TRACE ENTERPRISES

Final Report

Reconnaissance Flora, Basic Fauna Surveys & Black Cockatoo Habitat Assessment

Prepared for: TransAlta Energy (Australia) Pty Ltd

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Reviewed by: Joshua Davis & Sujan Henk

Date Submitted: 06/03/2026



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Project Details

This Final Report documents the desktop assessment, Reconnaissance Flora Survey, Basic fauna survey and Black cockatoo Habitat Assessment conducted at the Lot 502 Beros Road site from 10th to 15th November, 2025.

Assessment areas:	Lot 502 Beros Road, Warradarge, WA
Trace contract no.:	2025-121
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Survey dates:	10th to 15th November (inclusive)

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Acknowledgement of Country

We acknowledge the Traditional Custodians of the country, whose country is reported in this report, and recognise their continuing connection to the land, waters, and culture. We pay our respects to the Elders past, present and emerging.



Figure 1 Iconic Scarlet Featherflower (*Verticordia grandis*) flowering within the survey site (© Trace Enterprises 2026).

Document Control

Trace Enterprises has prepared this document for TransAlta Energy (Australia) Pty Ltd.

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Warning

Please be advised that the following content may contain images and names of people who have passed away.

Disclaimer

The research approach and methods utilised for this environmental study are outlined by the National Environmental Protection Measure and inclusive of Environmental Protection Authorities standards. An assessment was conducted within the capabilities of the Trace Enterprises Group. It is acknowledged that some aspects of the report are outside of the Trace Enterprises Group's facilities. While every effort has been made to ensure that all relevant data has been collated, the author(s) can take no responsibility for omissions and inconsistencies resulting from information becoming available after this report's completion.

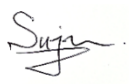
Spatial Accuracy

Locations were recorded using a Garmin GLO 2 adapter using the datum GDA 2020, with a spatial accuracy of 0.5-3 m. The coordinates contained in this report are MGA Zone 50.

Certification

This Final Report describes the desktop assessment, reconnaissance flora survey and basic fauna survey, conducted by environmental consultants from Trace Enterprises on behalf of TransAlta Energy (Australia) Pty Ltd from 10th to 15th November, 2025 at the Lot 502 Beros Road survey site.

The results, conclusions, and recommendations in this report are based on the information available at the time of its preparation. Whilst every effort has been made to ensure that all relevant data has been entered, the author(s) can take no responsibility for omissions and/or inconsistencies resulting from information becoming available after this report's completion.



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Date: 06/03/2026



Abbreviations

BC Act	Biodiversity Conservation Act
BOM	Bureau of Meteorology
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPAW	Department of Parks and Wildlife
DWER	Department of Water and Environmental Regulations
EPA	Environmental Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act
IBRA	Interim Biogeographic Regionalisation for Australia
PEC	Priority Ecological Communities
SoW	Scope of Work
TEC	Threatened Ecological Communities
Trace	Trace Enterprises



Executive Summary

On October 20th, 2025, TransAlta Energy (Australia) Pty Ltd requested assistance from Trace Enterprises Pvt Ltd (Trace) to assess environmental values of the proposed development site in accordance with federal and state legislation, including EPA Guidelines (EPA 2016 and 2020), WA threatened black cockatoo referral guidelines (DAWE 2022) and Matters of National Environmental Significance (MNES) Significant Impact Guidelines 1.1 (DoE 2013).

The survey area is located at Lot 502 Beros Road, Warradarge, WA (see Map 1). It represents a highly disturbed and fragmented envelope of land (51.68ha) in an area comprising a mix of farmland and remnant bushland, degraded by previous vegetation clearing, off-road vehicle use, farming, weeds, grazing, and trash disposal (see Map 12).

TransAlta is informed that;

- The desktop assessment, reconnaissance flora survey, basic fauna survey, and black cockatoo habitat assessment are completed.
- Desktop assessment suggested the potential occurrence of 105 Threatened and Priority flora (see Table 6), and 37 fauna (see Table 7) species.
- Field surveys resulted in the occurrence of 74 flora taxa, including 14 environmental weeds (see Table 9). None of the weeds is Weeds of National Significance (WONS) or Declared Pests.
- No Threatened flora species were recorded within the survey area.
- Two (2) of the recorded flora taxa represented Priority flora species; *Haemodorum loratum* (Priority 3), and *Jacksonia anthoclada* (Priority 3) (see Map 9).
- No Threatened or Priority Ecological Communities (TECs/PECs) were detected within or near the survey area.
- Twenty-seven (27) vertebrate fauna species were recorded within the survey area (see Table 11). None of them represents Threatened or Priority fauna.
- No threatened Carnaby's black cockatoo (*Zanda latirostris*) were observed within or near the survey area.
- No high-quality black cockatoo foraging habitat, suitable breeding trees, or roosting trees were located within the survey area (see Table 12).

Recommendations

- Proposed construction or vegetation clearing within the survey area (51.69ha) should not have any significant impact on the threatened Carnaby's black cockatoo (*Z. latirostris*) survival.
- Consult with DBCA regarding areas where the proposed vegetation clearing intersects with the two (2) Priority flora locations and the corresponding 50m buffer (see Map 9).
- Native Vegetation Clearing permits are required from DWER to clear native vegetation within the survey area.



Table of Contents

Project Details i
Contact Details i
Acknowledgement of Country ii
Document Control ii
Copyright iii
Warning iii
Disclaimer iii
Spatial Accuracy iii
Certification iii
Abbreviations iv
Executive Summary 1
1.0 Introduction 6
1.1 Background 6
1.2 Scope of Works 6
1.2.1 Desktop Assessment 6
1.2.2 Reconnaissance flora Survey 6
1.2.3 Basic Fauna Survey 6
1.2.4 Black cockatoo habitat assessment 6
1.3 Legislative Context 7
1.4 Legislation Related to Threatened Black Cockatoos 7
1.4.1 Significant Impact 7
1.4.2 Significant Impact Criteria for Threatened Species 8
1.5 Survey Team and Authorship 9
2.0 Regional Context 11
2.1 Survey Area 11
2.2 Biogeography 11
2.3 Regional Vegetation 12
2.4 Soils and Land Systems 12
2.5 Climate 12
2.6 Notable Areas 13
2.6.1 Threatened and Priority Ecological Communities (TECs/PECs) 13
2.6.2 Lands Under DBCA Jurisdiction 14
2.6.3 Other Notable Areas 14
3.0 Methods 15



3.1 Desktop Assessment 15
3.1.1 Data Sources 15
3.1.2 Environmental Constraints Analysis 18
3.1.3 Fauna Likelihood of Occurrence 18
3.2 Field Surveys 19
3.2.1 Reconnaissance flora Survey 19
3.2.2 Basic Fauna Survey 19
3.2.3 Survey Limitations 20
3.3 Habitat Mapping 21
3.3.1 Vegetation Communities and Condition Mapping 21
3.3.2 3.3.2 Fauna Habitat Mapping 21
3.4 Black Cockatoo Habitat Assessment 21
3.4.1 Black Cockatoo Habitat 22
3.4.2 Field Assessment Methods 22
4.0 Results 23
4.1 Desktop Survey 23
4.1.1 Conservation-significant Flora 23
4.1.2 Conservation-significant fauna 27
4.1.3 Conservation-Significant Ecological Communities 29
4.1.4 Other Significant Areas 29
4.1.5 Threatened Black Cockatoos 36
4.2 Reconnaissance Flora Survey 36
4.2.1 Conservation-Significant Flora 38
Haemodorum loratum (Priority 3) 38
Jacksonia anthoclada (Priority 3) 38
4.3 Vegetation Community and Condition Mapping 40
4.4 Basic Fauna Survey 40
4.5 Fauna Habitat Mapping 43
4.6 Black Cockatoo Habitat Assessment 45
4.6.1 Breeding habitat 45
4.6.2 Roosting Habitat 45
4.6.3 Foraging Habitat 45
5.0 Discussion 48
5.1 Reconnaissance flora Survey 48
5.2 Fauna survey 48



5.3 Black cockatoo habitat assessment 48
6.0 Conclusions and Recommendations 49
7.0 References 50
8.0 Maps 52
9.0 Appendices 66
Appendix 1 Scope of Works 66
Appendix 2 : Legislative Context 67
Appendix 3: Categories of Threatened Species under the EPBC Act 1999 69
Appendix 4 Categories of Threatened Species under the BC Act 2016 70
Appendix 5 Threatened and Priority Ecological Communities Classification Codes (DBCA) 72
Appendix 6 A summary of black cockatoo habitat information (DAWE 2022) 74
Appendix 7 Scoring System for the Assessment of Foraging Value of Vegetation for three (3) threatened black cockatoos (Bamford 2020) 75
Appendix 8 Foraging quality scoring tool (DAWE, 2022) 77
Appendix 9 Referral thresholds for black cockatoos (DAWE 2022) 78
Appendix 10 Vegetation Condition Scale as per Keighery 1994 (EPA 2016) 79
Appendix 11 Detailed information on selected survey sites. 80
Appendix 12 Complete results of the PMST database search. 92

List of Tables

Table 1 Survey personnel and experience. 9
Table 2 A summary description of vegetation types occurs in the survey area as per Beard et al. 2013. 12
Table 3 Major literature sources utilized for the literature survey. 16
Table 4 Fauna Likelihood of Occurrence Criteria. 18
Table 5 Survey Limitations of the present survey. 20
Table 6 Threatened and Priority flora species reported for the survey area and its vicinity (DBCA and PMST). . 23
Table 7 Threatened and Priority fauna species reported for the survey area and its vicinity (DBCA and PMST data) 28
Table 8 Pre- and post-survey likelihood of the occurrence for Threatened and Priority fauna species reported for the survey region (DBCA and PMST data). 30
Table 9. A list of flora species recorded during the 2025-121 flora survey. 36
Table 10 Descriptions of vegetation communities identified in the survey area. 40
Table 11 A summary of the fauna observed during the survey within the survey area. 41
Table 12 Foraging values and corresponding areas (ha) for Carnaby's black cockatoos. 46
Table 13 Foraging quality scoring tool for the survey area. 46



List of Maps

Map 1 Overview of the survey area. 53

Map 2 The distribution of Pre-European Vegetation Units across the survey areas. 54

Map 3 The distribution of Land Systems across the survey areas. 55

Map 4 Fauna and flora sampling and remote camera locations within the survey areas. 56

Map 5 The distribution of Threatened and Priority flora species in the region (DBCA data). 57

Map 6 The distribution of Threatened and Priority fauna species in the region (DBCA data). 58

Map 7 The distribution of Threatened and Priority Ecological Communities (TECs/PECs) in the region (DBCA data) 59

Map 8 The known locations of threatened black cockatoo breeding and roosting near the survey area. 60

Map 9 The distribution of Priority 3 *Haemodorum loratum* and Priority 3 *Jacksonia anthoclada* within the survey area. 61

Map 10 The distribution of fauna observations by taxa and observation type within the survey area. 62

Map 11 The distribution of vegetation communities within the survey area. 63

Map 12 The distribution of vegetation condition within the survey area. 64

Map 13 The distribution of fauna habitats within the survey area. 65

List of Figures

Figure 1 Iconic Scarlet Featherflower (*Verticordia grandis*) flowering within the survey site (© Trace Enterprises 2026). ii

Figure 2 An aerial view of the survey area, viewing west from the centre (© Trace Enterprises 2026). 11

Figure 3 Mean monthly temperature and rainfall from Badgingarra weather station (#009037) (BOM 2026). . 13

Figure 5 Photographic representations of some vertebrates recorded during the survey (© Trace Enterprises 2026). 44



1.0 Introduction

1.1 Background

A proposal developed by TransAlta Energy (Australia) Pty Ltd requests permission to construct a gas-fired power generation facility at Lot 502 Beros Road, Warradarge, WA (see Map 1).

On October 20th, 2025, TransAlta Energy (Australia) Pty Ltd requested assistance from Trace Enterprises Pvt Ltd (Trace) to assess environmental values of the proposed development site in accordance with federal and state legislation, including EPA Guidelines (EPA 2016 and 2020), WA threatened black cockatoo referral guidelines (DAWE 2022) and Matters of National Environmental Significance (MNES) Significant Impact Guidelines 1.1 (DoE 2013).

1.2 Scope of Works

TransAlta Energy (Australia) Pty Ltd commissioned Trace to conduct a reconnaissance flora survey, basic fauna survey and black cockatoo habitat assessment at the proposed development site at Lot 502 Beros Road, Warradarge, WA (see Appendix 1).

1.2.1 Desktop Assessment

Undertake a desktop assessment to identify Matters of National Environmental Significance (MNES) to identify conservation-significant fauna, flora and ecological communities present in the area to understand the potential impacts of the proposed development on the environmental values (DoE 2013).

1.2.2 Reconnaissance flora Survey

Undertake a reconnaissance flora survey to ground truth the desktop assessment findings, provide local and regional context of the vegetation assemblages, and identify any conservation-significant flora species within the survey area. The survey will be conducted in accordance with EPA guidelines (EPA 2016), and this critical data may inform project planning for the proposed works.

1.2.3 Basic Fauna Survey

Undertake a basic fauna survey to gather broad information on fauna and fauna habitats and ground-truth the desktop assessment findings. The survey will be completed based on visual and auditory observations collected during the daytime and remote camera data covering both day and night. Special emphasis will be given to identifying any threatened species or signs of their presence in the survey area. The survey will be conducted in accordance with EPA guidelines (EPA 2020). No fauna trapping will be conducted.

1.2.4 Black cockatoo habitat assessment



Assess the area for potential foraging, roosting, and breeding habitat of the threatened Black cockatoos. Complete a significant impact assessment based on the collected field data as per the Referral Guidelines for the 3 WA threatened black cockatoo species (DAWE 2022) and Matters of National Environmental Significance-Significant Impact Guidelines (DoE 2013).

1.3 Legislative Context

Several State and Federal environment-related legislation and policies affect how environmental values are managed in Western Australia. Relevant legislation includes:

- Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999);
- WA Environmental Protection Act 1986 (EP Act 1986);
- WA Biodiversity Conservation Act 2016 (BC Act 2016); and
- WA EPA Environmental Guidance for Planning and Development.

More details of environmental legislation and its relevance to this work are described in Appendix 2.

1.4 Legislation Related to Threatened Black Cockatoos

Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), and Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) are nationally protected as Endangered or Vulnerable under the EPBC Act 1999. Therefore, these threatened black cockatoos are considered a Matter of National Environmental Significance (MNES) as per the EPBC Act 1999.

The Referral Guidelines for threatened black cockatoos in WA (DAWE 2022) provide guidance on what actions are likely and unlikely to require referral to the Minister of Environment because they could have a significant impact on black cockatoos. It is required that EPBC Act 1999 Significant Impact Guidelines 1.1 be followed to determine any potential significant impacts of the proposed actions on threatened black cockatoos (DoE 2013).

1.4.1 Significant Impact

A person who proposes to take an action that will have, or is likely to have, a **significant impact** on a Matter of National Environmental Significance (MNES) must refer that action to the Minister for a decision on whether assessment and approval is required under the EPBC Act 1999 (DoE 2013).



A **significant impact** is an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. You should consider all of these factors when determining whether an action is likely to have a significant impact on matters of national environmental significance (DoE 2013).

Significant Impact Guidelines 1.1 (DoE 2013) recommends a self-assessment to decide whether the proposed action is likely to significantly impact any MNES. The black cockatoo habitat assessment is considered the self-assessment for the proposed vegetation clearing at the Chittering site.

1.4.2 Significant Impact Criteria for Threatened Species

The proposed vegetation clearing at the Chittering site may pose a significant impact on nationally threatened black cockatoos and their **critical habitat**.

A **critical habitat** of a species refers to areas that are necessary for activities such as foraging, breeding, roosting, or dispersal; for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators); to maintain genetic diversity and long term evolutionary development, or for the reintroduction of populations or recovery of the species or ecological community (DoE 2013).

Significant impact criteria for Critically Endangered and Endangered species (DoE 2013)

An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:

1) lead to a long-term decrease in the size of a population
2) reduce the area of occupancy of the species
3) fragment an existing population into two or more populations
4) adversely affect habitat critical to the survival of a species
5) disrupt the breeding cycle of a population
6) modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
7) result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat
8) introduce disease that may cause the species to decline, or
9) interfere with the recovery of the species.



Significant impact criteria for Vulnerable species (DoE 2013)

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1) lead to a long-term decrease in the size of an important population of a species
2) reduce the area of occupancy of an important population
3) fragment an existing important population into two or more populations
4) adversely affect habitat critical to the survival of a species
5) disrupt the breeding cycle of an important population
6) modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
7) result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
8) introduce disease that may cause the species to decline, or
9) interfere substantially with the recovery of the species.

1.5 Survey Team and Authorship

The survey team was led by Sujan Henk (Senior Ecologist and Zoologist) and accompanied by Anthony Smit (Senior Ecologist and Botanist), with assistance from Jeni Alford (Senior Botanist). This report is based on field data collected by Sujan Henk and Anthony Smit. Flora identification was completed by Anthony Smit, Sujan Henk and Jeni Alford. Sujan Henk and Anthony Smit compiled and analysed the data and wrote the final report. Anthony Smit completed the GIS data processing and map production. Joshua Davis and Sujan Henk then reviewed the document for quality assurance (see Table 1).

Table 1 Survey personnel and experience.

Personnel	Project Role and Qualifications	Relevant Experience
Anthony Smit	Senior Associate (Ecology) and Botanist BSc, Envi. Biology (2017); BSc (Hons) Envi. & Agri., Behavioural Ecology (2018)	2+ years of experience in ecological research, fauna and flora surveys, survey preparation, report writing, data collection, data management and analysis, GIS data processing, and map production.
Sujan Henk	Principal Consultant (Environmental) & Zoologist BSc, Zoology (2003); BSc (Hons), Biogeography (2004); PhD, Envi. & Conservation Sciences (2012); Postdoc, Envi. & Conservation Sciences (2013)	25+ years of experience in project management, ecological research, fauna capture and handling, Fauna and flora surveys, survey preparation, data collection, data management and analysis, report writing, and report review.



Personnel	Project Role and Qualifications	Relevant Experience
Jeni Alford	Senior Botanist BSc, Envi. Science (1982); BSc (Hons) Plant taxonomy	30+ years of experience in project management and approvals, invasive species, vegetation surveys, plant identification, technical reports, environmental permitting, and report writing.
Joshua Davis	Report quality assurance BA (Hons), MAAPD, MAICD, M.ICOMOS	10+ years of experience in report writing, report review, and quality assurance



2.0 Regional Context

2.1 Survey Area

The survey area is located at Lot 502 Beros Road, Warradarge, WA (see Map 1 and Figure 2). The larger landscape is dominated by Kwongan heathlands and shrublands mainly comprised of Proteaceous plants such as *Banksia, Grevillea*, and *Hakea*. The area adjacent to the survey area (i.e. Mt Lesueur and the vicinity) represents one of the "hottest" of the biodiversity hotspots in the world, with almost 60% endemism of plants and many short-range endemics (Mucina et al., 2014). However, the survey area represents an already disturbed and fragmented envelope of land (51.68ha) in an area comprising a mix of farmland and remnant bushland, which is degraded due to previous vegetation clearing, off-road vehicle use, farming, weeds, grazing and the disposal of trash. It is crucial to place the results, findings, and recommendations within the broader existing environmental landscape.



Figure 2 An aerial view of the survey area, viewing west from the centre (© Trace Enterprises 2026).

2.2 Biogeography

The Interim Biogeographic Regionalisation for Australia (IBRA 2012) classifies the bioregions based on common climate, geology, landform, native vegetation, and species information. There are 89 bioregions across Australia, which are refined into a further 419 subregions. The survey area is located within one (1) region and one (1) subregion, the Leseur Sandplain subregion (GES02) of the Geraldton Sandplains bioregion (GES).



2.3 Regional Vegetation

The project area lies in the South-West botanical province. The vegetation types across Western Australia are classified by Beard et al. (2013), which mapped the original vegetation of Western Australia at a 1:3,000,000 scale. The project area intersects with two (2) vegetation types (Beard et al. 2013); vegetation type 18, which is mixed heath with scattered tall shrubs of *Acacia* spp., Proteaceae spp. and Myrtaceae spp.; and vegetation type 19, which is heathland (see Map 2).

Table 2 A summary description of vegetation types occurs in the survey area as per Beard et al. 2013.

Vegetation type	Description
Type 18- Scrub-heath	Scrub-heath is a major component of the Geraldton Sandplains Bioregion (1.8 million ha), occurring on soils ranging from laterite to grey sand over laterite to deep yellow sands. It comprises mixed heath with scattered tall shrubs with very diverse and endemic flora such as *Acacia* spp., *Banksia* spp., *Eucalyptus* spp., *Grevillea* spp., *Hakea* spp., *Calothamnus* spp., *Allocasuarina* spp., *Conospermum* spp., *Eremaea* spp., *Hibbertia* spp., *Melaleuca* spp., *Petrophile* spp. and *Thryptomene* spp.
Type 19- Heath	A closed layer of low shrubs <1 m in height constitutes heath. It often occupies relatively small areas compared with the scrub-heaths (Type 18). Heaths occur on either limestone and lime sands near the coast, exposed laterite in upland situations or sand on laterite. The flora comprises Dryandra spp., Hakea spp., *Acacia lasiocarpa* (panjang) and *Melaleuca systena* (coastal honeymyrtle).

2.4 Soils and Land Systems

The Department of Primary Industries and Regional Development soil mapping has developed a soil and land resource to describe the soil-landscape and how this land resource information can be used for land assessment and land capability purposes (DPIRD 2018). Underlying soil characteristics are critical in determining the floral communities in each area. Therefore, this information is routinely used in ecological work associated with flora surveys. The survey area is located within the Yerramullah System (224). This system is characterised by subdued dissected lateritic plateaus, undulating low hills and rises on lateritised weathered sandstone., with pale deep sand, sandy gravels and yellow deep sand. (DPIRD 2018) (see Map 3).

2.5 Climate



The rainfall and temperature data for the survey area at the Beros Road Site were obtained from the Badgingarra weather station (#009037) and are illustrated in Figure 3. The mean annual rainfall is 519.1mm, with most of the rainfall occurring between May and September, which indicates a distinct wet season during the cooler months. The average maximum temperature is 26.0°C, and the average minimum temperature is 12.0°C (BOM 2026). This temperature range highlights the generally warm climate, providing insight into the environmental conditions of the area throughout the year (Bureau of Meteorology 2026).

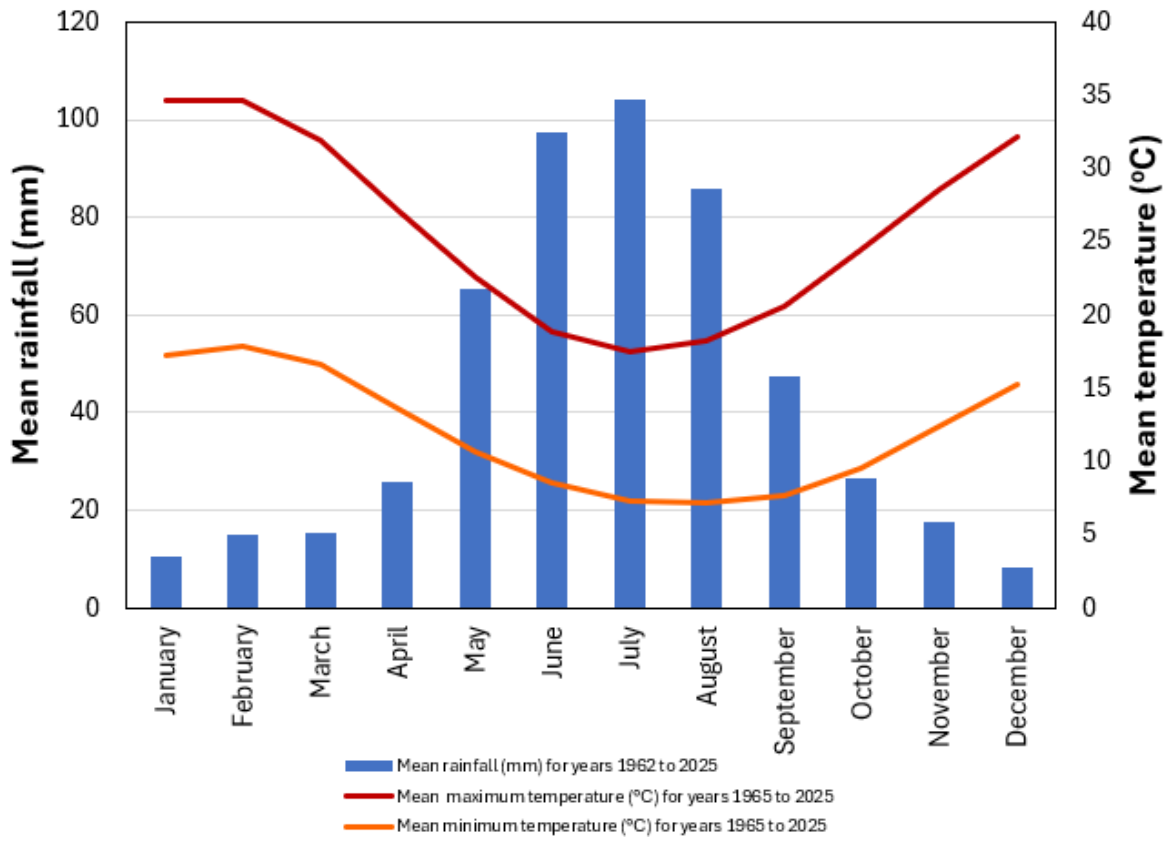


Figure 3 Mean monthly temperature and rainfall from Badgingarra weather station (#009037) (BOM 2026).

2.6 Notable Areas

2.6.1 Threatened and Priority Ecological Communities (TECs/PECs)

The survey area does not intersect with any Threatened or Priority Ecological Communities. However, two (2) Threatened Ecological Communities (TECs) and three (3) Priority Ecological Communities are listed for the Geraldton Sandplains Bioregion occur near the study area.

- Lesueur-Coomallo Floristic Community (D1) TEC- Critically Endangered
- Lesueur-Coomallo Floristic Community (A1.2) TEC- Endangered

- Lesueur-Coomallo Floristic Community (M2 *Melaleuca preissiana* woodland) PEC- Priority 1
- Lesueur-Coomallo Floristic Community (DFGH) PEC- Priority 1
- *Petrophile chrysantha* low heath on Lesueur dissected uplands PEC- Priority 2

2.6.2 Lands Under DBCA Jurisdiction

The survey area does not intersect with any lands under DBCA legislation. However, several large areas with remnant native vegetation are located in close proximity to the study area:

- Alexander Morrison National Park;
- Tathra National Park;
- South Eneabba Nature Reserve; and
- Lesueur National Park.

The Lesueur National Park is recognised for its floristic richness, with many rare and endemic species (Burbidge et al. 1990, Coates et al. 2014).

2.6.3 Other Notable Areas

The survey area does not intersect with any Regional Parks or other notable/sensitive areas.



3.0 Methods

The methodology was developed by Trace consultants to accommodate the client's needs and as per the current legislative guidelines published by the WA Environmental Protection Act 1986 and Commonwealth biodiversity legislation and guidelines.

- Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessments (EPA 2016a);
- Technical Guidance: Terrestrial vertebrate Fauna Surveys for Environmental Impact Assessments (EPA 2020);
- Environmental Factor Guideline: Terrestrial fauna, flora and vegetation (EPA 2016b);
- Matters of National Environmental Significance (MNES) Significant Impact Guidelines 1.1 (DoE 2013); and
- Flora taking (biological assessment) license. Regulation 62, Biodiversity Conservation Regulations 2018.

3.1 Desktop Assessment

The Desktop Assessment aims to identify the occurrence of conservation-significant species, communities, and other Matters of National Environmental Significance (MNES) within the survey area. The Desktop Assessment provides essential insights that may guide further investigations and ensure any future development activities in the survey area adhere to environmental regulations and conservation efforts. This proactive approach minimises ecological impact while promoting sustainable land use in the region.

Prior to fieldwork, a high-level desktop assessment was undertaken. This assessment involved researching and identifying any known conservation-significant fauna, ecological communities, and other significant locations (e.g. DBCA-managed reserves and parks, wetlands) reported at the survey site.

3.1.1 Data Sources

This Desktop Assessment was conducted using data from several state and Commonwealth databases. These databases included,

- DBCA Threatened and Priority fauna database;
- DBCA Threatened and Priority ecological communities (TEC/PEC) database;
- Commonwealth (EPBC Act) Protected Matters Search Tool (PMST); and

Related broadscale spatial data was incorporated and analysed, including vegetation mapping data and vegetation and land systems data to identify expected vegetation assemblages and significant landscape features. These datasets included;

- Clearing Regulations - Environmentally Sensitive Areas (DWER-046) dataset;
- Interim Biogeographic Regionalisation for Australia - IBRA7 subregions states dataset;



- Land Systems (DPIRD 064) dataset;
- Pre-European Vegetation (DPIRD 006) dataset;
- Native Vegetation Extent (DPIRD 005) dataset;
- DBCA Lands of Interest (DBCA 012); and
- Legislated Lands and Waters (DBCA 011) dataset.

Additionally, a literature review was conducted using publicly available literature and previous regional survey reports to find regional information on conservation-significant flora, fauna, ecological communities, and potential weeds in the survey area. The following sources were primarily used for the literature review (see Table 3).

Table 3 Major literature sources utilized for the literature survey.

Elements covered	Citation
Regional project reports	Bamford. (2022). Infinite Blue Energy: Arrowsmith Hydrogen Project Black-Cockatoo Assessment. A Report prepared by M.J. & A.R. Bamford Consulting Ecologist for Infinite Blue Energy. Pp. 19. Biota. (2012). Warradarge Wind Farm Flora, Vegetation and Fauna Assessment. A report prepared by Biota Environmental Sciences for Verve Energy. Pp. 183. Burbidge, A.A., Hopper, S.D. and van Leeuwen, S. (Editors) (1990). Nature Conservation, Landscape and Recreation values of the Lesueur area. A report to the Environmental Protection Authority from the Department of Conservation and Land Management. Pp. 151. CLA. (2022). Warradarge Project Supplement to Flora Reports and Clearing Permit Supporting Document. Prepared by Clark Lindbeck and Associates (CLA) Pty Ltd for Industrial Minerals Ltd. Pp. 159. PGV. (2023). Woodvale MRS Amendment- Black cockatoo habitat assessment. A Report prepared by PGV Environmental for Strategic Property Group. Pp. 24. Trace. (2024). Threatened Black Cockatoo Habitat Assessment and Significant Impact Assessment. Technical Memorandum prepared by Trace Enterprises for Harvest Road Group.
Threatened and priority mammals	Menkhorst, P. and Knight, F. (2010). A Field Guide to the Mammals of Australia (3rd Edition). Oxford University Press Australia and New Zealand. Ven Dyke, S., Gynther, I. and Baker, A. (2013). Field Companion to The Mammals of Australia. Reed New Holland. Baker, A.M. and Gynther, I.C. (Editors). (2024). Strahan's Mammals of Australia (4th Edition). Bloomsbury Wildlife.
Threatened and priority birds	Menkhorst, P., Rogers, D., Clarke, R. et al. (2019). The Australian Bird Guide: Revised Edition (Revised Edition). CSIRO Publishing, Victoria.



Elements covered	Citation
	DAWE. (2022). Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo, Department of Agriculture, Water and the Environment, Canberra.
Threatened and priority reptiles	Wilson, S. and Swan, G. (2020). A Complete Guide to Reptiles of Australia (6th Edition). Reed New Holland. Shea, G. and Miller, B. (1995). A Taxonomic Revision of the *Cyclodomorphus branchialis* Species Group (Squamata: Scincidae), *Records of the Australian Museum* (47): 265-325.
Fauna tracks and other signs	Moseby, K., Nano, T. and Southgate, R. (2022). Tales in The Sand: A Guide to Identifying Australian Arid Zone Fauna using Spoore and Other Signs. Ecological Horizons, South Australia. Triggs, B. (2023). Tracks, Scats and Other Traces: A Field Guide to Australian Mammals (Revised Edition). Oxford University Press, Victoria.
Threatened fauna survey methods	EPA. (2020). Technical Guidance: Terrestrial vertebrate fauna surveys for environmental impact assessments. Environmental Protection Authority. Perth, WA. DSEWPC. (2011). Survey guidelines for Australia's threatened mammals. Department of Sustainability, Environment, Water, Population and Communities. Canberra. DSEWPC. (2011). Survey guidelines for Australia's threatened bats. Department of Sustainability, Environment, Water, Population and Communities. Canberra. DSEWPC. (2010). Survey guidelines for Australia's threatened reptiles. Department of Sustainability, Environment, Water, Population and Communities. Canberra. DSEWPC. (2010). Survey guidelines for Australia's threatened birds. Department of Sustainability, Environment, Water, Population and Communities. Canberra.
Threatened Ecological Communities	Coates, D.J., Byrne, M., Cochrane, J.A. et al. (2014). Chapter 8: Conservation of the Kwongan flora: Threats and challenges (In). Lambers, H. (Editor). Plant Life on the Sandplains in Southwest Australia: A global biodiversity hotspot: 263-284. TSSC. (2019). Approved Conservation Advice (incorporating listing advice) for the Tuart (*Eucalyptus gomphocephala*) woodlands and forests of the Swan Coastal Plain ecological community. Threatened Species Scientific Committee. DEE. (2016). Banksia Woodlands of the Swan Coastal Plain: a nationally protected ecological community. Department of the Environment and Energy, Canberra. DEE. (2019). Tuart Woodlands and Forests of the Swan Coastal Plain: A Nationally Significant Ecological Community. Department of the Environment and Energy, Canberra.



3.1.2 Environmental Constraints Analysis

Environmental constraints analysis and mapping were conducted using the GIS software QGIS version 3.18.0 (QGIS.org 2024). Spatial data collected from DBCA, PMST, and other spatial datasets listed above were superimposed over the project area to identify potential threatened fauna, and ecological communities that intersect with the survey area. Intersecting areas were then mapped to identify areas that need to be surveyed to ground truth the findings of this Desktop Assessment. Based on all the information collected, a list of potential Threatened and Priority flora, fauna, and ecological communities was generated for the survey site to guide the field surveys.

3.1.3 Fauna Likelihood of Occurrence

Conservation-significant fauna species identified from the desktop assessment (PMST data and DBCA data) were assessed to determine the likelihood of their occurrence before and after the field survey. This analysis was conducted based on the habitat suitability and field survey data. Information on the preferred habitat for each species was extracted from the Species Profile and Threats Database (SPRAT 2025) and assessed against the currently available habitat and condition at the survey area using the criteria presented in Table 4. When habitat information was not available in SPRAT (2025), additional sources were utilised (ALA 2025, Greenslade and Jordana 2014, Menkhorst and Knight 2011, Menkhorst et al. 2019, Prendergast 2020, Timms 2008 and 2018, TSSC 2019, Wilson and Swan 2023). Listed marine species and invertebrates were excluded from this analysis.

Table 4 Fauna Likelihood of Occurrence Criteria.

Likelihood of occurrence category	Description
Low - Unlikely to occur	No suitable habitat is present within the survey area, or the area is well outside the taxon's known distribution, or the taxon is considered locally or regionally extinct. The survey area and surrounding habitat are unlikely to support individuals or populations of the taxon; however, individuals may rarely occur as transients or vagrants.
Medium - May occur	The high likelihood of occurrence criteria has not been met; however, suitable (not necessarily preferred) habitat occurs within the survey area (e.g., fragmented or small patches of habitat), and the survey area is within or near the taxon's known distribution. The survey area and surrounding habitat may support individuals or populations of the taxon.
High - Likely to occur	The preferred habitat is present within the survey area, the survey area is within the taxon's known distribution, and the taxon has been recorded near the survey area in the last 15 years. The survey area and surrounding habitat are expected to support individuals or populations of the taxon.



Likelihood of occurrence category	Description
Confirmed	The species has been recorded in the survey area either previously or in the current survey.

3.2 Field Surveys

3.2.1 Reconnaissance flora Survey

A Reconnaissance flora Survey was conducted to gather comprehensive information on the flora and vegetation of the survey area and ground-truth the desktop assessment findings. Twelve (12) sampling locations were selected based on the distribution and the overlap between Land Systems and Pre-European Vegetation Units. An attempt was made to sample at least three (3) 10m x 10m areas (or 100m^2 area in narrow habitats) for flora and vegetation sampling within each vegetation unit to satisfy EPA guidelines (EPA 2016).

Each species located within the quadrat was recorded with average height and coverage. Additionally, up to three (3) dominant flora species for each stratum (i.e. upper story, mid story, and under story) were recorded to assist in vegetation classification. Special emphasis was given to locating conservation-significant flora and key flora species.

When possible, flora species were identified in the field using field guides (i.e. common species, Priority and Threatened species) prepared exclusively for this project. Voucher specimens and photographs were collected for each species that could not be identified in the field. Voucher specimens were then pressed in the field to prepare them for laboratory identification and identification confirmation as per standard guidelines provided by the WA Herbarium (WA Herbarium 1989). A variety of sources were used for further identification and identity confirmation in the laboratory including field guides, identification keys, online keys powered by Lucid and online databases such as Florabase (WA Herbarium 1998) and Atlas of Living Australia (ALA 2025). When necessary, the reference library at the WA Herbarium was used.

3.2.2 Basic Fauna Survey

The survey area is located within the Geraldton Sandplains, where energy and agricultural development activities have impacted the existing habitats (including the present survey area). The fauna of this region is well understood, and comprehensive long-term data are available for most species to predict significant impacts (EPA 2020).

A basic fauna survey was conducted to gather broad information on vertebrate fauna (invertebrates were excluded) and fauna habitats at the local scale, and ground truth the desktop assessment findings. Low-intensity sampling was conducted by traversing potential fauna habitats located near the same twelve (12) sampling locations (see Map 4) and



recording opportunistic observations. A minimum of 100m x 100m area (i.e. 1ha) was sampled at each sampling location to collect fauna data. Data were gathered by visual and auditory observations of fauna and their signs (e.g., tracks, scat, burrows, scratches, shelters, and other signs). All fauna signs were electronically recorded using a field data collection device as georeferenced data points, and photographs of fauna were also taken whenever possible.

Additionally, four (4) camera traps were deployed strategically for three (3) nights in a variety of fauna habitat types and to capture evidence of nocturnal fauna species (see Map 4). Fauna species were identified using an array of field guides, identification keys (Menkhorst and Knight 2010, Menkhorst et al. 2019, Wilson and Swan 2020, Van Dyke et al 2021), and experience. Fauna signs were identified using Moseby et al. (2022) and Triggs (2023).

3.2.3 Survey Limitations

There are a number of potential limitations that may impact the quality and extent of data collected as outlined by the EPA Guidelines (EPA 2016 and 2020). However, none of those potential limitations constrained the present survey and/or the quality of the data collected in a significant manner (see Table 5).

Table 5 Survey Limitations of the present survey.

Limitation	Comment
Level of survey	**Not a constraint** The level of survey was adequate and in line with the outlined scope of works.
Availability of contextual information at a regional and local scale	**Not a constraint** There is an appropriate amount of information for the region and species present.
Competency / experience of the consultant(s) carrying out the survey	**Not a constraint** The consultants have adequate experience in carrying out various flora and fauna surveys in WA and NT.
Proportion of species recorded and any identification issues	**Not a constrained** Given the level of the survey, an adequate number of species were identified to describe the fauna and vegetation condition of the survey area.
Was the appropriate area fully surveyed (effort and extent)	**Not a constraint** All aspects in the scope were achieved in the given time constraint.



Limitation	Comment
Access restrictions within the survey area	**Not a constraint** No access restrictions have affected the survey.
Survey timing, rainfall, season of survey	**Not a constraint** The timing for flora/vegetation survey was within the EPA recommendations (EPA 2016). EPA-recommended fauna survey timing varies among taxa (EPA 2020). However, given the level of this survey, the timing is appropriate to survey a broad range of terrestrial vertebrates.
Disturbances that may have affected the results of survey such as fire, flood or clearing	**Not a constraint** No recent disturbances have affected the survey.

3.3 Habitat Mapping

3.3.1 Vegetation Communities and Condition Mapping

A combination of quantitative and qualitative data collected from the sampling sites, field observations during scouting, incidental observations, aerial images and footage, and terrestrial images were used to define and map vegetation communities based on the dominant species, and vegetation condition. A dendrogram was generated using cluster analysis based on the Euclidean distance of a species by site data matrix to visualise the similarity of vegetation communities between sites. This analysis was conducted using the R Statistical Software Package "Cluster" (Maechler et al. 2025). Where vegetation health and condition are considered less than Very Good as per Keighery scale (Keighery 1994, see Appendix 6), plausible causes were explored.

3.3.2 3.3.2 Fauna Habitat Mapping

A combination of quantitative and qualitative data collected from the sampling sites, field observations during scouting, incidental observations, aerial images and footage, and terrestrial images were used to define and map fauna habitats. Geological features of the survey area (e.g. Eucalyptus woodlands on sandy plains, sand dunes, disturbed areas etc.), combined with Vegetation communities and Land System data were used as baseline data layers to define the major fauna habitats.

3.4 Black Cockatoo Habitat Assessment



3.4.1 Black Cockatoo Habitat

Breeding habitat

Black cockatoo "breeding habitat" is defined as trees of species known to support black cockatoo breeding within the range of the species which either have a suitable nest hollow or have a DBH of 500mm or greater (e.g. Marri and Jarrah) or 300mm (e.g. Wandoo and Salmon Gum) (DAWE 2022). A summary of black cockatoo habitat information is provided in Appendix 6 (DAWE 2022, see Appendix 6).

Roosting habitat

Black cockatoo "roosting habitat' is defined based on the presence of black cockatoos in the survey area in the evening and early morning and if there are scats or moulted feathers under the roosting area (DAWE 2022, see Appendix 6).

Foraging habitat

Black cockatoo "foraging habitat" is defined based on the food plant species on the site and evidence of feeding such as direct observation of birds feeding or chewed nuts and cones (DAWE 2022, see Appendix 6).

3.4.2 Field Assessment Methods

The desktop assessment suggested that one (1) species of threatened black cockatoos is likely to occur in the proposed project area. Additionally, confirmed black cockatoo roosting sites are located within 1.3km, and confirmed breeding sites within 18km, of the survey area. (DBCA data; see Map 8).

A black cockatoo habitat assessment was conducted, focusing on potential breeding, roosting, and foraging habitats within the survey area. While traversing on foot, black cockatoo habitat information was electronically recorded using a field data collection device as georeferenced data points, and photographs were taken. The extent, type, and quality of the vegetation present, including the presence and extent of plants known to be used by black cockatoos, was recorded as per the referral guideline for threatened black cockatoos (DAWE 2022, see Appendix 6).

Foraging habitat was examined, recorded, and scored in accordance with the scoring system developed by Bamford (2020) for the assessment of the foraging value of vegetation. See Appendix 7 for details of the scoring system. Context adjustments for threatened black cockatoo foraging habitat within the survey area were completed based on the template provided by DAWE (2022, see Appendix 8).



4.0 Results

4.1 Desktop Survey

4.1.1 Conservation-significant Flora

One-hundred and five (105) Threatened and Priority flora species were reported based on the DBCA data and the PMST search from within 10km of the survey area (see Map 5 and Table 7). Among them, 25 taxa are listed under the EPBC Act 1999. Seven (7) of them are listed under the WA BC Act 2016 (6 overlaps with the EPBC listings), and the rest are WA Priority species (see Table 6). One (1) nationally Threatened (Vulnerable) flora taxa, *Eucalyptus johnsoniana*, was reported within 1km of the survey area. One (1) Priority 3 flora species, *Mesomelaena stygia* subsp. *deflexa*, was reported within the survey area in 1981. Additionally, Priority 4 *Hypolaena robusta* was also reported within 1km of the survey area (DBCA data, see Map 5).

Table 6 Threatened and Priority flora species reported for the survey area and its vicinity (DBCA and PMST).

Scientific name	Common name	EPBC Status	WA Status
Acacia cummingiana	-	-	Priority 3
Acacia epacantha	-	-	Priority 3
Acacia forrestiana	Forest's Wattle	Vulnerable	Vulnerable
Acacia retrorsa	-	-	Priority 2
Acacia wilsonii	Wilson's Wattle	Endangered	Endangered
Allocasuarina grevilleoides	-	-	Priority 3
Allocasuarina ramosissima	-	-	Priority 3
Andersonia gracilis	Slender Andersonia	Endangered	Vulnerable
Arnocrinum gracillimum	-	-	Priority 3
Banksia catoglypta	-	Vulnerable	Vulnerable
Banksia chamaephyton	Fishbone banksia	-	Priority 4
Banksia cypholoba	-	-	Priority 3
Banksia fraseri var. crebra	-	-	Priority 3
Banksia kippistiana var. paenepeccata	-	-	Priority 3



Scientific name	Common name	EPBC Status	WA Status
Banksia serratuloides subsp. perissa	Northern Serrate Dryandra	Critically Endangered	Critically Endangered
Beaufortia bicolor	Badgingarra beaufortia	-	Priority 3
Boronia scabra subsp. condensata	-	-	Priority 2
Calectasia browneana	-	-	Priority 2
Calytrix chrysantha	-	-	Priority 4
Calytrix eneabbensis	-	-	Priority 4
Calytrix superba	Superb starflower	-	Priority 4
Centrolepis milleri	-	-	Priority 3
Chordifex reseminans	-	-	Priority 2
Comesperma griffinii	-	-	Priority 2
Comesperma rhadinocarpum	Slender-fruited comesperma	-	Priority 3
Conostephium magnum	-	-	Priority 4
Cyanothamnus ramosus subsp. lesueuranus	-	-	Priority 2
Daviesia pteroclada	-	-	Priority 3
Daviesia speciosa	Beautiful Daviesia	Endangered	Endangered
Desmocladus elongatus	-	-	Priority 4
Eremophila glabra subsp. chlorella	-	Endangered	Endangered
Eremophila subangustifolia	-	Critically Endangered (listed as *Eremophila* sp. Narrow leaves (J.D.Start D12-150))	Critically Endangered
Eucalyptus absita	Badgingarra Box	Endangered	Critically endangered
Eucalyptus crispata	Yadanooka mallee	Vulnerable	Endangered
Eucalyptus exilis	Boyagin mallee	-	Priority 4
Eucalyptus johnsoniana	Johnson's mallee	Vulnerable	Vulnerable



Scientific name	Common name	EPBC Status	WA Status
Eucalyptus leprophloia	Scaly Butt Mallee, Scaly-butt Mallee	Endangered	Endangered
Eucalyptus loxophleba x wandoo	-	-	Priority 4
Eucalyptus macrocarpa subsp. elachantha	Small-leaved mottlecah	-	Priority 4
Eucalyptus pendens	Badgingarra mallee	-	Priority 4
Eucalyptus rhodantha	Rose Mallee	Vulnerable	-
Eucalyptus suberea	Mount Lesueur mallee	Vulnerable	Vulnerable
Eucalyptus x impensa	Eneabba mallee	Endangered	Critically endangered
Eucalyptus x lateritica	Laterite mallee	Vulnerable	Endangered
Goodenia xanthotricha	Yellow-haired goodenia	-	Priority 2
Grevillea althoferorum subsp. althoferorum	-	-	Critically endangered
Grevillea amplexans subsp. adpressa	-	-	Priority 1
Grevillea biformis subsp. cymbiformis	-	-	Priority 3
Grevillea christineae	Christine's Grevillea	Endangered	Endangered
Grevillea cooljarloo	-	-	Priority 1
Grevillea curviloba subsp. incurva	Narrow curved-leaf Grevillea	Endangered	-
Grevillea humifusa	Spreading Grevillea	Endangered	Critically endangered
Grevillea olivacea	Olive grevillea	-	Priority 4
Grevillea rudis	-	-	Priority 4
Grevillea thyrsoides subsp. thyrsoides	-	-	Priority 3
Grevillea uniformis	-	-	Priority 3
Haemodorum loratum	-	-	Priority 3
Hakea longiflora	-	-	Priority 3
Hakea megalosperma	Lesueur hakea	Vulnerable	Vulnerable



Scientific name	Common name	EPBC Status	WA Status
Hemiandra gardneri	Red Snakebush	Endangered	Critically endangered
Hemiandra rutilans	Sargents Snakebush, Colourful Snakebush	Endangered	Critically endangered
Hemiandra sp. Eneabba	-	-	Priority 3
Hensmania stoniella	-	-	Priority 3
Hibbertia propinqua	-	-	Priority 4
Hypolaena robusta	-	-	Priority 4
Jacksonia anthoclada	-	-	Priority 3
Lepidobolus quadratus	-	-	Priority 3
Lepyrodia curvescens	-	-	Priority 2
Leucopogon obtectus	Hidden Beard-heath	Endangered	Endangered
Liparophyllum congestiflorum	-	-	Priority 4
Loxocarya gigas	-	-	Priority 2
Mesomelaena stygia subsp. deflexa	-	-	Priority 3
Paracaleana dixonii	Sandplain duck orchid	Endangered	Vulnerable
Patersonia argyrea	-	-	Priority 3
Persoonia filiformis	-	-	Priority 3
Persoonia rudis	-	-	Priority 3
Petrophile biternata	-	-	Priority 3
Petrophile clavata	-	-	Priority 2
Petrophile nivea	-	Vulnerable	Vulnerable
Phlebocarya pilosissima subsp. pilosissima	-	-	Priority 3
Pityrodia viscida	-	-	Priority 4
Ptilotus clivicola	-	-	Priority 2
Scaevola eneabba	-	-	Priority 2
Schoenus griffinianus	-	-	Priority 4



Scientific name	Common name	EPBC Status	WA Status
Schoenus sp. Eneabba	-	-	Priority 2
Spirogardnera rubescens	Spiral Bush	Endangered	Vulnerable
Stenanthemum limitatum	-	-	Priority 2
Stylidium aeonioides	-	-	Priority 4
Stylidium inversiflorum	-	-	Priority 4
Stylidium torticarpum	-	-	Priority 3
Styphelia filamentosa	-	-	Priority 3
Styphelia obtecta	-	Endangered	Endangered
Styphelia williamsiorum	-	-	Priority 3
Synaphea endothrix	-	-	Priority 3
Tetratheca nephelioides	-	Critically endangered	Endangered
Thelymitra apiculata	Cleopatra's needles	-	Priority 4
Thelymitra stellata	Star orchid	Endangered	Endangered
Thysanotus glaucus	-	-	Priority 4
Verticordia albida	White Featherflower	Endangered	Critically endangered
Verticordia argentea	-	-	Priority 2
Verticordia aurea	-	-	Priority 4
Verticordia fragrans	-	-	Priority 3
Verticordia insignis subsp. eomagis	-	-	Priority 3
Verticordia rutilastra	-	-	Priority 3
Xanthosia tomentosa	Lesueur southern cross	-	Priority 4

4.1.2 Conservation-significant fauna

Thirty-seven (37) Threatened and Priority fauna species were reported based on DBCA data and PMST search from within 10km of the survey area (see Map 6 and Table 7). The removal of aquatic and marine species due to the terrestrial nature of the survey area leaves nineteen (19) threatened and priority species potentially occurring within the survey area. They



represent seven (7) birds (36.7%), four (4) invertebrates (21.1%), four (4) (21.1%) mammals and four (4) (21.1%) reptiles. Table 8 summarises the habitat characteristics and pre- and post-survey likelihood of occurrence for threatened and priority fauna species that may actually occur in the survey area. This table excludes all marine species and aquatic species since the survey area is terrestrial and does not support any aquatic habitats (see Table 8). See Appendix 12 for the complete list of fauna species from the PMST search.

Table 7 Threatened and Priority fauna species reported for the survey area and its vicinity (DBCA and PMST data).

MI = Specially Protected - Migratory; OS = Specially Protected - Other Specially Protected; CD = Specially Protected - Conservation Dependent & Migratory; EN = Threatened - Endangered; VU = Threatened - Vulnerable; CR = Threatened - Critically Endangered; P = Priority

NOTE: See Appendix 3 and Appendix 4 for definitions of threatened and priority categories.

Scientific name	Common name	Taxa	WA Status	EPBC Status	Data Source
Aphelocephala leucopsis	Southern Whiteface	Bird		VU	PMST
Apus pacificus	Fork-tailed Swift	Bird		MI	PMST
Falco hypoleucos	Grey Falcon	Bird		VU	PMST
Falco peregrinus	Peregrine falcon	Bird	OS		DBCA
Leipoa ocellata	Malleefowl	Bird		VU	DBCA, PMST
Pezoporus flaviventris	Western ground parrot	Bird	CR	CR	DBCA
Zanda latirostris	Carnaby's Black Cockatoo	Bird	EN	EN	DBCA, PMST
Hemisaga vepreculae	Thorny bush katydid (Moora)	Invertebrate	P2		DBCA
Idiosoma gardneri	Mt Lesueur shield-backed trapdoor spider	Invertebrate	P2		DBCA
Idiosoma kwongan	Kwongan heath shield-backed trapdoor spider	Invertebrate	P1		DBCA
Phasmodes jeeba	Springtime corroboree stick katydid (Eneabba)	Invertebrate	P3		DBCA
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal		VU	PMST
Macroderma gigas	Ghost bat	Mammal	VU	VU	DBCA
Notamacropus irma	Western brush wallaby	Mammal	P4		DBCA
Parantechinus apicalis	Dibbler	Mammal		EN	PMST



Scientific name	Common name	Taxa	WA Status	EPBC Status	Data Source
Cyclodomorphus branchialis	Gilled slender blue-tongue	Reptile	VU		DBCA
Egernia stokesii badia	Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink	Reptile		EN	PMST
Egernia stokesii badia	Western spiny-tailed skink	Reptile	VU	EN	DBCA
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	Reptile	P3		DBCA

4.1.3 Conservation-Significant Ecological Communities

No mapped nationally significant Threatened and Priority Ecological Communities (TECs/PECs) within the survey area were recorded.

4.1.4 Other Significant Areas

A significant portion of the survey area (26.05ha, 50.4%) is under native remnant vegetation (see Map 1).



Table 8 Pre- and post-survey likelihood of the occurrence for Threatened and Priority fauna species reported for the survey region (DBCA and PMST data).

MI = Specially Protected - Migratory; OS = Specially Protected - Other Specially Protected; CD = Specially Protected - Conservation Dependent & Migratory; EN = Threatened - Endangered; VU = Threatened - Vulnerable; CR = Threatened - Critically Endangered; P = Priority

NOTE: The definitions of the likelihood of occurrence criteria are defined in Table 4. Highlighted sections indicate highly likely and confirmed fauna.

Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
Aphelocephala leucopsis	Southern Whiteface	Bird		VU	Patchily distributed in woodlands and tall shrublands with grassy understory or low shrub layer. Usually forages on the ground as pairs or small flocks of up to 20 birds (Menkhorst et al. 2019).	Medium	Medium	Species may use the survey area as a transient habitat. However, the survey area is highly disturbed, making it unsuitable for supporting a viable population.
Apus pacificus	Fork-tailed Swift	Bird		MI	Exclusively aerial, flying from less then 1 m to at least 300m above ground. Mostly occur over inland plains but sometimes above foothills or in coastal areas. They also occur over settled areas, including	Low	Low	Species may use the survey area as a transient habitat. One (1) records exist within 30km of the survey area (DBCA data).



Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
					towns, urban areas and cities (SPRAT 2025).			
Falco hypoleucos	Grey Falcon	Bird		VU	Sparsely distributed and rarely encountered, inhabits open plains with treed watercourses in arid inland (Menkhorst et al. 2019).	Low	Low	Mainly an aridland species. The preferred habitat is not present within the survey site.
Falco peregrinus	Peregrine falcon	Bird	OS		A small raptor that inhabits most environments with suitable nest sites: cliff faces preferred, including man-made ones, but in Australia, it commonly uses stick nests built buy other species (Menkhorst et al. 2019).	Low	Low	Species may use the survey area as a transient habitat. Single unverified record from 2010 exists within 30km of the survey area (DBCA data).
Leipoa ocellata	Malleefowl	Bird		VU	This ground-dwelling bird is famous for its ability to build enormous mounds, occurs in scrubland and woodland	Low	Low	Two (2) records exist within 30km of the survey area including a 1950s record (DBCA data). Suitable breeding habitat does not exist within the



Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
					dominated by mallee and wattle species (SPRAT 2025).			highly disturbed survey area.
Pezoporus flaviventris	Western ground parrot	Bird	CR	CR	Highly elusive and extremely rare species. Currently restricted to dense heathlands in Cape Arid National Park in southwester WA (Menkhorst et al. 2019, SPRAT 2025).	Low	Low	One (1) historical written record exists within 30 km of the survey area (DBCA data).
Zanda latirostris	Carnaby's Black Cockatoo	Bird	EN	EN	A WA endemic, occurs in uncleared or remnant native eucalypt woodlands, especially those that contain salmon gum and wandoo, and in shrubland or kwongan heathland dominated by hakea, dryandra, banksia and grevillea species. It also occurs in remnant patches of native vegetation on land otherwise cleared for agriculture. The species forages seasonally in pine plantations in	High	Medium	Numerous records exist from around the survey area, including roosting habitat within 2km and breeding habitat within 20km of the survey area (DBCA data). The survey area is highly disturbed and supports only very limited low-quality foraging habitat. A large amount of high-quality foraging habitat is readily



Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
					areas that receive high rainfall, e.g. the Swan Coastal Plain (SPRAT 2025).			available in nearby conservation reserves.
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal		VU	Previously occurred throughout arid and semi arid Australia, but is now restricted to remnant wet and dry sclerophyll and mallee south-west WA (Menkhorst and Knight 2011, SPRAT 2025). .	Low	Low	The preferred habitat is limited at the survey site. No records exist within 30km of the survey area (DBCA data).
Macroderma gigas	Ghost bat	Mammal	VU	VU		Low	Low	Single record from 2007 exists within 20km of the survey area (DBCA data).
Notamacropus irma	Western brush wallaby	Mammal	P4		Locally common in dry sclerophyll forest and woodland in south-west WA, including some malee areas with grassy understory and thickets of shrub (Menkhorst and Knight 2011).	Low	Low	Three (3) records exist within 30km of the survey area, including a 2016 sighting (DBCA data). The survey area is highly disturbed and highly



Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
								unlikely to support a viable population.
Parantechinus apicalis	Dibbler	Mammal		EN	A small carnivorous marsupial confined to old-growth mallee heath in coastal southwestern WA and islands off Jurion Bay.	Low	Low	Preferred habitat is not available at the survey site.
Cyclodomorphus branchialis	Gilled slender blue-tongue	Reptile	VU		This WA endemic is restricted to lower west coast and hinterland of WA, from the Murchison River at Galena in the north, inland to 56 km south-east of Yalgoo, and south to the Irwin River. Typical habitat includes semi-arid shrubland on heavy red soils (Shea and Miller 1995, Wilson and Swan 2023).	Low	Low	Single record from 1999 exists within 25km of the survey area (DBCA data). Typical habitat does not exist within the survey area.
Egernia stokesii badia	Western spiny-tailed skink	Reptile	VU	EN	A WA endemic restricted dry to semi-arid lands in the southwest interior of WA and Dirk Hartog Island in Shark Bay. Typical	Low	Low	Two (2) records exist within 30km of the survey area from 2009 and 2011 (DBCA data). Suitable



Scientific name	Common name	Taxa	EPBC status	WA status	Habitat	Likelihood of occurrence		Remarks
						Pre-survey	Post -survey	
					habitat includes rock crevices and hollow timber.			habitat not present within the survey area.
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	Reptile	P3		This orangish-red snake is restricted to sandy coastal areas near Perth and between Mandurah and Cataby, with isolated populations near Eneabba and Dongara. The typical habitat including dunes and sand-plains vegetated with heaths and Eucalypt/Banksia woodlands (Wilson and Swan 2023).	Low	Low	One (1) 2007 record exist from the South Eneabba Nature Reserve within 10km of the survey area (DBCA data). Highly disturbed survey area is unlikely to support a population.



4.1.5 Threatened Black Cockatoos

One (1) threatened black-cockatoo taxon, Carnaby's black cockatoo (*Zanda latirostris*), is expected within the survey area (see Map 8). Nationally Endangered (EPBC Act 1999), Carnaby's black cockatoo is a WA endemic and restricted to Southwestern WA (DAWE 2022). It is listed as Endangered under the WA BC Act 2016 (SPRAT 2025) and globally, as Endangered by the IUCN Red List of Threatened Species (IUCN 2025). The Beros Road survey area lies within this species' known foraging range and modelled breeding range (DAWE 2022).

4.2 Reconnaissance Flora Survey

A total 74 flora taxa were recorded during the survey, belonging to 29 families (see Table 9). One (1) (1.4%) species was identified to the family level, while one (1) (1.4%) species was identified only to the genus level, mainly due to the lack of reproductive parts such as flowers, fruits or seeds. Fourteen (14) (18.9%) weed species were reported. Two (2) (2.7%) of the recorded taxa represented Priority flora species; *Haemodorum loratum* (Priority 3), and *Jacksonia anthoclada* (Priority 3). The WA Herbarium confirmed the identification of the two (2) Priority species.

Table 9. A list of flora species recorded during the 2025-121 flora survey.

Family Name	Scientific Name	Common Name	Status
Amaranthaceae	*Ptilotus polystachyus*	Prince of Wales Feather	
Anarthriaceae	*Lyginia imberbis*	-	
Araliaceae	*Trachymene pilosa*	Native parsnip	
Asparagaceae	*Lomandra hastilis*	-	
Asteraceae	*Asteraceae sp.*	-	
	**Hypochaeris glabra*	Smooth cats-ear	Permitted - s11
	**Hypochaeris radicata*	Flat weed	Permitted - s11
	**Ursinia anthemoides*	-	Permitted - s11
Brassicaceae	**Raphanus raphanistrum*	Wild radish	Permitted - s11
Campanulaceae	**Wahlenbergia capensis*	Cape bluebell	Permitted - s11
Colchicaceae	*Burchardia sp.*	Milkmaid	
Cupressaceae	*Callitris acuminata*	Dwarf cypress	
Cyperaceae	*Lepidosperma tenue*	-	
	Mesomelaena tetragona	Semaphore sedge	
	Schoenus rigens	-	



Family Name	Scientific Name	Common Name	Status
Dilleniaceae	*Hibbertia hypericoides ssp. septentrionalis*	Yellow buttercups	
	Hibbertia polystachya	-	
	Hibbertia subvaginata	-	
Droseraceae	*Drosera porrecta*	Leafy sundew	
Fabaceae	*Acacia pulchella var. glaberrima*	Prickly moses	
	Daviesia nudiflora ssp. nudiflora	-	
	Daviesia pedunculata	-	
	Daviesia podophylla	-	
	Gompholobium tomentosum	Hairy yellow pea	
	Jacksonia anthoclada	-	Priority 3
	**Trifolium arvense var. arvense*	-	Permitted - s11
Geraniaceae	**Erodium cicutarium*	Common storksbill	Permitted - s11
Goodeniaceae	*Leschenaultia floribunda*	Free-flowering leschenaultia	
Haemodoraceae	*Anigozanthos humilis ssp. humilis*	Catspaw	
	Haemodorum loratum	-	Priority 3
	Haemodorum spicatum	-	
Hemerocallidaceae	*Tricoryne elatior*	Yellow autumn lily	
Lamiaceae	*Quoya verbascina*	Golden bush	
Loranthaceae	*Nuytsia floribunda*	Christmas tree	
Macarthuriaceae	*Macarthuria apetala*	-	
Myrtaceae	*Apectospermum spinescens*	-	
	Baeckea robusta	-	
	Eremaea beaufortioides var. microphylla	-	
	Eucalyptus conveniens	Natta road mallee	
	Eucalyptus todtiana	Pricklybark	
	Leptospermopsis oligandra	-	
	Scholtzia involucrata	Spiked scholtzia	
	Verticordia grandis	Scarlet featherflower	
Orobanchaceae	**Orobanche minor*	Lesser broomrape	Permitted - s11
Phyllanthaceae	*Poranthera drummondii*	-	
Poaceae	**Aira cupaniana*	Silvery hairgrass	Permitted - s11
	Aristida holathera	-	
	Austrostipa elegantissima	-	
	Austrostipa flavescens	-	
	Austrostipa trichophylla	-	
	**Briza maxima*	Blowfly grass	Permitted - s11
	**Cynodon dactylon*	Couch grass	Permitted - s11



Family Name	Scientific Name	Common Name	Status
	**Ehrharta calycina*	Perennial veldt grass	Permitted - s11
	**Hordeum leporinum*	Barley grass	Permitted - s11
	Lachnagrostis plebeia		
	Neurachne alopecuroidea	Foxtail mulga grass	
	Rytidosperma setaceum	-	
	**Vulpia myuros* forma *myuros*	-	Permitted - s11
Polygalaceae	*Comesperma calymega*	Blue-spike milkwort	
Proteaceae	*Adenanthos cygnorum*	Common woolybush	
	Banksia attenuata	Slender banksia	
	Banksia candolleana	Propeller banksia	
	Banksia sessilis var. flabellifolia	-	
	Banksia tortifolia	-	
	Conospermum nervosum	-	
	Conospermum wycherleyi ssp. wycherleyi	-	
	Hakea varia	Variable-leaved hakea	
	Lambertia multiflora var. multiflora	-	
	Xylomelum angustifolium	Sandyplain woody pear	
Restionaceae	*Chordifex sinuosus*	-	
	Alexgeorgea subterranea	-	
Rutaceae	*Cyanothamnus ramosus ssp. anethifolius*	-	
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grass tree	
	Xanthorrhoea sp. Lesueur	-	

4.2.1 Conservation-Significant Flora

No Threatened flora species were reported from the survey area. However, isolated individuals of two (2) Priority flora species were reported.

Haemodorum loratum (Priority 3)

One (1), 1.0m tall, isolated individual of *H. loratum* was recorded from quadrat 6 (see Figure and Map 9). It is a bulbaceous, perennial, herb which can grow from 0.45 to 1.2(-2) m high. The flowers are black, brown-black, green, and bloom in November. It prefers habitats with grey or yellow sand, or gravel (WA Herbarium 1989-).

Jacksonia anthoclada (Priority 3)

One (1) small, 0.5m tall, isolated individual of *J. anthoclada* was recorded from quadrat 5 (see Figure and Map 9). It is an erect shrub, 1.5-2.5 m high. The flowers are yellow and red, and bloom in April. The preferred habitat is sandplains with white or grey sand (WA Herbarium 1989-).





Figure 3 *Haemodorum loratum* (Priority 3) recorded within the survey area (© Trace Enterprises 2025).



Figure 4 *Jacksonia anthoclada* (Priority 3) recorded within the survey area (© Trace Enterprises 2025).



4.3 Vegetation Community and Condition Mapping

Two (2) distinct vegetation communities were identified within the highly disturbed survey area (See Map 11, and Table 10). Vegetation condition mapping according to Keighery scale (Keighery 1994) showed that the vegetation in the survey area falls between "Degraded" and "Good" categories (see Map 12).

Table 10 Descriptions of vegetation communities identified in the survey area.

Vegetation type	Description	Representative Image
Hypochaeris glabra, Hordeum leporinum and *Vulpia myuros* (HyHoVu) (28.54ha, 55.2%)	Highly disturbed open low grassland/paddock dominated by weeds, *Hypochaeris glabra, Hordeum leporinum* and *Vulpia myuros* forma *myuros.* Vegetation condition- Completely degraded	
Eucalyptus spp., *Adenanthos cygnorum*, *Hibbertia spp.* (EuAdHi) (5.11ha, 9.9%)	Low scrubland with isolated *Eucalyptus todtiana* and *E. conveniens* over a midstory of *Adenanthos cygnorum* over an understory of *Hibbertia subvaginata* and *H. polystachya.* Vegetation condition- Good	

4.4 Basic Fauna Survey

Twenty-seven (27) vertebrate fauna species were recorded during the field survey (see Table 11 and Map). None (0) of them represented threatened fauna species. However, one (1) individual of nationally and state Endangered Carnaby's black cockatoo (*Zanda latirostris*) was observed approximately 10km west of the survey area. The majority of species, eighteen (18, 66.7%), were represented by birds, followed by six (6) species of mammals (22.2%) and three (3) species of reptiles (11.1%) (see and Figure 4). The presence of two (2, 7.4%) of fauna species was not confirmed to the species level.



Some non-native species were also detected in the survey. Scat and diggings of European rabbit (*Oryctolagus cuniculus*) along with scat and tracks for the Feral Cat (*Felis catus*), Domestic Sheep (*Ovis aries*) and Red Fox (*Vulpes vulpes*) were observed within the survey area.

Table 11 A summary of the fauna observed during the survey within the survey area.

Scientific Name	Common Name	Taxa	Remarks	Likelihood of Occurrence
Anthochaera carunculata	Red wattlebird	Bird	Two (2) individuals observed.	Confirmed
Anthus novaeseelandiae	Australasian pipit	Bird	A pair (2) observed.	Confirmed
Aquila audax	Wedge-tailed eagle	Bird	A pair (2) observed flying overhead.	Confirmed
Coracina novaehollandiae	Black-faced cuckoo-shrike	Bird	One (1) individual observed.	Confirmed
Corvus bennetti	Little crow	Bird	One (1) individual observed.	Confirmed
Corvus coronoides	Australian raven	Bird	Forty-six (46) individuals observed, predominantly as small groups, with one large foraging aggregation.	Confirmed
Eolophus roseicapilla	Galah	Bird	A pair (2) observed.	Confirmed
Falco cenchroides	Nankeen kestrel	Bird	Two (2) individuals observed overhead.	Confirmed
Gavicalis virescens	Singing honeyeater	Bird	One (1) individual observed.	Confirmed
Grallina cyanoleauca	Magpie lark	Bird	One (1) individual observed.	Confirmed
Gymnorhina tibicen	Australian magpie	Bird	One (1) individual observed.	Confirmed
Heteroscenes pallidus	Pallid cuckoo	Bird	One (1) individual heard.	Confirmed
Lichmera indistincta	Brown honeyeater	Bird	Thirty-three (33) individuals observed, primarily singly, several in pairs or small flocks.	Confirmed
Malurus leucopterus	White-winged fairy-wren	Bird	Nine (9) individuals observed, primarily as pairs.	Confirmed



Scientific Name	Common Name	Taxa	Remarks	Likelihood of Occurrence
Manorina falvigula	Yellow-throated miner	Bird	Two (2) individuals observed.	Confirmed
Ocyphaps lophotes	Crested pigeon	Bird	Four (4) individuals observed, in pairs.	Confirmed
Artamus cinereus	Black-faced woodswallow	Bird	Two (2) individuals observed.	Confirmed
Pachycephala rufiventris	Rufous whistler	Bird	Two (2) individuals observed.	Confirmed
Felis catus	Feral cat	Mammal	Non-native. Tracks observed throughout survey area. Man-made objects utilised as hunting lookouts (see picture).	Confirmed
Macropus fuliginosus	Western Grey Kangaroo	Mammal	Five (5) individuals observed, singly and in small groups, including nursing juveniles. Tracks, scat and rest areas widely scattered throughout survey area.	Confirmed
Oryctolagus cuniculus	European rabbit	Mammal	Non-native. Scat and distinctive foraging signs scattered throughout survey area.	Confirmed
Ovis aries	Domestic sheep	Mammal	Non-native. Scat, skeletal remains and loose wool present throughout survey area.	Confirmed
Mus musculus (?)	House mouse (?)	Mammal	Non-native. Numerous records in remote cameras. However, hard to confirm the identity without a specimen.	Not confirmed
Vulpes vulpes	Red Fox	Mammal	Non-native. Scat and tracks present in survey area. Recorded by remote cameras.	Confirmed
Pogona minor minor	Dwarf bearded dragon	Reptile	One (1) individual observed.	Confirmed



Scientific Name	Common Name	Taxa	Remarks	Likelihood of Occurrence
Tiliqua rugosa rugosa	Bobtail lizard	Reptile	Three (3) individuals reported in remote cameras.	Confirmed
Ctenotus sp.	Ctenotus lizard	Reptile	Two (2) individuals reported in remote cameras.	Not confirmed

4.5 Fauna Habitat Mapping

Two (2) broad fauna habitat types were identified within the survey area (see Map 13). However, the highly disturbed and fragmented nature of these habitats may not support any conservation-significant species. Additionally, several predatory non-native species, Feral Cat (*Felis catus*) and Red Fox (*Vulpes vulpes*) may pose a significant threat to any native fauna within the survey area.



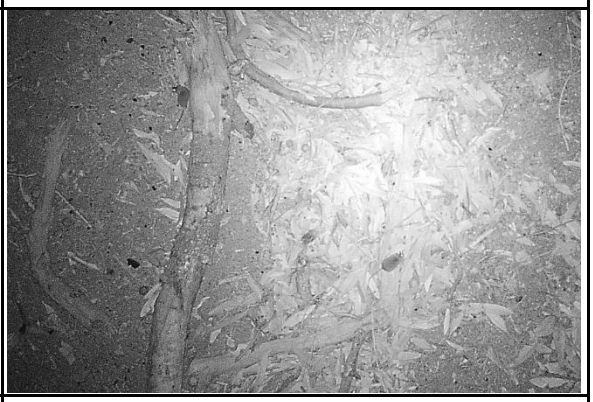
Nankeen kestrel (male) (*Falco cenchroides*)	Australasian pipit (*Anthus novaeseelandiae*)
	
Brown honeyeater (*Lichmera indistincta*)	House mouse (?) (*Mus musculus?)*
	
Shingleback skink (*Tiliqua rugosa rugosa*)	Dwarf bearded dragon (*Pogona minor minor*)
	

Figure 4 Photographic representations of some vertebrates recorded during the survey (© Trace Enterprises 2026).



4.6 Black Cockatoo Habitat Assessment

No black cockatoos were observed within the survey area.

4.6.1 Breeding habitat

No known breeding trees were reported within 12km of the survey area. The closest known breeding records were from the northern Lesueur National Park, 19km southwest of the survey area (DBCA data, see Map 8). No suitable cavity-bearing trees that may support black cockatoo nesting were located within the survey area.

4.6.2 Roosting Habitat

A known large black cockatoo roost was reported, 2km southeast of the survey area, where 404 cockatoos were counted in 2018, and 221 in 2019 (DBCA data, see Map 8). No evidence of black cockatoo roosting (e.g. moulted feathers, chewed food items, droppings etc.) was located within the survey area.

4.6.3 Foraging Habitat

Although preferred forage species (i.e. native Proteaceous plants such as *Banksia* spp., *Hakea* spp., and *Grevillia* spp.), for Carnaby's black cockatoos (*Z. latirostris*) are widespread outside the survey area, they are sporadically distributed within the survey area in extremely low densities. Areas dominated by grassland/paddock may support known non-native black cockatoo food sources such as melons and *Erodium* spp., which represent negligible to low foraging value (Bamford 2020). Additionally, scrubland areas with isolated Eucalypts had a projected foliage cover of <10% of shrubby *Banksia* spp. and 2-5% tree *Banksia* spp., which represent low foraging value (Bamford 2020, see Map 11).

Therefore, the possibility of black cockatoos using the survey area for foraging is extremely low. This is because the site represents a negligible to low foraging value for black cockatoos, while nearby high-quality foraging areas, such as the Kwongan heathland in nature reserves and national parks, are readily accessible for black cockatoos. Additionally, adjacent almond plantations may also provide a food source for black cockatoos. Additionally, No evidence of black cockatoo foraging in the survey area was recorded during the field survey.

A summary of Foraging Values of the vegetation communities within the survey area and corresponding areas (in ha) for Carnaby's black cockatoos (*Z. latirostris*) is presented in Table 12. The overall context-adjusted threatened black cockatoo foraging score for the habitat within the survey area is presented in Table 13. The overall appraisal is presented at the end of Table 13.



Table 12 Foraging values and corresponding areas (ha) for Carnaby's black cockatoos.

NOTE: The foraging values were generated based on the scoring system proposed by Bamford (2020, see Appendix 7).

Foraging value	Area (ha)	Justification
0 - No foraging value		
1 - Negligible to low foraging value	28.54 (55.2%)	The grassland/paddock areas (see Map 11) may seasonally support known non-native food sources such as melons and *Erodium* spp.
2 - Low foraging value		
3 - Low to Moderate foraging value	23.15 (44.8%)	The scrubland areas (see Map 11) with isolated Eucalyptus support a projected foliage cover of <10% of shrubby and 2-5% tree *Banksia* spp.
4 - Moderate foraging value		
5 - Moderate to High foraging value		
6 - High foraging value		
Average foraging value		2 ((1 + 3)/2) An average was estimated due to nearly equal amounts of two (2) different vegetation communities present within the survey area.
Total Area (Ha)	51.69 (100.0%)	

Table 13 Foraging quality scoring tool for the survey area.

Attribute	Scoring rules	Carnaby's black cockatoo
Starting score (10)	Start at a score of 10 if your site is native shrubland, Kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp. (including *Dryandra* spp.), *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation.	The survey site (51.69ha) represents a disturbed and fragmented native vegetation community with scattered *Banksia* spp., *Hakea* sp. and *Eucalyptus* spp. Cleared areas within the survey site are mainly covered with weedy grass. Due to the condition of the vegetation in the survey area, a moderated score approach was adopted (see below).



Attribute	Scoring rules	Carnaby's black cockatoo
	This tool only applies to sites equal to or larger than 1 hectare in size.	
Moderated starting score **(out of 10)**	The moderated starting score is based on the vegetation condition (Site condition), breeding potential (Site context) and the cockatoo density (Stocking rate) at local scale. See Appendix 7 for details. The maximum possible values are as follows. Site condition = 6 Site context = 3 Species stocking rate = 1	4 Site condition = 2 (see Table 12 for justification) Site context = 1 (the nearest known breeding location is 19km away from the survey area, see Map 8; no cavity-bearing trees were located within the survey area) Species stocking rate = 1 (DBCA data indicate numerous records of the species from the general area, see Map 8)
Foraging potential (-2)	Subtract 2 from your score if there is no evidence of feeding debris on your site.	-2 No feeding evidence found.
Connectivity (-2)	Subtract 2 from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	Plenty of high-quality foraging habitats are readily available outside of the survey area. No subtraction.
Proximity to breeding (-2)	Subtract 2 if you have evidence to conclude that your site is more than 12 km from breeding habitat.	-2 The nearest breeding records are from 19km away.
Proximity to roosting (-1)	Subtract 1 if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	The nearest roosting site is within 2km of the survey area. No subtraction.
Impact from significant plant diseases (-1)	Subtract 1 if your site has disease present (e.g.*Phytophthora* spp. or Marri canker) and the disease is affecting more than 50%of the preferred food plants present.	No evidence of dieback of Marri canker found. No subtraction.
Total Score	0 (4 - 2 - 2)	
Appraisal	The survey area is located at the northern distribution limit of the Carnaby's black cockatoo (*Z. latirostris*). The Kwongan heathland vegetation community is widely distributed in the general area and is critical for the long-term survival of this threatened black cockatoo. However, the highly disturbed and fragmented vegetation communities in the survey area have no foraging value for Carnaby's black cockatoos (see Table 12 and Table 13). Additionally, there are no suitable breeding sites or roosting sites within the survey area. Therefore, any proposed construction or vegetation clearing within the survey area (51.69ha) should not have any significant impact on the threatened Carnaby's black cockatoo.	



5.0 Discussion

5.1 Reconnaissance flora Survey

The desktop assessment suggested the potential occurrence of 105 Threatened and Priority flora species were reported based on the DBCA data and the PMST search from within 10km of the survey area. However, the survey area represents a highly disturbed and fragmented landscape due to past vegetation clearing, grazing, farming etc., hence there is a low probability of supporting conservation-significant flora, compared to intact Kwongan heath and shrubland communities nearby.

A total of seventy-four (74) flora taxa were recorded, belonging to twenty-nine (29) families during the field survey. No nationally threatened flora species were recorded within the survey area. Two (2, 2.7%) of the flora taxa represented Priority flora species; *Haemodorum loratum* (Priority 3), and *Jacksonia anthoclada* (Priority 3). We failed to detect Priority 3 *Mesomelaena stygia* subsp. *deflexa*, which was reported within the survey area in 1981 (DBCA data). No Threatened or Priority Ecological Communities (TECs/PECs) were present within or near the survey area. Additionally, fourteen (14) weed species were reported.

5.2 Fauna survey

The desktop assessment suggested the potential occurrence of nineteen (19) non-aquatic and non-marine threatened and priority fauna species in the survey area. Twenty-three (23) vertebrate fauna species were recorded during the basic fauna survey and none of the represented Threatened or Priority species.

5.3 Black cockatoo habitat assessment

The survey area is located at the northern distribution limit of the threatened Carnaby's black cockatoo (*Z. latirostris*). The Kwongan heathland vegetation community is widely distributed in the general area and is critical for the long-term survival of this threatened black cockatoo. However, the highly disturbed and fragmented vegetation communities in the survey area have no foraging value for Carnaby's black cockatoos. Additionally, there are no suitable breeding sites or roosting sites within the survey area. Therefore, any proposed construction or vegetation clearing within the survey area (51.69ha) should not have any significant impact on the threatened Carnaby's black cockatoo.



6.0 Conclusions and Recommendations

- No Threatened flora or ecological communities (TECs) were reported within the survey area.
- Two (2) Priority flora taxa were reported within the survey area; one (1) individual of Priority 3 *Haemodorum loratum*, and one (1) individual of Priority 3 *Jacksonia anthoclada* (see Map 9).
- No Priority ecological communities (PECs) were reported within the survey area.
- No Threatened or Priority fauna were recorded within the survey area.
- No threatened Carnaby's black cockatoo (*Z. latirostris*) were observed within or near the survey area.
- No high-quality black cockatoo foraging habitat, suitable breeding trees, or roosting trees were located within the survey area.
- Proposed construction or vegetation clearing within the survey area (51.69ha) should not have any significant impact on the threatened Carnaby's black cockatoo (*Z. latirostris*) survival.
- Consult with DBCA regarding areas where the proposed vegetation clearing intersects with the two (2) Priority flora locations and the corresponding 50m buffer (see Map 9).
- Native Vegetation Clearing permits are required from DWER to clear native vegetation within the survey area.



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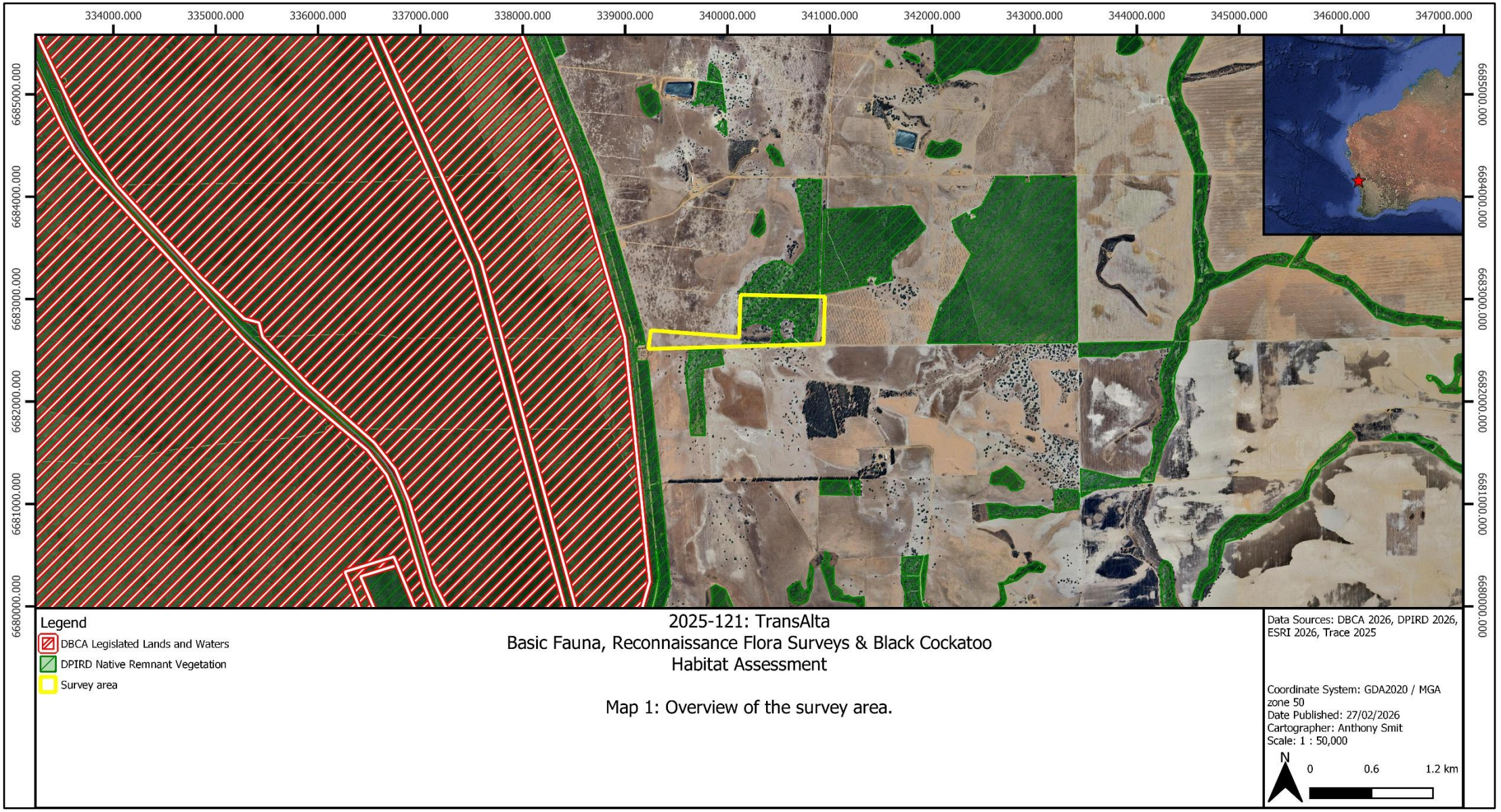
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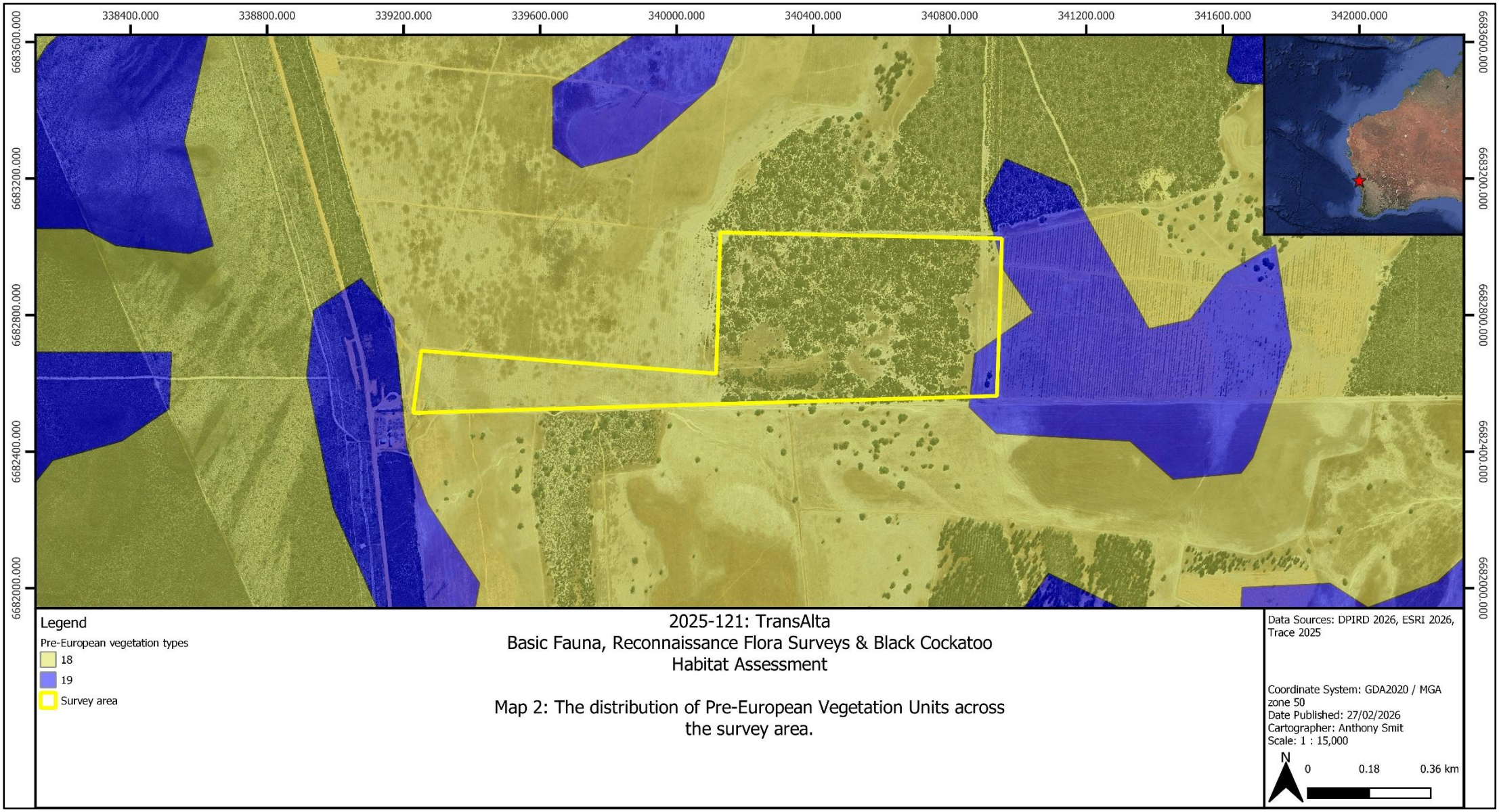
8.0 Maps

The GIS spatial data for this assessment has been provided to TransAlta Energy (Australia) Pty Ltd electronically. This data includes attribute tables developed to support the report content.

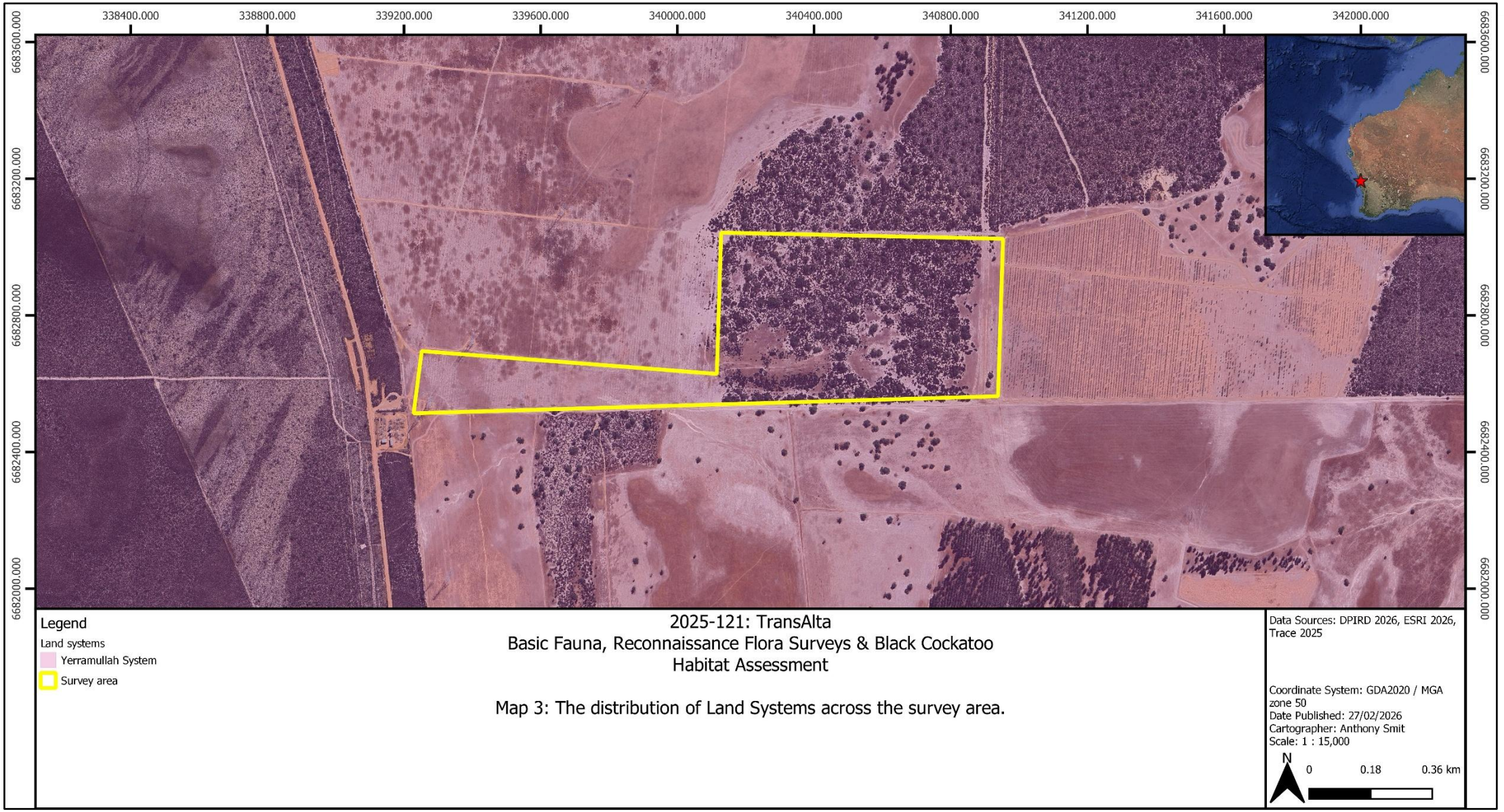



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Legend
DBCA Legislated Lands and Waters
DPIRD Native Remnant Vegetation
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo
Habitat Assessment
Map 1: Overview of the survey area.
Data Sources: DBCA 2026, DPIRD 2026, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
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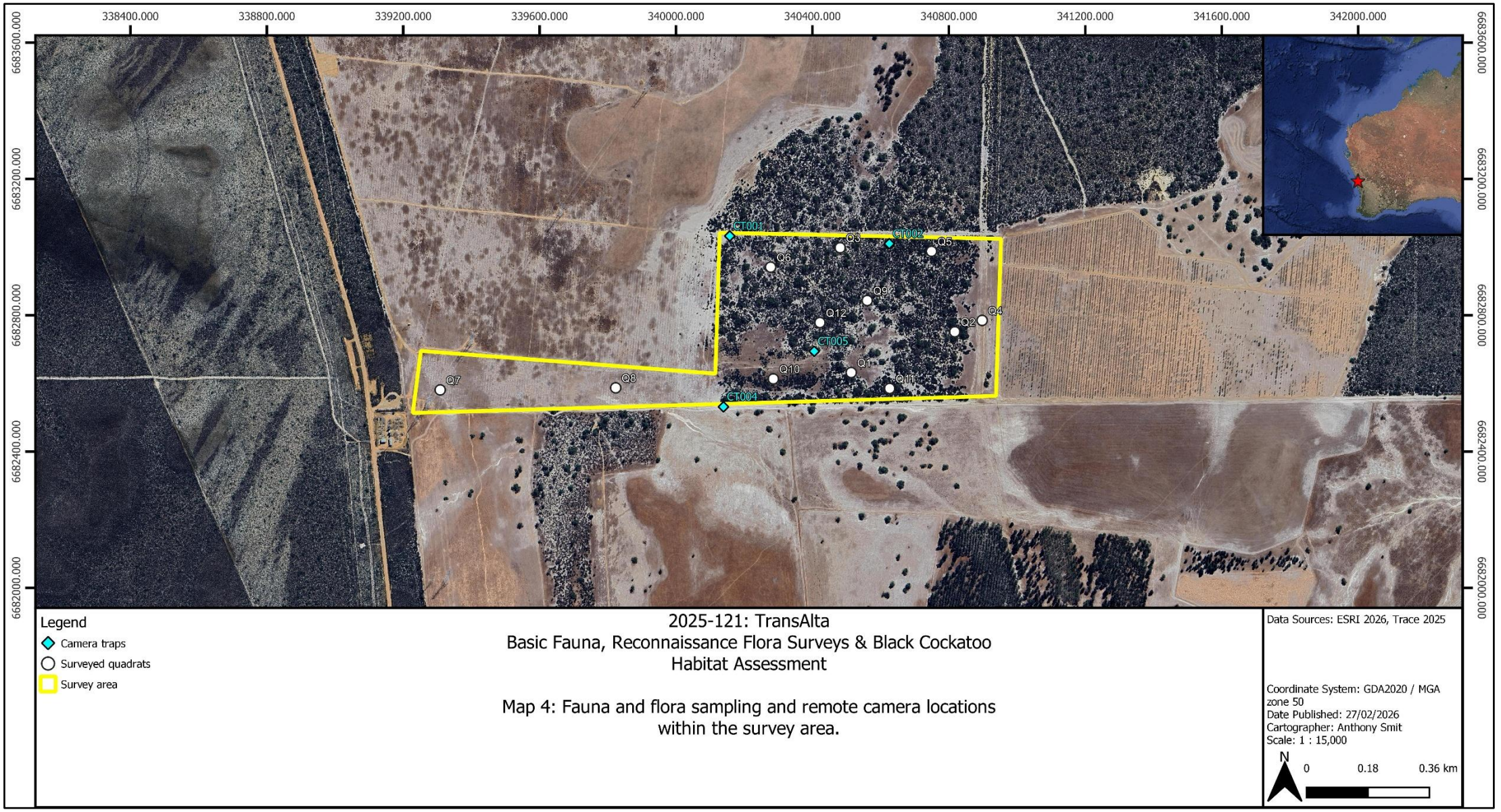



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Legend
Pre-European vegetation types
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Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 2: The distribution of Pre-European Vegetation Units across the survey area.
Data Sources: DPIRD 2026, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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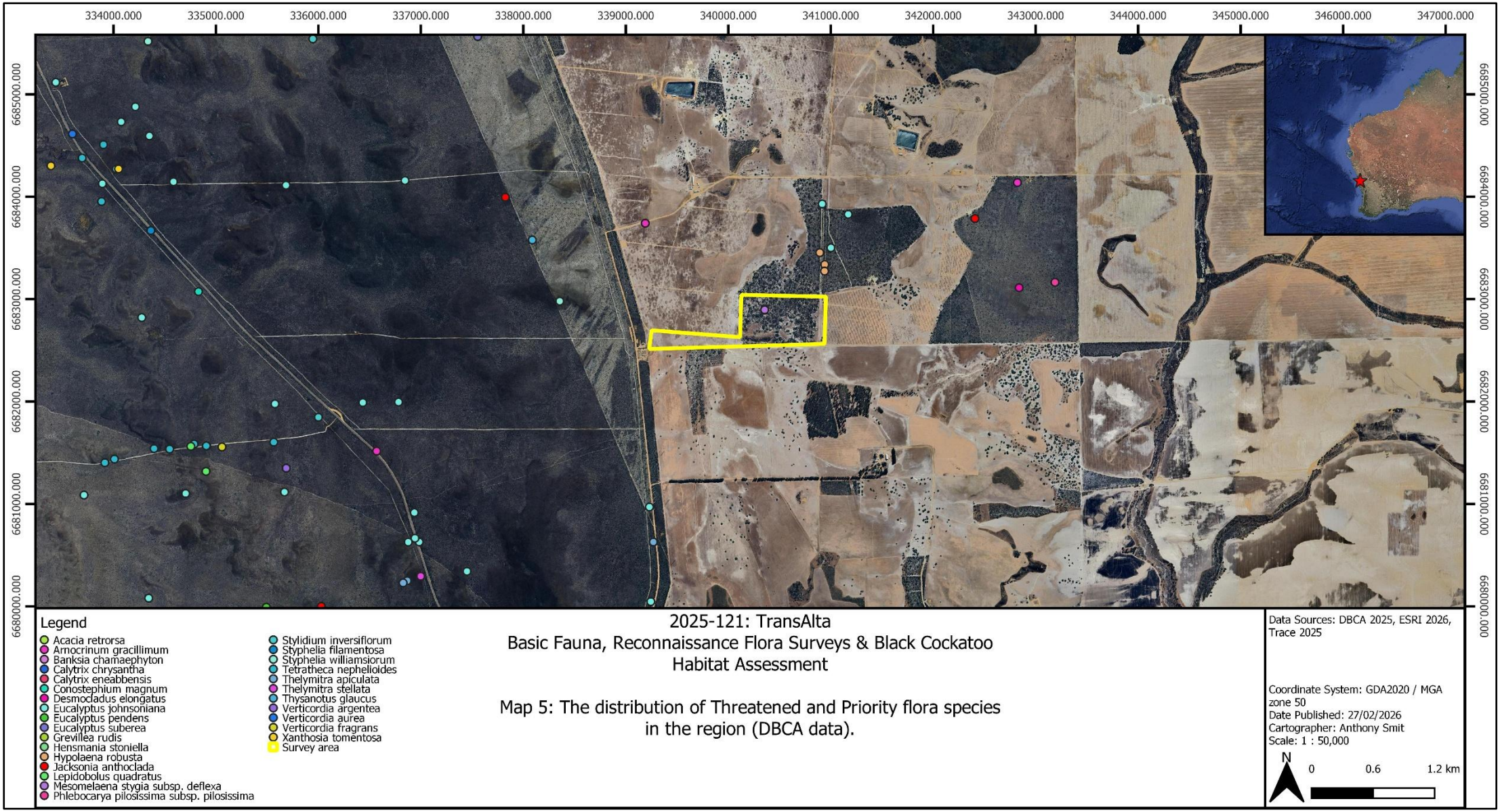



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Land systems
Yerramullah System
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo
Habitat Assessment
Map 3: The distribution of Land Systems across the survey area.
Data Sources: DPIRD 2026, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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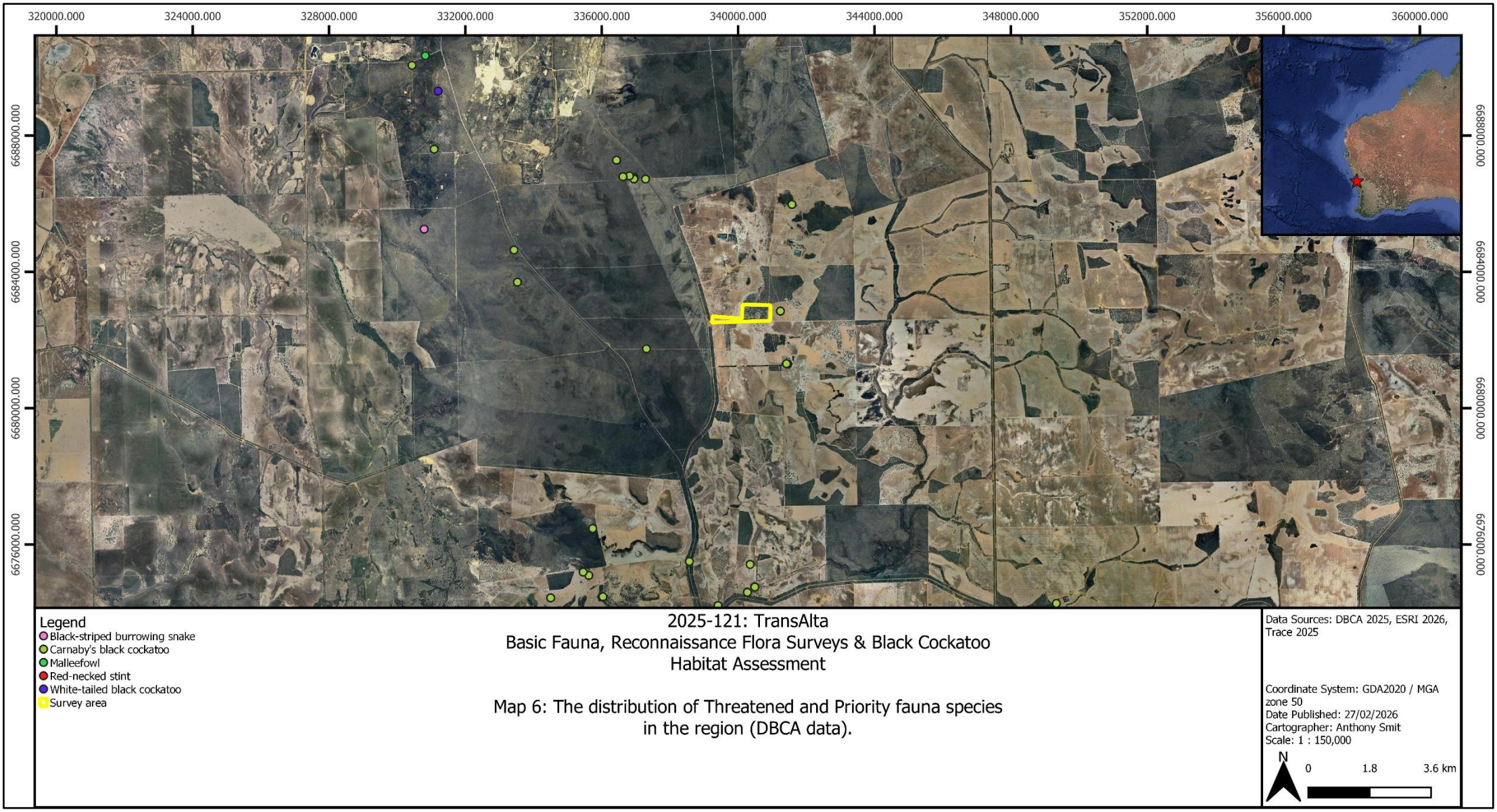



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Q9
Q10
Q11
Q12
Legend
Camera traps
Surveyed quadrats
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 4: Fauna and flora sampling and remote camera locations within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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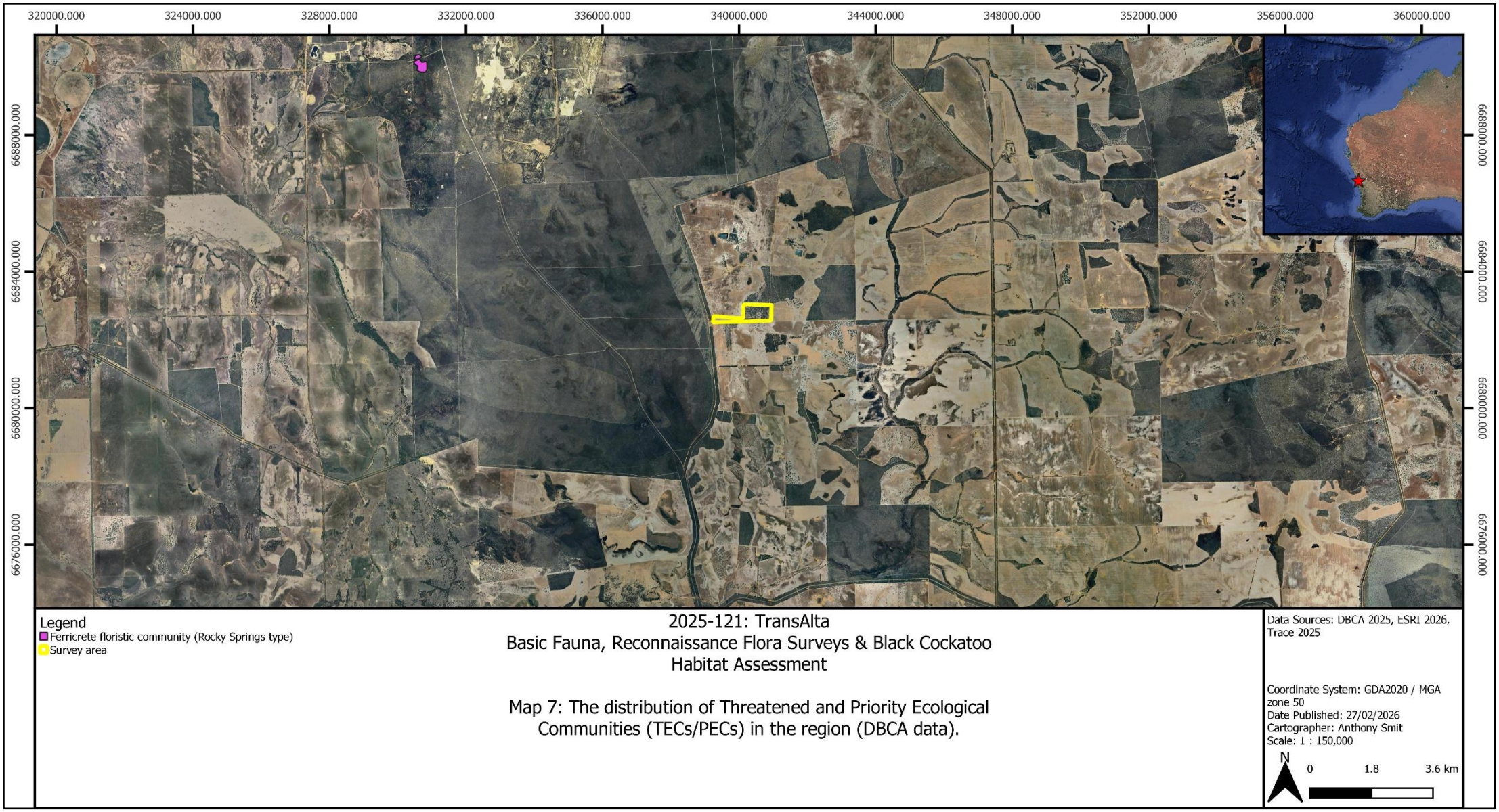



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Legend
Acacia retrorsa
Arnocrinum gracillimum
Banksia chamaephyton
Calytrix chrysantha
Calytrix eneabbensis
Conostephium magnum
Desmocladus elongatus
Eucalyptus johnsoniana
Eucalyptus pendens
Eucalyptus suberea
Grevillea rudis
Hensmania stoniella
Hypolaena robusta
Jacksonia anthoclada
Lepidobolus quadratus
Mesomelaena stygia subsp. deflexa
Phlebocarya pilosissima subsp. pilosissima
Stylidium inversiflorum
Styphelia filamentosa
Styphelia williamsiorum
Tetratheca nephelioides
Thelymitra apiculata
Thelymitra stellata
Thysanotus glaucus
Verticordia argentea
Verticordia aurea
Verticordia fragrans
Xanthosia tomentosa
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 5: The distribution of Threatened and Priority flora species in the region (DBCA data).
Data Sources: DBCA 2025, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 50,000
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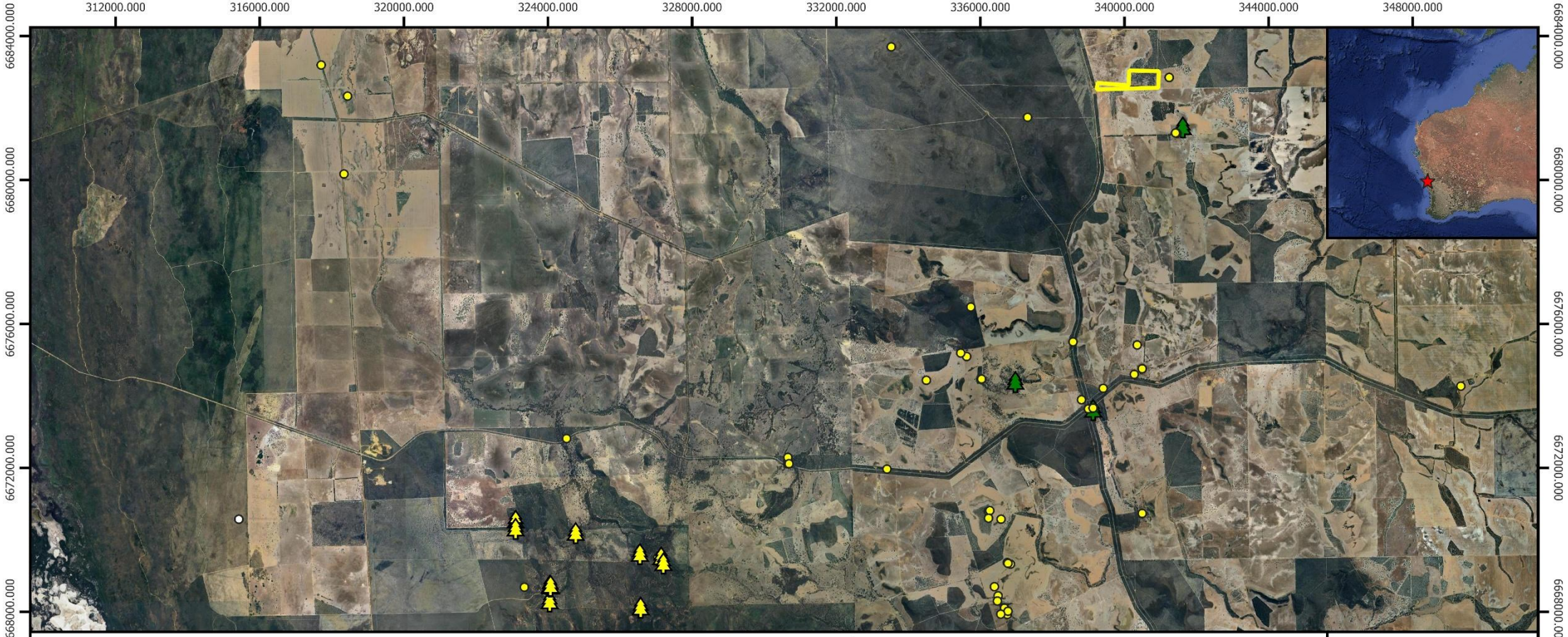



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Legend
Black-striped burrowing snake
Carnaby's black cockatoo
Malleefowl
Red-necked stint
White-tailed black cockatoo
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 6: The distribution of Threatened and Priority fauna species in the region (DBCA data).
Data Sources: DBCA 2025, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 150,000
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3.6 km




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Legend
Ferricrete floristic community (Rocky Springs type)
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 7: The distribution of Threatened and Priority Ecological Communities (TECs/PECs) in the region (DBCA data).
Data Sources: DBCA 2025, ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 150,000
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Legend
- Carnaby's black cockatoo sighting
- White-tailed black cockatoo sighting
- DBCA confirmed nesting site
- DBCA confirmed roosting site
- Survey area

2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment

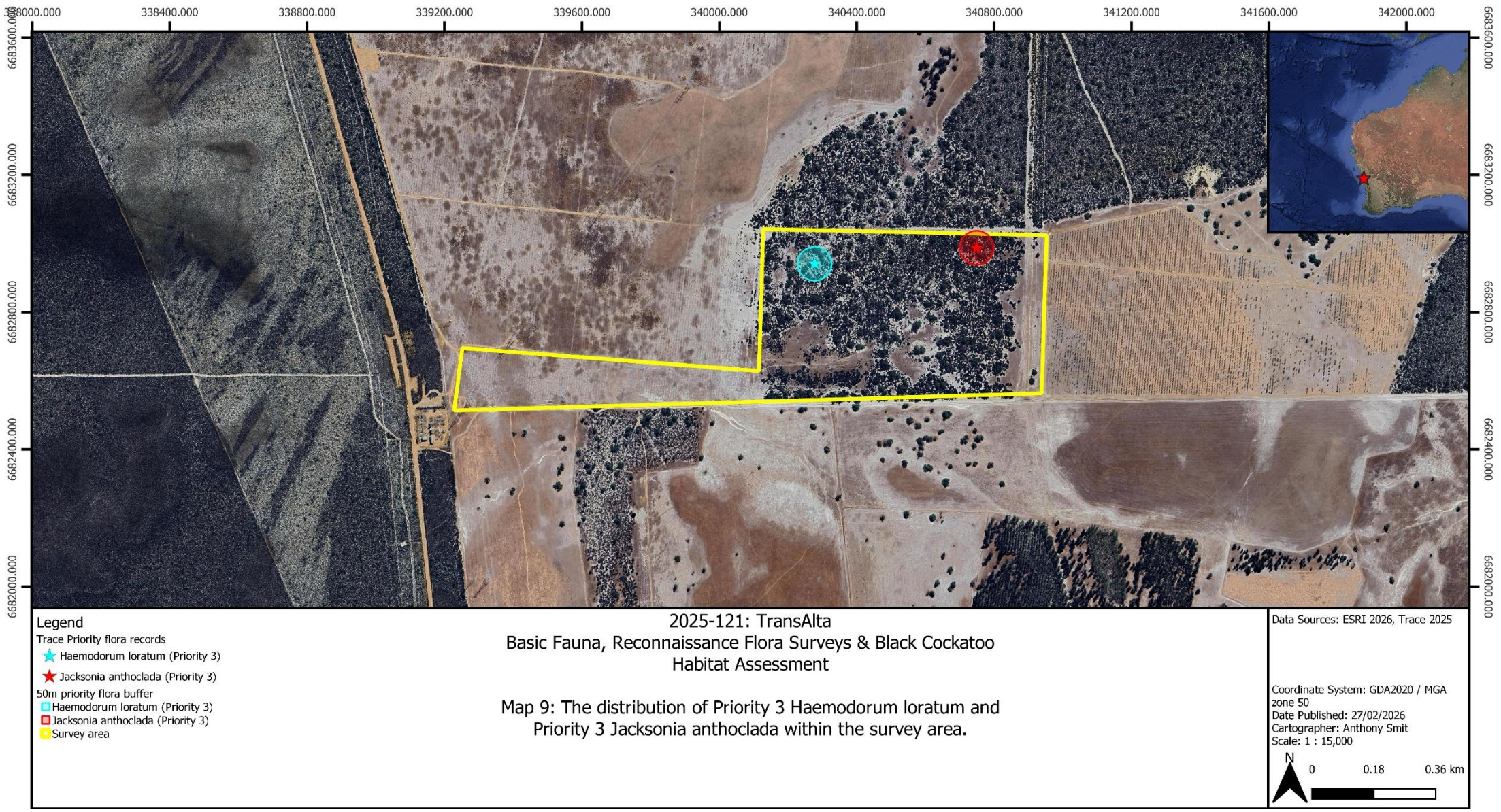
Map 8: The known locations of threatened Carnaby's black cockatoo records, breeding and roosting near the survey area.

Data Sources: DBCA 2025, ESRI 2026, Trace 2025

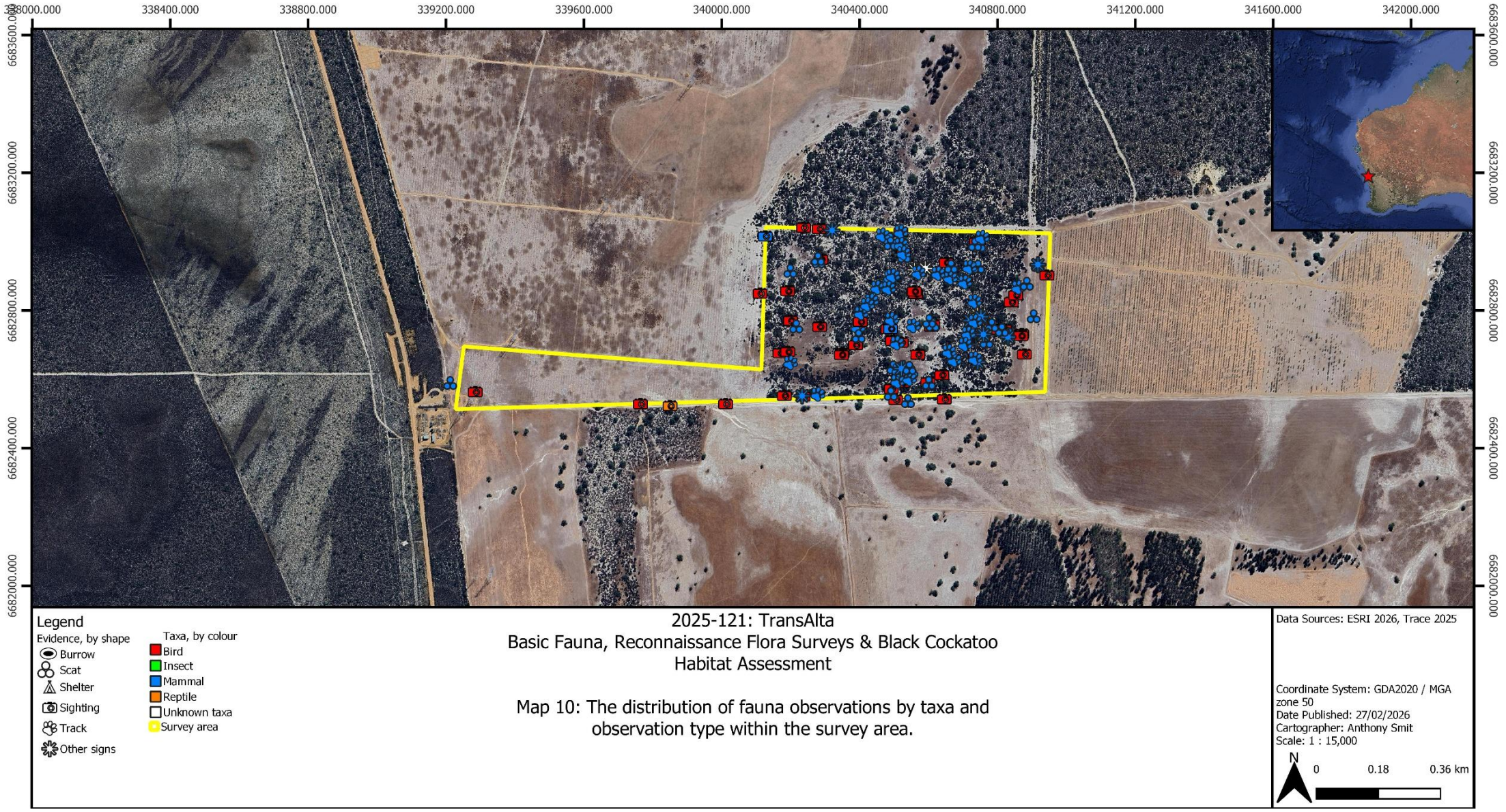
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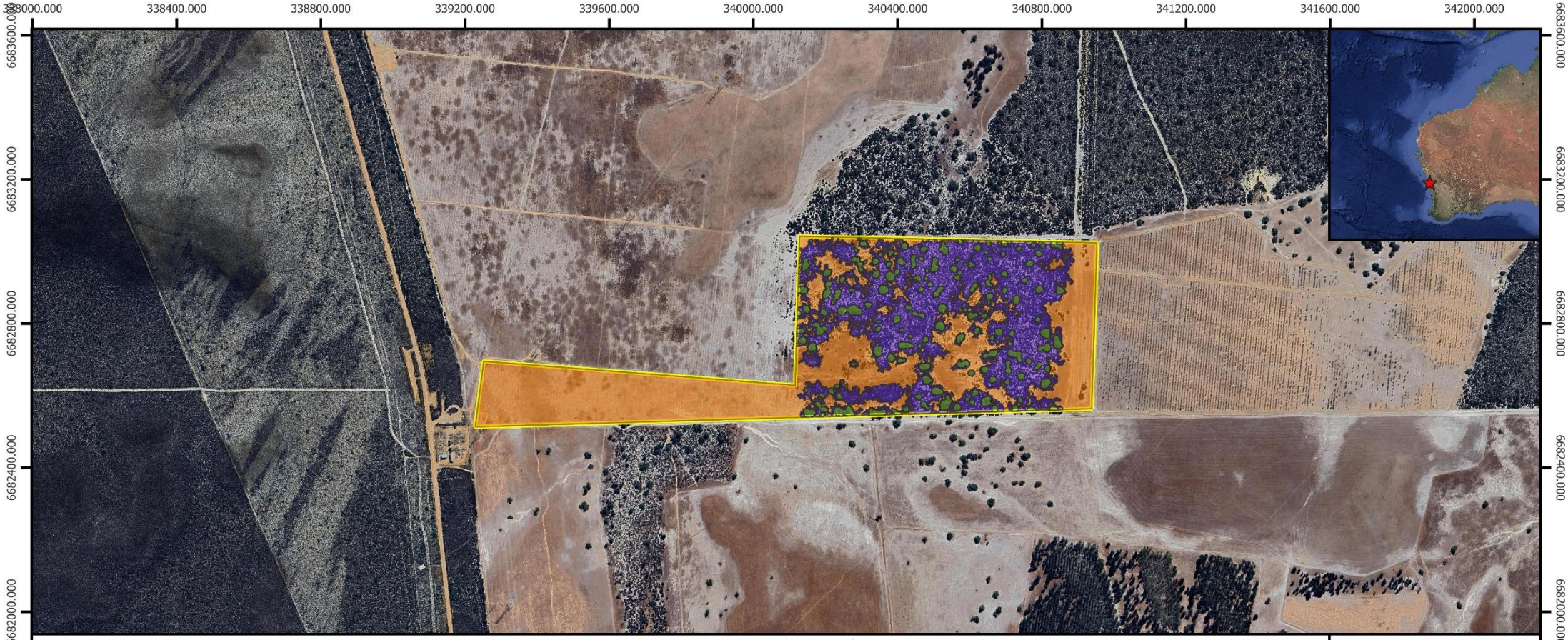



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Trace Priority flora records
Haemodorum loratum (Priority 3)
Jacksonia anthoclada (Priority 3)
50m priority flora buffer
Haemodorum loratum (Priority 3)
Jacksonia anthoclada (Priority 3)
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 9: The distribution of Priority 3 Haemodorum loratum and Priority 3 Jacksonia anthoclada within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
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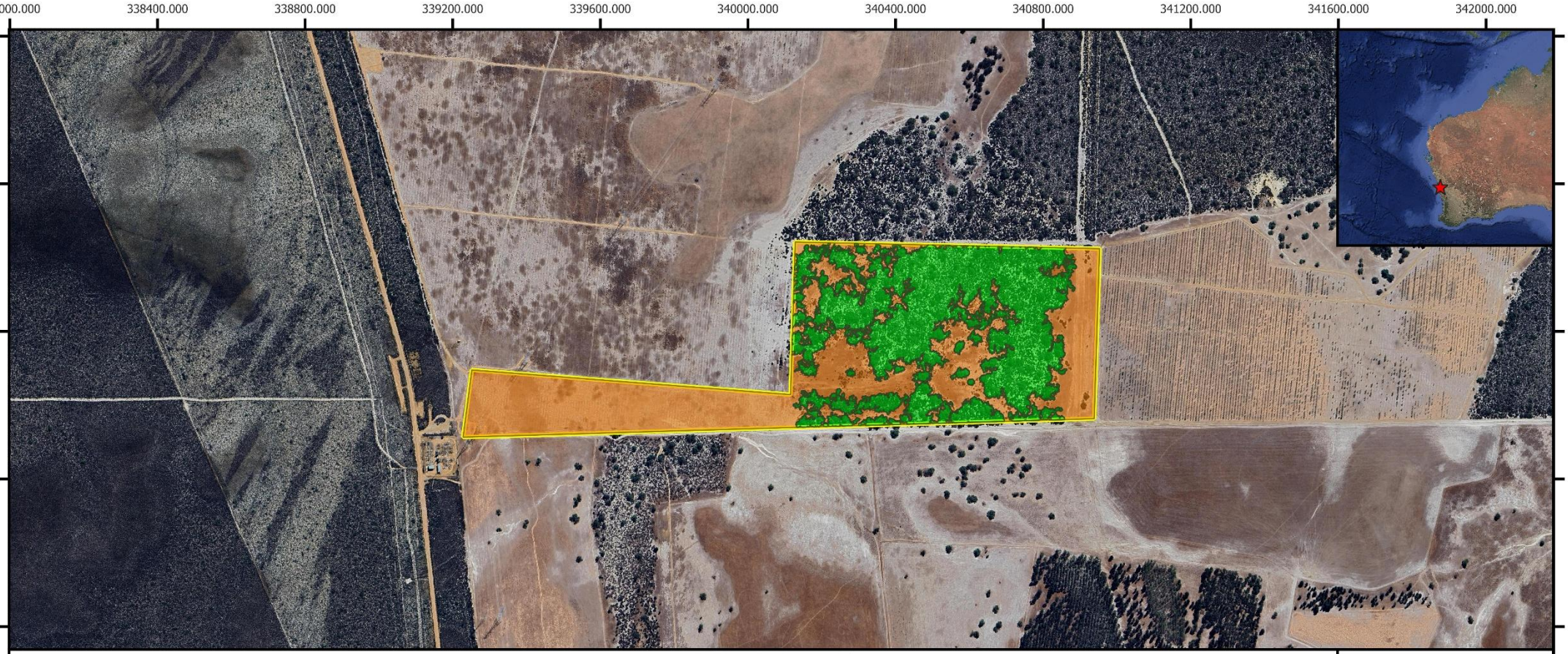



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Legend
Evidence, by shape
Burrow
Scat
Shelter
Sighting
Track
Other signs
Taxa, by colour
Bird
Insect
Mammal
Reptile
Unknown taxa
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 10: The distribution of fauna observations by taxa and observation type within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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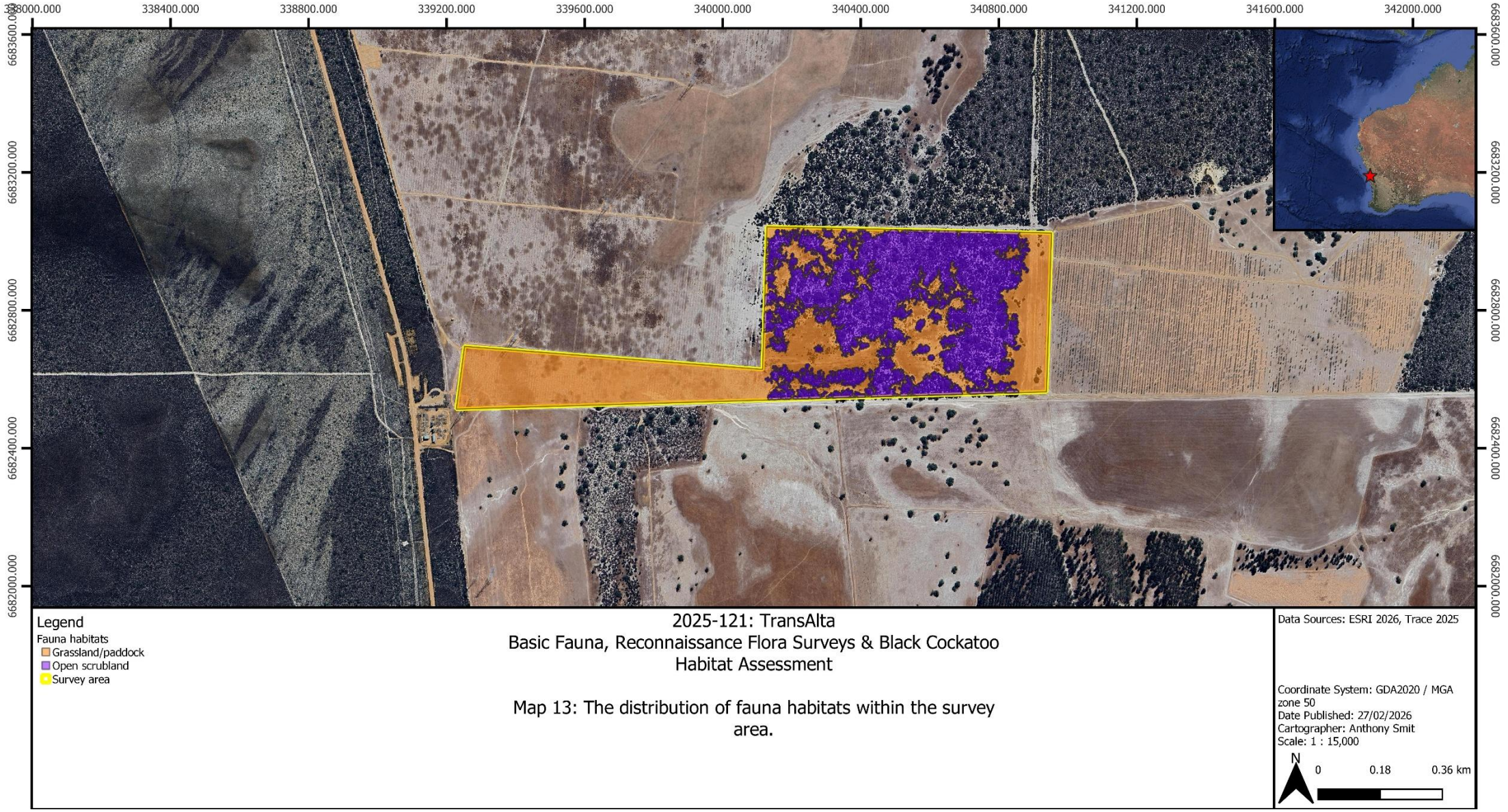



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Legend
Vegetation communities
Eucalyptus canopy
Grassland/paddock
Low scrubland
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 11: The distribution of vegetation communities within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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Legend
Vegetation condition
Degraded
Good
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 12: The distribution of vegetation condition within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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Legend
Fauna habitats
Grassland/paddock
Open scrubland
Survey area
2025-121: TransAlta
Basic Fauna, Reconnaissance Flora Surveys & Black Cockatoo Habitat Assessment
Map 13: The distribution of fauna habitats within the survey area.
Data Sources: ESRI 2026, Trace 2025
Coordinate System: GDA2020 / MGA zone 50
Date Published: 27/02/2026
Cartographer: Anthony Smit
Scale: 1 : 15,000
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9.0 Appendices

Appendix 1 Scope of Works

From: Eddie Kong <eddie_kong@transalta.com>
Sent: 20 October 2025 12:58
To: Rochelle Tonkin <rochelle.tonkin@traceenterprises.com>
Cc: Antony Piccinini <Antony_Piccinini@transalta.com>
Subject: RE: New Contact Us Form submission for Trace Enterprises

Hi Rochelle

Thanks for your email.

Please find attached a shape file for the site (Lot 502 Beros Rd, Warradarge) for your reference.

In terms of timeframe, we would like to target for both the flora and fauna surveys to be carried out before end of this November.

Please let me know if you have any further questions.

Kind regards

Eddie Kong | Principal, Project Development
TransAlta Energy (Australia) Pty Ltd

T: +61 8 9420 0652 | **M:** +61 450 520 980
Web | **Facebook** | **Twitter** | **LinkedIn**

CONFIDENTIALITY NOTICE: This email is confidential and may be privileged. If you are not the intended recipient please notify the sender immediately, and please delete it; you should not copy it or use it for any purpose or disclose its contents to any other person.



Appendix 2 : Legislative Context

Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act) 1999

The EPBC Act is the Australian Government's key piece of environmental legislation and commenced on 16 July 2000. The EPBC Act 1999 protects the environment, particularly matters of National Environmental Significance. It streamlines the national environmental assessment and approval process, protects Australian biodiversity, and integrates the management of important natural and cultural places.

The EPBC Act enables the Australian Government to join with the States and Territories in providing a truly national scheme of environment and heritage protection and biodiversity conservation. The EPBC Act 1999 focuses on the Australian Government's interests in protecting matters of national environmental significance, with the States and Territories having responsibility for matters of State and local significance.

Additionally, the EPBC Act 1999 protects Matters of National Environmental Significance (MNES), including threatened and migratory species protected under international agreements such as the Japan–Australia Migratory Bird Agreement (JAMBA), and the Bonn Convention (the Convention on the Conservation of Migratory Species of Wild Animals). The EPBC Act states that the proponent must not take an action that is likely to have a significant impact on any matters of MNES without approval.

The EPBC Act categorises threatened species according to their level of threat (see Appendix 3 for more details).

WA Biodiversity Conservation Act (BC Act) 2016

The Biodiversity Conservation Act 2016 (BC Act) aims to conserve and protect biodiversity and biodiversity components in the State, as well as promote the ecologically sustainable use of biodiversity components in the State. The Act follows the principles of ecologically sustainable development, detailing that decision-making processes should effectively integrate long-term and short-term economic, environmental, social, and equity considerations. If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. The present generation should ensure that the health, diversity, and productivity of the environment are maintained or enhanced for the benefit of future generations. At all times, the conservation of biodiversity and ecological integrity should be a fundamental consideration in decision-making. Improved valuation, pricing and incentive mechanisms should be promoted.

Conservation codes used for WA flora, fauna and ecological communities are provided in Appendix 4 and Appendix 5.



WA Environmental Protection Act (EP Act) 1986

The Environmental Protection Act 1986 (EP Act) provides for an Environmental Protection Authority to regulate the prevention, control and abatement of pollution and environmental harm, the conservation, preservation, protection, enhancement, and management of the environment, and for matters incidental to or connected with the foregoing.

Under the EP Act, it is an offence to clear native vegetation without a permit or unless an exemption applies. The Environmental Protection (Environmentally Sensitive Areas) Notice 2005 declares Environmentally Sensitive Areas (ESAs) such as wetlands and riparian vegetation, and areas covered by Threatened Ecological Communities (TECs).

WA Biosecurity and Agriculture Management Act (BAM Act) 2007

Western Australian Department of Primary Industries and Regional Development regulates weeds under The Biosecurity and Agriculture Management Act 2007. This act helps to set the legislative framework to manage the impact and spread of pests, weeds and diseases already present in Western Australia. It also aims to prevent the arrival of new pests into the state including weed species. Plants that are prevented entry into the State or have control or keeping requirements within the State are known as declared pests. In WA many Weeds of National Significance (WoNS) are also declared pests under the Biosecurity and Agriculture Management Act 2007.

WA EPA Environmental Guidance for Planning and Development

The purpose of Environmental Protection Authority (EPA) Guidance Statement No. 33 Environmental Guidance for Planning and Development (EPA, 2008) is to outline the significance of environmental factors and to provide the key definitions associated with the environmental factors. Ensuring that environmental factors are considered in line with the EPA's principals and objectives and within the planning framework is what this Environmental Assessment Report is primarily targeted at. In particular, EPA Guidance Statement No. 33 aims to:

- Provide an overview to environmental protection processes and information;
- Describe the referral and environmental impact assessment process under Part IV of the EP Act; and
- Provide the EPA's position and advice on a range of environmental factors, outlining how to protect, conserve and enhance the environmental values.



Appendix 3: Categories of Threatened Species under the EPBC Act 1999

Conservation Code	Category
EX	**Extinct** Taxa where there is no reasonable doubt that the last member of the species has died
EW	**Extinct in the Wild** Taxa where it 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.
CR	**Critically Endangered** Taxa that are facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
EN	**Endangered** Taxa which are not critically endangered and is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
VU	**Vulnerable** Taxa which are 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** Taxa which are the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered, or critically endangered; or (b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.



Appendix 4 Categories of Threatened Species under the BC Act 2016

Conservation Code	Category
Threatened Flora and Fauna	
T	**CR – Critically Endangered** Threatened species considered to be "facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines".
	EN – Endangered Threatened species considered to be "facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines".
	VU – Vulnerable Threatened species considered to be "facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines".
Priority Flora and Fauna	
P1	**Priority 1 - Poorly known species** Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g., agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
P2	**Priority 2 - Poorly known species** Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g., national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3 - Poorly known species**



Conservation Code	Category
	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
P4	**Priority 4 - Rare, Near Threatened and other species in need of monitoring** (i) 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. (ii) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as Conservation Dependent. (iii) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.



Appendix 5 Threatened and Priority Ecological Communities Classification Codes (DBCA)

Conservation Code	Category
Threatened Ecological Communities (TEC)	
T	**CR – Critically Endangered** An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.
	EN – Endangered An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future.
	VU – Vulnerable An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.
Priority Ecological Communities (PEC)	
P1	**Priority 1 - Poorly known communities** Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤5 occurrences or a total area of ≤ 100ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g., within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
P2	**Priority 2 - Poorly known communities** Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation.



Conservation Code	Category
	Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
P3	**Priority 3 - Poorly known communities** (i) 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 or; (ii) communities known from a few widespread occurrences, which are either large or with significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat (within approximately 10 years), or; (iii) communities made up of large, and/or widespread occurrences, that may or may not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing by domestic and/or feral stock, inappropriate fire regimes, clearing, hydrological change etc. Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them.
P4	**Priority 4 - Rare but not threatened communities** 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. (i) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. (ii) Near Threatened. Ecological communities that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for a higher threat category. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	**Priority 5 - Conservation Dependent communities** Conservation Dependent ecological communities are 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 6 A summary of black cockatoo habitat information (DAWE 2022)

Habitat	Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black Cockatoo
Breeding	Generally in woodland or forest, but may also breed in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (many eucalypt species may provide suitable hollows), particularly Karri *(Eucalyptus diversicolor)*, Marri, Jarrah, Wandoo, Bullich *(E. megacarpa)* and Tuart.	Generally in woodland or forest, but also breeds in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (many eucalypt species may provide suitable hollows), particularly Salmon Gum, Wandoo, Tuart, Jarrah, Flooded Gum *(E. rudis)*, York Gum, Powderbark *(E. accedens)*, Karri and Marri.	Generally in woodland or forest, but may also breed in partially cleared woodland or forest, including isolated trees. Nest in hollows in live or dead trees (many eucalypt species may provide suitable hollows), particularly Marri, Karri, Wandoo, Bullich, Blackbutt *(E. patens)*, Tuart and Jarrah.
Night roosting	Generally in or near riparian environments or other permanent water sources. Any tall trees may provide roosting habitat, but particularly Jarrah, Flooded Gum, Blackbutt, Tuart and introduced eucalypts (Blue Gum *(E. globulus)*, Lemon Scented Gum *(Corymbia citriodora)*.	Generally in or near riparian environments or natural and artificial permanent water sources. Any tall trees may provide roosting habitat, but particularly Flat-topped Yate *(E. occidentalis)*, Salmon Gum, Wandoo, Marri, Karri, Blackbutt, Tuart, introduced eucalypts and introduced pines.	Any tall trees may provide roosting habitat, but particularly tall Jarrah, Marri, Blackbutt, Tuart and introduced eucalypt trees or large trees on the edges of forests.
Foraging and common food items	Primarily seeds of Marri, rarely Jarrah, in woodlands and forest, and seeds of native proteaceous plant species (for example, *Banksia* spp. (includes *Dryandra* spp.) and *Hakea* spp.). During the breeding season feed primarily on native vegetation, particularly Marri (seeds, flowers, nectar and grubs). Also insects and insect larvae; pith of Kangaroo Paw (*Anigozanthos flavidus*); tips of *Pinus* spp.; *Macadamia* spp., almonds and pecans; seeds of apples and pears; and persimmons.	Native shrubland, kwongan heathland and woodland on seeds, flowers and nectar of native proteaceous plant species (*Banksia* spp., *Hakea* spp. and *Grevillea* spp.), as well as *Callistemon* spp. and Marri. Also seeds of introduced species including *Pinus* spp., *Erodium* spp., wild radish, canola, almonds, macadamia and pecan nuts; insects and insect larvae; occasionally apples and persimmons; and liquidambar.	Primarily seeds of Jarrah and Marri in woodlands and forest, and edges of Karri forests, including Wandoo and Blackbutt. Forages on *Allocasuarina* cones, fruits of Snottygobble (*Persoonia longifolia*) and Mountain Marri (*C. haematoxylon*). Other less important foods include Blackbutt, Bullich, *Allocasuarina fraseriana*, *Hakea* spp., Tuart, Redheart Moit (*E. decipiens*) and Bushy Yate (*E. lehmanni*). Also some introduced eucalypts such as River Red Gum (*E. camaldulensis*) and Rose Gum (*E. grandis*). On the Swan Coastal Plain, often feeds on introduced Cape Lilac (*Melia azedarach*), *E. caesia*, *E. erythrocorys*, Lemon-scented Gum and Kaffir Plum (*Harpephyllum caffrum*).



Appendix 7 Scoring System for the Assessment of Foraging Value of Vegetation for three (3) threatened black cockatoos (Bamford 2020)

Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	**Baudin's Black-Cockatoo**	**Forest Red-tailed Black-Cockatoo**
0	No foraging value. No Proteaceae, eucalypts or other potential sources of food. Examples: • Water bodies (e.g. salt lakes, dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits) or with vegetation of no food value, such as some suburban landscapes. • Mown grass	No foraging value. No eucalypts or other potential sources of food. Examples: • Water bodies (e.g. dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).	No foraging value. No eucalypts or other potential sources of food. Examples: • Water bodies (e.g. dams, rivers); • Bare ground; • Developed sites devoid of vegetation (e.g. infrastructure, roads, gravel pits).
1	Negligible to low foraging value. Examples: • Scattered specimens of known food plants but projected foliage cover of these is < 2%. This could include urban areas with scattered foraging trees; • Paddocks that are lightly vegetated with melons or other known food-source weeds (e.g. *Erodium* spp.) that represent a short-term and/or seasonal food source; • Blue Gum plantations (foraging by Carnaby's Black-Cockatoos has been reported but appears to be unusual).	Negligible to low foraging value. Scattered specimens of known food plants but projected foliage cover of these < 1%. This could include urban areas with scattered foraging trees.	Negligible to low foraging value. Scattered specimens of known food plants but projected foliage cover of these < 1%. Could include urban areas with scattered foraging trees.
2	Low foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have < 10% projected foliage cover; • Woodland with tree banksias 2-5% projected foliage cover; • Open eucalypt woodland/mallee of small-fruited species; • Paddocks that are densely vegetated with melons or other known food-source weeds (e.g. *Erodium* spp.) that represent a short-term and/or seasonal food source.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g. Marri and Jarrah) 1-5% projected foliage cover; • Urban areas with scattered foraging trees.	Low foraging value. Examples: • Woodland with scattered specimens of known food plants (e.g. Marri, Jarrah or Sheoak) 1-5% projected foliage cover; • Urban areas with scattered food plants such as Cape Lilac, *Eucalyptus caesia* and *E. erythrocorys*.
3	Low to Moderate foraging value. Examples: • Shrubland in which species of foraging value, such as shrubby banksias, have 10-20% projected foliage cover; • Woodland with tree banksias 5-20% projected foliage cover; • Eucalypt Woodland/Mallee of small-fruited species; • Eucalypt Woodland with Marri < 10% projected foliage cover.	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri) 5-20% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).	Low to Moderate foraging value. Examples: • Eucalypt Woodland with known food plants (especially Marri and Jarrah) 5-20% projected foliage cover; • Parkland-cleared Eucalypt Woodland/Forest with known food plants 10-40% projected foliage cover (poor long-term viability without management); • Younger areas of (managed) revegetation with known food plants 10-40% projected foliage cover (establishing food sources with good long-term viability).



Site Score	Description of Vegetation Values		
	Carnaby's Black-Cockatoo	**Baudin's Black-Cockatoo**	**Forest Red-tailed Black-Cockatoo**
4	Moderate foraging value. Examples: • Woodland/low forest with tree banksias (of key species *B. attenuata* and *B. menziesii*) 20-40% projected foliage cover; • Kwongan/ Shrubland in which species of foraging value, such as shrubby banksias, have 20-40% projected foliage cover; • Eucalypt Woodland/Forest with Marri 20-40% projected foliage cover.	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths. • Eucalypt Woodland/Forest with diverse, healthy understorey and known food trees (especially Marri) 10-20% projected foliage cover. • Orchards with highly desirable food sources (e.g. apples, pears, some stone fruits).	Moderate foraging value. Examples: • Marri-Jarrah Woodland/Forest with 20-40% projected foliage cover; • Marri-Jarrah Forest with 40-60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Sheoak Forest with 40-60% projected foliage cover.
5	Moderate to High foraging value. Examples: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with 40-60% projected foliage cover; • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths; • Pine plantations with trees more than 10 years old (but see pine note below in moderation section).	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths.	Moderate to High foraging value. Examples: • Marri-Jarrah Forest with 40-60% projected foliage cover; • Marri-Jarrah Forest with > 60% projected foliage cover but vegetation condition reduced due to weed invasion and/or some tree deaths. • Sheoak Forest with > 60% projected foliage cover.
6	High foraging value. Example: • Banksia Low Forest (of key species *B. attenuata* and *B. menziesii*) with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).	High foraging value. Example: • Marri-Jarrah Forest with > 60% projected foliage cover and vegetation condition good with low weed invasion and/or low tree deaths (indicating it is robust and unlikely to decline in the medium term).



Appendix 8 Foraging quality scoring tool (DAWE, 2022)

Table A1 Foraging quality scoring tool template

Starting score		Baudin's Cockatoo	Carnaby's Cockatoo	Forest Red-tailed Black-Cockatoo
10		**Start at a score of 10** if your site is native eucalypt woodlands and forest, and proteaceous woodland and heath, particularly Marri, within the range of the species, including along roadsides and parkland cleared areas. Can include planted vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	**Start at a score of 10** if your site is native shrubland, kwongan heathland or woodland, dominated by proteaceous plant species such as *Banksia* spp. (including *Dryandra* spp.), *Hakea* spp. and *Grevillea* spp., as well as native eucalypt woodland and forest that contains foraging species, within the range of the species, including along roadsides and parkland cleared areas. Also includes planted native vegetation. **This tool only applies to sites equal to or larger than 1 hectare in size.**	**Start at a score of 10** if your site is Jarrah or Marri woodland and/or forest, or if it is on the edge of Karri forest, or if Wandoo and Blackbutt occur on the site, within the range of the subspecies, including along roadsides and parkland cleared areas. **This tool only applies to sites equal to or larger than 1 hectare in size.**
Attribute	Sub-tractions	Context adjustor (attributes reducing functionality of foraging habitat)		
Foraging potential	**-2**	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	**Subtract 2** from your score if there is no evidence of feeding debris on your site.	**Subtract 2** from your score if there is no evidence of feeding debris on your site.
Connectivity	**-2**	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.	**Subtract 2** from your score if you have evidence to conclude that there is no other foraging habitat within 12 km of your site.
Proximity to breeding	**-2**	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.	**Subtract 2** if you have evidence to conclude that your site is more than 12 km from breeding habitat.
Proximity to roosting	**-1**	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.	**Subtract 1** if you have evidence to conclude that your site is more than 20 km from a known night roosting habitat.
Impact from significant plant disease	**-1**	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.	**Subtract 1** if your site has disease present (e.g. *Phytophthora* spp. or Marri canker) and the disease is affecting more than 50% of the preferred food plants present.
Total score		*Enter score*	*Enter score*	*Enter score*
Appraisal		To support your habitat score, you should provide an overall appraisal of the habitat on the impact site and within 20km of the impact area to clearly explain and justify the score. It should include discussion on the foraging habitat's proximity to other resources (e.g. exact distance to proximate resources), frequency of use of proximate sites, the degree of evidence and description of vegetation type and condition.		



Appendix 9 Referral thresholds for black cockatoos (DAWE 2022)

Table 3 Referral thresholds for black cockatoos

Attribute	Referral threshold	Reasons
Breeding	Any loss of / impact upon known, suitable or potential nesting trees, and the habitat around these trees, is highly likely to require a referral to the minister. Loss of any potential nesting habitat is likely to require a referral to the minister.	As identified in the conservation planning documents, clearing of breeding habitat is a known threat to the 3 species[a] as a lack of tree hollows is a limiting factor. Habitat loss, habitat degradation, lack of recruitment, fire and competition are causing the scarcity of nesting resource[b].
High-quality native foraging habitat	Loss of greater than or equal to 1 ha of foraging habitat scoring 5-10 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (see Appendix A) and takes into account context i.e. proximity of the impact site to important attributes.	As identified in the conservation planning documents, clearing of foraging habitat is a known threat to the 3 species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources[c]. These resources are critical at all stages of life for the species.
Lower-quality native foraging habitat	Loss of greater than or equal to 10 ha of foraging habitat scoring 0-4 using the foraging quality scoring tool is likely to require referral to the minister. Foraging habitat quality is determined using the foraging quality scoring tool (see Appendix A) and takes into account context i.e. proximity of the impact site to important attributes.	As identified in the conservation planning documents, clearing of foraging habitat is a known threat to the 3 species. Habitat loss, habitat modification, climate change and fire are increasingly causing the scarcity of foraging resources. These resources are critical at all stages of life for the species.
Exotic foraging habitat	Loss of greater than or equal to 1 ha of predominantly exotic habitat (e.g. Cape Lilac trees and pine trees) known to be utilised by black cockatoos is likely to require a referral to the minister.	As identified in the conservation planning documents, clearing of exotic foraging habitat is a known threat to the 3 species, noting that its value in comparison to native habitat depends upon the context.
Night roosting habitat	Removal of any part of a known night roosting site is likely to require referral to the minister.	As identified in the conservation planning documents, clearing of night roosting habitat is a known threat to the 3 species.

Note: Referral threshold described may be a result of direct loss, as well as loss from indirect and facilitated impacts.

a Chapman (2008); Department of Parks and Wildlife (2013)

b Johnstone & Kirkby (2008); Saunders et al. (2014)

c Saunders (1990); Johnstone et al. (2017)



Appendix 10 Vegetation Condition Scale as per Keighery 1994 (EPA 2016)

Vegetation Condition	Definitions for South West and Interzone Botanical Provinces
Pristine	Pristine or nearly so, no obvious signs of disturbance or damage caused by human activities since European settlement.
Excellent	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.
Very Good	Vegetation structure altered, obvious signs of disturbance. Disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. Disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
Completely Degraded	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 and shrubs.



Appendix 11 Detailed information on selected survey sites.

2025-121 Quadrat 1			
Dominant species:	*Eucalyptus todtiana*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	40	**Key features:**	Previously grazed land
Estimate of rock cover (%):	0	**Disturbance:**	High; Post-grazing area, weeds, tracks, and washouts



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Acacia pulchella var. glaberrima	2	*Hibbertia subvaginata*	1
Adenanthos cygnorum	<1%	*Hordeum leporinum*	<1%
Aristida holathera	1	*Hypochaeris glabra*	<1%
Austrostipa elegantissima	<1%	*Mesomelaena tetragona*	<1%
Briza maxima	<1%	*Nuytsia floribunda*	2
Burchardia sp.	<1%	*Trachymene pilosa*	<1%
Daviesia nudiflora ssp. nudiflora	2	*Ursinia anthemoides*	<1%
Ehrharta calycina	1	*Xanthorrhoea sp. Lesueur*	2
Eucalyptus todtiana	10	-	-



2025-121 Quadrat 2			
Dominant species:	*Eucalyptus todtiana, Adenanthos cygnorum*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	40	**Key features:**	Wooly-bush (*A. cygnorum)* and Eucalyptus dominated
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed, weeds, and tracks



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Adenanthos cygnorum	10	*Eucalyptus todtiana*	30
Aristida holathera	3	*Hibbertia subvaginata*	1
Austrostipa flavescens	<1%	*Hypochaeris glabra*	<1%
Austrostipa trichophylla	<1%	*Ptilotus polystachyus*	<1%
Burchardia sp.	<1%	*Trachymene pilosa*	<1%
Comesperma calymega	<1%	*Ursinia anthemoides*	2
Ehrharta calycina	1	*Xanthorrhoea sp. Lesueur*	2



2025-121 Quadrat 3			
Dominant species:	*Adenanthos cygnorum.*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	30	**Key features:**	Dominated by wooly-bush (*A. cygnorum)*
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed, dead plants, tracks nearby, weeds



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Adenanthos cygnorum	10	*Hibbertia subvaginata*	3
Aristida holathera	3	*Hypochaeris glabra*	<1%
Austrostipa flavescens	1	*Macarthuria apetala*	<1%
Austrostipa trichophylla	<1%	*Mesomelaena tetragona*	1
Baeckea robusta	<1%	*Poranthera drummondii*	<1%
Briza maxima	<1%	*Ptilotus polystachyus*	<1%
Burchardia sp.	<1%	*Trachymene pilosa*	<1%
Comesperma calymega	<1%	*Tricoryne elatior*	<1%
Daviesia podophylla	5	*Ursinia anthemoides*	1
Ehrharta calycina	1	*Wahlenbergia capensis*	<1%
Eucalyptus todtiana	5	*Xanthorrhoea sp. Lesueur*	1
Haemodorum spicatum	<1%	-	-



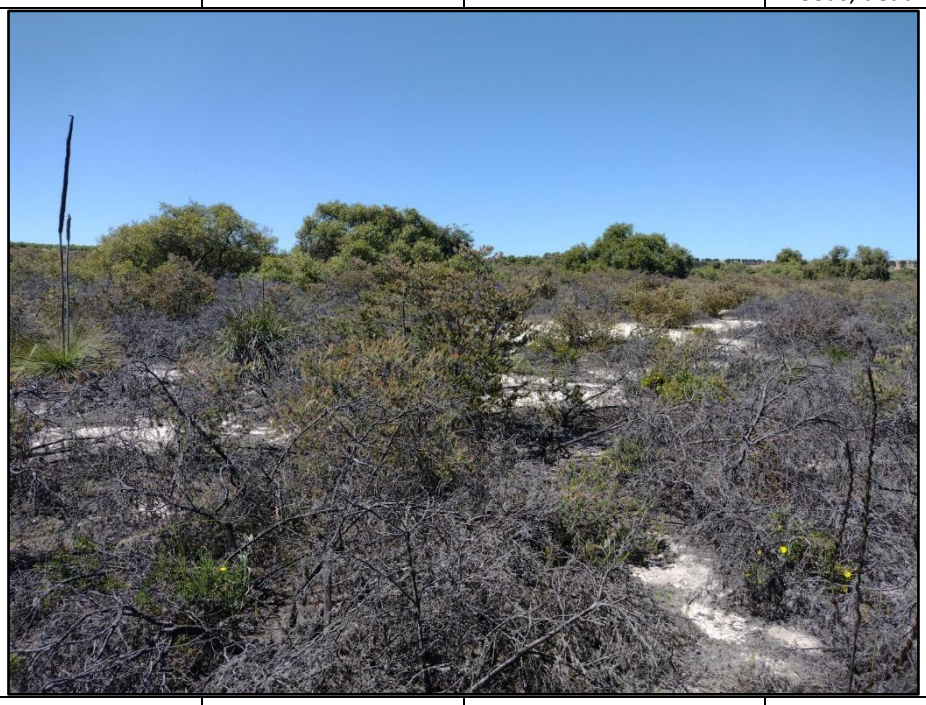
2025-121 Quadrat 4			
Dominant species:	*Aristida holathera, Lachnagrostis plebeia, Aira cupaniana.*		
Vegetation height (m):	0.6	**Elevation (m):**	
Vegetation layers:	1	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System Grey sand on laterite Compacted
Estimate of bare ground (%):	20	**Key features:**	Degraded area
Estimate of rock cover (%):	0	**Disturbance:**	High; Tracks, weeds, compacted soil, herbivore scat, signs of heavy grazing



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Aira cupaniana	10	*Hypochaeris glabra*	5
Aristida holathera	10	*Lachnagrostis plebeia*	10
Austrostipa trichophylla	1	*Raphanus raphanistrum*	<1%
Erodium cicutarium	<1%	*Trifolium arvense var. arvense*	<1%
Hordeum leporinum	<1%	*Vulpia myuros forma myuros*	3



2025-121 Quadrat 5			
Dominant species:	*Adenanthos cygnorum*		
Vegetation height (m):		**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	10	**Key features:**	Wooly-bush (*A. cygnorum*) dominated but mostly dead Close to track and powerlines
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed, weeds, dead wooly-bush



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Acacia pulchella var. glaberrima	1	*Hibbertia subvaginata*	5
Adenanthos cygnorum	10	*Hypochaeris glabra*	<1%
Aristida holathera	<1%	*Jacksonia anthoclada*	2
Austrostipa elegantissima	<1%	*Leschenaultia floribunda*	<1%
Austrostipa flavescens	5	*Lomandra hastilis*	1
Austrostipa trichophylla	<1%	*Macarthuria apetala*	<1%
Burchardia sp.	1	*Mesomelaena tetragona*	1
Callitris acuminata	1	*Trachymene pilosa*	<1%
Cyanothamnus ramosus ssp. anethifolius	1	*Trifolium arvense var. arvense*	<1%
Ehrharta calycina	<1%	*Ursinia anthemoides*	1
Haemodorum spicatum	<1%	*Xanthorrhoea sp. Lesueur*	1
Hibbertia hypericoides subsp. septentrionalis	<1%	-	-



2025-121 Quadrat 6			
Dominant species:	*Adenanthos cygnorum, Eucalyptus todtiana, lexgeorgea subterranea, Banksia candolleana*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	60	**Key features:**	More open
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed, weeds



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Adenanthos cygnorum	5	*Eucalyptus todtiana*	5
Aristida holathera	1	*Haemodorum loratum*	<1%
Austrostipa elegantissima	1	*Haemodorum spicatum*	<1%
Austrostipa flavescens	3	*Hibbertia hypericoides subsp. septentrionalis*	1
Austrostipa trichophylla	<1%	*Hibbertia subvaginata*	3
Banksia candolleana	5	*Hypochaeris glabra*	<1%
Briza maxima	<1%	*lexgeorgea subterranea*	5
Burchardia sp.	<1%	*Lomandra hastilis*	1
Conospermum nervosum	<1%	*Mesomelaena tetragona*	2
Daviesia pedunculata	1	*Rytidosperma setaceum*	1
Daviesia podophylla	1	*Ursinia anthemoides*	<1%
Ehrharta calycina	<1%	*Xanthorrhoea sp. Lesueur*	1



2025-121 Quadrat 7			
Dominant species:	*Hypochaeris glabra.*		
Vegetation height (m):	0.6	**Elevation (m):**	
Vegetation layers:	1	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System Grey sand on laterite Compacted
Estimate of bare ground (%):	5	**Key features:**	Mostly dead and dry grass
Estimate of rock cover (%):	0	**Disturbance:**	Very high; No large vegetation, mainly weeds, previously cleared and grazed area, nearby tracks and power structures



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Aristida holathera	1	*Lachnagrostis plebeia*	3
Austrostipa trichophylla	5	*Ptilotus polystachyus*	<1%
Avena fatua	1	*Raphanus raphanistrum*	1
Erodium cicutarium	5	*Trifolium arvense var. arvense*	5
Hordeum leporinum	20	*Vulpia myuros forma myuros*	20
Hypochaeris glabra	30	-	-



2025-121 Quadrat 8			
Dominant species:	*Hypochaeris glabra.*		
Vegetation height (m):	0.6	**Elevation (m):**	
Vegetation layers:	1	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System Grey sand on laterite Compacted
Estimate of bare ground (%):	5	**Key features:**	Degraded area
Estimate of rock cover (%):	0	**Disturbance:**	Very high; Previously cleared and grazed, weeds, tracks all over



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Aira cupaniana	5	*Hypochaeris glabra*	30
Aristida holathera	2	*Lachnagrostis plebeia*	1
Asteraceae sp.	1	*Orobanche minor*	<1%
Austrostipa trichophylla	5	*Ptilotus polystachyus*	<1%
Avena fatua	3	*Raphanus raphanistrum*	5
Cynodon dactylon	1	*Trifolium arvense var. arvense*	3
Ehrharta calycina	<1%	*Vulpia myuros forma myuros*	20
Hordeum leporinum	20	-	-



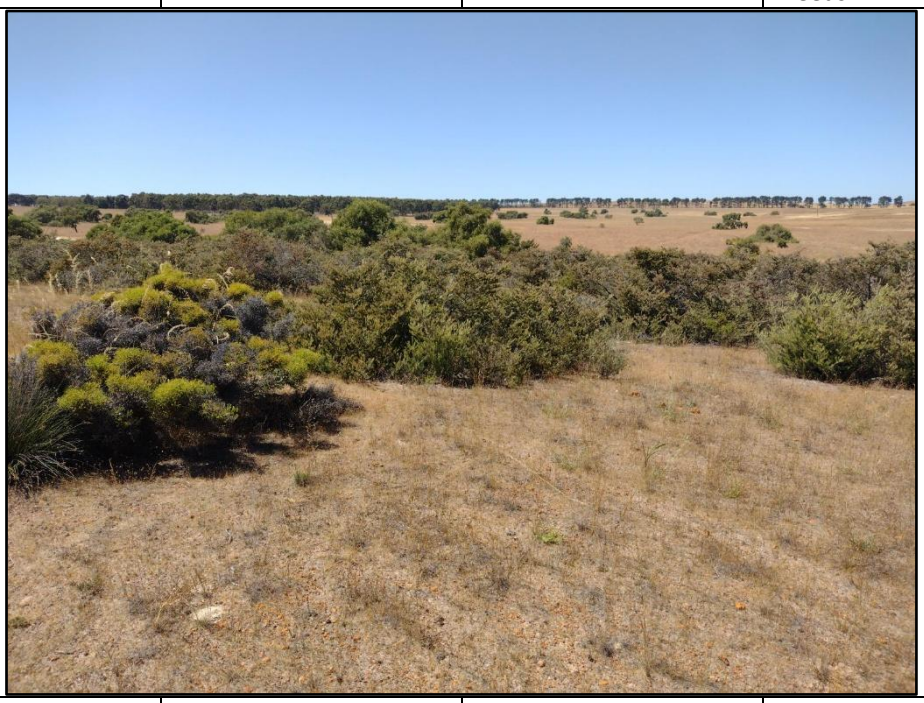
2025-121 Quadrat 9			
Dominant species:	*Adenanthos cygnorum.*		
Vegetation height (m):	6	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	20	**Key features:**	Wooly-bush (*A. cygnorum)* dominated
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed Weeds and dead wooly-bush



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Adenanthos cygnorum	30	*Hibbertia subvaginata*	3.1
Anigozanthos humilis ssp. humilis	<1%	*Leptospermopsis oligandra*	1
Austrostipa elegantissima	1	*Mesomelaena tetragona*	1
Austrostipa flavescens	2	*Poranthera drummondii*	<1%
Austrostipa trichophylla	1	*Rytidosperma setaceum*	1
Briza maxima	<1%	*Trachymene pilosa*	<1%
Burchardia sp.	<1%	*Tricoryne elatior*	<1%
Comesperma calymega	1	*Ursinia anthemoides*	<1%
Conospermum nervosum	<1%	*Vulpia myuros forma myuros*	1
Eucalyptus todtiana	2	*Xanthorrhoea sp. Lesueur*	3
Hibbertia polystachya	2	-	-



2025-121 Quadrat 10			
Dominant species:	*Adenanthos cygnorum*		
Vegetation height (m):	2.0	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Degraded	**Land system:**	Yerramullah System Mixed Grey sand and laterite Transitional area?
Estimate of bare ground (%):	20	**Key features:**	Transitional habitat, unique substrate/soil Wooly-bush (*A. cygnorum)* dominated
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed and cleared, tracks, and weeds



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Adenanthos cygnorum	10	*Hypochaeris glabra*	3
Apectospermum spinescens	1	*Lepidosperma tenue*	1
Aristida holathera	1	*Mesomelaena tetragona*	1
Austrostipa trichophylla	3	*Neurachne alopecuroidea*	1
Briza maxima	2	*Ptilotus polystachyus*	2
Chordifex sinuosus	1	*Ursinia anthemoides*	1
Ehrharta calycina	1	*Vulpia myuros forma myuros*	2
Hakea varia	3	-	-



2025-121 Quadrat 11			
Dominant species:	*Adenanthos cygnorum*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	40	**Key features:**	Wooly-bush (*A. cygnorum)* dominated
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed Weeds, dead wooly-bush



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Acacia pulchella var. glaberrima	2	*Hibbertia polystachya*	1
Adenanthos cygnorum	20	*Hypochaeris glabra*	<1%
Austrostipa flavescens	2	*Leschenaultia floribunda*	2
Austrostipa trichophylla	1	*Lomandra hastilis*	2
Banksia candolleana	2	*Macarthuria apetala*	<1%
Daviesia podophylla	3	*Trachymene pilosa*	<1%
Ehrharta calycina	2	*Ursinia anthemoides*	<1%
Eucalyptus todtiana	4	*Vulpia myuros forma myuros*	<1%
Haemodorum spicatum	<1%	*Wahlenbergia capensis*	<1%



2025-121 Quadrat 12			
Dominant species:	*Eucalyptus todtiana*		
Vegetation height (m):	8	**Elevation (m):**	
Vegetation layers:	2	**Position in landscape:**	Upper Slope
Vegetation condition:	Good	**Land system:**	Yerramullah System White sand
Estimate of bare ground (%):	20	**Key features:**	Eucalyptus and wooly-bush (*A. cygnorum)* dominated
Estimate of rock cover (%):	0	**Disturbance:**	High; Previously grazed, weeds, dead wooly-bush



Scientific name	**% coverage**	**Scientific name**	**% coverage**
Acacia pulchella var. glaberrima	1	*Hibbertia hypericoides subsp. septentrionalis*	<1%
Adenanthos cygnorum	10	*Hibbertia polystachya*	5
Apectospermum spinescens	2	*Hibbertia subvaginata*	4
Austrostipa elegantissima	<1%	*Lepidosperma tenue*	1
Austrostipa flavescens	<1%	*Lomandra hastilis*	3
Burchardia sp.	<1%	*Lyginia imberbis*	1
Chordifex sinuosus	1	*Mesomelaena tetragona*	5
Comesperma calymega	<1%	*Rytidosperma setaceum*	<1%
Conospermum nervosum	<1%	*Trachymene pilosa*	<1%
Daviesia pedunculata	<1%	*Tricoryne elatior*	<1%
Drosera porrecta	<1%	*Ursinia anthemoides*	<1%
Ehrharta calycina	1	*Vulpia myuros forma myuros*	<1%
Eucalyptus todtiana	40	*Xanthorrhoea sp. Lesueur*	10



Appendix 12 Complete results of the PMST database search.

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 31-Oct-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements



Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	41
Listed Migratory Species:	8

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	13
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	9
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None



Details

Matters of National Environmental Significance

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Aphelocephala leucopsis Southern Whiteface [529]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Breeding known to occur within area	In feature area
MAMMAL			



Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat may occur within area	In feature area
Parantechinus apicalis Dibbler [313]	Endangered	Species or species habitat may occur within area	In feature area
PLANT			
Acacia forrestiana Forest's Wattle [17235]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Acacia wilsonii Wilson's Wattle [65228]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area
Banksia catoglypta [85021]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Banksia serratuloides subsp. perissa Northern Serrate Dryandra [82767]	Critically Endangered	Species or species habitat may occur within area	In feature area
Caleana dixonii listed as Paracaleana dixonii Sandplain Duck Orchid [87944]	Endangered	Species or species habitat known to occur within area	In feature area
Daviesia speciosa Beautiful Daviesia [56698]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eremophila glabra subsp. chlorella [84927]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Eremophila subangustifolia listed as Eremophila sp. Narrow leaves (J.D.Start D12-150) [89829]	Critically Endangered (listed as Eremophila sp. Narrow leaves	Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus absita Badgingarra Box [24260]	Endangered	Species or species habitat may occur within area	In buffer area only
Eucalyptus crispata Yandanooka Mallee [24268]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus johnsoniana Johnson's Mallee [14516]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus leprophloia Scaly Butt Mallee, Scaly-butt Mallee [56712]	Endangered	Species or species habitat likely to occur within area	In feature area
Eucalyptus rhodantha Rose Mallee [9362]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Eucalyptus suberea Cork Mallee, Mount Lesueur Mallee [5529]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Eucalyptus x impensa listed as Eucalyptus impensa Eneabba Mallee [94219]	Endangered	Species or species habitat known to occur within area	In feature area
Eucalyptus x lateritica listed as Eucalyptus lateritica Laterite Mallee, Mt Michaud Mallee [94036]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Grevillea althoferorum [64906]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Grevillea christineae Christine's Grevillea [64520]	Endangered	Species or species habitat may occur within area	In buffer area only
Grevillea curviloba subsp. incurva Narrow curved-leaf Grevillea [64909]	Endangered	Species or species habitat known to occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
Grevillea humifusa Spreading Grevillea [61182]	Endangered	Species or species habitat may occur within area	In buffer area only
Hakea megalosperma Lesueur Hakea [10505]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hemiandra gardneri Red Snakebush [7945]	Endangered	Species or species habitat likely to occur within area	In feature area
Hemiandra rutilans Sargents Snakebush, Colourful Snakebush [17932]	Endangered	Species or species habitat may occur within area	In buffer area only
Leucopogon obtectus Hidden Beard-heath [19614]	Endangered	Species or species habitat known to occur within area	In feature area
Petrophile nivea [75847]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Spirogardnera rubescens Spiral Bush [15667]	Endangered	Species or species habitat may occur within area	In feature area
Tetratheca nephelioides [83217]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Thelymitra stellata Star Sun-orchid [7060]	Endangered	Species or species habitat known to occur within area	In feature area
Verticordia albida White Featherflower [55635]	Endangered	Species or species habitat likely to occur within area	In buffer area only
REPTILE			
Egernia stokesii badia Western Spiny-tailed Skink, Baudin Island Spiny-tailed Skink [64483]	Endangered	Species or species habitat may occur within area	In feature area
Listed Migratory Species			[Resource Information]



Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat may occur within area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area



Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus Osprey [952]		Species or species habitat may occur within area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
South Eneabba	Nature Reserve	WA	In feature area
Unnamed WA42481	Nature Reserve	WA	In buffer area only
Unnamed WA46713	Nature Reserve	WA	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Ocean Hill 3D seismic survey, Eneabba, WA	2017/7970		Completed	In feature area
Controlled action				
Central West Coal Project near Enneabba, WA	2007/3869	Controlled Action	Completed	In buffer area only
Coolimba Coal Power Project	2007/3876	Controlled Action	Completed	In feature area
Expansion of mineral sand mine	2008/4192	Controlled Action	Completed	In buffer area only
Not controlled action				
Iluka Eneabba Rare Earth Refinery	2021/9096	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Northern Looping project, Karratha to Gingin	2005/2251	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
Transmission Line Rebuild and Extension	2009/5105	Not Controlled Action (Particular	Post-Approval	In feature area



Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
		Manner)		
Referral decision				
Transmission Line Rebuild and Extension	2009/4972	Referral Decision	Completed	In feature area



Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.



Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.



Please feel free to provide feedback via the Contact us page.

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