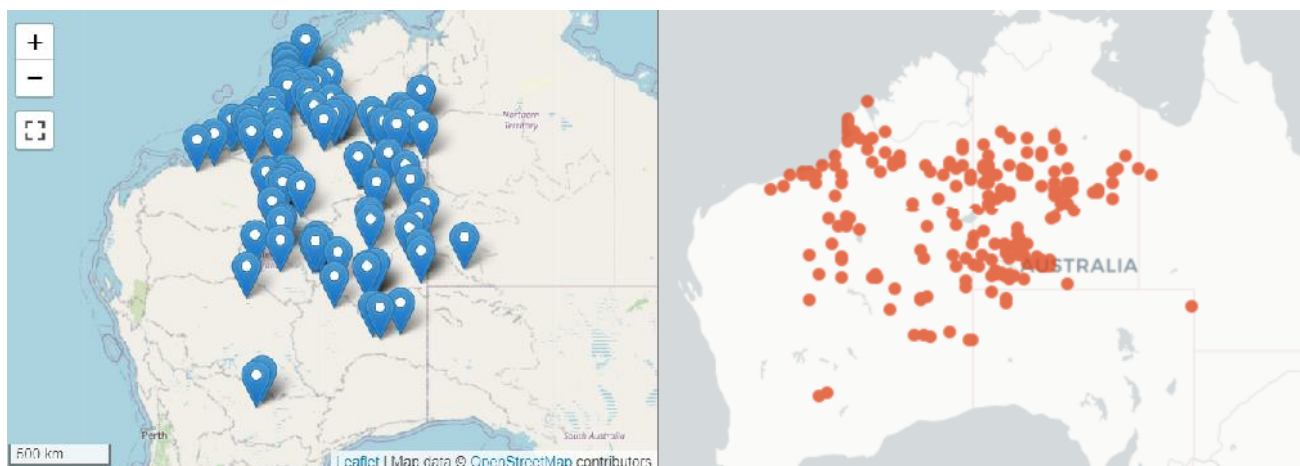
4.10. *Gyrostemon tepperi*

Nyangumarta name: Julyungku

Common name: None

Description: Pyramidal, often slightly viscid shrub, 0.2-2.5 m high. Flowers green-yellow, May to September. Sand. Sandhills and plains (WAH, 1998-).

Distribution:



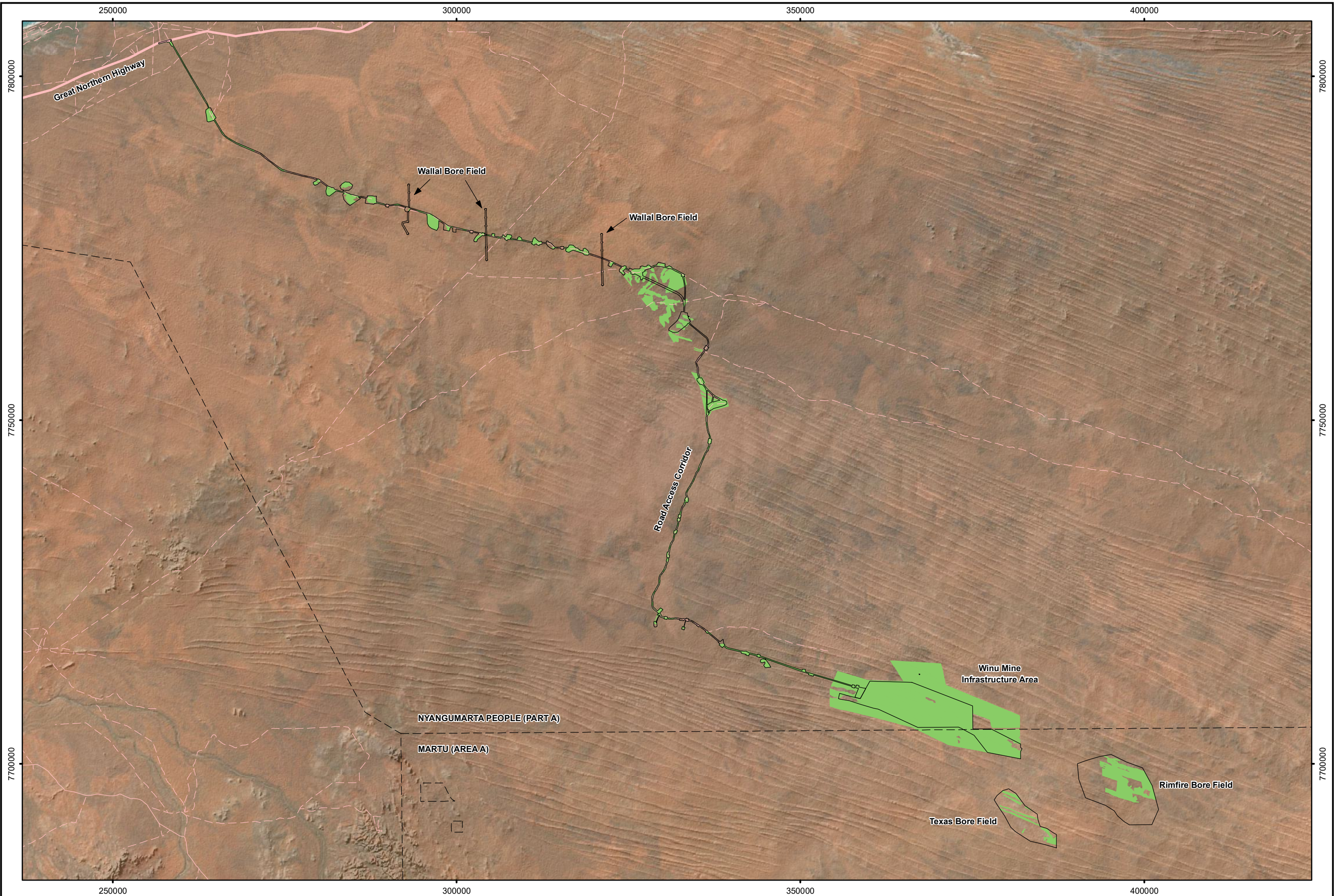
Distribution of *Gyrostemon tepperi* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Gyrostemon tepperi is associated with a variety of habitat types. It is considered common and widespread across the Winu Project. Its distribution extends throughout north-western Australia into the Northern Territory.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Gyrostemon tepperi</i>	D1, D2, D3, P1, P2, P3, P4, P5, P9, P10, P13, P14, P16, P18, P19, R2, R3	16,512.5	28,603.3

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Gyrostemon tepperi</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51)			
		Ref: a2923_WB1010_10_23	Author: J. Paterson	WB Ref: WB1010	
		Date: Sep 2023 Rev: A A3	Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

**Interim Consolidated Detailed Flora & Vegetation
Assessment of the Winu Project, September 2023
Culturally Significant Species - *Gyrostemon tepperi***

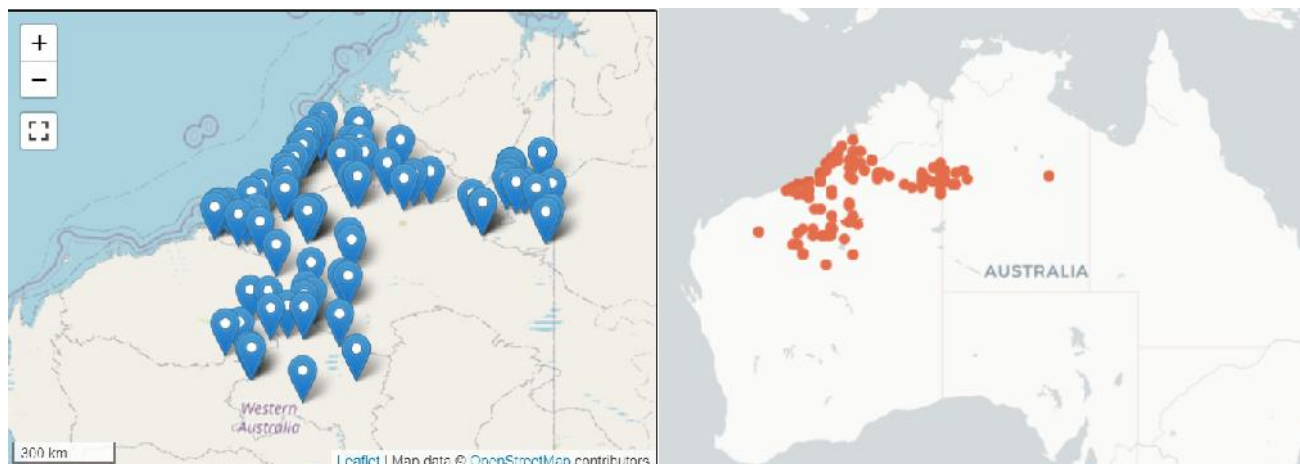
4.11. *Jacksonia aculeata*

Nyangumarta name: Purarrpurarr

Common name: None

Description: Divaricate, somewhat spiny shrub, 0.2-1(-1.5) m high. Flowers yellow/yellow-orange, April to October. Red sand. Sand dunes and sandplains (WAH, 1998-).

Distribution:



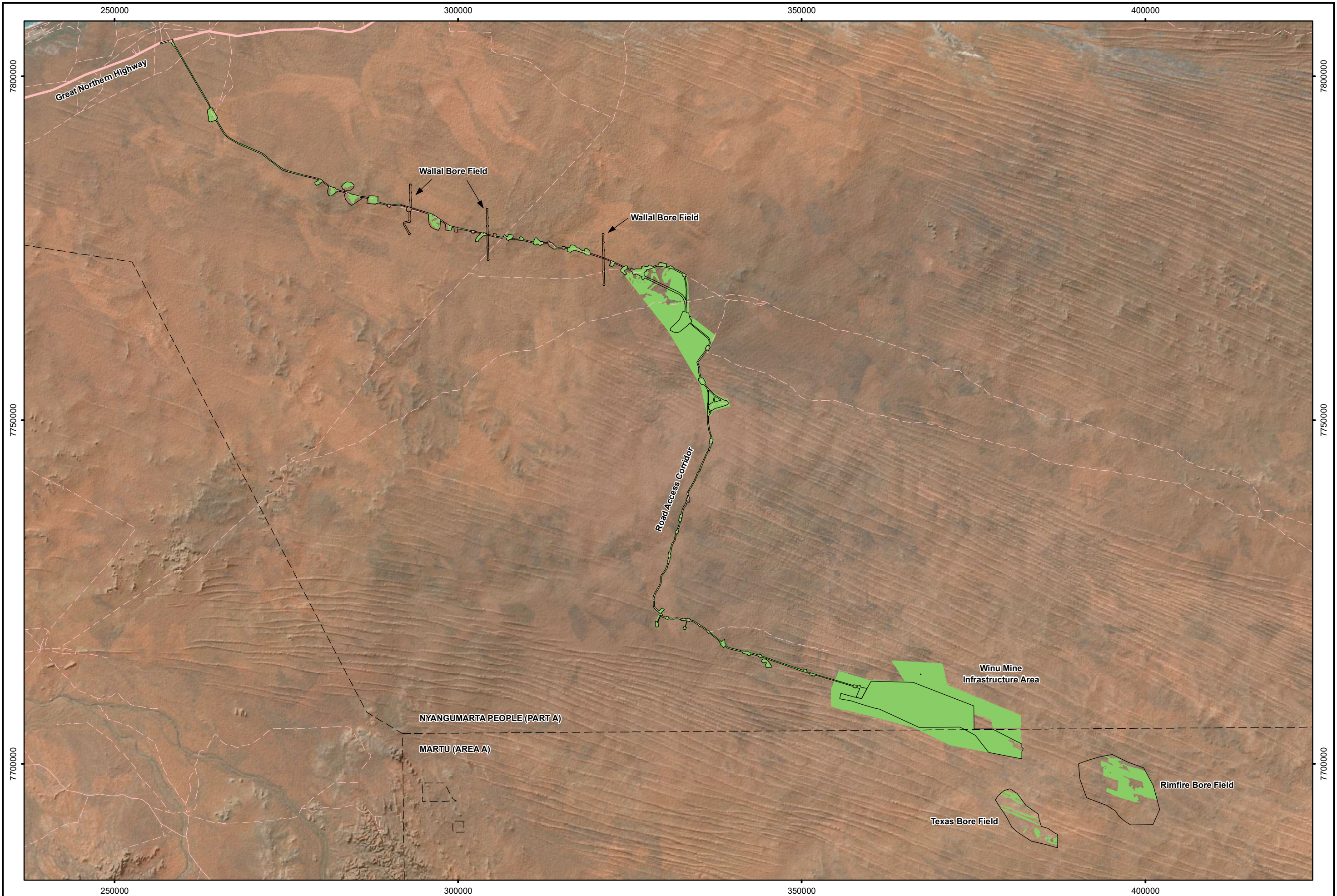
Distribution of *Jacksonia aculeata* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Jacksonia aculeata is associated with a variety of habitat types. It is considered common and widespread both locally, and within the Great Sandy Desert bioregion.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Jacksonia aculeata</i>	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P10, P13, P14, P15, P16, R2, R3, R6	17,191.6	33,497.9

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Jacksonia aculeata</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_26 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Jacksonia aculeata</i>
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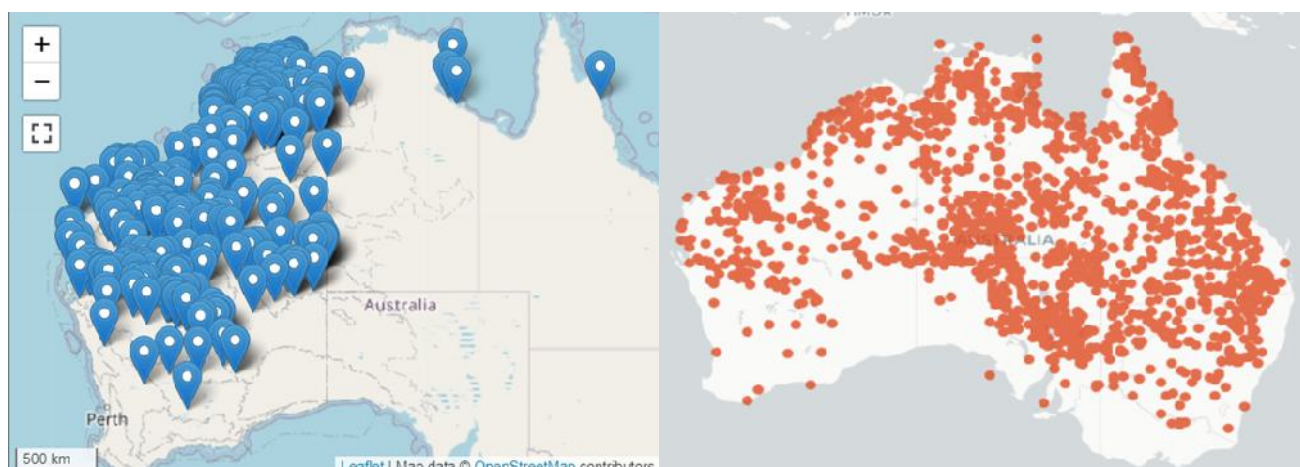
4.12. *Santalum lanceolatum*

Nyangumarta name: Purtatu

Common name: Northern Sandalwood

Description: Shrub, 1-7 m high, hemiparasitic on roots. Flowers green-white-cream, January to October. Red sand, sandy loam, clay. Creek and river beds, red sand dunes, sandstone or limestone ridges (WAH, 1998-).

Distribution:



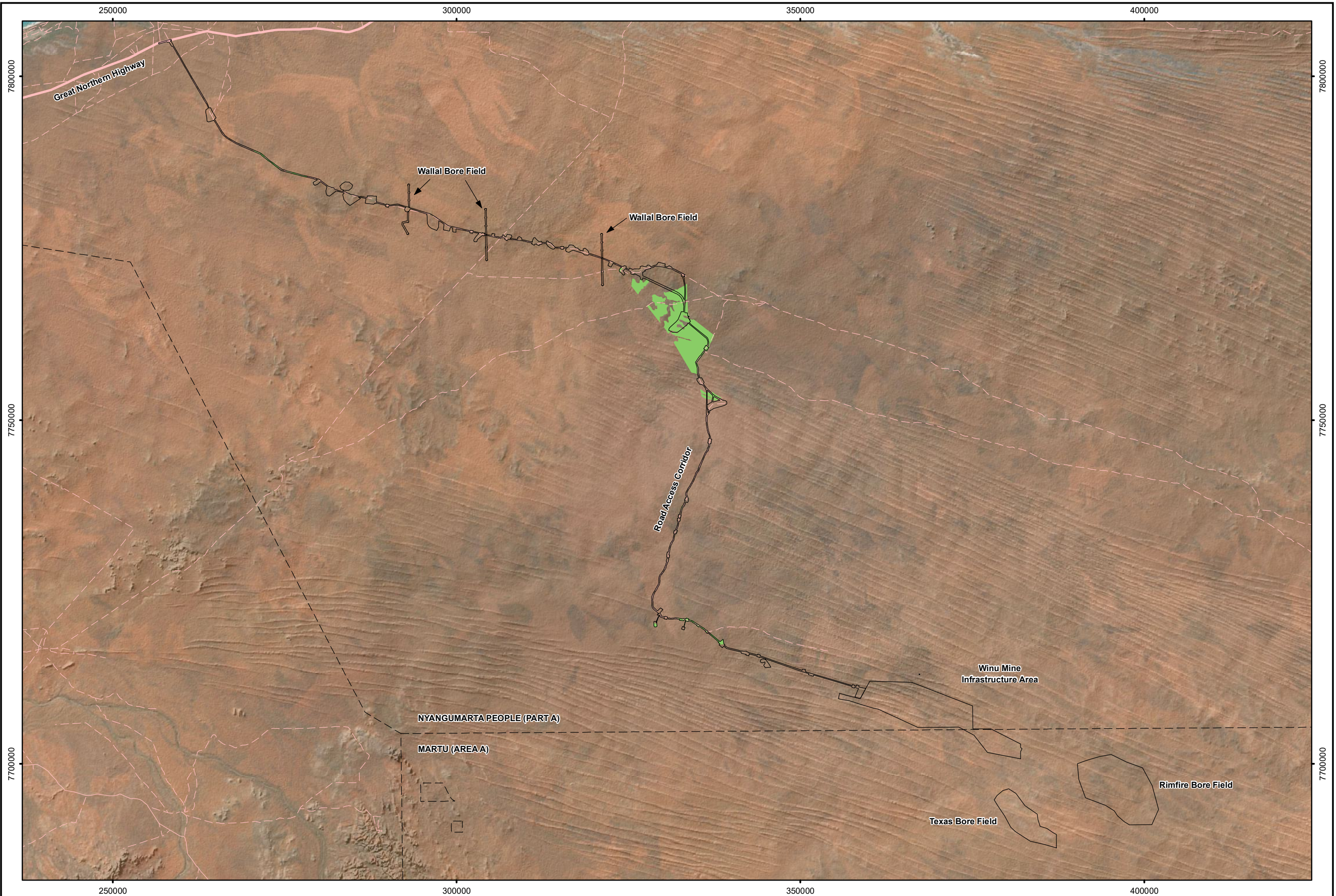
Distribution of *Santalum lanceolatum* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Santalum lanceolatum has a restricted distribution across the Project Area, occurring within one quadrat only in the *Acacia eriopoda* & *Acacia sericophylla* Tall Open Shrubland over *Triodia schinzii* (*Triodia epactia*) (P8) Vegetation Association. This taxon was observed sporadically across the project and likely has a larger distribution than depicted below. While *Santalum lanceolatum* was not locally common across the Project, it is extremely widespread throughout Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Santalum lanceolatum</i>	P8	914.5	5,004.1

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend  Winu Development Envelope  Distribution of <i>Santalum lanceolatum</i>  Principal Road  Minor Road  Track		 0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_28 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Santalum lanceolatum</i>
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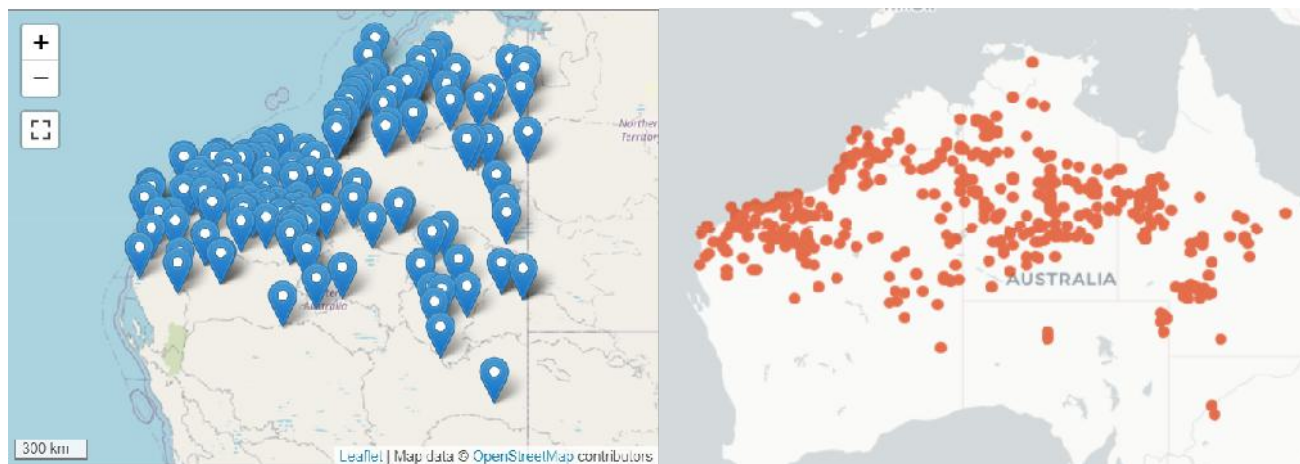
4.13. *Senna notabilis*

Nyangumarta name: Kalayakalaya

Common name: Cockroach Bush

Description: Spreading shrub, 0.3-1.5(-2.1) m high. Flowers yellow, April to October. Red sandy, clay or stony soils (WAH, 1998-).

Distribution:



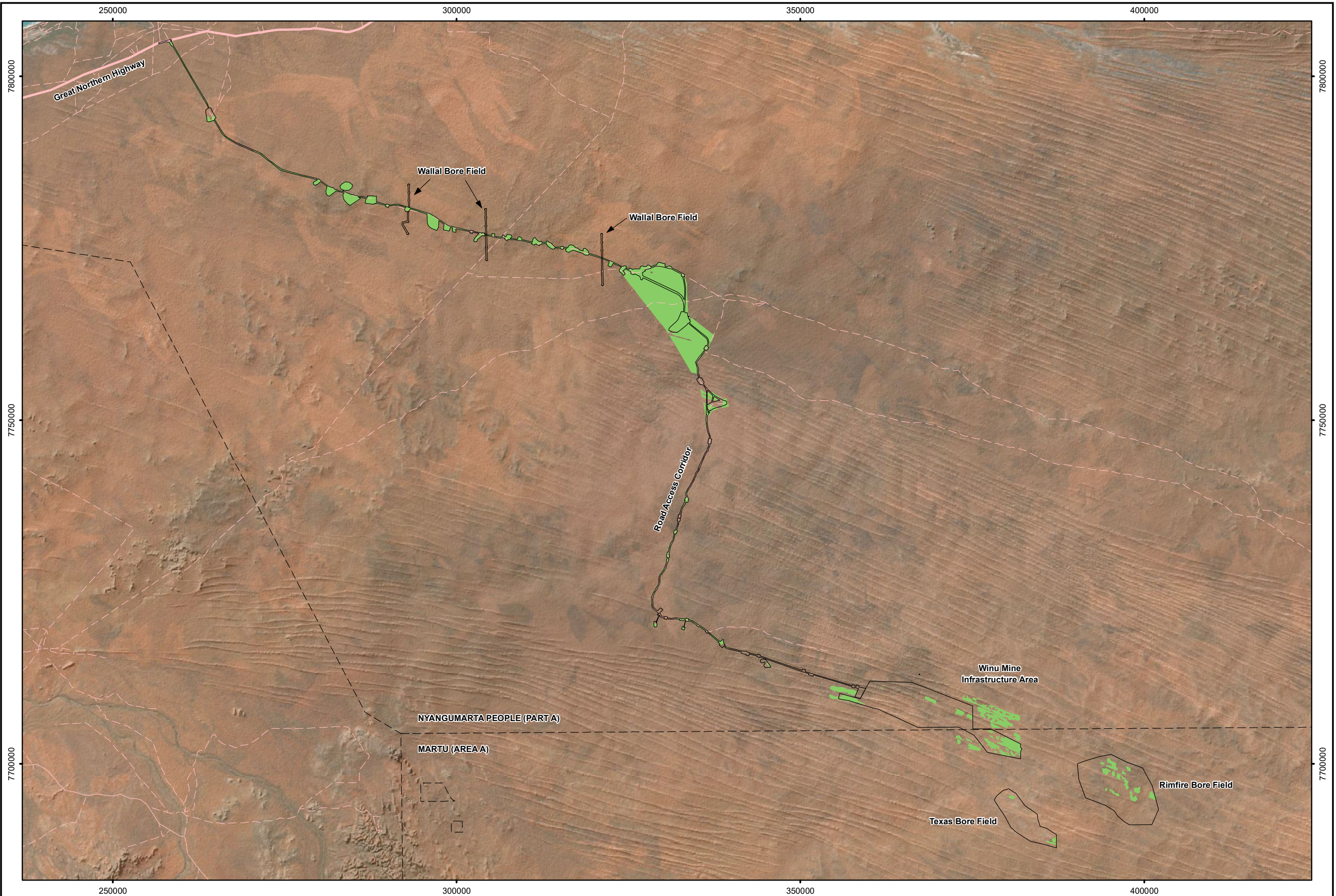
Distribution of *Senna notabilis* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Senna notabilis is associated with Inter-dunal Sandplains and Stony Rises and Gentle Outcroppings. It is considered common and widespread, both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Senna notabilis</i>	P4, P6, P7, P8, P9, P10, P11, P16, R1, R2, R3	6,134.9	14,701.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Senna notabilis</i>	Principal Road Minor Road Track	N	0510km Scale: 1:500,000 MGA94 (Zone 51)		Western Botanical Author: J. PatersonWB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Senna notabilis</i>
			Ref: a2923_WB1010_10_29			
			Date: Sep 2023 Rev: A A3			

5. Perennial Herb Species

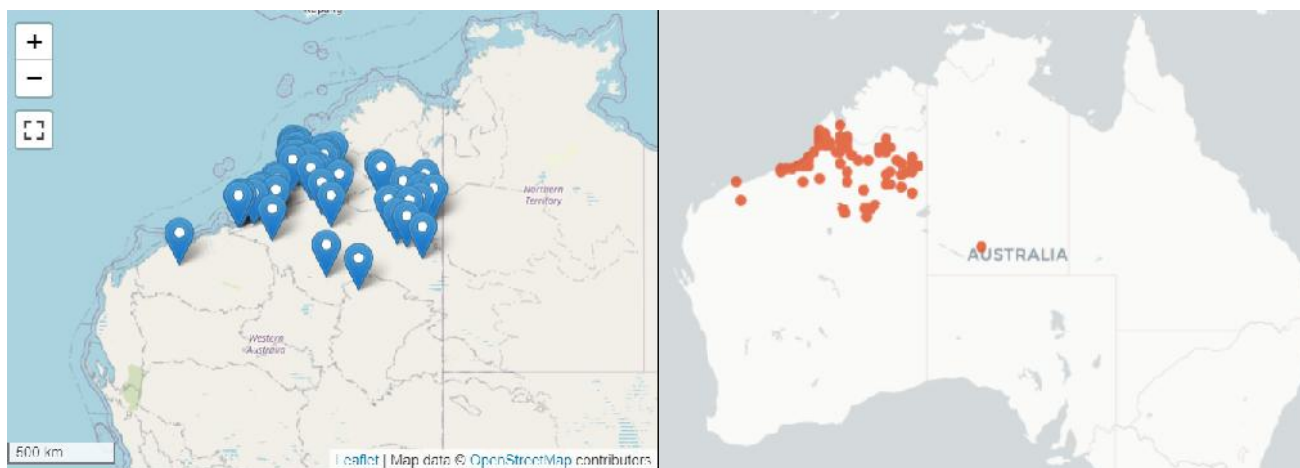
5.1. *Cyanostegia cyanocalyx*

Nyangumarta name: Mirlpa Mirlpa

Common name: Northern Tinsel Flower

Description: Sprawling shrub, 0.5-2.5 m high. Flowers blue-purple, May to October. Red sand. Dunes, sandplains (WAH, 1998-).

Distribution:



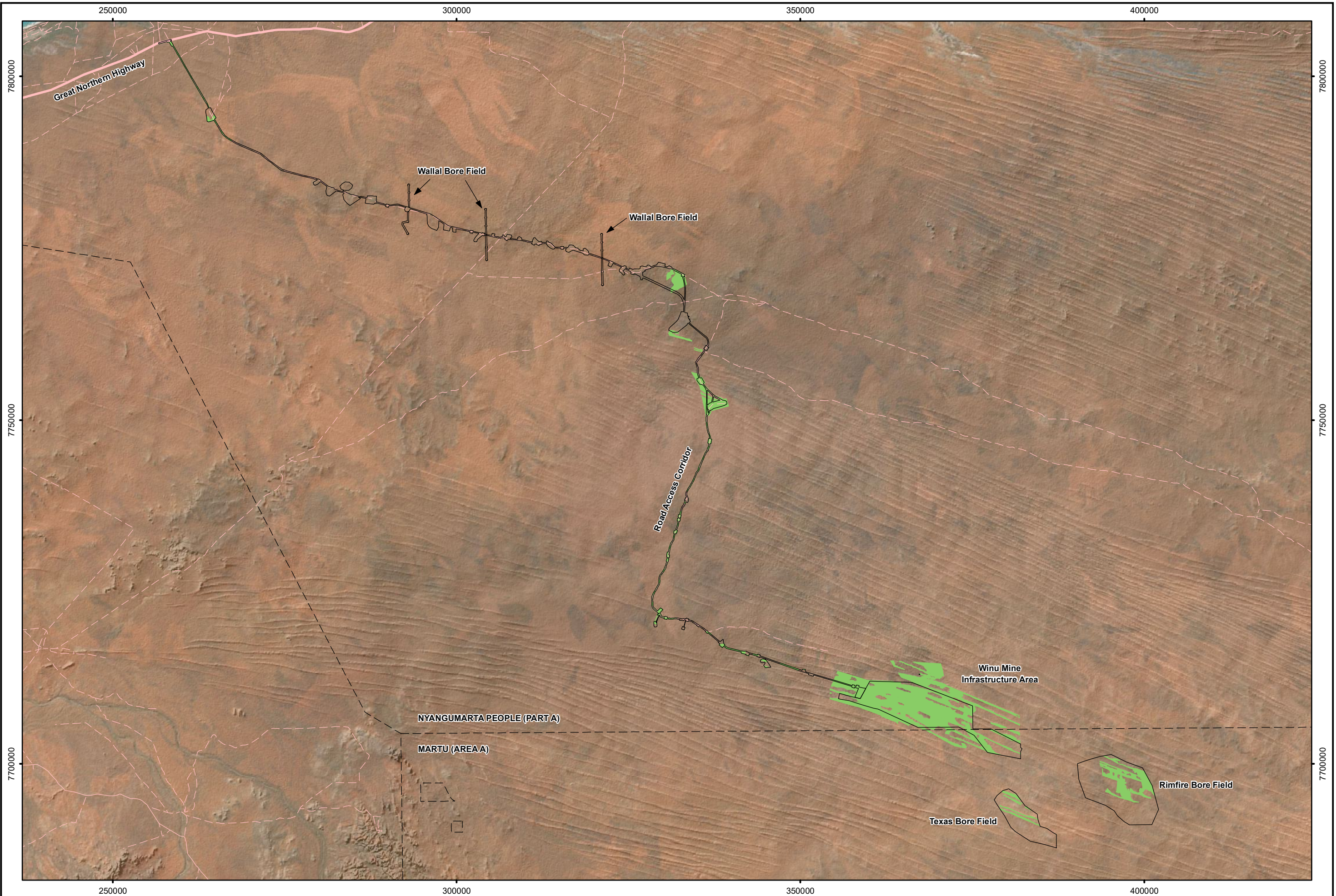
Distribution of *Cyanostegia cyanocalyx* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Cyanostegia cyanocalyx is associated with Sand Dunes and Associated Swales, as well as occurring within the P10 and P13 Vegetation Associations. It is considered common and widespread both across the Project Area, and within the Great Sandy Desert bioregion.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Cyanostegia cyanocalyx</i>	D1, D2, D3, P1, P10, P13	10,071.1	15,395.8

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Cyanostegia cyanocalyx</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_16 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Cyanostegia cyanocalyx</i>
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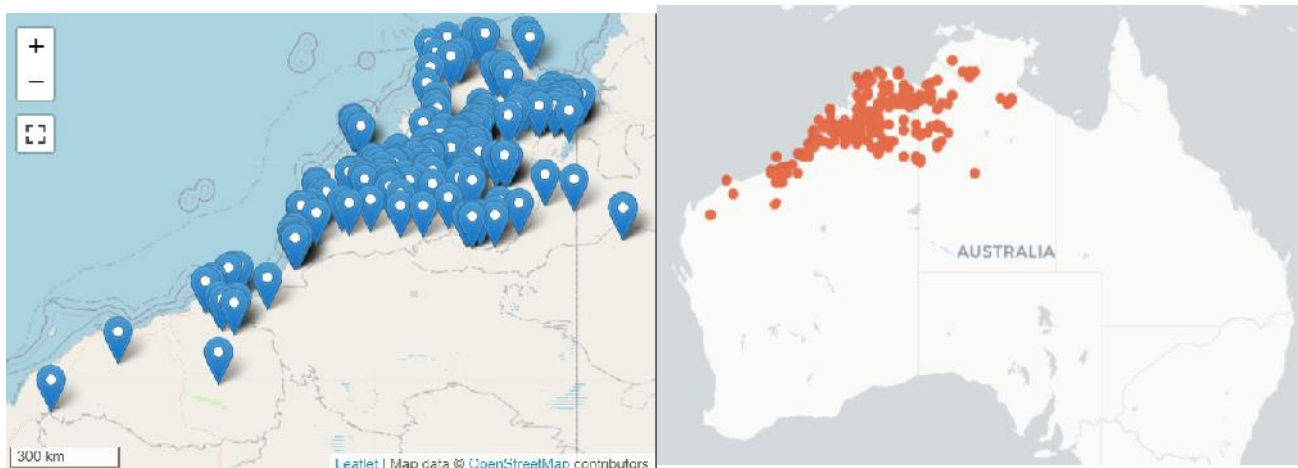
5.2. *Solanum dioicum*

Nyangumarta name: Jinyjiwirrily

Common name: None

Description: Erect or spreading shrub, 0.3-1(-2) m high. Flowers purple-blue, January to October. Sandy soils. Sandplains, alluvial flats, rocky outcrops (WAH, 1998-).

Distribution:



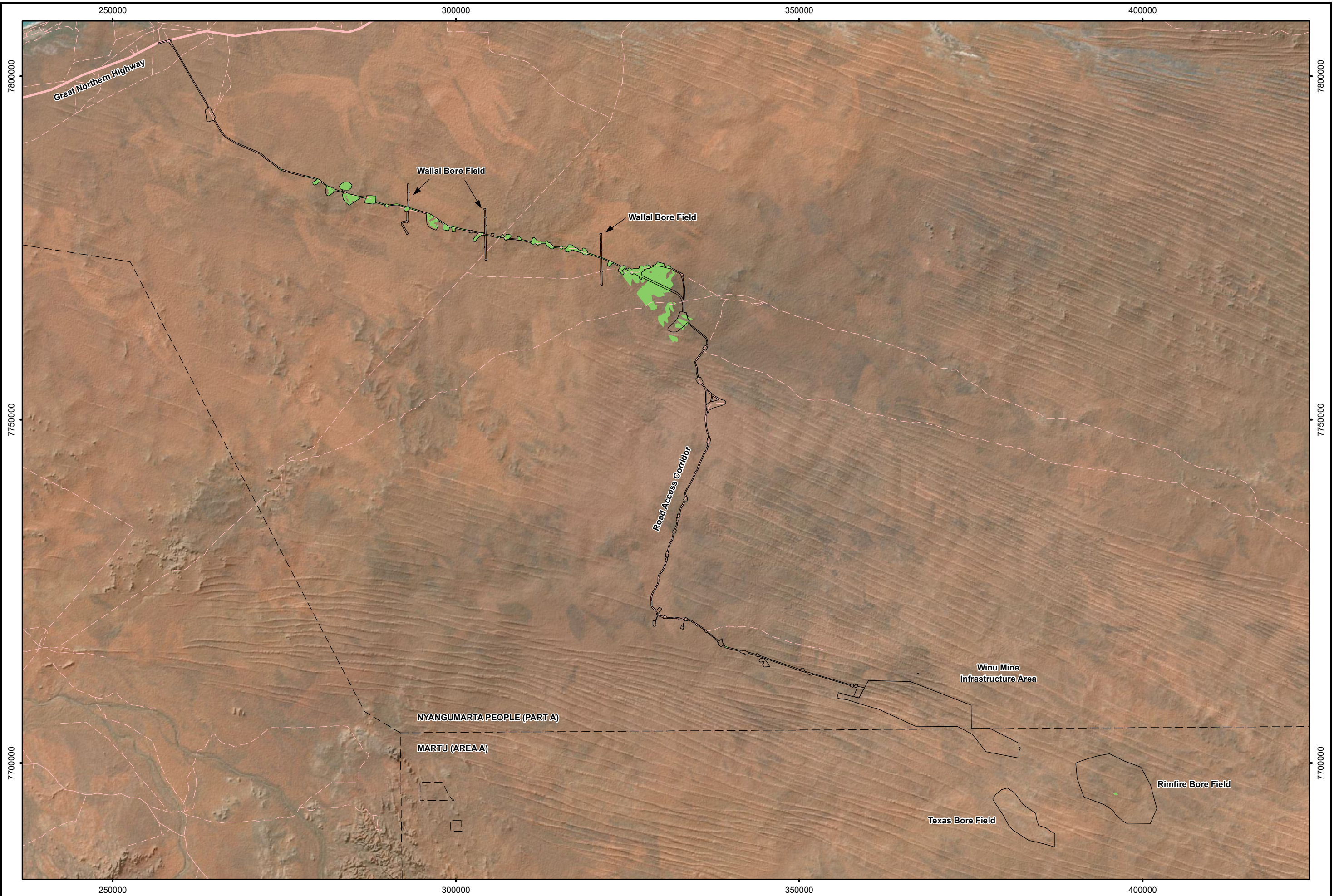
Distribution of *Solanum dioicum* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Solanum dioicum is associated with Stony Rises and Gentle Outcroppings, as well as the *Grevillea refracta* (*Acacia ancistrocarpa* & *Acacia monticola*) Scattered Tall Shrubs over *Triodia epactia* (P11) Vegetation Association. This taxon has a limited distribution across the Winu Project, however, is considered common and widespread in north-Western Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Solanum dioicum</i>	P11, R3, R4	2,541.8	5,019.7

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_30 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Solanum dioicum</i>
Winu Development Envelope	Principal Road				
Distribution of <i>Solanum dioicum</i>	Minor Road Track				

5.3. *Solanum diversiflorum*

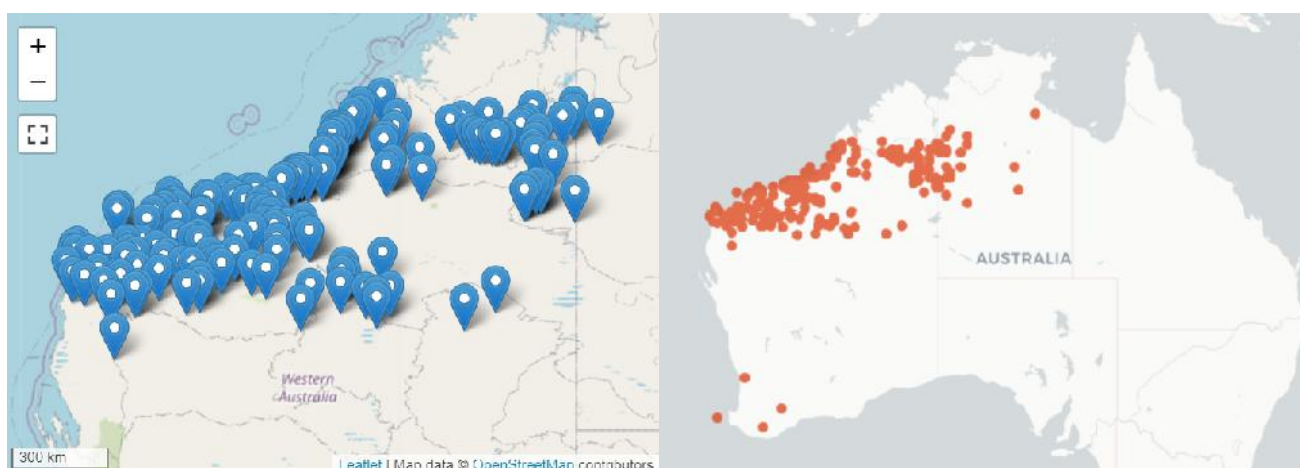
Note – This species is incorrectly listed as *Solanum diversifolium* in Nyangumarta Warrarn Aboriginal Corporation and Yamatji Marlpa Aboriginal Corporation (2016).

Nyangumarta name: Wamulu

Common name: Bush Tomato

Description: Spreading, prickly shrub, 0.2-1 m high. Flowers purple-blue, February to November. Often on sand (WAH, 1998-).

Distribution:



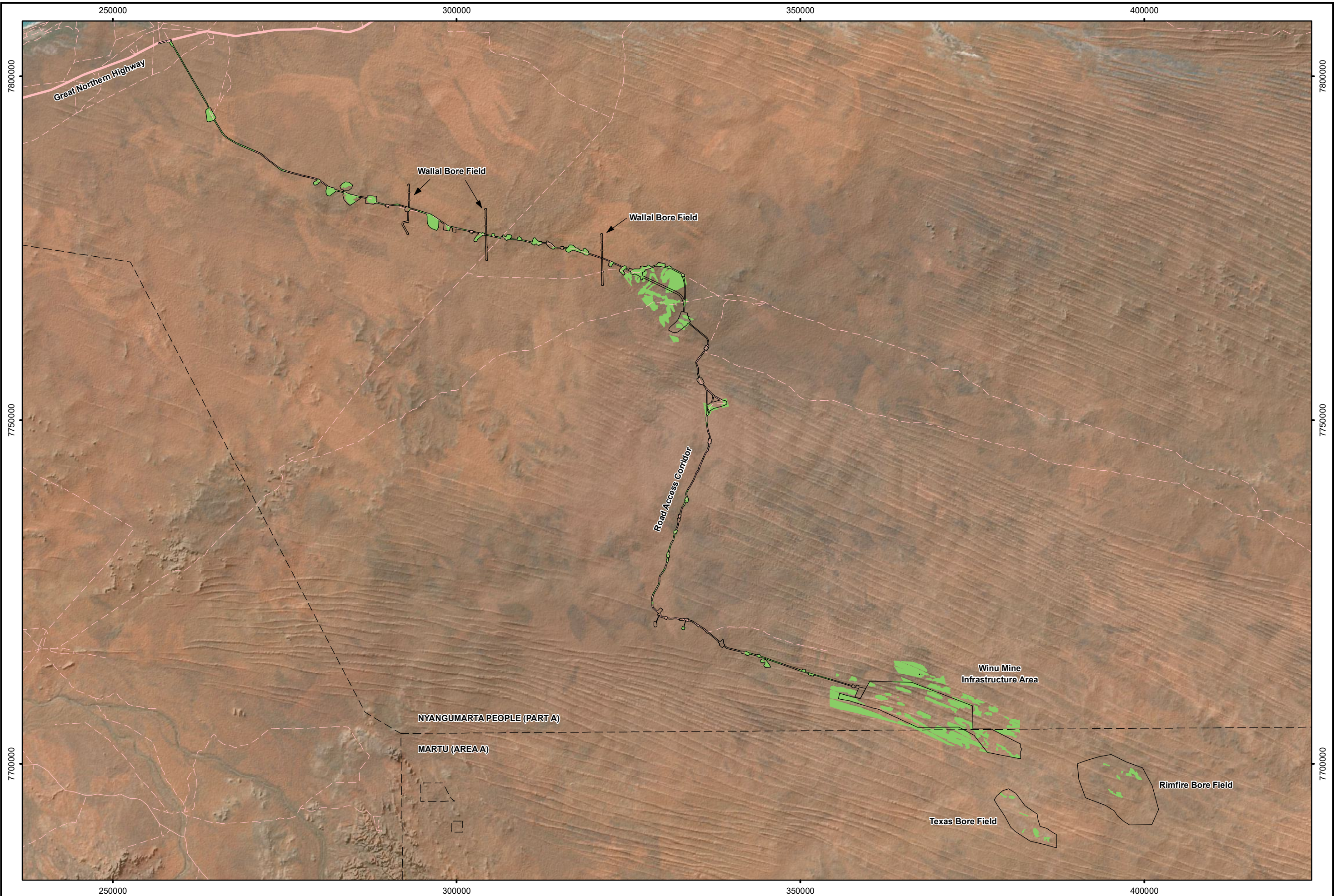
Distribution of *Solanum diversiflorum* within WA (WAH, 1998-) and Australia (AVH, 2023).

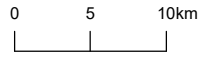
Occurrence within the Winu Project Area:

Solanum diversiflorum was commonly encountered within Vegetation Associations occupying Inter-dunal Sand Plains. It is considered common and widespread both locally and regionally, with numerous records occurring within north-western Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Solanum diversiflorum</i>	P2, P3, P6, P7, P9, P10, P15, P16, R3	5,677.6	12,130.5

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_31 Date: Sep 2023 Rev: A A3	 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Solanum diversiflorum</i>
 Winu Development Envelope	 Principal Road				
 Distribution of <i>Solanum diversiflorum</i>	 Minor Road  Track				

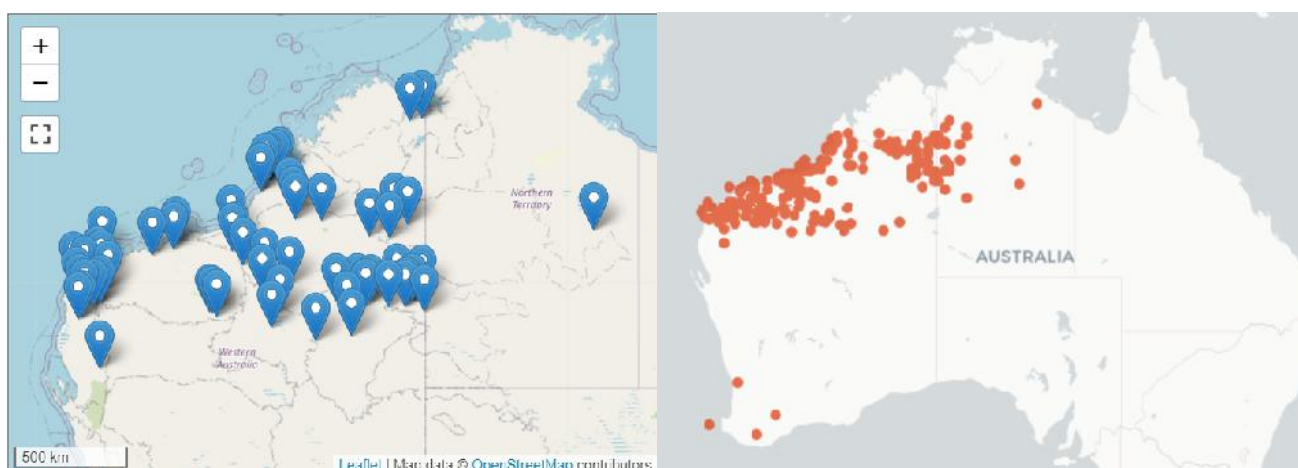
5.4. *Streptoglossa macrocephala*

Nyangumarta name: Marrpari

Common name: Stinkweed

Description: Erect to spreading, aromatic perennial, herb or shrub, to 0.5(-1) m high. Flowers pink-purple, July to October. Red sand. Dunes, sandplains, limestone outcrops (WAH, 1998-).

Distribution:



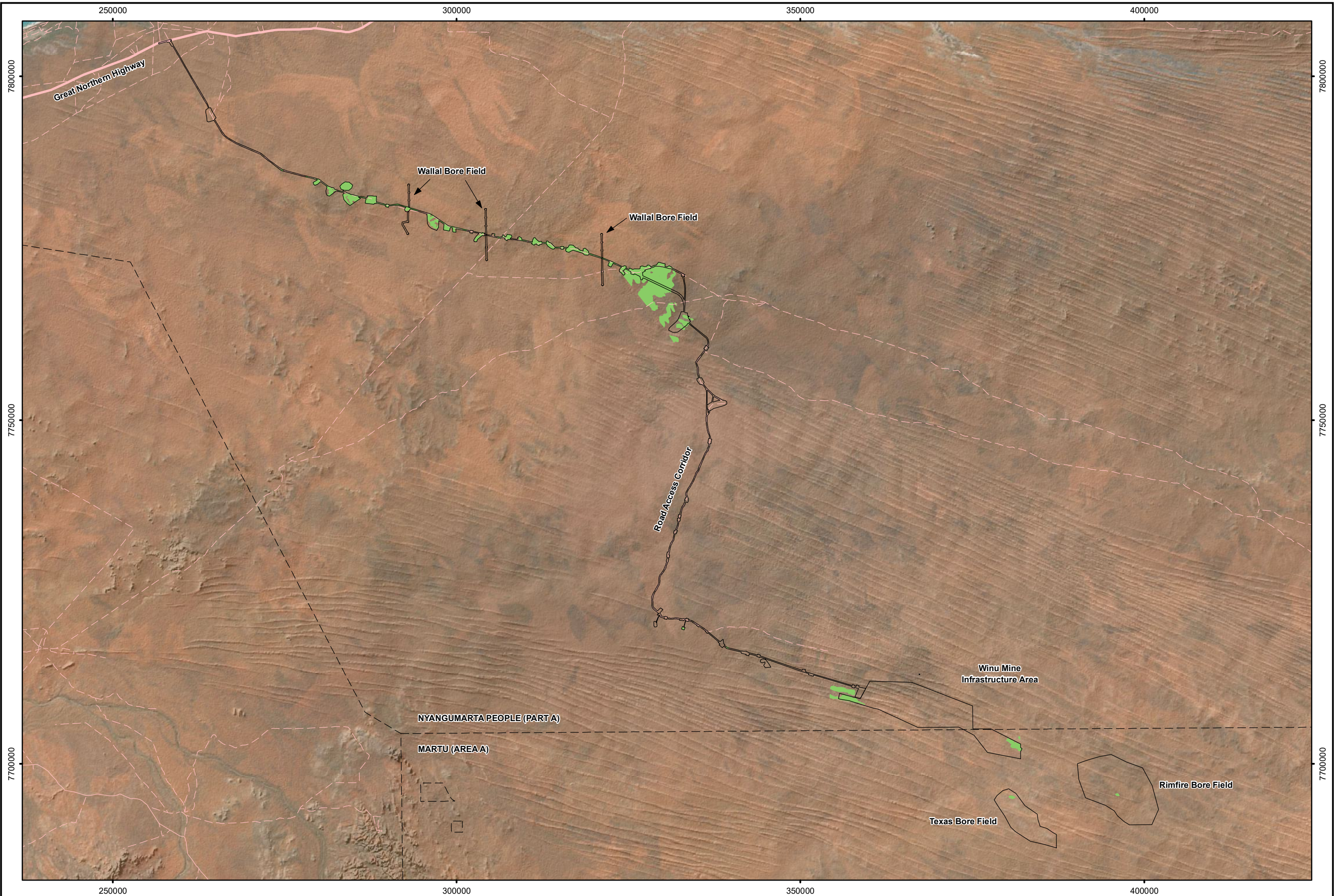
Distribution of *Streptoglossa macrocephala* within WA (WAH, 1998-) and Australia (AVH, 2023).

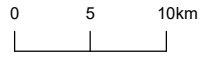
Occurrence within the Winu Project Area:

Streptoglossa macrocephala has a limited distribution across the Winu Project, encountered in only four quadrat sites. Considering this, the below image is rather generous, and the true distribution of *Streptoglossa macrocephala* across the Winu Project is reduced – particularly across the RAC. This taxon is considered common and widespread in the region, extending from Exmouth into the NT.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Streptoglossa macrocephala</i>	P7, P11, R1, R3	2,878.9	5,614.3

Image Source: Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend			 Scale: 1:500,000 MGA94 (Zone 51)		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Streptoglossa macrocephala</i>	
 Winu Development Envelope	 Principal Road					
 Distribution of <i>Streptoglossa macrocephala</i>	 Minor Road					
	 Track					
Ref: a2923_WB1010_10_32		Author: J. Paterson		WB Ref: WB1010		
Date: Sep 2023 Rev: A A3		Drawn: CAD Resources ~ www.cadresources.com.au		Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

6. Vines and Creeper Species

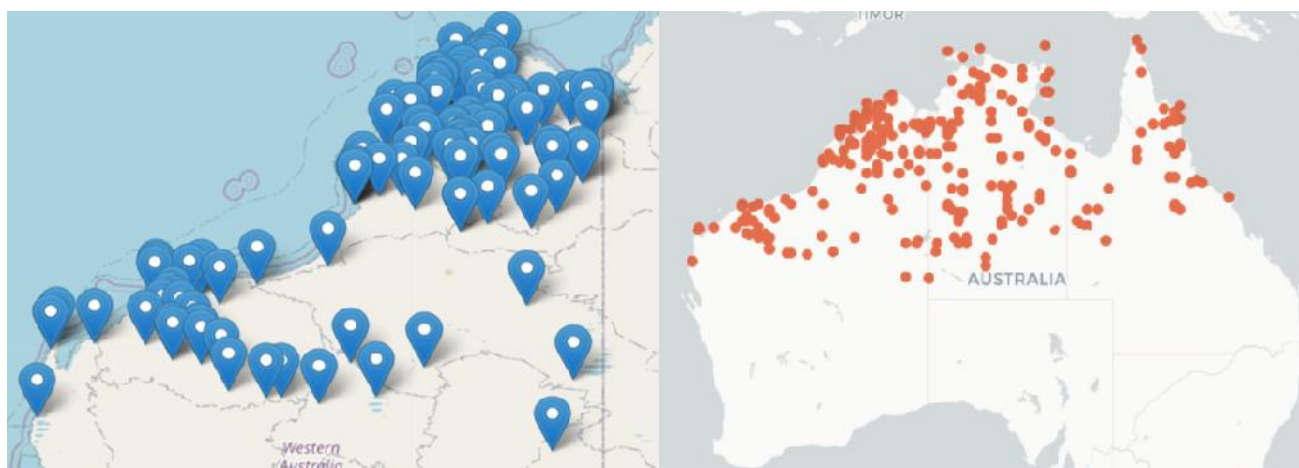
6.1. *Cassytha capillaris*

Nyangumarta name: Yukurli

Common name: Dodder; Locally: Berry Bush

Description: Parasitic perennial, herb and climber. Flowers white, January to December (depending on rain). Found on undergrowth (grasses) (WAH, 1998-).

Distribution:



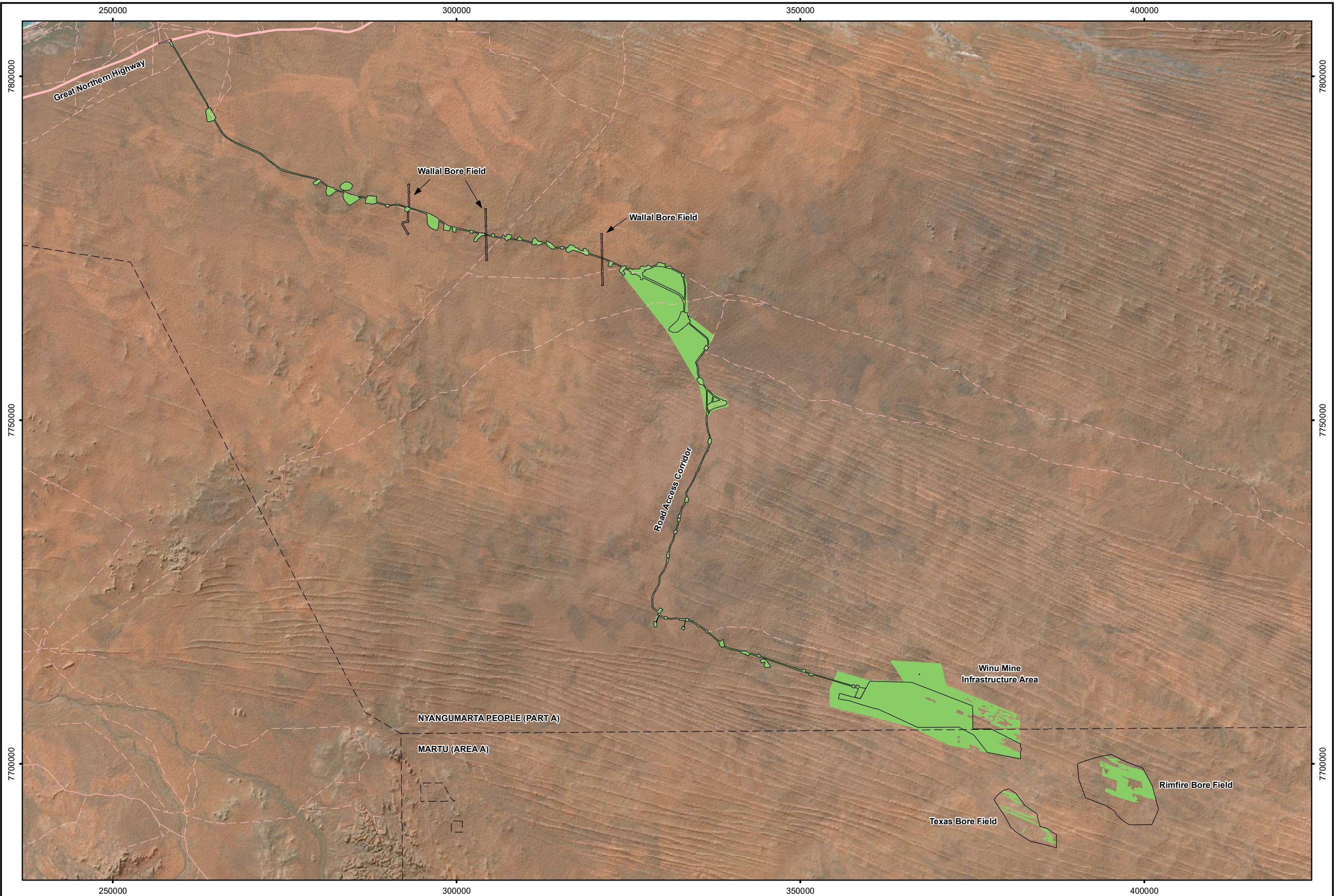
Distribution of *Cassytha capillaris* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Cassytha capillaris occurs across all habitats of the Winu Project. It was recorded in 68 of the 95 quadrat sites. *Cassytha capillaris* is considered common and widespread both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Cassytha capillaris</i>	D1, D2, D3, P1, P2, P3, P5, P7, P8, P9, P10, P11, P12, P13, P14, P16, P18, R2, R3, R6	18,244.1	34,800.6

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Cassytha capillaris</i>				 Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_10 Date: Sep 2023 Rev: A A3		 Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	
Principal Road Minor Road Track		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Cassytha capillaris</i>					

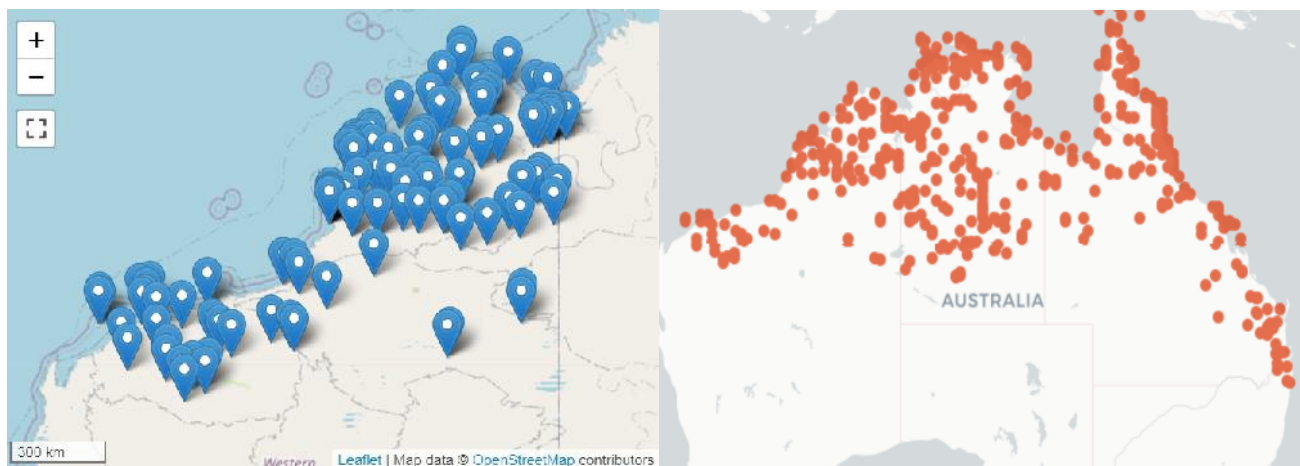
6.2. *Tinospora smilacina*

Nyangumarta name: Wirikaru

Common name: Snakevine

Description: Slender, woody, deciduous climber. Flowers green-white-yellow, March to November. Sandy soils, sandstone, clay. Sand dunes, riverine flats, hills, plateaus (WAH, 1998-).

Distribution:



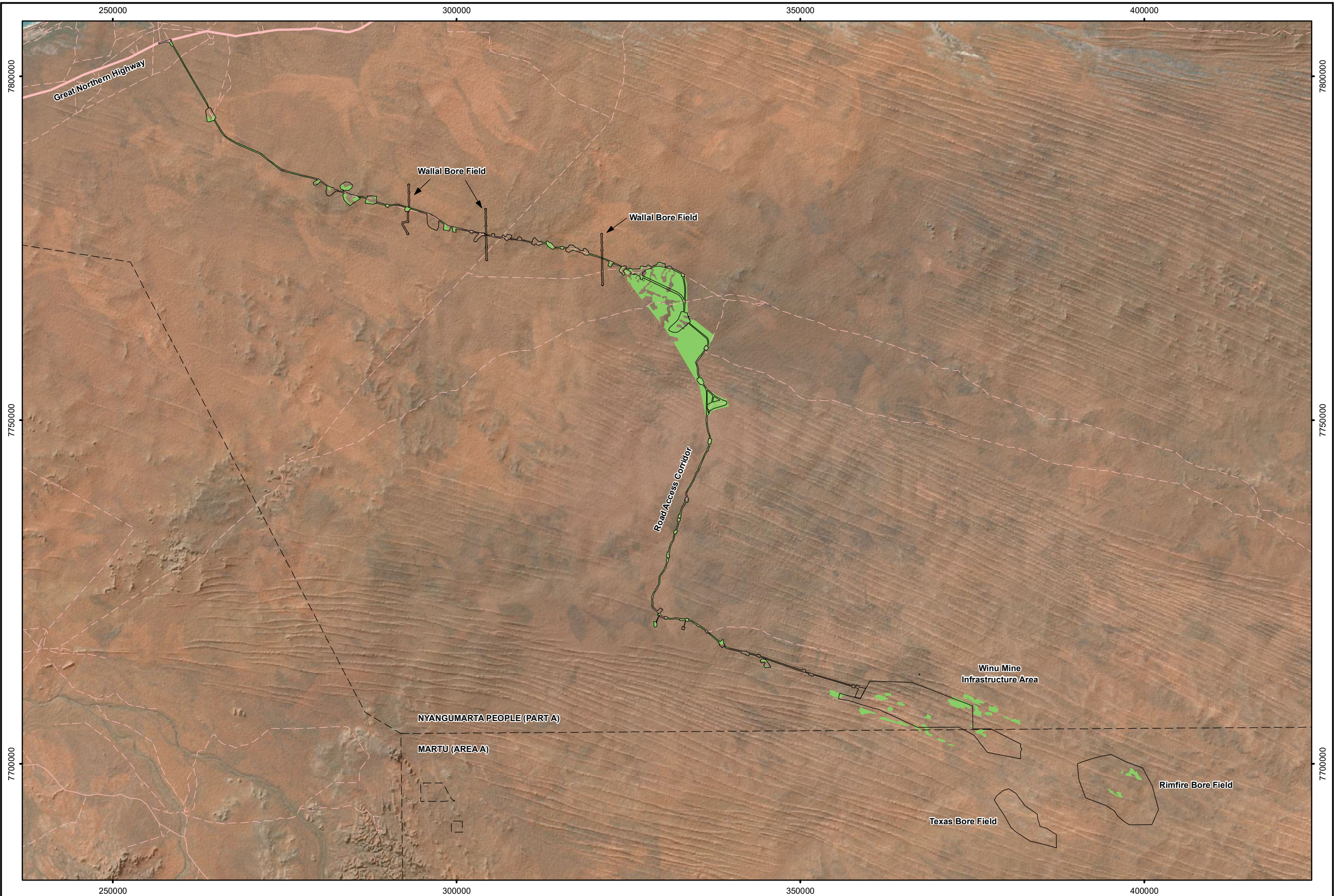
Distribution of *Tinospora smilacina* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Tinospora smilacina was associated with Inter-dunal Sand Plains, as well as the *Grevillea stenobotrya*, *Grevillea wickhamii* & *Acacia anaticeps* Tall Shrubland over *Triodia schinzii* (D3) Vegetation Association. It's distribution within the Winu Project is predominantly around the RAC. *Tinospora smilacina* is considered an occasionally occurring taxon across the Project, however, is common and widespread across north-Western Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Tinospora smilacina</i>	D3, P3, P8, P10, P11, P13	4,050.6	11,034.8

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Tinospora smilacina</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_33 Date: Sep 2023 Rev: A A3			Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Tinospora smilacina</i>
			Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

7. Grass Species

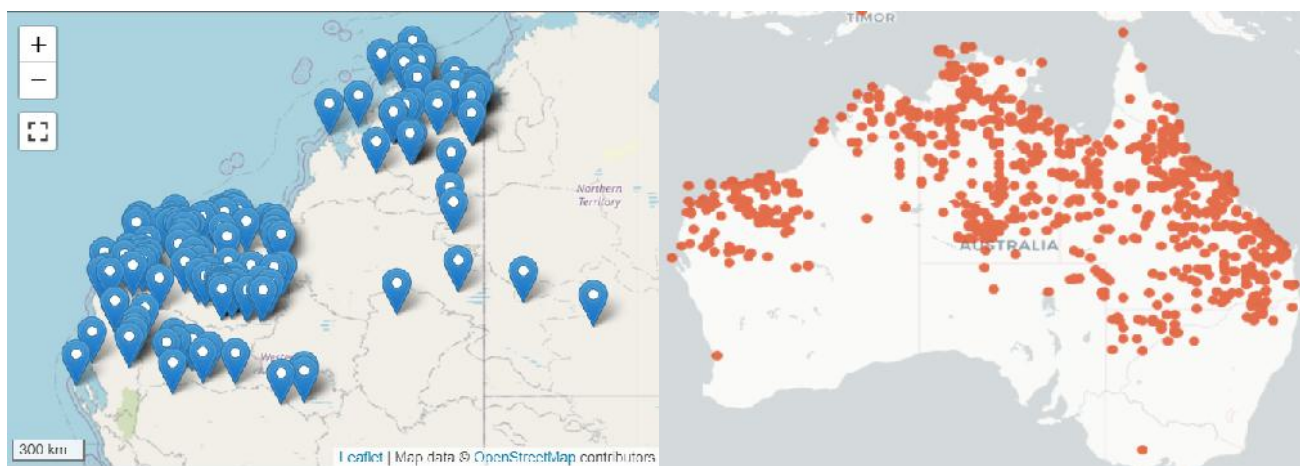
7.1. *Chrysopogon fallax*

Nyangumarta name: Paru

Common name: Ribbon Grass

Description: Densely tufted perennial, grass-like or herb, 0.3-1.5 m high. Flowers green, January to June. White sand, red clay, lateritic loam (WAH, 1998-).

Distribution:



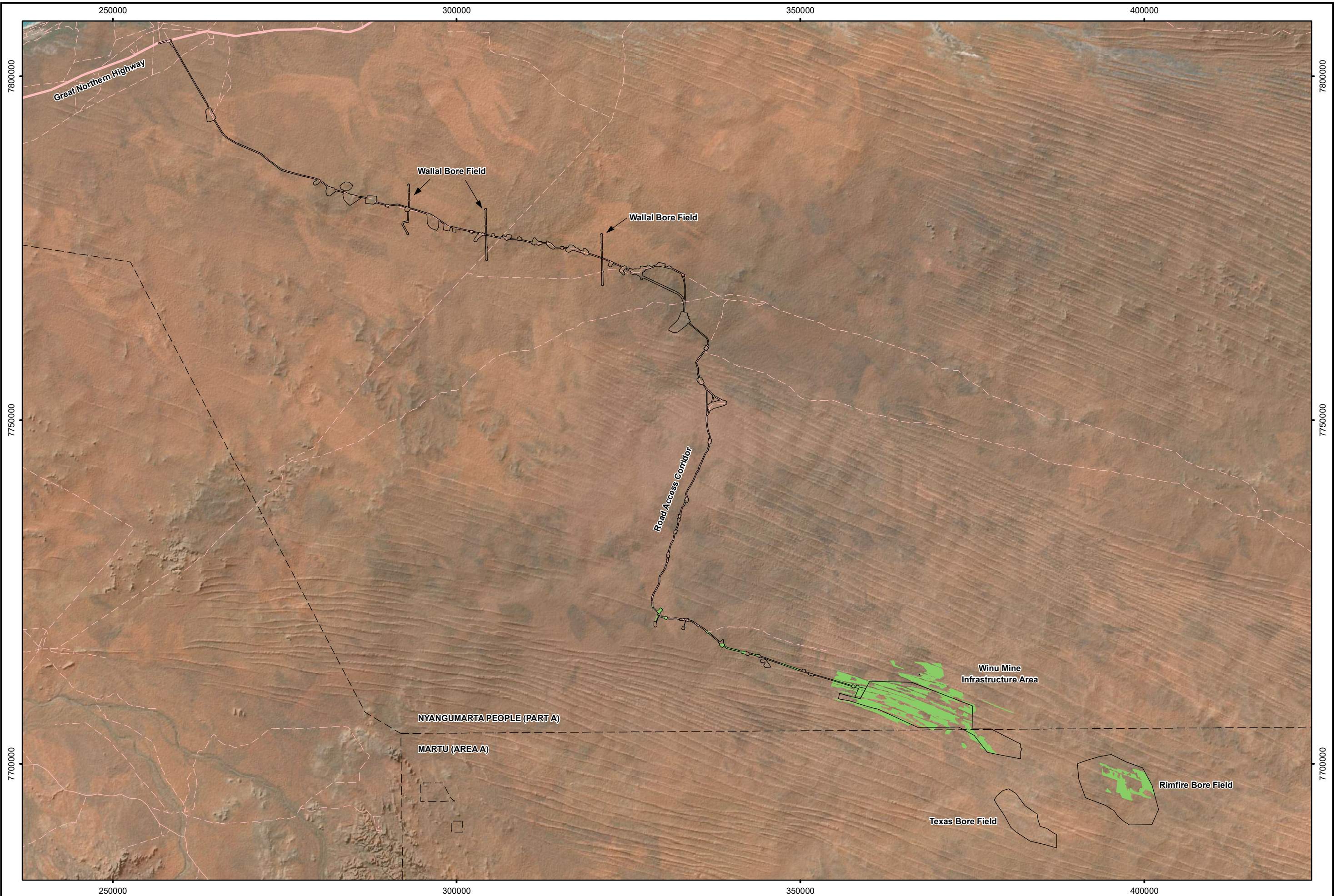
Distribution of *Chrysopogon fallax* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Chrysopogon fallax has a restricted distribution across the Winu Project. As it was only encountered within one quadrat site within the P1 Vegetation Association, its distribution depicted in the below map is not accurate. *Chrysopogon fallax* is common and widespread across northern parts of Australia.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Chrysopogon fallax</i>	P1	5,525.3	7,949.2

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend

Winu Development Envelope	Principal Road
Distribution of <i>Chrysopogon fallax</i>	Minor Road
	Track

0 5 10km
Scale: 1:500,000
MGA94 (Zone 51)
Ref: a2923_WB1010_10_11
Date: Sep 2023 | Rev: A | A3

Author: J. Paterson	WB Ref: WB1010
Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	

**Interim Consolidated Detailed Flora & Vegetation
Assessment of the Winu Project, September 2023
Culturally Significant Species - *Chrysopogon fallax***

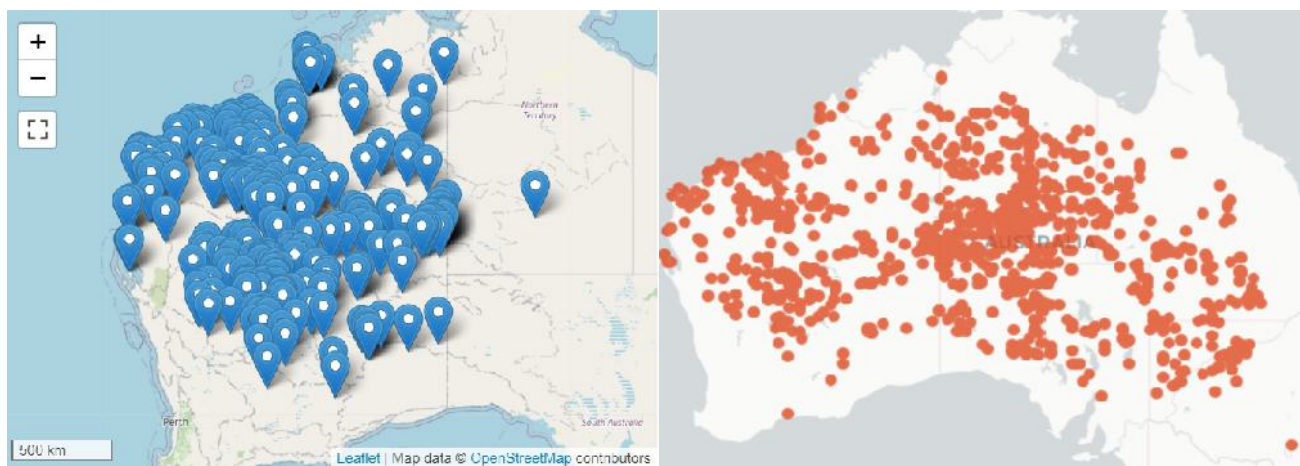
7.2. *Eragrostis eriopoda*

Nyangumarta name: Ngujarna

Common name: Woolly Butt Grass

Description: Caespitose perennial, grass-like or herb, 0.1-0.6 m high, with bulbous, woolly base. Flowers green/purple, March to September. Red or white sand, clay, calcareous loam, sandstone, alluvium (WAH, 1998-).

Distribution:



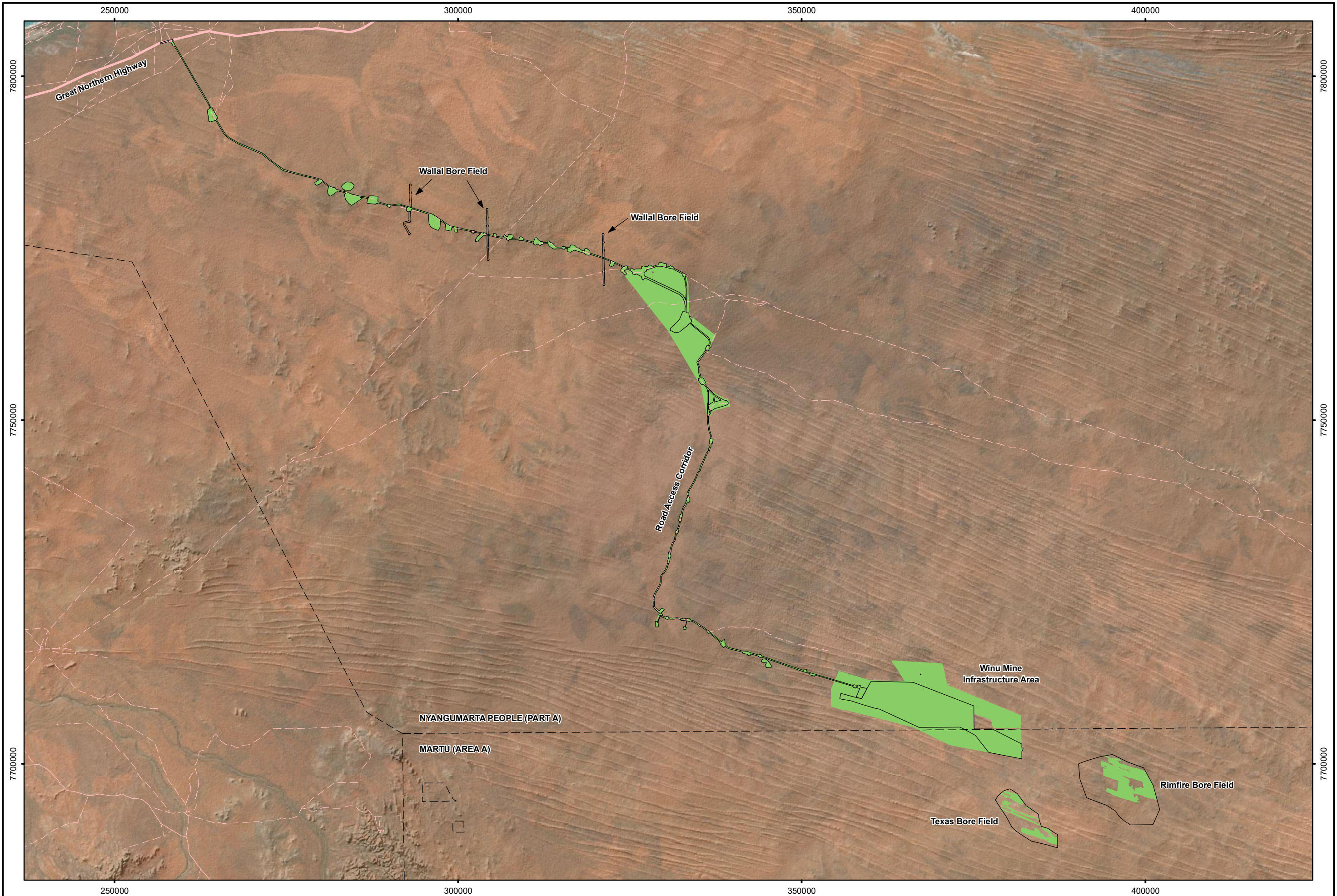
Distribution of *Eragrostis eriopoda* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Eragrostis eriopoda occurs across all habitats of the Winu Project. It was recorded in 75 of the 95 quadrat sites. *Eragrostis eriopoda* is considered common and widespread both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Eragrostis eriopoda</i>	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P13, P14, P15, P16, P18, P19, R1, R2, R3, R5, R6	19,225.4	36,743.7

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Eragrostis eriopoda</i> Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51) Ref: a2923_WB1010_10_17 Date: Sep 2023 Rev: A A3	Author: J. Paterson WB Ref: WB1010 Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202	Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Eragrostis eriopoda</i>
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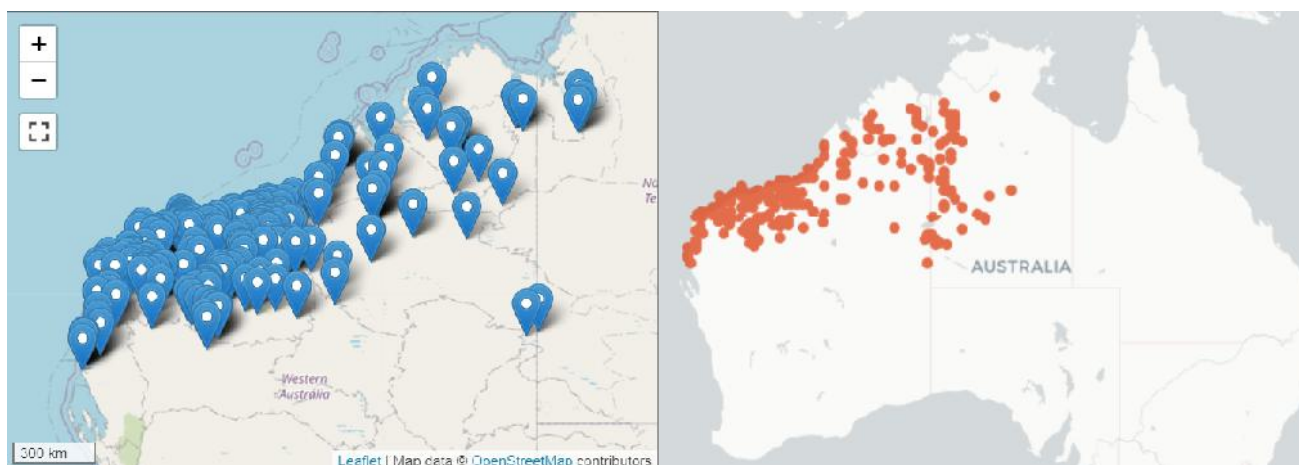
7.3. *Triodia epactia*

Nyangumarta name: Karrarl

Common name: Soft Spinifex

Description: Tussock-forming perennial, grass-like or herb, 0.45-2 m high, foliage resinous, panicle usually narrow and dense, lemma bi-textured with winged lobes. White-red sand, black gravelly sandy loam, sandstone, limestone. Coastal sand dunes, sand plains, rocky hills, near creek banks (WAH, 1998-).

Distribution:



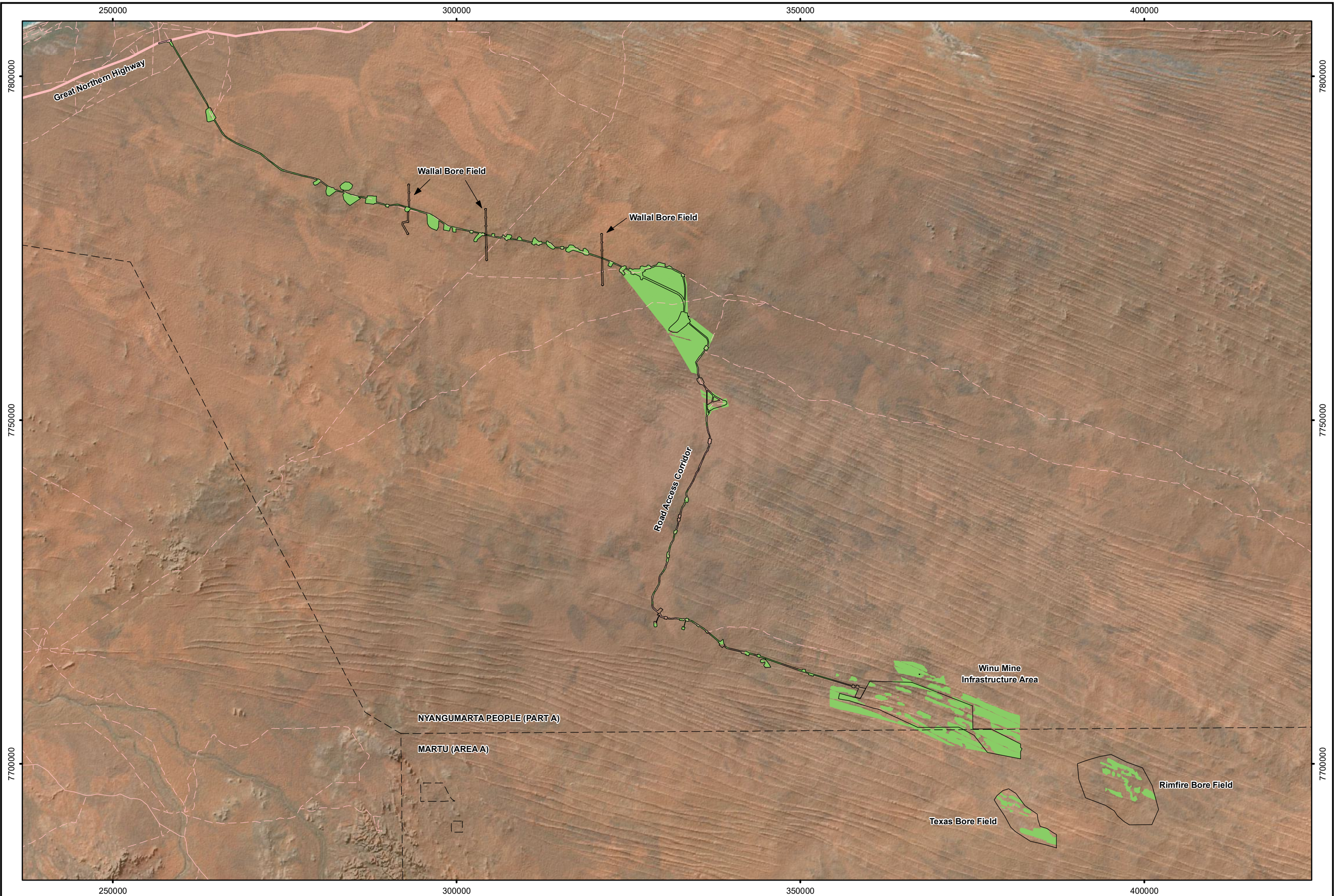
Distribution of *Triodia epactia* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Triodia epactia is associated with Interdunal Sand Plains and Stony Rises and Gentle Outcroppings. It is considered common and widespread, both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Triodia epactia</i>	P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P12, P14, P15, P17, P18, R1, R2, R3, R4, R5, R6	10,251.6	23,037.5

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Triodia epactia</i>	Principal Road Minor Road Track	0 5 10km Scale: 1:500,000 MGA94 (Zone 51)			Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Triodia epactia</i>
			Author: J. Paterson WB Ref: WB1010		
			Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

Ref: a2923_WB1010_10_34

Date: Sep 2023 | Rev: A | A3

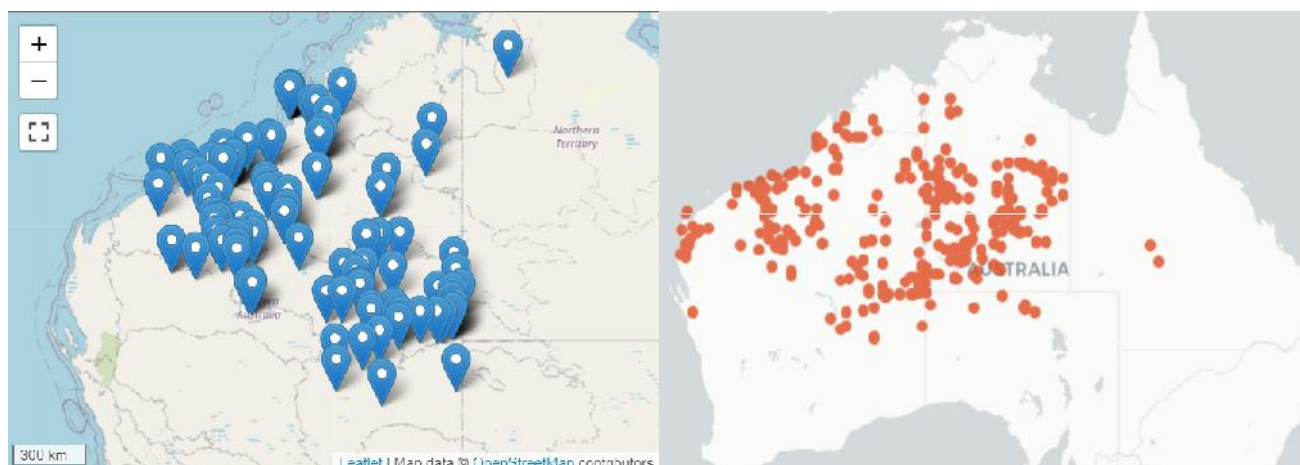
7.4. *Triodia schinzii*

Nyangumarta name: Karrarl

Common name: Soft Spinifex

Description: Tussock-forming resinous perennial, grass-like or herb, 0.6-2.1 m high, glumes aristulate, much longer than body of spikelet. Flowers August to October or January to March. Red sandy soils. Sandplains, red sand dunes (WAH, 1998-).

Distribution:



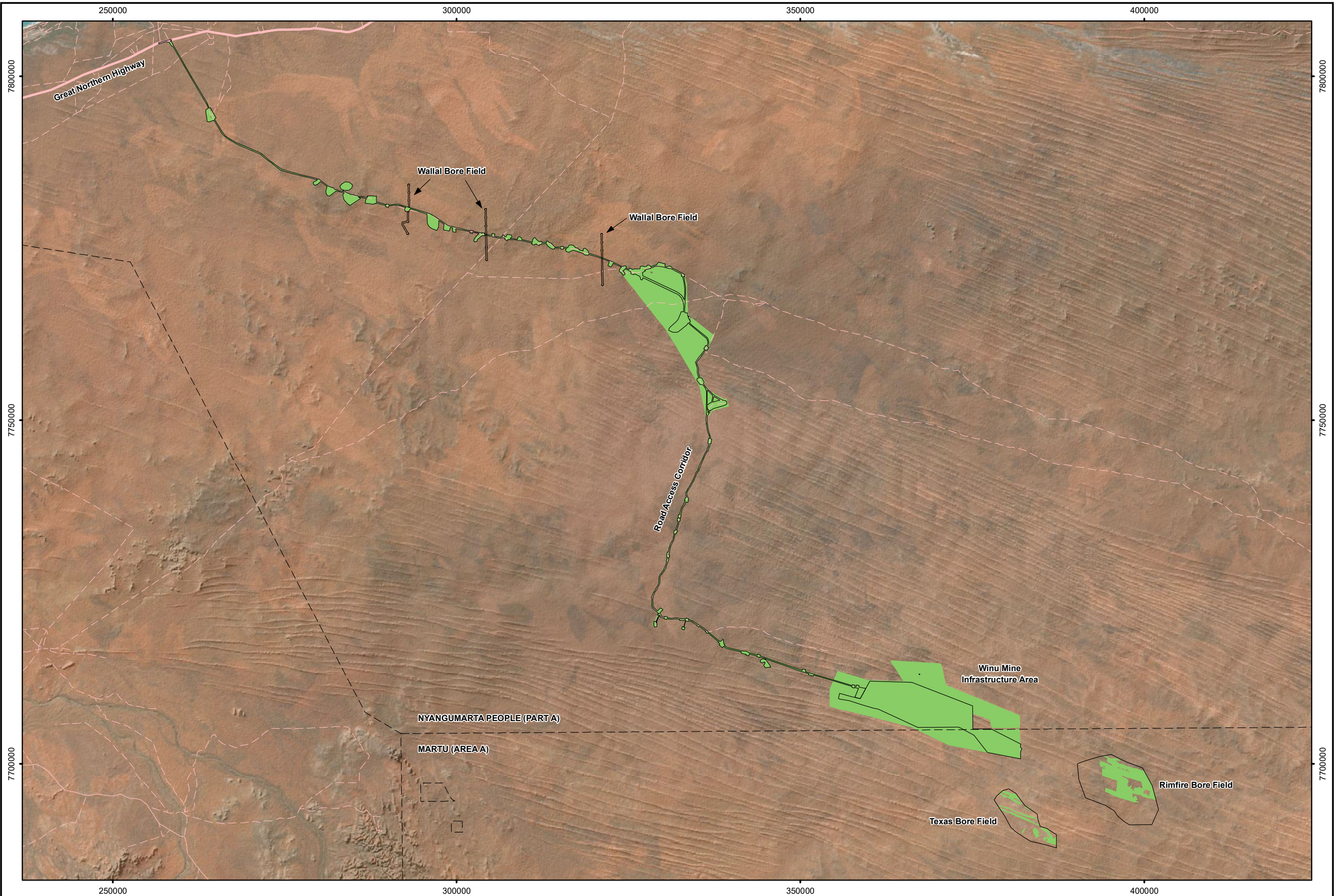
Distribution of *Triodia schinzii* within WA (WAH, 1998-) and Australia (AVH, 2023).

Occurrence within the Winu Project Area:

Triodia schinzii occurs across all habitats of the Winu Project. It was recorded in 89 of the 95 quadrat sites. *Triodia schinzii* is considered common and widespread both locally and regionally.

Species	Vegetation Associations	Area (ha) Within DE	Total Area (ha)
<i>Triodia schinzii</i>	D1, D2, D3, P1, P2, P3, P4, P5, P6, P7, P8, P9, P10, P11, P13, P14, P15, P16, P18, P19, R1, R2, R3	18,836.7	36,355.0

Image Source: Esri, Maxar, Earthstar Geographics, and the GIS User Community



Legend Winu Development Envelope Distribution of <i>Triodia schinzii</i>	Principal Road Minor Road Track		0 5 10km Scale: 1:500,000 MGA94 (Zone 51)		Interim Consolidated Detailed Flora & Vegetation Assessment of the Winu Project, September 2023 Culturally Significant Species - <i>Triodia schinzii</i>	
			Ref: a2923_WB1010_10_35	Author: J. Paterson		WB Ref: WB1010
			Date: Sep 2023 Rev: A A3	Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202		

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E info@westernbotanical.com.au
www.westernbotanical.com.au