# Appendix 78 Assessment of Flora and Vegetation Values - Haul Road Options, O'Neil, Huntly Mine, WA

# ASSESSMENT OF FLORA AND VEGETATION VALUES

## ALCOA OF AUSTRALIA HAUL ROAD OPTIONS, ONEIL,

## HUNTLY MINE, WA

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

**Alcoa of Australia Limited**

**April 2024**

| DOCUMENT STATUS | | | | |
|---|---|---|---|---|
| **DOCUMENT REFERENCE: ALC2004/015/20** | | | | |
| **VERSION** | **TYPE** | **AUTHOR/S** | **REVIEWER/S** | **DATE DISTRIBUTED** |
| V1 | Internal review | J. Marshall and E. Mattiske | E. Mattiske | |
| V2 | Draft for client | J. Marshall and E. Mattiske | E. Mattiske | 25/03/2024 |
| FINAL | Final report | E. Mattiske | E. Mattiske | 30/04/2024 |


Mattiske Consulting Pty Ltd

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437
Kalamunda WA 6926
**Phone:** +61 8 9257 1625
**Email:** admin@mattiske.com.au

**TABLE OF CONTENTS**

**Page**

## TABLES



## FIGURES



## APPENDICES

## LIST OF ABBREVIATIONS

| | |
|---|---|
| **BAM Act:** | *Biosecurity and Agriculture Management Act 2007* (WA) |
| **BC Act:** | *Biodiversity Conservation Act 2016* (WA) |
| **BOM:** | Bureau of Meteorology |
| **DBCA:** | Department of Biodiversity, Conservation and Attractions |
| **DCCEEW:** | Department of Climate Change, Energy, the Environment and Water |
| **DPIRD:** | Department of Primary Industries and Regional Development |
| **EP Act:** | *Environmental Protection Act 1986* (WA) |
| **EPA:** | Environmental Protection Authority |
| **EPBC Act:** | *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) |
| **MATTISKE:** | Mattiske Consulting Pty Ltd |
| **IBRA:** | Interim Biogeographical Regionalisation for Australia |
| **PEC:** | Priority ecological community |
| **RFA:** | Regional Forest Agreement |
| **TEC:** | Threatened ecological community |
| **WAH:** | Western Australian Herbarium (PERTH) |

## EXECUTIVE SUMMARY

Mattiske Consulting Pty Ltd was commissioned in 2023 by GHD on behalf of Alcoa of Australia Ltd (Alcoa) to conduct an assessment of the flora and vegetation values within the ONeil Transport Corridor areas, approximately 60 km south east of Perth, WA. Initially this work entailed a review of past mapping in the area by Mattiske Consulting (2009, 2012) and an updated desktop assessment of the area. Field studies were then undertaken in the spring months of 2023 to search for additional threatened and priority flora and to reassess some of the previous site-vegetation type mapping as undertaken by Mattiske Consulting in a selection of sites. The ONeil Transport Corridor survey area is located in tenement ML 1SA and as such overlaps current Alcoa operational areas and previous mapping areas.

Various databases were used to identify the possible occurrence of flora (including introduced, threatened and priority taxa) and threatened and priority ecological communities within the ONeil Transport Corridor area. Historical documentation of the floristics and vegetation mapping of the region, along with results of previous flora and vegetation surveys in the nearby areas, were reviewed again in 2023 in line with some changes in nomenclature from 2022 to 2023.

The ONeil Transport Corridor survey area lies within the Northern Jarrah Forest subregion of the Southwest Botanical Province. The geology of the region comprises lateritic duricrust, with drainage lines and occasional granite hills. The Northern Jarrah Forest subregion is characterised by Jarrah (*Eucalyptus marginata*) forest on ironstone gravels and Marri-Wandoo (*Corymbia calophylla* - *Eucalyptus wandoo*) woodlands on loamy soils, with sclerophyll understoreys. The vegetation of the region has been extensively studied, and has been described in a series of vegetation complexes of the Darling System.

**Potential Flora**

Based on the previous nearby surveys and the recent additional studies a total of 459 vascular plant taxa, representative of 168 genera and 59 families (Appendix B), have the potential to occur within the ONeil Transport Corridor survey area (Mattiske Consulting 1998-2023). The most commonly represented families were Fabaceae (67 taxa), Proteaceae (53 taxa), Myrtaceae (38 taxa) and Asparagaceae (253 taxa).

A total of twelve threatened flora species and 37 priority flora species has the potential to occur in the ONeil Transport Corridor survey area. Of the threatened flora species, all are considered to have a very low potential of occurring in the Oneil Transport survey area due to the lack of suitable habitat and also know distributions away from the survey area.

In 2023, the data indicated that of the Priority flora species, five priority flora species have a high potential to be in the survey area and four priority flora species have a moderate or moderate to high potential to be in the survey area.

On the basis of databases and previous surveys near or within the Oneil survey areas a total of 15 introduced taxa has the potential to occur in the ONeil Transport Corridor survey area (Appendix C). None of the weeds are declared pest organisms pursuant to section 22 of the BAM Act (DPIRD 2024) and none are listed as Weeds of National Significance (DCCEEW 2024d).

**Potential Vegetation Values**

There are no TECs listed at Commonwealth or State level, or PECs listed at State level which would be likely to occur in the ONeil Transport Corridor survey area.

The ONeil Transport Corridor survey area occurs within the Regional Forest Agreement (RFA) area of the southwest forests DCCEEW (2024b) and as such was considered during the RFA process.

Based on data from Department of Biodiversity, Conservation and Attractions, there are no old growth forests occurring in the ONeil Transport Corridor survey area. In view of the proximity of the survey areas to the well-established North-East Road it is extremely unlikely that there will be additional old growth forests in the survey area. The ONeil Transport Corridor has areas of dieback in some of the valley systems.

**Survey Effort**

The survey effort in the ONeil Transport Corridor survey areas includes multiple survey efforts by Mattiske Consulting (2009, 2012) from the earlier flora and vegetation studies to the more recent targeted work and re-assessment of sites in a range of the site-vegetation types within the survey area.

**Recorded Flora**

In the more recent targeted flora and vegetation studies (including re-assessment of 45 sites a total of 122 vascular plant taxa, representative of 66 genera and 37 families (Appendix C), have been recorded in the ONeil Transport Corridor survey area. The most commonly represented families were Fabaceae (13 taxa), Myrtaceae (12 taxa), Asparagaceae (11 taxa), Proteaceae (9 taxa) and Asteraceae (7 taxa). .

A total of 2 priority flora species (*Hibbertia hortiorum* P1 and *Senecio leucoglossus* P4) were recorded in the ONeil Transport Corridor survey area. The *Hibbertia hortiorum* appears relatively regularly and in part reflects the recent split of *Hibbertia commutata* into multiple species by Kevin Thiele (2019). Recent work since this study by the Mattiske team has located this Hibbertia priority species outside the ONeil Transport Corridor survey area. The identification of this *Hibbertia* species as a Priority species has been confirmed at the State Herbarium.

**Recorded Vegetation**

A total of 17 site-vegetation types were defined and mapped in the ONeil Transport Corridor survey area and an addition two mapping units (CL cleared land and Rehabilitation areas). The site-vegetation types were defined on the basis of key species and site parameters as defined in Havel (1975a and 1975b) for the Jarrah forest and as refined and developed by Mattiske over the last 40 years. It is clearly apparent that there are some dominant site-vegetation types that dominate the ONeil Transport Corridor survey area (namely SP, S and TS which together cover 45.3% of the survey area). A total of some 26.55% of the area has been either cleared or rehabilitated within the ONeil Transport Corridor.

None of these site-vegetation types are restricted to the ONeil Transport Corridor survey area; however all of the northern jarrah forest has not been mapped at this finer scale it is not feasible to provide a percentage representation of each site-vegetation type.

There are no threatened ecological communities (TECs) listed at Commonwealth level pursuant to sections 181 and 182 of the *EPBC Act* or listed by the DCCEEW (2024e) or at State level pursuant to Part 2 of the *BC Act* and as listed by DBCA (2024b) within the ONeil Transport Corridor survey area.

There are no priority ecological communities (PECs), as listed at State level by DBCA (2024a) within the ONeil Transport Corridor survey area. At a State or National level none of the site-vegetation types have been listed as Threatened or Priority Ecological Communities.

# 1. INTRODUCTION

Mattiske Consulting Pty Ltd (Mattiske) was commissioned by GHD on behalf of Alcoa of Australia Ltd (Alcoa) to conduct a desktop assessment and field assessment to evaluate the flora and vegetation values within the ONeil Transport Corridor areas, approximately 80 km south east of Perth, WA. Alcoa wishes to expand their mining operations into the ONeil Transport Corridor region. The ONeil Transport Corridor survey area is located in tenement ML 1SA and consists of three priority areas as defined by Alcoa of Australia Ltd. These studies incorporated previous data from transects in the northern section undertaken by Mattiske for Alcoa over a series of monitoring times from 1994 to 2015 in the Cameron block and from recent permanent plots established in 2023 within the ONeil Transport Corridor areas.

## 1.1. Location and Scope of Project

The ONeil Transport Corridor survey area lies within the Northern Jarrah Forest subregion of the Southwest Botanical Province (Beard 1990), approximately 80 km south of Perth, WA (Figure 1). The ONeil Transport Corridor survey area consists of one polygon located in tenement ML 1SA (Figure 2).

This report describes the potential and recorded flora and vegetation values of the proposed ONeil Transport Corridor survey area and places them within a local and regional context.

## 1.2. Environmental Legislation and Guidelines

The following key Commonwealth (federal) legislation relevant to this survey is the:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The following key Western Australian (state) legislation relevant to this survey includes the:

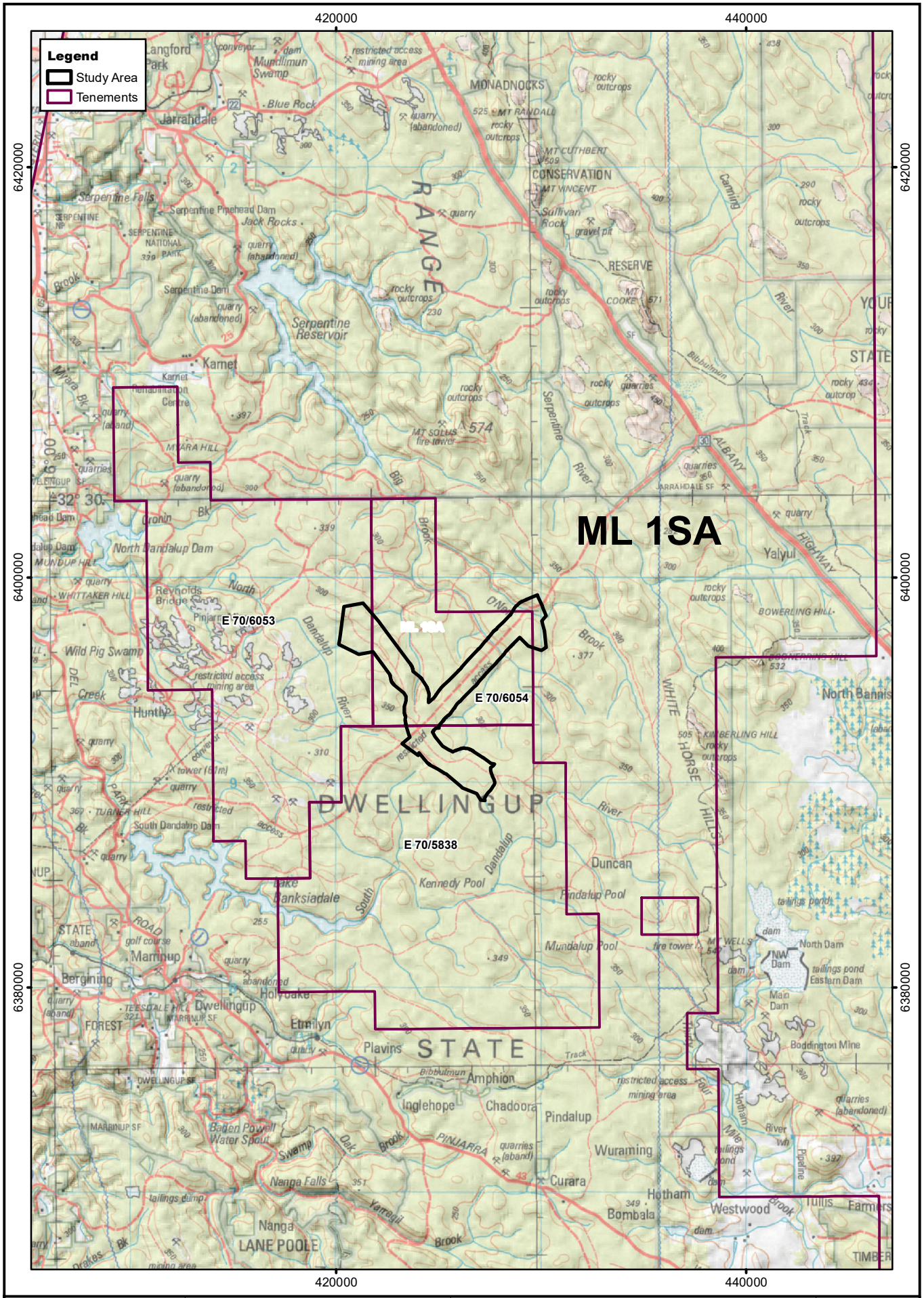
- *Biodiversity Conservation Act 2016* (BC Act);
- *Biosecurity and Agriculture Management Act 2007* (BAM Act) and *Regulations 2013*;
- *Environmental Protection Act 1986* (EP Act); and
- *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*

Furthermore, key Western Australian guidelines relevant to this survey are the:

- Environmental Factor Guideline: Flora and Vegetation (Environmental Protection Authority [EPA] 2016a);
- Technical Guidance – Flora and vegetation surveys for environmental impact assessment (EPA 2016b); and
- Survey Guidelines for Australia's Threatened Orchids. Guidelines for detecting Orchids listed as "Threatened" under the *Environment Protection and Biodiversity Conservation Act 1999*. (Commonwealth of Australia 2013)

Definitions of flora and vegetation terminology commonly used throughout this report are provided in Appendix A1-A5.


| | | | |
|---|---|---|---|
| N 0 3 6 km<br>Scale: 1:400,000<br>MGA94 (Zone 50) | Mattiske Consulting Pty Ltd<br>28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640 | **Transport Corridor**<br>**Locality** | Figure:<br>**1** |
| CAD Ref: a1992_F026_01 | Author: E M Matttiske \| MCPL Ref: | | |
| Date: March 2024 \| Rev: A \| A4 | Drawn: CAD Resources ~ www.cadresources.com.au<br>Tel: (08) 9246 3242 ~ Fax (08) 9246 3202 | | |




N

0 2 4 km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_02

Date: March 2024 | Rev: A | A4


Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202


# Transport Corridor
# Tenements

Figure: **2**

# 2. OBJECTIVES

The objective of this assessment was to combine the earlier desktop assessment and the findings from the recent field studies of the ONeil Transport Corridor survey area, including:

- A desktop assessment of the flora and vegetation of the ONeil Transport Corridor survey area, with an emphasis on threatened and priority flora, and threatened and priority ecological communities;
- Review previous literature and current databases associated with the ONeil Transport Corridor survey area;
- A summary of key findings from the detailed studies (plots, recording sites, transects and targeted surveys) conducted within the ONeil Transport Corridor area;
- Review the conservation status of the vascular plant species recorded by reference to current literature and current listings by the Department of Biodiversity, Conservation and Attractions (DBCA 2023a, 2023c) and plant collections held at the Western Australian Herbarium ([WAH] 1998 -), and plants listed by the Department of Climate Change, Energy and the Environment [DCCEEW] (2024a) under the EPBC Act; and
- Prepare a report summarising the findings.

# 3. METHODS

## 3.1. Desktop Assessment

The NatureMap (DBCA 2007- ) and EPBC Act Protected Matters Search Tool (DCCEEW 2023b) databases were used to identify the possible occurrence of flora (including threatened and priority taxa) and threatened and priority ecological communities within the ONeil Transport Corridor survey area.

In addition, historical documentation and vegetation mapping of the Northern Jarrah Forest subregion that provide resource material for the floristics and vegetation of the ONeil Transport Corridor survey area was reviewed, including Mattiske Consulting Pty Ltd (2009-2012) reports on their flora and vegetation surveys in the ONeil Transport Corridor region. Nomenclature of flora species was checked against and is consistent with Florabase (WAH 1998- ).

## 3.2. Field Studies

To maintain consistency with previous mapping of the area, enabling spatial and temporal comparisons, flora and vegetation were assessed using site-type classification based on Heddle *et al.* (1980). Sites were pre-designated using a grid system overlaid on the survey area. Additional opportunistic sites were surveyed when changes in the vegetation, representing communities which would otherwise have been missed, were encountered whilst walking between designated survey sites. Site data was used to define vegetation types for each survey site. This data was then used in combination with aerial imagery and field observations to map the vegetation of the survey area. Furthermore, searches for threatened, priority or Declared (plant) pests species were undertaken whilst walking between survey sites.

The following information was recorded at each vegetation assessment site:

| | |
|---|---|
| GPS location | Easting, Northing and datum; |
| Soil types | gravels, sandy-gravels, sandy-loam-gravels, sandy-loams, loams, clay-loams, clays and peat; |
| Topography | ridge, upper slope, mid-slope, lower slope, valley floor and swamp; |
| Outcropping | type – granite, laterite, dolerite, and quantity – few, moderate, numerous; |
| Logging history | light, moderate or heavy, together with number of stumps within a 20 m radius; |
| Fire history | years since last fire; and |

Dieback occurrence *Phytophthora* spp. demarcation – field blazing, coloured flagging on trees, vegetation deaths, either old or recent.

At each site species were ranked according to the scale developed by Havel (1975a, 1975b). Tree and understorey species were assessed separately using the following method.

### *Tree species*

Tree species (*Allocasuarina fraseriana, Banksia grandis, B. littoralis, B. seminuda, Corymbia calophylla, Eucalyptus marginata, E. megacarpa, E. patens, E. rudis, E. wandoo, Melaleuca preissiana, M. rhaphiophylla, Nuytsia floribunda, Persoonia elliptica, P. longifolia* and *Xylomelum occidentale*) were assessed within a 20 m radius from the observation point using the following scale:

0 absent;
1 one or two trees;
2 three to five trees;
3 more than five trees, but contributing less than one third of the total stand;
4 between one third and one half of the total stand; or
5 more than one half of the total stand.

### *Understorey species*

Understorey species were assessed within a 5 m radius from the observation point using the following scale:

0 absent;
1 very rarely seen, only after a careful search;
2 present, observable, but in small numbers only;
3 common locally, but not uniform over the whole area;
4 common over the whole area; or
5 completely dominating the understorey.

The physiological stress was determined for each species within a 20 m radius from the observation point and ranked according to the following scale.

0 healthy, no evidence of stress;
1 odd plant showing signs of stress, not dead;
2 one or two dead plants, near death;
3 scattered stressed plants, (2-4) dead plants around survey site;
4 susceptible plants dying or dead (> 4 plants); or
5 "graveyard" death

All plant specimens collected during the field survey were dried and processed in accordance with the requirements of the Western Australian Herbarium (WAH). All plant specimens were identified through comparisons with pressed specimens housed at the WAH. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

## 3.3. Survey Limitations

A general assessment was made of the current survey area against a range of factors that may have limited the outcomes and conclusions of this report (Table 1).

**Table 1: Potential flora and vegetation survey limitations for the ONeil Transport Corridor survey area**

| Potential Survey Limitation | Impact on Survey |
|---|---|
| Sources of information and availability of contextual information (*i.e.* pre-existing background versus new material) | **Not a constraint:** Reference resources such as mapping by Beard 1979, Mattiske and Havel 1998, previous vegetation mapping completed for Alcoa by E.M Mattiske and Associates together with online flora and vegetation information, has provided an appropriate level of information for the current survey. |
| Scope (*i.e.* what life forms, *etc.*, were sampled) | **Not a constraint:** Vascular flora, which were the focus of the present survey were thoroughly sampled on a grid pattern within the survey area. |
| Proportion of flora collected and identified (based on sampling, timing and intensity) | **Minor constraint:** The survey areas were sampled on a grid pattern. The botanists undertaking the field surveys have had extensive experience working with the flora of the Jarrah forest. Any flora which could not be identified in the field was collected for subsequent identification. Only minor constraint was the difficulty of assessing the total extent of the Priority 1 *Hibbertia hortiorum* records as this taxon was included in the earlier H*ibbertia commutata* records in previous assessments. Thiele (2019) split the Hibbertia commutate into multiple taxa and as a result the historical records for *Hibbertia commutata* may include more occurrences of the Priority species in the survey area. Therefore there is a need in this report to rely on the concentrated effort near the current tracks and also the wider 2023 records to summarize the occurrence of this species. In addition, the relationships of the Priority Hibbertia species with the site-vegetation types was also reviewed and summarized. |
| Mapping reliability | **Not a constraint:** The vegetation were assessed on a grid pattern within the survey area. This together with opportunistic survey sites will provide high quality data enabling the survey area to be mapped with a high level of confidence. |
| Timing, weather, season, cycle | **Not a constraint:** The EPA (2016a) recommends that flora and vegetation surveys in the South – West Botanical Province be conducted in Spring (September-November). The sampling was undertaken in the spring months of 2023 and when combined with the extensive work undertaken in the area and in adjacent areas reduces the risk of not covering the flora species.<br>With regard to the conservation significant flora, the majority identified as potentially occurring within the survey area can be recorded out of season with the exception of some orchid species which do not flower as regularly and some *Drosera* species. Further detailed work will be undertaken in 2024. |
| Disturbances (fire flood, accidental human intervention, *etc.*) | **Potential Constraint:** Some areas had been recently burnt and hence it was necessary to extrapolate from nearby mapping. Generally, many species take 2 to 3 years to recover after burns in the northern Jarrah forest.<br>**P**revious logging activities have been undertaken for many decades in this area. Some forestry areas had been burned recently; this affected the ability to accurately define vegetation communities. These land uses and activities may influence surveys in the area. |
| Access problems (*i.e.* ability to access survey area) | **Not a constraint:** Vehicle access was not restricted in the survey areas. |
| Experience levels (*e.g.* degree of expertise in plant identification to taxon level) | **Not a constraint:** All botanists had direct and recent experience working in the Jarrah Forest and working for Alcoa, and thus were familiar with the local flora and vegetation values. Dr Mattiske has more than 40 years of ecological experience in flora and vegetation studies in the southwest forests. |

# 4. RESULTS

The climate, geology, soils and landforms all influence the vegetation of the area and are described in this section. Potential flora, including threatened, priority and introduced species are described, along with possible vegetation communities, and placed within a local and regional context.

## 4.1. Climate

The survey area lies in the Northern Jarrah Forest subregion. Beard (1990) described the climate of this area as being warm Mediterranean, with rainfall of 600 – 1200 mm per annum and 5 - 6 dry months per year. Annual average rainfall at Dwellingup is 1218.5 mm (Bureau of Meteorology [BOM] 2024). Rainfall in 2021 (1335.4mm) was higher than the long term (LT) of 1221.8mm, see Figure 3. The rainfall decreased in 2022 to 1009.2mm for the year and for the 11 months (January to November in 2023) to 951.6mm, Figure 3. The trend of lowering rainfall is not replicated in similar changes to the temperature.

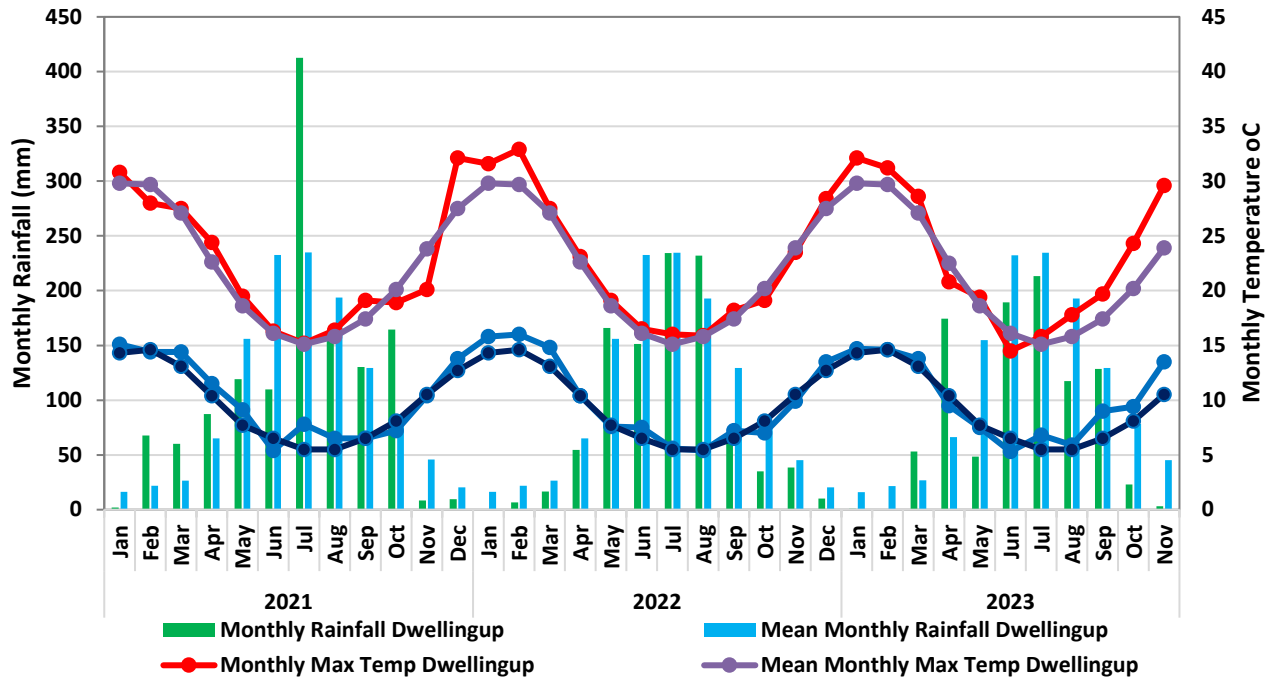
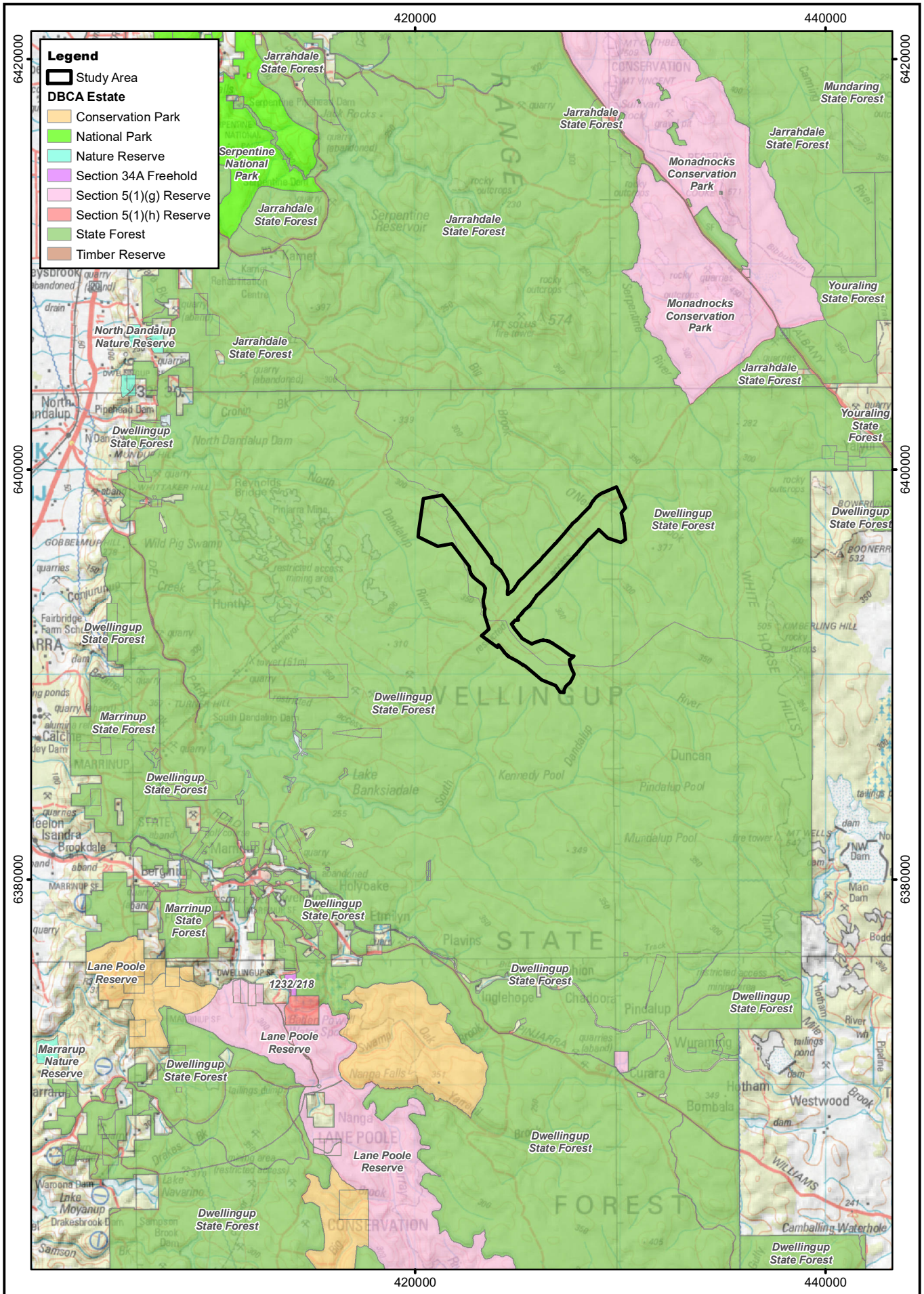



**Figure 3: Climatic data for ONeil Transport Corridor survey area (BOM 2024)**
Long term average rainfall and temperature from the Dwellingup weather station

## 4.2. DBCA Estates

The ONeil Transport Corridor survey area is situated in State Forest to the north-east of Dwellingup (Figure 4).




N

0 2 4 km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_03

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# DBCA Estates

Figure: **4**

## 4.3. Geology, Soils and Topography

The ONeil Transport Corridor survey area is situated within Beard's (1990) Northern Jarrah Forest subregion of the Southwest Province. The Northern Jarrah Forest subregion encompasses the area to the east of the Darling Scarp, overlying Archaean granite and metamorphic rocks of the Yilgarn Craton at an average elevation of 300 m (Beard 1990). The area is capped by extensive lateritic duricrust, dissected by drainage lines and broken by occasional granite hills. In the eastern section, the laterite becomes deeply dissected until it compresses isolated remnants. The duricrusted plateau of the Yilgarn Craton is characterised by lateritic gravels, consisting of 5 m or more of ironstone gravels in a yellow sandy matrix, and related lateritic podzolic soils with ironstone gravels in a sandy surface horizon. This overlay mottled yellow-brown clay subsoils and hard setting loamy soils, which become evident in the east (Beard 1990).

Furthermore, Western Australia is divided into twelve Systems, separated by natural and demographic boundaries (Department of Conservation and Environment 1980). The survey area lies within the Darling System (as known as System 6), which is further divided into provinces, with the survey area lying in The Darling Plateau province (Department of Conservation and Environment 1980).

The underlying geological units of The Darling Plateau province have been defined by Churchward and McArthur (1980), with three main landform and soil units occurring within the survey areas, these are:

**Dwellingup:** Gently undulating landscape with duricrust on ridges; sands and gravels in shallow depressions.

**Yarragil:** Valleys of the western part of the plateau; sandy gravels on the slopes; orange earth in swampy floors.

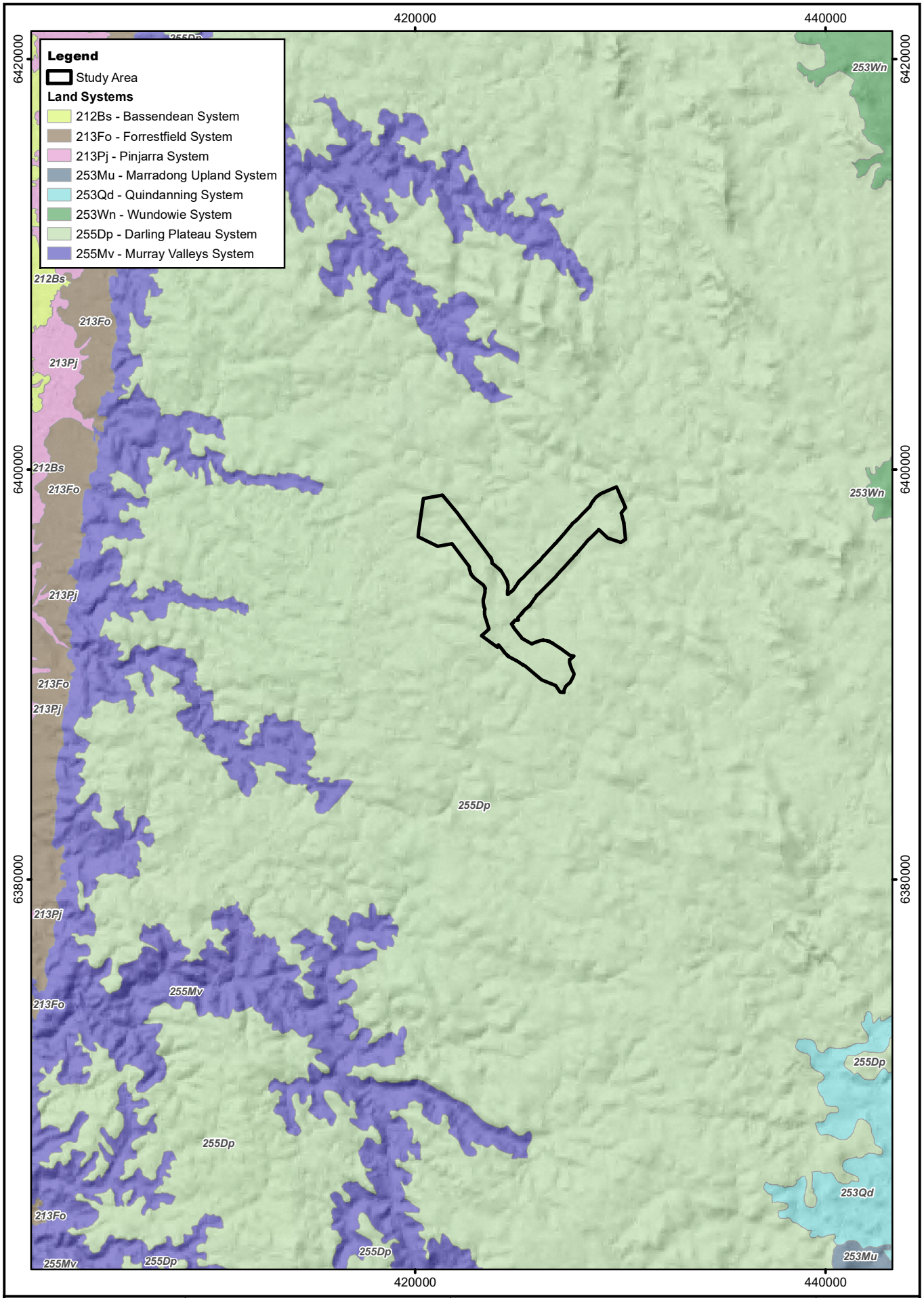
**Cook:** Hills rising above general plateau level ; mainly laterite but with some rock outcrop.

The Department of Primary Industries and Regional Development's (DPIRD) Land Systems present within the ONeil Transport Corridor survey area (Figure 5, Table 2) includes:

1. **Darling Plateau System (255Dp):** Lateritic plateau. Duplex sandy gravels, loamy gravels and wet soils. Jarrah-marri-wandoo forest and woodland.

**Table 2: Extent of Land Systems intersecting the ONeil Transport Corridor survey area**

| Land System | Mapping Unit | Total Extent (ha) | Area of Intersection with the ONeil Transport Corridor survey area | Proportion of Current Extent (%) |
|---|---|---|---|---|
| Darling Plateau System | 255Dp | 820265.73 | 2592.57 | 0.316 |




N

0 2 4 km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_04

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Land Systems

Figure: **5**

## 4.4. Regional Vegetation

The survey area is situated within Beard's (1990) Northern Jarrah Forest subregion of the Southwest Province. The Northern Jarrah Forest subregion is characterised by Jarrah (*Eucalyptus marginata*) forest on ironstone gravels and Marri-Wandoo (*Corymbia calophylla* - *Eucalyptus wandoo*) woodlands on loamy soils, with sclerophyll understoreys. Dell and Havel (1989) broadly classified the Jarrah Forest as an open forest in its northern extent and as a tall forest in its southern extent. In lower rainfall areas towards the east trees decrease in size, forming woodlands or low forests. This dry sclerophyllous forest typically comprises a dominant *Eucalyptus marginata* and *Corymbia calophylla* overstorey, a mid-storey of *Allocasuarina fraseriana* (Sheoak), *Banksia grandis* (Bull Banksia), *Persoonia longifolia* (Snottygobble), *Persoonia elliptica* (Spreading Snottygobble), and a groundcover of woody shrubs with grass trees *Xanthorrhoea preissii*, *Kingia australis* and the cycad *Macrozamia riedlei* (Dell and Havel 1989).

The Pre-European vegetation system present within the ONeil Transport Corridor survey area (Figure 6, Table 3) includes:

1. **West Darling System**

   **Vegetation Association 3.3:** Mainly jarrah and marri *Eucalyptus marginata, Corymbia calophylla*.

**Table 3: Extent of pre-European vegetation associations intersecting the ONeil Transport Corridor survey area**

| System | Vegetation Association | State-wide Pre-European Extent (ha) | Area of Intersection with the ONeil Transport Corridor survey area (ha) | Proportion of Current Extent (%) |
|---|---|---|---|---|
| West Darling | 3.3 | 485226 | 2593 | 0.5 |

Heddle *et al.* (1980) and Mattiske and Havel (1998) described the dominant pre-European vegetation of the Darling System in a series of vegetation complexes (Regional Forest Agreement vegetation complexes) and determined how they relate to the landforms, soils and climatic conditions. Four broad vegetation complexes occur in the ONeil Transport Corridor survey area (Figure 7, Table 4), these are:

**Dwellingup 1 (D1):** Open Forest of *Eucalyptus marginata* subsp. *marginata* - *Corymbia calophylla* on lateritic uplands in mainly humid and subhumid zones.

**Dwellingup 2 (D2):** Open Forest of *Eucalyptus marginata* subsp. *marginata* - *Corymbia calophylla* on lateritic uplands in subhumid and semiarid zones.

**Cooke (Ce):** Mosaic of Open Forest of E*ucalyptus marginata* subsp. *marginata – Corymbia calophylla* (subhumid zone) and open forest of *Eucalyptus marginata* subsp*. thalassica – Corymbia calophylla* (semi-arid and arid zones) and on the deeper soils adjacent to outcrops closed heath of Myrtaceae-Proteaceae species and lithic complex on granite outcrops and associated soils in all climatic zones with some *Eucalyptus laeliae* (semi-arid), and *Allocasuarina huegeliana* and *Eucalyptus wandoo* (mainly semiarid to perarid zones).

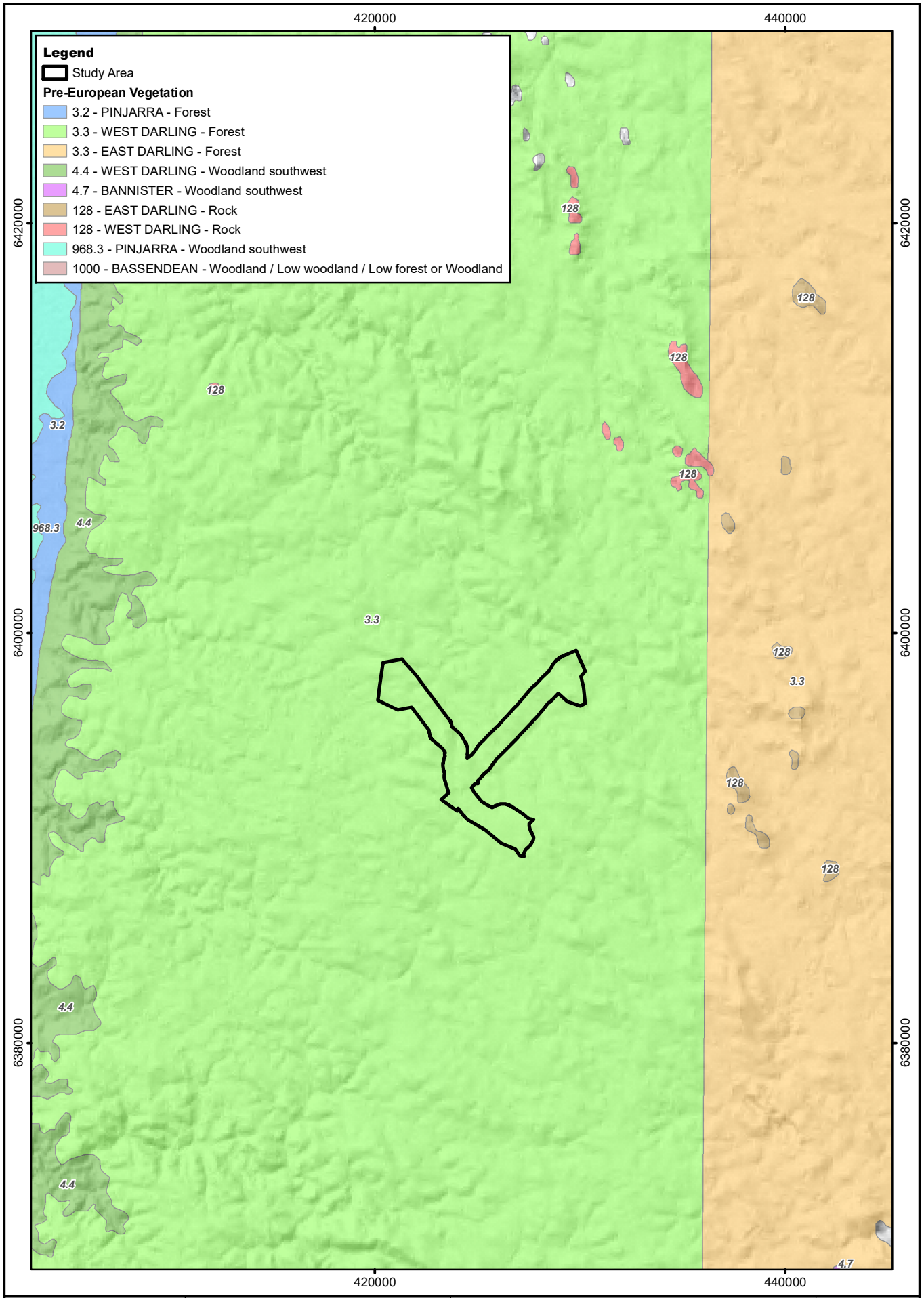
**Yarragil 2 (Yg2):** Open Forest of *Eucalyptus marginata* subsp. *thalassica* - *Corymbia calophylla* on slopes, woodland of *Eucalyptus patens-Eucalyptus rudis* with *Hakea prostrata* and *Melaleuca viminea* on valley floors in subhumid and semiarid zones.

**Swamp (S):** Mosaic of open woodland of *Melaleuca preissiana – Banksia littoralis,* closed scrub of Myrtaceae spp., closed heath of Myrtaceae spp., and sedgelands of *Baumea* and *Leptocarpus* spp. On seasonally wet and moist sand, peat and clay soils on valley floors in all climatic zones.

More recently, the vegetation of Western Australia has been assigned to bioregions and subregions under the Interim Biogeographical Regionalisation for Australia (IBRA), with the survey area falling within the Northern Jarrah Forest subregion (JF1) of the Jarrah Forest (JAF) Region (DCCEEW 2024c). The vegetation of the Northern Jarrah Forest subregion consists of Jarrah – Marri forest, with Bullich and Blackbutt in the valleys to the west, grading to Wandoo and Marri woodlands to the east. Heath vegetation is the common understorey of forests and woodlands and occurs on granite rocks. The majority of the diversity between communities in this subregion occurs on lower slopes and near granite soils (Williams and Mitchell 2001).

**Table 4: Extent of Vegetation Complexes intersecting the ONeil Transport Corridors survey area**

| Area (Blocks) | Vegetation Complex | Vegetation Class | Total Extent (ha) | Area of Intersection with the ONeil Transport Corridor survey area (ha) | Proportion of Current Extent (%) |
|---|---|---|---|---|---|
| ONeil Transect Corridors | Coole | Ce | 51872 | 7.6 | 0.02 |
| | Dwellingup 1 | D1 | 297625 | 1937.9 | 0.65 |
| | Dwellingup 2 | D2 | 120755 | 24.7 | 0.02 |
| | Swamp | S | 76246 | 40.6 | 0.05 |
| | Yarragil 2 | Yg2 | 71234 | 581.8 | 0.82 |




N

0 2 4 km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_06

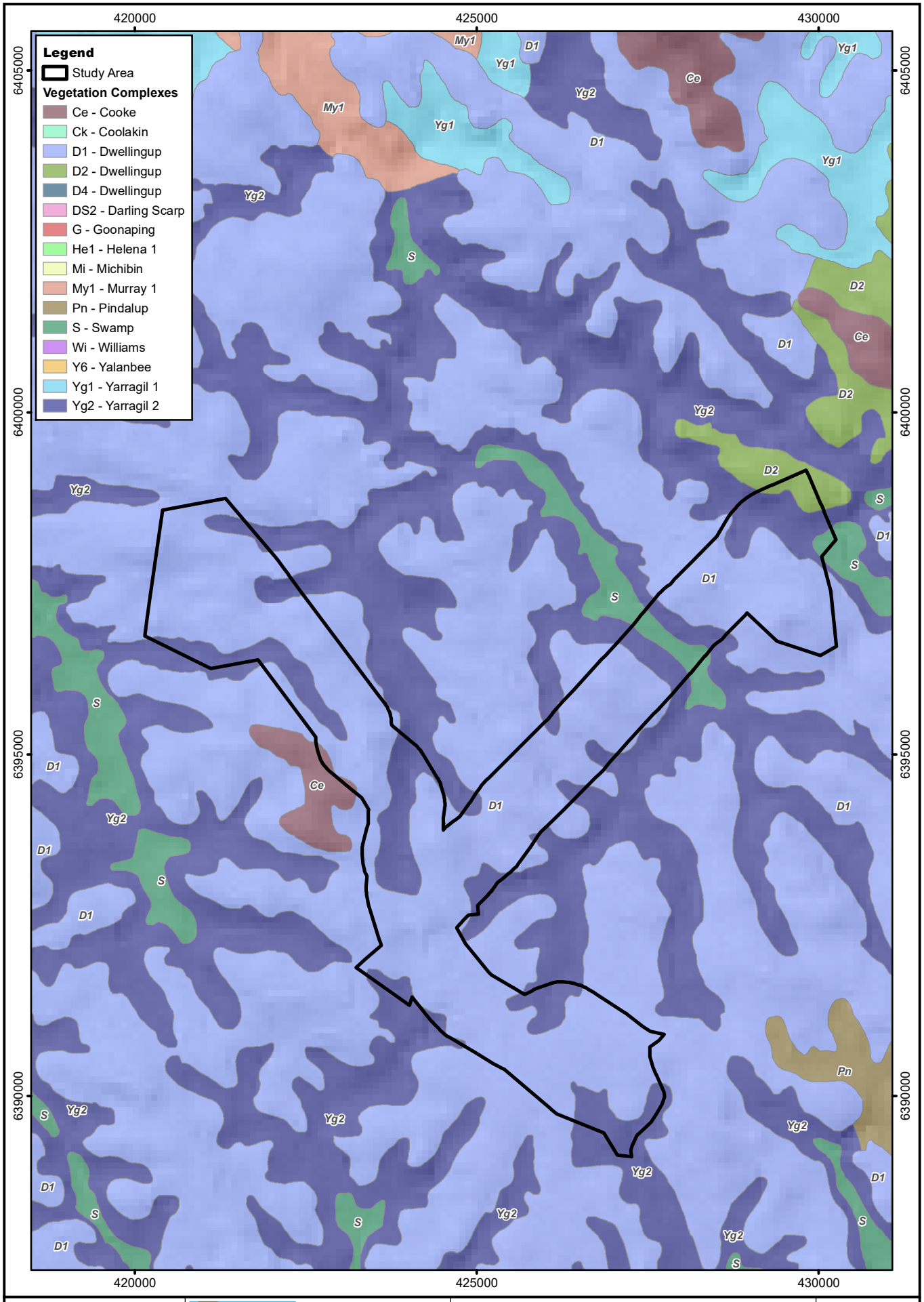
Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Transport Corridor

# Pre-European Vegetation

Figure: 6




N

0 0.55 1.1 km

Scale: 1:75,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_07

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Vegetation Complexes

Figure: **7**

## 4.5. Potential Flora

Based on the previous nearby surveys and the recent additional studies a total of 459 vascular plant taxa, representative of 168 genera and 59 families (Appendix B), have the potential to occur within the ONeil Transport Corridor survey area (Mattiske Consulting 1998-2023). The most commonly represented families were Fabaceae (67 taxa), Proteaceae (53 taxa), Myrtaceae (38 taxa) and Asparagaceae (253 taxa).

### 4.5.1. Potential Threatened and Priority Flora

A total of twelve threatened flora species and 37 priority flora species has the potential to occur in the ONeil Transport Corridor survey area. Of the threatened flora species, all are considered to have a very low potential of occurring in the Oneil Transport survey area due to the lack of suitable habitat and also know distributions away from the survey area.

In 2023, the data indicated that of the priority flora species, five species have a high potential to occur in the survey area and four priority flora species have a moderate or moderate to high potential to occur in the survey area.

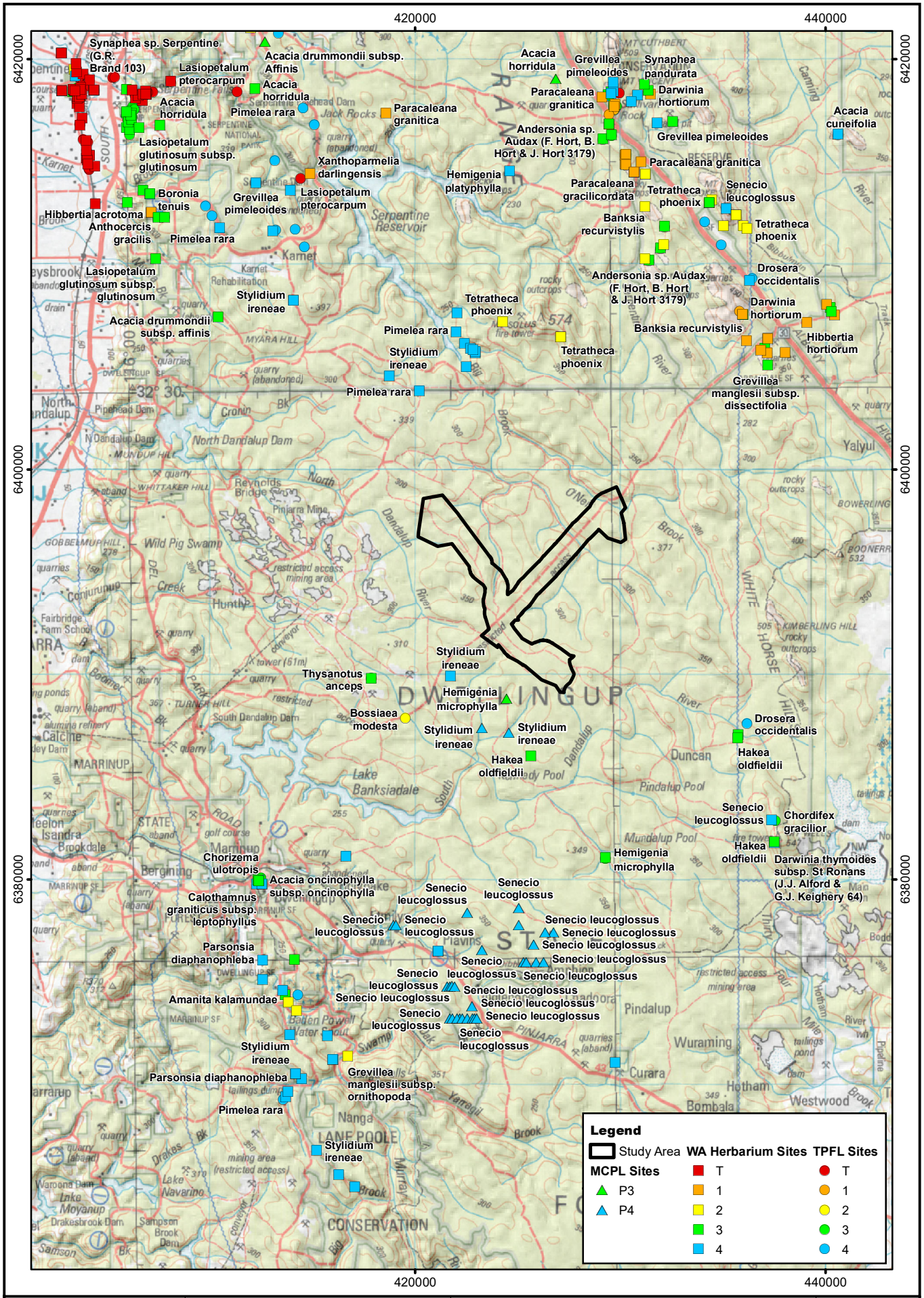
The likelihood that these species would occur within the survey areas was determined using the following criteria:

- Known records within a 20 km radius of the centre of the survey area (as described above). More recent, proximal and numerous records were ranked higher.
- Potential presence of suitable habitat and landforms for the species within the survey area (e.g. soil type, bedrock type, topography, drainage lines, vegetation).
- The likelihood was ranked Low, Moderate or High.

All potential threatened and priority flora are listed in Appendix B, along with their State and Federal Conservation Codes (see Appendix A for definitions), a description and an assessment of the likelihood of their occurrence in the ONeil Transport Corridor survey area.

Based on this assessment, five priority flora species had a high likelihood of occurring in the ONeil Transport Corridor survey area, Appendix C and Figure 8. These included *Hibbertia hortiorum* (P1), *Tetratheca phoenix* (P2), *Pimelea rara* (P4), *Senecio leucoglossus* (P4) and *Stylidium ireneae* (P4).

A further four priority flora had a moderate to high and moderate-high likelihood of occurrence in the Oneil Transport Corridor survey area (Appendix C). These included *Adenanthos cygnorum* subsp. *chamaephyton* (P3), *Andersonia* sp. Audax (F. Hort, B. Hort & J. Hort 3179) (P3), *Cyathochaeta teretifolia* (P3) and *Thysanotus anceps* (P3).




N

0 2 4 km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_05

Date: March 2024 | Rev: A | A4


Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202


Transport Corridor

# Threatened and Priority Flora

Figure: **8**

### 4.5.2. Potential Introduced (Weed) Species and Declared Pest (Plant) Organisms

On the basis of databases and previous surveys near or within the Oneil survey areas a total of 15 introduced taxa has the potential to occur in the ONeil Transport Corridor survey area (Appendix C). None of the weeds are declared pest organisms pursuant to section 22 of the BAM Act (DPIRD 2024) and none are listed as Weeds of National Significance (DCCEEW 2024d).

An assessment of the likelihood that the significant weed species (Weeds of National Significance and/or declared pest organisms) would occur within the ONeil Transport Corridor survey area was determined using the following criteria:

- Known records within a 10-20 km radius of the centre of the survey area, based on studies that overlap the survey area or that have been recorded in nearby areas
- More recent, proximal and numerous records were ranked higher.
- Potential presence of suitable habitat and landforms for the species within the survey area (e.g. soil type, bedrock type, topography, drainage lines, vegetation).

The majority of the weeds are relatively short-lived species that will not compete with native species unless the vegetation is cleared or disturbed.

## 4.6. Groundwater Dependant Ecosystems

The potential groundwater dependent ecosystems were determined on the basis of the extent of the vegetation complexes (Yarragil 2 and Swamp), Figure 9. In view of the extensive flora and vegetation studies in the Northern Jarrah Forest subregion these vegetation complexes support species and site-vegetation types that prefer and occur on seasonally moister and wetter soils. This approach was considered to represent a precautionary approach in the absence of detailed groundwater level data at the time of selecting the potential groundwater dependent ecosystems at this juncture in the absence of site-vegetation type data.

Key indicator plant species that are generally accepted as indicators of moister soils and, hence, potential groundwater dependent ecosystems include – *Banksia littoralis, Hakea varia, Acacia divergens, Boronia molloyae, Thomasia paniculata, Astartea scoparia, Babingtonia camphorosmae, Eucalyptus patens, Hypocalymma angustifolium, Melaleuca preissiana, Melaleuca viminea* and *Taxandria linearifolia.*


N

0 0.55 1.1 km

Scale: 1:75,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_12

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Potential GDE

Figure:

**9**

## 4.7. Old Growth Forests

Based on data from Department of Biodiversity, Conservation and Attractions, there are no old growth forests occurring in the ONeil Transport Corridor survey area (Figure 10).

Due to the proximity of the proposed transport corridoes to the main North-East Road is unlikely that there will be additional old growth forests in the survey area.

The data as presented on the history of harvesting in the area reflects the age of logging on the ONeil Transport Corridor survey area, see Figure 11. The data in Figure 11 reflects the more recent logging in the northern options which in part reflects the operational activities of Alcoa (pre mining). Some of the valley areas have not been logged for some time and as such reflect the linear patterns of these systems.

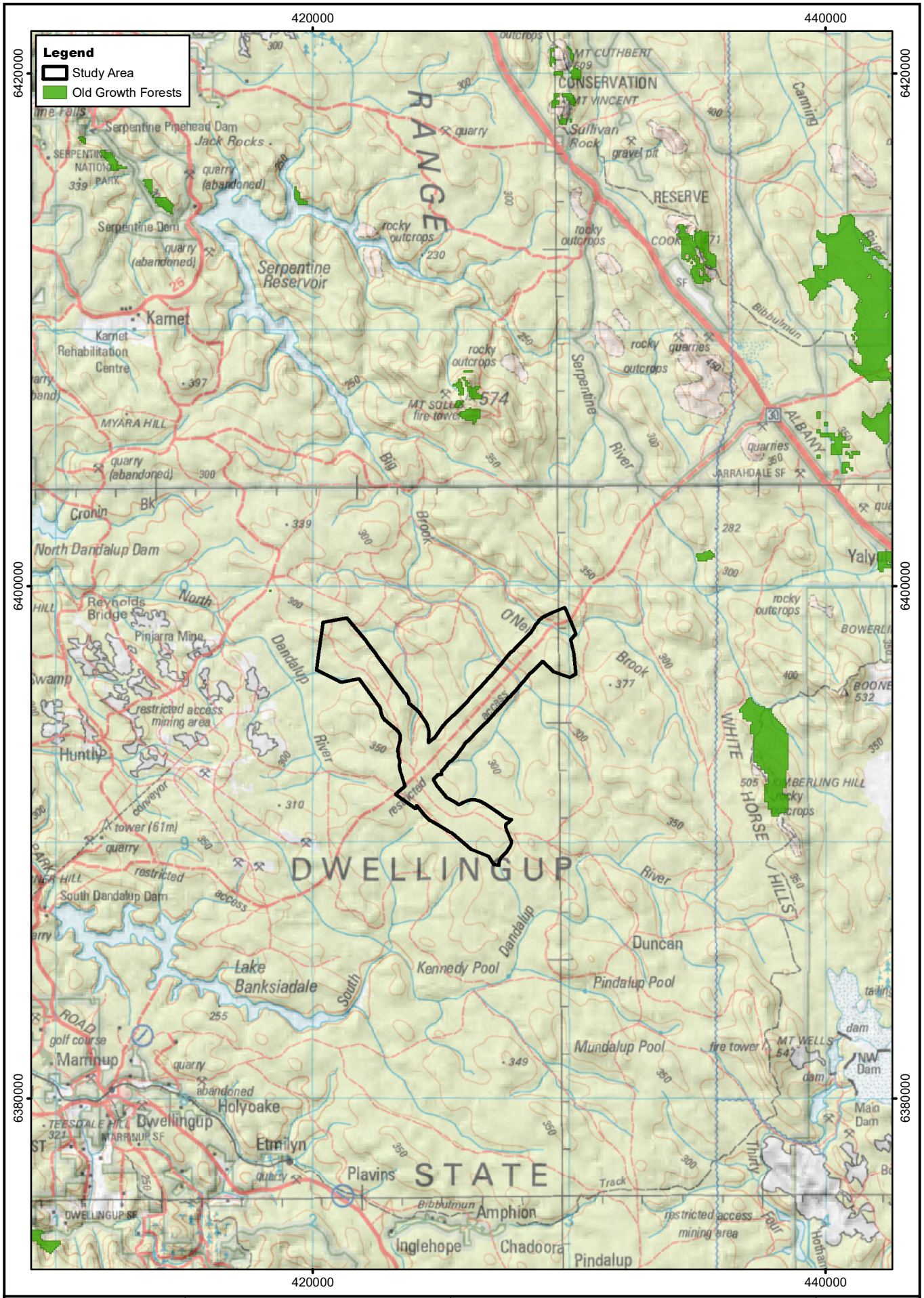
## 4.8. Previous Surveys

Mattiske Consulting has previously mapped the vegetation in the areas surrounding the ONeil Transport Corridor survey area. Recent flora and vegetation studies relevant to the ONeil Transport Corridor survey area include the previous flora and vegetation studies and transect monitoring has been done in the nearby Cameron block (including the sub-catchment Gordon) since 1993 (E.M. Mattiske and Associates 1993 to 1994; and Mattiske Consulting 1996 to 2006) and the ONeil Transport Corridor areas (Mattiske Consulting Pty Ltd 2009, 2012).

## 4.9. Potential Threatened and Priority Ecological Communities

There are no threatened ecological communities (TECs) listed at Commonwealth level pursuant to sections 181 and 182 of the *EPBC Act* or listed by the DCCEEW (2043e) or at State level pursuant to Part 2 of the *BC Act* and as listed by DBCA (2023c) with the potential to occur within the ONeil Transport Corridor survey area.

There are no priority ecological communities (PECs), as listed at State level by DBCA (2023b) with the potential to occur within the ONeil Transport Corridor survey area.




N

0 1.5 3 km

Scale: 1:200,000
MGA94 (Zone 50)

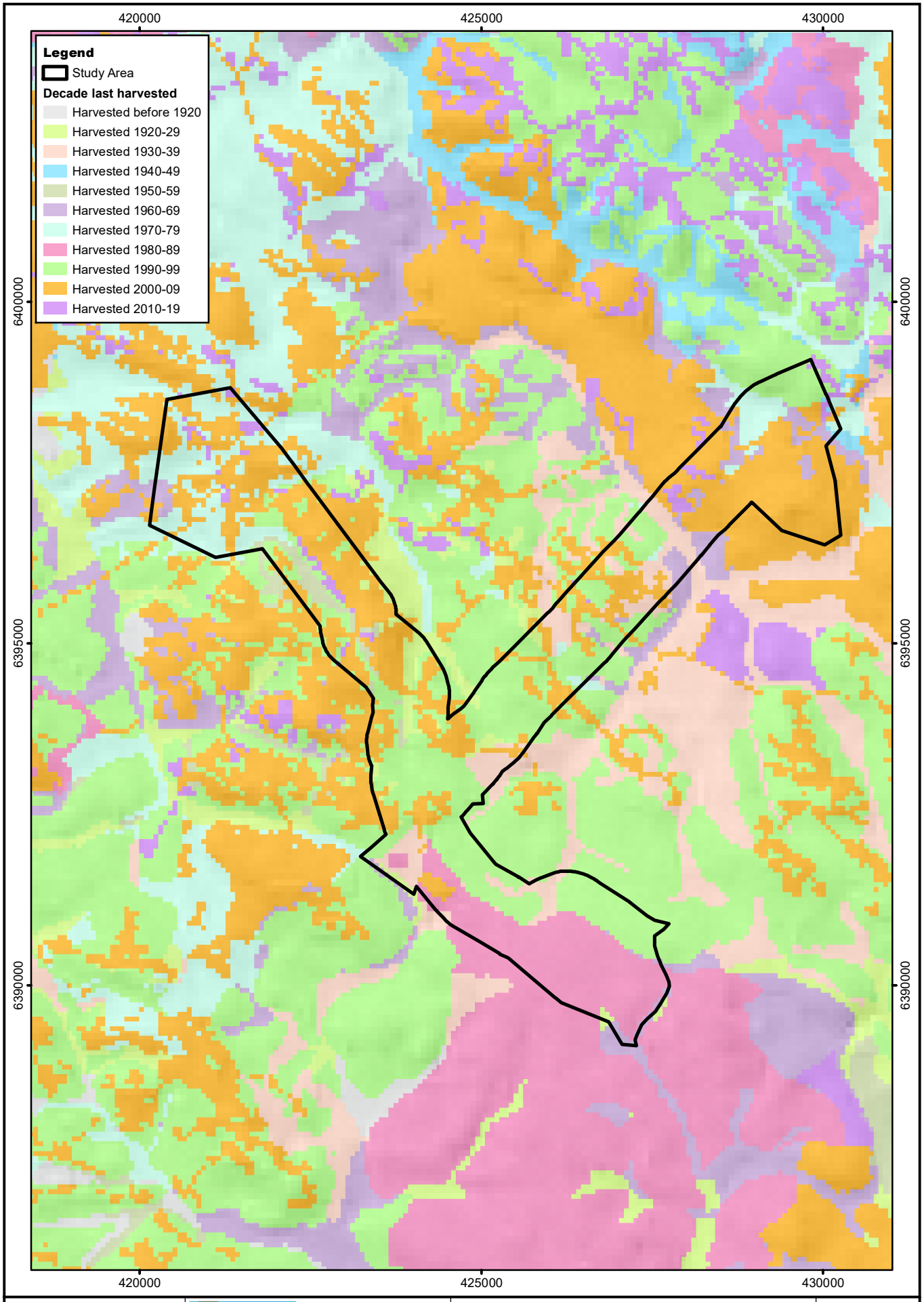
CAD Ref: a1992_F026_08

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Old Growth Forest

Figure:
**10**




N

0 0.55 1.1 km

Scale: 1:75,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_10

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Harvested Year

Figure:

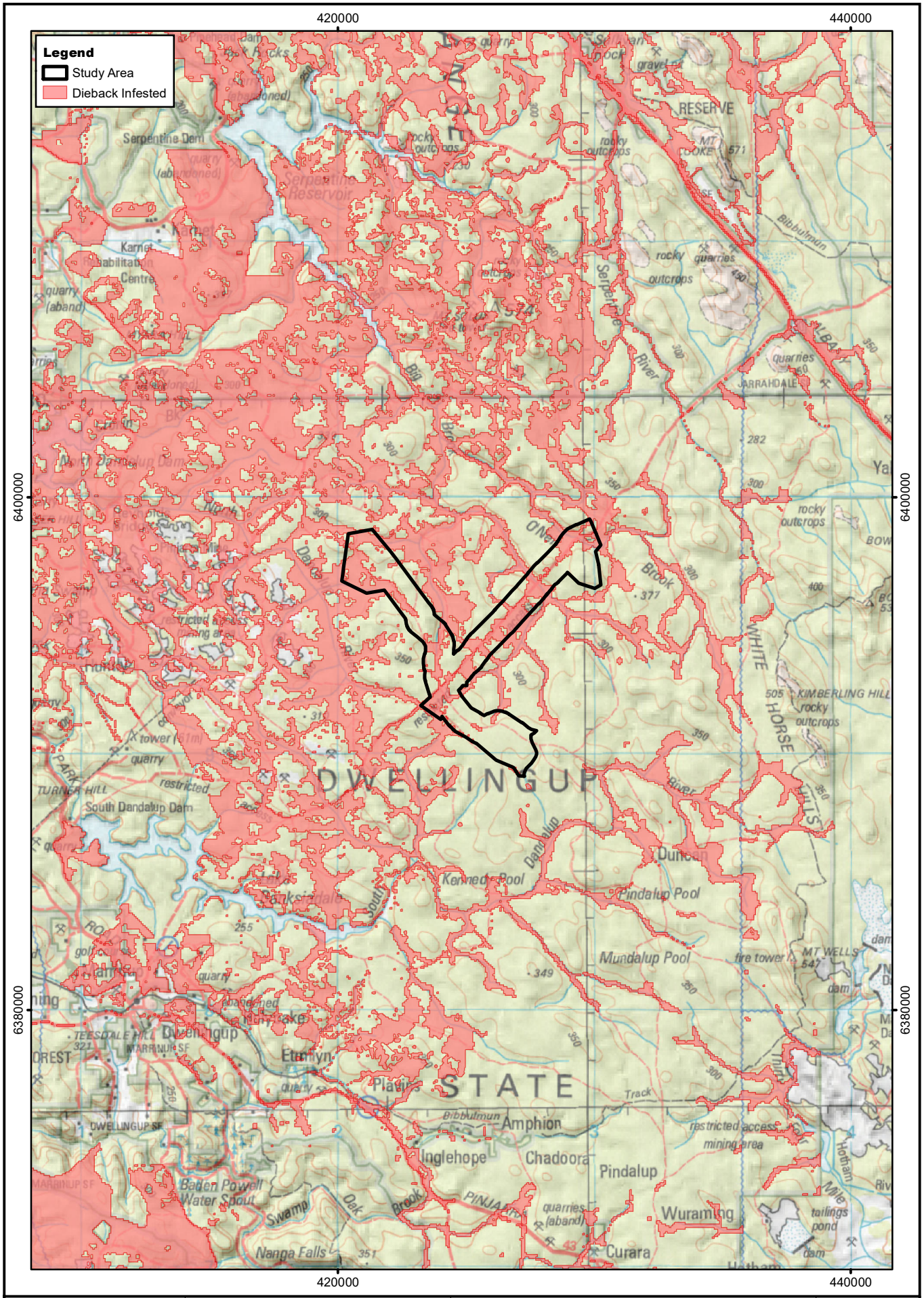
**11**

## 4.10. Wetlands of International Importance (Ramsar)

The Peel-Yalgorup System, a listed Ramsar Wetland of International Importance, is located adjacent to the City of Mandurah and consists of shallow estuaries, freshwater marshes and coastal saline lakes that include the Harvey Estuary, Peel Inlet, Lake McLarty, Lake Mealup and ten Yalgorup National Park wetlands (DCCEEW 2024f). The fringing vegetation is mainly samphire, rushes, sedges and paperbark communities. The Peel-Yalgorup System supports a wide variety of waterbirds, invertebrates and estuarine and marine fish and is considered the most important area for waterbirds in south-western Australia (DCCEEW 2024f). Whilst these potential values were recognized in the National database search (DCCEEW 2024f) these wetlands occur 50km west of the survey area and not in the ONeil Transport Corridor survey area.

## 4.11 Review of Dieback Occurrence

The dieback data as shown on Figure 12 reflects the most up to date dieback interpretation data from both DBCA and Glevan Consulting for the ONeil Transport Corridor survey area. Sections of the ONeil Transport Corridor survey area have been infested with the dieback disease caused by *Phytophthora cinnamomi*. In other areas of the survey area the dieback infections are concentrated to the valleys systems. There may be some differences also in coverage and sampling in some of the areas of ONeil Transport Corridor survey area.




N

0 1.5 3 km

Scale: 1:200,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_09

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd

28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Dieback

Figure:

**12**

# 5. RESULTS

## 5.1 Survey Effort

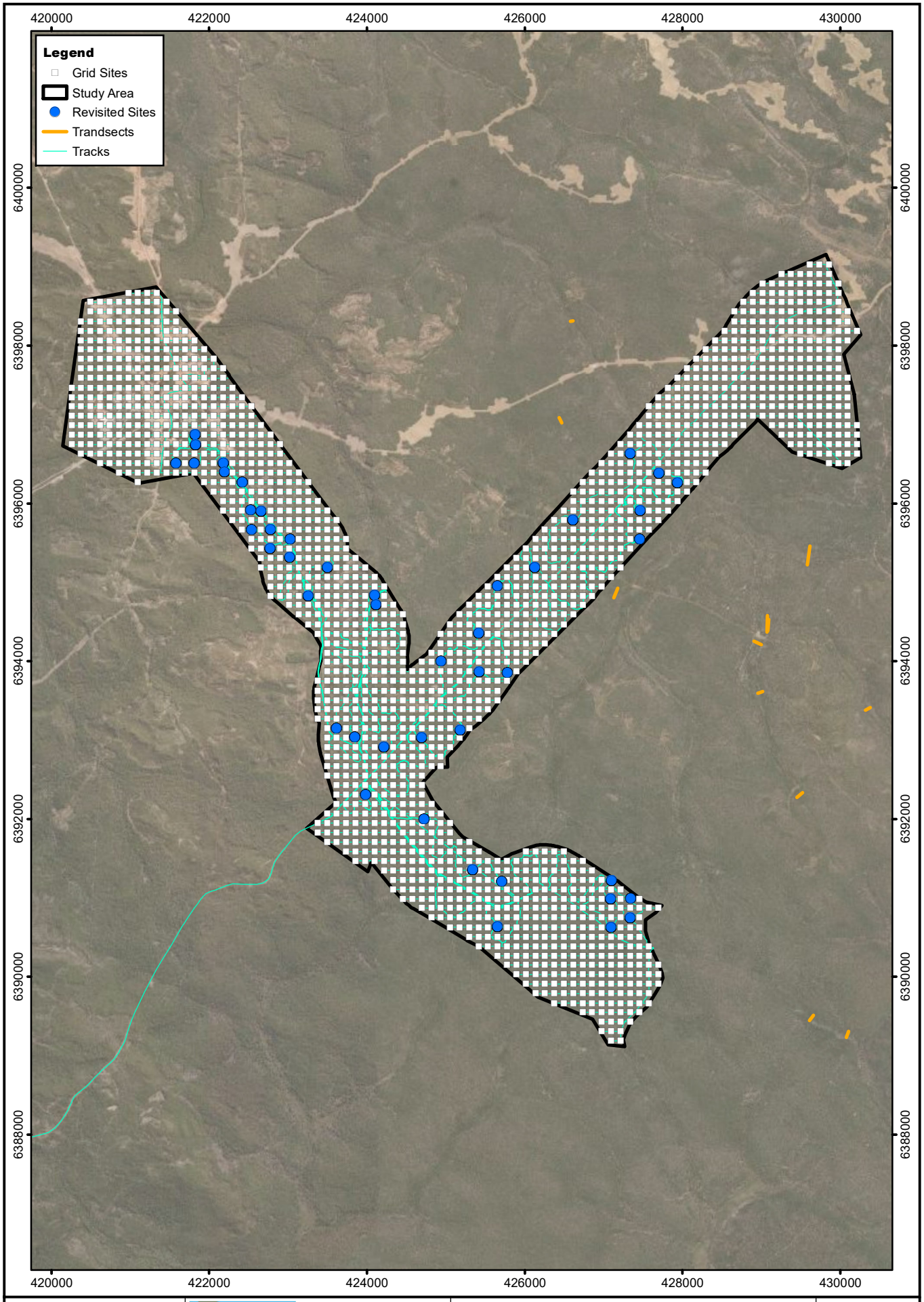
The survey effort is summarized in Table 5 and Figure 13 and in the following text.

- Previous detailed studies were undertaken by the Mattiske Consulting team on some 2047 sites for assessing native vegetation.
- Additional targeted flora and vegetation mapping was undertaken over two months from August 2023 to September 2023 by 4 experienced botanists from Mattiske Consulting.
- Targeted re-assessment of 45 sites was undertaken in the spring months of 2023.

Table 5 provides a summary of the number of recording sites in each site-vegetation type. The more restricted site-vegetation types are obviously less well represented in the recording sites. None of the site-vegetation types are restricted to the survey area.

**Table 5: Sampling Intensity in the respective areas of each Site-Vegetation Type**

| Site-vegetation Type | No Recording Sites (pre-2023) | No. Reassessed Sites (2023) | ONeil Transport Corridors (ha) | % Total Survey Area |
|---|---|---|---|---|
| A | 2 | - | 1.834 | 0.07 |
| AC | 100 | 2 | 73.772 | 2.85 |
| AW | 6 | - | 3.5 | 0.14 |
| C | 36 | 2 | 16.359 | 0.63 |
| CW | 36 | 2 | 23.386 | 0.9 |
| W | 90 | 2 | 76.226 | 2.94 |
| DA | - | - | 1.285 | 0.05 |
| D | 180 | 2 | 131.509 | 5.07 |
| G1 | 2 | - | 2.362 | 0.09 |
| R | 6 | - | 3.695 | 0.14 |
| PS | 108 | - | 76.051 | 2.93 |
| PT | 46 | 2 | 28.332 | 1.09 |
| PW | 54 | 3 | 40.318 | 1.56 |
| SW | 114 | 2 | 79.299 | 3.06 |
| S | 670 | 11 | 479.312 | 18.49 |
| SP | 512 | 2 | 372.414 | 14.36 |
| ST | 172 | 6 | 117.036 | 4.51 |
| TS | 436 | 5 | 322.895 | 12.45 |
| T | 80 | 4 | 54.646 | 2.11 |
| CLEARED | 236 | - | 171.025 | 6.6 |
| REHABILITATION | 724 | - | 517.315 | 19.95 |
| TOTAL | 3610 | 45 | 2592.572 | |




N

0 490 980 m

Scale: 1:65,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_16

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

# Transport Corridor
# Survey Effort

Figure:
**13**

## 5.2 Flora

In the more recent targeted flora and vegetation studies (including re-assessment of 45 sites a total of 122 vascular plant taxa, representative of 66 genera and 37 families (Appendix C), have been recorded in the ONeil Transport Corridor survey area. The most commonly represented families were Fabaceae (13 taxa), Myrtaceae (12 taxa), Asparagaceae (11 taxa), Proteaceae (9 taxa) and Asteraceae (7 taxa). .

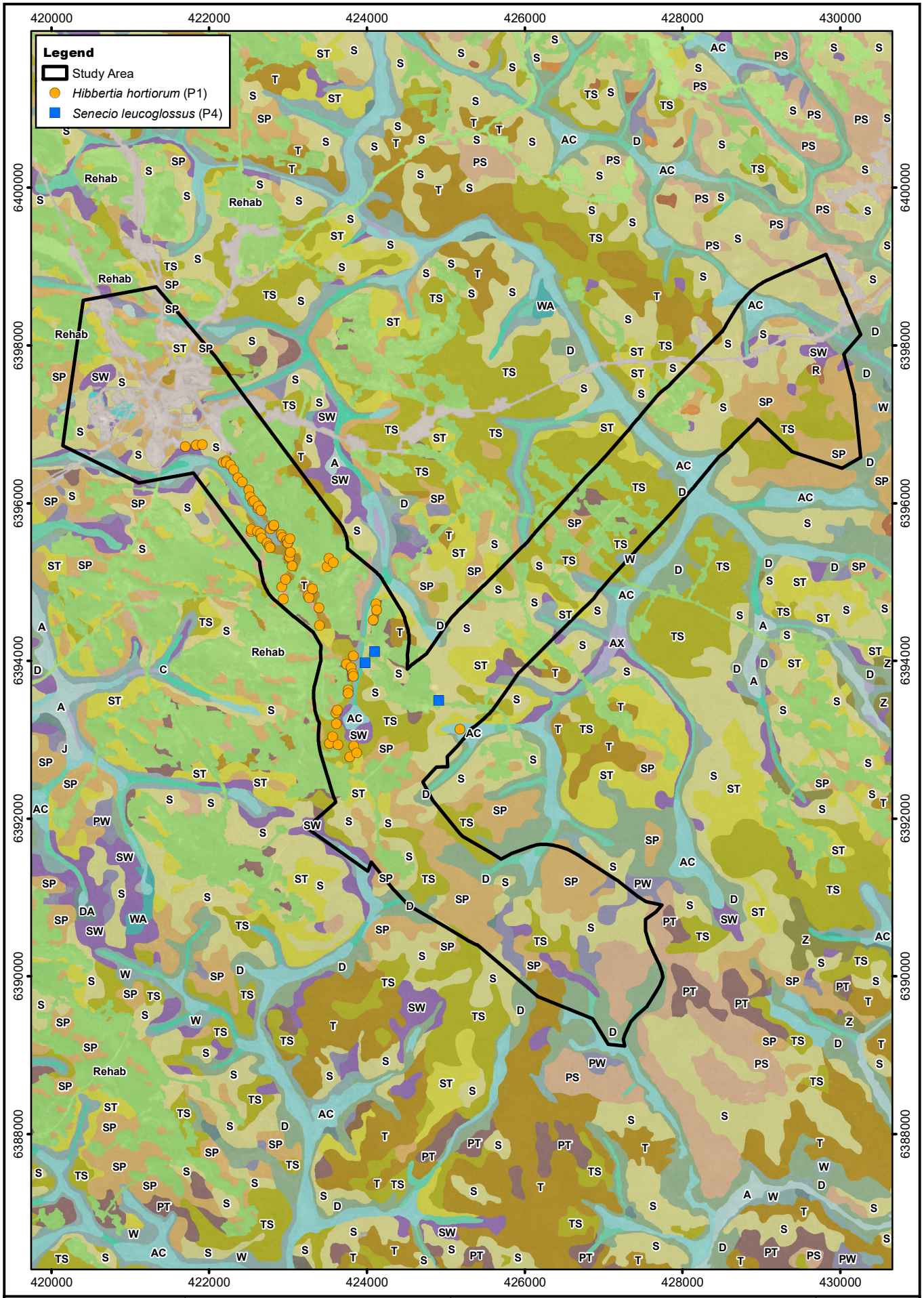
## 5.3 Threatened and Priority Flora

A total of 2 priority flora species (*Hibbertia hortiorum* P1 and *Senecio leucoglossus* P4) were recorded in the ONeil Transport Corridor survey area. The *Hibbertia hortiorum* appears relatively regularly and in part reflects the recent split of *Hibbertia commutata* into multiple species by Kevin Thiele (2019). Recent work since this study by the Mattiske team has located this *Hibbertia* priority species outside the ONeil Transport Corridor survey area towards the records known on the State Herbarium records (Florabase – WAH 1998 -). Currently this species is known from 12 records in the State Herbarium collection. The identification of this Hibbertia species as a Priority species has been confirmed at the State Herbarium. The location of the priority flora species and the range extension as recorded are summarized on Figure 14 and Appendix D.

*Senecio leucoglossus* (P4) has mainly been recorded extensively as scattered plants through the northern Jarrah forest. One specimen of this species wase confirmed at the State Herbarium (ACC10469/E). This species tends occur on lateritic soils and is known from 45 specimens at the State Herbarium. This species general mainly occurs in Jarrah-Marri-Bull Banksia (*Eucalyptus marginata – Corymbia calophylla – Banksia grandis*) forests. This species was recorded at three locations within the ONeil Transport Corridor survey area, but has been recorded regularly as scattered occurrences in other forest areas by the Mattiske team.

## 5.4 Introduced Species

One introduced taxa (**Hypochaeris glabra*) was recorded in the ONeil Transport Corridor survey area during the re-assessment. This introduced species is not a declared pest organisms pursuant to section 22 of the BAM Act. This species is not listed as a Weeds of National Significance (DCCEEW 2024d). This species is a short-lived annual.




N

0 500 1,000 m

Scale: 1:65,000
MGA94 (Zone 50)

CAD Ref: a1992_F026_14

Date: March 2024 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Transport Corridor

# Current Vegetation Mapping

Figure: 14

## 5.5 Vegetation

A total of 17 site-vegetation types were defined and mapped in the ONeil Transport Corridor survey area and an addition two mapping units (CL cleared land and Rehabilitation areas), Table 6 and Figure 14. The site-vegetation types were defined on the basis of key species and site parameters as defined in Havel (1975a and 1975b) for the Jarrah forest and as refined and developed by Mattiske over the last 40 years.

The results presented in Table 6 for each site-vegetation type also reflect the extent of the site-vegetation types and their percentage representation in the survey area. It is clearly apparent that there are some dominant site-vegetation types that dominate the ONeil Transport Corridor survey area (namely SP, S and TS which together cover 45.3% of the survey area). A total of some 26.55% of the area has been either cleared or rehabilitated within the ONeil Transport Corridor.

**Table 6: Summary of site-vegetation types as defined for the ONeil Transport Corridor survey area based on Havel (1975a and 1975b) site-vegetation types as defined for the northern Jarrah forest**

| | SVT Code | Description | Total Area (ha) | % Survey Area |
|---|---|---|---|---|
| Swamps and Broad Valleys | A | Open Woodland of *Eucalyptus rudis – Melaleuca preissiana - Eucalyptus patens - Banksia littoralis* with dense stands of *Melaleuca viminea, Hakea varia, Taxandria linearifolia* and *Astartea scoparia* in understorey on broad swamps and water-courses. | 1.834 | 0.07 |
| | AC | Open Woodland of *Eucalyptus rudis – Melaleuca preissiana - Eucalyptus patens - Banksia littoralis* with dense *Taxandria linearifolia* and *Astartea scoparia* in understorey on broad swamps and water-courses. | 73.772 | 2.85 |
| | AW | Low open woodland of *Eucalyptus patens* and *Melaleuca preissiana* over *Banksia littoralis, Hakea prostrata* and *Pericalymma ellipticum* over low shrubs and herbs on leached sands over sandy-gravel on lower slopes. | 3.5 | 0.14 |
| | DA | Open Forest of *Eucalyptus marginata -Corymbia calophylla – Eucalyptus patens - Alllocasuarina fraseriana - Hakea prostrata* on lower slopes with patches of *Melaleuca preissiana, Banksia littoralis* over mixed low understorey species, including *Babingtonia camphorosmae* and *Astartea scoparia* on clay loams to gravelly clay-loams. | 143.41 | 2.50 |
| | D | Open Forest of *Eucalyptus marginata -Corymbia calophylla – Eucalyptus patens - Alllocasuarina fraseriana - Hakea prostrata* on lower slopes with mixed low understorey species, including *Babingtonia camphorosmae, Daviesia decurrens, Davieisa preissii* and *Acacia extensa* on clay loams to gravelly clay-loams. | 556.98 | 9.72 |
| Valley Floors and Lower Slopes | C | Woodland to Open Forest of *Eucalyptus patens – Corymbia calophylla - Banksia littoralis* with dense *Taxandria linearifolia* and *Astartea scoparia* in understorey on creek-lines and water-courses. | 16.359 | 0.63 |
| | CW | Woodland to Open Forest of *Eucalyptus patens – Eucalyptus megacarpa - Corymbia calophylla - Banksia littoralis* with dense *Taxandria linearifolia* and *Astartea scoparia* in understorey on creek-lines and water-courses. | 23.386 | 0.9 |
| | W | Open Forest of *Eucalyptus megacarpa - Eucalyptus patens – Corymbia calophylla* on lower slopes with mixed low understorey species, including *Hypocalymma angustifolium* on seasonally moister sandy-loam gravelly soils. | 76.226 | 2.94 |
| Slopes with seasonal soil moisture | SW | Open Forest of *Eucalyptus marginata - Corymbia calophylla – Banksia grandis* with scattered understorey, including *Adenanthos barbiger, Hypocalymma angustifolium* and *Styphelia tenuiflora* on seasonally moister sandy-gravelly soils. | 79.299 | 3.06 |
| | PW | Open Forest of *Allocasuarina fraseriana - Eucalyptus marginata - Corymbia calophylla* with scattered understorey, including *Grevillea wilsonii, Adenanthos barbiger, Babingtonia camphorosmae* and *Hypocalymma angustifolium* on sandy gravels. | 40.318 | 1.56 |

**Table 6: Summary of site-vegetation types as defined for the ONeil Transport Corridor survey area based on Havel (1975a and 1975b) site-vegetation types as defined for the northern Jarrah forest** (continued)

| | SVT Code | Description | Total Area (ha) | % Survey Area |
|---|---|---|---|---|
| Slopes and Ridges - Sandy Loam Gravels | PT | Open Forest of *Allocasuarina fraseriana - Eucalyptus marginata - Corymbia calophylla - Banksia grandis* with scattered understorey, including *Adenanthos barbiger, Leucopogon verticillatus, Pteridium esculentum* and *Bossiaea aquifolium* subsp. *aquifolium* on sandy-loam gravels. | 28.332 | 1.09 |
| | PS | Open Forest of *Allocasuarina fraseriana - Eucalyptus marginata - Corymbia calophylla - Banksia grandis* with scattered understorey, including *Adenanthos barbiger, Leucopogon capitellatus* on gravels and sandy gravels. | 76.051 | 2.93 |
| | SP | Open Forest of *Allocasuarina fraseriana - Eucalyptus marginata - Corymbia calophylla - Banksia grandis* with scattered understorey, including *Adenanthos barbiger, Grevillea wilsonii* and *Leucopogon capitellatus* on sandy-gravels to gravelly soils. | 372.414 | 14.36 |
| | S | Open Forest of *Eucalyptus marginata - Banksia grandis – Allocasuarina fraseriana* with scattered understorey, including *Adenanthos barbiger, Leucopogon capitellatus* and *Styphelia tenuiflora* on gravels and sandy-gravels. | 479.312 | 18.49 |
| | ST | Open Forest of *Eucalyptus marginata - Corymbia calophylla* with scattered understorey, including *Leucopogon capitellatus, Leucopogon verticillatus, Pteridium esculentum, Lasiopetalum floribundum* and *Styphelia tenuiflora* on sandy-gravelly soils. | 117.036 | 4.51 |
| | TS | Open Forest of *Eucalyptus marginata - Corymbia calophylla – Banksia grandis* with scattered understorey, including *Leucopogon verticillatus, Pteridium esculentum, Clematis pubescens* and *Bossiaea aquifolium* subsp. *aquifolium* on sandy-loam gravelly to gravelly soils. | 322.895 | 12.45 |
| | T | Open Forest of *Eucalyptus marginata - Corymbia calophylla* with scattered understorey, including *Leucopogon verticillatus, Pteridium esculentum, Clematis pubescens* and *Bossiaea aquifolium* subsp. *aquifolium* on sandy-loam gravelly soils. | 54.646 | 2.11 |
| Other Areas | CL | Cleared Areas | 171.025 | 6.6 |
| | Rehab | Rehabilitation Areas | 517.315 | 19.95 |
| | **Total** | | **2592.572** | |

None of these site-vegetation types are restricted to the ONeil Transport Corridor survey area; however as all of the northern jarrah forest has not been mapped at this finer scale, it is not feasible to provide a percentage representation of each site-vegetation type.

The condition of the vegetation is excellent, except for the degraded areas in the rehabilitation areas that are still regenerating and completely degraded in Cleared areas.

There are no threatened ecological communities (TECs) listed at Commonwealth level pursuant to sections 181 and 182 of the *EPBC Act* or listed by the DCCEEW (2024e) or at State level pursuant to Part 2 of the *BC Act* and as listed by DBCA (2023c) within the ONeil Transport Corridor survey area.

There are no priority ecological communities (PECs), as listed at State level by DBCA (2023b) within the ONeil Transport Corridor survey area. At a State or National level none of the site-vegetation types have been listed as Threatened or Priority Ecological Communities.

# 6. DISCUSSION, CONCLUSIONS AND RECOMMENDATIONS

Various databases were used to identify the possible occurrence of flora (including introduced, threatened and priority taxa) and threatened and priority ecological communities within the ONeil Transport Corridor area. Historical documentation of the floristics and vegetation mapping of the region, along with results of previous flora and vegetation surveys in the nearby areas, were reviewed again in 2023 in line with some changes in nomenclature from 2022 to 2023.

The ONeil Transport Corridor survey area lies within the Northern Jarrah Forest subregion of the Southwest Botanical Province. The geology of the region comprises lateritic duricrust, with drainage lines and occasional granite hills. The Northern Jarrah Forest subregion is characterised by Jarrah (*Eucalyptus marginata*) forest on ironstone gravels and Marri-Wandoo (*Corymbia calophylla* - *Eucalyptus wandoo*) woodlands on loamy soils, with sclerophyll understoreys. The vegetation of the region has been extensively studied, and has been described in a series of vegetation complexes of the Darling System (Heddle *et al.* 1980; Mattiske and Havel (1998).

**Potential Flora**

Based on the previous nearby surveys and the recent additional studies a total of 459 vascular plant taxa, representative of 168 genera and 59 families, have the potential to occur within the ONeil Transport Corridor survey area (Mattiske Consulting 1998-2023). The most commonly represented families were Fabaceae (67 taxa), Proteaceae (53 taxa), Myrtaceae (38 taxa) and Asparagaceae (253 taxa).

A total of twelve threatened flora species and 37 priority flora species has the potential to occur in the ONeil Transport Corridor survey area. Of the threatened flora species, all are considered to have a very low potential of occurring in the Oneil Transport survey area due to the lack of suitable habitat and also know distributions away from the survey area.

In 2023, the data indicated that of the Priority flora species, five priority flora species have a high potential to be in the survey area and four priority flora species have a moderate or moderate to high potential to be in the survey area.

On the basis of databases and previous surveys near or within the Oneil survey areas a total of 15 introduced taxa has the potential to occur in the ONeil Transport Corridor survey area (Appendix C). None of the weeds are declared pest organisms pursuant to section 22 of the BAM Act (DPIRD 2024) and none are listed as Weeds of National Significance (DCCEEW 2024d).

**Potential Vegetation Values**

There are no TECs listed at Commonwealth or State level, or PECs listed at State level which would be likely to occur in the ONeil Transport Corridor survey area.

Based on data from Department of Biodiversity, Conservation and Attractions, there are no old growth forests occurring in the ONeil Transport Corridor survey area. In view of the proximity of the Dwellingup as a forestry township it is unlikely that there will be additional old growth forests in the survey area. The ONeil Transport Corridor has areas of dieback in some of the valley systems. The results for the dieback occurrence in these survey areas may also reflect the degree of sampling which is less intensive than in the western areas of the northern Jarrah forest.

**Survey Effort**

The survey effort in the ONeil Transport Corridor survey areas includes data from previous studies that overlap this area and also in nearby Jarrah forest areas. The recent survey effort concentrated on targeted

Threatened and Priority species and a re-assessment of selected sites in the dominant site-vegetation types. The degree of current mining activities restricted coverage of some site-vegetation types.

**Recorded Flora**

In the more recent targeted flora and vegetation studies (including re-assessment of 45 sites a total of 122 vascular plant taxa, representative of 66 genera and 37 families, have been recorded in the ONeil Transport Corridor survey area. The most commonly represented families were Fabaceae (13 taxa), Myrtaceae (12 taxa), Asparagaceae (11 taxa), Proteaceae (9 taxa) and Asteraceae (7 taxa). .

A total of 2 priority flora species (*Hibbertia hortiorum* P1 and *Senecio leucoglossus* P4) were recorded in the ONeil Transport Corridor survey area. The *Hibbertia hortiorum* appears relatively regularly and in part reflects the recent split of *Hibbertia commutata* into multiple species by Kevin Thiele (2019). Recent work since this study by the Mattiske team has located this *Hibbertia* priority species outside the ONeil Transport Corridor survey area towards the records known on the State Herbarium records (Florabase – WAH 1998). *Senecio leucoglossus* (P4) has mainly been recorded extensively as scattered plants through the northern Jarrah forest. This species was recorded at three locations within the ONeil Transport Corridor survey area, but has been recorded regularly as scattered occurrences in other forest areas by the Mattiske team.

The variety of weeds was low in the reassessed areas, although it would be expected that there would be more near cleared and disturbed areas. This low number reflects the slightly different approach on the Oneil Transport Corridor that has been studies multiple times during studies on the Huntly, Myara and Cameron areas by Mattiske Consulting over the last few decades.

**Recorded Vegetation**

A total of 17 site-vegetation types were defined and mapped in the ONeil Transport Corridor survey area and an addition two mapping units (CL cleared land and Rehabilitation areas). The site-vegetation types were defined on the basis of key species and site parameters as defined in Havel (1975a and 1975b) for the Jarrah forest and as refined and developed by Mattiske over the last 40 years.

None of these site-vegetation types are restricted to the ONeil Transport Corridor survey area; however all of the northern jarrah forest has not been mapped at this finer scale it is not feasible to provide a percentage representation of each site-vegetation type.

The condition of the vegetation is excellent, except for the degraded areas in the rehabilitation areas that are still regenerating and completely degraded in Cleared areas.

There are no threatened ecological communities (TECs) listed at Commonwealth level pursuant to sections 181 and 182 of the *EPBC Act* or listed by the DCCEEW (2024e) or at State level pursuant to Part 2 of the *BC Act* and as listed by DBCA (2023c) within the ONeil Transport Corridor survey area.

There are no priority ecological communities (PECs), as listed at State level by DBCA (2023b) within the ONeil Transport Corridor survey area. At a State or National level none of the site-vegetation types have been listed as Threatened or Priority Ecological Communities.

The ONeil Transport Corridor survey area occurs within the Regional Forest Agreement (RFA) area of the southwest forests DCCEEW (2024b) and as such was considered during the RFA process.

Based on data from Department of Biodiversity, Conservation and Attractions, there are no old growth forests occurring in the ONeil Transport Corridor survey area. In view of the proximity of the North-East Road it is unlikely that there will be additional old growth forests in the survey area.

## 6. ACKNOWLEDGEMENTS

The authors would like to thank Alcoa of Australia Ltd for their assistance with this project.

## 7. PERSONNEL

The following Mattiske Consulting Pty Ltd personnel were mainly involved in this project:

| NAME | POSITION | PROJECT INVOLVEMENT | FLORA COLLECTION PERMITS |
|---|---|---|---|
| Dr EM Mattiske | Managing Director & Principal Ecologist | Planning, managing, reporting | FB62000019-2 |
| Dr S Ruoss | Senior Botanist | Field Studies and Plant IDs | FB62000031-4,5 |
| Mr L Rowles | Senior Botanist | Field Studies and Plant IDs | FB62000020-4,5 |
| Mr A Pereira | Experienced Botanist | Data collection and Field Studies | FB62000035-4, 145-5 |
| Mr D Rubick | Experienced Botanist | Data collection and Field Studies | FB62000328-2,3 |
| Ms K Tribbeck | Experienced Botanist | Data collection and Field Studies | FB62000467, 2 |
| Ms A Rowe | Experienced Botanist | Data collection and field studies | FB62000329-2,3 |
| Ms JJ Werny | Botanist | Data collection and field studies | FB62000587 |
| R Jones | Botanist | Data collation, reporting | N/A |
| J Wescombe | Botanist | Data collation, reporting | N/A |

# 8. REFERENCES


Beard, J.S. 1979, The vegetation of the Pinjarra Area, Western Australia. Map and Explanatory Memoir,1:250,000 Series. Vegmap Publications, Perth.

Beard, JS 1990, *Plant life of Western Australia*, Kangaroo Press, Kenthurst, NSW.

*Biodiversity Conservation Act 2016* (WA).

*Biosecurity and Agriculture Management Act 2007* (WA).

*Biosecurity and Agriculture Management Regulations 2013* (WA).

Bureau of Meteorology 2024, *Climate averages for specific sites*. Available from: http://www.bom.gov.au/climate/data/.

Churchward, H.M and McArthur, W.M. 1980, Landforms and Soils of the Darling System, Western Australia. In: Department of Conservation and Environment (1980) Atlas of Natural Resources Darling System, Western Australia. Published by the Department of Conservation and Environment, Perth, 1980.

Commonwealth of Australia 2013, *Survey Guidelines for Australia's Threatened Orchids.* Guidelines for detecting Orchids listed as "Threatened" under the *Environment Protection and Biodiversity Conservation Act 1999*. https://www.environment.gov.au/system/files/resources/e160f3e7-7142-4485-9211-2d1eb5e1cf31/files/draft-guidelines-threatened-orchids.pdf

Dell, B. & Havel, J.J. 1989, *The Jarrah Forest, an Introduction*, Chapter 1. In B. Dell et al. (eds.), *The Jarrah Forest*, pp. 1-10. Kluwer Academic Publishers, Dordrecht – Netherlands.

Department of Biodiversity, Conservation and Attractions 2007-2019, *NatureMap - mapping Western Australia's biodiversity*. Available from: http://naturemap.dec.wa.gov.au.

Department of Biodiversity, Conservation and Attractions 2019, *Conservation codes for Western Australian flora and fauna, 3 January 2019*. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities.

Department of Biodiversity, Conservation and Attractions 2023a, *Wildlife conservation (rare flora) notice 2023*, 6 October *2023*, Minister for the Environment under section 2 of the BC Act. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/threatened-plants.

Department of Biodiversity, Conservation and Attractions 2023b, *Priority Ecological Communities for Western Australia Version 32, 15 July 2021*. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities.

Department of Biodiversity, Conservation and Attractions 2023c, *Threatened flora, fauna and ecological communities database searches*. Available from: https://www.dpaw.wa.gov.au/images/documents/plants-animals/threatened-species/database-search-request-information-sheet.pdf.

Department of Climate Change, Energy, the Environment and Water 2024a, *EPBC Act list of threatened flora*, Commonwealth of Australia. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publicthreatenedlist.pl?wanted=flora.

Department of Climate Change, Energy, the Environment and Water 2024b, *Protected Matters Search Tool*. Available from: http://www.environment.gov.au/epbc/protected-matters-search-tool.

Department of Climate Change, Energy, the Environment and Water 2024c, *Australia's bioregions (IBRA).* Available from: http://www.environment.gov.au/topics/land/national-reserve-system/science-maps-and-data/australias-bioregions-ibra.

Department of Climate Change, Energy, the Environment and Water 2024d, *Weeds of National Significance*. Available from: www.environment.gov.au/biodiversity/invasive/weeds/weeds/lists/wons.html.

Department of Climate Change, Energy, the Environment and Water 2024e, *EPBC Act List of Threatened Ecological Communities*. Available from: http://www.environment.gov.au/cgi-bin/sprat/public/publiclookupcommunities.pl.

Department of Climate Change, Energy, the Environment and Water 2024f, *Australian Wetlands Database: Ramsar wetlands – Peel-Yalgorup System.* Available from: http://www.environment.gov.au/cgi-bin/wetlands/ramsardetails.pl?refcode=36.

Department of Conservation and Environment 1980, Atlas of Natural Resources Darling System, Western Australia. Published by the Department of Conservation and Environment, Perth, 1980.

Department of Environment and Conservation 2013, *Definitions, categories and criteria for threatened and priority ecological communities*, Government of Western Australia. Available from: http://www.dpaw.wa.gov.au/plants-and-animals/threatened-species-and-communities/wa-s-threatened-ecological-communities.

Department of Environment Regulation 2015, *Clearing Regulation Fact Sheet 1: Native vegetation clearing legislation in Western Australia – Environmental Protection Act 1986.* Available from: https://www.der.wa.gov.au/our-work/clearing-permits/49-fact-sheets.

Department of Parks and Wildlife 2014, *Ecological impact and invasiveness ratings from the Department of Parks and Wildlife South West Region Species Prioritisation Process*. Available from: https://www.dpaw.wa.gov.au/plants-and-animals/plants/weeds/156-how-do-we-manage-weeds.

Department of Primary Industries and Regional Development 2024, *Western Australian Organism List*. Available from: https://www.agric.wa.gov.au/organisms.

*Environment Protection and Biodiversity Conservation Act 1999* (Cth)

*Environmental Protection Act 1986* (WA)

*Environmental Protection (Clearing of Native Vegetation) Regulations 2004*

*Environmental Protection (Environmentally Sensitive Areas) Notice 2005*

Environmental Protection Authority 2016a, *Environmental Factor Guideline: Flora and Vegetation*, Environmental Protection Authority, Western Australia.

Environmental Protection Authority 2016b, *Technical Guidance – Flora and vegetation surveys for environmental impact assessment*, Environmental Protection Authority, Western Australia.

Havel, J.J. 1975a, Site-vegetation mapping in the northern jarrah forest (Darling Range). I. Definition of site-vegetation types. Bull. For. Dep. W. Aust. 87.

Havel, J.J. 1975b, Site-vegetation mapping in the northern jarrah forest (Darling Range). II. Location and mapping of site-vegetation types. Bull. For. Dep. W. Aust. 87.

Heddle, E.M., Havel, J.J., and Loneragan, O.W., 1980, Vegetation Complexes of the Darling System, Western Australia. In: Department of Conservation and Environment (1980) Atlas of Natural Resources Darling System, Western Australia. Department of Conservation and Environment, Perth, 1980.

Mattiske E.M. and Associates, 1993, Botanical Studies – Gordon Catchment Area. Unpublished report prepared for Alcoa of Australia Limited, September 1993.

Mattiske E.M. and Associates, 1994, Botanical Studies – Cameron Catchment Area. Unpublished report prepared for Alcoa of Australia Limited, February 1994.

Mattiske Consulting Pty Ltd 1996a, Flora and Vegetation. Huntly east (G44, H44, J44, J45, H46 and J46). Unpublished report prepared for Alcoa of Australia Limited, May 1996.

Mattiske Consulting Pty Ltd 1996b, Review of Tree Species on the Cameron West and Cameron Central Experiment Catchments in Spring 1996. Unpublished report prepared for Alcoa of Australia Limited, December 1996.

Mattiske Consulting Pty Ltd 1998, Botanical Studies – Cameron Corridor. Unpublished report prepared for Alcoa of Australia Limited, February 1998.

Mattiske Consulting Pty Ltd 2001, Flora and Vegetation – Jayrup and Scott catchment areas. Unpublished report prepared for Alcoa of Australia Limited, February 2001.

Mattiske Consulting Pty Ltd 2003, Flora and Vegetation – Jayrup and Scott catchment areas. Unpublished report prepared for Alcoa of Australia Limited, January 2003.

Mattiske Consulting Pty Ltd 2004, Vegetation Monitoring of the Intermediate rainfall zone in the Jayrup, Cameron and Gordon Catchments. Unpublished report prepared for Alcoa of Australia Limited, May 2004.

Mattiske Consulting Pty Ltd 2006, Vegetation Monitoring of the Intermediate rainfall zone in the Jayrup, Cameron and Gordon Catchments. Unpublished report prepared for Alcoa of Australia Limited, February 2006.

Mattiske Consulting Pty Ltd 2009, Botanical Studies – Oneil Survey Area. Unpublished report prepared for Alcoa of Australia Limited, May 2009.

Mattiske, E.M. and Havel, J.J. 1998, Vegetation Complexes of the South-west Forest Region of Western Australia. Maps prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Thiele, K. R. (2019). A revision of the *Hibbertia commutata* (Dilleniaceae) species group. *Australian Systematic Botany*, *32*(1), 71-109. https://doi.org/10.1071/SB18007

Western Australian Herbarium 1998-, *FloraBase - the Western Australian Flora*. Available from: https://florabase.dpaw.wa.gov.au.

Williams, K. and Mitchell, D. 2001, 'Jarrah Forest 1 (JF1 – Northern Jarrah Forest subregion)' in A biodiversity audit of Western Australia's 53 biogeographical subregions in 2002, eds. JE May and NL McKenzie, Department of Conservation and Land Management, Western Australia, pp. 369 –

# APPENDIX A1: THREATENED AND PRIORITY FLORA DEFINITIONS

Under section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), **threatened flora** are categorised as extinct, extinct in the wild, critically endangered, endangered, vulnerable and conservation dependent (Table A1.1).

**Table A1.1 Federal definition of threatened flora species**

**Note:** Adapted from section 179 of the EPBC Act.

| CODE | CATEGORY | DEFINITION |
|---|---|---|
| **Ex** | **Extinct** | Species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died. |
| **ExW** | **Extinct in the Wild** | Species which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form. |
| **CE** | **Critically Endangered** | Species which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria. |
| **E** | **Endangered** | Species which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria. |
| **V** | **Vulnerable** | Species which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria. |
| **CD** | **Conservation Dependent** | Species which at a particular time if, at that time, the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years. |

The *Biodiversity Conservation Act 2016* (BC Act) provides for (amongst other things) the protection of flora that is facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future in Western Australia under Part 10 (Division 2).

**Threatened flora** are listed in the *Wildlife Conservation (Rare Flora) Notice 2018* (under Part 2, Division 1, Subdivision 2 of the BC Act; Department of Biodiversity, Conservation and Attractions (DBCA 2024a) and are categorised under Schedules 1-3**.** A flora species is defined as **threatened** if it is facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future, pursuant to sections 20, 21 and 22 of the BC Act. Threatened species are categorised as critically endangered, endangered, and vulnerable (Table A1.2).

**Table A1.2 State definition of threatened flora species**

**Note:** Adapted from DBCA (2024a).

| CODE | CATEGORY | DEFINITION |
|---|---|---|
| **CR** | **Critically endangered** | Species considered to be facing an extremely high risk of becoming extinct in the wild (listed under Schedule 1 of the *Wildlife Conservation (Rare Flora) Notice 2018*). |
| **EN** | **Endangered** | Species considered to be facing a very high risk of becoming extinct in the wild (listed under Schedule 2 of the *Wildlife Conservation (Rare Flora) Notice 2018*). |
| **VU** | **Vulnerable** | Species considered to be facing a high risk of becoming extinct in the wild (listed under Schedule 3 of the *Wildlife Conservation (Rare Flora) Notice 2018*). |

**Priority flora** species are defined as "possibly threatened species that do not meet the survey criteria, or are otherwise data deficient" or species that are "adequately known, are rare but not threatened, meet criteria for near threatened or have recently been removed from the threatened species list" for other than taxonomic reasons" (DBCA 2024a). Priority species are not afforded the same level of protection under state or federal legislation as the listed Threatened species, however are considered significant under the Environmental Protection Authority's *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority 2016a). The Department of Biodiversity, Conservation and Attractions categorises priority flora into four categories: Priority 1; Priority 2, Priority 3 and Priority 4 (Table A1.3).

**Table A1.3: State definition of priority flora species**

**Note:** Adapted from DBCA (2024a).

| CODE | CATEGORY | DEFINITION |
|---|---|---|
| **P1** | **Priority 1:** Poorly-known species | Known from one or a few locations (< 5) which are potentially at risk.<br>All occurrences are either: very small; or on lands not managed for conservation; or are otherwise under threat of habitat destruction or degradation.<br>In urgent need of further survey. |
| **P2** | **Priority 2:** Poorly-known species | Known from one or a few locations (< 5).<br>Some occurrences are on lands managed primarily for nature conservation.<br>In urgent need of further survey. |
| **P3** | **Priority 3:** Poorly-known species | Known from several locations and the species does not appear to be under imminent threat; or from few but widespread locations with either a large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.<br>In need of further survey. |
| **P4** | **Priority 4:** Rare, Near Threatened, and other species in need of monitoring | **a) Rare -** Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.<br>**b) Near Threatened -** Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable.<br>**c) Other -** Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy. |

# APPENDIX A2: THREATENED AND PRIORITY ECOLOGICAL COMMUNITY DEFINITIONS

Under section 181 of the EPBC Act, **threatened ecological communities** are categorised as critically endangered, endangered and vulnerable (Table A2.1).

**Table A2.1 Federal definition of threatened ecological communities**

**Note:** Adapted from section 181 and section 182 of the EPBC Act.

| CATEGORY | DEFINITION |
|---|---|
| **Critically Endangered** | If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future. |
| **Endangered** | If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future. |
| **Vulnerable** | If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future. |

**Threatened ecological communities** (TECs) are listed in the *List of Threatened Ecological Communities endorsed by the Western Australian Minister for Environment (26 May 2023)* (under Part 2, Division 2, Subdivision 1 of the BC Act; DBCA 2023b). An ecological community is defined as **threatened** if it is facing an extremely high risk of collapse in the immediate, near or medium-term future, pursuant to sections 28, 29 and 30 of the BC Act. Threatened ecological communities are categorised as critically endangered, endangered, and vulnerable (Table A2.2).

Currently there is no Western Australian legislation covering the conservation of state listed **threatened ecological communities** (TECs), however, a non-statutory process is in place, whereby the DBCA (and former equivalent departments) have been identifying and informally listing TECs since 1994. Some of these TECs are also endorsed by the Federal Minister as threatened, and some of these are listed under the EPBC Act and therefore afforded legislative protection at the Commonwealth level.

**Table A2.2 State definition of threatened ecological communities**

**Note:** Adapted from DBCA (2023b).

| CODE | CATEGORY | DEFINITION |
|---|---|---|
| **CR** | **Critically Endangered** | An ecological community will be listed as CR when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting **any one or more of** the following criteria:<br>**1.** The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification;<br>**2.** The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or<br>**3.** The ecological community is highly modified with potential of being rehabilitated in the immediate future. |
| **EN** | **Endangered** | An ecological community will be listed as EN when it has been adequately surveyed and is not CR, but is facing a very high risk of total destruction in the near future. The ecological community must meet **any one or more of** the following criteria:<br>**1.** The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification;<br>**2.** The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or<br>**3.** The ecological community is highly modified with potential of being rehabilitated in the short term future. |
| **VU** | **Vulnerable** | An ecological community will be listed as VU when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet **any one or more of** the following criteria:<br>**1.** The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated;<br>**2.** The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution; or<br>**3.** The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes. |

**Priority ecological communities** (PECs) are defined as possible threatened ecological communities that do not meet the stringent survey criteria for the assessment of threatened ecological communities, and are listed by the DBCA (2023a) in the *Priority Ecological Communities for Western Australia – Version 35 (19 June 2023)*. Similarly to priority flora, PECs are not afforded legislative protection, however are considered significant under the Environmental Protection Authority's (2016a) *Environmental Factor Guideline: Flora and Vegetation*. The Department of Biodiversity, Conservation and Attractions categorises priority ecological communities into five categories: Priority 1; Priority 2, Priority 3, Priority 4 and Priority 5 (Table A2.3).

**Table A2.3 State definition of priority ecological communities**

**Note:** Adapted from DBCA (2023a).

| CODE | CATEGORY | DEFINITION |
|---|---|---|
| **P1** | **Priority 1**<br><br>(Poorly known ecological communities) | Ecological communities that are known from very few, restricted occurrences (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Most of these occurrences are not actively managed for conservation (e.g. located within agricultural or pastoral lands, urban areas, or active mineral leases) and for which immediate threats exist. |
| **P2** | **Priority 2**<br><br>(Poorly known ecological communities) | Communities that are known from few small occurrences (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation. |
| **P3** | **Priority 3**<br><br>(Poorly known ecological communities) | **1.** Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation;<br>**2.** Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat; or<br>**3.** Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes. |
| **P4** | **Priority 4**<br><br>(Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring) | **1.** Rare – Communities known from few occurrences that are considered to have been adequately surveyed, sufficient knowledge is available, and are considered not to be currently threatened.<br>**2.** Near Threatened – Communities considered to have been adequately surveyed and do not qualify for Conservation Dependent, but are close to qualifying for Vulnerable.<br>**3.** Communities that have been removed from the list of threatened communities during the past five years. |
| **P5** | **Priority 5**<br><br>(Conservation Dependent ecological communities) | Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years. |

# APPENDIX A3: CATEGORIES AND CONTROL MEASURES OF DECLARED PEST (PLANT) ORGANISMS IN WESTERN AUSTRALIA

Section 22 of Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act) makes provision for a plant taxon to be listed as a declared pest organism in respect to parts of, or the entire State. According to the BAM Act, a declared pest is defined as a prohibited organism (section 12), or an organism for which a declaration under section 22 (2) of the Act is in force.

Under the *Biosecurity and Agriculture Management Regulations 2013* (WA), declared pest plants are placed in one of three control categories, C1 (exclusion), C2 (eradication) or C3 (management), which determines the measures of control which apply to the declared pest (Table A4.1). The current listing of declared pest organisms and their control category is through the Western Australian Organism List (Department of Primary Industries and Regional Development 2024).

**Table A3.1 Categories and control measures of declared pest (plant) organisms**

**Note:** Adapted from *Biosecurity and Agriculture Management Regulations 2013*.

| CONTROL CATEGORY | CONTROL MEASURES |
|---|---|
| **C1 (Exclusion)**<br>'(a) Category 1 (C1) — Exclusion: if in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented.'<br>Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State. | In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest. |
| **C2 (Eradication)**<br>'(b) Category 2 (C2) — Eradication: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible.'<br>Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility. | In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest. |
| **C3 (Management)**<br>'(c) Category 3 (C3) — Management: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to:<br>**(i)** alleviate the harmful impact of the declared pest in the area; or<br>**(ii)** reduce the number or distribution of the declared pest in the area; or<br>**(iii)** prevent or contain the spread of the declared pest in the area.'<br>Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest. | In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to:<br>**(a)** alleviate the harmful impact of the declared pest in the area for which it is declared; or<br>**(b)** reduce the number or distribution of the declared pest in the area for which it is declared; or<br>**(c)** prevent or contain the spread of the declared pest in the area for which it is declared. |

# APPENDIX A4: OTHER DEFINITIONS

### Environmentally sensitive areas

Environmentally sensitive areas are declared by the State Minister under section 51B of the *Environmental Protection Act 1986* (EP Act) and are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, gazetted 8 April 2005. Specific environmentally sensitive areas relevant to this report include: a defined wetland and the area within 50 metres of the wetland; the area covered by vegetation within 50 metres of rare flora; the area covered by a threatened ecological community; a Bush Forever site – further areas and information are described in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

### Conservation significant flora

Under the *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority 2016a), flora may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority species;
- locally endemic or associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; or
- relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

### Conservation significant vegetation

Under the *Environmental Factor Guideline: Flora and Vegetation* (Environmental Protection Authority 2016a), vegetation may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority ecological communities;
- restricted distribution;
- degree of historical impact from threatening processes;
- a role as a refuge; or
- providing an important function required to maintain ecological integrity of a significant ecosystem.

# APPENDIX A5: DEFINITION OF VEGETATION CONDITION SCALE FOR THE SOUTH WEST AND INTERZONE BOTANICAL PROVINCES

Vegetation condition ratings relate to vegetation structure, level of disturbance at each structural layer and the ability of the vegetation unit to regenerate (Table A5.1). Vegetation condition provides complementary information for assessing the significance of potential impacts.

**Table A5.1 Definition of vegetation condition categories**

**Note:** Adapted from Keighery (1994).

| CATEGORY | DEFINITION |
|---|---|
| **1** | Pristine or nearly so, no obvious sign of disturbance or damage caused by human activities since European settlement. |
| **2** | Vegetation structure intact, disturbance affecting individual species, and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks. |
| **3** | Vegetation structure altered obvious signs of disturbance.<br>For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing. |
| **4** | Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing. |
| **5** | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management.<br>For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing. |
| **6** | The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Anthocercis gracilis* | Solanaceae | T | Vulnerable | Habit: Erect, spindly shrub, to 0.6 (-1) m high.<br>Flower colour: yellow-green<br>Flowering period (indicated in green): J F M A M J J A **S** **O** N D<br>Soils: Sandy or loamy soils. Granite outcrops.<br>IBRA Distribution: AVW, JAF<br>Florabase records: 30 | **Very Low**<br>On eastern and western fringes of northern Jarrah forest |
| *Banksia mimica* | Proteaceae | T | Endangered | Habit: Prostrate, lignotuberous shrub, 0.15-0.4 m high.<br>Flower colour: yellow-brown<br>Flowering period (indicated in green): J F M A M J J A **S** **O** N D<br>Soils: White or grey sand over laterite, sandy loam.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 40 | **Very Low**<br>Occurs to the north on the SWA and south JAF |
| *Caladenia huegelii* | Orchidaceae | T | Endangered | Habit: Tuberous, perennial, herb, 0.25-0.6 m high.<br>Flower colour: green & cream & red<br>Flowering period (indicated in green): J F M A M J J A **S** **O** N D<br>Soils: Grey or brown sand, clay loam.<br>IBRA Distribution: JAF, SCP<br>Florabase records: 43 | **Very Low**<br>Location outside species known range. Species not known within central part of northern Jarrah forest. |
| *Diuris drummondii* | Orchidaceae | T | Vulnerable | Habit: Tuberous, perennial, herb, 0.5-1.05 m high.<br>Flower colour: yellow<br>Flowering period (indicated in green): **J** F M A M J J A S O **N** **D**<br>Soils: Low-lying depressions, swamps<br>IBRA Distribution: AVW, JAF, SWA, WAR<br>Florabase records: 55 | **Very Low**<br>Dependent on suitable low-lying depressions/habitat conditions. |

**APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS**

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Diuris micrantha* | Orchidaceae | T | Vulnerable | Habit: Tuberous, perennial, herb, 0.3-0.6 m high.<br>Flower colour: yellow & brown<br>Flowering period (indicated in green):<br>J F M A M J J A **S** **O** N D<br>Soils: Brown loamy clay. Winter-wet swamps, in shallow water.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 9 | **Very Low**<br>Dependent on suitable depressions/habitat conditions. |
| *Diuris purdiei* | Orchidaceae | T | Endangered | Habit: Tuberous, perennial, herb, 0.15-0.35 m high.<br>Flower colour: yellow<br>Flowering period (indicated in green): only after a summer or early autumn fire<br>J F M A M J J A **S** **O** N D<br>Soils: Grey-black sand, moist. Winter-wet swamps.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 26 | **Very Low**<br>Dependent on suitable swamps/habitat conditions. |
| *Drakaea micrantha* | Orchidaceae | T | Vulnerable | Habit: Tuberous, perennial, herb, 0.15-0.3 m high.<br>Flower colour: red & yellow<br>Flowering period (indicated in green):<br>J F M A M J J A **S** **O** N D<br>Soils: White-grey sand.<br>IBRA Distribution: JAF, SWA, WAR<br>Florabase records: 50 | **Very Low**<br>Outside species range. Species not known within the Northern Jarrah Forest. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Eleocharis keigheryi* | Cyperaceae | T | Vulnerable | Habit: Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 m high.<br>Flower colour: green<br>Flowering period (indicated in green): J F M A M J J **A S O N** D<br>Soils: Clay, sandy loam. Emergent in freshwater: creeks, claypans.<br>IBRA Distribution: AVW, GES, JAF, SWA<br>Florabase records: 59 | **Very Low**<br>Not recorded within proximity. Dependent on appropriate hydrology on site. |
| *Lasiopetalum pterocarpum* | Malvaceae | T | Endangered | Habit: Open, multi-stemmed shrub (with distinctly winged fruit), to 1.2 m high.<br>Flower colour: pink<br>Flowering period (indicated in green): J F M A M J J **A S O N D**<br>Soils: Dark red-brown loam or clayey sand over granite. On sloping banks near creeklines.<br>IBRA Distribution: JAF<br>Florabase records: 11 | **Very Low**<br>Restricted to creeklines near Darling Scarp. |
| *Morelotia australiensis* | Cyperaceae | T | Vulnerable | Habit: Rhizomatous, tufted perennial, grass-like or herb (sedge), to 1 m high.<br>Flower colour: brown<br>Flowering period (indicated in green): J F M A M J J A S O **N D**<br>Soils: Sand, sandy loam. Flats, well-drained areas.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 49 | **Very Low**<br>North of survey area near Darling Scarp |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Thelymitra stellata* | Orchidaceae | T | Endangered | Habit: Tuberous, perennial, herb, 0.15-0.25 m high.<br>Flower colour: yellow & brown<br>Flowering period (indicated in green): J F M A M J J A S **O N** D<br>Soils: Sand, gravel, lateritic loam.<br>IBRA Distribution: GES, JAF, SWA<br>Florabase records: 20 | **Very Low**<br>Spread between Three Springs and Pinjarra. |
| *Verticordia fimbrilepis* subsp. *fimbrilepis* | Myrtaceae | T | Endangered | Habit: Shrub, 0.3-0.7 m high.<br>Flower colour: pink-white<br>Flowering period (indicated in green): **J** F M A M J J A S **O N D**<br>Soils: Gravelly or clayey soils. Flats, road verges.<br>IBRA Distribution: AVW, JAF<br>Florabase records: 39 | **Very Low**<br>Species habitat within north-eastern extent of JAF and AVW (EPBC Conservation Advice, 2021) |
| *Darwinia hortiorum* | Myrtaceae | P1 | - | Habit: Low spreading shrub, 10-25cm<br>Flower colour: green-cream<br>Flowering period (indicated in green): J F M A M J J **A S O N D**<br>Soils: Loam soils over laterite or granite slopes associated with outcrops<br>IBRA Distribution: JAF<br>Florabase records: 9 | **Very Low**<br>Species habitat within north-eastern extent of JAF |
| *Hibbertia acrotoma* | Dilleniaceae | P1 | - | Habit: Openly branched, spreading to prostrate shrub to 0.5m.<br>Flower colour: yellow<br>Flowering period (indicated in green): J F M A M J J **A S** O N D<br>Soils: Loam soils over laterite or granite<br>IBRA Distribution: JAF, SWA<br>Florabase records: 7 | **Very Low**<br>Edge of Darling Scarp between Serpentine & Oakley Dam |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Hibberta hortiorum* | Dilleniaceae | P1 | - | Habit: Mat-forming shrubs to 0.1m high or less.<br>Flower colour: yellow<br>Flowering period (indicated in green):<br>J F M A M J J A **S** **O** N D<br>Soils: Laterite<br>IBRA Distribution: JAF<br>Florabase records: 12 | **High**<br>Species known from mainly north-eastern areas of northern Jarrah forest |
| *Paracaleana granitica* | Orchidaceae | P1 | - | Habit: Perennial, herb, to 0.07 m high.<br>Flower colour: green-purple<br>Flowering period (indicated in green):<br>J F M A M J J A S **O** **N** **D**<br>Soils: Growing on moss mats, granite. Outcrops.<br>IBRA Distribution: JAF<br>Florabase records: 7 | **Low**<br>Mainly north of survey area and more common on north-eastern section of northern Jarrah forest |
| *Banksia recurvistylis* | Proteaceae | P2 | - | Habit: Shrub, spreading, 2m to 3m wide and 1.5m high<br>Flower colour: yellow<br>Flowering period (indicated in green):<br>**J** F M A M J J A S O **N** **D**<br>Soils: In cracks in granite outcrops, brown clays, sand and gravel with lateritic boulders<br>IBRA Distribution: JAF<br>Florabase records: 7 | **Low**<br>Mainly north of survey area and more common on north-eastern section of northern Jarrah forest |
| *Bossiaea modesta* | Fabaceae | P2 | - | Habit: Slender, trailing and twining shrub.<br>Flower colour: yellow/red<br>Flowering period (indicated in green):<br>J F M A M J J A S **O** **N** **D**<br>Soils: On soils derived from granite<br>IBRA Distribution: JAF<br>Florabase records: 22 | **Low-Moderate**<br>Mainly north of survey area, although been recorded west of survey area in the northern Jarrah forest |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Calectasia grandiflora* | Dasypogaceae | P2 | - | Habit: Rhizomatous, perennial, herb (or undershrub), to 0.65 m high, without stilt roots.<br>Flower colour: blue/purple<br>Flowering period (indicated in green): J F M A M **J J A S O N** D<br>Soils: On soils derived from granite. Damp areas close to streams.<br>IBRA Distribution: JAF, SWA, AVW<br>Florabase records: 12 | **Very Low**<br>Species not known in the area near the survey area, mainly near the Darling Scarp and Perth |
| *Grevillea ornithopoda* | Proteaceae | P2 | - | Habit: Spreading, virgate shrub, 1-3 (-5) m high, up to 3 m wide.<br>Flower colour: cream-white<br>Flowering period (indicated in green): J F M A **M J J A S O N** D<br>Soils: Loam, loam over clay, sand, clay. Edge of river bank and creek, dunes<br>IBRA Distribution: JAF, SWA<br>Florabase records: 20 | **Low Moderate**<br>Within species range, recorded south, west and north of survey area. |
| *Tetratheca phoenix* | Elaeocarpaceae | P2 | - | Habit: Few-branched shrub (subshrub), to 0.25 m high.<br>Flower colour: dark pink-magenta<br>Flowering period (indicated in green): J F M A M J J A **S O** N D<br>Soils: Brown gravelly loam over granite. Mid to Upper slopes, near granite outcrops.<br>IBRA Distribution: JAF<br>Florabase records: 10 | **High**<br>Within species range. Recorded near survey area |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Acacia drummondii* subsp. *affinis* | Fabaceae | P3 | - | Habit: Erect shrub, 0.3-1 m high.<br>Flower colour: yellow<br>Flowering period (indicated in green): J F M A M J **J** **A** S O N D<br>Soils: Lateritic gravelly soils.<br>IBRA Distribution: AVW, JAF, SWA<br>Florabase records: 37 | **Very Low**<br>Mainly north-east of Perth in northern forests |
| *Acacia horridula* | Fabaceae | P3 | - | Habit: Harsh, slender, single-stemmed shrub, 0.3-0.6 (-1) m high.<br>Flower colour: yellow<br>Flowering period (indicated in green): J F M A **M** **J** **J** **A** S O N D<br>Soils: Gravelly soils over granite, sand. Rocky hillslopes.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 33 | **Low-Moderate**<br>Mainly north of survey area and on Darling Scarp |
| *Acacia oncinophylla* subsp. *oncinophylla* | Fabaceae | P3 | - | Habit: Shrub, 0.9-2.5 m high, 'minni-ritchi' bark, phyllodes mostly 8-13 cm long, 1-2 mm wide.<br>Flower colour: yellow<br>Flowering period (indicated in green): J F M A M J J **A** **S** **O** N D<br>Soils: Granitic soils<br>IBRA Distribution: AVW, JAF, SWA<br>Florabase records: 42 | **Low-Moderate**<br>Within species range but associated with granitic soils. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Adenanthos cygnorum subsp. chamaephyton* | Proteaceae | P3 | - | Habit: Prostrate, mat-forming, non-lignotuberous shrub, to 0.3 m high.<br>Flower colour: white-cream-pink-green/green<br>Flowering period (indicated in green): **J F** M A M J **J A S O N D**<br>Soils: Grey sand, lateritic gravel.<br>IBRA Distribution: AVW, JAF, SWA<br>Florabase records: 22 | **Moderate**<br>Within species range. Recorded at O'Neil (MCPL 2009) |
| *Andersonia* sp. Audax (F. Hort, B. Hort & J. Hort 3179) | Ericaceae | P3 | - | Habit: Shrub, to 1.1 m high and 1.1 m wide.<br>Flower colour: white-cream/mauve-pink<br>Flowering period (indicated in green): J F M A M J J A S **O N** D<br>Soils: Loam, clay, sand, gravel. Granite, slopes and drainage lines.<br>IBRA Distribution: JAF<br>Florabase records: 23 | **Moderate**<br>Within species range, mainly to the north and north-east of survey area. |
| *Conospermum scaposum* | Proteaceae | P3 | - | Habit: Erect shrub, 0.2-0.45(-0.75) m high.<br>Flower colour: blue<br>Flowering period (indicated in green): **J F** M A M J J A S **O N D**<br>Soils: White-grey sand, sandy clay. Low swampy areas, road verges.<br>IBRA Distribution: AVW, GES, JAF, SWA<br>Florabase records: 47 | **Low-Moderate**<br>Species recorded at Myara North (MCPL 2019/20); however mainly north-east of Jarrah forest |

**APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS**

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Cyathochaeta teretifolia* | Cyperaceae | P3 | - | Habit: Rhizomatous, clumped, robust perennial, grass-like or herb (sedge), to 2.0 m high, to 1.0 m wide.<br>Flower colour: brown<br>Flowering period (indicated in green): J F M A M J J A S O N D<br>Soils: Grey sand, sandy clay. Swamps, creek edges.<br>IBRA Distribution: JAF, SWA, WAR<br>Florabase records: 40 | **Moderate**<br>Dependent on habitat hydrology requirements on-site. |
| *Grevillea dissectifolia* | Proteaceae | P3 | - | Habit: Erect shrub, 1-2.5m high.<br>Flower colour: white-pink<br>Flowering period (indicated in green): J F M A M J J A S O N D<br>Soils: Sands, loam and laterite and near lateritic boulders<br>IBRA Distribution: JAF<br>Florabase records: 24 | **Low-Moderate**<br>Species records mainly north and north-east of survey area. |
| *Hakea oldfieldii* | Proteaceae | P3 | - | Habit: Open straggling shrub up to 2.5m.<br>Flower colour: white-cream to yellow<br>Flowering period (indicated in green): J F M A M J J A S O N D<br>Soils: Red clay or sand over laterite, seasonally wet flats<br>IBRA Distribution: GES, SWA, AVW, JAF. MAL, ESP<br>Florabase records: 66 | **Low**<br>Soil conditions less likely in survey area and occurs mainly south, southeast and east of survey area |
| *Halgania corymbosa* | Boraginaceae | P3 | - | Habit: Erect shrub, 0.35-1 m high.<br>Flower colour: blue-purple<br>Flowering period (indicated in green): J F M A M J J A S O N D<br>Soils: Gravelly soils, soils over granite.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 18 | **Very Low**<br>Species records to the west of the Darling Scarp and either north or east of survey area. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Hemigenia microphylla* | Lamiaceae | P3 | - | Habit: Slender shrub, 0.4-1.8 m high.<br>Flower colour: blue-purple<br>Flowering period (indicated in green): J F M A M J J A **S O N D**<br>Soils: Sandy-clay, peaty clay, granite and winter wet depressions.<br>IBRA Distribution: JAF, SWA, WAR<br>Florabase records: 26 | **Low - Moderate**<br>Mainly west and south, although localised occurrence south of survey area. |
| *Isopogon autumnalis* | Proteaceae | P3 | - | Habit: Shrub 0.5-1 m high.<br>Flower colour: cream, yellow<br>Flowering period (indicated in green): **J F M A M J** J A S O N D<br>Soils: Sandy soils.<br>IBRA Distribution: GES, JAF, SWA<br>Florabase records: 59 | **Very Low**<br>Records to the west of the Darling Scarp. |
| *Lasiopetalum glutinosum* subsp. *glutinosum* | Malvaceae | P3 | - | Habit: Shrub to 0.8 m high.<br>Flower colour: pink-purple<br>Flowering period (indicated in green): J F M A M J J A **S O** N D<br>Soils: Lateritic gravel and clay, clay loam, sandy clay over granite. Slopes, granite outcrops.<br>IBRA Distribution: AVW, JAF, SWA<br>Florabase records: 48 | **Very Low**<br>Records mainly north or west near Darling Scarp. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Lepyrodia heleocharoides* | Restionaceae | P3 | - | Habit: Rhizomatous, slender, tufted perennial, herb (sedge-like), 0.15-0.25 m high.<br>Flower colour: -<br>Flowering period (indicated in green): J F M A M J J A S O N **D**<br>Soils: Moist peaty sand. Dry or seasonally inundated heath or woodland, swamps.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 20 | **Very Low**<br>Mainly west of in southern forested areas |
| *Meionectes tenuifolia* | Haloragaceae | P3 | - | Habit: Annual semi-aquatic herb, to 0.35 m high.<br>Flower colour: orange-red-brown, green<br>Flowering period (indicated in green): J F M A M J J A **S O N D**<br>Soils: Grey sand or grey-brown clay, shallow soils. Seasonally inundated flat, edge of swamp.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 27 | **Low**<br>Dependent on suitable habitat. |
| *Stackhousia* sp. Red-blotched corolla (A. Markey 911) | Celastraceae | P3 | - | Habit: Erect herb or shrub, approximately 0.2 m high.<br>Flower colour: cream-yellow<br>Flowering period (indicated in green): J F M A M J J A **S O N** D<br>Soils: Brown loamy sand, clayey sand over laterite, white sandy clay over granite, grey clay. Slopes.<br>IBRA Distribution: AVW, GES, JAF<br>Florabase records: 9 | **Very Low**<br>Mainly west and north of survey area. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Thysanotus anceps* | Asparagaceae | P3 | - | Habit: Rhizomatous, leafless perennial, herb, to 0.4 m high.<br>Flower colour: purple<br>Flowering period (indicated in green): J F M A M J J A S **O N D**<br>Soils: White or grey sand, lateritic gravel, laterite.<br>IBRA Distribution: GES, JAF, SWA<br>Florabase records: 17 | **Moderate – High**<br>Recorded west of survey area. |
| *Acacia oncinophylla subsp. patulifolia* | Fabaceae | P4 | - | Habit: Shrub, 0.5-2.5(-3) m high, 'minni-ritchi' bark, phyllodes 4-9 cm long, 3-6 mm wide.<br>Flower colour: yellow<br>Flowering period (indicated in green): J F M A M J J **A S O N D**<br>Soils: Granitic soils, occasionally on laterite.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 31 | **Low-Moderate**<br>Recorded mainly to north and north-west. |
| *Aponogeton hexatepalus* | Aponogetonceae | P4 | - | Habit: Rhizomatous or cormous, aquatic perennial, herb, leaves floating.<br>Flower colour: green-white<br>Flowering period (indicated in green): J F M A M J **J A S O** N D<br>Soils: Mud. Freshwater: ponds, rivers, claypans.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 30 | **Very Low**<br>Mainly on Swan Coastal Plain and southern forests. |
| *Calothamnus graniticus* subsp. *leptophyllus* | Myrtaceae | P4 | - | Habit: Erect, multi-stemmed shrub, 1-2 m high.<br>Flower colour: red<br>Flowering period (indicated in green): J F M A M **J J A** S O N D<br>Soils: Clay over granite, lateritic soils. Hillsides.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 32 | **Low**<br>Nearby records within SWA and then occurs of survey area. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Cyanothamnus tenuis* | Rutaceae | P4 | - | Habit: Procumbent or erect & slender shrub, 0.1-0.5 m high.<br>Flower colour: blue/pink-white<br>Flowering period (indicated in green):<br>J F M A M J J **A S O N** D<br>Soils: Laterite, stony soils, granite.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 45 | **Low**<br>Mainly west on coastal plain and then on eastern fringes of Jarrah forest. |
| *Drosera occidentalis* | Droseraceae | P4 | - | Habit: Fibrous-rooted, rosetted perennial, herb, to 0.025 m high.<br>Flower colour: pink/white<br>Flowering period (indicated in green):<br>**J** F M A M J J A S **O N D**<br>Soils: White/black sand over yellow clay, yellow sand, moist brown/grey clay/sand, peaty sand, sandy clay. Damp flats, flood plain.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 23 | **Low - Moderate**<br>Nearby records within coastal plain and on eastern area of Jarrah orest. |
| *Grevillea pimeleoides* | Proteaceae | P4 | - | Habit: Non-lignotuberous shrub, 0.4-2.4 m high.<br>Flower colour: yellow-orange<br>Flowering period (indicated in green):<br>J F M A **M J J A S O N** D<br>Soils: Gravelly soils over granite. Rocky hillsides.<br>IBRA Distribution: JAF<br>Florabase records: 36 | **Low**<br>Species recorded mainly to north of survey area and then localised site near Albany. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Parsonsia diaphanophleba* | Apocynaceae | P4 | - | Habit: Woody climber, to 10 m high.<br>Flower colour: white/cream & pink<br>Flowering period (indicated in green): **J F** M **A M J** J A **S** O N D<br>Soils: Alluvial soils. Along rivers.<br>IBRA Distribution: JAF, SWA<br>Florabase records: 28 | **Very Low**<br>Species occurs on alluvial soils along rivers; mainly on coastal plain and south of survey area. |
| *Pimelea rara* | Thymelaeaceae | P4 | - | Habit: Shrub, 0.2-0.35 m high.<br>Flower colour: white<br>Flowering period (indicated in green): **J** F M A M J J A S O N **D**<br>Soils: Lateritic soils.<br>IBRA Distribution: JAF<br>Florabase records: 52 | **High**<br>Species recorded near survey area. |
| *Senecio leucoglossus* | Asteraceae | P4 | - | Habit: Erect annual, herb, to 1.3 m high.<br>Flower colour: white<br>Flowering period (indicated in green): J F M A M J J **A S O N D**<br>Soils: Gravelly lateritic or granitic soils. Granite outcrops, slopes.<br>IBRA Distribution: JAF, SWA, WAR<br>Florabase records: 45 | **High**<br>Species recorded near and within survey area. |
| *Stylidium ireneae* | Stylidiaceae | P4 | - | Habit: Lax perennial, herb, (0.06-) 0.1-0.28 m high.<br>Flower colour: pink<br>Flowering period (indicated in green): J F M A M J J A S **O N D**<br>Soils: Sandy loam. Valleys near creek lines.<br>IBRA Distribution: JAF, SWA, WAR<br>Florabase records: 30 | **High**<br>Species recorded near survey area. |

## APPENDIX B: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN ONEIL TRANSPORT CORRIDORS

**Note:** Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt; ESP – Esperance Plains; GES – Geraldton Sandplains; JAF – Jarrah Forest; MAL – Mallee; SWA – Swan Coastal Plain; WAR – Warren. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking.

| Species | Family | SCC | FCC | Description and Habitat | Likelihood of Occurrence |
|---|---|---|---|---|---|
| *Verticordia lindleyi* subsp. *lindleyi* | Myrtaceae | P4 | - | Habit: Erect shrub, 0.2-0.75 m high.<br>Flower colour: pink<br>Flowering period (indicated in green):<br>J F M A M J J A S O N D<br>Soils: Sand, sandy clay. Winter-wet depressions.<br>IBRA Distribution: GES, JAF, SWA<br>Florabase records: 83 | **Very Low**<br>Nearby records within SWA. Grows on sand, sandy clay. |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Amaranthaceae | *Ptilotus drummondii* | | x | |
| | *Ptilotus drummondii var. drummondii* | | x | |
| | *Ptilotus manglesii* | x | x | x |
| Anarthriaceae | *Lyginia barbata* | | x | |
| | *Lyginia imberdis* | | x | |
| Apiaceae | *Pentapeltis peltigera* | x | x | x |
| | *Platysace compressa* | x | | x |
| | *Platysace filoformis* | | x | |
| | *Platysace tenuissima* | x | x | |
| | *Platysace* sp. | | | x |
| | *Xanthosia atkinsoniana* | x | x | x |
| | *Xanthosia candida* | x | x | x |
| | *Xanthosia ciliata* | | x | |
| | *Xanthosia huegelii* | x | x | |
| | *Xanthosia singuliflora* | | x | x |
| | Apiaceae sp. | | | x |
| Araliaceae | *Trachymene pilosa* | | x | x |
| Asparagaceae | *Lomandra brttanii* | x | x | |
| | *Lomandra caespitosa* | x | x | x |
| | *Lomandra drummondii* | | x | |
| | *Lomandra integra* | x | x | |
| | *Lomandra hermaphrodita* | x | x | x |
| | *Lomandra micrantha* | x | x | x |
| | *Lomandra micrantha subsp. micrantha* | | x | |
| | *Lomandra nigricans* | | x | x |
| | *Lomandra odora* | | x | |
| | *Lomandra preissii* | x | x | |
| | *Lomandra purpurea* | x | | |
| | *Lomandra sericea* | x | x | x |
| | *Lomandra sonderi* | x | x | x |
| | *Lomandra spartea* | x | x | x |
| | *Lomandra* sp. | | x | x |
| | *Sowerbaea laxiflora* | x | | |
| | *Thysnaotus arenarius* | | x | |
| | *Thysanotus dichotomus* | x | x | |
| | *Thysnaotus fastigiatus* | x | x | |
| | *Thysanotus manglesianus* | | x | |
| | *Thysanotus multiflorus* | x | x | x |
| | *Thysanotus sparteus* | | x | |
| | *Thysnaotus tenellus* | | x | |
| | *Thysanotus thyrsoideus* | x | x | x |
| | *Thysanotus sp.* | | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|---|
| Asteraceae | * | *Conyza sumatrensis* | x | | |
| | | *Craspedia variabilis* | x | x | |
| | | *Helichrysum luteoalbum* | | x | |
| | | *Hyalosperma cotula* | | x | |
| | * | *Hypochaeris glabra* | x | x | x |
| | | *Lagenophora huegelii* | x | x | x |
| | | *Millotia tenuifolia* | | x | |
| | | *Ozothamnus cordatus* | x | | |
| | | *Podolepis lessonii* | | x | |
| | | *Pterochaeta paniculata* | | x | |
| | | *Senecio diaschides* | x | x | |
| | | *Senecio hispidulus* | x | x | x |
| | | *Senecio hispidulus var. hispidulus* | | x | |
| | P4 | *Senecio leucoglossus* | x | x | x |
| | | *Senecio quadridentatus* | | x | |
| | * | *Senecio vulgaris* | | x | |
| | | *Senecio sp.* | | x | |
| | * | *Sonchus asper* | | x | |
| | | *Siloxerus humifusus* | | x | |
| | | *Trichocline spathulata* | x | x | x |
| | * | *Ursinia anthemoides* | | x | |
| | | *Waitzia acuminata* | | x | |
| | | *Waitzia suaveolens var. suaveolens* | | x | |
| | | *Asteraceae sp.* | | x | |
| Campanulaceae | | *Isotoma hypocrateriformis* | | x | |
| | | *Lobelia gibbosa* | | x | |
| | | *Lobelia heterophylla* | | x | |
| | | *Lobelia rhombifolia* | | x | |
| | * | *Wahlenbergia capensis* | | x | |
| Caryophyllaceae | | *Caryophyllaceae sp.* | | x | |
| Casuarinaceae | | *Allocasuarina fraseriana* | x | x | x |
| | | *Allocasuarina humilis* | x | x | |
| Colchicaceae | | *Burchardia congesta* | | x | x |
| Cyperaceae | | *Baumea vaginalis* | | x | |
| | | *Cyathochaeta avenacea* | x | x | |
| | | *Gahnia decomposita* | | x | x |
| | | *Gahnia trifida* | x | x | |
| | | *Lepidosperma brunonianum* | | x | |
| | | *Lepidosperma gladiatum* | | x | |
| | | *Lepidosperma leptostachyum* | | x | |
| | | *Lepidosperma longitudinale* | | x | |
| | | *Lepidosperma pubisquameum* | x | x | |
| | | *Lepidosperma squamatum* | x | x | |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Cyperaceae | *Lepidosperma tenue* | x | x | |
| (continued) | *Lepidosperma tetraquetrum* | | x | x |
| | *Lepidosperma tuberculatum* | | x | |
| | *Lepidosperma* sp. | | x | x |
| | *Mesomelaena ?graciliceps* | | x | |
| | *Mesomelaena tetragona* | x | x | |
| | *Morelotia octandra* | x | x | |
| | *Netrostylis sp. Jarrah Forest (R. Davis 7391)* | x | x | x |
| | *Schoenus brevisetis* | | x | |
| | *Schoenus clandestinus* | | x | |
| | *Schoenus sp.* | | x | |
| | Cyperaceae sp. | | | x |
| Dasypogonaceae | *Kingia australis* | | x | |
| Dennstaedtiaceae | *Pteridium esculentum* | x | x | x |
| Dilleniaceae | *Hibbertia acerosa* | x | x | x |
| | *Hibbertia amplexicaulis* | x | x | x |
| | *Hibbertia commutata* | x | x | x |
| | *Hibbertia commutata (hairy)* | | x | |
| | *Hibbertia diamesogenos* | | x | |
| | *Hibbertia gracilipes* | x | | |
| | P1 *Hibbertia hortiorum* | | | x |
| | *Hibbertia huegelii* | | x | |
| | *Hibbertia hypericoides* | | x | |
| | *Hibbertia inconspicua* | x | | |
| | *Hibbertia lasiopus* | x | x | |
| | *Hibbertia lasiopus/quadricolor* | x | | |
| | *Hibbertia ovata* | | x | x |
| | *Hibbertia pachyrrhiza* | | x | |
| | *Hibbertia perfoliata* | x | x | x |
| | *Hibbertia pilosa* | | x | |
| | *Hibbertia quadricolor* | | x | |
| | *Hibbertia rhadinopoda* | x | | |
| | *Hibbertia silvestris* | | x | |
| | *Hibbertia stellaris* | x | x | |
| | *Hibbertia* sp. | | | x |
| Droseraceae | *Drosera erythrorhiza* | x | x | |
| | *Drosera platystigma* | | x | |
| | *Drosera sp.* | | x | x |
| | *Drosera sp. Climbing* | | | x |
| Elaeocarpaceae | *Platytheca galioides* | | x | |
| | *Tetratheca hirsuta* | | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Ericaceae | *Andersonia caerulea* | | x | |
| | *Leucopogon australis* | x | x | |
| | *Leucopogon capitellatus* | x | x | x |
| | *Leucopogon glabellus* | | x | |
| | *Leucopogon pulchellus* | | x | |
| | *Leucopogon verticillatus* | x | x | x |
| | *Leucopogon sp.* | | x | |
| | *Styphelia conostephioides* | | x | |
| | *Styphelia discolor* | x | x | x |
| | *Styphelia erectifolia* | | x | |
| | *Styphelia nitens* | x | x | x |
| | *Styphelia pallida* | x | x | x |
| | *Styphelia propinqua* | x | x | x |
| | *Styphelia tenuiflora* | x | x | x |
| | Ericaceae sp. | | | x |
| Euphorbiaceae | *Monotaxis gracilis* | x | | |
| | *Monotaxis grandiflora* | | x | |
| | *Monotaxis grandiflora var. grandiflora* | | x | |
| | *Monotaxis occidentalis* | x | x | x |
| | *Stachystemon vermicularis* | | x | |
| Fabaceae | *Acacia alata* | x | x | x |
| | *Acacia applanata* | x | | |
| | *Acacia barbinervis* | | x | |
| | *Acacia browniana* | x | | x |
| | *Acacia celstrifolia* | | x | |
| | *Acacia divergens* | x | x | x |
| | *Acacia drummondii subsp. candolleana* | x | x | |
| | *Acacia drummondii subsp. drummondii* | x | x | x |
| | * *Acacia elata* | | x | |
| | *Acacia extensa* | x | x | |
| | *Acacia incurva* | x | x | |
| | *Acacia lateriticola* | | x | x |
| | *Acacia nervosa* | x | x | |
| | *Acacia obovata* | | x | |
| | *Acacia preissiana* | x | | |
| | *Acacia pulchella* | x | x | |
| | *Acacia pulchella var. glaberrima* | | x | |
| | *Acacia saligna* | x | | |
| | *Acacia stenoptera* | | x | |
| | *Acacia urophylla* | x | x | |
| | *Acacia varia* | | x | |
| | *Acacia willdenowniana* | x | x | |
| | *Acacia sp.* | | x | |
| | *Aotus cordifolia P3* | | x | |
| | *Bossiaea aquifolium* | x | x | x |
| | *Bossiaea ornata* | x | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|---|
| Fabaceae | | *Callistachys lanceolata* | | x | |
| (continued) | | *Chorizema cordatum* | | x | |
| | | *Chorizema dicksonii* | x | | |
| | | *Chorizema rhombeum* | x | x | |
| | | *Daviesia decurrens* | x | x | |
| | | *Daviesia horrida* | x | x | |
| | | *Daviesia incrassata* | x | x | |
| | | *Daviesia inflata* | | x | |
| | | *Daviesia longifolia* | | x | |
| | | *Daviesia physodes* | x | x | |
| | | *Daviesia preissii* | x | x | |
| | | *Daviesia rhombifolia* | x | x | |
| | | *Eutaxia parvifolia* | | x | |
| | | *Eutaxia virgata* | | x | |
| | | *Gastrolobium calycinum* | | x | |
| | | *Gastrolobium ebracteolatum* | | | x |
| | | *Gastrolobium spinosum* | x | x | |
| | | *Gompholobium capitatum* | x | x | |
| | | *Gompholobium confertum* | x | | |
| | | *Gompholbium cyaninum* | | x | |
| | | *Gompholobium knightianum* | x | x | |
| | | *Gompholobium marginatum* | x | x | x |
| | | *Gompholobium polymorphum* | x | x | x |
| | | *Gompholobium preissii* | x | x | x |
| | | *Gompholobium preissii* | | x | |
| | | *Gompholobium tomentosum* | | x | |
| | | *Gompholobium venustum* | | x | |
| | | *Gompholobium sp.* | | x | |
| | | *Hardenbergia comptoniana* | | x | |
| | | *Hovea chorizemifolia* | x | x | |
| | | *Hovea trisperma* | | x | x |
| | | *Jacksonia furcellata* | | x | |
| | | *Jacksonia horrida* | | x | |
| | | *Kennedia coccinea* | x | x | |
| | | *Kennedia prostrata* | x | x | x |
| | | *Labichea punctata* | x | | |
| | | *Mirbelia dilatata* | x | x | |
| | | *Mirbelia spinosa* | x | | |
| | | *Sphaerolobium medium* | x | x | |
| | | *Sphaerolobium vimineum* | | x | |
| | * | *Trifolium sp.* | | x | |
| Gentianaceae | * | *Centaurium erythraea* | | | |
| Goodeniaceae | | *Dampiera alata* | x | x | |
| | | *Dampiera linearis* | x | x | x |
| | | *Lechenaultia biloba* | x | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|---|
| Goodeniaceae | | *Scaevola calliptera* | x | x | x |
| (continued) | | *Scaevola pilosa* | x | x | |
| Haemodoraceae | | *Anigozanthos manglesii* | | x | |
| | | *Conostylis aculeata* | x | | |
| | | *Conostylis serrulata* | x | x | x |
| | | *Conostylis setigera* | x | x | |
| | | *Conostylis setigera subsp. setigera* | x | x | |
| | | *Conostylis setosa* | x | x | x |
| | | *Conostylis sp.* | | x | |
| | | *Haemodorum discolor* | | x | |
| | | *Haemodorum ?simplex* | | x | |
| | | *Haemodorum* sp. | | x | x |
| | | Haemodoraceae sp. | | x | x |
| Haloragaceae | | *Glischrocaryon aureum* | x | x | |
| | | *Gonocarpus cordiger* | x | x | |
| | | *Gonocarpus sp.* | | x | |
| Hemerocallidaceae | | *Agrostocrinum hirsutum* | | x | |
| | | *Agrostocrinum scabrum* | x | | |
| | | *Chamaescilla corymbosa* | x | x | x |
| | | *Dianella revoluta var. divaricata* | x | x | |
| | | *Tricoryne elatior* | x | x | |
| | | *Tricoryne humilis* | | x | |
| Hypericaceae | * | *Hypericum perforatum* | | x | |
| Iridaceae | | *Patersonia babianoides* | x | x | |
| | | *Patersonia juncea* | | x | |
| | | *Patersonia occidentalis* | x | x | x |
| | | *Patersonia pygmaea* | x | x | x |
| | | *Patersonia rudis* | x | x | |
| | | *Patersonia rudis subsp. rudis* | | x | |
| Lamiaceae | | *Hemiandra pungens* | | x | |
| | | *Hemigenia incana* | | x | |
| | | *Hemigenia pritzelii* | x | x | |
| Lauraceae | | *Cassytha racemosa* | x | x | |
| | | *Cassytha* sp. | | x | x |
| Lentibulariaceae | | *Utricularia multifida* | | x | |
| Lindsaeaceae | | *Lindsaea linearis* | x | x | |
| Loganiaceae | | *Logania serpyllifolia* | x | x | |
| | | *Logania serpyllifolia subsp. angustifolia* | | x | |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Loranthaceae | *Nuytsia floribunda* | | x | |
| Malvaceae | *Lasiopetalum floribundum* | x | x | x |
| | *Lasiopelatum glabratum* | x | x | |
| | *Thomasia paniculata* | x | x | x |
| Myrtaceae | *Astartea scoparia* | x | x | x |
| | *Babingtonia camphorosmae* | x | x | x |
| | *Beaufortia macrostemon* | | x | |
| | *Calothamnus planifolius* | | x | |
| | *Calothamnus quadrifidus* | | x | |
| | *Calytrix ?angulata* | | x | |
| | *Corymbia calophylla* | x | x | x |
| | *Eucalyptus aspersa* | | x | |
| | *Eucalyptus marginata* | x | x | x |
| | *Eucalyptus megacarpa* | x | x | x |
| | *Eucalyptus patens* | x | x | x |
| | *Eucalyptus rudis* | x | x | |
| | *Hypocalymma angustifolium* | x | x | x |
| | *Hypocalymma cordifolium* | x | x | x |
| | *Hypocalymma robustum* | | x | |
| | *Kunzea ericifolia* | | x | |
| | *Kunzea micrantha* | | x | |
| | *Kunzea recurva* | x | x | |
| | *Leptospermopsis erubescens* | | x | |
| | *Melaleuca incana* | x | | x |
| | *Melaleuca incana subsp. incana* | x | x | |
| | *Melaleuca lateritia* | | x | |
| | *Melaleuca parviceps* | | x | |
| | *Melaleuca pauciflora* | x | x | x |
| | *Melaleuca preissiana* | x | x | x |
| | *Melaleuca rhaphiophylla* | | x | |
| | *Melaleuca trichophylla* | | x | |
| | *Melaleuca viminea* | x | x | |
| | *Melaleuca viminea subsp. viminea* | | x | |
| | *Melaleuca sp.* | | x | |
| | *Pericalymma ellipticum* | x | x | |
| | *Taxandria linearifolia* | x | x | x |
| | *Verticordia densiflora* | | x | |
| | *Verticordia huegelii var. huegelii* | | x | |
| | *Verticordia pennigera* | | x | |
| | *Verticordia plumosa var. plumosa* | | x | |
| | *Verticordia serrata* | | x | |
| | *Myrtaceae sp.* | | x | |
| Olacaceae | *Olax benthamiana* | x | | |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|---|
| Orchidaceae | | *Caladenia flava* | | *x* | |
| | | *Caladenia flava subsp. flava* | | *x* | |
| | | *Caladenia* sp. | | *x* | x |
| | | *Cyrtostylis heugelii* | *x* | | |
| | | *Elythranthera brunonis* | | *x* | |
| | | *Elythranthera sp.* | | *x* | |
| | | *Eriochilus dilatatus* | *x* | | |
| | | *Microtis media* | *x* | | |
| | | *Pterostylis vittata* | *x* | | |
| | | *Pterostylis* sp. | | *x* | x |
| | | *Pyrorchis nigricans* | *x* | | |
| | | *Thelymitra crinita* | *x* | | |
| | | *Thelymitra sp.* | | *x* | |
| | | Orchidaceae sp. | | x | x |
| Orobanchaceae | * | *Parentucellia latifolia* | | *x* | |
| Oxalidaceae | | *Oxalis* sp. | | | x |
| Phyllanthaceae | | *Lysiandra calycina* | *x* | *x* | x |
| | | *Poranthera huegelii* | | *x* | |
| Philydraceae | | *Philydrella drummondii* | | *x* | |
| Pittosporaceae | | *Billardiera floribunda* | *x* | *x* | |
| | | *Billardiera fusiformis* | | *x* | |
| | | *Billardiera heterophylla* | *x* | | |
| | | *Billardiera variifolia* | *x* | *x* | |
| | | *Billardiera sp.* | | *x* | |
| | | *Marianthus bicolor* | *x* | | |
| | | *Marianthus drummondianus* | *x* | *x* | |
| Plantaginaceae | * | *Plantago lanceolata* | *x* | | |
| Poaceae | * | *Aira caryophyllea* | *x* | *x* | |
| | * | *Aira cupaniana* | | *x* | |
| | | *Amphipogon amphipogonoides* | *x* | *x* | |
| | | *Amphipogon laguroides subsp. laguroides* | | *x* | |
| | | *Amphipogon turbinatus* | | *x* | |
| | | *Austrostipa campylachne* | | *x* | |
| | | *Austrostpa elegantissima* | *x* | | |
| | | *Neurachne alopecuroidea* | *x* | *x* | |
| | * | *Pentaschistis airoides* | | *x* | |
| | | *Rytidosperma acerosum* | | *x* | |
| | | *Rytidosperma caespitosum* | *x* | *x* | x |
| | | *Rytidosperma setacea* | | *x* | |
| | | *Rytidosperma sp.* | | *x* | |
| | | *Tetrarrhena laevis* | *x* | *x* | x |
| | | Poaceae sp. | | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Polygalaceae | *Comesperma calymega* | x | x | |
| | *Comesperma confertum* | x | | |
| | *Comesperma polygaloides* | | x | |
| | *Comesperma virgatum* | x | x | |
| Proteaceae | *Adenanthos barbiger* | | x | x |
| | *Adenanthos cygnorum* | | x | |
| | *Adenanthos cygnorum subsp. cygnorum* | | x | |
| | *Adenanthos obovatus* | | x | |
| | *Banksia armata var. armata* | | x | |
| | *Banksia bipinnatifida subsp. bipinnatifida* | | x | |
| | *Banksia dallanneyi* subsp. *dallanneyi* var. *dallanneyi* | x | x | x |
| | *Banksia dallanneyi* subsp. *sylvestris* | | x | |
| | *Banksia grandis* | x | x | x |
| | *Banksia littoralis* | x | x | x |
| | *Banksia seminuda* | x | x | x |
| | *Banksia sessilis* | x | x | |
| | *Banksia sphaerocarpa var. sphaerocarpa* | | x | |
| | *Banksia squarrosa* | | x | |
| | *Banksia squarrosa subsp. squarrosa* | | x | |
| | *Conospermum amoenum* | | x | |
| | *Conospermum capitatum* | x | x | |
| | *Conospermum capitatum subsp. glabratum* | | x | |
| | *Grevillea bipinnatifida* | | x | |
| | *Grevillea diversifolia* | | x | |
| | *Grevillea diversifolia subsp. diversifolia* | | x | |
| | *Grevillea manglesii subsp. manglesii* | | x | |
| | *Grevillea pulchella* | | x | |
| | *Grevillea pulchella subsp. ascendens* | | x | |
| | *Grevillea quercifolia* | x | x | |
| | *Grevillea trifida* | | x | |
| | *Grevillea wilsonii* | | x | |
| | *Hakea amplexicaulis* | x | x | x |
| | *Hakea erinacea* | | x | |
| | *Hakea incrassata* | x | x | |
| | *Hakea lissocarpha* | x | x | x |
| | *Hakea marginata* | | x | |
| | *Hakea prostrata* | x | x | |
| | *Hakea ruscifolia* | x | x | |
| | *Hakea trifurcata* | | x | |
| | *Hakea undulata* | | x | |
| | *Hakea varia* | x | x | |
| | *Hakea sp.* | | x | |
| | *Isopogon crithmifolius* | | x | |
| | *Isopogon dubius* | | x | x |
| | *Isopogon sphaerocephalus* | | x | |
| | *Persoonia angustiflora* | x | x | |
| | *Persoonia elliptica* | x | x | |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Proteaceae | *Persoonia longifolia* | x | x | x |
| (continued) | *Petrophile heterophylla* | | x | |
| | *Petrophile serruriae* | | x | |
| | *Petrophile striata* | x | x | |
| | *Stirlingia latifolia* | | x | |
| | *Stirlingia simplex* | | x | |
| | *Synaphea damopsis* | x | x | |
| | *Synaphea gracillima* | x | x | |
| | *Synaphea petiolaris* | x | x | |
| | *Xylomelum occidentale* | x | x | |
| Ranunculaceae | *Clematis pubescens* | x | x | x |
| | *Ranunculus colonorum* | x | x | |
| | *Ranunculus* sp. | | | x |
| | Ranunculaceae sp. | | | x |
| Restionaceae | *Alexgeorgea nitens* | | x | |
| | *Desmocladus fasciculatus* | x | x | x |
| | *Desmocladus flexuosus* | | x | x |
| | *Hypolaena exsulca* | x | x | |
| | *Lepidobolus chaetocephalus* | | x | |
| | *Lepidobolus preissianus* | | x | |
| | *Lepidobolus preissianus subsp. preissianus* | | x | |
| | *Leptocarpus canus* | x | x | |
| | *Leptocarpus coangustatus* | | x | |
| | *Leptocarpus scariosus* | x | x | |
| | *Leptocarpus tenax* | | x | |
| | *Lepyrodia riparia* | | x | |
| | *Loxocarya cinerea* | x | x | |
| Rhamnaceae | *Cryptandra arbutiflora* | x | x | |
| | *Trymalium ledifolium* | x | x | x |
| | *Trymalium odoratissimum* | x | x | x |
| | *Trymalium odoratissimum subsp. odoratissimum* | | x | |
| Rubiaceae | *Opercularia apiciflora* | x | x | |
| | *Opercularia echinocephala* | x | x | x |
| | *Opercularia hispidula* | x | x | |
| Rutaceae | *Asterolasia pallida subsp. pallida* | | x | |
| | *Boronia crenulata* | x | x | |
| | *Boronia crenulata subsp. viminea* | | x | |
| | *Boronia fastigiata* | x | x | x |
| | *Boronia molloyae* | | x | |
| | *Philotheca spicata* | x | x | x |
| Santalaceae | *Exocarpos sparteus* | | x | |
| | *Leptomeria cunninghamii* | x | x | x |

**APPENDIX C: VASCULAR PLANT SPECIES NEAR AND WITHIN THE ONEIL TRANSPORT CORRIDORS, 1998 TO 2023**

Note: *Denotes introduced species; P1 and P4 denote Priority Flora Species (DBCA 2401)

| Family | Species | 1998 | 2009 | 2023 |
|---|---|---|---|---|
| Sapindaceae | *Dodonaea ceratocarpa* | | x | |
| Stackhousiaceae | *Stackhousia monogyna* | x | x | |
| | *Tripterococcus brunonis* | x | x | |
| Stylidiaceae | *Levenhookia pusilla* | | x | |
| | *Levenhookia sp.* | | x | |
| | *Stylidium amoenum* | x | x | x |
| | *Stylidium amoenum* | | x | |
| | *Stylidium brunonianum* | | x | |
| | *Stylidium calcaratum* | | x | |
| | *Stylidium canaliculatum* | x | | |
| | *Stylidium dichotomum* | | x | |
| | *Stylidium diuroides subsp. diuroides* | | x | |
| | *Stylidium junceum* | x | x | |
| | *Stylidium piliferum* | x | x | x |
| | *Stylidium pulchellum* | | x | |
| | *Stylidium repens* | | x | |
| | *Stylidium schoenoides* | | x | |
| | *Stylidium thesioides* | | x | |
| | *Stylidium sp.* | | | |
| Thymelaeceae | *Pimelea ciliata* | x | x | |
| | *Pimelea ciliata subsp. ciliata* | | x | |
| | *Pimelea lehmanniana* | x | x | |
| | *Pimelea spectabilis* | | x | |
| | *Pimelea suaveolens* | x | x | x |
| | *Pimelea* sp. | | | x |
| Tremandraceae | *Tetratheca hirsuta* | x | | |
| Violaceae | *Hybanthus floribundus* | x | | |
| Xanthorrhoeaceae | *Xanthorrhoea gracilis* | x | x | x |
| | *Xanthorrhoea preissii* | x | x | x |
| Zamiaceae | *Macrozamia riedlei* | x | x | x |

**APPENDIX D: LOCATION OF PRIORITY SPECIES RECORDED ON ONEIL TRANSPORT CORRIDOR AREAS IN 2023**

Note P1 - P4 Prioirty species defined in DBCA 2024a; SCC - State Conservation Code

| Datum | Easting | Northing | Confirmed Species | SCC | Popn | Area (m2) |
|---|---|---|---|---|---|---|
| GDA94 | 421704 | 6396718 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 421839 | 6396738 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 421917 | 6396748 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422217 | 6396539 | *Hibbertia hortiorum* | P1 | 20 | 10x10 |
| GDA94 | 422221 | 6396514 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422273 | 6396481 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422313 | 6396424 | *Hibbertia hortiorum* | P1 | 15 | 5x5 |
| GDA94 | 422366 | 6396322 | *Hibbertia hortiorum* | P1 | 35 | 10x10 |
| GDA94 | 422507 | 6396161 | *Hibbertia hortiorum* | P1 | 2 | 5x5 |
| GDA94 | 422522 | 6396083 | *Hibbertia hortiorum* | P1 | 3 | 5x2 |
| GDA94 | 422535 | 6395640 | *Hibbertia hortiorum* | P1 | 16 | 10x10 |
| GDA94 | 422556 | 6396023 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 422570 | 6396032 | *Hibbertia hortiorum* | P1 | 80 | 10x10 |
| GDA94 | 422614 | 6395648 | *Hibbertia hortiorum* | P1 | 5 | 10x10 |
| GDA94 | 422622 | 6395936 | *Hibbertia hortiorum* | P1 | 3 | 2x2 |
| GDA94 | 422628 | 6395959 | *Hibbertia hortiorum* | P1 | 7 | 10x10 |
| GDA94 | 422654 | 6395615 | *Hibbertia hortiorum* | P1 | 5 | 10x10 |
| GDA94 | 422670 | 6395558 | *Hibbertia hortiorum* | P1 | 10 | 10x10 |
| GDA94 | 422738 | 6395495 | *Hibbertia hortiorum* | P1 | 7 | 10x10 |
| GDA94 | 422763 | 6395456 | *Hibbertia hortiorum* | P1 | 15 | 10x10 |
| GDA94 | 422817 | 6395709 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 422824 | 6395725 | *Hibbertia hortiorum* | P1 | 100+ | 2x100 |
| GDA94 | 422917 | 6395605 | *Hibbertia hortiorum* | P1 | 2 | 5x5 |
| GDA94 | 422926 | 6394936 | *Hibbertia hortiorum* | P1 | 5 | 3x3 |
| GDA94 | 422935 | 6395562 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 422946 | 6394781 | *Hibbertia hortiorum* | P1 | 20 | 5x5 |
| GDA94 | 422975 | 6395033 | *Hibbertia hortiorum* | P1 | 4 | 2x2 |
| GDA94 | 422980 | 6395510 | *Hibbertia hortiorum* | P1 | 4 | 2x2 |
| GDA94 | 422987 | 6395533 | *Hibbertia hortiorum* | P1 | 7 | 5x5 |
| GDA94 | 423000 | 6395493 | *Hibbertia hortiorum* | P1 | 25 | 10x10 |
| GDA94 | 423002 | 6395492 | *Hibbertia hortiorum* | P1 | 50+ | 10x10 |
| GDA94 | 423032 | 6395374 | *Hibbertia hortiorum* | P1 | 4 | 4x4 |
| GDA94 | 423055 | 6395202 | *Hibbertia hortiorum* | P1 | 6 | 5x2 |
| GDA94 | 423268 | 6394799 | *Hibbertia hortiorum* | P1 | 10 | 10x10 |
| GDA94 | 423313 | 6394913 | *Hibbertia hortiorum* | P1 | 5 | 10x10 |
| GDA94 | 423399 | 6394674 | *Hibbertia hortiorum* | P1 | 8 | 10x10 |
| GDA94 | 423403 | 6394449 | *Hibbertia hortiorum* | P1 | 5 | 10x10 |
| GDA94 | 423525 | 6395299 | *Hibbertia hortiorum* | P1 | 15 | 10x10 |
| GDA94 | 423528 | 6392953 | *Hibbertia hortiorum* | P1 | 30 | 50x50 |
| GDA94 | 423569 | 6393037 | *Hibbertia hortiorum* | P1 | 30 | 20x20 |
| GDA94 | 423580 | 6395242 | *Hibbertia hortiorum* | P1 | 50+ | 20x20 |

**APPENDIX D: LOCATION OF PRIORITY SPECIES RECORDED ON ONEIL TRANSPORT CORRIDOR AREAS IN 2023**

Note P1 - P4 Prioirty species defined in DBCA 2024a; SCC - State Conservation Code

| Datum | Easting | Northing | Confirmed Species | SCC | Popn | Area (m2) |
|---|---|---|---|---|---|---|
| GDA94 | 423613 | 6393340 | *Hibbertia hortiorum* | P1 | 100 | 10x10 |
| GDA94 | 423614 | 6393200 | *Hibbertia hortiorum* | P1 | 10 | 10x10 |
| GDA94 | 423630 | 6393367 | *Hibbertia hortiorum* | P1 | 4 | 5x5 |
| GDA94 | 423641 | 6392935 | *Hibbertia hortiorum* | P1 | 30 | 20x20 |
| GDA94 | 423744 | 6393958 | *Hibbertia hortiorum* | P1 | 200 | 50x20 |
| GDA94 | 423764 | 6393628 | *Hibbertia hortiorum* | P1 | 100 | 20x20 |
| GDA94 | 423767 | 6393581 | *Hibbertia hortiorum* | P1 | 4 | 5x5 |
| GDA94 | 423786 | 6392780 | *Hibbertia hortiorum* | P1 | 25 | 20x20 |
| GDA94 | 423801 | 6393912 | *Hibbertia hortiorum* | P1 | 200 | 50x20 |
| GDA94 | 423824 | 6393838 | *Hibbertia hortiorum* | P1 | 150 | 50x20 |
| GDA94 | 423829 | 6394061 | *Hibbertia hortiorum* | P1 | 200 | 50x20 |
| GDA94 | 423833 | 6393802 | *Hibbertia hortiorum* | P1 | 8 | 10x10 |
| GDA94 | 423839 | 6392916 | *Hibbertia hortiorum* | P1 | 25 | 20x20 |
| GDA94 | 423875 | 6392830 | *Hibbertia hortiorum* | P1 | 25 | 20x20 |
| GDA94 | 424084 | 6394515 | *Hibbertia hortiorum* | P1 | 7 | 5x5 |
| GDA94 | 424127 | 6394640 | *Hibbertia hortiorum* | P1 | 18 | 5x5 |
| GDA94 | 422180 | 6396513 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422422 | 6396270 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 422539 | 6395669 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422662 | 6395905 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 422776 | 6395431 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 422780 | 6395672 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 423020 | 6395315 | *Hibbertia hortiorum* | P1 | 1 | 1x1 |
| GDA94 | 423026 | 6395549 | *Hibbertia hortiorum* | P1 | 1 | 1s1 |
| GDA94 | 423258 | 6394828 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 423500 | 6395187 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 424118 | 6394715 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 425185 | 6393127 | *Hibbertia hortiorum* | P1 | 2 | 2x2 |
| GDA94 | 423980 | 6393970 | *Senecio leucoglossus* | P4 | 1 | 1x1 |
| GDA94 | 424102 | 6394112 | *Senecio leucoglossus* | P4 | 2 | 1x1 |
| GDA94 | 424915 | 6393492 | *Senecio leucoglossus* | P4 | 5 | 5x5 |