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Basic Fauna & Reconnaissance Flora Surveys, Wokalup

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Date Submitted: 14/05/2025

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Project Details

This Final Report documents a desktop assessment, basic fauna survey, and reconnaissance flora survey conducted on 15th April 2025 at Wokalup survey site.

Assessment areas:	Wokalup survey site
Trace contract no.:	2025-028
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Survey dates:	15th April 2025

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Document Control

The Trace Enterprises has prepared this document for Harvest Road Group.

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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 Harvey is predominantly an agricultural and pastoral area with highly fragmented native vegetation (© Trace Enterprises 2025).

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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.

Abbreviations

BC Act	Biodiversity Conservation Act
BOM	Bureau of Meteorology
DBCA	Department of Biodiversity, Conservation and Attractions
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

Certification

This Final Report describes the desktop assessment, basic fauna survey, and reconnaissance flora survey conducted by environmental consultants from Trace Enterprises on behalf of Harvest Road Group on 15th April 2025 at Wokalup 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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Executive Summary

The Harvest Road Group seeks consent to clear a narrow strip of native vegetation along a 4.2km of road verge for power cable installation in Wokalup, located approximately 150km south of Perth CBD (see Map 1). The cable installation will be done by the directional drilling method, which has a relatively low impact on flora and vegetation (see Appendix 1).

The Harvest Road Group commissioned Trace Enterprises to prepare an Environmental Assessment Report describing the environmental values of the survey area and assessing the potential environmental impacts of the proposed development.

The field surveys were completed on 15th April 2025. The Harvest Road Group is informed that;

- The desktop assessment, basic fauna survey and reconnaissance flora survey are completed.
- The desktop assessment suggested the potential occurrence of 39 threatened and priority flora species in the survey area. Forty (40) flora species were recorded during the reconnaissance flora survey, but none of them represented conservation-significant species (see Map 9 and Table 8).
- Twenty (20) weed species were identified, including one (1) Declared Pest - s22(2) (BAM Act 2007), Narrow-Leaved Cotton Bush (**Gomphocarpus fruticosus*) along Hocart Road (see Map 10).
- Thirty-one (31) terrestrial vertebrates were recorded during the field surveys. The presence of 28 was confirmed by direct visual and/or auditory observations (see Table 9).
- Indirect evidence for four (4) threatened and Priority species/taxa was also recovered. It includes Priority 4 Quenda/Southwestern brown bandicoot (*Isoodon fusciventer*), and three (3) species/taxa of threatened black cockatoos; Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), and Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).
- A threatened black cockatoo habitat assessment is required per the referral guidelines (DAWE 2022) to assess the presence of breeding, roosting, and foraging habitat.

- A significant impact assessment is required as per Matters of National Environmental Significance (MNES) significant Impact guidelines 1.1 (DoE 2013) to determine whether the proposed action is likely to have a significant impact on MNES (i.e. threatened black cockatoos in this case).

Table of Contents

List of Tables

List of Maps

List of Figures

1.0 Introduction

1.1 Background

The Harvest Road Group seeks consent to clear a narrow strip of native vegetation along a 4.2km of road verge for power cable installation in Wokalup, located approximately 150km south of Perth CBD (see Map 1). The cable installation will be done by the directional drilling method, which has a relatively low impact on flora and vegetation (see Appendix 1).

The Harvest Road Group commissioned Trace Enterprises to prepare an Environmental Assessment Report describing the environmental values of the survey area and assessing the potential environmental impacts of the proposed development.

1.2 Scope of Works

The Environmental Assessment Report includes a desktop assessment, basic fauna survey, and reconnaissance flora survey as per the client's need (see Appendix 1). The specific objectives of the survey are listed below;

1) Conduct a desktop assessment using publicly available data on the environmental values of the survey area.
2) Describe the physical environment of the survey area, including biogeography, vegetation, land systems, and climate.
3) Describe the flora and the vegetation of the survey area based on a Reconnaissance flora survey and verify/ground-truth desktop assessment findings.
4) Describe the fauna and fauna habitats of the survey area based on a basic fauna survey and verify/ground-truth desktop assessment findings.
5) Generate a comprehensive report summarising the major findings of the surveys.

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);
- Biosecurity and Agriculture Management Act 2007 (BAM Act 2007); 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 Survey Team and Authorship

The survey team was led by Sujan Henk (senior zoologist) and accompanied by Hannah Anthony (botanist). This report is based on field data collected by Sujan Henk and Hannah Anthony. Sujan Henk compiled and analysed the data and wrote the final report. Hannah Anthony assisted with flora identification, GIS data processing, and map production. Joshua Davis and Sujan Henk then reviewed the document for quality assurance.

Table 1 Survey personnel and experience.

Personnel	Project Role and Qualifications	Project Role
Sujan Henk	Senior Zoologist BSc (Hons), PhD	25 years of experience in fauna capture, handling, and surveys, survey preparation, data collection, data management and analysis, report writing, and report review
Hannah Anthony	Botanist BA Sus. Dev.	1+ years of experience in survey preparation, field survey, flora identification, report writing, data analysis, GIS data processing, and map production
Joshua Davis	Report quality assurance BA (Hons), MAICD, M.ICOMOS	10 years of experience in report writing, report review, and quality assurance

2.0 Regional Context

This section overviews the regional context of the Wokalup survey site near Harvey, WA (see Map 1). It is crucial to place the results, findings, and recommendations within the broader existing environmental landscape.

2.1 Biogeography

The Interim Biogeographic Regionalisation for Australia (IBRA) classifies the bioregions based on common climate, geology, landform, native vegetation, and species information. Eighty-nine (89) bioregions across Australia are refined into 419 subregions (DCCEEW 2023). The survey area is situated within the Swan Coastal Plain (SWA02) sub-region of the Swan Coastal Plain biogeographic region, as defined in the Interim Biogeographical Regionalisation for Australia (IBRA) (DCLM 2002).

The Swan Coastal Plain is a low-lying coastal plain mainly covered with woodlands. It is dominated by Banksia or Tuart on sandy soils, *Casuarina obesa* on outwash plains, and paperbark in swampy areas. In the east, the plain rises to duricrusted Mesozoic sediments dominated by Jarrah woodland. The climate is Warm Mediterranean. Three phases of marine sand dune development provide relief. The outwash plains, once dominated by *C. obesa*-marri woodlands and Melaleuca shrublands, are extensive only in the south (DCLM 2002).

2.2 Regional Vegetation

The survey 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 only one (1) vegetation type (Type 3, see Map 2), which is Woodland: jarrah, marri, wandoo, tuart and flooded gum (Beard et al. 2013).

The vegetation is composed of mixed woodlands containing *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri) and/or *Eucalyptus wandoo* (wandoo), with the jarrah present on the lateritic residuals and largely absent from the valleys. In this part of the bioregion the trees reach 20–25 m in height and are more widely spaced than trees in the jarrah forest

proper, and the understorey is composed of a wide variety of sclerophyllous shrub species. Small pockets of pure jarrah occur in the northern and central parts of this bioregion, with more extensive areas in the south. Jarrah, marri and wandoo occur to the west and on the northern slopes of the Stirling Range and in the western edge of the Esperance Plains Bioregion (Beard et al. 2013).

2.3 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 Pinjarra system (see Map 3) which covers Swan Coastal Plain from Perth to Capel. It is an alluvial tract of unconsolidated clays and loams, with minor amounts of limestone, extending west from the Ridge Hill Shelf for 1.5km to 5km. It consists of alluvial fans near the scarp and floodplains along the rivers. The two broadest areas of the Pinjarra Plain in the Perth Region are the Swan Valley and Serpentine River flats. The elevation of the plain increases northward, from 7m east of Perth to 75m at Bullsbrook. The alluvial fans are higher along the courses of the larger streams that emerge from the Darling Plateau, but farther west they merge imperceptibly with floodplain and estuarine sedimentary rocks (Gozzard 2007).

2.4 Climate

The survey area's average climate is Mediterranean. The Swan Coastal Plain IBRA subregion's annual rainfall ranges between 600mm and 1000mm (DCLM 2002).

The records obtained from the Wokalup weather station (# 009642) near the survey area recorded a mean maximum temperature of 31.0^{o}C in January and a mean minimum temperature of 7.9^{o}C in August. The average annual rainfall for the survey area is 923.7mm, with the highest amount of rain in June-July (i.e. 178.1mm - 182.2mm) and a distinct dry period from December to March (BOM 2025, see Figure 2).

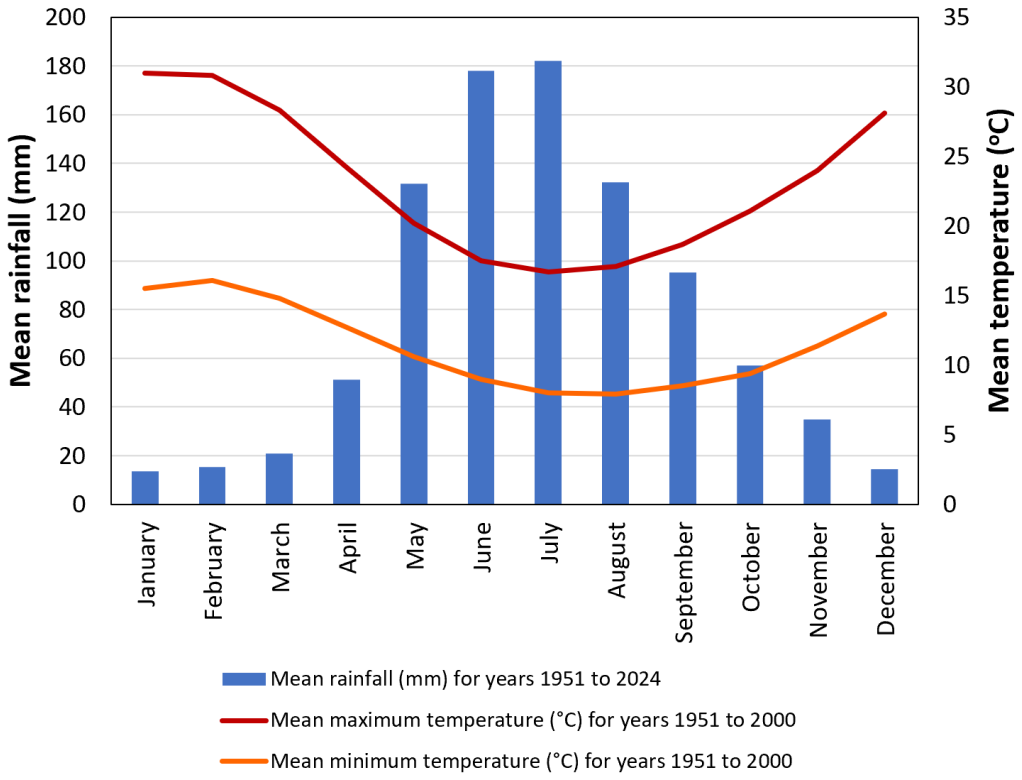

Figure 2 Mean monthly temperature and rainfall, Wokalup weather station (#009642) (BOM 2025).

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.

- Technical Guidance: Flora and Vegetation Surveys for Environmental Impact Assessments (EPA 2016);
- Technical Guidance: Terrestrial vertebrate Fauna Surveys for Environmental Impact Assessments (EPA 2020);
- Environmental Factor Guideline: Inland waters, Terrestrial fauna, Flora and vegetation (EPA 2016); and
- Flora taking (biological assessment) license. Regulation 62, Biodiversity Conservation Regulations 2018.

The assessment strategy was developed based on the client's needs as outlined by the Scope of Works (see Appendix 1) and the guidelines provided by EPA (EPA 2016). The recommended survey time for flora is March - June, as per the EPA guidelines (EPA 2016). The recommended survey timing for fauna varies among taxa (EPA 2020).

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 flora, 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 flora database;
- DBCA Threatened and Priority fauna database;
- DBCA Threatened and Priority ecological communities (TEC/PEC) database;
- Commonwealth (EPBC Act) Protected Matters Search Tool (PMST); and
- Western Australian Herbarium Florabase database.

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; and
- Legislated Lands and Waters (DBCA 011) dataset.

Additionally, a literature review was conducted using publicly available literature and previous regional survey reports (see Table 2) to find 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 2).

Table 2 Major literature sources utilized for the literature survey.

Elements covered	Citation
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.

Elements covered	Citation
Threatened and priority birds	Menkhorst, P., Rogers, D., Clarke, R. et al. (2019). The Australian Bird Guide: Revised Edition (Revised Edition). CSIRO Publishing.
Threatened and priority reptiles	Wilson, S. and Swan, G. (2020). A Complete Guide to Reptiles of Australia (6th Edition). Reed New Holland.
Threatened and priority fish	TSSC. (2018). Conservation Advice *Galaxiella nigrostriata* (black-stripe minnow), Threatened Species Scientific Committee, Environment Protection and Biodiversity Conservation Act 1999.
Threatened and priority invertebrates	TSSC. (2017). Conservation Advice *Westralunio carteri* (Carter's freshwater mussel), Threatened Species Scientific Committee, Environment Protection and Biodiversity Conservation Act 1999 .
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.
Local flora identification	Barrett, R. and Tay, E.P. (2023). Perth Plants: A field guide to the bushland and coastal flora of Kings Park and Bold Park (2nd Edition). CSIRO Publishing/ Botanic Gardens and Parks Authority. 1-423 pp. Dixon, K. (2020). Coastal Plants: A guide to the identification and restoration of plants of the Greater Perth Coast (2nd edition). CSIRO Publishing. 1-346 pp. Sainsbury, R.M. (2020). A Field Guide to Western Australian Isopogons and Petrophiles. Robert Malcolm Sainsbury. 1-212 pp. Holliday, I. and Watton, G. (2008). Banksias: A Field and Garden Guide. Ivan Holliday & Geoff Watton. 1-192 pp.

Elements covered	Citation
	Young, J.A. (2023). A Field Guide to Melaleucas of South-west Western Australia (Revised). Anon. 1-165 pp.
Flora survey methods	EPA. (2016). Technical Guidance: Flora and vegetation surveys for environmental impact assessments. Environmental Protection Authority. Perth, WA.

3.1.2 Environmental Constraints Analysis

Environmental constraints analysis and mapping were conducted using the GIS software QGIS version 3.2.2 (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 flora, 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 within the survey area 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 the Table 3. When habitat information was not available in SPRAT (2025), additional sources were utilised (Menkhorst and Knight 2011, Menkhorst et al. 2019, TSSC 2017 and 2018).

Table 3 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.
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 broad information about the flora and vegetation of the survey area and ground truth the desktop assessment findings. Additionally, the survey area is not likely to support conservation-significant flora and vegetation due to its highly altered and disturbed nature from agricultural and pastoral activities (EPA 2016). Low intensity sampling was conducted by walking along the proposed project transect line (see Map 1). Special emphasis was given to locate conservation-significant flora and key flora species that are important for threatened black cockatoos.

When possible, flora species were identified in the field using field guides (i.e. common species, Priority and Threatened species, environmental weed 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 Swan Coastal Plain, where the existing habitat is highly impacted (including the present survey area). However, the fauna of this region is well understood, and comprehensive long-term data is available to predict significant impacts (EPA 2020).

Therefore, a basic fauna survey was conducted to gather broad information about fauna and fauna habitats, and ground truth the desktop assessment findings, in addition to a threatened black cockatoo habitat assessment (see 0). Low intensity sampling was conducted by walking along the proposed project transect line (see Map 1) and collecting fauna data within and beyond the 20m project corridor. Data were gathered by visual and auditory observations of fauna and their signs. All fauna signs were electronically recorded using a field data collection device as georeferenced data points, and photographs of fauna signs were also taken. Fauna species were identified using an array of field guides (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 (see Table 4).

Table 4 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 flora recorded and/or collected, any identification issues	**Not a constrained** Given the level of the survey, an adequate number of flora specimens were collected and identified to describe the flora 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.
Access restrictions within the survey area	**Not a constraint** A 20m corridor along the project alignment was surveyed sufficiently to gather necessary data for the assessment.
Survey timing, rainfall, season of survey	**Not a constraint** The timing for flora 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 group 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.

4.0 Results

4.1 Desktop Survey

4.1.1 Conservation-significant flora

Thirty-nine (39) threatened and priority flora species were reported based on DBCA data and PMST search from within 10km of the survey area (see Map 4 and Table 5). Among them, 18 were nationally listed threatened species (see Appendix 3 for definitions), and the rest were listed as priority species by DBCA (see Appendix 4 for definitions). However, the survey area is unlikely to support these conservation-significant species due to the highly disturbed and fragmented environment. See Appendix 6 for complete PMST results.

Table 5 Threatened and Priority flora species reported for the survey area and its vicinity (DBCA data and PMST).

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

Scientific name	Common name	EPBC Act 1999	Priority status
Caladenia huegelii		Critically Endangered	
Caladenia procera		Critically Endangered	
Synaphea sp. Fairbridge Farm (D.Papenfus 696)	Selena's Synaphea	Critically Endangered	
Synaphea sp. Serpentine (G.R.Brand 103)		Critically Endangered	
Austrostipa bronweniae		Endangered	
Andersonia gracilis	Slender Andersonia	Endangered	
Banksia mimica	Summer Honeypot	Endangered	
Diuris purdiei	Purdie's Donkey-orchid	Endangered	
Drakaea elastica	Glossy-leafed Hammer Orchid	Endangered	
Lambertia echinata subsp. occidentalis	Western Prickly Honeysuckle	Endangered	
Synaphea sp. Pinjarra Plain (A.S.George 17182)		Endangered	
Synaphea stenoloba	Dwellingup Synaphea	Endangered	
Anthocercis gracilis	Slender Tailflower	Vulnerable	
Diuris drummondii	Tall Donkey Orchid	Vulnerable	
Diuris micrantha	Dwarf Bee-orchid	Vulnerable	
Eleocharis keigheryi	Keighery's Eleocharis	Vulnerable	
Drakaea micrantha	Dwarf Hammer-orchid	Vulnerable	

Scientific name	Common name	EPBC Act 1999	Priority status
Morelotia australiensis	Southern Tetraria	Vulnerable (listed as *Tetraria australiensis*)	
Caladenia uliginosa subsp. patulens			P1
Caladenia swartsiorum			P2
Haloragis aculeolata			P2
Pterostylis frenchii			P2
Schizaea rupestris			P2
Acacia horridula			P3
Boronia capitata subsp. gracilis			P3
Dillwynia dillwynioides			P3
Grevillea prominens			P3
Hemigenia microphylla			P3
Hibbertia leptotheca			P3
Lasiopetalum membranaceum			P3
Meionectes tenuifolia			P3
Myriophyllum echinatum			P3
Acacia semitrullata			P4
Acacia flagelliformis			P4
Conostylis pauciflora subsp. pauciflora			P4
Caladenia speciosa			P4
Loricobbia skinneri			P4
Senecio leucoglossus			P4
Stylidium longitubum			P4

4.1.2 Conservation-significant fauna

Thirty (30) threatened and priority fauna species were reported based on DBCA data and PMST search from within 10km of the survey area (see Map 5 and Table 6). Among them, 23 were nationally listed threatened species (see Appendix 3 for definitions), and the rest were listed as priority species by DBCA (see Appendix 4 for definitions). Due to the highly disturbed and fragmented nature of the survey area, it is unlikely to support most of these conservation-significant species. However, desktop assessment data suggest that it is highly likely that the survey area still supports all three (3) species of threatened black cockatoos, at least during certain months of the year. See Appendix 6 for complete PMST results.

The Table 7 summarises the habitat characteristics and pre- and post-survey likelihood of occurrence for each threatened and priority fauna species.

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

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

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status
Numenius madagascariensis	Eastern Curlew	Bird	Critically Endangered, migratory	
Calidris ferruginea	Curlew Sandpiper	Bird	Critically Endangered, migratory	
Oxyura australis	Blue-billed duck	Bird		P4
Botaurus poiciloptilus	Australasian Bittern	Bird	Endangered	
Botaurus dubius	Australian little bittern	Bird		P4
Plegadis falcinellus	Glossy ibis	Bird	Specially Protected - Migratory	
Tringa nebularia	Common Greenshank	Bird	Specially Protected - Migratory	
Rostratula australis	Australian Painted Snipe	Bird	Endangered	
Actitis hypoleucos	Common sandpiper	Bird	Specially Protected - Migratory	
Tringa glareola	Wood sandpiper	Bird	Specially Protected - Migratory	
Zanda baudinii	Baudin's Cockatoo	Bird	Endangered (listed as *Calyptorhynchus baudinii*)	
Zanda latirostris	Carnaby's Black Cockatoo	Bird	Endangered (listed as *Calyptorhynchus latirostris*)	
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Bird	Vulnerable	
Falco hypoleucos	Grey Falcon	Bird	Vulnerable	
Tyto novaehollandiae novaehollandiae	Masked owl (southwest)	Bird		P3
Falco peregrinus	Peregrine falcon	Bird	Specially Protected - Other Specially Protected	
Leipoa ocellata	Malleefowl	Bird	Vulnerable	
Calidris acuminata	Sharp-tailed Sandpiper	Bird	Specially Protected - Migratory	
Galaxiella nigrostriata	Blackstriped Dwarf Galaxias	Fish	Endangered	
Pseudocheirus occidentalis	Western Ringtail Possum	Mammal	Critically Endangered	
Myrmecobius fasciatus	Numbat	Mammal	Endangered	

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status
Bettongia penicillata ogilbyi	Woylie	Mammal	Endangered	
Setonix brachyurus	Quokka	Mammal	Vulnerable	
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal	Vulnerable	
Isoodon fusciventer	Quenda, southwestern brown bandicoot	Mammal		P4
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale	Mammal	Specially protected	
Notamacropus irma	Western brush wallaby	Mammal		P4
Hydromys chrysogaster	Water-rat, rakali	Mammal		P4
Westralunio carteri	Carter's Freshwater Mussel	Invertebrate	Vulnerable	
Ctenotus ora	Coastal Plains skink	Reptile		P3

4.1.3 Conservation-Significant Ecological Communities

The DBCA data generated the occurrence of five (5) Threatened and Priority Ecological Communities (TECs and PECs) within 10km of the survey area. Three (3) of these were picked up by the PMST database search. However, none of these TECs and PECs intersect with the proposed work alignment (see Map 8).

4.1.4 Other Significant Areas

Although the PMST database search identified several nationally significant areas (see Appendix 6), none of them intersect with the proposed work alignment. Additionally, two (2) small fragments of native remnant vegetation either intersect or skirt the proposed work alignment (see Map 1).

Table 7 Pre- and post-survey likelihood of their occurrence for Threatened and Priority fauna species reported for the survey area and its vicinity (DBCA data and PMST).

NOTE: The definitions of the likelihood of occurrence criteria are defined in Table 3.

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Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Numenius madagascariensis	Eastern Curlew	Bird	Critically Endangered, migratory		A migratory shorebird, takes an annual migratory flight to Russia and north-eastern China to breed, arriving back home to Australia in August to feed on crabs and molluscs in intertidal mudflats (SPRAT 2025).	Low	Low
Calidris ferruginea	Curlew Sandpiper	Bird	Critically Endangered, migratory		A migratory shorebird, it occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north (SPRAT 2025).	Low	Low
Oxyura australis	Blue-billed duck	Bird		P4	Almost wholly aquatic, it occurs in deep freshwater wetlands, never in marine waters (Menkhorst et al. 2019)	Low	Low
Botaurus poiciloptilus	Australasian Bittern	Bird	Endangered		A native secretive, stocky, heron-like bird, living in wetlands where it forages. Bitterns are very well camouflaged and can be difficult to spot in the reeds and rushes (SPRAT 2025).	Low	Low
Botaurus dubius	Australian little bittern	Bird		P4	A small heron-like bird, it occurs mainly in dense emergent vegetation in freshwater wetlands, especially in reedbeds, also in annundated small shrub thickets (Menkhorst et al. 2019)	Low	Low

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Plegadis falcinellus	Glossy ibis	Bird	Specially Protected - Migratory		Patchily distributed in WA, fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation. The species is occasionally found in coastal locations such as estuaries, deltas, saltmarshes and coastal lagoons (SPRAT 2025).	Low	Low
Tringa nebularia	Common Greenshank	Bird	Specially Protected - Migratory		A migratory shorebird, the species occurs in all types of wetlands and has the widest distribution of any shorebird in Australia (SPRAT 2025).	Low	Low
Rostratula australis	Australian Painted Snipe	Bird	Endangered		Generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (SPRAT 2025).	Low	Low
Actitis hypoleucos	Common sandpiper	Bird	Specially Protected - Migratory		A migratory shorebird, utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties (SPRAT 2025).	Low	Low

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Tringa glareola	Wood sandpiper	Bird	Specially Protected - Migratory		A migratory shorebird, uses well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees, especially Melaleuca and River Red Gums *Eucalyptus camaldulensis* and often with fallen timber (SPRAT 2025).	Low	Low
Zanda baudinii	Baudin's Cockatoo	Bird	Endangered (listed as *Calyptorhynchus baudinii*)		A WA endemic, occurs in eucalypt forests, especially jarrah, marri and karri forest. The species is less frequently in woodlands of wandoo (*Eucalyptus wandoo*), blackbutt (E. *patens*), flooded gum (*E. rudis*), yate (*E. cornuta*), partly cleared farmlands and urban areas, including roadside trees and house gardens. This cockatoo forages at all levels of the forest, from the canopy to the ground, often feeding in the understorey on proteaceous trees and shrubs, especially banksias, and in orchards (both in trees and on dropped or fallen fruit on the ground) (SPRAT 2025).	High	High
Zanda latirostris	Carnaby's Black Cockatoo	Bird	Endangered (listed as *Calyptorhynchus latirostris*)		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 areas that receive high rainfall, e.g. the Swan Coastal Plain (SPRAT 2025).	High	High

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Calyptorhynchus banksii naso	Forest Red-tailed Black-Cockatoo	Bird	Vulnerable		A WA endemic subspecies, inhabits the dense jarrah, karri (*Eucalyptus diversicolor*) and marri forests receiving more than 600 mm average rainfall annually , mainly in the hilly interior. Although most records are in jarrah-marri forests, the subspecies has been observed in a range of other forest and woodland types, including blackbutt (*E. patens*), wandoo (*E. wandoo*), tuart (*E. gomphocephala*), Albany blackbutt (*E. staeri*), yate (*E. cornuta*) and flooded gum (*E. rudis*). This subspecies is also now seen feeding in more open agricultural areas and in the Perth metropolitan area, where it will also breed (SPRAT 2025).	High	High
Falco hypoleucos	Grey Falcon	Bird	Vulnerable		Sparsely distributed and rarely encountered, inhabits open plains with with treed watercourses in arid inland (Menkhorst et al. 2019).	Low	Low
Tyto novaehollandiae novaehollandiae	Masked owl (southwest)	Bird		P3	One of the subspecies that occurs in low densities, strictly nocturnal, roost in tree hollows, dense foliage, or caves. Inhabits a wide variety of forests and open country (Menkhorst et al. 2019).	Medium	Low
Falco peregrinus	Peregrine falcon	Bird	Specially Protected - Other Specially Protected		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).	Medium	Low
Leipoa ocellata	Malleefowl	Bird	Vulnerable		This ground-dwelling bird is famous for its ability to build enormous mounds, occurs in scrubland and woodland dominated by mallee and wattle species (SPRAT 2025).	Low	Low

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Calidris acuminata	Sharp-tailed Sandpiper	Bird	Specially Protected - Migratory		A migratory shorebird, prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry (SPRAT 2025).	Low	Low
Galaxiella nigrostriata	Blackstriped Dwarf Galaxias	Fish	Endangered		A small fish that inhabits acidic ephemeral wetlands of the south-west of WA. Generally prefer sandy soils (has been shown to be more suited for burrowing). Has been documented to survive in both natural wetlands, as well as excavated roadside pools (TSSC 2018).	Low	Low
Pseudocheirus occidentalis	Western Ringtail Possum	Mammal	Critically Endangered		A nocturnal species that roams through the trees at night, feeding on leaves of eucalypt, marri and peppermint trees and other fruits and flowers. It is only found in the south-west of Western Australia and can thrive in urban gardens that have suitable food trees planted and are free from roaming predators, such as cats (SPRAT 2025).	Medium	Low
Myrmecobius fasciatus	Numbat	Mammal	Endangered		It is diurnal and feeds almost exclusively on termites which it obtains by uncovering galleries on the forest floor. It nests in hollow logs, tree hollows or in burrows. Previously widespread in arid and semi-arid Australia, the species is now restricted to two isolated wild populations in south-west Western Australia and a number of translocations to predator proof locations (SPRAT 2025).	Low	Low

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
Bettongia penicillata ogilbyi	Woylie	Mammal	Endangered		A small kangaroo-like mammal, restricted to remnant dry sclerophyll forests with dense understory habitat patches in south-west WA (Menkhorst and Knight 2011).	Low	Low
Setonix brachyurus	Quokka	Mammal	Vulnerable		It is a habitat specialist. In the north of its range it prefers dense understorey, less than 10 years since fire, adjacent vegetation age that is greater than 25 years and the absence of feral predators. In the south of its range, quokkas are strongly linked to complex vegetation structure (minimum of three layers), low densities of woody debris and habitat patchiness (SPRAT 2025).	Low	Low
Dasyurus geoffroii	Chuditch, Western Quoll	Mammal	Vulnerable		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
Isoodon fusciventer	Quenda, southwestern brown bandicoot	Mammal		P4	Scrubby, often swampy, vegetation with dense cover up to 1 m (3 ft 3 in) high, often feeds in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations inhabiting Jarrah and Wandoo forests are usually associated with watercourses. Quenda will thrive in more open habitat subject to introduced predator control. On the Swan Coastal Plain, quenda are often associated with wetlands (ALA 2025).	Medium	High
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale	Mammal	Specially protected		Sparsely distributed outside the semi-arid zone in dry sclerophyll forest and monsoonal forest and woodland. Most common in south-west WA (Menkhorst and Knight 2011).	Low	Low

Scientific name	Common name	Taxa	EPBC Act 1999	Priority status	Habitat	Likelihood of occurrence	
						Pre-survey	Post-survey
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
Hydromys chrysogaster	Water-rat, rakali	Mammal		P4	Widespread and common in variety of aquatic habitats including streams, rivers, lakes, farm dams, and sleltered marine waters (Menkhorst and Knight 2011).	Low	Low
Westralunio carteri	Carter's Freshwater Mussel	Invertebrate	Vulnerable		A WA endemic, patchily distributed in sandy/muddy sediments of freshwater lakes, rivers and streams with greatest densities associated with woody debris and overhanging riparian vegetation near stream banks and edges of lakes/dams (TSSC 2017). There are four (4) previous records within 5km of the site from habitats associated with a stream (DBCA data 2025).	Low	Low
Ctenotus ora	Coastal Plains skink	Reptile		P3	A WA endemic, it has only been found in low numbers in a small stretch of sand dunes on the Swan Coastal Plain south of Perth, WA, between Dunsborough and Mandurah.	Low	Low

4.2 Reconnaissance Flora Survey

Forty (40) flora species were recorded during the flora survey. None of them represented conservation-significant species. However, several important forage species of threatened black cockatoos were identified. The primary black cockatoo forage species was Marri (*Corymbia calophylla*), and a significant portion of the road verge along the proposed work alignment was populated by mature Marri trees with a Diameter at Breast Height (DBH) exceeding 500mm (see Figure 3 and Table 8). Additionally, *Eucalyptus* spp. (predominantly *E. rudis*) were also present.

Figure 3 Mature Marri (*Corymbia calophylla*) trees populated most of the road verge along the proposed work alignment (© Trace Enterprises 2025).

Twenty (20, 50%) flora species were recognised as weed/non-native species (see Table 8). One (1) individual of Narrow-Leaved Cotton Bush (**Gomphocarpus fruticosus*) was observed along Hocart Road, and it is a Declared Pest - s22(2) (BAM Act 2007). It is not a Weed of National Significance (WNS). However, **Gomphocarpus fruticosus* remains a weed of potential national significance (WeedAustralia 2001). The Declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. They may also be subject to control and

keeping requirements once within Western Australia (DPIRD 2025). The rest of the weeds were classified as "Permitted - s11" which indicates permitted organisms must satisfy any applicable import requirements when imported. They may be subject to an import permit if they are potential carriers of high-risk organisms (DPIRD 2025).

Table 8 A list of flora species reported during the flora survey.

Family	Scientific name	Common name	Remarks
Apocynaceae	**Gomphocarpus fruticosus*	Narrow-Leaved Cotton Bush	Declared Pest - s22(2). Not WONS. However, it remains a weed of potential national significance.
Arecaceae	**Washingtonia filifera*	Cotton Palm	Weed, Permitted - s11
Asteraceae	**Erigeron bonariensis*	Flaxleaf Fleabane	Weed, Permitted - s11
Cucurbitaceae	**Citrullus amarus*	Paddy Melon	Weed, Permitted - s11
Dennstaedtiaceae	*Pteridium esculentum*	Austral Bracken	
Fabaceae	*Acacia decurrens*	Early Black-Wattle	
	**Acacia paradoxa*	Kangaroo Thorn	Weed, Permitted - s11
	Acacia pulchella	Prickly Moses	
	**Erythrina* sp.	Coral tree	Weed, Permitted - s11
Haemodoraceae	*Haemodorum spicatum*	Bohn	
Moraceae	**Ficus carica*	Edible Fig	Weed, Permitted - s11
Myrtaceae	*Agonis flexuosa*	Willow Myrtle	
	Corymbia calophylla	Marri	
	Eucalyptus caesia	Silver Princess	
	**Eucalyptus lane-poolei*	Salmonbark	Weed, Permitted - s11
	Eucalyptus occidentalis	Swamp Yate	
	Eucalyptus rudis	Flooded Gum	
	Kunzea glabrescens	Spearwood	
	Melaleuca sp.		
	Melaleuca acutifolia		
	Melaleuca huegelii	Chenille Honeymyrtle	
	**Melaleuca quinquenervia*	Swamp Paperbark	Weed, Permitted - s11
	Melaleuca radula	Graceful Honeymyrtle	
	Melaleuca rhaphiophylla	Swamp Paperbark	
	**Melaleuca viminalis*		Weed, Permitted - s11
Oleaceae	**Olea europaea*	Olive	Weed, Permitted - s11
Pinaceae	**Pinus sp.*		Weed, Permitted - s11
Poaceae	**Arundo donax*	Giant Reed	Weed, Permitted - s11
	**Avena barbata*	Bearded Oats	Weed, Permitted - s11
	**Briza maxima*	Large Quaking-Grass	Weed, Permitted - s11
	**Briza minor*	Lesser Quaking-Grass	Weed, Permitted - s11
	**Cynodon dactylon*	Couch	Weed, Permitted - s11
	**Phalaris aquatica*	Phalaris	Weed, Permitted - s11

Family	Scientific name	Common name	Remarks
Proteaceae	*Hakea linearis*		
	Hakea varia	Variable-Leaved Hakea	
Rosaceae	**Rosa sp.*		Weed, Permitted - s11
Salicaceae	**Populus nigra*	Lombardy Poplar	Weed, Permitted - s11
Solanaceae	**Solanum nigrum*	Black Nightshade	Weed, Permitted - s11
Unknown	*Unknown sp.*		
Xanthorrhoeaceae	*Xanthorrhoea preissii*	Grasstree	

4.3 Basic Fauna Survey

Thirty-one (31) terrestrial vertebrates were recorded during the field survey. The presence of 28 of them was confirmed by direct visual and/or auditory observations (see Table 9). The rest (3 taxa) were not confirmed and represent conservation-significant fauna, and evidence of habitat use was recovered for three (3) taxa. The majority (97%) were represented by birds, while one (1, 3%) taxon was a mammal.

A potential shelter of Priority 4 Quenda/Southwestern brown bandicoot (*Isoodon fusciventer*) was located on the verge of Herbert Road (see Figure 5). Quenda is a small marsupial endemic to WA. They are distributed in urban and suburban environments and are highly likely to occur in the survey area (DBCA 2017). All fauna native to Australia are protected under both State and Commonwealth legislation. The DBCA recognises Quenda as a Priority 4 species, which is described as "Rare, Near Threatened and other species in need of monitoring" (see Appendix 4). Therefore, caution must be exercised during the construction to avoid any negative impacts on Quenda.

A tail feather of a White-tailed black cockatoo (*Zanda latirostris* OR *Z. baudinii*) was recovered below a mature Marri (*Corymbia calophylla*) tree along Herbert Road (see Figure 4). Additionally, evidence of threatened black cockatoos using the survey area as a foraging habitat was recovered.

Figure 4 A tail feather of a White-tailed black cockatoo (*Zanda latirostris* OR *Z. baudinii*) was recovered below a mature Marri tree on a road verge (© Trace Enterprises 2025).

Figure 5 A potential shelter of Priority 4 quenda/southwestern brown bandicoot (*Isoodon fusciventer*) on a road verge (© Trace Enterprises 2025).

Table 9 Terrestrial vertebrate species identified during the fauna survey.

Common name	Scientific name	Taxa	Remarks	Likelihood of occurrence
Australian shelduck	*Tadorna (Casarca) tadornoides*	Bird	Several flocks (3-15 in each flock) observed in wet pastures	Confirmed
Pacific black duck	*Anas (Anas) superciliosa*	Bird	3 observed by a small creek	Confirmed
Australian white ibis	*Threskiornis moluccus*	Bird	~15 observed soaring in the vicinity and then feeding in wet pasture	Confirmed
Straw-necked ibis	*Threskiornis spinicollis*	Bird	~20 observed in scattered flocks feeding in wet pasture	Confirmed
Wedge-tailed eagle	*Aquila (Uroaetus) audax*	Bird	A single bird observed soaring	Confirmed
Galah	*Eolophus roseicapilla*	Bird	Several flocks of ~20 birds in each observed	Confirmed
Western corilla	*Cacatua (Licmetis) pastinator*	Bird	One flock of ~30 birds observed drinking from a water trough and feeding on paddy melons (*Cucumis myriocarpus*)	Confirmed
Australian ringneck	*Barnardius zonarius semitorquatus*	Bird	Widespread and the most abundant species in the survey area, ~50 birds observed in pairs or in small flocks	Confirmed
Elegant parrot	*Neophema (Neonanodes) elegans carteri*	Bird	A small flock of 3 birds observed	Confirmed
Crested pigeon	*Ocyphaps lophotes*	Bird	2 birds observed a nearby electricity cable	Confirmed
Laughing kookaburra	*Dacelo (Dacelo) novaeguineae*	Bird	2 animals heard and 1 observed	Confirmed
Welcome swallow	*Hirundo (Hirundo) neoxena*	Bird	Small flocks of 2-3 observed on several occasions and one large flock of ~30 birds feeding on a pasture	Confirmed
Tree martin	*Petrochelidon (Hylochelidon) nigricans*	Bird	2 birds observed	Confirmed
Yellow-rumped thornbill	*Acanthiza (Geobasileus) chrysorrhoa*	Bird	~15 birds observed feeding in a mixed-species feeding flock	Confirmed
Inland thornbill	*Acanthiza (Acanthiza) apicalis apicalis*	Bird	Several flocks of up to 12-15 birds observed in mixed-species feeding flocks	Confirmed
Brown honeyeater	*Lichmera (Lichmera) indistincta*	Bird	4 birds observed feeding in a blooming exotic South African coral tree (*Erythrina afra*)	Confirmed
Red wattlebird	*Anthochaera (Anthochaera) carunculata*	Bird	Widespread in the survey area, ~15 birds either heard or seen	Confirmed
New Holland honeyeater	*Phylidonyris (Meliornis) novaehollandiae*	Bird	Single bird observed	Confirmed
White-winged triller	*Lalage (Lalage) tricolor*	Bird	Single bird observed	Confirmed
Black-faced cuckoo-shrike	*Coracina (Coracina) novaehollandiae*	Bird	~12 birds observed mainly in either pairs or small family groups	Confirmed
Grey butcherbird	*Cracticus torquatus*	Bird	Single bird observed	Confirmed

Common name	Scientific name	Taxa	Remarks	Likelihood of occurrence
Australian magpie	*Gymnorhina tibicen*	Bird	Small flocks of 2- 6 birds observed on several occasions	Confirmed
Australian raven	*Corvus coronoides*	Bird	Widespread in the survey area, ~15 birds either heard or seen singly or in small flocks of 2-5 birds	Confirmed
Magpie-lark	*Grallina cyanoleuca*	Bird	~5 solitary birds observed	Confirmed
Grey fantail	*Rhipidura (Rhipidura) albiscapa*	Bird	~5 solitary birds observed, some in mixed-species feeding flocks	Confirmed
Willie wagtail	*Rhipidura (Sauloprocta) leucophrys*	Bird	2 solitary birds observed	Confirmed
Rufous whistler	*Pachycephala (Alisterornis) rufiventris*	Bird	3 birds observed, 2 in mixed-species feeding flocks	Confirmed
Silvereye	*Zosterops lateralis*	Bird	Several flocks of up to 12-15 birds observed in mixed-species feeding flocks	Confirmed
Forest red-tailed black cockatoo	*Calyptorhynchus banksii naso*	Bird	A threatened black cockatoo, no direct observations. Evidence recovered for foraging in the survey area.	High
White-tailed black cockatoo	*Zanda latirostris* OR *Zanda baudinii*	Bird	A threatened black cockatoo, no direct observations. Evidence recovered for foraging in the survey area.	High
Quenda/southwestern brown bandicoot	*Isoodon fusciventer*	Mammal	Priority 4 mammal, no direct observations. A potential shelter has been identified.	High

5.0 Discussion

The desktop assessment suggested the potential occurrence of 39 threatened and priority flora species in the survey area. Forty (40) flora species were recorded during the reconnaissance flora survey, but none of them represented conservation-significant species. However, several important forage species of threatened black cockatoos were identified (e.g. *Corymbia calophylla* and *Eucalyptus* spp.). Additionally, 20 weed species were identified, including one (1) Declared Pest - s22(2) (BAM Act 2007), Narrow-Leaved Cotton Bush (**Gomphocarpus fruticosus*) along Hocart Road.

Although the desktop assessment suggested a high to medium likelihood of occurrence for some threatened fauna, none of them were directly observed during the field survey. Thirty-one (31) terrestrial vertebrates were recorded. The presence of 28 was confirmed by direct visual and/or auditory observations. Indirect evidence for four (4) threatened and Priority species/taxa was also recovered. It includes Priority 4 Quenda/Southwestern brown bandicoot (*Isoodon fusciventer*), and three (3) species/taxa of threatened black cockatoos; Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), and Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

Evidence of threatened black cockatoos foraging on Marri nuts (*Corymbia calophylla*) was abundant in the survey area.

Recommendations

- A threatened black cockatoo habitat assessment is required as per the referral guidelines (DAWE 2022) to assess the presence of breeding, roosting, and foraging habitat.
- A significant impact assessment is required as per Matters of National Environmental Significance (MNES) significant Impact guidelines 1.1 (DoE 2013) to determine whether the proposed action is likely to have a significant impact on MNES (i.e. threatened black cockatoos in this case).

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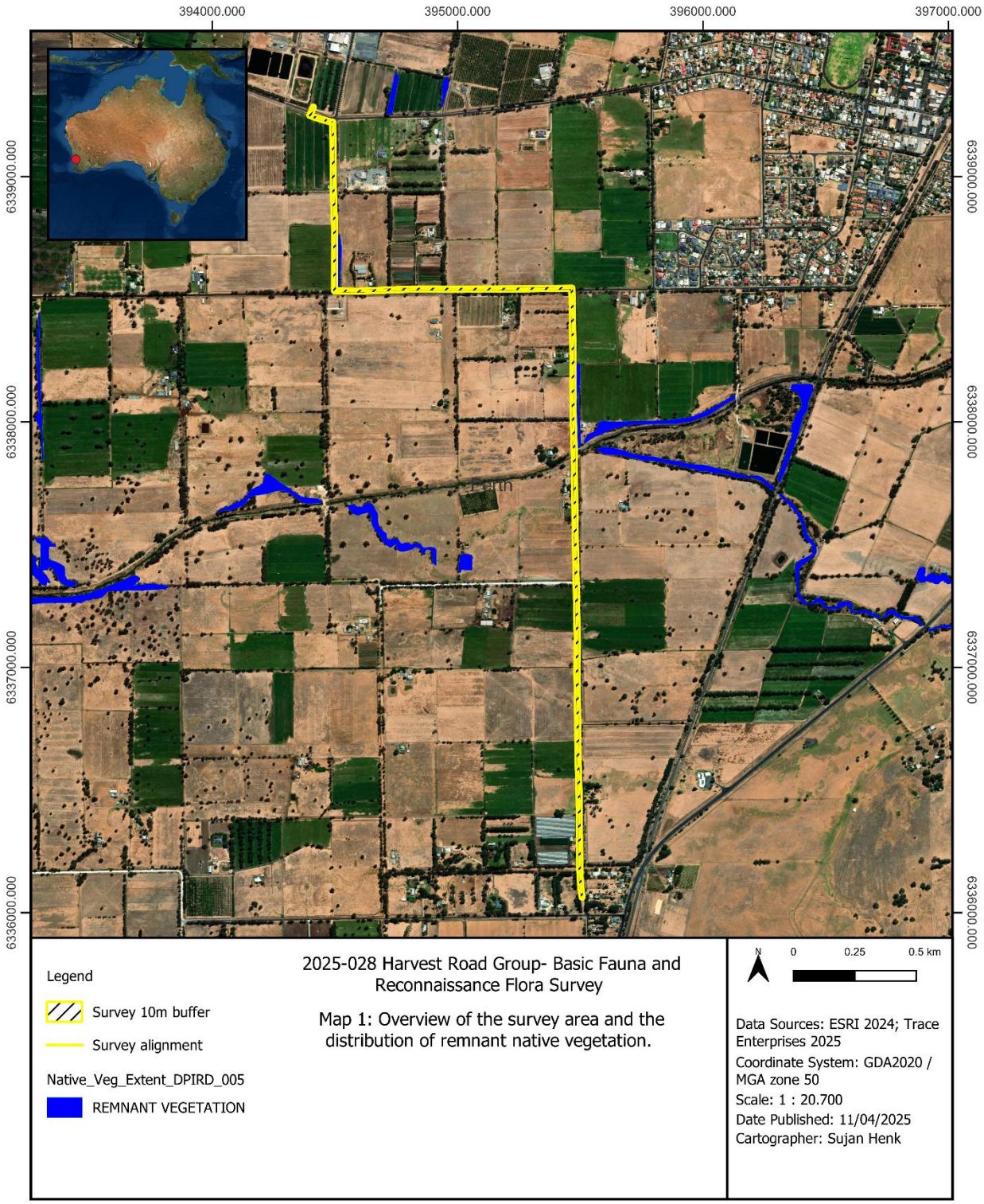
6.0 Maps

Trace developed the GIS spatial data for this assessment, including the survey alignment and associated buffers, based on the cadastral files provided by the client. All the spatial data were electronically provided to the client. This comprehensive dataset includes detailed attribute tables to support and enhance Trace's recommendations.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395000.000
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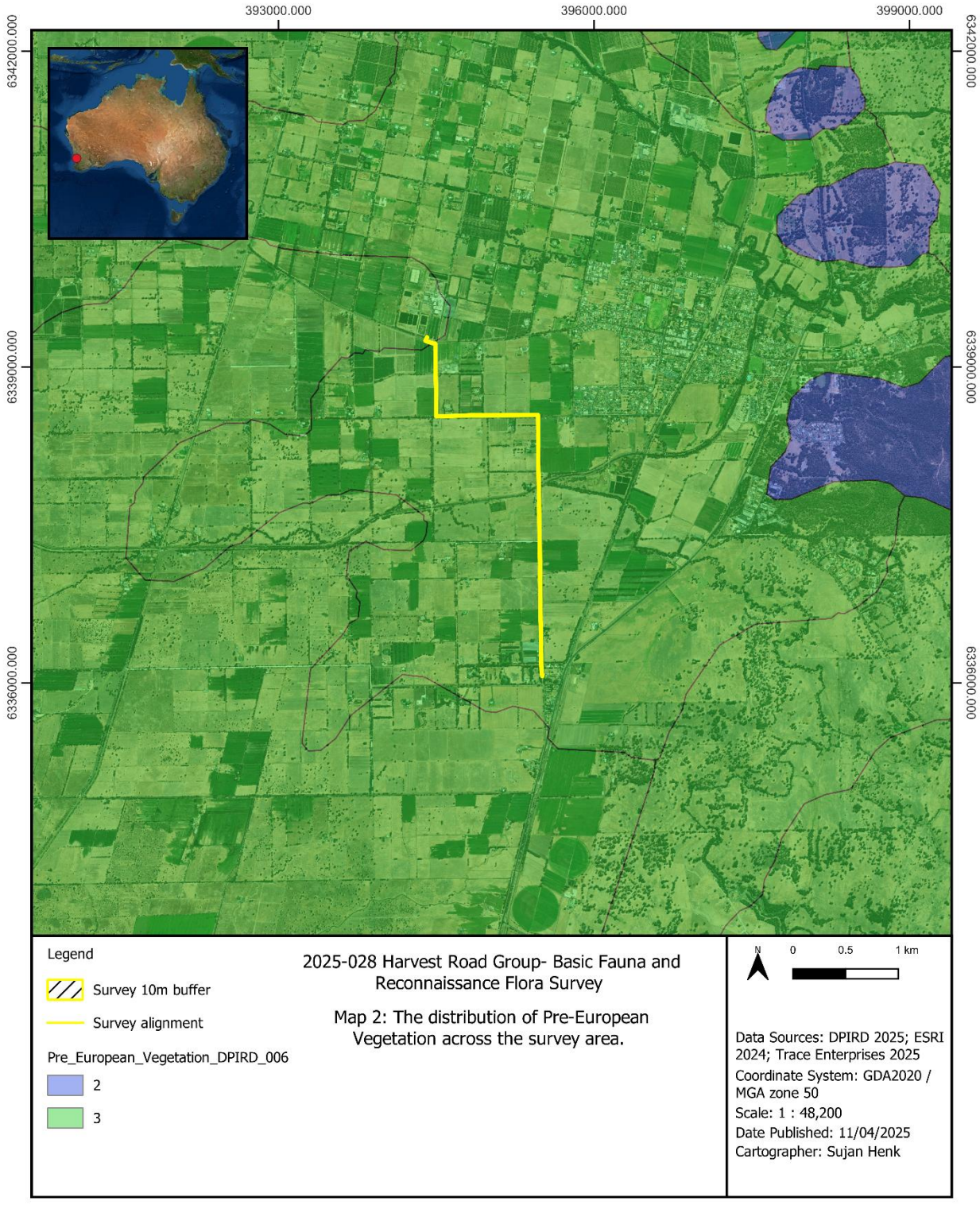
6337000.000
6336000.000
Perth
Legend
Survey 10m buffer
Survey alignment
Native_Veg_Extent_DPIRD_005
REMNANT VEGETATION
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 1: Overview of the survey area and the distribution of remnant native vegetation.
N
0
0.25
0.5 km
Data Sources: ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 20.700
Date Published: 11/04/2025
Cartographer: Sujan Henk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396000.000
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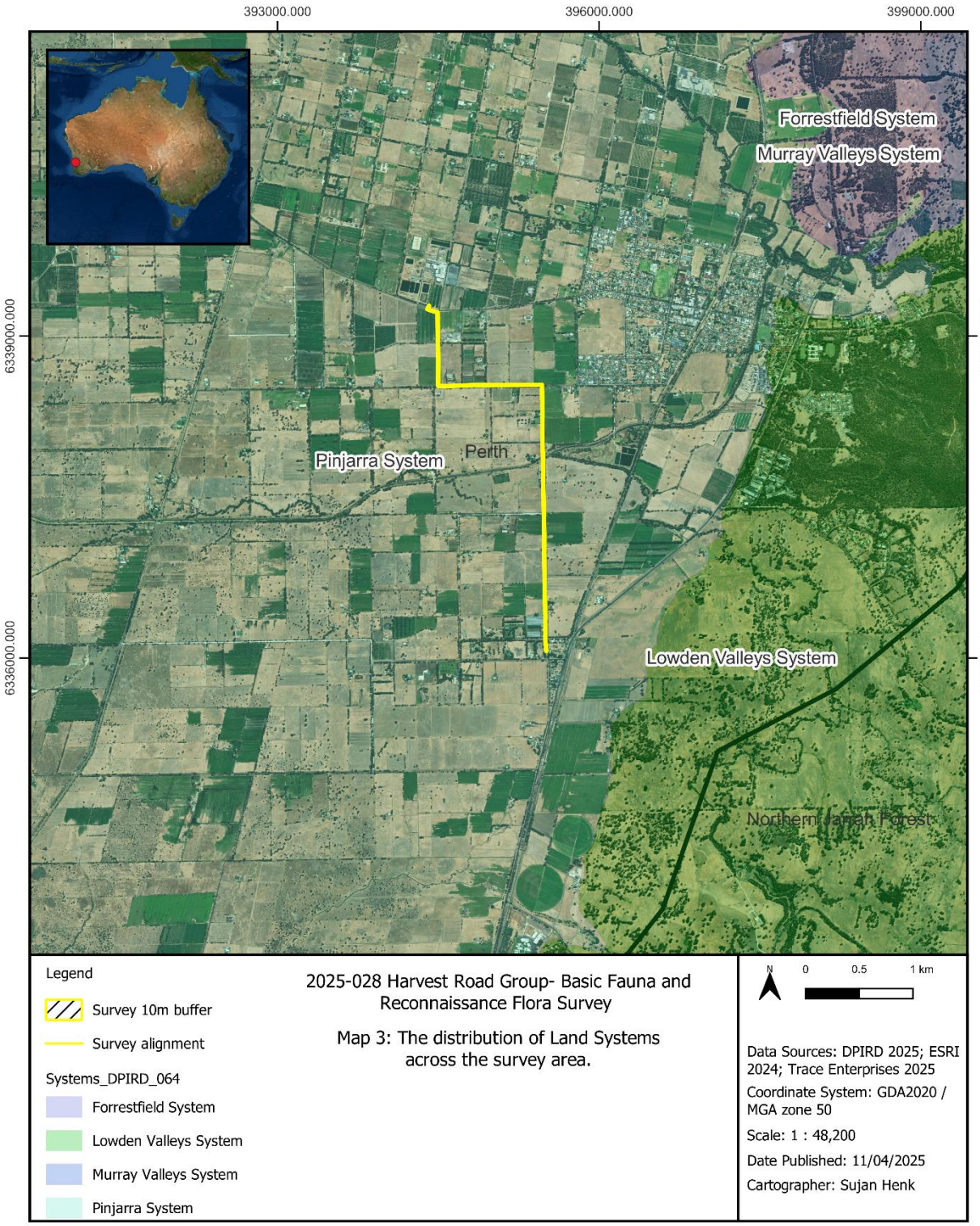
6342000.000
6339000.000
6336000.000
Legend
Survey 10m buffer
Survey alignment
Pre_European_Vegetation_DPIRD_006
2
3
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 2: The distribution of Pre-European Vegetation across the survey area.
N
0
0.5
1 km
Data Sources: DPIRD 2025; ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 48,200
Date Published: 11/04/2025
Cartographer: Sujan Henk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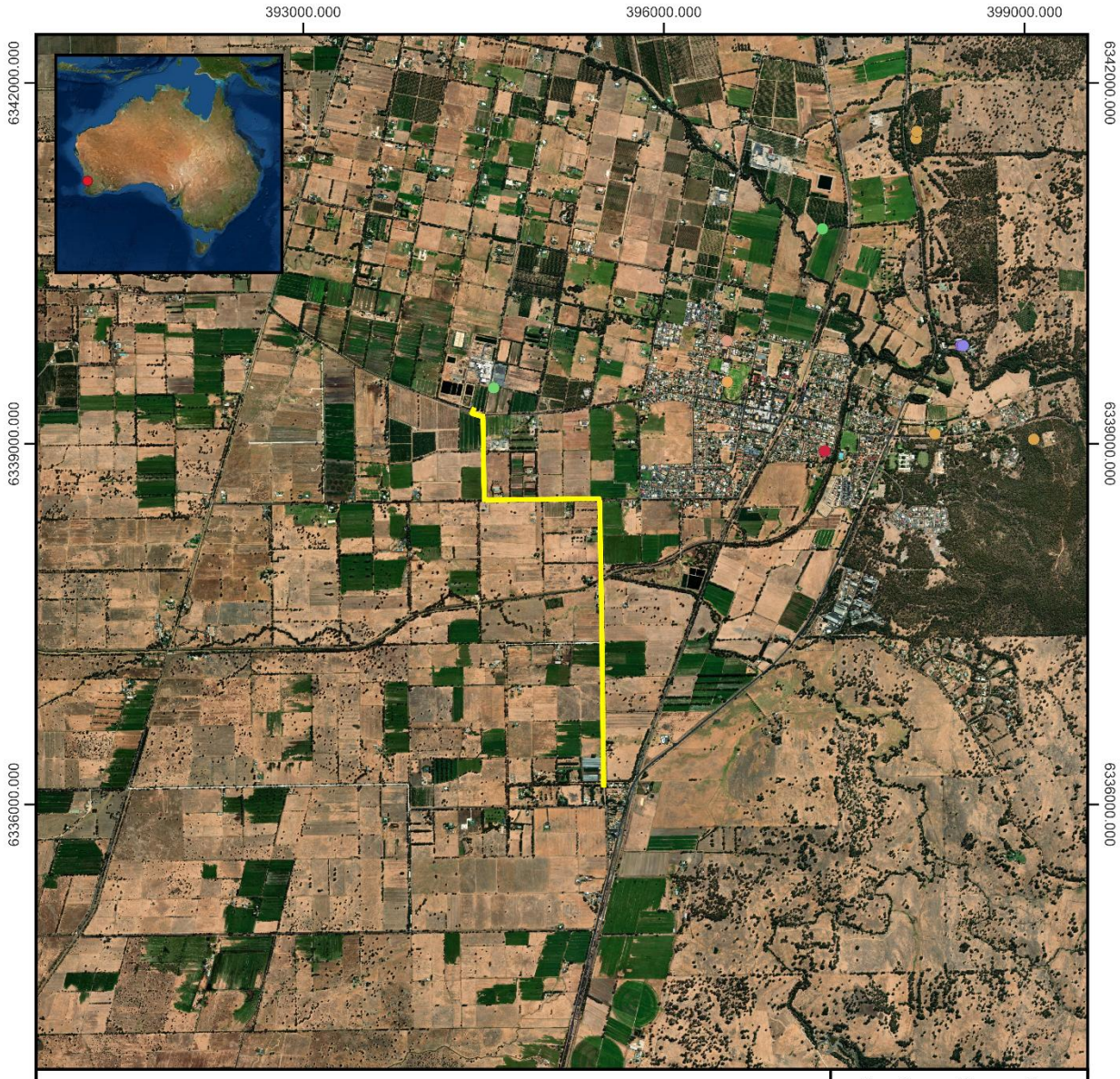
399000.000
6339000.000
6336000.000
Forrestfield System
Murray Valleys System
Pinjarra System
Perth
Lowden Valleys System
Northern Jarrah Forest
Legend
Survey 10m buffer
Survey alignment
Systems_DPIRD_064
Forrestfield System
Lowden Valleys System
Murray Valleys System
Pinjarra System
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 3: The distribution of Land Systems across the survey area.
N
0
0.5
1 km
Data Sources: DPIRD 2025; ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 48,200
Date Published: 11/04/2025
Cartographer: Sujan Henk



2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey

Map 4: The distribution of threatened and priority flora species in the vicinity of the survey area (DBCA data).

Legend

- Revised 10m buffer
- Revised survey alignment

Threatened & Priority flora (WAHerb)

- Acacia semitrullata
- Angianthus drummondii
- Caladenia uliginosa subsp. patulens
- Carex tereticaulis
- Dillwynia dillwynioides
- Diuris drummondii
- Grevillea bipinnatifida subsp. pagna
- Hemigenia microphylla
- Senecio leucoglossus
- Stylidium korijekup

Threatened & Priority flora (TPFL)

- Caladenia uliginosa subsp. patulens

N 0 0.5 1 km

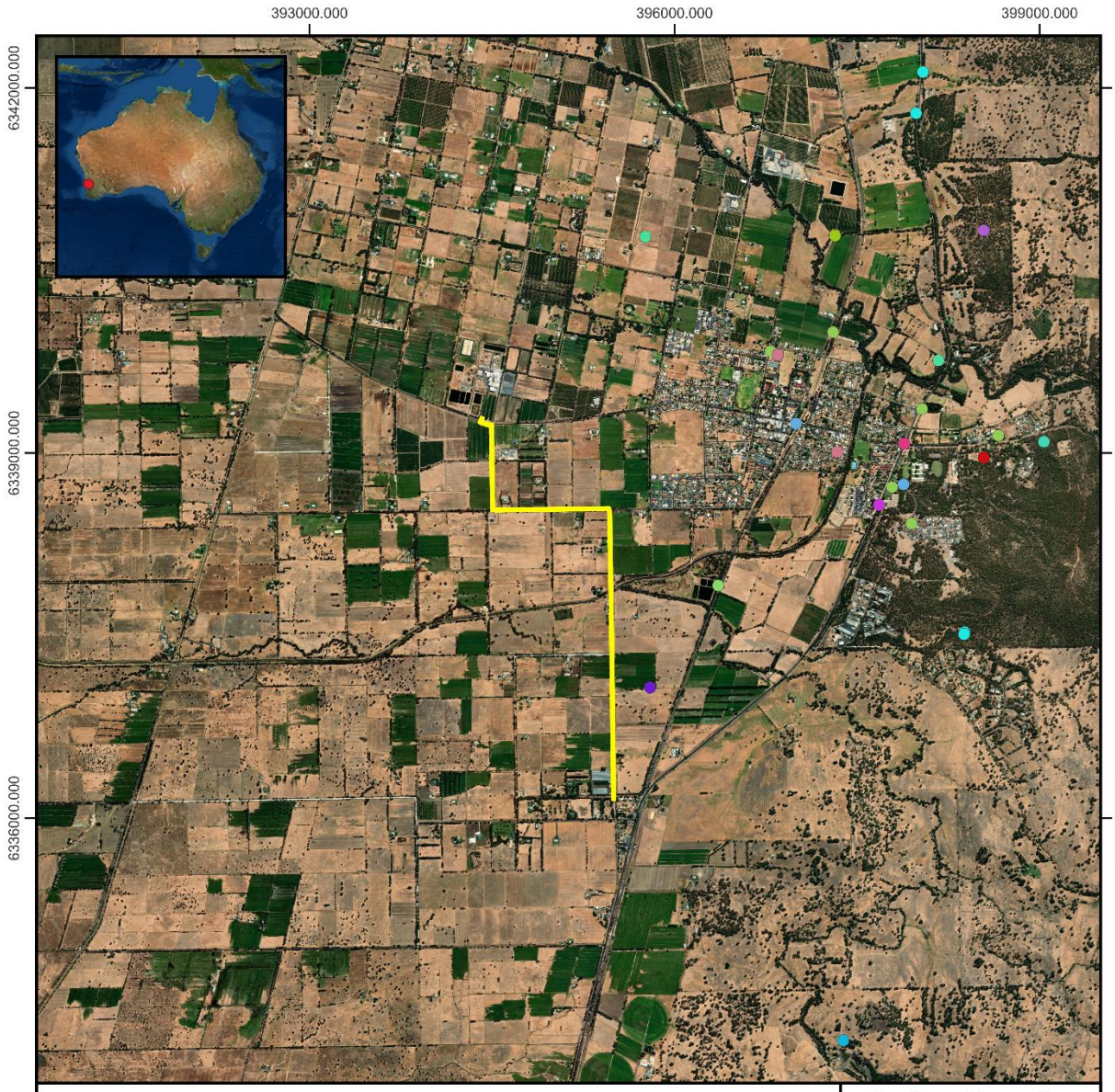
Data Sources: DBCA 2025; ESRI 2024; Trace Enterprises 2025

Coordinate System: GDA2020 / MGA zone 50

Scale: 1 : 48,200

Date Published: 16/04/2025

Cartographer: Sujan Henk



2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey

Map 5: The distribution of threatened and priority fauna species in the vicinity of the survey area (DBCA data).

N 0 0.5 1 km

Legend

Fauna records

- Australasian bittern
- Baudin's cockatoo
- blue-billed duck
- Carnaby's cockatoo
- Carter's freshwater mussel
- chuditch, western quoll
- common greenshank
- forest red-tailed black cockatoo
- masked owl (southwest)
- peregrine falcon
- quokka
- south-western brush-tailed phascogale
- water-rat, rakali
- western brush wallaby
- western ringtail possum
- white-tailed black cockatoo
- wood sandpiper

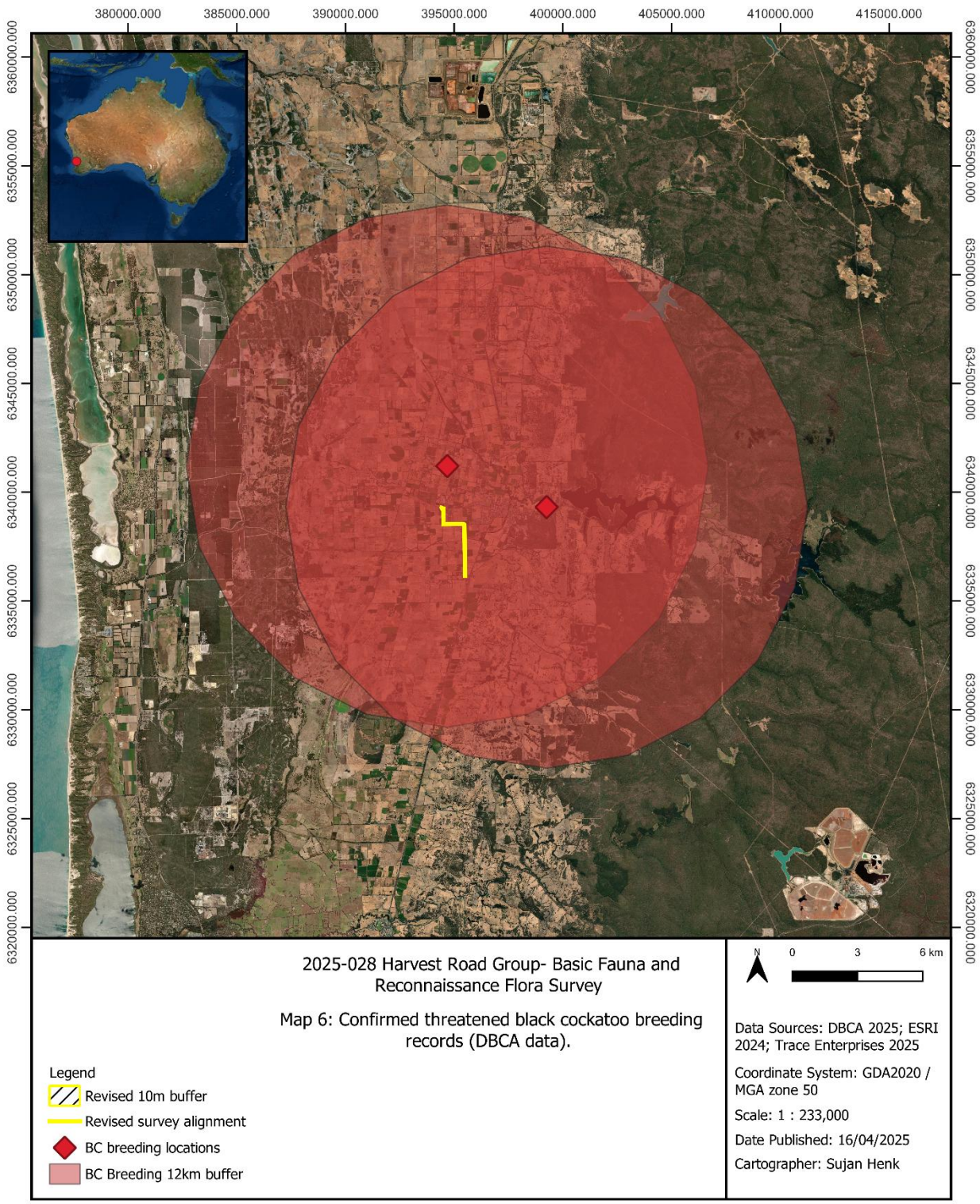
Data Sources: DPIRD 2025; ESRI 2024; Trace Enterprises 2025

Coordinate System: GDA2020 / MGA zone 50

Scale: 1 : 48,200

Date Published: 16/04/2025

Cartographer: Sujan Henk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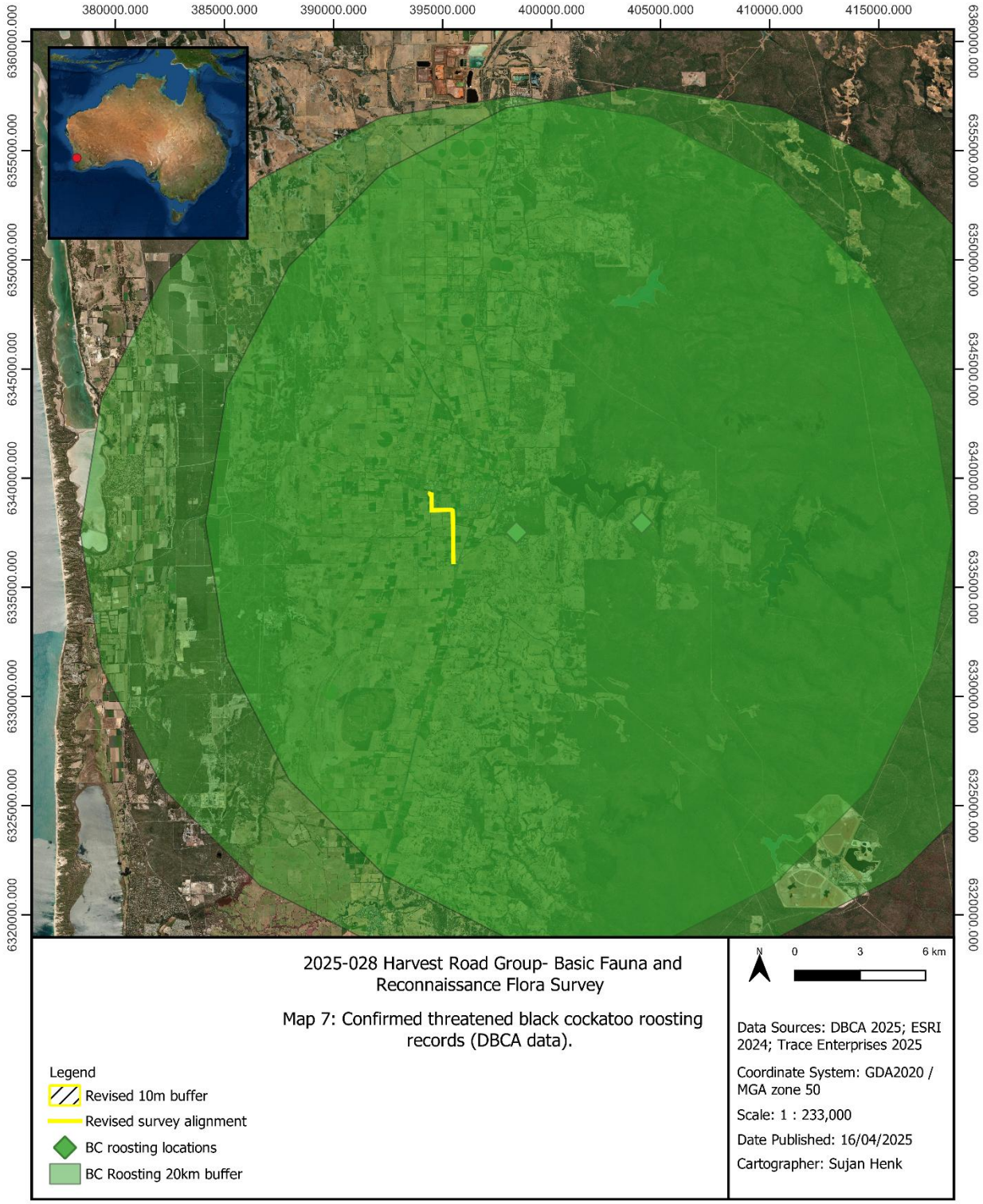
6335000.000
6330000.000
6325000.000
6320000.000
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 6: Confirmed threatened black cockatoo breeding records (DBCA data).
Legend
Revised 10m buffer
Revised survey alignment
BC breeding locations
BC Breeding 12km buffer
N
0
3
6 km
Data Sources: DBCA 2025; ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 233,000
Date Published: 16/04/2025
Cartographer: Sujan Henk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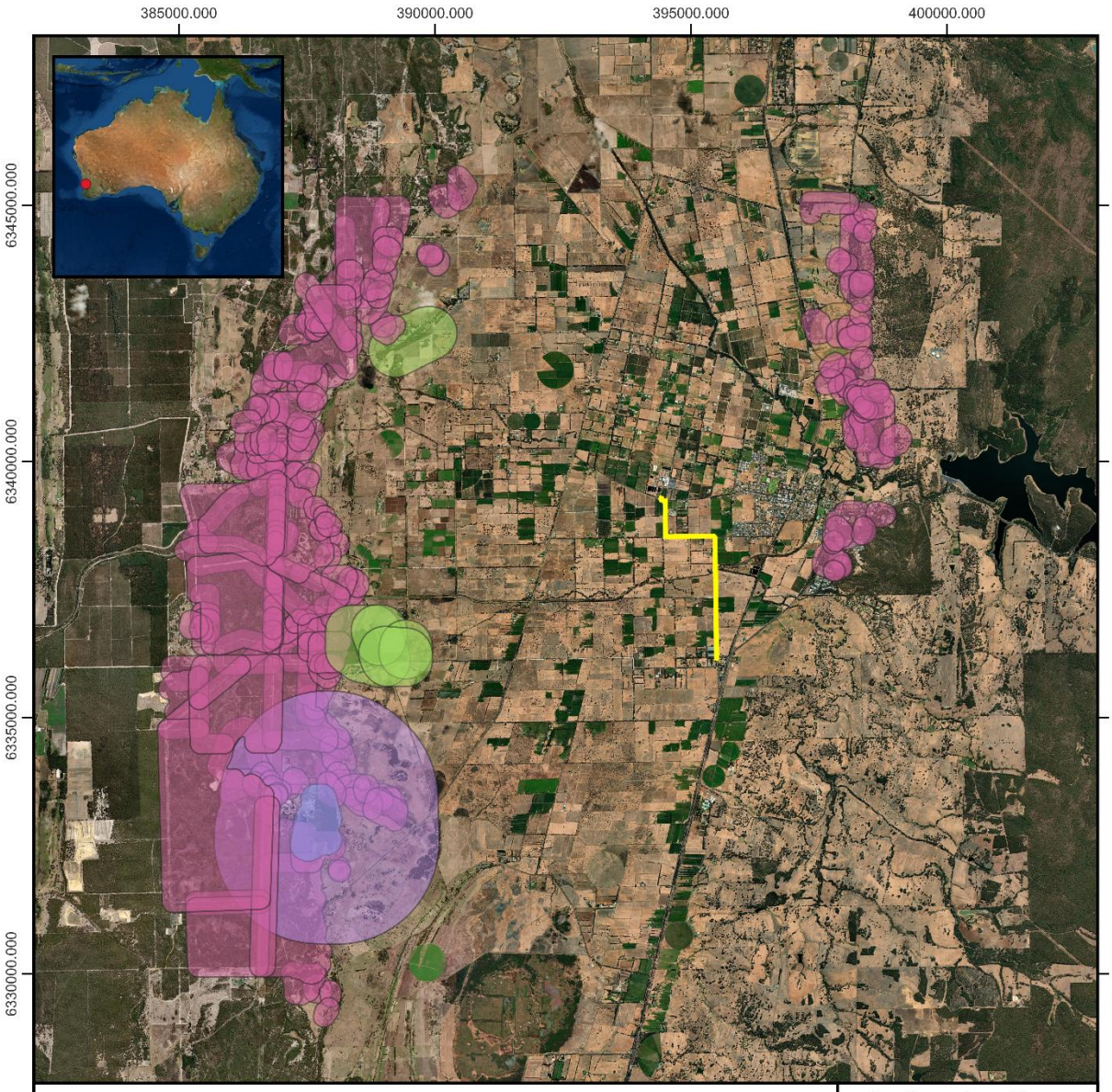
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 7: Confirmed threatened black cockatoo roosting records (DBCA data).
Legend
Revised 10m buffer
Revised survey alignment
BC roosting locations
BC Roosting 20km buffer
N
0
3
6 km
Data Sources: DBCA 2025; ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 233,000
Date Published: 16/04/2025
Cartographer: Sujan Henk



2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey

Map 8: The distribution of Threatened and Priority Ecological Communities (TECs and PECs) in the vicinity of the survey area (DBCA data).

Legend

Revised 10m buffer

Revised survey alignment

TECs and PECs

- Banksia attenuata and/or Eucalyptus marginata woodlands
- Banksia Woodlands of the Swan Coastal Plain ecological community
- Dense shrublands on clay flats floristic community type 9
- Herb rich shrublands in clay pans floristic community type 8
- Shrublands and woodlands on Muchea Limestone of the Swan Coastal Plain

N 0 1 2 km

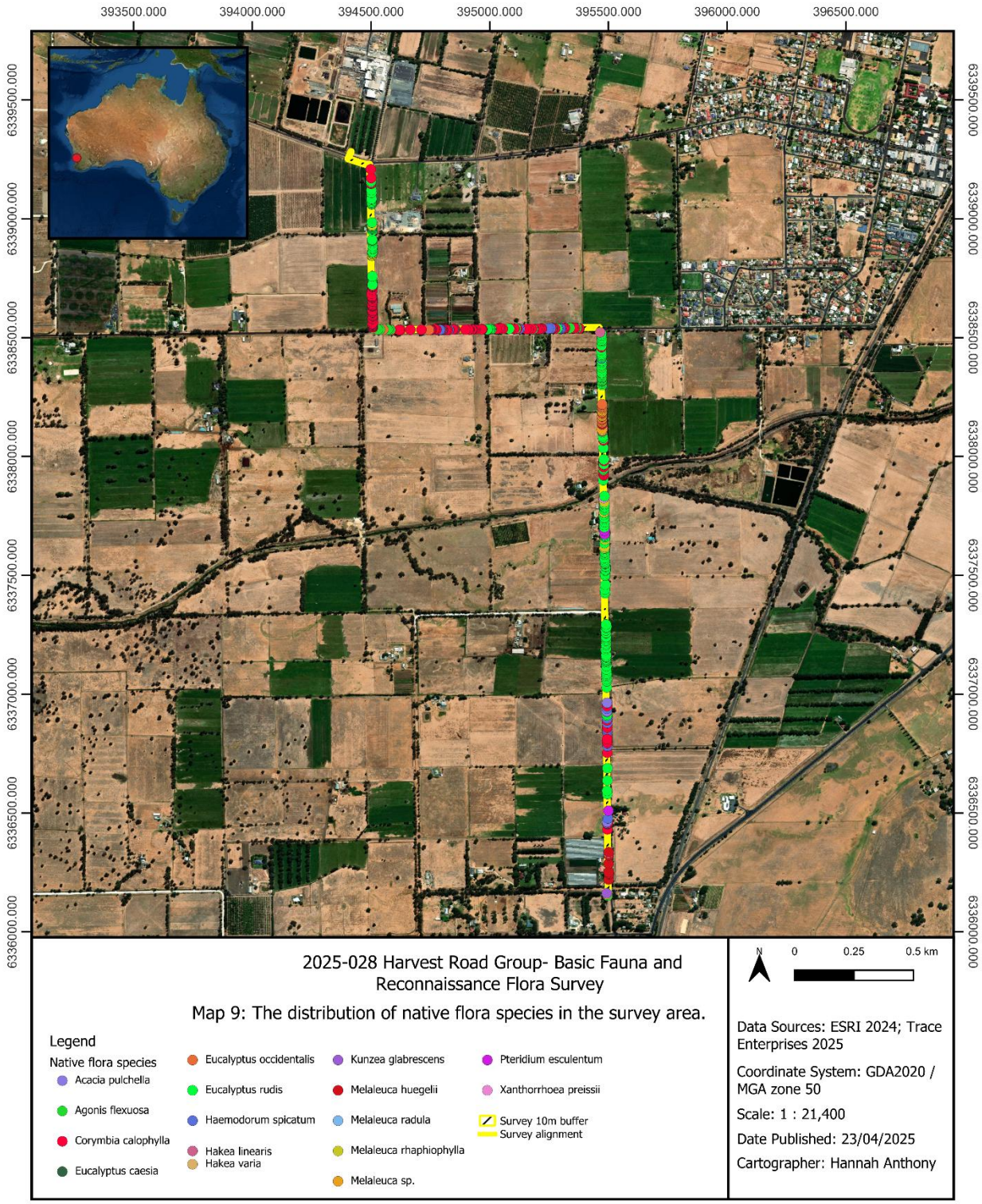
Data Sources: DBCA 2025; ESRI 2024; Trace Enterprises 2025

Coordinate System: GDA2020 / MGA zone 50

Scale: 1 : 233,000

Date Published: 16/04/2025

Cartographer: Sujan Henk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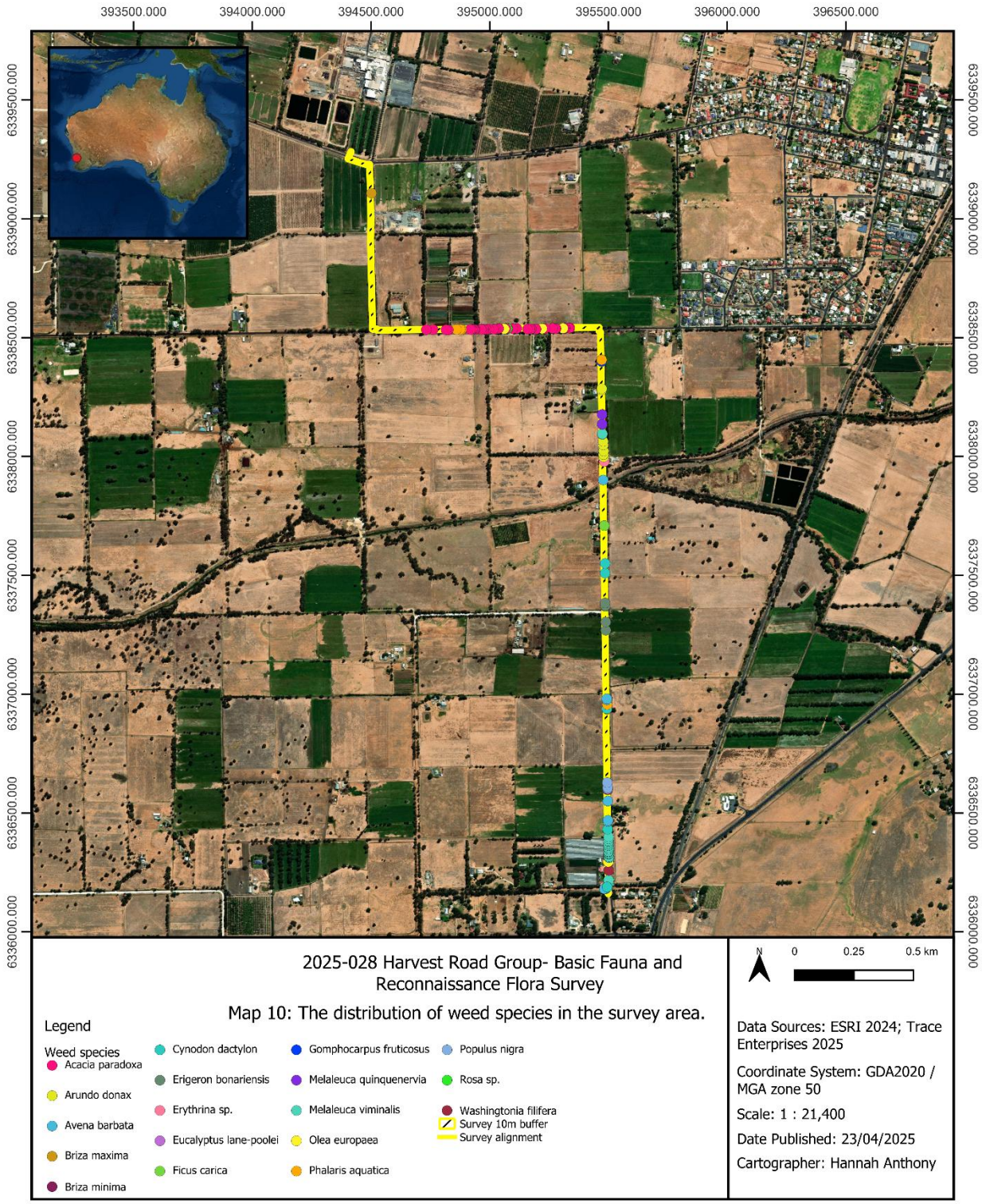
6338500.000
6338000.000
6337500.000
6337000.000
6336500.000
6336000.000
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 9: The distribution of native flora species in the survey area.
Legend
Native flora species
Acacia pulchella
Agonis flexuosa
Corymbia calophylla
Eucalyptus caesia
Eucalyptus occidentalis
Eucalyptus rudis
Haemodorum spicatum
Hakea linearis
Hakea varia
Kunzea glabrescens
Melaleuca huegelii
Melaleuca radula
Melaleuca rhaphiophylla
Melaleuca sp.
Pteridium esculentum
Xanthorrhoea preissii
Survey 10m buffer
Survey alignment
N
0
0.25
0.5 km
Data Sources: ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 21,400
Date Published: 23/04/2025
Cartographer: Hannah Anthony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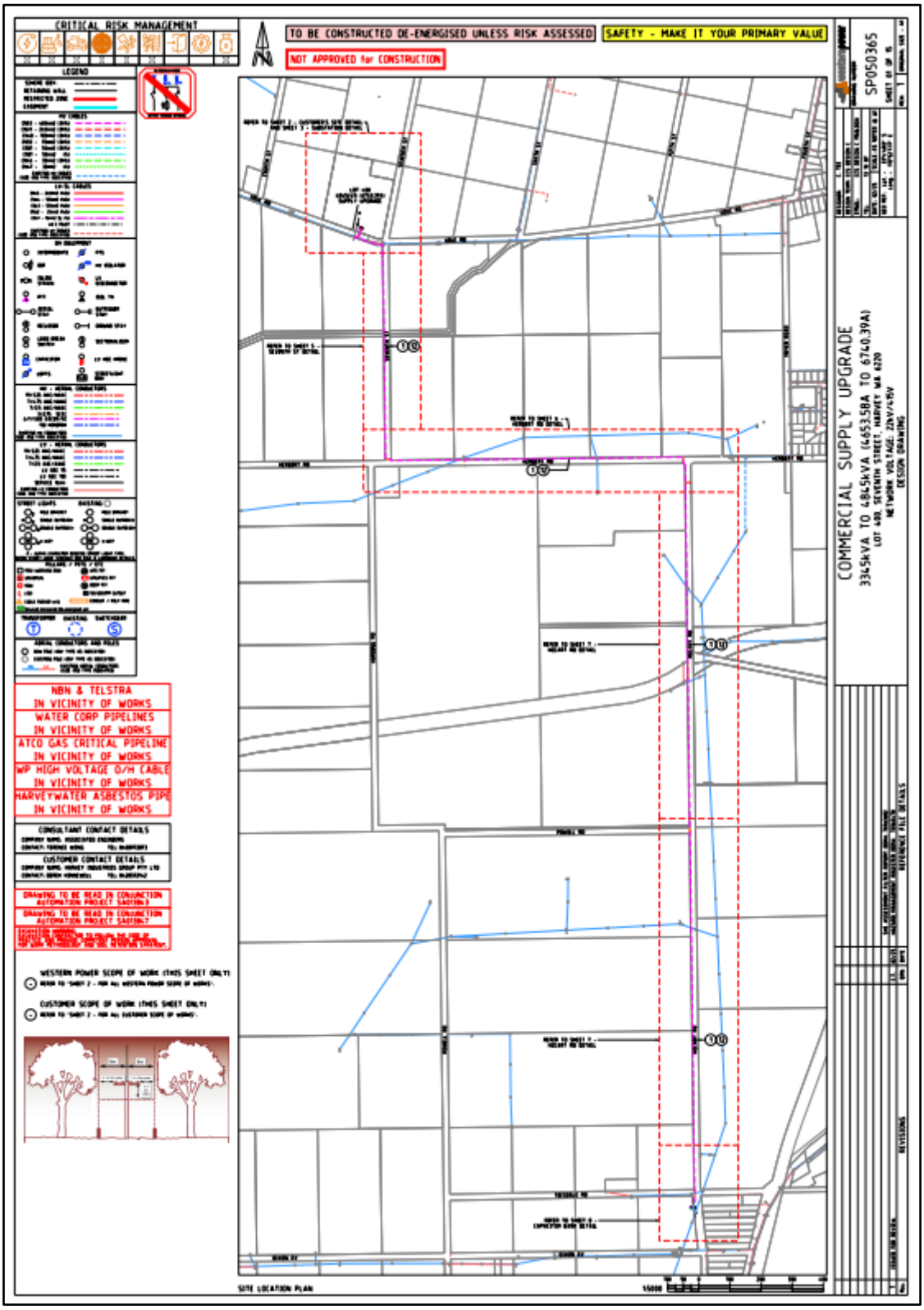
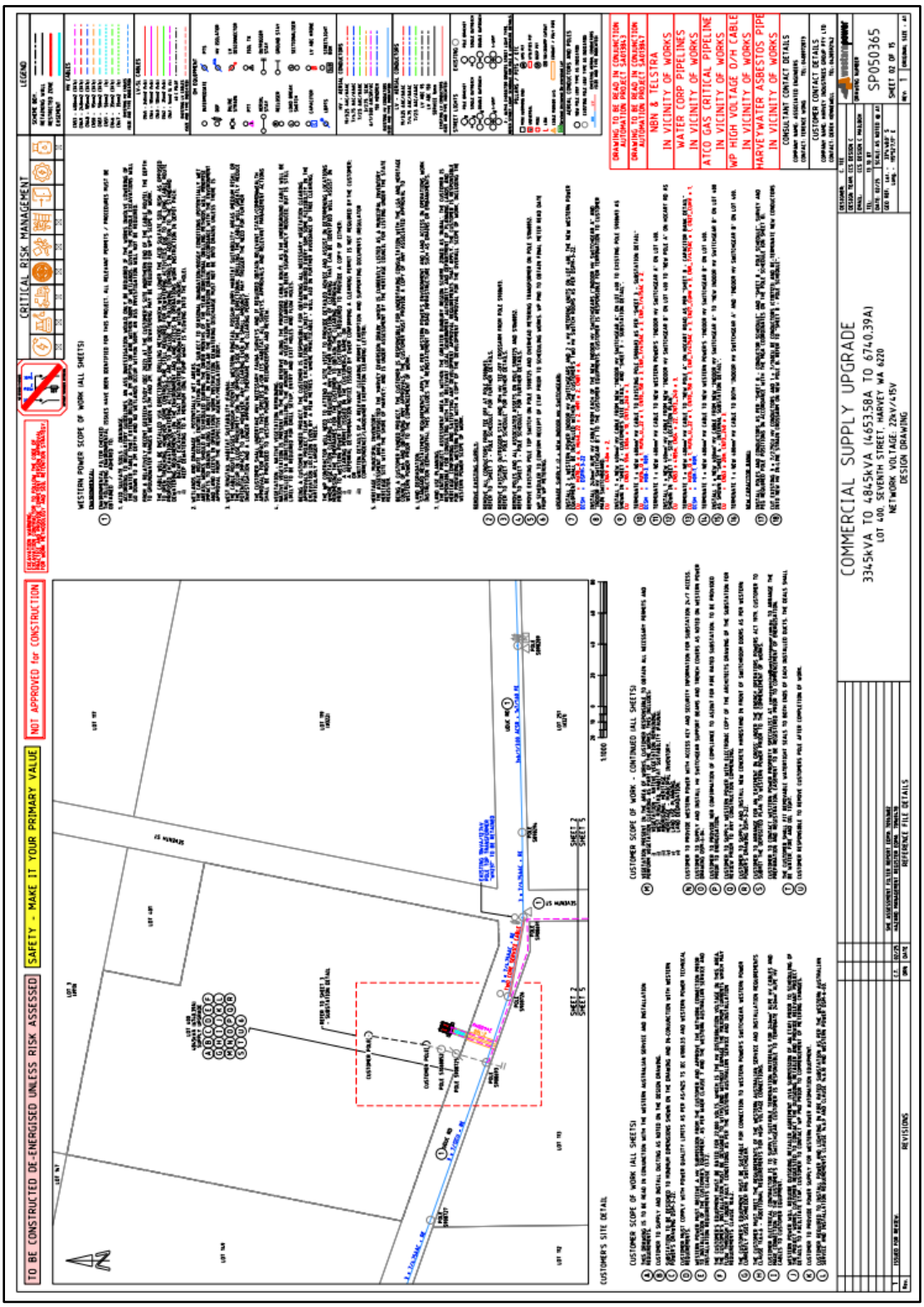
6338500.000
6338000.000
6337500.000
6337000.000
6336500.000
6336000.000
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 10: The distribution of weed species in the survey area.
Legend
Weed species
Acacia paradoxa
Arundo donax
Avena barbata
Briza maxima
Briza minima
Cynodon dactylon
Erigeron bonariensis
Erythrina sp.
Eucalyptus lane-poolei
Ficus carica
Gomphocarpus fruticosus
Melaleuca quinquenervia
Melaleuca viminalis
Olea europaea
Phalaris aquatica
Populus nigra
Rosa sp.
Washingtonia filifera
Survey 10m buffer
Survey alignment
N
0
0.25
0.5 km
Data Sources: ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 21,400
Date Published: 23/04/2025
Cartographer: Hannah Anthony

7.0 Appendices

Appendix 1 Scope of Works

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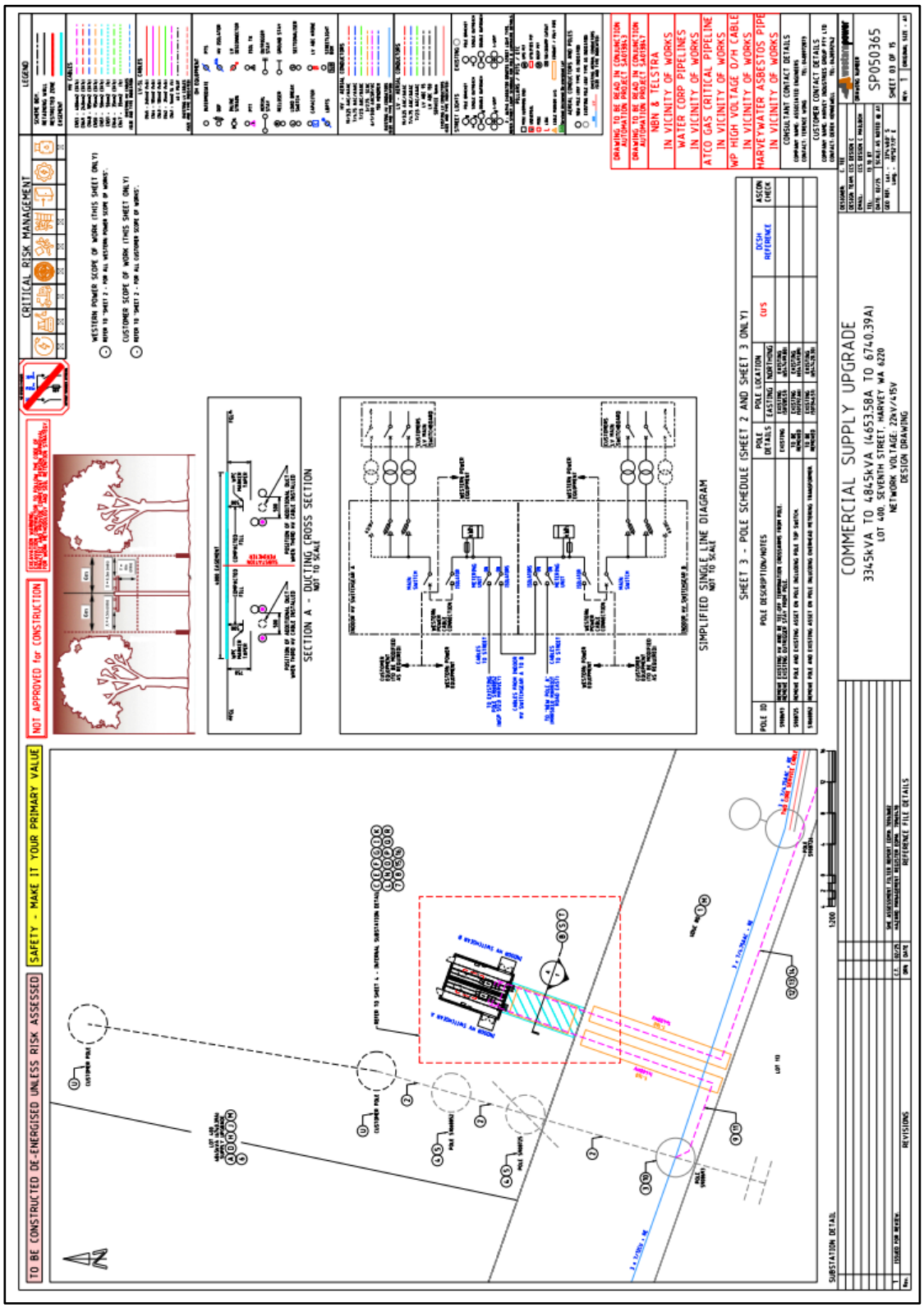
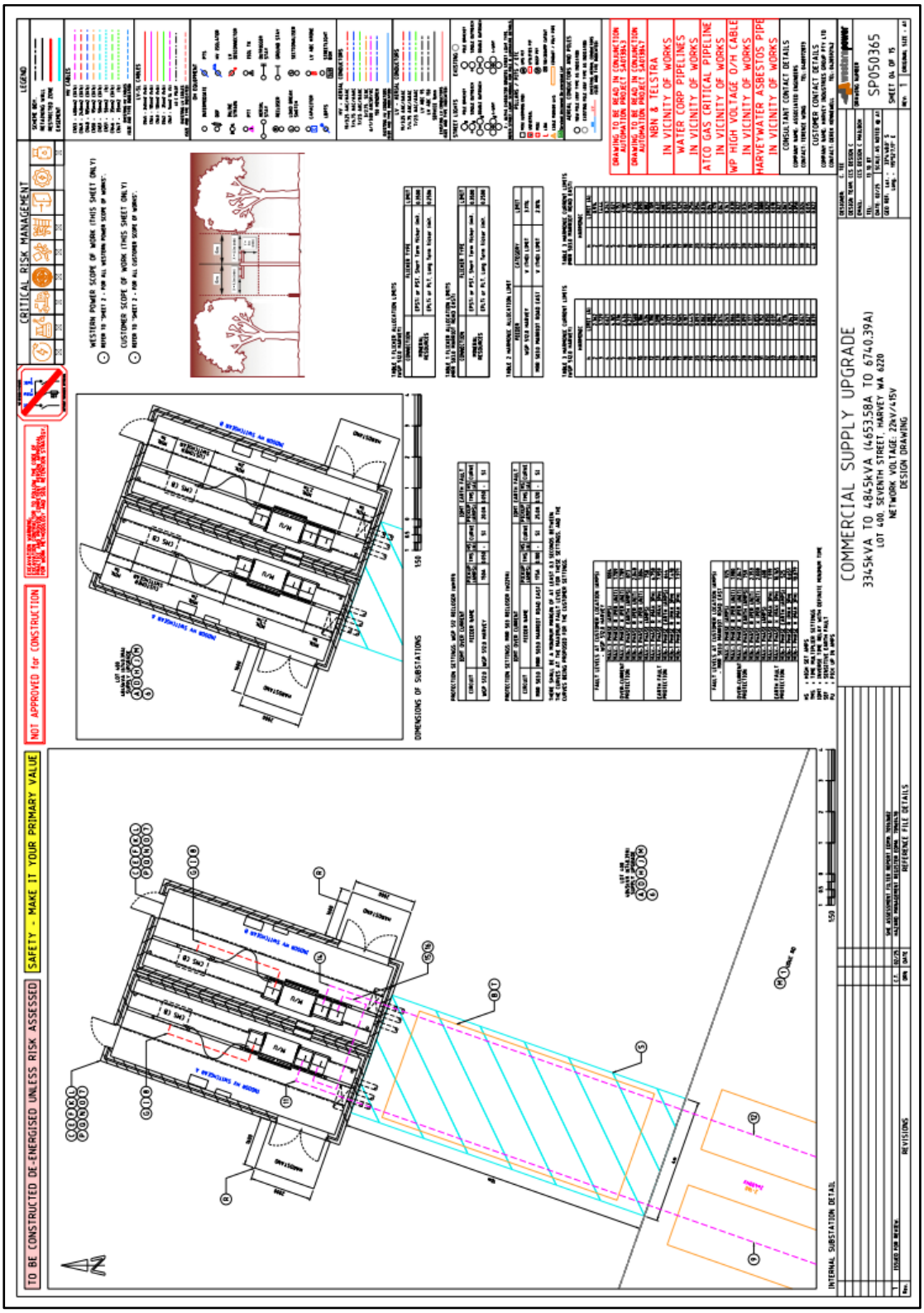
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
CRITICAL RISK MANAGEMENT
LEGEND
COMMERCIAL SUPPLY UPGRADE
3345kVA TO 4845kVA (465358A TO 674039A)
LOT 600 SEVENTH STREET, HARVEY WA 6220
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
SP050365
SHEET 02 OF 15
NBN & TELSTRA
IN VICINITY OF WORKS
WATER CORP PIPELINES
IN VICINITY OF WORKS
ATCO GAS CRITICAL PIPELINE
IN VICINITY OF WORKS
WP HIGH VOLTAGE O/H CABLE
IN VICINITY OF WORKS
HARVEYWATER ASBESTOS PIPE
IN VICINITY OF WORKS
CUSTOMER'S SITE DETAIL
CUSTOMER SCOPE OF WORK (ALL SHEETS)
CUSTOMER SCOPE OF WORK - CONTINUED (ALL SHEETS)
WESTERN POWER SCOPE OF WORK (ALL SHEETS)


TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
CRITICAL RISK MANAGEMENT
LEGEND
WESTERN POWER SCOPE OF WORK (THIS SHEET ONLY)
CUSTOMER SCOPE OF WORK (THIS SHEET ONLY)
SECTION A - DUCTING CROSS SECTION
NOT TO SCALE
SIMPLIFIED SINGLE LINE DIAGRAM
NOT TO SCALE
SHEET 3 - POLE SCHEDULE (SHEET 2 AND SHEET 3 ONLY)
COMMERCIAL SUPPLY UPGRADE
3345kVA TO 4845kVA (465358A TO 674039AI)
LOT 400, SEVENTH STREET, HARVEY WA 6220
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
SP050365
SUBSTATION DETAIL
REVISIONS
REFERENCE FILE DETAILS


COMMERCIAL SUPPLY UPGRADE
3345kVA TO 4845kVA (4653.58A TO 6740.39A)
LOT 400 SEVENTH STREET, HARVEY WA 6220
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
SP050365
CRITICAL RISK MANAGEMENT
SAFETY - MAKE IT YOUR PRIMARY VALUE
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
NOT APPROVED for CONSTRUCTION
DRAWING TO BE READ IN CONJUNCTION AUTOMATION PROJECT SARTRA1
DRAWING TO BE READ IN CONJUNCTION AUTOMATION PROJECT SARTRA1
NBN & TELSTRA
IN VICINITY OF WORKS
WATER CORP PIPELINES
IN VICINITY OF WORKS
ATCO GAS CRITICAL PIPELINE
IN VICINITY OF WORKS
WP HIGH VOLTAGE O/H CABLE
IN VICINITY OF WORKS
HARVEYWATER ASBESTOS PIPE
IN VICINITY OF WORKS
LEGEND
INTERNAL SUBSTATION DETAIL
DIMENSIONS OF SUBSTATIONS
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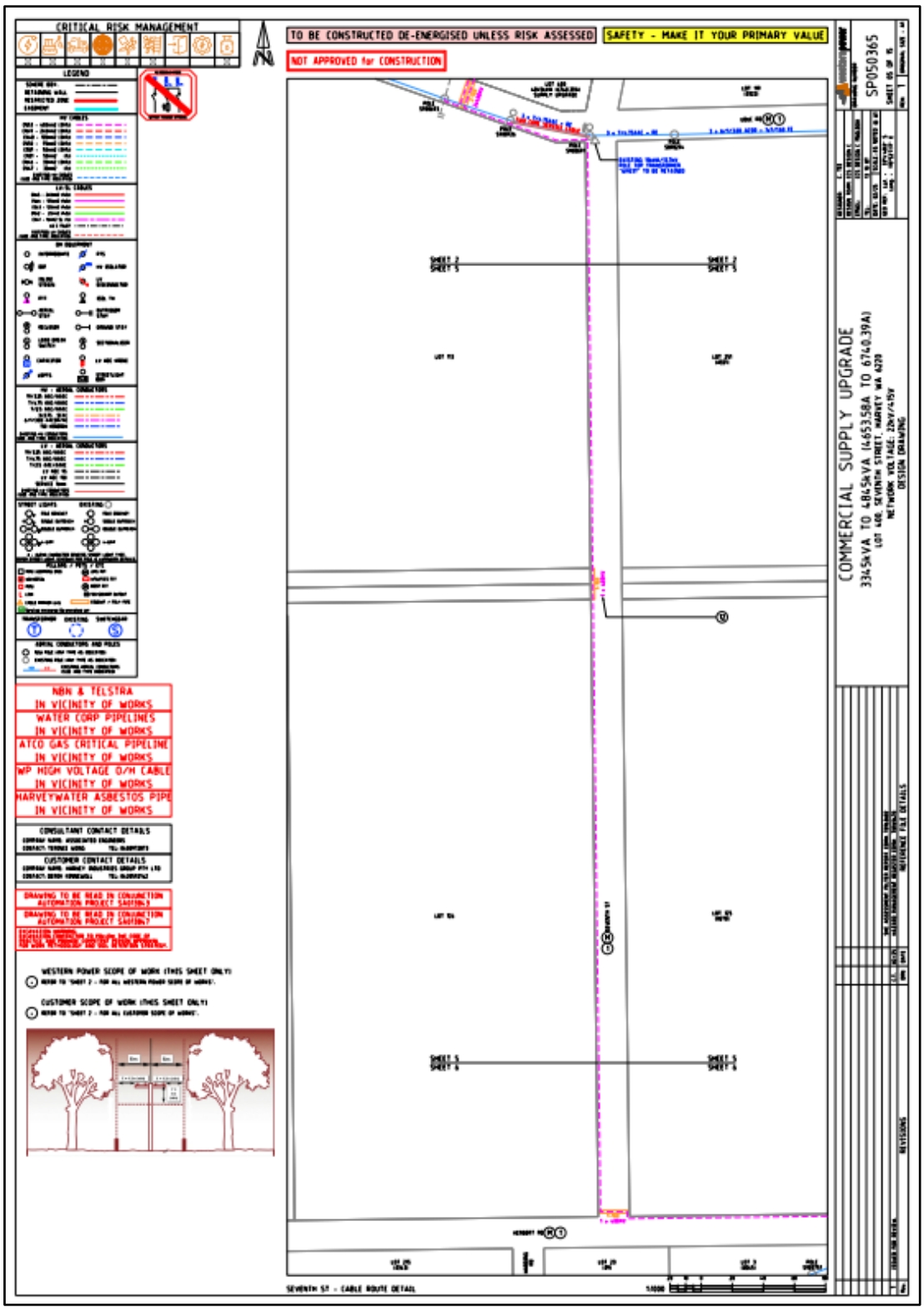
CUSTOMER SCOPE OF WORK (THIS SHEET ONLY)
REVISIONS
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS


CRITICAL RISK MANAGEMENT
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
LEGEND
NBN & TELSTRA IN VICINITY OF WORKS
WATER CORP PIPELINES IN VICINITY OF WORKS
ATCO GAS CRITICAL PIPELINE IN VICINITY OF WORKS
WP HIGH VOLTAGE O/H CABLE IN VICINITY OF WORKS
HARVEYWATER ASBESTOS PIPE IN VICINITY OF WORKS
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
WESTERN POWER SCOPE OF WORK (THIS SHEET ONLY)
CUSTOMER SCOPE OF WORK (THIS SHEET ONLY)
COMMERCIAL SUPPLY UPGRADE
3345kVA TO 4845kVA (4653.58A TO 6740.39A)
LOT 400, SEVENTH STREET, HARVEY WA 6220
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
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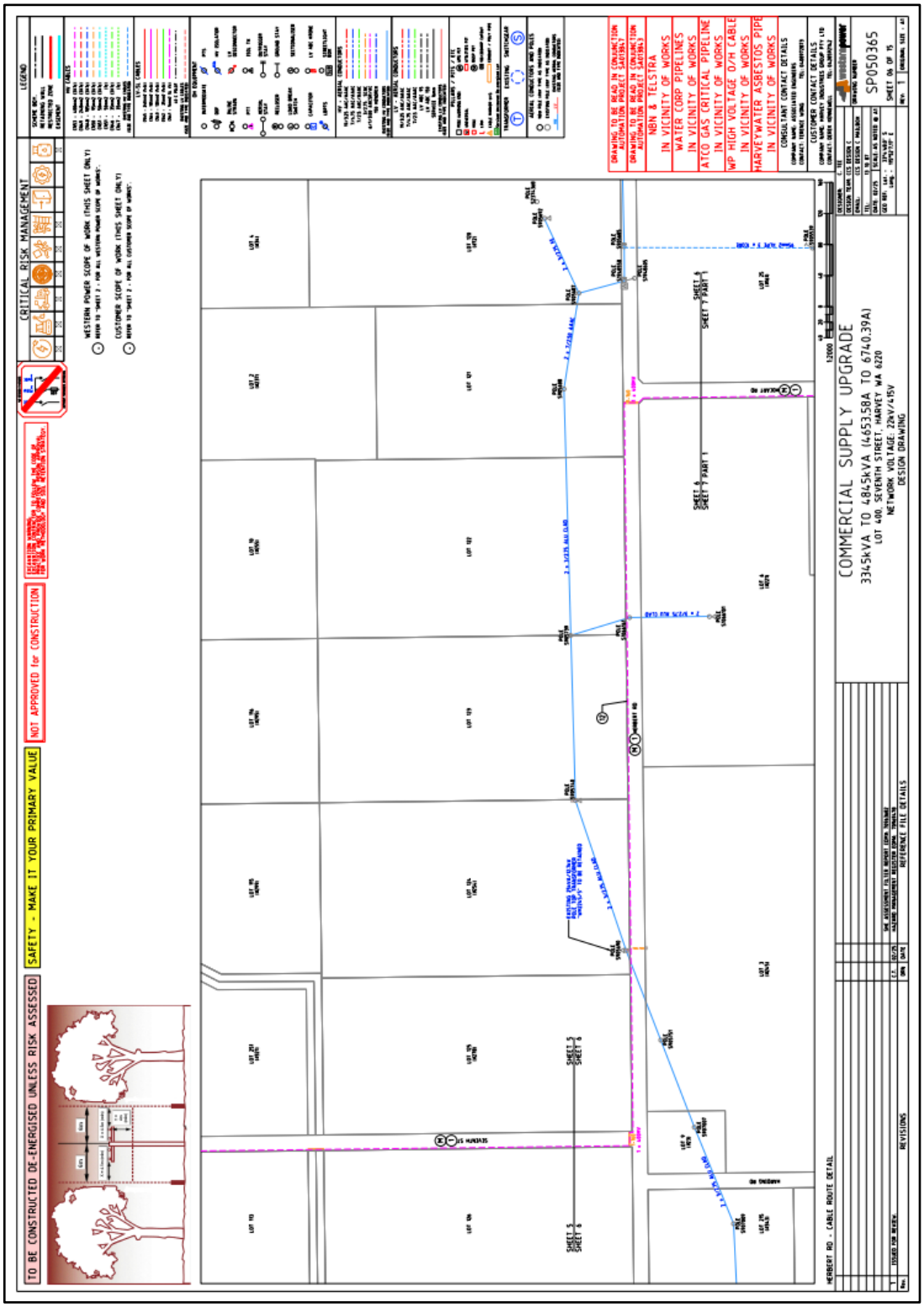
SEVENTH ST - CABLE ROUTE DETAIL


TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
CRITICAL RISK MANAGEMENT
LEGEND
COMMERCIAL SUPPLY UPGRADE
334.5kVA TO 484.5kVA (4653.58A TO 6740.39A)
LOT 400, SEVENTH STREET, HARVEY WA 6220
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
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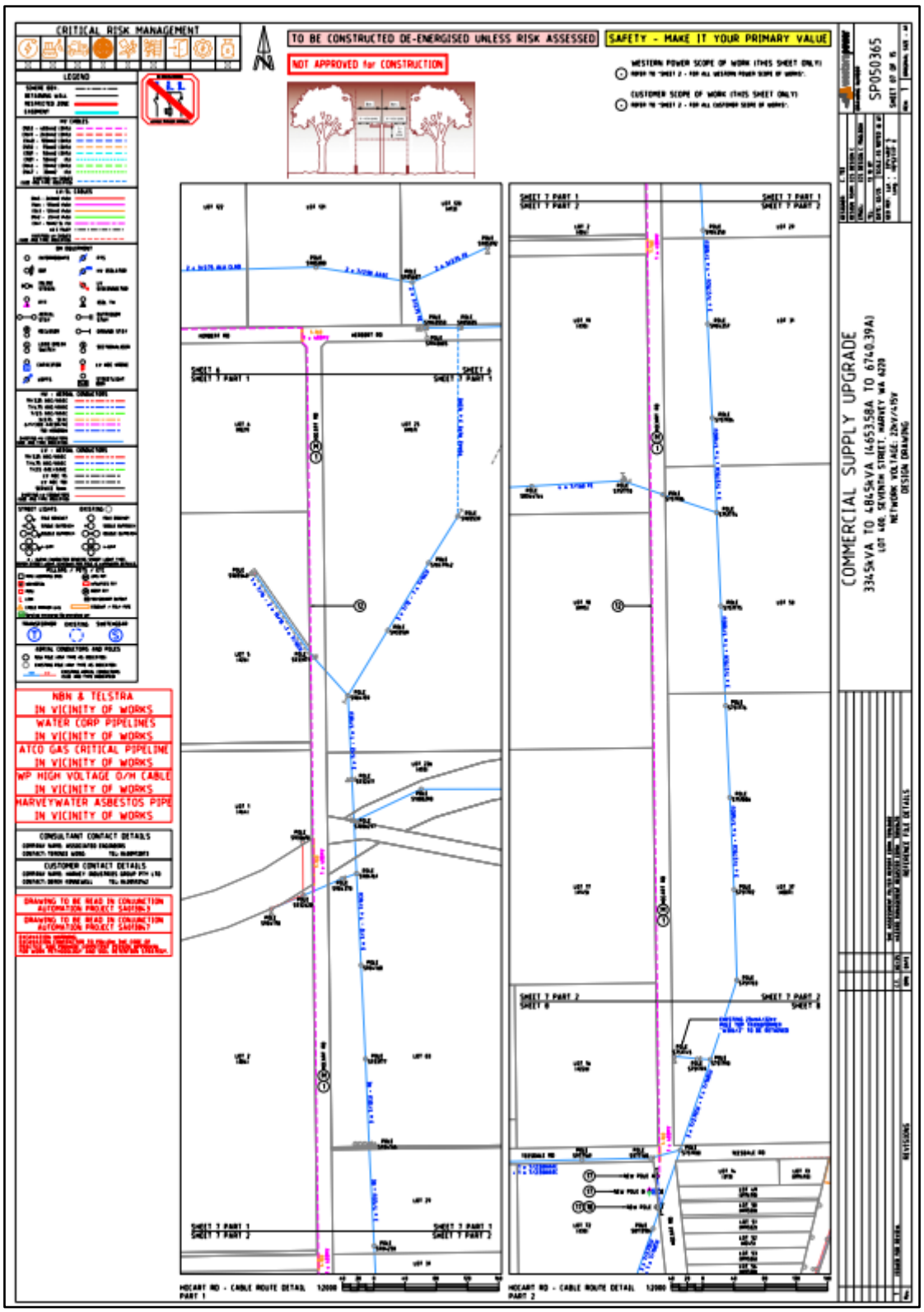
HERBERT RD - CABLE ROUTE DETAIL
REVISIONS
REFERENCE FILE DETAILS
CUSTOMER CONTACT DETAILS
CONSULTANT CONTACT DETAILS
DRAWING TO BE READ IN CONJUNCTION WITH NBN & TELSTRA IN VICINITY OF WORKS
DRAWING TO BE READ IN CONJUNCTION WITH WATER CORP PIPELINES IN VICINITY OF WORKS
ATCO GAS CRITICAL PIPELINE IN VICINITY OF WORKS
WP HIGH VOLTAGE O/H CABLE IN VICINITY OF WORKS
HARVEYWATER ASBESTOS PIPE IN VICINITY OF WORKS
WESTERN POWER SCOPE OF WORK (THIS SHEET ONLY)
CUSTOMER SCOPE OF WORK (THIS SHEET ONLY)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SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
LEGEND
NBN & TELSTRA IN VICINITY OF WORKS
WATER CORP PIPELINES IN VICINITY OF WORKS
ATCO GAS CRITICAL PIPELINE IN VICINITY OF WORKS
WP HIGH VOLTAGE O/H CABLE IN VICINITY OF WORKS
HARVEYWATER ASBESTOS PIPE IN VICINITY OF WORKS
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
COMMERCIAL SUPPLY UPGRADE
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SP050365
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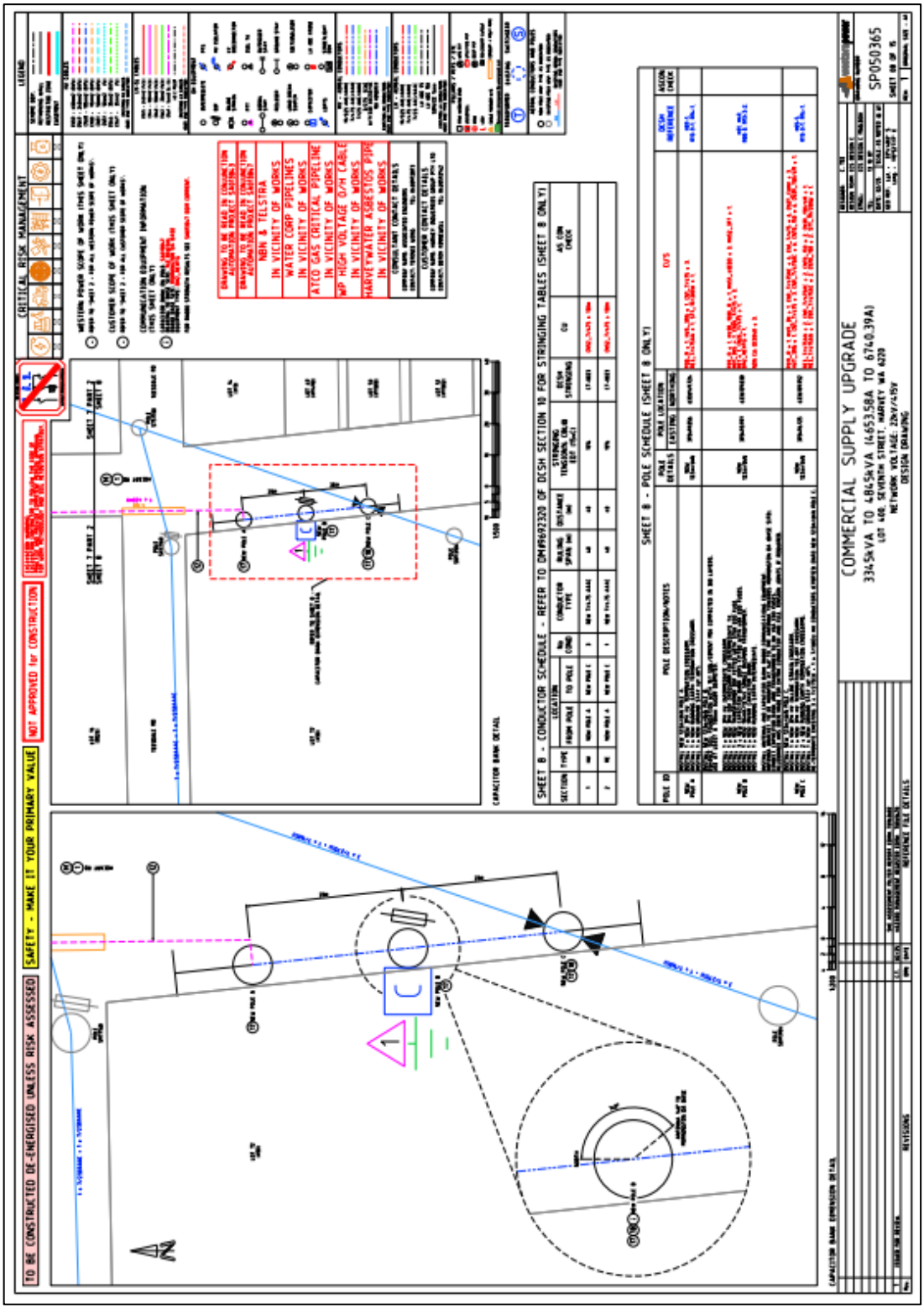
HOCART RD - CABLE ROUTE DETAIL PART 2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LOT 460, SEVENTH STREET, MARKEY WA 6220
NETWORK VOLTAGE: 22kV/415V
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SHEET 8 - POLE SCHEDULE (SHEET 8 ONLY)
SHEET 8 - CONDUCTOR SCHEDULE - REFER TO DM#6692320 OF DCSH SECTION 10 FOR STRINGING TABLES (SHEET 8 ONLY)
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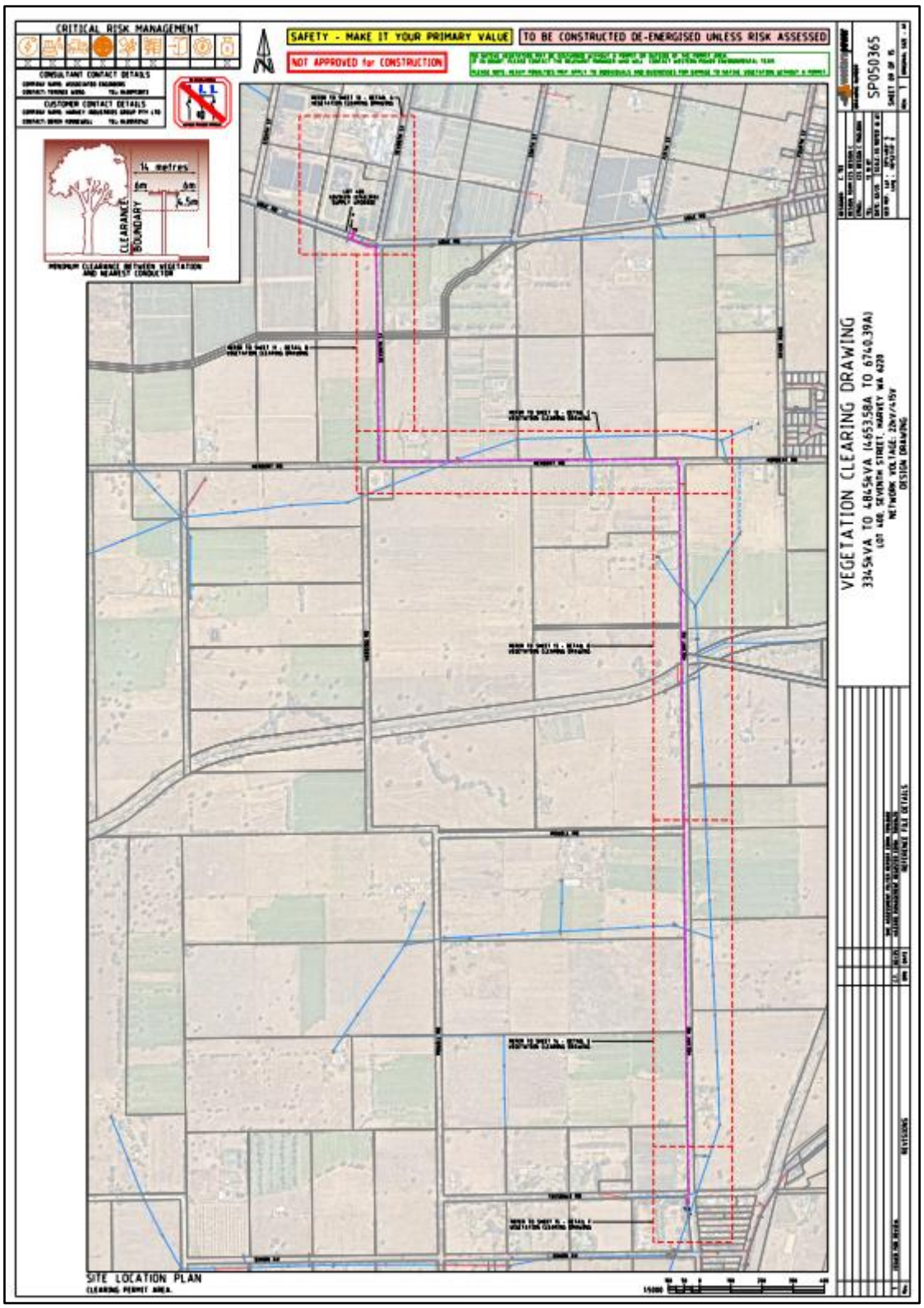
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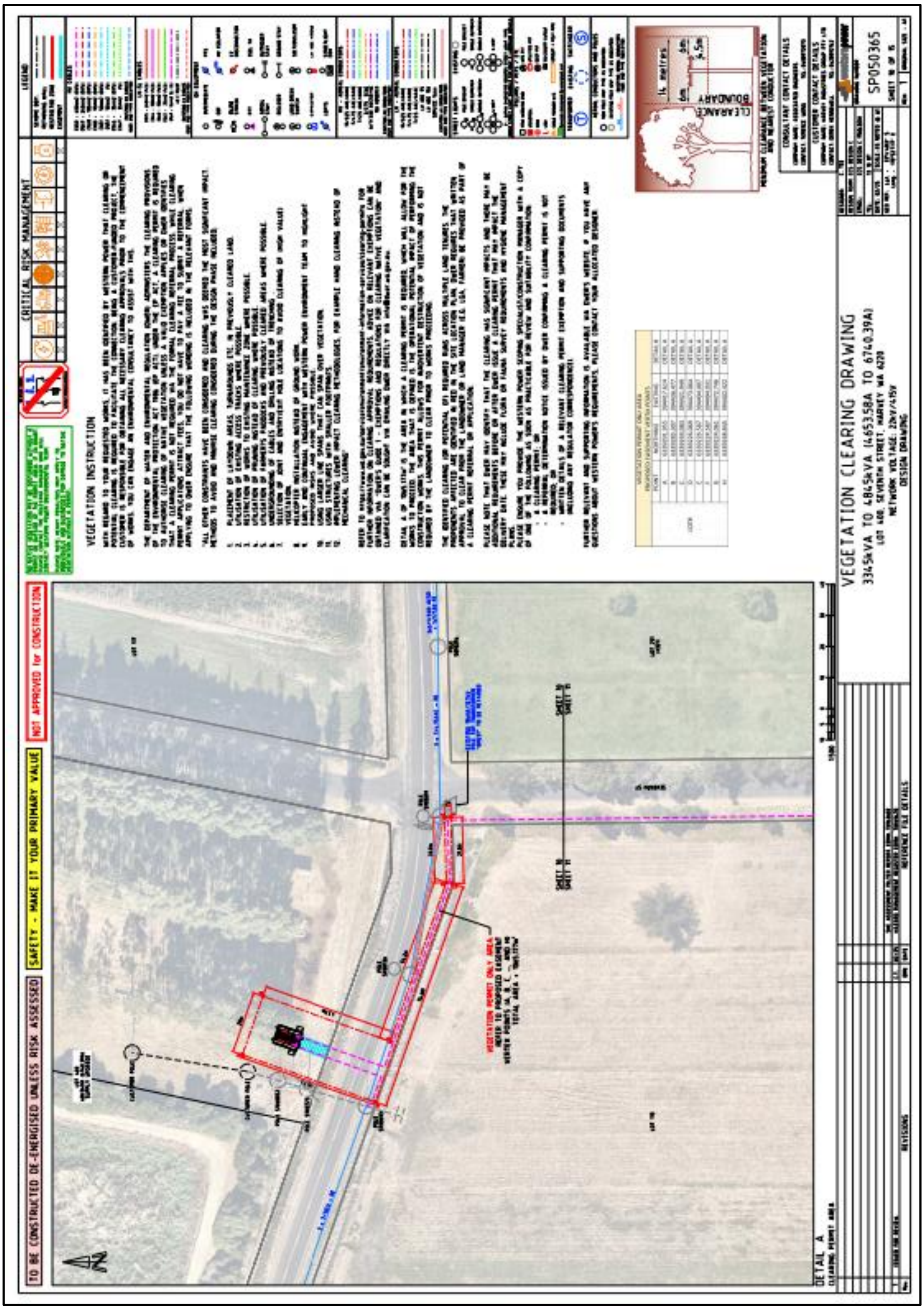
SAFETY - MAKE IT YOUR PRIMARY VALUE
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
NOT APPROVED for CONSTRUCTION
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
14 metres
6m
6m
4.5m
CLEARANCE BOUNDARY
VEGETATION CLEARING DRAWING
SP050365
SITE LOCATION PLAN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SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
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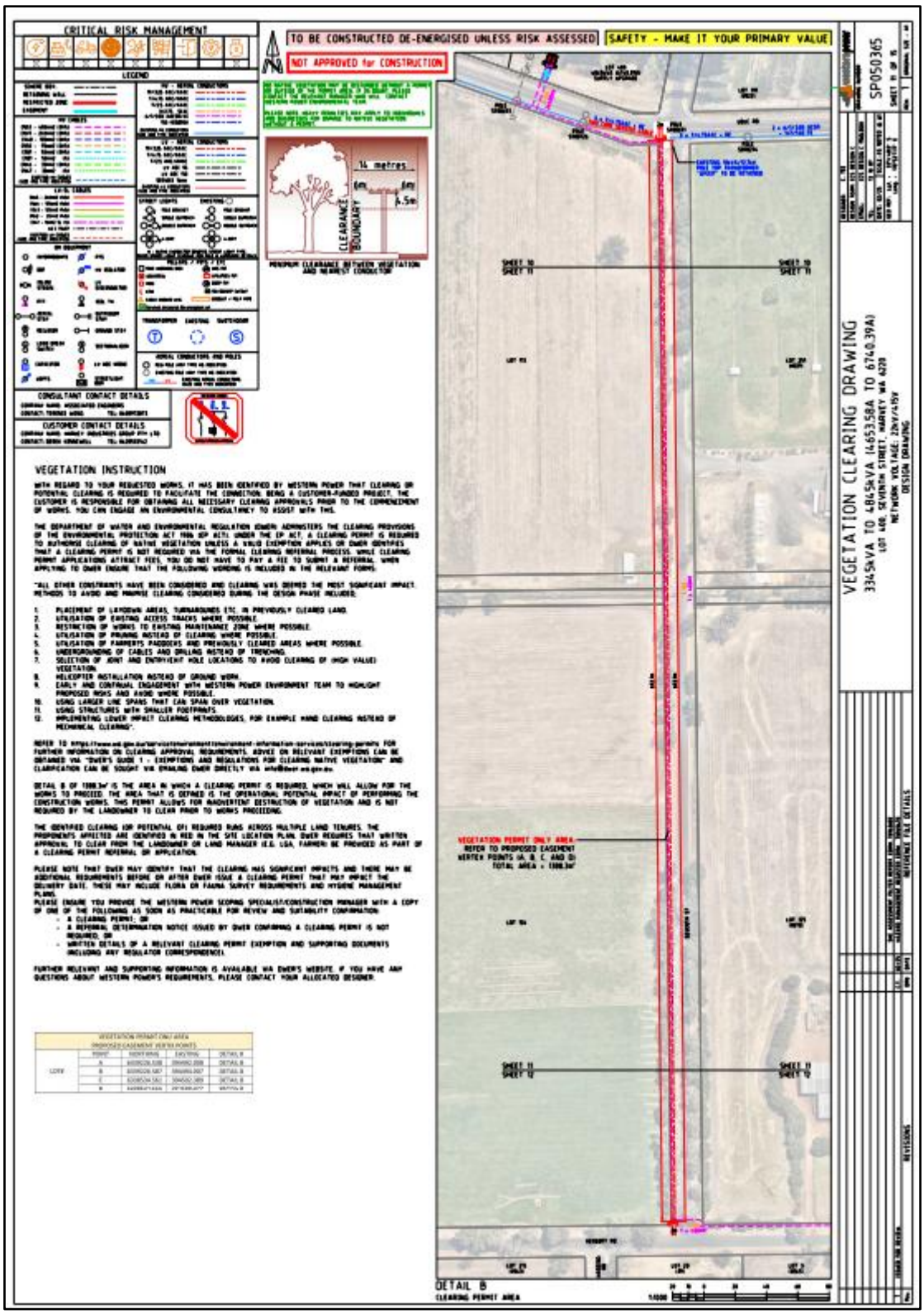
LEGEND
VEGETATION INSTRUCTION
VEGETATION CLEARING DRAWING
SP050365
DETAIL A


CRITICAL RISK MANAGEMENT
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
LEGEND
14 metres
CLEARANCE BOUNDARY
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
VEGETATION INSTRUCTION
VEGETATION CLEARING DRAWING
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DETAIL B
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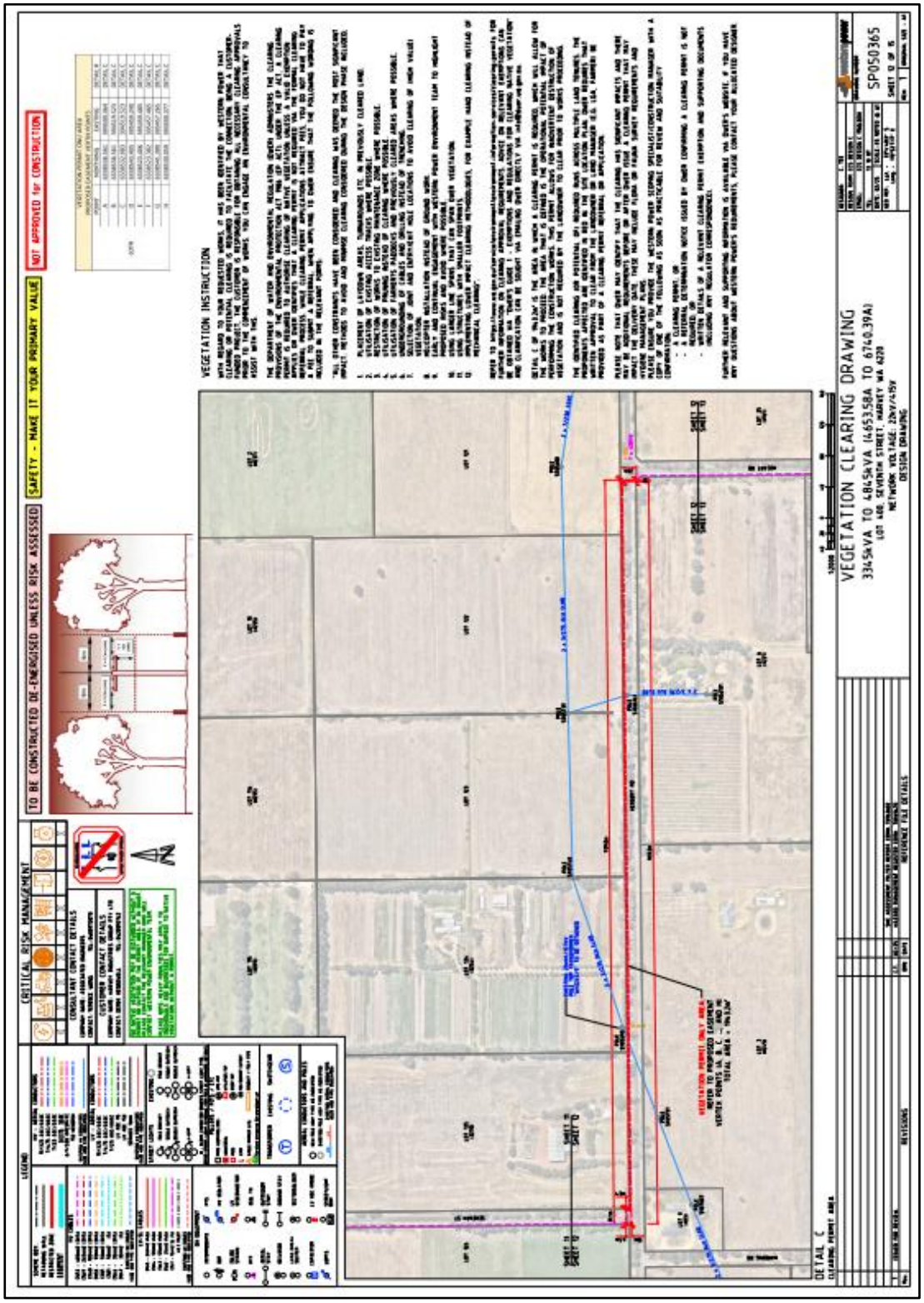
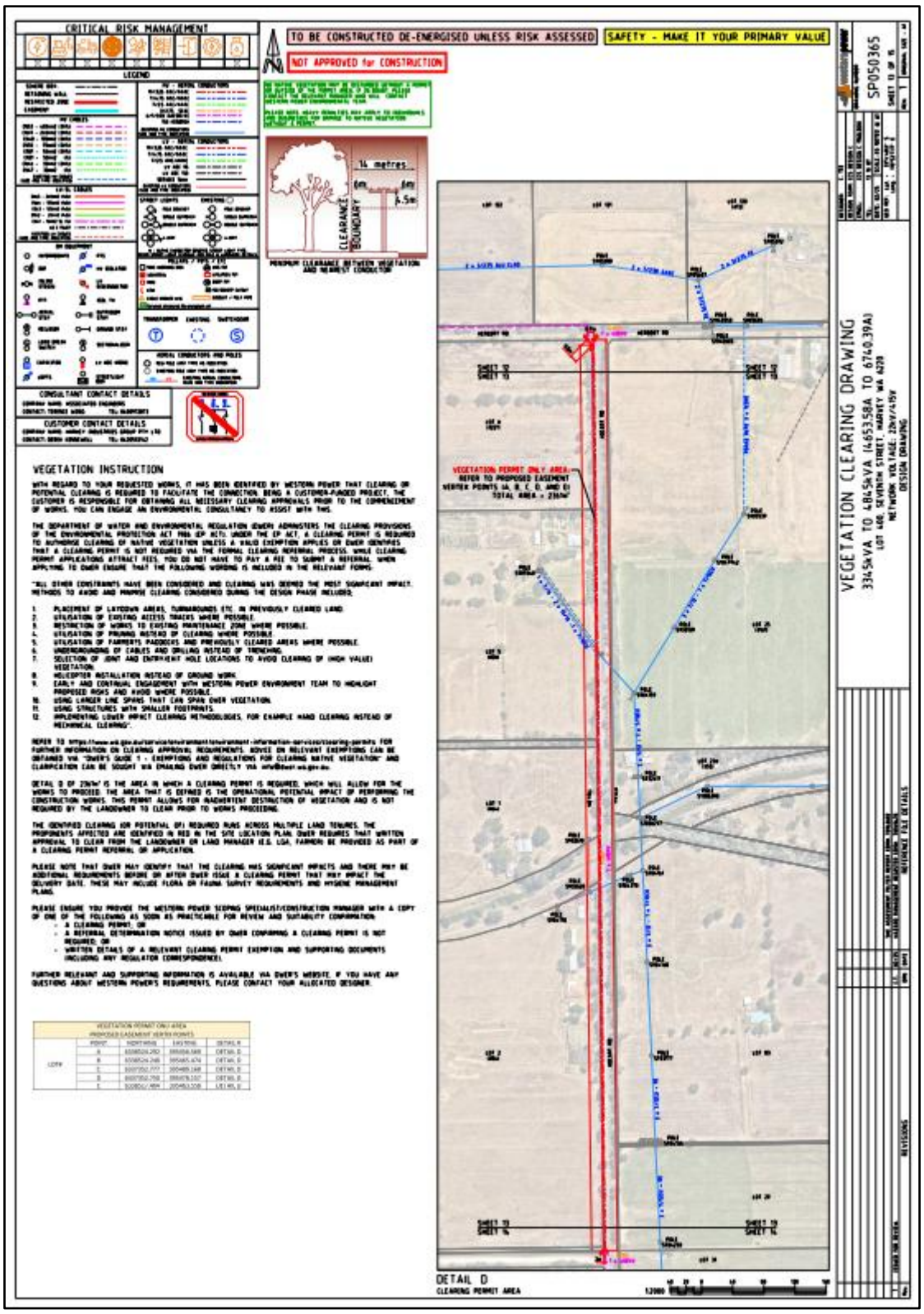
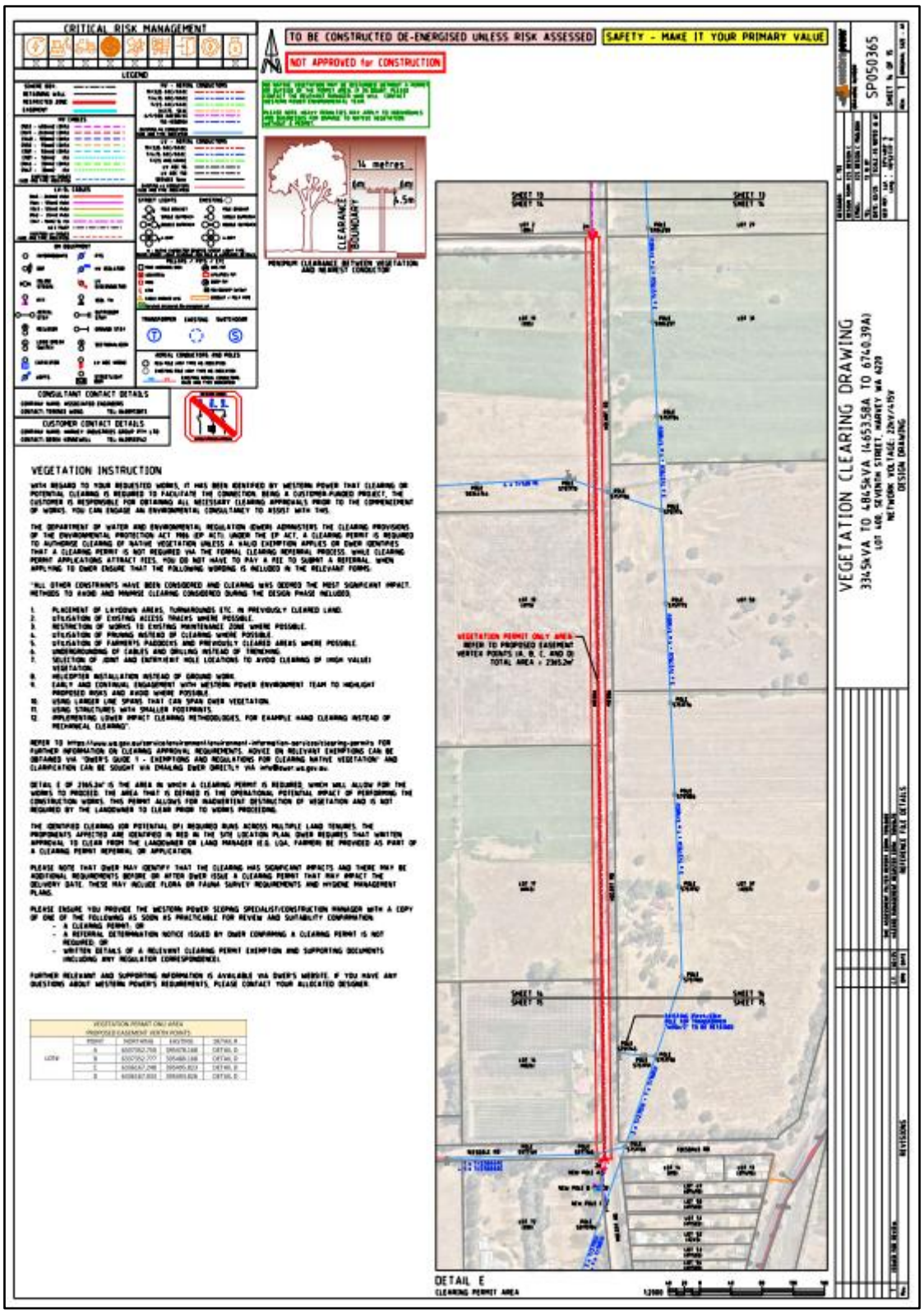
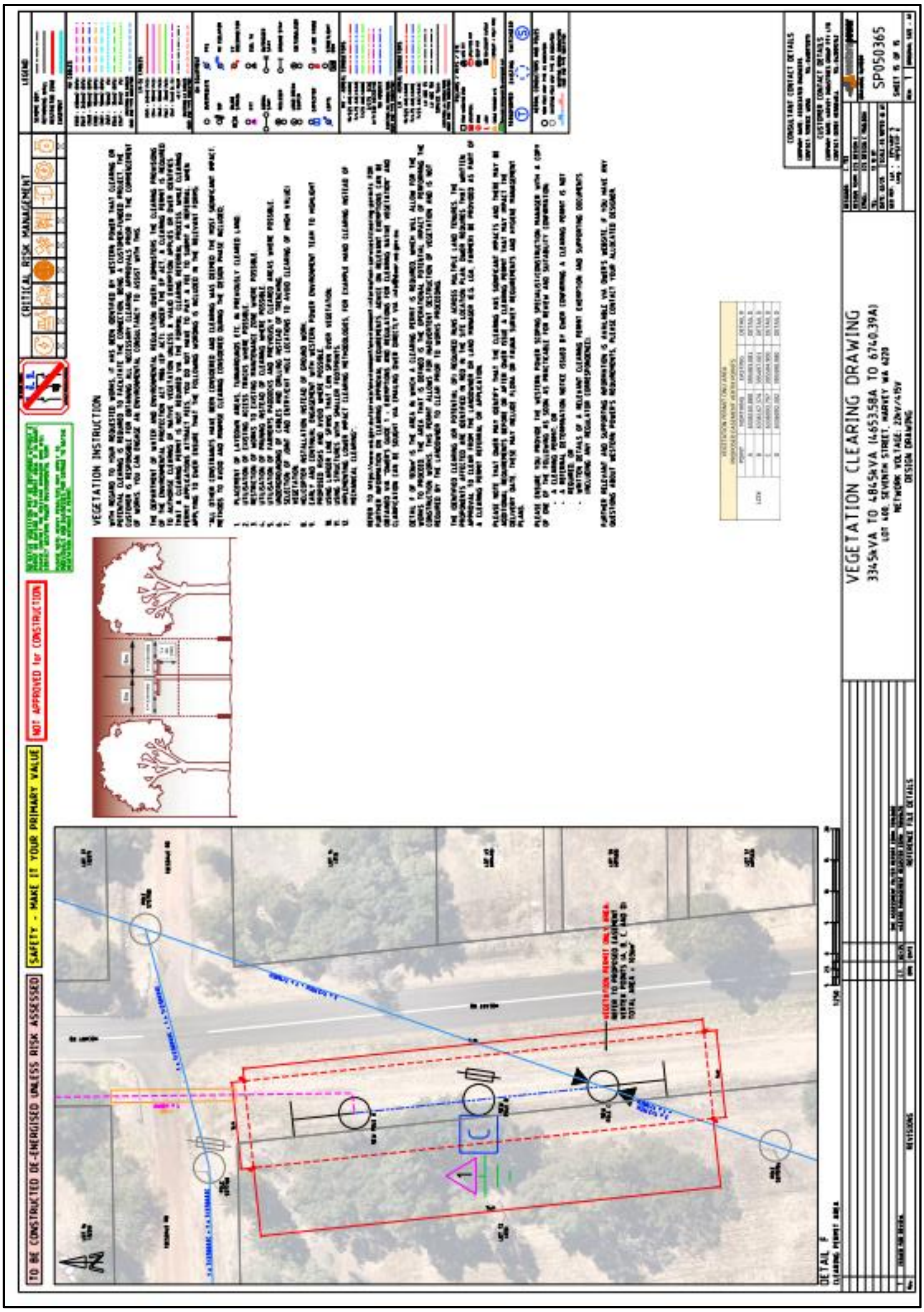

VEGETATION CLEARING DRAWING
334kVA TO 484kVA (1465358A TO 6740394A)
LOT 446, SEVENTH STREET, MARKEY WA 6280
SP050365
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
VEGETATION INSTRUCTION
CRITICAL RISK MANAGEMENT
LEGEND
DETAIL C


CRITICAL RISK MANAGEMENT
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
LEGEND
14 metres
6m
6m
4.5m
CLEARANCE BOUNDARY
MINIMUM CLEARANCE BETWEEN VEGETATION AND NEAREST CONDUCTOR
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
VEGETATION INSTRUCTION
WITH REGARD TO YOUR REQUESTED WORKS, IT HAS BEEN IDENTIFIED BY WESTERN POWER THAT CLEARING OR POTENTIAL CLEARING IS REQUIRED TO FACILITATE THE CONNECTION BEING A CUSTOMER-FUNDED PROJECT. THE CUSTOMER IS RESPONSIBLE FOR OBTAINING ALL NECESSARY CLEARING APPROVALS PRIOR TO THE COMMENCEMENT OF WORKS. YOU CAN ENGAGE AN ENVIRONMENTAL CONSULTANCY TO ASSIST WITH THIS.
THE DEPARTMENT OF WATER AND ENVIRONMENTAL REGULATION (DWER) ADMINISTERS THE CLEARING PROVISIONS OF THE ENVIRONMENTAL PROTECTION ACT 1986 (EP ACT). UNDER THE EP ACT, A CLEARING PERMIT IS REQUIRED TO AUTHORISE CLEARING OF NATIVE VEGETATION UNLESS A VALID EXEMPTION APPLIES OR DWER IDENTIFIES THAT A CLEARING PERMIT IS NOT REQUIRED VIA THE FORMAL CLEARING REFERRAL PROCESS. WHILE CLEARING PERMIT APPLICATIONS ATTRACT FEES, YOU DO NOT HAVE TO PAY A FEE TO SUBMIT A REFERRAL WHEN APPLYING TO DWER ENSURE THAT THE FOLLOWING WORDING IS INCLUDED IN THE RELEVANT FORMS:
"ALL OTHER CONSTRAINTS HAVE BEEN CONSIDERED AND CLEARING WAS DEEMED THE MOST SIGNIFICANT IMPACT. METHODS TO AVOID AND MINIMISE CLEARING CONSIDERED DURING THE DESIGN PHASE INCLUDED:
1. PLACEMENT OF LAYDOWN AREAS, TURNAROUNDS ETC. IN PREVIOUSLY CLEARED LAND.
2. UTILISATION OF EXISTING ACCESS TRACKS WHERE POSSIBLE.
3. RESTRICTION OF WORKS TO EXISTING MAINTENANCE ZONE WHERE POSSIBLE.
4. UTILISATION OF PRUNING INSTEAD OF CLEARING WHERE POSSIBLE.
5. UTILISATION OF FARMERS PADDOCKS AND PREVIOUSLY CLEARED AREAS WHERE POSSIBLE.
6. UNDERGROUNDING OF CABLES AND DRILLING INSTEAD OF TRENCHING.
7. SELECTION OF JOINT AND ENTRY/EXIT HOLE LOCATIONS TO AVOID CLEARING OF (HIGH VALUE) VEGETATION.
8. HELICOPTER INSTALLATION INSTEAD OF GROUND WORK.
9. EARLY AND CONTINUAL ENGAGEMENT WITH WESTERN POWER ENVIRONMENT TEAM TO HIGHLIGHT PROPOSED RISKS AND AVOID WHERE POSSIBLE.
10. USING LONGER LINE SPANS THAT CAN SPAN OVER VEGETATION.
11. USING STRUCTURES WITH SMALLER FOOTPRINTS.
12. IMPLEMENTING LOWER IMPACT CLEARING METHODOLOGIES, FOR EXAMPLE HAND CLEARING INSTEAD OF MECHANICAL CLEARING".
REFER TO https://www.wa.gov.au/service/environment/environment-information-services/clearing-permits FOR FURTHER INFORMATION ON CLEARING APPROVAL REQUIREMENTS. ADVICE ON RELEVANT EXEMPTIONS CAN BE OBTAINED VIA "DWER'S GUIDE 1 - EXEMPTIONS AND REGULATIONS FOR CLEARING NATIVE VEGETATION" AND CLARIFICATION CAN BE SOUGHT VIA EMAILING DWER DIRECTLY VIA info@dwer.wa.gov.au.
DETAIL D OF 23ha² IS THE AREA IN WHICH A CLEARING PERMIT IS REQUIRED, WHICH WILL ALLOW FOR THE WORKS TO PROCEED. THE AREA THAT IS DEFINED IS THE OPERATIONAL POTENTIAL IMPACT OF PERFORMING THE CONSTRUCTION WORKS. THIS PERMIT ALLOWS FOR INADVERTENT DESTRUCTION OF VEGETATION AND IS NOT REQUIRED BY THE LANDOWNER TO CLEAR PRIOR TO WORKS PROCEEDING.
THE IDENTIFIED CLEARING FOR POTENTIAL DFI REQUIRED RUNS ACROSS MULTIPLE LAND TENURES. THE PROPONENTS AFFECTED ARE IDENTIFIED IN RED IN THE SITE LOCATION PLAN. DWER REQUIRES THAT WRITTEN APPROVAL TO CLEAR FROM THE LANDOWNER OR LAND MANAGER (E.G. LGA, FARMER) BE PROVIDED AS PART OF A CLEARING PERMIT REFERRAL OR APPLICATION.
PLEASE NOTE THAT DWER MAY IDENTIFY THAT THE CLEARING HAS SIGNIFICANT IMPACTS AND THERE MAY BE ADDITIONAL REQUIREMENTS BEFORE OR AFTER DWER ISSUE A CLEARING PERMIT THAT MAY IMPACT THE DELIVERY DATE. THESE MAY INCLUDE FLORA OR FAUNA SURVEY REQUIREMENTS AND HYGIENE MANAGEMENT PLANS.
PLEASE ENSURE YOU PROVIDE THE WESTERN POWER SIDPNG SPECIALIST/CONSTRUCTION MANAGER WITH A COPY OF ONE OF THE FOLLOWING AS SOON AS PRACTICABLE FOR REVIEW AND SUITABILITY CONFIRMATION:
- A CLEARING PERMIT, OR
- A REFERRAL DETERMINATION NOTICE ISSUED BY DWER CONFIRMING A CLEARING PERMIT IS NOT REQUIRED, OR
- WRITTEN DETAILS OF A RELEVANT CLEARING PERMIT EXEMPTION AND SUPPORTING DOCUMENTS (INCLUDING ANY REGULATOR CORRESPONDENCE).
FURTHER RELEVANT AND SUPPORTING INFORMATION IS AVAILABLE VIA DWER'S WEBSITE. IF YOU HAVE ANY QUESTIONS ABOUT WESTERN POWER'S REQUIREMENTS, PLEASE CONTACT YOUR ALLOCATED DESIGNER.
VEGETATION PERMIT ONLY AREA
REFER TO PROPOSED EASEMENT
VERTEX POINTS (A, B, C, D, AND E)
TOTAL AREA = 23ha²
VEGETATION CLEARING DRAWING
3345kVA TO 4865kVA (465358A TO 6740.39A)
(LOT 406, SEYMOUR STREET, JURIEY WA 6210)
NETWORK VOLTAGE: 22kV/415V
DESIGN DRAWING
SP050365
SHEET 11 OF 15
DETAIL D
CLEARING PERMIT AREA
REVISIONS


CRITICAL RISK MANAGEMENT
TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
LEGEND
14 metres
CLEARANCE BOUNDARY
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
VEGETATION INSTRUCTION
VEGETATION CLEARING DRAWING
SP050365
DETAIL E
CLEARING PERMIT AREA



TO BE CONSTRUCTED DE-ENERGISED UNLESS RISK ASSESSED
SAFETY - MAKE IT YOUR PRIMARY VALUE
NOT APPROVED for CONSTRUCTION
CRITICAL RISK MANAGEMENT
LEGEND
VEGETATION INSTRUCTION
DETAIL F
CLEARING PERMIT AREA
CONSULTANT CONTACT DETAILS
CUSTOMER CONTACT DETAILS
VEGETATION CLEARING DRAWING
DESIGN DRAWING
SP050365

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 Threatened and Priority Flora and Fauna Classification Codes

Under BC Act 2016, Threatened and Priority flora and fauna are classified into three (3) threatened and four (4) priority categories. Species under the BC Act can be specifically protected and are listed as Threatened (Critically Endangered, Endangered or Vulnerable) or Extinct.

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

Conservation Code	Category
	known threatening processes. Such species are in urgent need of further survey.
P3	**Priority 3 - Poorly known species** 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

Under the BC Act 2016, Priority Ecological Communities (PEC) and Threatened Ecological Communities (TEC) are classified into three (3) threatened categories and five (5) priority categories.

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

Conservation Code	Category
	≤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. 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 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: 08-Apr-2025

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	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	33
Listed Migratory Species:	9

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:	5
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:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	1
EPBC Act Referrals:	7
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands) [Resource Information]

Ramsar Site Name	Proximity	Buffer Status
Peel-yalgorup system	Within 10km of Ramsar site	In buffer area only

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, 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.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Banksia Woodlands of the Swan Coastal Plain ecological community	Endangered	Community likely to occur within area	In feature area
Clay Pans of the Swan Coastal Plain	Critically Endangered	Community likely to occur within area	In buffer area only
Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain ecological community	Critically Endangered	Community likely to occur within area	In feature area

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			
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calyptorhynchus banksii naso Forest Red-tailed Black-Cockatoo, Karrak [67034]	Vulnerable	Species or species habitat known to occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In buffer area only
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 likely to occur within area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Zanda baudinii listed as Calyptorhynchus baudinii Baudin's Cockatoo, Baudin's Black-Cockatoo, Long-billed Black-cockatoo [87736]	Endangered	Species or species habitat known to occur within area	In feature area
Zanda latirostris listed as Calyptorhynchus latirostris Carnaby's Black Cockatoo, Short-billed Black-cockatoo [87737]	Endangered	Species or species habitat known to occur within area	In feature area
FISH			
Galaxiella nigrostriata Blackstriped Dwarf Galaxias, Black-stripe Minnow [88677]	Endangered	Species or species habitat may occur within area	In buffer area only
MAMMAL			
Bettongia penicillata ogilbyi Woylie [66844]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus geoffroii Chuditch, Western Quoll [330]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myrmecobius fasciatus Numbat [294]	Endangered	Species or species habitat may occur within area	In buffer area only
Pseudocheirus occidentalis Western Ringtail Possum, Ngwayir, Womp, Woder, Ngoor, Ngoolangit [25911]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Setonix brachyurus Quokka [229]	Vulnerable	Species or species habitat likely to occur within area	In feature area
OTHER			
Westralunio carteri Carter's Freshwater Mussel, Freshwater Mussel [86266]	Vulnerable	Species or species habitat known to occur within area	In feature area
PLANT			
Andersonia gracilis Slender Andersonia [14470]	Endangered	Species or species habitat may occur within area	In feature area
Anthocercis gracilis Slender Tailflower [11103]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Banksia mimica Summer Honeypot [82765]	Endangered	Species or species habitat may occur within area	In feature area
Diuris drummondii Tall Donkey Orchid [4365]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Diuris micrantha Dwarf Bee-orchid [55082]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Diuris purdiei Purdie's Donkey-orchid [12950]	Endangered	Species or species habitat may occur within area	In feature area
Drakaea elastica Glossy-leafed Hammer Orchid, Glossy-leaved Hammer Orchid, Warty Hammer Orchid [16753]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Drakaea micrantha Dwarf Hammer-orchid [56755]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eleocharis keigheryi Keighery's Eleocharis [64893]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Lambertia echinata subsp. occidentalis Western Prickly Honeysuckle [64528]	Endangered	Species or species habitat may occur within area	In buffer area only
Morelotia australiensis listed as Tetraria australiensis Southern Tetraria [92784]	Vulnerable	Species or species habitat may occur within area	In feature area
Synaphea sp. Fairbridge Farm (D.Papenfus 696) Selena's Synaphea [82881]	Critically Endangered	Species or species habitat likely to occur within area	In feature area
Synaphea sp. Pinjarra Plain (A.S.George 17182) [86878]	Endangered	Species or species habitat may occur within area	In feature area
Synaphea sp. Serpentine (G.R.Brand 103) [86879]	Critically Endangered	Species or species habitat may occur within area	In feature area
Synaphea stenoloba Dwellingup Synaphea [66311]	Endangered	Species or species habitat likely to 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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat known to 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 likely to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Unknown		
Commonwealth Land - [52004]	WA	In buffer area only
Commonwealth Land - [50813]	WA	In buffer area only
Commonwealth Land - [51512]	WA	In buffer area only
Commonwealth Land - [50830]	WA	In buffer area only
Commonwealth Land - [50802]	WA	In buffer area only

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat likely to occur within area	In feature area
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 known to 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
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to 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 likely to occur within area	In buffer area only
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Tringa nebularia Common Greenshank, Greenshank [832]	Endangered	Species or species habitat likely to occur within area overfly marine area	In buffer area only

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Korijekup	Conservation Park	WA	In buffer area only
Wellard	Nature Reserve	WA	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
South West WA RFA	Western Australia	In feature area

Nationally Important Wetlands [Resource Information]

Wetland Name	State	Buffer Status
Benger Swamp	WA	In buffer area only

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Southern Seawater Desalination Project	2008/4173	Controlled Action	Post-Approval	In buffer area only
Yarragadee Water Supply Development	2005/2073	Controlled Action	Completed	In feature area
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Kemerton Lateral Gas Pipeline Project	2005/2388	Not Controlled Action	Completed	In buffer area only
South Western Highway - Wokalup to Brunswick Junction - Upgrade	2001/325	Not Controlled Action	Completed	In feature area
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	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.

28 April 2025
Trace Enterprises,
Level 1/57 Guthrie St,
Osborne Park WA 6017.

Mr. Joe Shiels
Harvest Road,
Level 7, 190 St Georges Terrace,
Perth, WA 6000.

Dear Mr. Shiels,

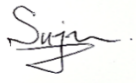
Technical Memorandum: Threatened Black Cockatoo Habitat Assessment and Significant Impact Assessment (2025-028)

We wish to share the findings of the Threatened Black Cockatoo Habitat Assessment and Significant Impact Assessment related to the Basic Fauna and Reconnaissance Flora surveys completed at Wokalup, WA (see Trace 2025). The black cockatoo habitat assessment was completed as per the referral guidelines (DAWE 2022) to assess the presence of breeding, roosting, and foraging habitat. A Significant Impact Assessment is required as per Matters of National Environmental Significance (MNES) Significant Impact Guidelines 1.1 (DoE 2013) to determine whether the proposed action is likely to have a significant impact on threatened black cockatoos as per the EPBC Act 1999.

Trace consultants found evidence for potential black cockatoo breeding and high-quality foraging habitats along the proposed work alignment. Therefore, it is likely to require a referral to the minister. However, if the proposed impact mitigation methods were adopted and followed (see Section 9.0), it may eliminate the need to refer the proposed actions to the minister as per referral guidelines (DAWE 2022).

It is recommended that you read and interpret the information presented in this document in conjunction with the separately submitted final report documenting the basic fauna and reconnaissance flora surveys. Please feel free to contact us if you have any questions and/or need further clarification.

Yours sincerely,



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1.0 Background

The Harvest Road Group seeks consent to clear a narrow strip of native vegetation along a 4.2km of road verge for power cable installation in Wokalup, WA. The Harvest Road Group commissioned Trace Enterprises to prepare an Environmental Assessment Report describing the environmental values of the survey area and assessing the potential environmental impacts of the proposed development. The basic fauna survey conducted on April 15th 2025 (see Trace 2025), recovered evidence for a high likelihood of occurrence for three (3) species/taxa of threatened black cockatoos in the survey area: Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*), and Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*).

2.0 Black Cockatoo Taxa

Carnaby's black cockatoo (*Zanda latirostris*)

Nationally endangered (EPBC Act 1999), Carnaby's black cockatoo is a WA endemic and restricted to Southwestern WA. 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). It may occur in its foraging habitat and night roosts located in Swan Coastal Plain (SCP) at any time of year, with the main period being from January to July; some individuals occur all year. Localised breeding may occur from July to December. The Harvey survey area lies well within this species' known breeding and foraging range (DAWE 2022).

Baudin's black cockatoo (*Zanda baudinii*)

Nationally endangered, Baudin's black cockatoo is a WA endemic and restricted to Southwestern WA. It is listed as endangered under the WA BC Act 2016 (SPRAT 2025) and globally, as critically endangered by the IUCN Red List of Threatened Species (IUCN 2025). It is unlikely to occur in much of the SCP, especially western and northern areas. Foraging may occur in SCP from March to September. Breeding may occur in the southern SCP. The Harvey survey area lies within this species' known foraging and wintering areas (DAWE 2022).

NOTE: Without closer inspection of bill morphology and vocalisations, it is very hard to separate Carnaby's Black Cockatoo (*Zanda latirostris*) from Baudin's Black Cockatoo (*Z. baudinii*). Additionally, both species are likely in the survey area, and no black cockatoos were directly observed visually or auditorily during the fauna survey. Therefore, this report treats both species as White-tailed black cockatoo (*Zanda latirostris* OR *Z. baudinii*). Note that the survey area lies well within possible White-tailed black cockatoo breeding and foraging ranges (see Trace 2025).

Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*)

Nationally vulnerable, Forest red-tailed black cockatoo is one of five subspecies of *Calyptorhynchus banksii*, and this subspecies is a WA endemic and restricted to Southwestern WA (Menkhorst et al. 2019). It is listed as vulnerable under the WA BC Act 2016 (SPRAT 2025). This black cockatoo is more widespread than the two (2) previous species and can be found in foraging habitats and night roosts at any time of the year. Breeding habitat may occur in some locations containing suitable breeding tree species, including the Perth metropolitan area. The Harvey survey area lies within this species' known foraging and wintering areas (DAWE 2022).

3.0 Legislative Context

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).

4.0 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 Wokalup site.

5.0 Significant Impact Criteria for Threatened Species

The proposed vegetation clearing at Wokalup 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

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.

6.0 Black Cockatoo Habitat Assessment

The black cockatoo breeding, roosting and foraging habitat is defined as follows.

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). See Appendix 7 for a summary of black cockatoo habitat information (DAWE 2022).

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. See Appendix 7 for a summary of black cockatoo habitat information (DAWE 2022).

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. See Appendix 7 for a summary of black cockatoo habitat information (DAWE 2022).

The desktop assessment suggested that three (3) species of threatened black cockatoos are highly likely to occur in the proposed project area. Additionally, nearby records exist for black cockatoo breeding and roosting within 5km of the survey area (DBCA data). Therefore, a black cockatoo habitat assessment was conducted, focusing on potential breeding, roosting, and foraging habitats along the proposed project transect line. 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 (DAWA 2022).

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 8 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 9).

7.0 Black Cockatoo Habitat Assessment Results

Three (3) taxa of threatened black cockatoos are expected in the survey area. No threatened black cockatoos were directly observed during the field survey. About 2.35ha of the survey area represented potential black cockatoo habitat (see Map 11 and Map 12). Definitive evidence of black cockatoos using the survey area as a foraging habitat and the presence of potential breeding trees were uncovered during the field survey.

Breeding habitat

The majority of the mature Marri (*Corymbia calophylla*) trees located along the proposed work alignment (see Map 11 and Map 12) met the definition of potential breeding habitat due to their DBH being ≥500mm. However, none of the trees had hollows suitable for black cockatoo breeding.

Roosting Habitat

No evidence for black cockatoo roosting habitats was recovered during the field survey. An isolated moulted white-tailed black cockatoo tail feather (see Trace 2025) was recovered from the survey area. However, sufficient evidence to support black cockatoo roosting was not recovered.

Foraging Habitat

Although black cockatoos were not observed during the field survey, evidence for the black cockatoo foraging (i.e. chewed Marri nuts) was recovered (see Figure 6 and Figure 7). Collectively, about 2.35ha of the survey area was identified as potential black cockatoo

foraging habitat (see Map 11 and Map 12). The survey area supported small clusters and individual trees of mature and fruit-bearing Marri trees (*Corymbia calophylla*; total area 1.12ha), which is a preferred foraging species for Baudin's and Forest red-tailed black cockatoos (see Map 11 and Map 12). Tracks of *Eucalyptus* spp. (predominantly Flooded gum, *Eucalyptus rudis*; total area 1.23ha) were also present in the survey area, which supports black cockatoo foraging (see Map 11 and Map 12).

A summary of Foraging Values and corresponding areas for each black cockatoo species is presented in Table 10 and the overall context adjusted threatened black cockatoo foraging habitat within the survey area is presented in Table 11. The overall appraisal is presented at the end of the Table 11.

Table 10 Foraging values and corresponding areas (ha) for three (3) threatened black cockatoo species within the survey area.

NOTE: The foraging values were generated based on the scoring system proposed by Bamford (2020, see Appendix 8).

Foraging value	Area (ha) for Carnaby's black cockatoo	Area (ha) for Baudin's black cockatoo	Area (ha) for Forest red-tailed black cockatoo
0 - No foraging value			
1 - Negligible to low foraging value		1.23 (52%)	1.23 (52%)
2 - Low foraging value	1.23 (52%)		
3 - Low to Moderate foraging value	1.12 (48%)		
4 - Moderate foraging value		1.12 (48%)	1.12 (48%)
5 - Moderate to High foraging value			
6 - High foraging value			
Total Area (Ha)	2.35	2.35	2.35

Table 11 Context adjustments for threatened black cockatoo foraging habitat within the survey area.

NOTE: The context adjustments for black cockatoo foraging habitat were completed based on the foraging quality scoring tool developed by DAWE (2022, see Appendix 9).

Score adjustment	Description	Carnaby's black cockatoo	Baudin's black cockatoo	Forest red-tailed black cockatoo
Starting score (10)	Site condition = 6 Site context = 3 Species stocking rate = 1	10	10	10
Moderated starting score	The moderated score based on the foraging value, vegetation condition, and presence of preferred foraging species.	6 Proteaceae plants rare. But healthy small-fruited Eucalypts present. 52% low and 48% low-moderate foraging values.	8 Clusters of healthy Marri trees and other Eucalypts present with evidence for feeding (i.e. chewed Marri nuts). But 52% negligible - low and 48% moderate foraging values.	8 Clusters of healthy Marri trees and other Eucalypts present with evidence for feeding (i.e. chewed Marri nuts). But 52% negligible - low and 48% moderate foraging values.
Foraging potential (-2)	Contains suitable foraging species. No evidence of feeding debris.	-2		
Connectivity (-1)	No other foraging habitat within 12 km of survey area.			
Proximity to breeding (-2)	Survey site is more than 12 km from breeding habitat.			
Proximity to roosting (-1)	Survey site is more than 20 km from a known night roosting habitat.			
Proximity to water (-1)	Survey site is more than 2 km from a watering point.			

Score adjustment	Description	Carnaby's black cockatoo	Baudin's black cockatoo	Forest red-tailed black cockatoo
Impact from significant plant diseases (-1)	Disease present (e.g. *Phytophthora cinnamomi* or marri canker).			
Total Score		4	8	8
Appraisal	Foraging values for each species (see Table 10) show that the survey area supports preferred foraging species for Baudin's and Forest red-tailed black cockatoos. However, only about 52% of the potential habitat (Marri) has a moderate foraging value, while the rest (Eucalypts) have a negligible to low foraging value. Therefore, the moderated starting score was lowered by -2 to account for the overall foraging habitat quality for Baudin's and Forest red-tailed black cockatoos. Species stocking rate was treated as 1 due to the finding of feeding debris for both species in the survey area (see Figure 6 and Figure 7). Preferred foraging species for Carnaby's black cockatoo are virtually absent in the survey area, and the remaining foraging species (Marri and Eucalypts) provide only a low-moderate foraging value for this species. Therefore, the moderated starting score was lowered by -3 to account for the overall foraging habitat quality for Carnaby's black cockatoos. The species stocking rate was treated as 0 (i.e. -1) due to the lack of direct observations/feeding debris in the survey area. Context adjustor for foraging potential was adjusted by -2 due to a lack of feeding debris for Carnaby's black cockatoos. Other factors were not impacted due to the presence of additional foraging habitats, breeding habitats, roosting habitats, and watering points within the specified distances in DAWE (2022). No signs of significant plant diseases were observed during the survey. **Therefore, the survey area represents high-quality native foraging habitat (a score of 5-10, see Appendix 10) for Baudin's and Forest red-tailed black cockatoos, while low-quality native foraging habitat (a score of 0-4) for Carnaby's black cockatoo.**			

Figure 6 Chewed Marri (Corymbia calophylla) nuts possibly by Forest red-tailed black cockatoos (Calyptorhynchus banksii naso) (© Trace Enterprises 2025).

Figure 7 Chewed Marri (*Corymbia calophylla*) nuts possibly by Baudin's black cockatoos (*Z. baudinii*) (© Trace Enterprises 2025).

8.0 Summary & Conclusions

Although not directly observed, the survey area provides habitat for threatened black cockatoos, consisting predominantly of suitable foraging habitat. No known roosting habitat nor any known or likely breeding habitat was recorded at the site, although trees that could be suitable for roosting and breeding occur in the survey area.

The available foraging habitat value for Carnaby's black cockatoo ranged between "low" and "low to moderate", while for Baudin's and Forest red-tailed black cockatoos, it ranged between "negligible to low" and "moderate".

The overall foraging habitat quality assessment with context adjustors showed that the survey area represents high-quality native foraging habitat (a score of 5-10) for Baudin's and Forest red-tailed black cockatoos, while low-quality native foraging habitat (a score of 0-4) for Carnaby's black cockatoo.

The Referral Guidelines (DAWE 2022) suggest referral of a project if the proposed actions involve loss of;

- any breeding habitat (i.e. known, suitable, or potential nesting trees),
- part of a night roosting site,
- more than 1ha of high-quality foraging habitat,
- more than 10ha of low-quality foraging habitat, or
- more than 1ha of exotic foraging habitat (e.g. Cape Lilac trees and pine trees).

The proposed cable installation at the Wokalup site by directional drilling method (~4.2km) has a relatively low impact on flora and vegetation. Although the amount of vegetation clearing has been significantly reduced, it is still likely required for drill setup, entry and exit holes, and flow holes (see Appendix 1: Scope of Works, Trace 2025).

The application of referral thresholds (DAWE 2022, see Appendix 10 for details) for three (3) threatened black cockatoos likely in the Wokalup site indicate that;

- The majority of the mature Marri (*Corymbia calophylla*) trees located along the proposed work alignment (see Map 11 and Map 12) met the definition of potential breeding habitat due to their DBH being ≥ 500mm. However, none of the trees had

hollows suitable for black cockatoo breeding. Due to the scarcity of nesting resources, the loss of any potential nesting habitat is likely to require a referral to the minister.

- Although the available foraging habitat for Carnaby's black cockatoos along the proposed work alignment (see Map 11 and Map 12) represents less than 10ha of low-quality native foraging habitat, the same 2.35ha area met the definition of high-quality native foraging habitat for both Baudin's and Forest red-tailed black cockatoos. Since the area of the high-quality foraging habitat is more than 1ha, it is likely to require a referral to the minister due to the critical nature of these resources at all stages of life for the black cockatoo species.

By adopting the following mitigation standards to avoid any significant impacts to threatened black cockatoo habitat at the Wokalup site, the proponent will be able to eliminate the need to refer the proposed actions to the minister as per the referral guidelines (DAWE 2022, DoE 2013).

9.0 Recommendations for Impact Mitigation

The potential black cockatoo breeding habitat and high-quality foraging habitat identified along the proposed work alignment represent critical habitat of threatened black cockatoos. Therefore, it is vital to avoid any impacts or damage to mature trees (especially Marri, *Corymbia calophylla*) due to proposed work at the Wokalup site.

Avoiding impacts to breeding habitat and high-quality foraging habitat may eliminate the need to refer proposed actions to the minister (DAWE 2022). Trace suggests the following impact mitigation methods to avoid impacts to the breeding habitat and high-quality foraging habitat of black cockatoos at the Wokalup site.

1) Do not clear or damage mature Marri (*Corymbia calophylla*) trees with a DBH of ≥ 300mm to preserve potential black cockatoo breeding habitat (see Map 11 and Map 12).
2) Do not clear or damage more than 1ha Marri (*Corymbia calophylla*) and native *Eucalyptus* spp. that may support high-quality black cockatoo foraging habitat (see Map 11 and Map 12).

Additionally, Trace recommends the following actions to preserve the overall quality of threatened black cockatoo habitat at the Wokalup site.

1) A qualified arborist should be on site during the drilling works for areas requiring tree trimming or pruning.
2) Utilise a hydrovac system during directional drilling to avoid damage to the root systems of mature Marri (*Corymbia calophylla*) and native *Eucalyptus* spp.
3) Engage an accredited Green Card trainer to deliver Green Card training to the field and key personnel to avoid the spread of Phytophthora dieback.

10.0 References

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Trace. (2025). Basic Fauna & Reconnaissance Flora Surveys, Wokalup. A Report prepared by Trace Enterprises for Harvest Road Group. Pp. 93.

11.0 Maps


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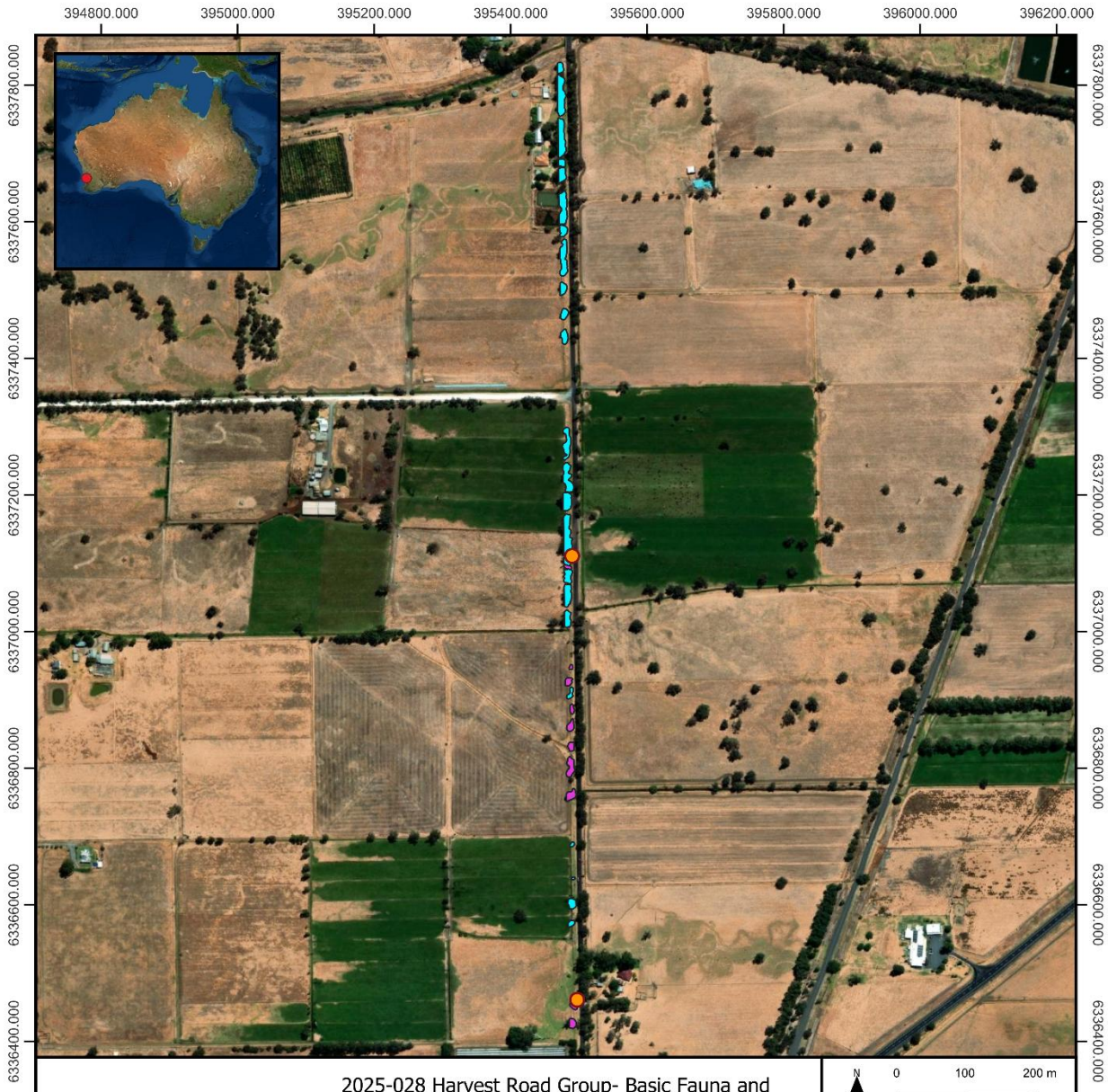
2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 1: Threatened black cockatoo potential foraging habitat, and locations of chewed marri (Corymbia calophylla) nuts (Northern end).
Legend
Chewed Marri nuts
Foraging habitat
Corymbia calophylla
Eucalyptus spp.
N
0
100
200 m
Data Sources: ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 8,400
Date Published: 28/04/2025
Cartographer: Hannah Anthony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2025-028 Harvest Road Group- Basic Fauna and Reconnaissance Flora Survey
Map 2: Threatened black cockatoo potential foraging habitat, and locations of chewed marri (Corymbia calophylla) nuts (Southern end).
Legend
Chewed Marri nuts
Foraging habitat
Corymbia calophylla
Eucalyptus spp.
N
0
100
200 m
Data Sources: ESRI 2024; Trace Enterprises 2025
Coordinate System: GDA2020 / MGA zone 50
Scale: 1 : 8,400
Date Published: 28/04/2025
Cartographer: Hannah Anthony

12.0 Appendices

Appendix 7 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 8 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 9 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 10 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)

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