WESTERN
ENVIRONMENTAL

Environmental Assessment Report

Local Planning Scheme Amendment: Lot 39 Lakes Road, North Dandalup

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Environmental Assessment Report

Local Planning Scheme Amendment: Lot 39
Lakes Road, North Dandalup

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Western Environmental acknowledges the traditional Custodians of the lands on which we work and live. This report was prepared in Perth and Bunbury offices, on Whadjuk and Wardandi Boodjar. We acknowledge the on-going connection First Nations people have to land, waters and sea. Our environmental work endeavours to better understand the natural environment and its values, in this we seek to honour the long history of Kaartdijin (knowledge) held by the Noongar people of Boodjar.

Internal Review

Author	Reviewed by	Approved by
		
Julia Burr Environmental Consultant	**Hannah Sullivan** Associate Consultant	**Daniel Panickar** Senior Principal and Partner
23-Jul-2025	**24-Jul-2025**	**30-Jul-2025**

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Scope of Services

This environmental report ("this report") has been prepared for the sole benefit and exclusive use of the Client for the purpose for which it was prepared in accordance with the agreement between the Client and WEPL ("the Agreement"). However, in addressing the requirements of the Contaminated Sites Act 2003, an Accredited Contaminated Sites Auditor may be engaged by the Client to undertake review of this report, prior to its submission to the DWER. The report shall be made available and can be relied upon for the purposes of the Contaminated Sites Act.

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The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in this report, or the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

Reliance on Data

In preparing this report, WEPL has relied on data, surveys, analyses, designs, plans and other information provided by the Client (or its agents), other individuals and organisations ("the data").

Except as otherwise stated in this report, WEPL has not verified the accuracy or completeness of the data. WEPL does not represent or warrant that the data is true or accurate, and disclaims any and all responsibility or liability with respect to the use of the data.

To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in this report ("conclusions") are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data.

WEPL does not accept any responsibility or liability for any incorrect or inaccurate conclusions should any data be incorrect, inaccurate or incomplete or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WEPL.

The conclusions must also be considered in light of the agreed scope of services (including any constraints or limitation therein) and the methods used to carry out those services, both of which are as stated or referred to in this report.

Environmental Conclusions

In accordance with the scope of services, WEPL has conducted environmental field monitoring and/or testing in the preparation of this report. The nature and extent of monitoring and/or testing conducted is described in this report.

On all sites, varying degrees of non-uniformity of vertical and horizontal conditions in media (soil, water, air, waste or other media as described in the report) are encountered. Hence no monitoring, common testing or sampling technique can eliminate the possibility that monitoring or testing results/samples are not totally representative of media conditions encountered. The conclusions are based on the data and the environmental field monitoring and/or testing actually undertaken, and are therefore merely indicative of the environmental condition of the site at the time of preparing this report, including the presence or otherwise of contaminants or emissions. It should be recognised that site conditions, including the extent and concentration of contaminants, can change.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. To the maximum extent permitted by law, no other warranty, express or implied, is made.

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If an Auditor is engaged by the Client to undertake review of this report, it shall be made available subject to the terms and conditions of the agreement between the Client and WEPL and the caveats in this statement.

Other Limitations

This report is intended to be read in its entirety, and sections or parts of this report should therefore not be read and relied on out of context.

WEPL will not be liable to update or revise this report to take into account any events or circumstances or facts becoming apparent after the date of this report.

Executive Summary

Western Environmental Approvals Pty Ltd (WEPL) was commissioned by Valley Holdings WA (the Proponent) to prepare an Environmental Assessment Report (EAR) for Lot 39 Lakes Road, North Dandalup (the Site). The purpose of this report is to support the development of a Local Planning Scheme Amendment for the Site by understanding its environmental values and potential constraints to development.

The Site is located within the Shire of Murray and is zoned Rural under the Peel Region Scheme (PRS) as well as under the Shire of Murray (2024) Local Planning Scheme No. 4. The Site contains a mixture of paddocks used for grazing cattle, unmanaged, classifiable vegetation, mainly associated with the foreshore of North Dandalup River as well as some rural residential dwellings and sheds.

The foreshore area was delineated in a study by Bayley Environmental (2025). This study has informed the design of the foreshore reserve, which is proposed to be retained in the preliminary concept design.

The environmental assessment involved a review of publicly available datasets, a reconnaissance flora and vegetation survey, a basic fauna survey and a black cockatoo habitat assessment undertaken in April 2025. Key findings were:

- The Site is mapped as moderate to low risk of Acid Sulfate Soils occurring within 3 m of the natural soil surface. Further investigation and potential management may be required during future development and earthwork phases if excavation or dewatering should occur.
- No contaminated sites are located within the Site, and the nearest is 7.5 km away.
- No conservation significant flora species or ecological communities were recorded within the Site.
- Four vegetation types were identified within the Site (63.77 ha), of which three were considered to represent native vegetation, comprising a total area of 54.10 ha. The balance of the Site is pasture paddock. All vegetation is in Degraded to Completely Degraded condition.
- The proposed North Dandalup River foreshore reserve (49.81 ha) occurs through the centre of the Site where environmental values will be retained and protected. A minimum of 34.26 ha of native vegetation will be retained within the foreshore area.
- No TECs or PECs were identified as present within the Site.
- The Site provides potential black cockatoo habitat. A total of 32.69 ha within the retained foreshore area was not assessed for black cockatoo habitat due to the planned retention of the area. The retainer of the Site provides the following black cockatoo habitat values:
    - One nesting tree (containing a suitable breeding hollow) was recorded within the Site.

- 852 potential nesting trees were recorded within the Site. More trees are expected to occur within the unassessed portion of FHT-08 and FHT-09, comprising the majority of fauna habitat contained within the foreshore reserve.

- Foraging evidence for black cockatoo species was recorded within FHT-03 (marri woodland).

- 41.96 ha of suitable foraging habitat for Baudin's black cockatoo (9.27 ha assessed, 32.69 ha inferred), of which

    - 7.43 ha is of very high foraging value.
    - 1.84 ha is of low to moderate value.
    - Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.

- 41.96 ha of suitable foraging habitat for Carnaby's black cockatoo (9.27 ha assessed, 32.69 ha inferred), of which

    - 7.43 ha is of very high foraging value.
    - 1.84 ha is of low to moderate value.
    - Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.

- 45.60 ha of suitable foraging habitat for Forest red-tailed black cockatoo (12.91 ha assessed, 32.69 ha inferred), of which

    - 9.26 ha is of very high foraging value.
    - 3.65 ha is of low to moderate value.
    - Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.

- No evidence of roosting was recorded. Within the Site, fauna habitat types FHT-01 and FHT-03 provides the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Site from the North Dandalup River.

- No evidence for other conservation significant fauna was recorded within the Site. FHT-09, which is associated with the riparian vegetation along North Dandalup River, was assessed to provide potential core habitat for Carter's freshwater mussel, south-western brush-tailed phascogale, quenda and western brush wallaby. This habitat type will be retained within the planned foreshore reserve.

- North Dandalup River and one associated tributary pass through the Site from the northeastern to the southwestern corner. The preparation of a Stormwater Management Plan may be required during future planning stages to manage potential indirect impacts to the North Dandalup River.

- Two Conservation Category Wetlands (CCWs) (UFID 13313 and UFID 6018) are mapped within North Dandalup River foreshore area. Both wetlands will be retained within the determined foreshore reserve.

- The Site is located within a bushfire prone area. A Bushfire Management Plan (BMP) has been prepared by WEPL (2025b) to address bushfire safety considerations and should be read in conjunction with this EAR.

- A registered Aboriginal heritage site (ID 27937), North Dandalup River, is mapped as intersecting the Site. Implementation of the foreshore area as defined in Bayley (2025) and the current concept plan is considered sufficient to protect ecological and heritage values associated with the watercourse.

Avoidance Measures

A foreshore reserve (49.81 ha) has been determined to be retained, containing 34.26 ha of native vegetation, mainly comprised of VT 03 - Riparian vegetation. This vegetation type contains scattered patches of marri, which provide high value foraging habitat for black cockatoo. A detailed assessment of black cockatoo habitat has not been undertaken within this area yet due to the planned retention. The retained area of black cockatoo foraging habitat was inferred to be 32.61 ha. Additionally, 48 potential nesting trees with a DBH ≥ 500 mm are contained within the 49.81 ha of foreshore reserve that was assessed. Significantly more trees are expected to occur within the unassessed portion of FHT-08 and FHT-09 (30.25 ha), comprising the majority of fauna habitat contained within the foreshore reserve. A detailed assessment of black cockatoo habitat values within the foreshore reserve will be undertaken during future planning stages once site designs are finalised and impacts as well as retained values can be accurately quantified.

Further, two mapped CCWs and Aboriginal Heritage site ID 27937 are located within the retained foreshore reserve. Aboriginal heritage site ID 27937 is associated with North Dandalup River, its mythological narratives of the Waugal and its importance as water resource and hunting place. The implementation of the foreshore reserve will protect the ecological and cultural values associated with the watercourse. Impacts are limited to the construction of one road passing through the reserve.

The proponent has committed to the provision of an Environmental Management Plan to accompany any subdivision application that will provide for future protection of ecological values within the Site.

Preliminary Impact Assessment

No detailed impact assessment can be undertaken at this stage as site designs have not been finalised yet. This will be undertaken during future planning stages when further information is applicable.

Expected impacts are limited to:

- The clearing of native vegetation, providing potential fauna habitat, including potential black cockatoo nesting trees and foraging habitat, to facilitate construction of building envelopes, APZs, roads, and services.

- Impacts associated with the construction of a road connecting the portion north-west of North Dandalup River with the south-eastern portion of the Site. Impacts will include limited clearing of riparian vegetation along North Dandalup River within the foreshore area.

- Impacts associated with the alignment of bushfire emergency access way within the southern portion of the foreshore reserve (refer to BMP in Appendix B).

- Indirect impacts due to intensified land use.

The following mitigation measures have been identified and will be implemented to ensure impacts are appropriately managed through subsequent stages of planning and development:

- Protection of the proposed foreshore reserve, including access control via the installation of fencing and allocated walk paths.

- Designation of suitable building envelopes and APZs to avoid impacts to native vegetation where possible.

- Implementation of scheme provisions as described in section 9.2.

- Preparation of a Stormwater Management Plan during future planning stages to minimise indirect impacts to North Dandalup River and its tributaries and protect ecological as well as heritage values associated with the watercourse.

- Authorisation under Section 18 of the *Aboriginal Heritage Act 1972* will be required for the construction the road passing through the heritage site.

- If the construction of the road will lead to disturbances of North Dandalup River, a permit to interfere with beds and banks of a watercourse under the *Rights in Water and Irrigation Act 1914* may be required.

- If significant residual impacts to Matters of National Environmental Significance (MNES) should be identified during the detailed impact assessment, the project will be formally referred under the *Environment Protection and Biodiversity Conservation Act 1999*.

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Figures

Appendices

1. Introduction

1.1 Background

Western Environmental Approvals Pty Ltd (WEPL) presents the following Environmental Assessment Report (EAR) to inform the Shire of Murray Local Planning Scheme 4 (LPS 4) Amendment for Lot 39 Lakes Road, North Dandalup (the Site, Figure 1).

The Site is located within the Shire of Murray and currently zoned 'Rural' under the Peel Region Scheme (PRS) as well as under LPS 4, which is shown in Figure 2 and Figure 3 respectively. The Site comprises a total area of 196.48 hectares (ha). The amendment application proposes a rezoning of the Site from 'Rural' to 'Special Rural' with the intention of subsequent subdivision during future planning stages. A preliminary concept design is presented in Figure 4.

North Dandalup River passes through the Site from north-east to south-west. The current design proposes the retention of the associated foreshore area as designated foreshore reserve.

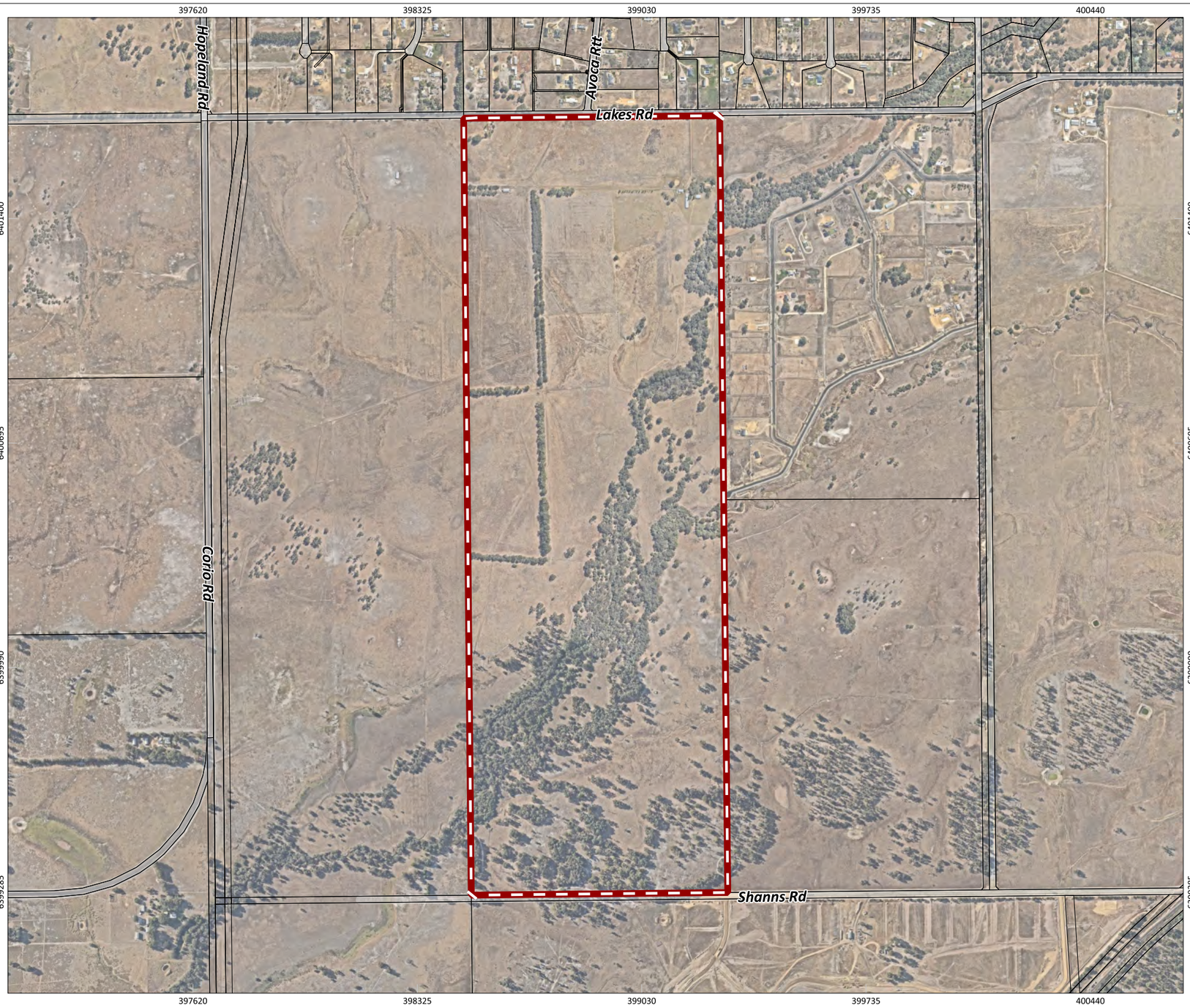
This EAR has been informed by a reconnaissance flora and vegetation survey, a basic fauna survey and black cockatoo habitat assessment undertaken by WEPL on the 1st and 2nd of April 2025 (WEPL, 2025a; Appendix A). Due to the planned retention of the foreshore reserve, no detailed black cockatoo assessment has been undertaken within this area. The survey focused on areas which could potentially be directly impacted during future development.

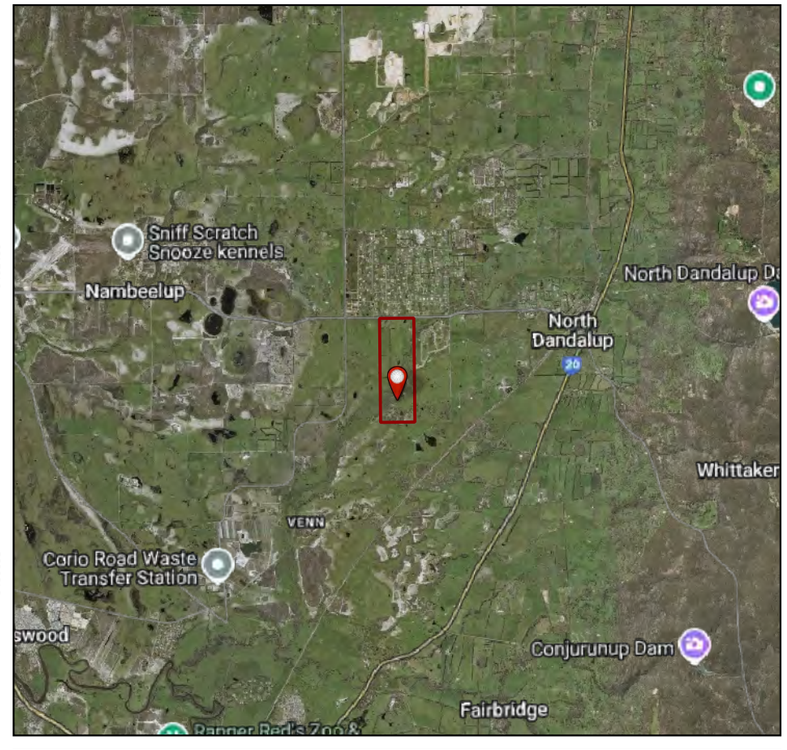
1.2 Purpose and Scope

This EAR will inform and support the LPS amendment by describing the environmental and heritage values, legacies and processes relevant to the Site in the context of the proposed land use and change.

The scope of this EAR includes the following (to a level of detail commensurate with the nature of this strategic planning proposal):

- Identification of key environmental factors relevant to the Site and the proposed LPS amendment in accordance with the EPA *Statement of Environmental Principles, Factors, Objectives and Aims of EIA* (EPA, 2023a).
- Description of key environmental and heritage values present on the Site.
- Identification of potential environmental impacts and consequences.
- Description of mitigation measures, considering the mitigation hierarchy of avoid, minimise, rehabilitate, offset.





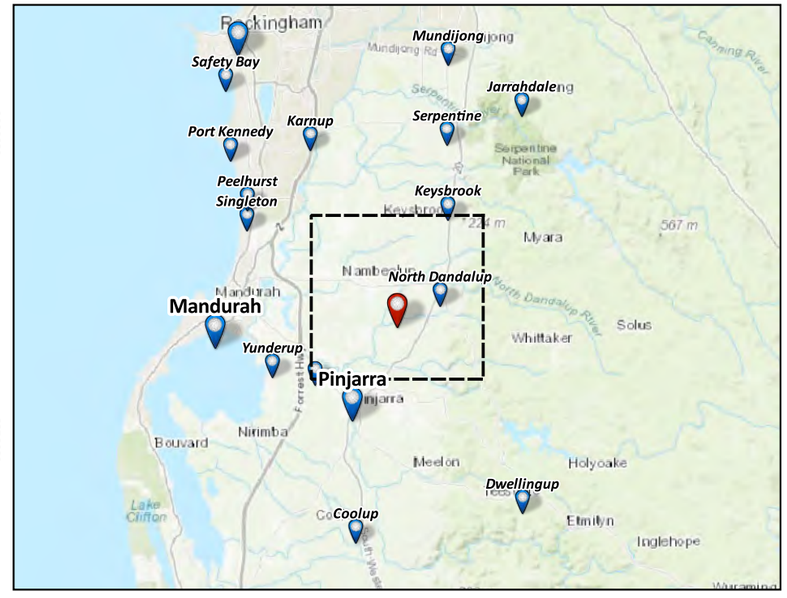


Figure 1: Site Location

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0 200 400 600 800 m

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup		
SCALE: 1:14,100	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 9/5/2025

Legend

- Survey Area
- Cadastre (No Attributes) (LGATE-001)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	9/5/2025

NOTES:

Cadastral boundary (LGATE-002). Base map ESRI Topo. Townsites (LGATE-248).

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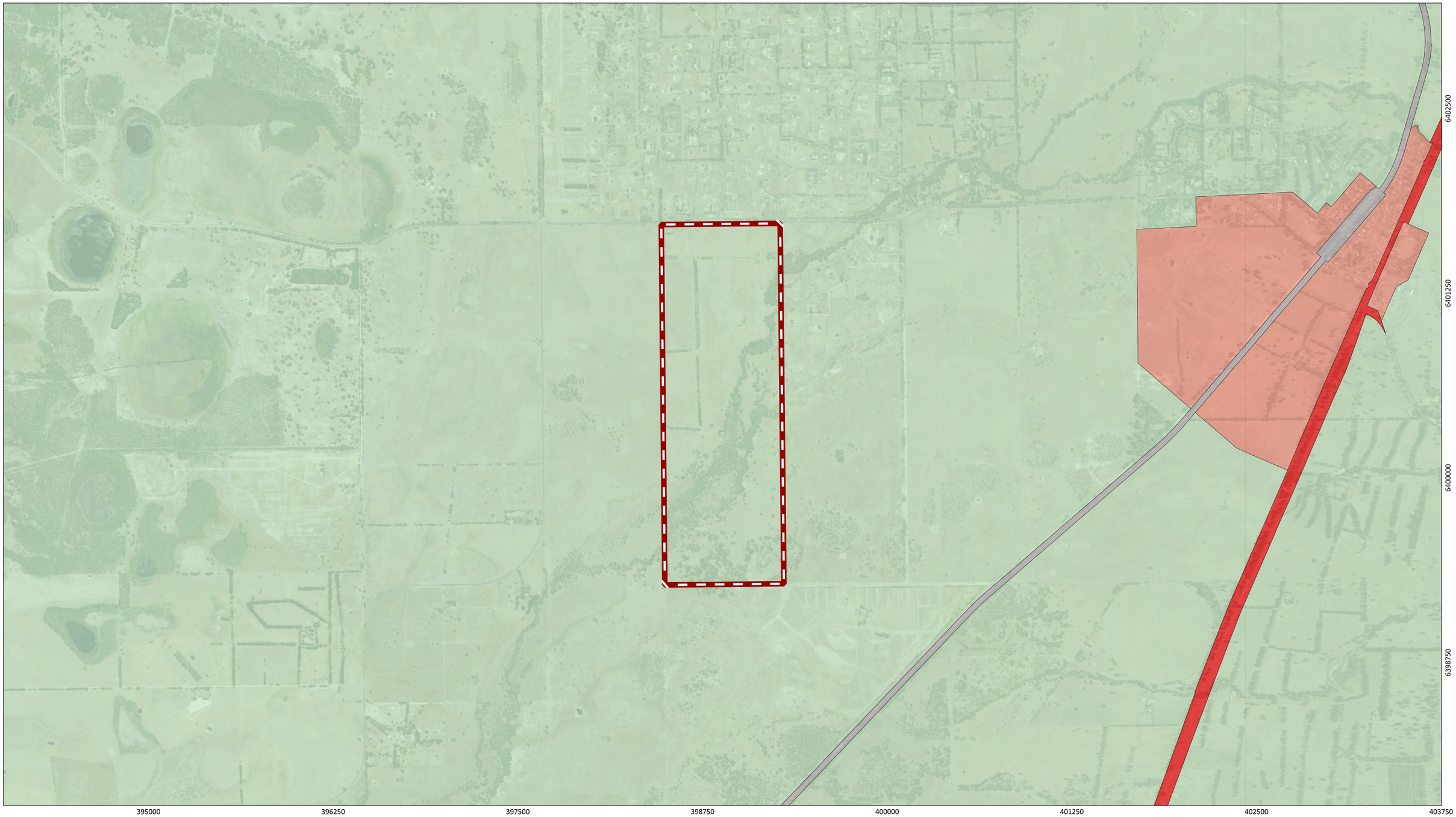

Figure 2: Metropolitan Region Scheme Zones and Reserves

N

0 250 500 750 1,000 m

PROJECT/REPORT NAME	Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup
SCALE	1:25,000
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	LANDGATE AERIAL IMAGERY NOW
DRAWN BY / REVIEWED BY	JP / JB
DATE	29/7/2025

Legend

- Survey Area

Region Scheme - Zones and Reserves (DPLH-023)

- Primary regional roads
- Railways
- Rural
- Urban

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary from LANDGATE 2022. UFID stands for Unique Identifier

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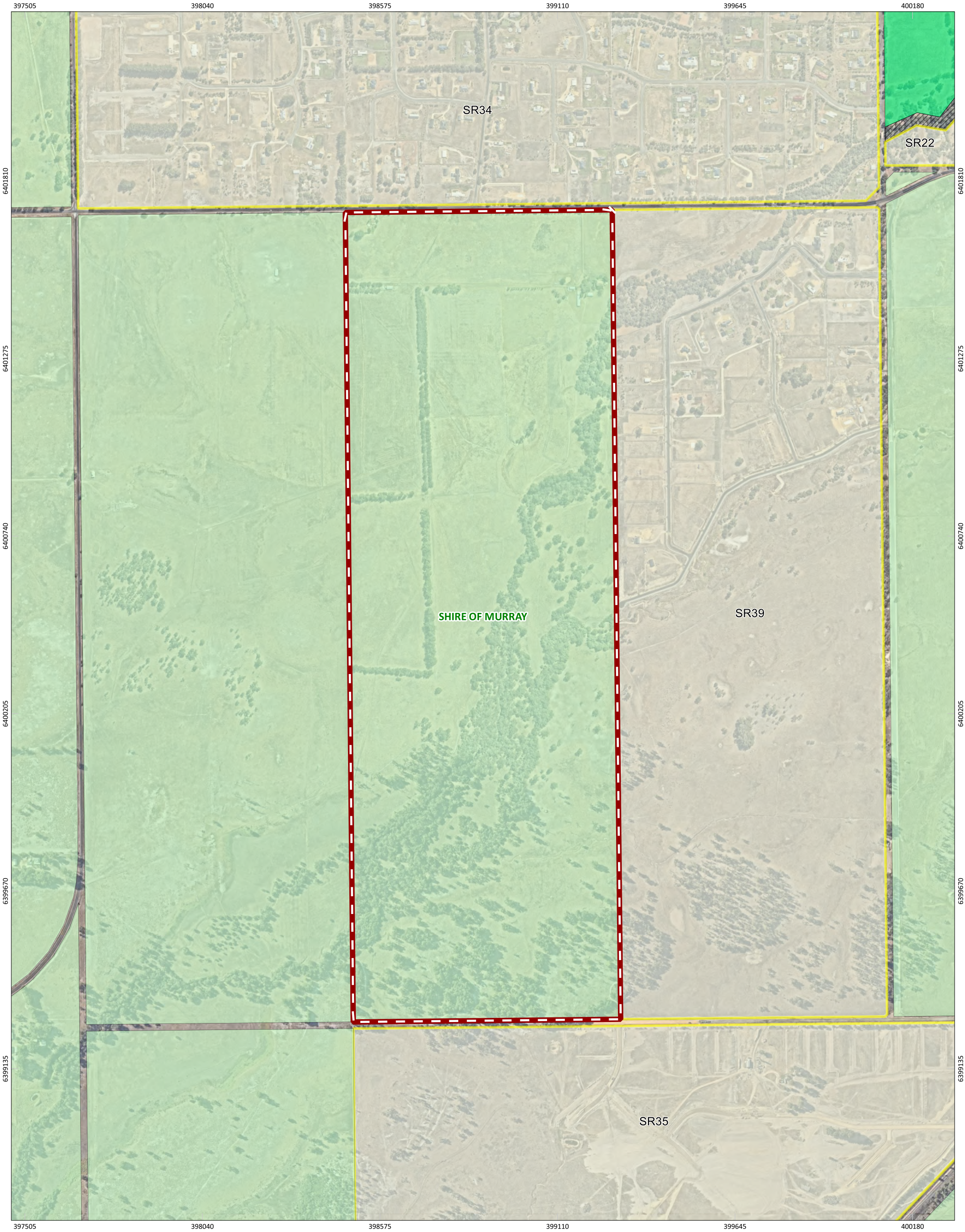

Figure 3: Surrounding Land Use and Zoning

N

0 75 150 225 300 m

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup			
SCALE: 1:10,700	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area
- Local Planning Scheme - Zones and Reserves (DPLH-071)
  - Farmlet
  - Public recreation / conservation
  - Rural
  - Special rural

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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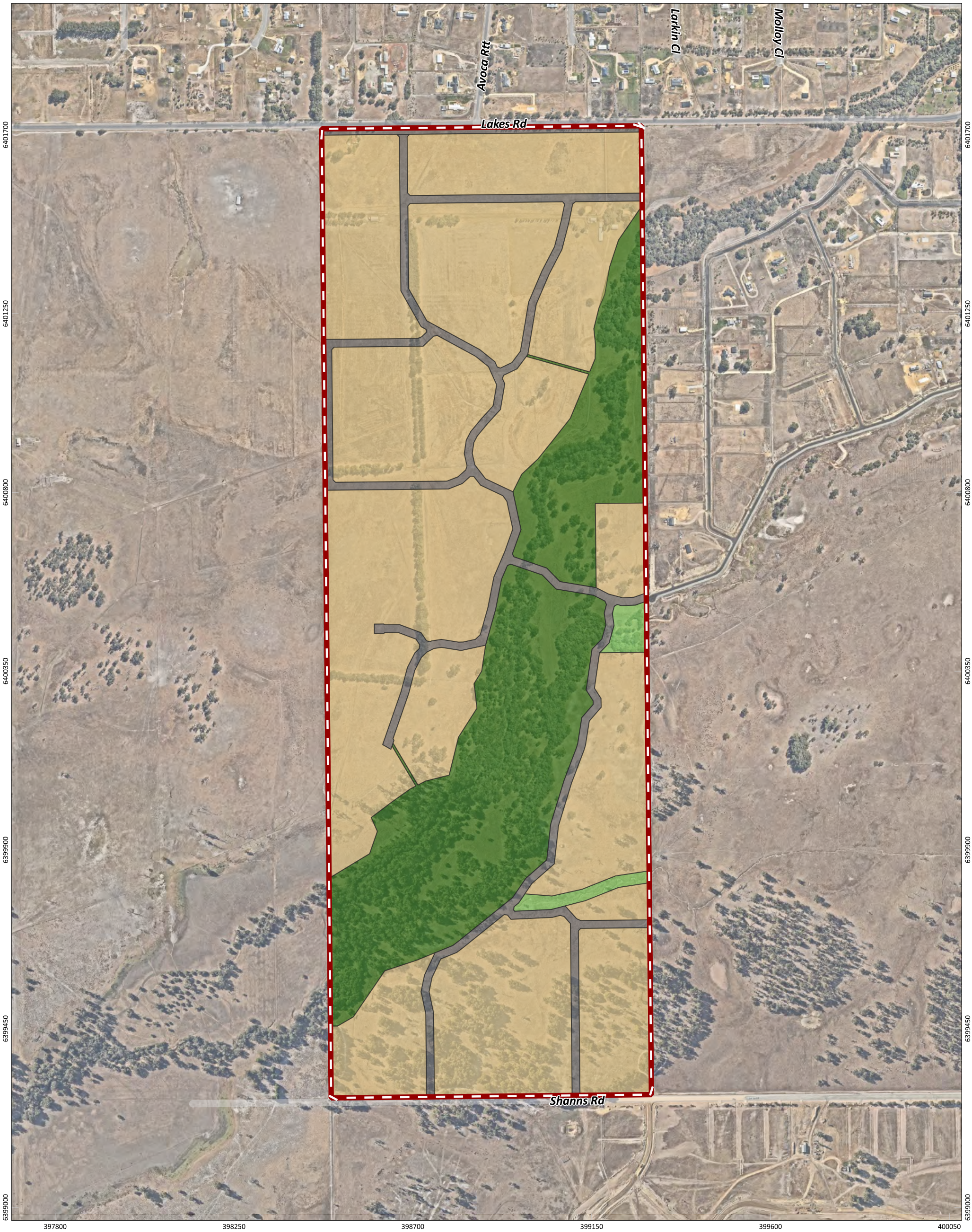

Figure 4: Preliminary Concept Plan

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0 75 150 225 300 m

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup		
SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area

Concept Plan

- Road
- Lot Boundary
- Foreshore Reserve
- Public Open Space

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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2. Environmental Legislation, Policies and Guidelines

2.1 Commonwealth Legislation

For the purpose of the development of Local Scheme Amendments, State legislation is the only relevant legislation. Commonwealth environmental legislation, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is not directly relevant to the Region or Local Scheme Amendment process, as this legislation is not appropriately geared toward the assessment of strategic planning exercises and would only be applicable to future proposed development action, should Matters of National Environmental Significance (MNES) be impacted.

However, the following legislation and policy were considered as they relate to environmental values within the Site and future planning stages:

- EPBC Act.
- Department of the Environment Water Heritage and the Arts (DEWHA). (2010). *Survey Guidelines for Australia's Threatened Birds.*
- Department of the Environment (DoE). (2013). *Matters of National Environmental Significance. Significant Impact Guidelines 1.1.*
- Department of Agriculture, Water and the Environment (DAWE). (2022). *Referral guideline for 3 threatened black cockatoo species: Carnaby's Cockatoo* (Zanda latirostris), *Baudin's Cockatoo* (Zanda baudinii) *and Forest Red-tailed Black-cockatoo* (Calyptorhynchus banksii naso).

2.2 State Government Legislation

2.2.1 Environmental Protection Act 1986 (EP Act)

The *Environmental Protection Act 1986* (EP Act) is the key legislative tool for environmental protection in Western Australia. It is administered by the Environmental Protection Authority (EPA) and the Minister for Environment. Under Section 48A of the EP Act, when a scheme amendment (i.e. LPS amendment) is referred to the EPA, the EPA must decide whether or not to assess the scheme or determine that it is incapable of being made environmentally acceptable. The assessment levels include the following:

- Scheme amendment not to be assessed under part IV of the EP Act. No advice given (not appealable).
- Scheme amendment not to be assessed under part IV of the EP Act. Advice given (not appealable).
- Scheme incapable of being made environmentally acceptable.
- Assess – Environmental Review.

2.2.2 Other Relevant State Legislation

All assessments have been conducted with reference to the following State legislation, which provides for the environmental values and contamination risks addressed within this document:

- *Biodiversity Conservation Act 2016* (BC Act).
- *Biosecurity and Agriculture Management Act 2007* (BAM Act).
- *Contaminated Sites Act 2003* (CS Act).
- *Contaminated Sites Regulations 2006* (CS regulations).
- *Planning and Development Act 2005*.
- *Aboriginal Heritage Act 1972*.
- *Heritage Act 2018*.

2.3 Relevant Standards, Guidelines and Policies

Table 1 details the key standards, guidelines, and State Planning Policies relevant to future residential development of the Site.

Table 1: Key Standards, Guidelines, and State Planning Policies

Document	Description
Environmental Protection Authority (EPA) Guidance	
Statement of Environmental Principles, Factors, Objectives and Aims of EIA **(EPA, 2023a)**	This statement communicates the EPA considers the object and principles of the EP Act, uses environmental factors and objectives to organise and systemise environmental impact assessment (EIA), taking a holistic view of the environment and considering significance of a proposal.
Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment **(EPA, 2016c)**	The technical information provided within this guidance is applicable to flora and vegetation only and should be applied in conjunction with the Environmental Protection Authority's (EPA) policy for the Flora and Vegetation Factor.
Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment **(EPA, 2020)**	The purpose of this technical guidance is to ensure that terrestrial vertebrate fauna data of an appropriate standard are obtained and used for environmental impact assessment.
Guidance Statement No. 3: Separation Distances Between Industrial and Sensitive Land Uses **(EPA, 2005)**	Provides guidance on the generic separation (buffer) distances between Industrial and Sensitive land uses to avoid conflicts between these land uses.
Guidance Statement No. 33: Environmental Guidance for Planning and Development **(EPA, 2008)**	Provides information and advice to assist land use planning and development processes to protect, conserve and enhance the environment.

Document	Description
	Describes the processes the EPA may apply under the EP Act to land use planning and development in Western Australia, and the environmental impact assessment process applied by the EPA to schemes.
Guidance Statement No. 41: Aboriginal Heritage Assessment **(EPA, 2004)**	Provides guidance on the EPA's position on the assessment of Aboriginal heritage and information that the EPA will consider when assessing proposals where Aboriginal heritage is a relevant environmental factor.
EPA Environmental Factor Guidelines	The EPA factor guidelines provide guidance on how to the environmental factors are considered by the EPA in the EIA process. The applicable environmental factors for this report have been identified in Section 4.2 and further discussed in the following sections. Relevant EPA factor guidelines are listed in the allocated sections of each applicable factor.
Guidance for Planning and Development: Protection of Naturally Vegetated Areas in Urban and Peri-urban Areas **(EPA, 2021)**	Sets out the EPA's views and expectations for the design of urban and peri-urban development proposals to protect naturally vegetated area to help planners and developers to integrate and consider naturally vegetated areas during all stages of the planning process, to meet the EPA's objectives for relevant factors, notably Terrestrial Fauna, Flora and Vegetation, Social Surroundings and Inland Waters.
WA Environmental Offsets Policy (EPA, 2011)	Seeks to protect and conserve environmental and biodiversity values for present and future generations. The policy ensures that economic and social development may occur while supporting long term environmental and conservation values.
State Planning Policies	
State Planning Policy 2.9: Water Resources (WAPC, 2006)	Provides clarification and additional guidance to planning decision-makers for consideration of water resources identified as having significant economic, social, cultural, or environmental values.
Statement of Planning Policy 2.2: Gnangara Groundwater Protection (WAPC, 2005a)	Purpose of the policy is to prevent, control or manage development and land use changes in the policy area that are likely to cause detrimental effects to the groundwater resource.
State Planning Policy 3.7: Bushfire (DPLH, 2024a)	Provides guidance on the implementation of effective risk-based land use planning and development to preserve life and reduce the impact of bushfire on property and infrastructure.
Planning for Bushfire Guidelines. For the implementation of State Policy 3.7 Bushfire (DPLH, 2024b)	Provides specific requirements and support for decision makers and proponents to address and implement SPP 3.7.
Guideline for the Determination of Wetland Buffer Requirements (WAPC, 2005b)	Provides guidance on the consideration of wetland during a chance in land use or a proposed development in the immediate vicinity of a wetland where future land use is likely to conflict with the established wetland management objectives. Under these guidelines, an appropriate buffer distance should be identified to achieve an acceptable planning outcome.
Department of Water and Environmental Regulation (DWER) Guidelines (formerly Department of Environment Regulation [DER])	
Assessment and Management of Contaminated Sites (DWER, 2021a)	Provides guidance on the assessment and management of contaminated sites in Western Australian within legislative

Document	Description
	framework of the *Contaminated Sites Act 2003* and the Contaminated Sites Regulations 2006.
Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DER, 2015)	Provides guidance to assist with the identification, assessment, and management of acid sulfate soils in Western Australia.
Water Quality Protection Note No. 25: Land Use Compatibility Tables for Public Drinking Water Source Areas (DWER, 2021)	This note provides guidance for land use planning within onshore PDWSAs. It sets out guidelines on appropriate land uses and activities within PDWSAs that represents best management practice to protect water quality and public health.
Clearing Regulation Fact Sheet 24: Environmentally Sensitive Areas (DER, 2014)	Provides information on the declaration of environmentally sensitive areas (ESAs), how to view the location of ESAs and how ESAs affect when a clearing permit is required.
DBCA Guidelines	
A Guide to Managing and Restoring Wetlands in Western Australia (DBCA, 2012)	This guide provides information about the nature of Western Australia's wetlands and practical guidance on how to manage and restore wetlands for nature conservation.

3. Site Description

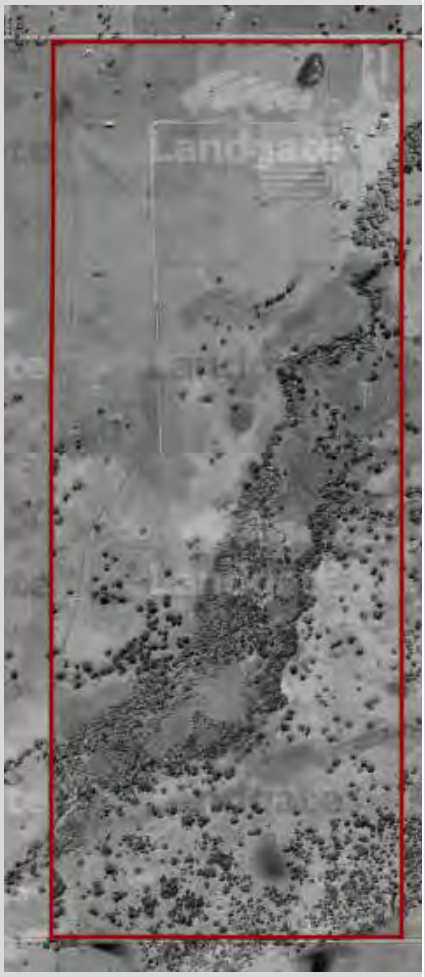
3.1 Current Land Use

The Site comprises of 196.48 ha and is situated within the locality of North Dandalup within the Shire of Murray. It is bound by Lakes Road in the north, adjacent lot in the west and east, and bound by Shanns Road in the south.

3.2 Historic Land Uses

Historical aerial photographs (Landgate n.d.) of the Site was reviewed as part of this assessment. The Site has been historically cleared prior to the 1970s. All aerial imagery findings are summarised in Table 2. The boundary shown in red in the pictures represents the current lot boundary of Lot 39.

Table 2: Historical Aerial Image Review of the Site (Landgate n.d.)

		
1979: Earliest available aerial of Site	1989-1995: Planting of windbreak trees in the western portion	2025: Current land use

3.3 Surrounding Land Uses

A review of current aerial photography indicates the current land uses surrounding the Site:

- North - immediately north of the Site is land zoned as 'Special Rural (SR34)' under the MRS.
- East - immediately east of the Site is land zoned as 'Special rural (SR39)' within the MRS.
- South - Immediately south of the Site is land zoned as 'Special rural (SR35)' within the MRS.
- West - Land immediately west of the Site is zoned as 'Rural' within the MRS.

4. Environmental Principles and Factors

4.1 Environmental Principles

Section 4A of the EP Act defines the five environmental principles on which environmental protection in Western Australia (WA) is based upon. This EAR has considered these principles as described in Table 3 below.

Table 3: Environmental Principles (EP Act)

Principle	Description
1. The Precautionary Principle Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be use as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by: • Careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and • An assessment of the risk-weighted consequences of various options.	During the development of the LPS amendment design, site assessments were undertaken to identify environmental values present within the Site. The LPS amendment design has taken the environmental values present within the area into consideration and implemented design strategies to avoid impacts on valuable environmental assets. This was done by strategically locating areas of retention, such as the foreshore reserve and Public Open Space (POS), in areas where a high density of conservation significant environmental values occur.
2. The Principle of Intergenerational Equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	Environmental values within the Site are mainly located along the North Dandalup River, including Conservation Category Wetlands (CCW; UFID 13313 and 6018) and an associated tributary, which intersect the Site. Additional environmental values are located within the southern portion of the Site. These values are currently not managed for conservation purposes. Whilst future development of the Site will result in some environmental impacts, significant impact avoidance measures have been incorporated into the LPS amendment design. As part of the LPS development, a biophysical assessment of the watercourse, which intersects the Site, has been undertaken to delineate the foreshore area, which covers an area of 49.81 ha. Including these areas in reserves will allow for better future management of significant environmental values and their long-term enhancement to benefit future generations.
3. The Principle of the Conservation of Biological Diversity and Ecological Integrity Conservation of biological diversity and ecological integrity should be a fundamental consideration.	A range of thorough and detailed site-specific investigations have been undertaken to determine the existing biological diversity and ecological integrity of the Site. These investigations have informed the LPS design. Implemented foreshore and retention areas will support the biological diversity and ecological integrity of environmental values within the Site.
4. Principles Relating to Improved Valuation, Pricing and Incentive Mechanisms • Environmental factors should be included in the valuation of assets and services.	The ongoing and long-term maintenance and management costs of retention areas as proposed by the LPS amendment will be minimised due to the continuity of the vegetation type within the foreshore area, creating one larger reserve.

Principle	Description
• The polluter pays principle: Those who generate pollution and waste should bear the cost of containment, avoidance or abatement. • The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any wastes. • Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which enable those best placed to maximise benefits and/or minimise costs to develop their own solutions and responses to environmental problems.	Smaller and more disturbed areas are less viable and have not been planned for retention but instead development structures have been located in those areas in order to maximise benefits while minimising costs. Where it is suitable and feasible to retain valuable environmental characteristics, such as mature habitat trees, this has been and will be incorporated into multiple use areas such as POS, road reserves or potential drainage infrastructure. Given the proposed zoning of 'Special Rural', the majority of trees will be retained within rural residential lots, subject to bushfire requirements at future planning stages.
5. The Principle of Waste Minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	Measurements and practices to minimise the generation of waste and its discharge into the environment will be implemented into any future development designs of the Site.

4.2 Environmental Factors

The EPA (2023a) *Statement of Environmental Principles, Factors, Objectives and Aims of EIA* defines 14 environmental factors within five themes: sea, land, water, air and people. The applicability of these factors for the proposed LPS amendment has been assessed in Table 4. Subsequently, this report assesses the significance of impacts caused by the proposal on each applicable factor with regard to the specific objectives defined by the EPA.

Table 4: EPA Factors Applicable to the MRS Amendment

Theme	Factor	Objective	Applicable to MRS Amendment
Sea	Benthic communities and habitats	To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	No. The Site is located approximately 18 km inland from the coast and is not linked to marine environments. Therefore, this factor is not applicable for the LPS amendment and the future development of the Site.
	Coastal processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	No. The Site is located approximately 18 km inland from the coast and is not linked to marine environments. Therefore, this factor is not applicable for the LPS amendment and the future development of the Site.
	Marine environmental quality	To maintain the quality of water, sediment and biota so that environmental values are protected.	No. The Site is located approximately 18 km inland from the coast and is not linked to marine environments. Therefore, this factor is not applicable for the LPS amendment and the future development of the Site.
	Marine fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	No. The Site is located approximately 18 km inland from the coast and is not linked to marine environments. Therefore, this factor is not applicable for the LPS amendment and the future development of the Site.
Land	Flora and vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	Yes. The Site contains flora and vegetation values of state and regional significance. The proposed LPS amendment has been designed in a way to avoid and mitigate significant impacts to flora and vegetation values. This factor is, however, applicable to the LPS amendment. This factor is discussed in Section 5.2.
	Landforms	To maintain the variety and integrity of distinctive physical landforms so that environmental values are protected.	No. The Site is generally flat with only light slopes. The physical landforms which occur within the Site are not significant, given they are common and widespread across the local area and eastern Swan Coastal Plain region. Therefore, this is not an applicable factor for the LPS amendment and any associated future development of the Site.

Theme	Factor	Objective	Applicable to MRS Amendment
	Subterranean fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	No. It is unlikely that the Site supports any significant habitat values for subterranean fauna. It is acknowledged that there is some uncertainty as to the specific occurrence of subterranean fauna. However, the risk of significant impacts to subterranean fauna as a result of future development of the Site is low considering the currently planned land uses. Groundwater management is discussed under the factor of inland waters. Consequently, the factor of subterranean fauna is not applicable for the LPS amendment.
	Terrestrial environmental quality	To maintain the quality of land and soils so that environmental values are protected.	Yes. Acid Sulfate Soil (ASS) risk mapping by the Department of Water and Environmental Regulation (DWER) identifies the potential for ASS to occur within the Site. No significant terrestrial environmental quality risks associated with the proposed future urban land uses within the Site have been identified. However, this factor is applicable factor for the LPS amendment and is further discussed in Section 5.1.
	Terrestrial fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Yes. The site contains a range of habitat values for conservation significant fauna species, such as threatened black cockatoo. The proposed LPS amendment has been designed in a way to avoid and mitigate significant impacts to existing fauna habitat. This factor is, however, applicable to the LPS amendment. This factor is discussed in Sections 5.3 and 5.3.3.
Water	Inland waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	Yes. The Site contains surface water features, including wetlands and waterways. The proposed LPS amendment has been designed in a way to avoid and mitigate significant impacts to those hydrological values and processes that maintain environmental value. This factor is, however, applicable to the LPS amendment. This factor is discussed in Section 6.1.
Air	Air quality	To maintain air quality and minimise emissions so that environmental values are protected.	No. The LPS amendment design does not propose any future land uses within the Site which would generate emissions that would significantly impact air quality. In addition, the LPS amendment does not propose any sensitive land uses to be established in proximity to any existing operations whose emissions significantly impact air quality. Hence, this is not an applicable factor for this report.

Theme	Factor	Objective	Applicable to MRS Amendment
	Greenhouse gas emissions	To minimise the risk of environmental harm associated with climate change by reducing greenhouse gas emissions as far as practicable.	No. Future development of the Site, facilitated by the proposed scheme amendment, will result in scope 1, 2 and 3 greenhouse gas emissions. These will occur during construction and operation. However, given the scale of development these emissions will not exceed the threshold identified in the EPA (2024) *Environmental Factor Guideline - Greenhouse Gas Emissions*.
People	Social surroundings	To protect social surroundings from significant harm.	Yes. A Registered Aboriginal Heritage Site is mapped by the Department of Planning, Land and Heritage (DPLH) as occurring over the Site which is associated with the mythological values of the North Dandalup River and its tributaries. Whilst the MRS amendment has been designed in a way to avoid significant impacts to social surrounds, this factor is applicable to the LPS amendment. This factor is further discussed in Section 7.1.
	Human health	To protect human health from significant harm.	No. This factor relates solely to impacts to human health arising from the emission of radiation. The LPS does not propose any future land uses within the site which would produce radioactive emissions that would impact human health. In addition, the LPS does not propose any sensitive land uses to be established in proximity to any existing operations which emit radioactive emissions impacting human health. As such, this is not an applicable factor for the LPS and any associated future special rural development of the Site.

5. Land

5.1 Terrestrial Environmental Quality

5.1.1 Factor Specific Policies and Guidance

Relevant policy and guidance documents for terrestrial fauna, which have informed site-specific investigations and/or have been used to assess potential impacts, include:

- *Environmental Factor Guideline: Terrestrial Environmental Quality* (EPA, 2016c).

5.1.2 Soil Surface Geology and Topography

The Site is relatively flat throughout with only gentle slopes. The elevation across the Site ranges from 18 m Australian Height Datum (mAHD) in the southwestern corner to 26 mAHD in the eastern centre and southeastern corner (*DPIRD-072*). A general downgradient toward North Dandalup River can be observed (Figure 5).

The Site is located mainly within the Pinjarra Zone of the Swan Province, and a portion in the south intersects with the Bassendean Zone. These zones are described as featuring the following soils:

- **Pinjarra Zone**: Alluvial deposits (early Pleistocene to Recent) between the Bassendean Dunes Zone and the Darling Scarp, colluvial and shelf deposits adjacent to the Darling Scarp. Clayey to sandy alluvial soils with wet areas (Schoknecht et al., 2004).

- **Bassendean Zone:** Mid-Pleistocene Bassendean sand. Fixed dunes inland from coastal dune zone. Non-calcareous sands, podsolised soils with low-lying wet areas (Schoknecht et al., 2004).

Mapping by the Department of Primary Industries and Regional Development (DPIRD) (*DPIRD-027*) shows that five soil units are present within the Site as described in Table 5 and shown on Figure 5.

Table 5: Soil Units within the Site

Unit (151)	Name	Description	Area (ha)
213Pj__P1a	Pinjarra phase P1a	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Shallow pale sand to sandy loam over clay; imperfect to poorly drained and generally not susceptible to salinity.	84.92
213Pj__P1b	Pinjarra phase P1b	Flat to very gently undulating plain with deep acidic mottled yellow duplex (or effective duplex) soils. Moderately deep pale sand to loamy sand over clay: imperfectly drained and moderately susceptible to salinity in limited areas.	9.31
213Pj__P9	Pinjarra phase P9	Shallowly incised stream channels of minor creeks and rivers with deep acidic mottled yellow duplex soils.	58.33

Unit (151)	Name	Description	Area (ha)
213Pj_P8	Pinjarra P8 phase	Broad poorly drained flats and poorly defined stream channels with moderately deep to deep sands over mottled clays; acidic or less commonly alkaline clay and yellow duplex soils to uniform bleached or pale brown sands over clay.	0.26
212Bs_B2	Bassendean B2 phase	Flat to very gently undulating sandplain with well to moderately well drained deep bleached grey sands with a pale yellow B horizon or a weak iron-organic hardpan 1-2 m.	29.99
212Bs_B1	Bassendean B1 phase	Extremely low to very low relief dunes, undulating sandplain and discrete sand rises with deep bleached grey sands sometimes with a pale yellow B horizon or a weak iron-organic hardpan at depths generally greater than 2 m; banksia dominant.	13.67

5.1.3 Acid Sulfate Soils

The entire Site is mapped as having a moderate to low risk of Acid Sulfate Soils (ASS) occurring within 3 m of the natural soil surface but high to moderate risk of ASS beyond 3 m of natural soil surface (*DWER-055*; Figure 6).

5.1.4 Potential Contamination

According to the DWER Contaminated Sites Database (*DWER-059*), there are no contaminated sites recorded within the Site.

The nearest registered contaminated site is Lot 89 on Plan 741, located 7.5 km northeast of the Site (*DWER-059*). The site has been identified as remediated for restricted use. The DWER Summary of Records under the *Contaminated Sites Act 2003* states that the site has been historically used for activities, such as a "piggery and two composting operations" (DWER, 2025). The nature of the contamination present is described as elevated levels of nutrients in groundwater as well as heavy metals being present in soil, groundwater.

Given the distance from the Site and this is not considered a constraint to the propose future development of the Site.

Figure 5: Surface Geology (Soils) and Topography

0 100 200 300 400 m

N

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup			
SCALE: 1:14,200	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area

Soil Landscape Mapping - Best Available (DPIRD-027)

- 212Bs__B1
- 212Bs__B2
- 213Pj__B1
- 213Pj__B2
- 213Pj__P1a
- 213Pj__P1b
- 213Pj__P7
- 213Pj__P8
- 213Pj__P9

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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Figure 6: Acid Sulfate Soils Risk

N

0 75 150 225 300 m

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup			
SCALE: 1:10,700	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

Survey Area

Acid Sulfate Soil Risk Map, Swan Coastal Plain (DWER-055)

2 – Moderate to low risk of ASS occurring within 3m of natural soil surface but high to moderate risk of AS beyond 3m of natural soil surface

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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5.2 Flora and Vegetation

5.2.1 Factor Specific Policies and Guidance

Relevant policy and guidance documents for terrestrial fauna, which have informed site-specific investigations and/or have been used to assess potential impacts, include:

- *Environmental Factor Guideline: Flora and Vegetation* (EPA, 2016a).

A Reconnaissance flora and vegetation survey was undertaken by WEPL over 1st and 2nd April 2025 (WEPL, 2025a). Results of this survey have been used to inform this section of the EAR.

5.2.2 Regional Context

The Site is located within the Swan Coastal Plain (SCP) bioregion of the Interim Biogeographic Regionalisation of Australia (IBRA) and within the SCP Perth subregion (SWA02). The SCP region 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 (Mitchell et al., 2002).

5.2.3 Conservation Areas

No conservation areas are mapped within or in proximity of the Site.

The Site does not intersect any Bush Forever Areas (DPLH-019). The nearest Bush Forever Sites are over 8 km north-west of the Survey Area (Site 77 - Yangedi Swamp).

5.2.4 Pre-European Vegetation

Pre-European Vegetation Association

During the 1970s, John Beard and associates conducted a systematic survey of native vegetation, describing the vegetation systems in Western Australia at a scale of 1:250 000 in the south-west and at a scale of 1:1,000,000 in less developed areas (Beard, 1981).

This mapping sought to describe the native vegetation presumed to occur prior to European settlement and, as such, is referred to as pre-European vegetation associations. These vegetation maps are maintained in digital form by DPIRD (*DPIRD-006*). Extents are updated periodically by Department of Biodiversity, Conservation and Attractions (DBCA) (Government of Western Australia, 2019a).

The pre-European vegetation association identified within the Site is displayed in Figure 7. Its pre-European and current extents within the SCP are listed in Table 6.

Table 6: Pre-European Vegetation Association within the Site and the SCP

Vegetation Association	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Pinjarra_968 Remnant native vegetation within Site: 172.00 ha	Medium woodland; jarrah, marri & wandoo	135,999.02	8,996.33	6.61%	1.19%
Bassendean_1000 Remnant native vegetation within Site: 24.48 ha	Mosaic: Medium forest; jarrah-marri / Low woodland; banksia / Low forest; teatree (*Melaleuca* spp.)	88,077.18	23,647.51	26.85%	1.90%

Vegetation Complexes

Regional vegetation for the SCP was mapped at vegetation complex level by Heddle et al. (1980) at a scale of 1:250,000 and are maintained in digital form by DBCA (*DBCA-046*; Government of Western Australia, 2019b). The Site is located within the area of the Guildford Complex, which is described as open woodland (Figure 7). The pre-European and current extents of the vegetation complex within the SCP are listed in Table 7 (Government of Western Australia, 2019b).

Table 7: Extent of Pre European Regional Vegetation Complexes within the Site and the SCP

Vegetation Association or Complex within the Waterloo Site	Description	Original Extent (ha)	Current Extent (ha)	% Remaining	% Managed for Conservation
Guildford Complex	A mixture of open forest to tall open forest of *Corymbia calophylla* (marri) - *Eucalyptus wandoo* (wandoo) - *Eucalyptus marginata* (jarrah) and woodland of *Eucalyptus wandoo* (wandoo) (with rare occurrences of *Eucalyptus lane-poolei* [salmon white gum]). Minor components include *Eucalyptus rudis* (flooded gum) - *Melaleuca rhaphiophylla* (swamp paperbark).	90,513.13	4,607.91	5.09%	0.26%

The Site is within the mapped extent of the Guildford Complex and contains key species for the complex as per the structural description in Heddle et. al (1980). The state-wide vegetation statistics (GoWA, 2018) indicates that, of the estimated pre-European extent for Guildford Complex, approximately 5.09 % remains.

This is below the 30 % retention threshold identified in the national objective and targets for biodiversity conservation in Australia (Commonwealth of Australia, 2001). In recognition of past land use planning decisions, areas within the: Greater Bunbury Region Scheme; Metropolitan Region Scheme; Peel Region Scheme; and Bush Forever study area, have been identified as 'constrained' areas. Within these constrained areas, native vegetation retention objectives may be varied to “at least 10 %”. However, other principles do apply within these constrained areas, subject to exemptions for assessed schemes and deemed works of subdivisions (DER, 2014).

Due to the Completely Degraded condition of all vegetation types, VT01, VT02, VT03 and VT04 are not considered to represent an extant occurrence of the Guildford Complex vegetation type, and therefore the Site is not considered to comprise an occurrence of vegetation of other significance based on the threshold levels of pre-European vegetation extents.

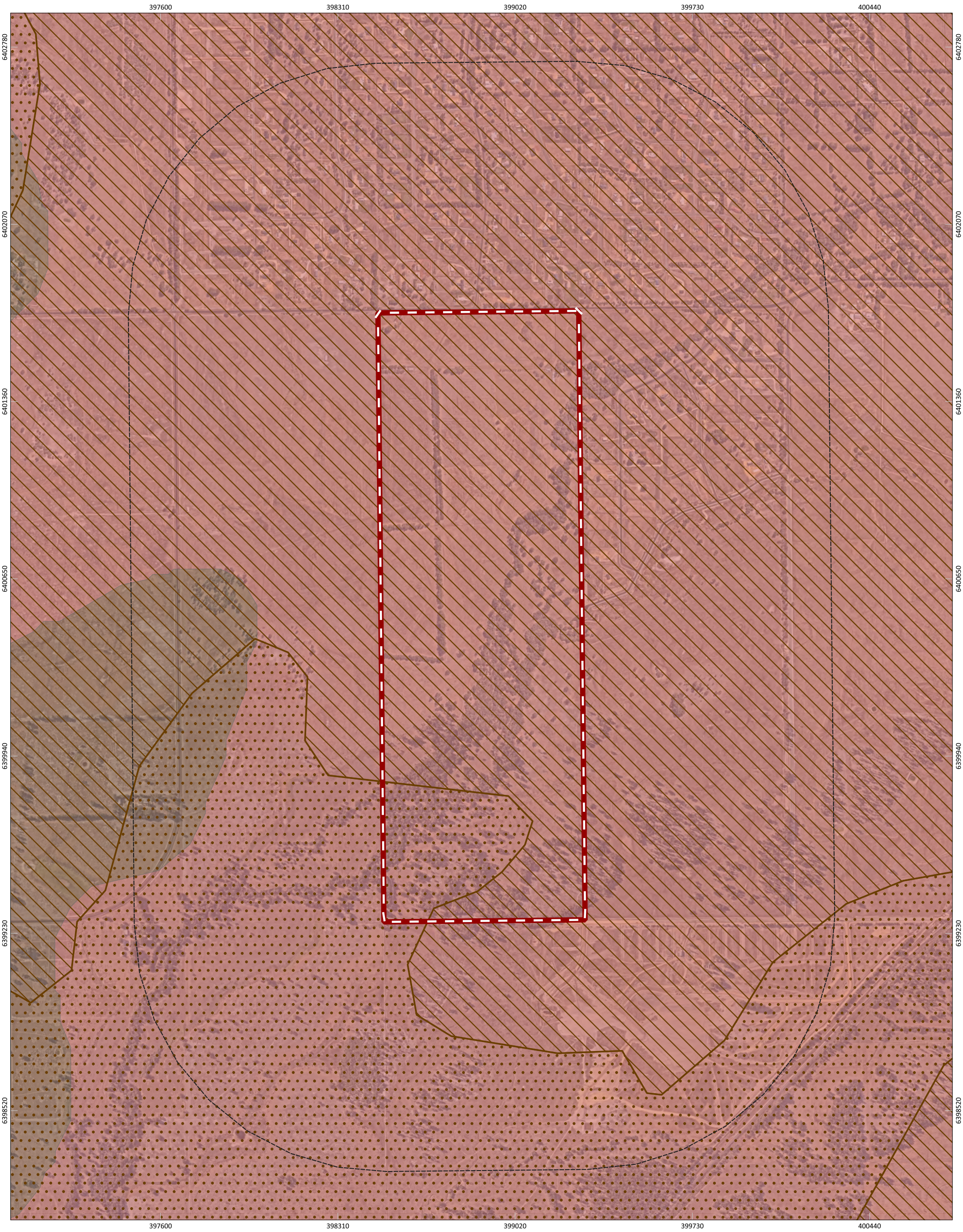

Figure 7: Pre-European Vegetation Complexes and Associations

0 100 200 300 400 m N	PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup		
SCALE: 1:14,200	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area
- 1km Buffer

Pre-European Vegetation (DPIRD-006)

- BASSENDEAN_1000
- PINJARRA_968

Vegetation Complexes - Swan Coastal Plain (DBCA-046)

- Southern River Complex
- Guildford Complex

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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5.2.5 Vegetation Types

Four vegetation types were identified within the Site, covering a total area of 63.77 ha. Vegetation types are described in Table 8 and depicted in Figure 8. Only three vegetation types are considered to represent native vegetation under Part V of the EP Act, given that planted vegetation (VT04) is not an extant occurrence of native vegetation. The native vegetation types within the Site are VT01, VT02 and VT03, comprising a total area of 54.10 ha.

The riparian vegetation adjacent to the western portion of North Dandalup River contained the best condition (Degraded to Completely Degraded) native vegetation (relative to the rest of the Site), comprising of *Melaleuca preissiana* and *Juncus pallidus* rushes over weedy grasses (VT03). This vegetation type is associated with the North Dandalup River foreshore reserve which will be retained as shown in the current draft concept plan (Figure 4).

The remaining areas of VT01 and VT02 were mainly composed of *Eucalyptus marginata* woodland and *Corymbia calophylla* woodland, respectively.

Table 8: Vegetation Types and Descriptions

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT01 Description: *Eucalyptus marginata* open woodland with scattered *Banksia* spp. *Eucalyptus marginata* open woodland with scattered individuals of *Banksia attenuata*, *Banksia menziesii*, *Allocasuarina fraseriana* mid stratum over **Xanthorrhoea gracilis* individual shrubs over **Bromus diandrus*, **Ehrharta calycina* and **Hypochaeris glabra* grasses/herbs. Highly disturbed from cattle presence and grazing. TECs/PECs: None identified. Historical clearing and grazing have resulted in the loss of all potentially occurring communities.	Completely Degraded	R02 R03 R09	4.39 ha 2.2%	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT02 Description: *Corymbia calophylla/Kingia australis* woodland *Corymbia calophylla* mid open forest with scattered *Kingia australis* over paddock grassland. Occurs in lower landscapes on margins of wetlands and atop of heavy soils of southern SCP. Heavily degraded due to historical clearing and agricultural grazing presence. TECs/PECs: None identified. Historical clearing and grazing have resulted in the loss of all potentially occurring communities.	Completely Degraded	R01 R04	16.35 ha 8.3%	 

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Veg Code: VT03 Description: Riparian vegetation *Melaleuca preissiana* riparian woodland over *Juncus pallidus* rushes over *Alternanthera denticulata* and**Ehrharta calycina*, **Hypochaeris glabra* and **Vulpia myuros* weedy grasses. Highly degraded with mainly introduced species in the ground stratum. TECs/PECs: None identified	Degraded to Completely Degraded	R05	33.36 ha 17.0%	
Veg Code: VT04 Description: Mixed non-native planting Planted **Eucalyptus grandis* over **Avena barbata*, **Ehrharta calycina*, **Vulpia myuros* weedy grasses. Highly degraded due to cattle presence and grazing.	Completely Degraded	R08	9.67 ha 4.9%	

Vegetation Unit Description	Vegetation Condition	Sampling Sites	Area (ha) % of Survey Area	Representative Photo
Paddock* Scattered individual *Corymbia calophylla*, *Eucalyptus marginata*, *Eucalyptus rudis*, *Xylomelum occidentale* and *Melaleuca preissiana* over **Vulpia myuros* and **Bromus diandrus* grasses. *These areas contain scattered foraging species for black cockatoo. These values have therefore been mapped and considered as foraging habitat.	Completely Degraded	R06 R07	132.71 ha 67.5%	 
Total			196.48 ha	

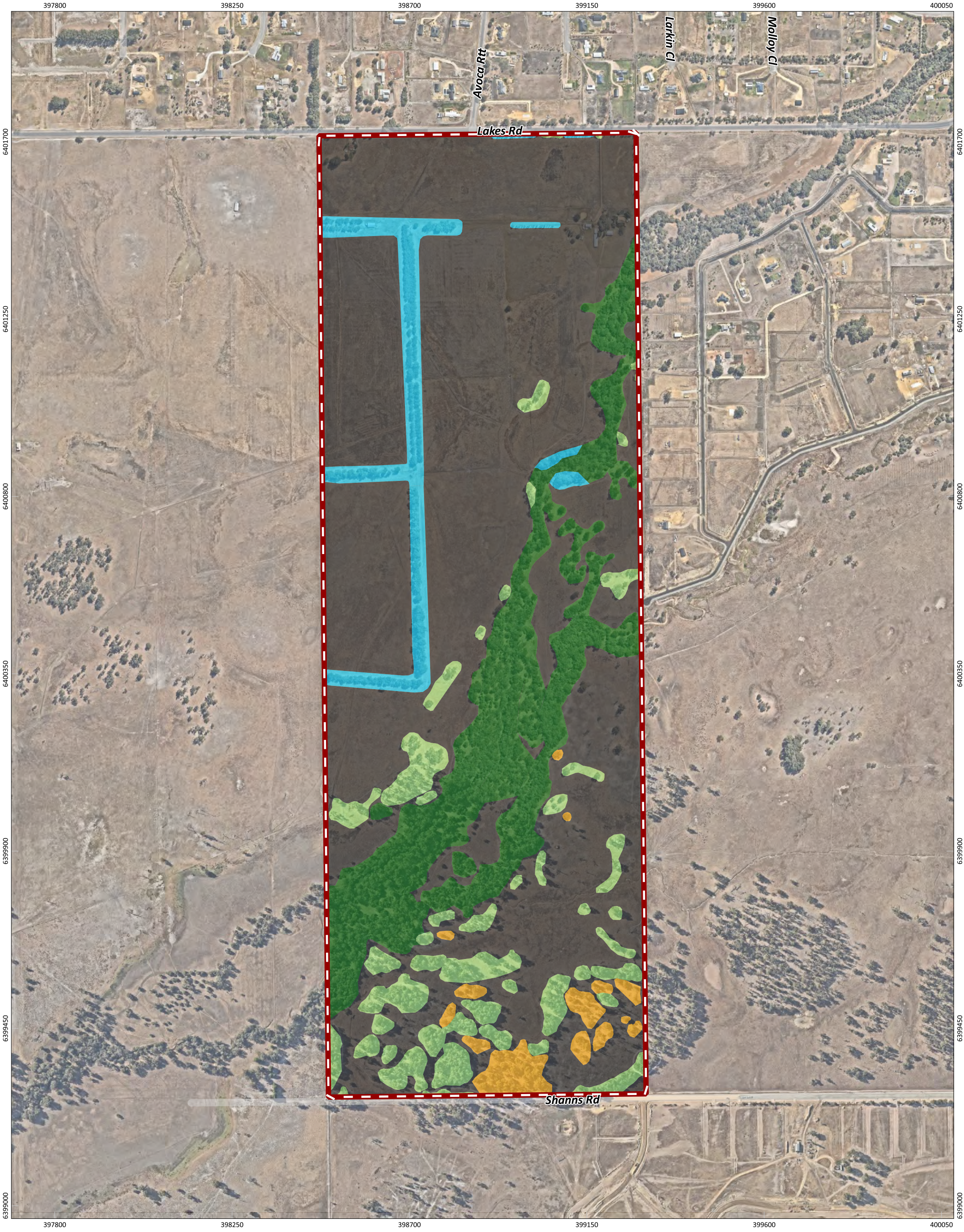

Figure 8: Vegetation Types

N

0 75 150 225 300 m

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup		
SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

Survey Area

Vegetation Type
- Cleared Paddock
- VT01
- VT02
- VT03
- VT04

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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5.2.6 Vegetation Condition

Vegetation within the Site ranges from Degraded to Completely Degraded condition, as per as per EPA (2016) vegetation condition scale. The majority of the Site is in Completely Degraded condition, as detailed in Table 9 and shown on Figure 9. The Site has been affected by degrading factors including clearing, grazing cattle and weed invasion. Vegetation condition is worse within the northern portion of the Site where more intensive historical clearing and agriculture grazing has occurred.

Table 9: Vegetation Condition of the Site

Vegetation Condition	Area (ha)	Proportion of Survey Area (%)
Excellent	-	-
Very Good	-	-
Good	-	-
Degraded	24.71	12.6
Completely Degraded	171.77	87.4
Total	196.48	100.0

Significant Weeds

The majority of weeds species recorded during the survey were common and widespread.

One species recorded, Narrowleaf Cottonbush *(*Gomphocarpus fruticosus*), is listed as a Declared Pest under the BAM Act in Western Australia. Nine individuals were recorded in the eastern portion of the Site within the riparian vegetation of VT04 (WEPL, 2025), as shown in Figure 9.

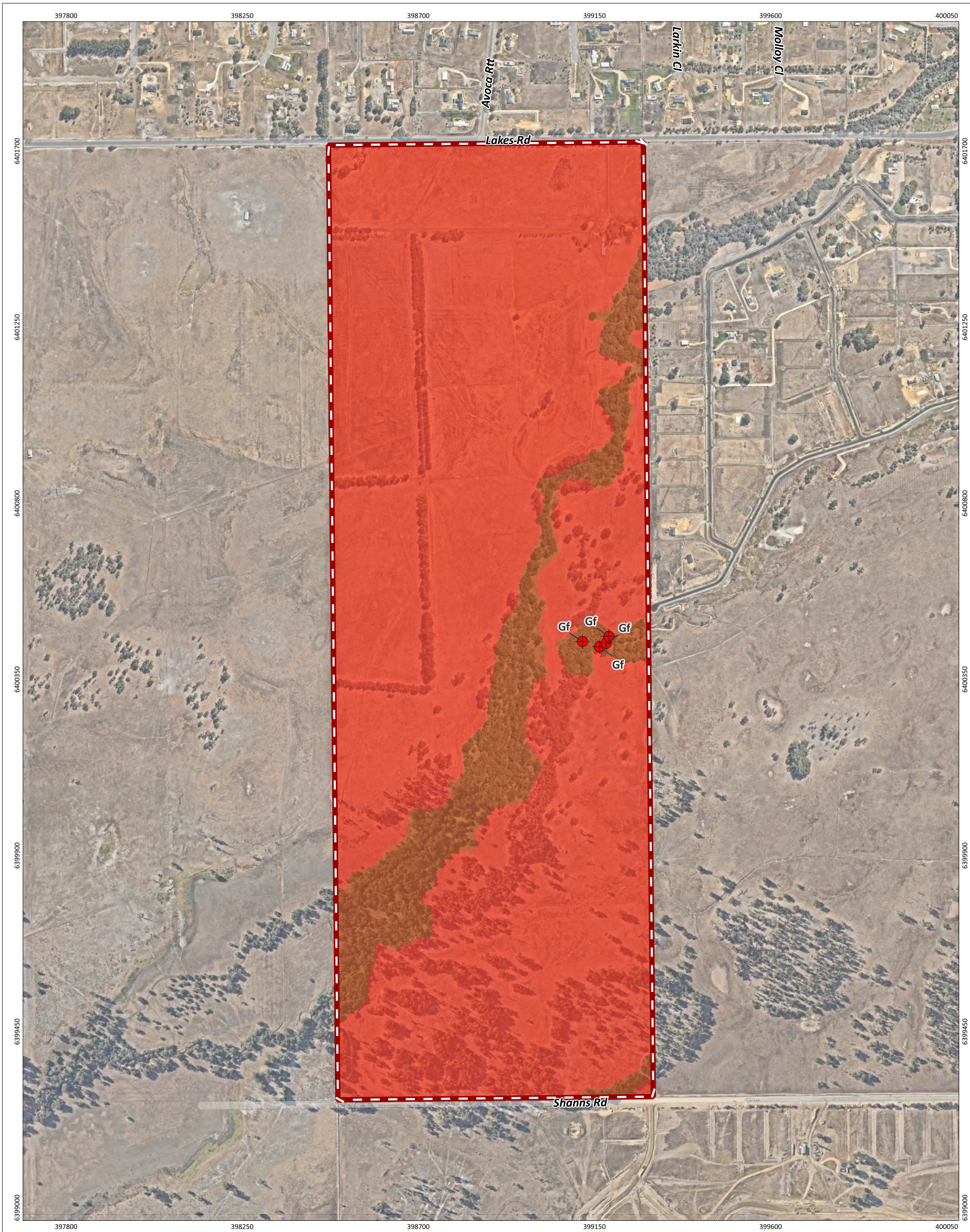

Figure 9: Vegetation Condition and Significant Weeds Location

N 0 75 150 225 300 m		PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area
- Vegetation Condition
  - Completely Degraded
  - Degraded
- Declared Pest
  - Gf - Gomphocarpus fruticans

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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5.2.7 Threatened and Priority Ecological Communities

The presence or absence of Threatened Ecological Communities (TECs) and Priority Ecological Communities (PECs) was determined as per the following guidance:

- *Methods for survey and identification of Western Australian threatened ecological communities* (DBCA, 2023a).
- Comparison of species to the Gibson et al. (1994) report and Keighery et al. (2012) reports, particularly the list of taxa presented in Appendix 1 of Gibson et al. (1994).
- *Listing in the Priority Ecological Communities for Western Australia version 35* (DBCA, 2023b).
- Where applicable, Commonwealth Approved Conservation Advice including Listing Advice was also applied for EPBC Act listed communities.

Given the level of degradation present within the Survey Area and survey timing, Floristic Community Type (FCT) analysis is not considered suitable for TEC/PEC determination.

No TECs or PECs listed under the EPBC Act, BC Act or by DBCA were confirmed within the Site. The highly disturbed condition of vegetation within the Site and the paucity of native flora justifies the conclusion that the likelihood of TECs or PECs occurring is low.

5.2.8 Vegetation of Other Significance

As detailed in the Flora and Vegetation Technical Guidance as well as the EPA's Environmental Factor Guideline for Flora and Vegetation, vegetation may be considered of significance for a range of reasons, other than a listing as a TEC or a PEC, including:

- Pre-European vegetation extent being below a threshold level.
- Scarcity.
- Unusual species.
- Novel combinations of species.
- A role as a refuge.
- A role as a key habitat for threatened species or large populations representing a significant proportion of the local to regional total population of a species.
- A restricted distribution.

As described in section 5.2.4 the vegetation types within the Site are not considered to represent an extant occurrence of the Guildford Complex vegetation type, and therefore are not considered to comprise an occurrence of vegetation of other significance.

No other valid reasons exist to consider the vegetation as of other significance.

5.3 Terrestrial Fauna

5.3.1 Factor Specific Policies and Guidance

Relevant policy and guidance documents for terrestrial fauna, which have informed site-specific investigations and/or have been used to assess potential impacts, include:

- *Environmental Factor Guideline: Terrestrial Fauna* (EPA, 2016d).
- *Referral Guideline for 3 WA Threatened Black Cockatoo Species: Carnaby's Cockatoo* (Zanda latirostris), *Baudin's Cockatoo* (Zanda baudinii) *and the Forest Red-tailed Black-cockatoo* (Calyptorhynchus banksii naso) (DAWE, 2022).

A basic fauna survey and targeted black cockatoo assessment were undertaken by WEPL over 1st and 2nd April 2025 (WEPL, 2025a). Results of this survey have been used to inform this section of the EAR.

5.3.2 Desktop Assessment of Threatened and Priority Fauna

Desktop database searches of DBCA database records and the Commonwealth PMST search identified 37 conservation listed fauna species potentially occurring within a 20 km radius of the Site. A likelihood of occurrence assessment was undertaken to determine how likely each species is to occur within the Site based on suitable habitat present and the species' known distribution. The following likelihood of occurrence ratings have been allocated:

- **High:** Preferred habitat is present on the Site; the Site is in the species' known distribution and the species has been recorded on more than one occasion within the vicinity (<5 km of the site).
- **Medium:** Limited or no suitable habitat occurs in the Site but is nearby and the species has good dispersal abilities and is known from the general area or preferred habitat occurs.
- **Low:** No suitable habitat is present in the Site, or the Site is outside the species known distribution, or the species is known from the general area but has poor dispersal abilities.

This assessment was undertaken both before (as detailed in Appendix A) and after the survey. The post-survey likelihood of occurrence found that:

- Three species had a high likelihood of occurrence, and were subject to targeted assessment as discussed in Section 5.3.4. These were:
    - Baudin's black cockatoo (*Zanda baudinii*) - listed as Endangered under the EPBC Act (Cth) and under the BC Act (WA).
    - Carnaby's black cockatoo (*Zanda latirostris*) - listed as Endangered under the EPBC Act (Cth) and under the BC Act (WA).

- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*) - listed as Vulnerable the EPBC Act (Cth) and under the BC Act (WA).

- Four species had a medium likelihood of occurrence.
- Thirty species had a low likelihood of occurrence.

See Appendix A for the full assessment of likelihood of occurrence.

5.3.3 Fauna Habitat Types

Nine fauna habitat types were identified within the Site. These are described in Table 10. FHT-09 and a small portion of FHT-08 are located within the foreshore reserve, which is planned to be retained.

Table 10: Fauna Habitat Types

Foraging Habitat Type	Description	Extent (ha)
FHT-01 Jarrah Woodland	Patches of *Eucalyptus marginata* (jarrah) woodland over grazed paddock. Degraded with some connective canopy and minimal understory species. Minimal amount of leaf litter, dominated by paddock grasses, limiting ground-based fauna from utilising the habitat. Several trees have small hollows (Class 4).	1.83
FHT-02 Planted *Eucalyptus* spp. and Flooded Gums	Planted windbreak rows of small-fruited smooth bark eucalypts and *Eucalyptus rudis* (flooded gum) over cleared/grazed paddock. Limited understory species due to agricultural grazing, dominated by paddock grasses. No evidence of foraging was observed.	3.16
FHT-03 Open Marri Woodland with Scattered Jarrah	Woodlands of *Corymbia calophylla* (marri) with scattered jarrah over cleared/grazed paddock. Degraded condition with some connective canopy. No understory species observed, minimal ground leaf cover, mostly dominated by paddock grasses. Scattered hollow fallen logs and branches on ground, with older growth portions containing individual trees with suitable hollows for black cockatoos (Class 3). Some foraging evidence was observed, no roosting evidence.	7.43
FHT-04 Scattered Individual Banksias	Scattered individual *Banksia attenuata* and *B. menziesii* over cleared/grazed paddock. The entire area is completely degraded with *Banksia* species showing upper canopy banksia death. No native understory species were observed, mostly dominated by paddock grasses due to grazing/clearing.	0.01
FHT-05 Individual *Xylomelum* sp.	Individual *Xylomelum occidentale* over cleared/grazed paddock. No understory species, dominated by paddock grasses.	0.03
FHT-06 Planted Garden Trees	Mix non-native and exotic eucalypts and garden species over cleared paddock and built infrastructure (paved areas).	0.36

Foraging Habitat Type	Description	Extent (ha)
FHT-07 Planted Rows of *Allocasuarina* spp.	Planted rows of non-native casuarina over cleared/grazed paddocks. No understory species, dominated by paddock grasses.	0.49
FHT-08 Paddock and Residential Use	Cleared pasture grassland, dominated by paddock grasses. Areas of residential use includes buildings and cleared vehicle access paths.	152.92
FHT-09 Riparian Foreshore Reserve*	*Melaleuca preissiana* woodland with scattered Marri and non-native eucalypt trees near bank edges, understory is dominated by weedy grasses. *No detailed assessment of black cockatoo habitat has been undertaken within this area due to proposed retention of the foreshore reserve. This FHT type has therefore been excluded from the application of the black cockatoo foraging habitat scoring tool, as presented in Table 15.	30.25
Total		**196.48**

5.3.4 Black Cockatoo

The Site falls within the SCP which is within the modelled distribution range of Baudin's black cockatoo (*Zanda baudinii*), Carnaby's black cockatoo (*Zanda latirostris*) and Forest red-tailed (*Calyptorhynchus banksii naso*) (DAWE, 2022).

The SCP is used by Carnaby's black cockatoos for foraging, with some patches of breeding within the SCP from July to December (DAWE, 2022). Vegetation used by Carnaby's black cockatoo is dominated by *Banksia* spp. and tuart (*Eucalyptus gomphocephala*) woodlands, as well as marri (*Corymbia calophylla*), with jarrah (*E. marginata*) in the eastern SCP (DAWE, 2022).

Within the eastern and southern portion of the SCP, Baudin's black cockatoos can be observed foraging from March to September, with unlikely observations in the western and northern SCP. Vegetation used by Baudin's black cockatoo is dominated by marri and native proteaceous plant species (*Banksia* ssp.) including *Hakea* species, but rarely jarrah (DAWE, 2022). Breeding for Baudin's black cockatoo typically occurs in the southern jarrah forest but may also occur in the southern SCP (DAWE, 2022).

Within the SCP, forest red-tailed black cockatoo can be flexibly observed year-round, most commonly present from January through to July, some individuals remain present all year round. Vegetation used by forest red-tails are primarily the seeds of jarrah and marri woodlands and forests, allocasuarina cones, fruits of snotty-gobble (*Persoonia longifolia*), blackbutt, bullich, *Hakea* spp., tuart and some introduced eucalypts such as river red gum (DAWE, 2022). Breeding may occur in locations containing suitable breeding tree species, including the Perth Metropolitan Area (DAWE, 2022).

The timing of the survey in April 2025 provided good opportunity to record foraging individuals and nesting for all three species of black cockatoos. If no individuals are present, searching for foraging evidence is a reliable alternative as it will generally persist in the landscape (particularly marri nut chews) for up to two years (DAWE, 2022).

Breeding Habitat Assessment

All nine fauna habitat types identified within the Site (Table 10) contain species which provide potentially suitable nesting habitat for black cockatoos. FHT-09 and a small portion of FHT-08 are located within the foreshore area (32.69 ha), which is planned to be retained. These areas have not been assessed in detail for the presence black cockatoo breeding habitat. It is however expected that trees of sufficient size and preferred species are present within these areas.

DAWE (2022) defines breeding habitat as that which contains known, suitable or potential nesting trees, and which occurs within the range of the species. All three black cockatoo species breed in deep hollows with a large entry diameter, within eucalypt species of a suitable size and species to form such hollows. Eucalypt trees with the capacity to develop suitable hollows generally have a diameter at breast height (DBH) of at least 500 mm (> 500 mm for most species, >300mm for wandoo and salmon gum) (DAWE, 2022).

Terminology used in this report for breeding habitat trees follows that defined in glossary of DAWE (2022) as shown in Table 11 below.

Table 11: Breeding Habitat Terminology

Breeding Habitat Term	Definition (DAWE, 2022)
Known nesting trees	Trees (live or dead but still standing) which contains a hollow where black cockatoo breeding has been recorded or which demonstrates evidence of breeding (i.e. showing evidence of use through scratches, chew marks or feathers).
Suitable nesting trees	Trees with suitable nesting hollows present, although no evidence of use.
Suitable nesting hollows	Any hollow with dimensions suitable for use for nesting by black cockatoos. See Appendix I for further discussion on nesting hollow characteristics.
Potential nesting trees	Trees that have a suitable Diameter at Brest Height (DBH) to develop a nest hollow, but do not currently have hollows. For most species of trees, suitable nest hollows are only found in live trees with a DBH of at least 500 mm.
Potential future nesting trees	Trees suitable to develop a nest hollow in the future are 300-500 mm DBH.

In addition to Commonwealth guidelines for assessing breeding habitat trees, a scoring system based on that developed by Dr Mike Bamford (referred to as Bamford Class) was applied to class breeding habitat trees. This system and the Bamford Class alignment with DAWE (2022) breeding habitat terminology are shown in Table 12.

Table 12: Black Cockatoo Potential Breeding Tree Class

Bamford Class	Description of Tree and Hollows/Activity	Alignment with DAWE (2022) Breeding Habitat Terminology
1	Active nest observed; adult (or immature) bird seen entering or emerging from hollow, eggs present.	Known nesting tree
2	Hollow of suitable size and angle visible with chew marks attributed to Black Cockatoo nesting activity around entrance.	Known nesting tree
3	Potentially suitable hollow visible but no chew marks present; or potentially suitable hollow present if from ground-based assessment only (as suggested by structure of tree, such as large, vertical trunk broken off at a height of >10 m with thin rim).	Suitable nesting tree
4	Tree with hollows or broken branches that might or do contain hollows, but hollows or potential hollows are not of a suitable size, or are aligned or obstructed so as to prevent access	Potential nesting tree
5	Tree lacking large hollows or broken branches that might have large hollows; a tree with more or less intact branches and a spreading crown.	Potential nesting tree
No Class	No description. Potential future nesting trees were not considered in the Bamford Class scale.	Potential future nesting trees

Breeding typically occurs in native eucalypt species particularly marri, jarrah, wandoo and tuart, however many species of eucalypt including non-endemic species may develop suitable hollows for breeding (DAWE, 2022). A summary of suitable nesting hollow characteristics for the three species is provided below in Table 13.

Table 13: Black Cockatoo Nesting Hollow Characteristics

Species	Baudin's Black cockatoo	Carnaby's Black cockatoo	Forest Red-tailed Black cockatoo
Tree species and hollow characteristic	Nesting in mainly karri, jarrah wandoo, bullich and tuart. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep. Hollow depth ranges from 0.1 to 2.5+ m.	Nesting mainly in salmon gum, wandoo, tuart, jarrah, flooded gum, karri and marri. Utilise hollows from 10-65 cm diameter (average 26 cm) and >1 m deep	Nesting mainly in jarrah, marri, karri, wandoo, bullich, blackbutt and tuart Utilise hollow from 12-150 cm diameter (average 34 cm) and >1 m depth
Sources	DAWE, 2022; Johnstone and Kirkby 2011	DAWE, 2022; Saunders et al., 2014a; Saunders et al., 2014b	DAWE, 2022; Johnstone et al., 2013

Trees identified as having potentially suitable hollows present were inspected using a pole camera or small drone to inspect hollow internal dimensions.

- Species.
- Diameter at breast height (DBH) (at approximately 1.3 m) ≥ 500 mm (≥ 300 mm for Wandoo and Salmon Gum) regardless of the presence or absence of hollows.
- All hollows observed within trees were recorded and categorised as follows:
- Hollows = Total number of hollows observed within the tree, or 'no' if none were observed.
- Hollows > 12 cm diameter = Number of hollows within the tree that are observed to contain an opening diameter > 12 cm, which has the potential of being used by black cockatoo species (DAWE, 2022). This also included recording any evidence of chewing around the hollow opening.
- Bamford Class.

A total of 853 potential nesting trees were recorded within the Site, as summarised in Table 14 and shown on Figure 10. The large majority of potential nesting trees (685 trees) were Class 5, with no signs of hollow development. A total of 164 trees are Class 4, with small hollows that are too small to support nesting (<10 cm entrance); or have an entrance of >10 cm but the internal dimensions are not suitable, or with a hollow that is not accessible. Class 4 trees are, however, of sufficient age and growth form to be developing hollows. One Class 3 tree was recorded (Tree number 315) which contains a hollow of suitable dimensions for use by black cockatoos. The tree is, however, in poor condition. No evidence of current or previous nesting behaviour, such as chew marks at hollow entrance attributed to black cockatoos, or flushed individuals were recorded.

Given that marri, flooded gum and other eucalypts have been observed to be part of FHT-09 and the unassessed portion of FHT-08 in the centre of the foreshore area, it is expected that significantly more (potential) nesting trees occur within the unassessed portion of FHT-08 and FHT-09 (30.25 ha), comprising the majority of fauna habitat contained within the foreshore reserve.

Table 14: Summary of Potential Nesting Trees Recorded

Bamford Class and DAWE (2022) Terminology	Class 1 / Class 2 Known Nesting Tree		Class 3 Suitable Nesting Tree	Class 4 Potential Nesting Tree	Class 5 Potential nesting tree	Totals (Trees)
Tree Species						
Jarrah	-	-	-	42	83	**125**
Marri			-	84	360	**444**
Flooded Gum	-	-	-	1	111	**112**
Eucalyptus	-	-	-	-	102	**102**

Bamford Class and DAWE (2022) Terminology	Class 1	Class 2	Class 3	Class 4	Class 5	Totals (Trees)
	Known Nesting Tree		Suitable Nesting Tree	Potential Nesting Tree	Potential nesting tree	
Dead	-	-	1	40	28	**69**
River Red Gum	-	-	-	-	1	**1**
Total (Bamford Class)	**0**	**0**	**1**	**167**	**685**	**853**

Foraging Habitat Assessment

All nine fauna habitat types identified within the Site (Table 10) contain species that provide foraging habitat for black cockatoos. FHT-09 and a small portion of FHT-08 are located within the foreshore area (32.69 ha), which is planned to be retained. These areas have not been assessed in detail for the presence and extent of foraging species for black cockatoo and have therefore been excluded from application of the habitat quality scoring tools. For the purpose of regional foraging habitat assessment, it was inferred that those areas will provide suitable foraging habitat and score an average of 3 or above out of 7.

As per DAWE (2022) Habitat Quality Scoring Tool, areas with a site condition score of 2 or lower (shaded cells in Table 15) are "extremely unlikely to be considered as suitable habitat". These areas are therefore classified as not comprising suitable foraging habitat in this assessment.

No observations were recorded for the three species of black cockatoos during the field survey. Numerous observation records for Baudin's, Carnaby's and Forest Red-tailed black cockatoo were identified in DBCA database within a 10 km buffer of the Site, with 12, 147 and 37 records, respectively.

A total of 12.91 ha of high value foraging habitat (score a weighted average of 6 out of 7) was recorded within the Site during the survey. Detailed assessment results are summarised in Table 16 and shown in Figure 12, Figure 13 and Figure 14. Of those, 9.26 ha is considered to be Very High value foraging habitat (7/7), and 3.65 ha was assessed to be of Low to Moderate value (3/7).

Additionally, 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 or above.

It is therefore assumed that the Site provides a total 45.60 ha suitable black cockatoo foraging habitat.

Table 15: Black Cockatoo Foraging Habitat within the Site, outside the Foreshore Area

Site Condition	Baudin's Black Cockatoo (ha)	Carnaby's Black Cockatoo (ha)	Forest Red-tailed Black Cockatoo (ha)
7- Very High	7.43	7.43	9.26
6- High	-	-	-
5-Moderate-High	-	-	-
4-Moderate	-	-	-
3-Low-Moderate	1.84	1.84	3.65
Total	**9.27**	**9.27**	**12.91**
2-Low	0.49	0.52	0.24
1-Negligible to Low	153.32	153.32	150.16
0-None	0.71	0.68	0.48
Not considered suitable	154.52	154.52	150.88

*Shaded cells are classified as not comprising suitable foraging habitat

Roosting Habitat Assessment

Night roosting locations are typically in proximity to foraging habitat (black cockatoos mainly foraging within 20 km of night roosts) and with access to water points <2 km from roosting location (DAWE, 2022). Any groups of tall trees, particularly large native eucalypts in proximity to water sources may provide night roosting habitat (DAWE, 2022).

Roosting habitat was assessed based on observation of roosting or roosting evidence recorded during survey and based on habitat suitability (generally tall trees in the landscape in proximity to a water source). During the field survey, searches were conducted for evidence of roosting (e.g. piles of scats, feeding debris or chewed trees).

Three known roost sites are present 3.6 km north-east and 4.5 km north (Object ID 127) of the Site (*DBCA-064*). No evidence of roosting within the Site was recorded.

Within the Site, fauna habitat types FHT-01 and FHT-03 provide the most suitable roosting habitat as they contain medium and large stands of eucalypts with medium canopies. Access to permanent water is within the Site from the North Dandalup River. Additionally, the unassessed area of FHT-09 has been observed to contain patches of marri and flooded gum, which have the potential to provide suitable roosting habitat. These values will be retained within the proposed foreshore reserve.

Regional Black Cockatoo Habitat

There are no confirmed Carnaby's black cockatoo breeding areas within 12 km of the Site (*DBCA-054*). However, there are numerous observation records for Baudin's, Carnaby's and Forest red-tailed black

cockatoo identified in the DBCA database within a 10 km buffer of the Site, with 12, 147 and 37 records, respectively. The closest record is less than 2 km northeast of the Site, recorded near the North Dandalup River for forest red-tailed black cockatoo. Seven mapped black cockatoo roosting sites are present within 12 km of the Site (*DBCA-064*). All are confirmed Carnaby's black cockatoo roost sites (DBCA-064), as shown in Figure 11.

Assessment of the estimated foraging habitat extent within the local area was also undertaken to provide further context. The estimated extent of foraging habitat is calculated for a buffer of 12 km around and including the Site. This buffer is selected as recommended in the Commonwealth referral guidelines due to black cockatoos mainly foraging within 12 km of their nest site during the breeding season and their reliance on this proximity of foraging resources to successfully raise chicks (DAWE, 2022).

The assessment undertaken considers Remnant Native Vegetation mapping (*DPIRD-005*) and Vegetation Complexes- Swan Coastal Plain and South West forest region (*DBCA-046* and *DBCA-047*) as summarised in Table 16 and Figure 15. Analysis indicates 16,757.81 ha of remnant native vegetation mapped within a 12 km buffer of the Site. It is expected that the majority of this vegetation would contain suitable foraging species at the same or greater rate than that present within the Site. Much of this regional remnant native vegetation is located within the Dwellingup State Forest in the east.

For the purpose of regional foraging habitat assessment, it was inferred that the portion of FHT-08 and FHT-09, which have not been assessed in detail for the presence of foraging species, will score a weighted average of 3/7 or above and is therefore considered to provide suitable foraging habitat. FHT-09 (30.25 ha) contains patches of *Corymbia calophylla*, which provide very high foraging value, as well as large patches of *Melaleuca preissiana*, providing negligible foraging value. This fauna habitat type is located within the foreshore area and will therefore be retained. It is not considered to be impacted as described in sections 9 and 10.

Consequently, there is an inferred total of 45.60 ha of suitable foraging habitat scoring between 3 (low to moderate) and 7 (very high) on the Habitat Quality Scoring Tool - Site Condition scale (WEPL, 2025a). This represents 0.27% of the estimated regional habitat extent.

Table 16: Regional Foraging Habitat Extent within 12 km of the Site

Vegetation Complex	Dominant Foraging Species	Remnant Extent (ha)
Dwellingup, D1	*Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	4384.16
Bassendean Complex-Central and South	*Eucalyptus marginata* (jarrah)	4176.68
Darling Scarp, DS2	*Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	1924.63
Yarragil 1, Yg1	*Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	1362.56

Vegetation Complex	Dominant Foraging Species	Remnant Extent (ha)
Murray 1, My1	*Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	1149.17
Guildford Complex	*Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah)	1103.40
Helena 1, He1	*Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	719.58
Southern River Complex	*Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah)	718.35
Herdsman Complex	*Eucalyptus rudis* (flooded gum)	316.38
Swan Complex	*Eucalyptus rudis* (flooded gum)	293.16
Yarragil 2, Yg2	*Corymbia calophylla* (marri)	246.00
Forrestfield Complex	*Corymbia calophylla* (marri), *Eucalyptus marginata* (jarrah)	221.74
Vasse Complex	*Eucalyptus gomphocephala* (tuart), *Eucalyptus marginata* (jarrah), *Corymbia calophylla* (marri)	86.09
Swamp, S	*Banksia littoralis*	55.92
Total		**16,757.81**

5.3.5 Other Fauna of Conservation Significance

No other fauna of conservation significance had a high likelihood of occurrence within the Site. The following four species were found to have medium likelihood of occurrence within the Site:

- *Westralunio carteri* (Carter's Fresh Water Mussel) - Vulnerable.
- *Phascogale tapoatafa wambenger* (South-western brush-tailed phascogale) - Conservation Dependent.
- *Isoodon fusciventer* (Quenda, south-west brown bandicoot) - Priority 4.
- *Notamacropus irma* (Western brush wallaby) - Priority 4.

Westralunio carteri (Carter's Fresh Water Mussel)—VU

This species occurs in greatest abundance in slower flowing waters where sediments are stable and soft enough to allow the species to burrow (<10 cm depth) but are usually visible from the surface to facilitate filter feeding. Carter's freshwater mussel has a complex life cycle involving a parasitic larval stage, which it attaches to a fish host before it metamorphoses into the juvenile form that drop off the fish host to begins its life on the sediment. The period of attachment to a fish host functions as an effective dispersal mechanism for this otherwise sessile animal.

This species has been recorded approximately 5 km upstream of the North Dandalup River which flows through the Site. The two most recent records are 9 years old and therefore considered relevant. Due to the hydrological connectivity of the nearest record and downstream streamflow direction to FHT-09 within the Site, it is considered suitable core habitat for Carter's freshwater mussels.

This habitat type will be retained as part of the foreshore reserve and no direct impacts to the species are expected.

Phascogale tapoatafa wambenger (South-western brush-tailed phascogale)—CD

The south-western brushed-tailed phascogale is known to occur in the southwest between Perth and Albany, occurring at low densities in the northern Jarrah Forest and high densities in the lower southwest in isolated populations. Their preferred habitat is in dry sclerophyll forests and open woodlands that contain hollow-bearing trees. This species has been recorded >8 km east of the Site in denser forests, the lack of records may suggest lack of targeted surveys and nocturnal cryptic nature of the species making it not easily detected.

Within the Site, FHT-09 is considered suitable core habitat for the species as it offers connective tree canopy and tree hollows to support nesting. FHT-03 and FHT-01 can be considered supportive habitat due to connectivity with FHT-09 in certain areas and providing opportunities for foraging.

Given that FHT-09 will be retained within the foreshore reserve, the core habitat for this species within the Site will not be impacted. Individuals utilising other habitat types within the Site are considered to be vagrant visitors of those habitats, which will be able to find refuge within FHT-09 if clearing of other habitat types should occur during future development stages.

Isoodon fusciventer (Quenda, south-west brown bandicoot)—P4

Quendas are widely distributed in south-west WA and are associated with wetlands and fringing areas with dense cover of shrubs and sedges adjoining areas of woodland and grassland. Quenda will forage in grassland or paddocks when adjacent to dense cover. Quendas are commonly recorded in bushlands <5 km from the Site. Due to presence of suitable habitat within the foreshore reserve and numerous previous records close by, the species is expected to be present in the foreshore reserve and occasionally present in paddocks adjacent to the foreshore reserve.

Fauna habitat type FHT-09 is considered to provide core habitat to this species due to presence of native understory that provides cover and foraging opportunities. Fauna habitat type FHT-03 is considered to provided supporting habitat due to its connectivity to FHT-09.

All other habitats are considered non-significant for this species due to lack of understory plant species to support tunnelling, denning and foraging.

Given that FHT-09 will be retained within the foreshore reserve, the core habitat for this species within the Site will not be impacted. Individuals utilising other habitat types within the Site are considered to be vagrant visitors of those habitats, which will be able to find refuge within FHT-09 if clearing of other habitat types should occur during future development stages.

Notamacropus irma (Western brush wallaby)—P4

The western brush wallaby's suitable habitat is open forest or woodland, particularly favouring open seasonally wet flats with low grasses and open scrubby thickets for foraging. The species also inhabits some areas of mallee and heathland where moderate ground level vegetation persists. This species has been recorded >5 km east of the Site along the creek line. Fauna habitat FHT-09 can be considered core habitat for the species due to moderate vegetation cover and opportunities for foraging.

Fauna habitat type FHT-01, FHT-02 and FHT-03 are considered suitable supporting habitat for the species. These habitat types have a moderate vegetation and are adjacent to the foreshore reserve in FHT-09.

Given that FHT-09 will be retained within the foreshore reserve, the core habitat for this species within the Site will not be impacted. Individuals utilising other habitat types within the Site are considered to be vagrant visitors of those habitats, which will be able to find refuge within FHT-09 if clearing of other habitat types should occur during future development stages.

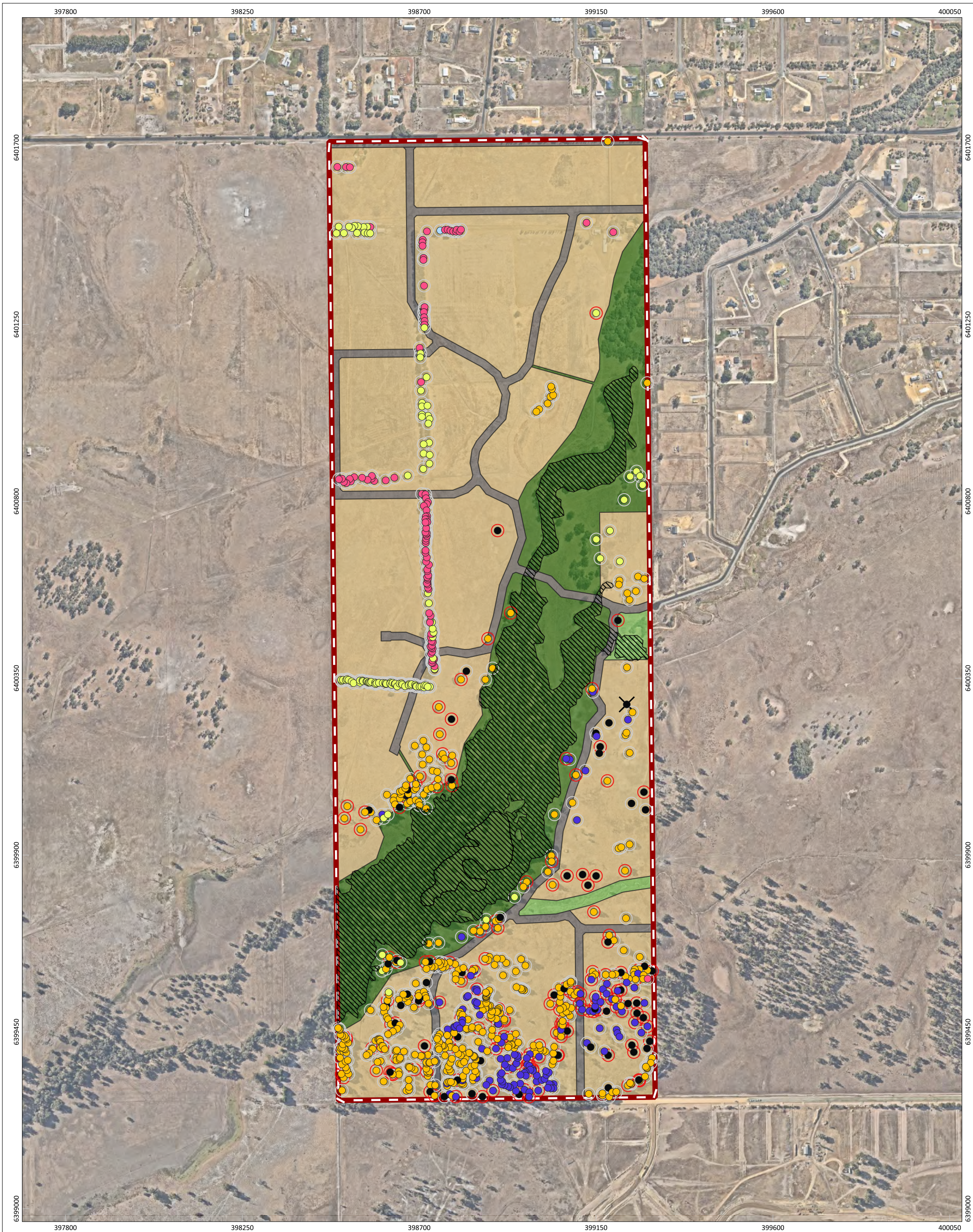

Figure 10: Black Cockatoo Potential Breeding Habitat

0 75 150 225 300 m

N

PROJECT/REPORT NAME	Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup
SCALE	1:9,000
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	31/7/2025

Legend

- Survey Area
- Not Assessed

Concept Plan

- Foreshore Reserve
- Lot Boundary
- Public Open Space
- Road

Tree Species

- Dead
- Eucalyptus
- Flooded Gum
- Jarrah
- Marri
- River Red Gum

Bamford Tree Class

- 3
- 4
- 5

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	31/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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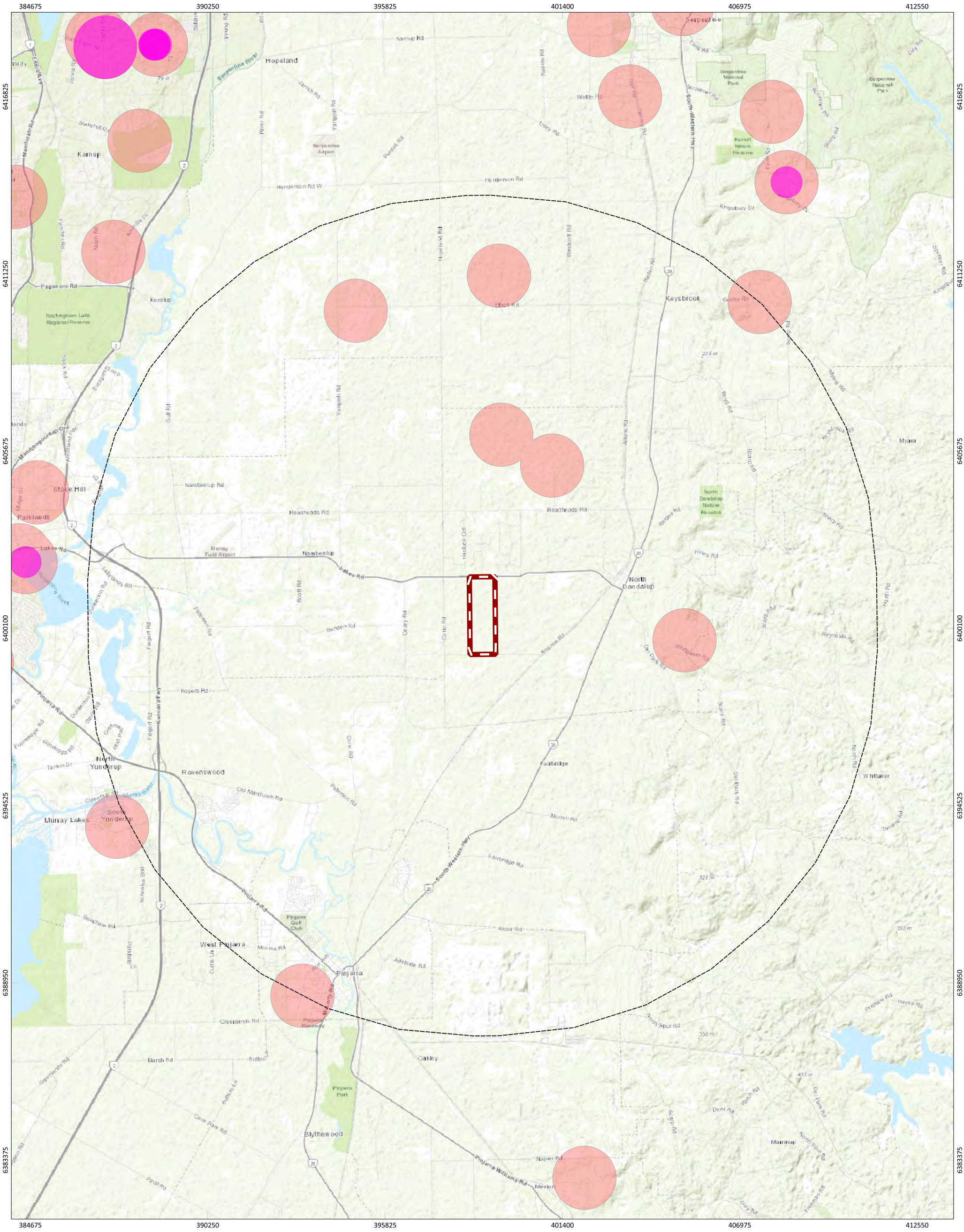

Figure 11: Known Black Cockatoo Roosting and Breeding Sites within 12 km Buffer

N

0 1 2 3 km

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup			
SCALE: 1:111,500	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area
- 12km Buffer
- Black Cockatoo Roosting Sites - Buffered (DBCA-064)
- Carnabys Cockatoo Confirmed Breeding Areas within the Swan Coastal Plain and Jarrah Forest IBRA Regions (DBCA-054)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

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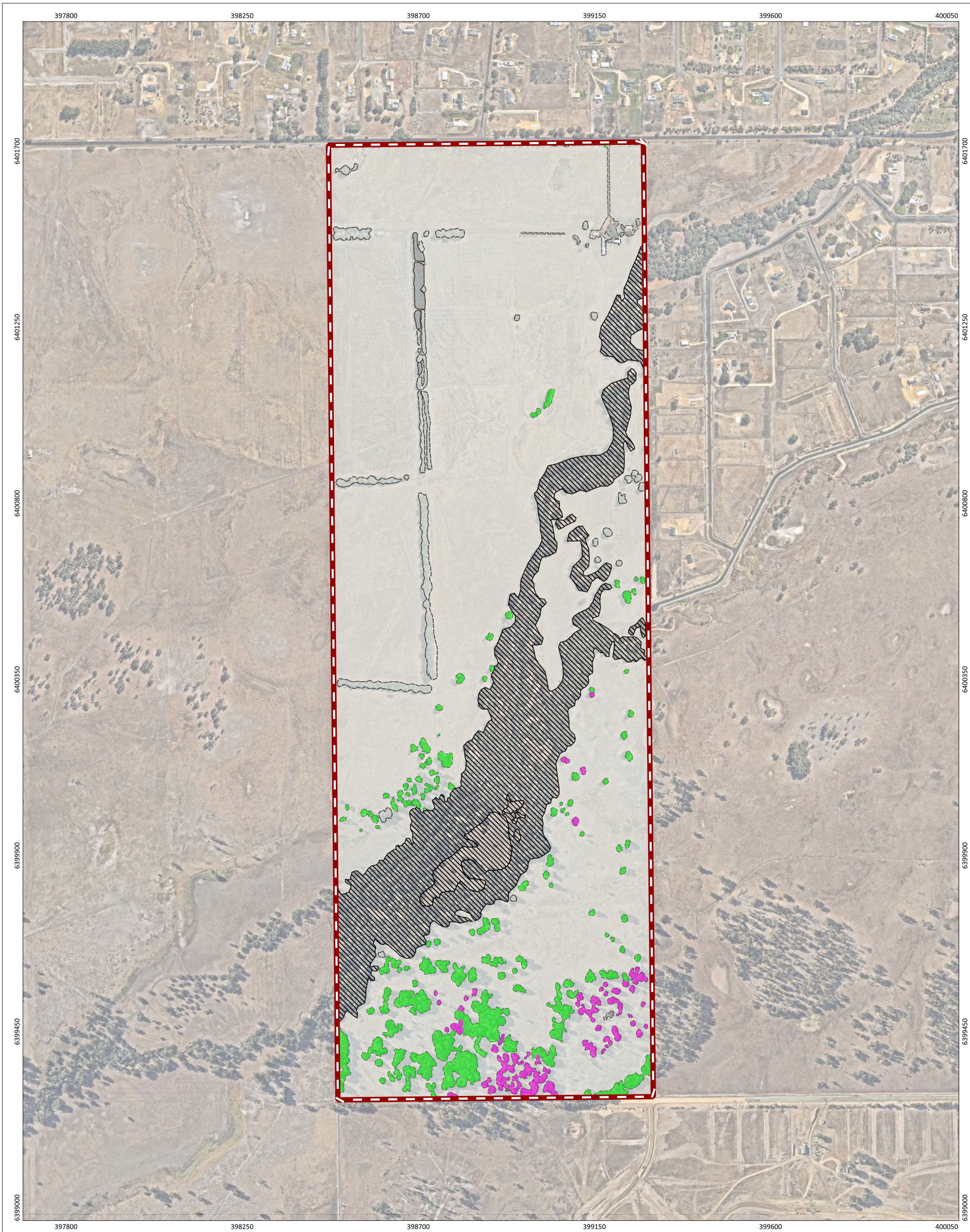

Figure 12: Baudin's Black Cockatoo Foraging Habitat

0 75 150 225 300 m N		PROJECT/REPORT NAME Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
SCALE 1:9,000	SHEET SIZE A3 COLOUR	CLIENT Harley Dykstra	
COORDINATE REFERENCE SYSTEM GDA2020 / MGA zone 50		PROJECT NUMBER A25.034	VERSION 0
DATA SOURCE NEARMAPS		DRAWN BY / REVIEWED BY JP/JB	DATE 30/7/2025

Legend

- Survey Area

Site Condition Score (Habitat Quality Score Tool)

- Not Assessed
- 0 - None
- 1 - Negligible
- 2 - Low
- 3 - Low to Moderate
- 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	30/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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397800 398250 398700 399150 399600 400050

6401700 6401250 6400800 6400350 6399900 6399450 6399000

Figure 13: Carnaby's Black Cockatoo Foraging Habitat

0 75 150 225 300 m

N

SCALE: 1:9,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: NEARMAPS		DRAWN BY / REVIEWED BY: JP/JB	DATE: 30/7/2025

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup

Legend

- Survey Area

Site Condition Score (Habitat Quality Score Tool)

- Not Assessed
- 0 - None
- 1 - Negligible
- 2 - Low
- 3 - Low to Moderate
- 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	30/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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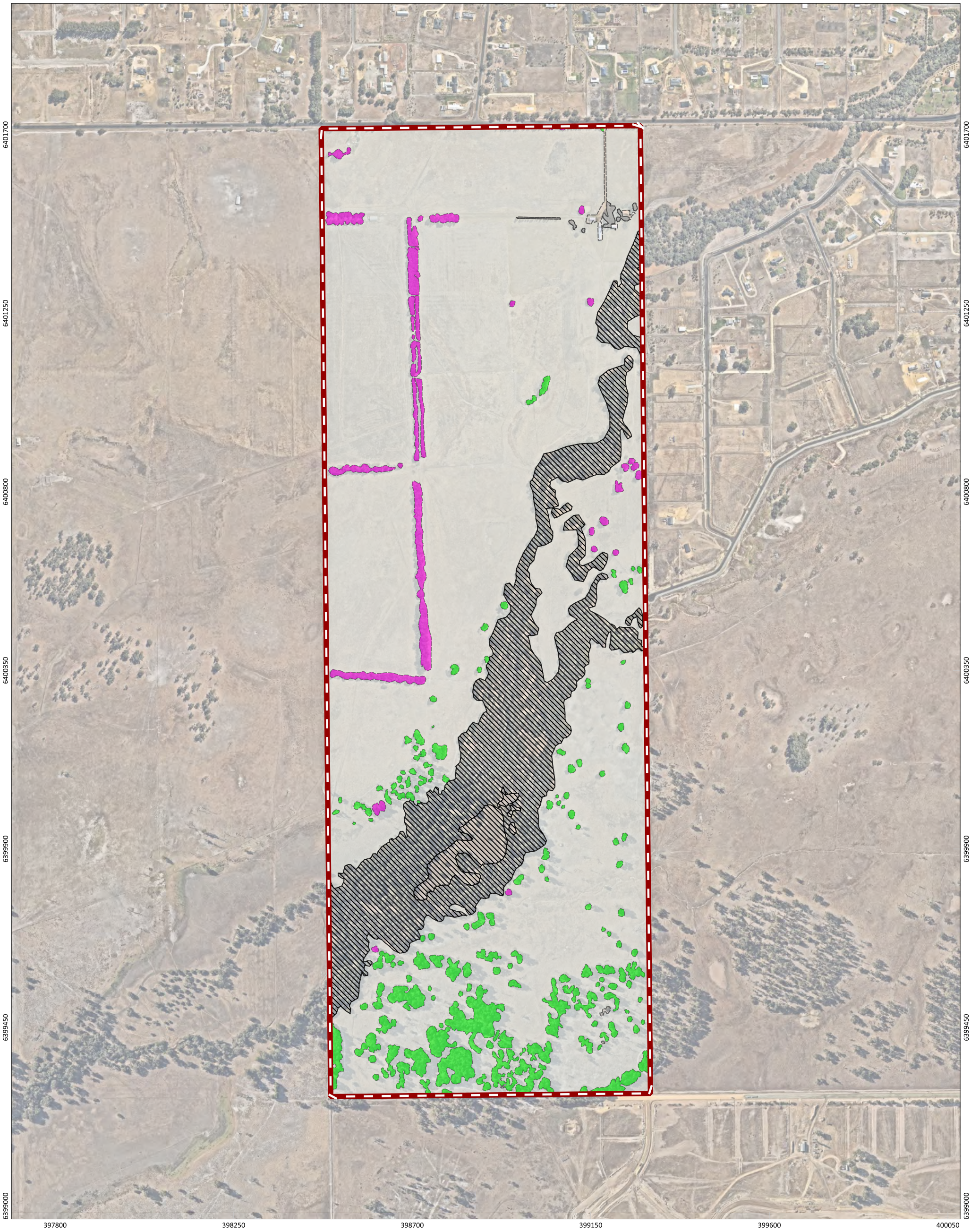

Figure 14: Forest Red-tailed Black Cockatoo Foraging Habitat

N

0 75 150 225 300 m

PROJECT/REPORT NAME	Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup
SCALE	1:9,000
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	30/7/2025

Legend

- Survey Area

Site Condition Score (Habitat Quality Score Tool)

- Not Assessed
- 0 - None
- 1 - Negligible
- 2 - Low
- 3 - Low to Moderate
- 7 - High

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	30/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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Figure 15: Black Cockatoo Foraging Habitat Extent 12 km Buffer

N

0 1 2 3 km

PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup			
SCALE: 1:111,500	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50		PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: ESRI Topographic Map		DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025

Legend

- Survey Area
- 12km Buffer

Native Vegetation (DPIRD-005) Intersect with Vegetation Complexes (DBCA-046 and DBCA-047)

- Bassendean Complex-Central and South
- Darling Scarp, DS2
- Dwellingup, D1
- Forrestfield Complex
- Guildford Complex
- Helena 1, He1
- Herdsman Complex
- Murray 1, My1
- Southern River Complex
- Swamp, S
- Swan Complex
- Vasse Complex
- Yarragil 1, Yg1
- Yarragil 2, Yg2

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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6. Water

6.1 Inland Waters

6.1.1 Factor Specific Policies and Guidance

Relevant policy and guidance documents for terrestrial fauna, which have informed site-specific investigations and/or have been used to assess potential impacts, include:

- *Environmental Factor Guideline: Inland Waters* (EPA, 2018).

6.1.2 Groundwater

Mapping by the Perth Groundwater Atlas (Department of Water [DoW], 2004) indicates that groundwater elevation reaches from a minimum of 20 mAHD in the north-eastern corner of the Site to a maximum of 25 mAHD, 270 m south-west of the south-western corner of the Site (Figure 16). The inferred groundwater flow direction is therefore from north-east to south-west.

A Local Water Management Strategy (LWMS) is being prepared, which will provide more detailed information on depth to groundwater.

6.1.3 Surface Water

Two watercourses are present within the Site and have been mapped by DWER (*DWER-031*):

- North Dandalup River, classified as Minor River, running from the northeastern corner to the southwestern corner of the Site.
- A mapped insignificant tributary to North Dandalup River, running from the centre of the eastern site boundary to the southwestern portion, joining North Dandalup River 80 m before the river crosses the Site boundary in the southwest.

A 1 in 100 (1%) AEP floodplain is mapped surrounding the two watercourses present within the Site. This area will be inundated during major river events.

A biophysical assessment to delineate the foreshore boundary in accordance with *Foreshore Policy 1 - Identifying the Foreshore Area* (Water and River Commission [WRC], 2002) and *Water note 23 - Determining foreshore reserves* (WRC, 2001) has been prepared by Bayley Environmental (Appendix C) and should be read in conjunction with this EAR. The proposed foreshore reserve is shown in Figure 4. The reserve extends between 30 m and 265 m to each side of the river, measured from the top of the river bank.

6.1.4 Wetlands

Mapping undertaken by DBCA (*DBCA-019*) identifies the following five wetlands as intersecting the Site, which are displayed in Figure 18:

- Conservation Category Wetland (CCW) UFID 13313, categorised as palusplain.

  This wetland is associated with the North Dandalup River foreshore area and located within the southern half of the Site. The exact boundaries of the foreshore area require delineation via a biophysical assessment in accordance with *Operational Policy 4.3 - Identifying and establishing foreshore areas* (DoW, 2012) and *Water note 23 - Determining foreshore reserves* (Water and Rivers Commission, 2001). The biophysical assessment is being prepared by Bayley Environmental (2025, Appendix C) and should be read in conjunction with this EAR. The CCW is planned to be retained within the foreshore area.

- Conservation Category Wetland (CCW) UFID 6018, categorised as palusplain.

  This wetland is associated with the portion of North Dandalup River intersecting the Site within the northern portion. Equal to CCW UFID 13313, this wetland will be retained as part of the foreshore area delineated by Bayley Environmental (2025).

- Multiple Use Wetland (MUW) UFID 15802, categorised as palusplain.

  This wetland is mapped across the majority of the Site.

- Two MUWs, UFID 6030 and UFID 6022, both categorised as palusplain.

  These wetlands are located within the southern portion, surrounded by CCW UFID 13313. They are considered to be part of the foreshore area, which is planned to be retained.

6.1.5 Public Drinking Water Resources

The Site is not located in a Public Drinking Water Source Area (PDWSA) (*DWER-033*). The closest PDWSA is the Protection Area (Priority 1) North Dandalup Dam Catchment Area, located approximately 8.0 km east of the Site.

Figure 16: Groundwater Contours

N 0 75 150 225 300 m		PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
SCALE: 1:10,700	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0	
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025	

Legend

- Survey Area
- Inferred Regional Groundwater Direction
- Groundwater Contours (Minimum)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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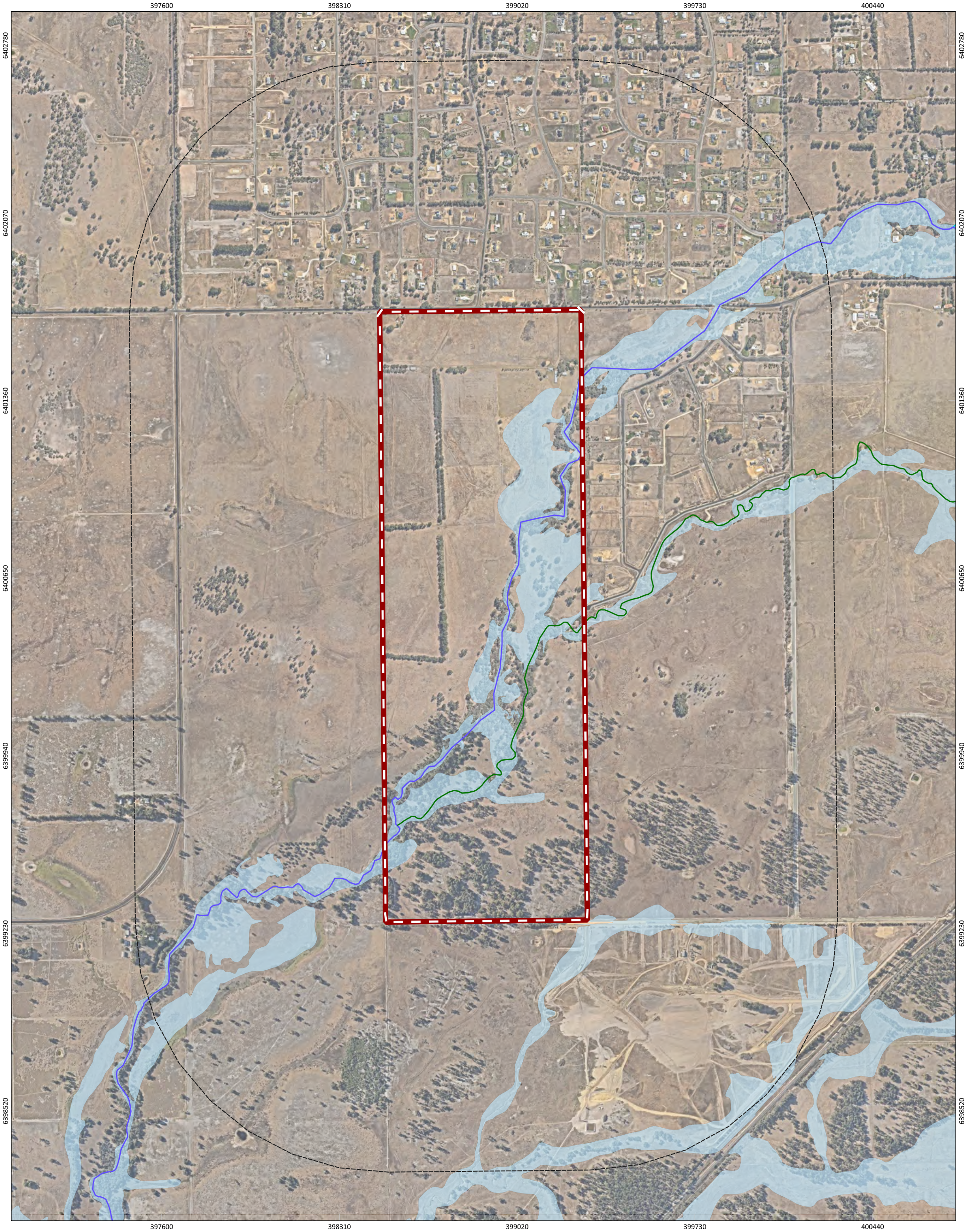

Figure 17: Surface Water Features and Floodplain

0 100 200 300 400 m

N

SCALE: 1:14,200	SHEET SIZE: A3 COLOUR
PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034 / VERSION: 0
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB / DATE: 29/7/2025

Legend

- Survey Area
- 1km Buffer

Hydrography Linear (Hierarchy) (DWER-031)

- Minor River
- Minor Tributary
- Insignificant Tributary

FPM Floodplain Area (DWER-020)

- 1 in 100 (1%) AEP floodplain

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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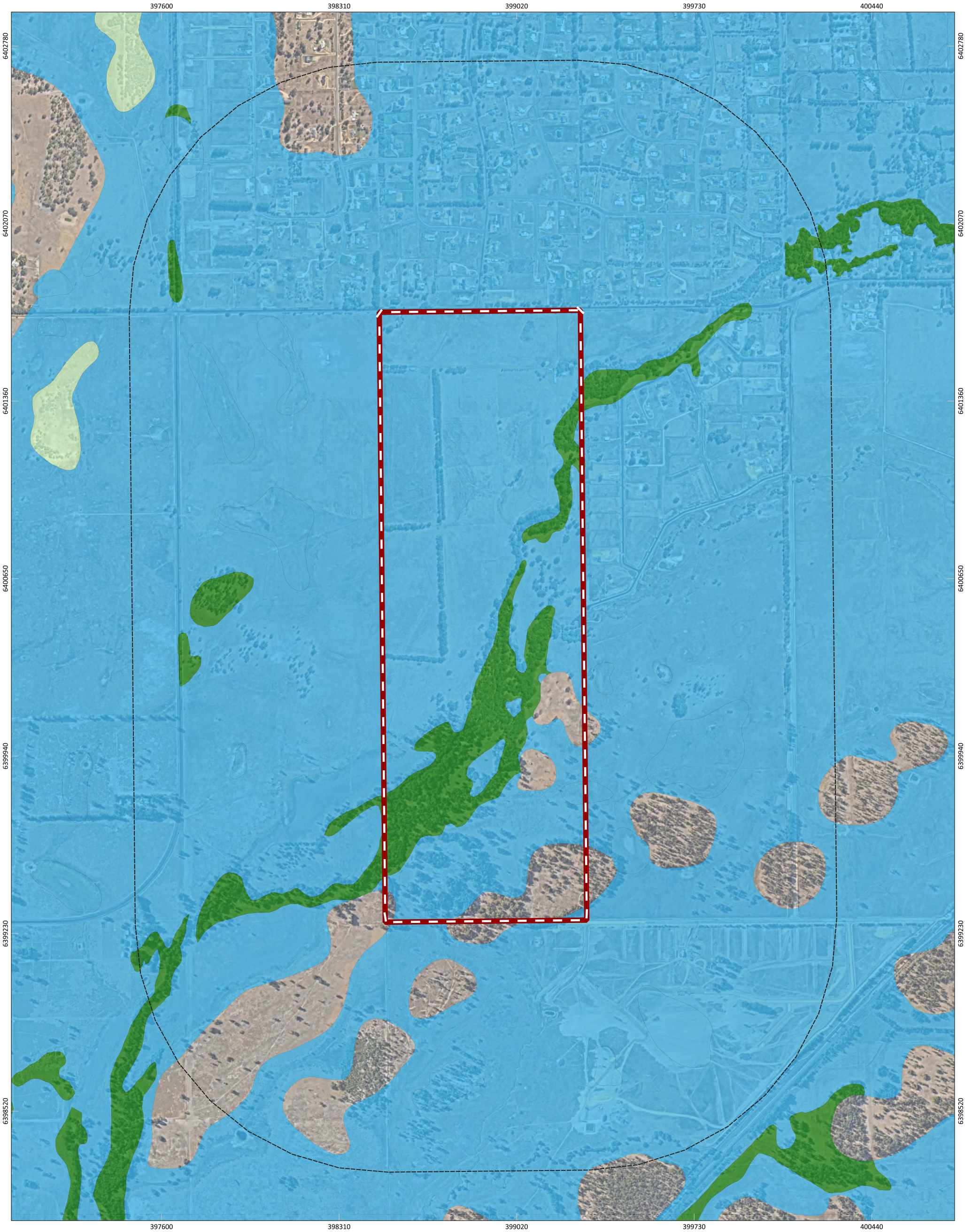

Figure 18: Geomorphic Wetlands, Swan Coastal Plain

0 100 200 300 400 m

N

PROJECT/REPORT NAME	Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup
SCALE	1:14,200
SHEET SIZE	A3 COLOUR
CLIENT	Harley Dykstra
COORDINATE REFERENCE SYSTEM	GDA2020 / MGA zone 50
PROJECT NUMBER	A25.034
VERSION	0
DATA SOURCE	NEARMAPS
DRAWN BY / REVIEWED BY	JP/JB
DATE	29/7/2025

Legend

- Survey Area
- 1km Buffer

Geomorphic Wetlands, Swan Coastal Plain (DBCA-019)

- Conservation
- Multiple Use
- Resource Enhancement

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary (LGATE-002). Label corresponds to the vegetation association number.

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7. People

7.1 Social Surroundings

7.1.1 Factor Specific Policies and Guidance

Relevant policy and guidance documents for terrestrial fauna, which have informed site-specific investigations and/or have been used to assess potential impacts, include:

- *Environmental Factor Guideline: Social Surroundings* (EPA, 2023b).

7.1.2 Aboriginal Heritage

Mapping by DPLH (DPLH-001) shows one Registered Aboriginal heritage site intersecting the Site (Figure 19):

- Registered Aboriginal heritage site ID 27937: Dandalup River – Creation / Dreaming Narrative; Hunting Place; Landscape / Seascape Feature; Plant Resource; Water Source.

The site is of importance and significance for its association within the mythological narratives of the Waugal and is associated with the waters and riverbed of the North Dandalup River. It is mapped with a 30 m buffer from the centre of the river to each side. As described in section 6.1.3, a foreshore reserve with a width of 30 m to 265 m to each side of the river will be established. This will protect environmental and heritage values associated with the watercourse.

Impacts will be limited to the construction of one road passing through the foreshore reserve. Authorisation under Section 18 of the *Aboriginal Heritage Act 1972* will be required prior to undertaking the works.

No sites that have been lodged for assessment are located within the Site.

Other Aboriginal sites within 4 km of the Site are:

- Registered Aboriginal heritage Place ID 4325: Gas pipeline 84 - Artefacts/Scatter, located 2.4 km southwest of the Site.
- Lodged Place ID 3594: Mundup - Camp; Plant Resource, located 2.9 km northeast of the Site.
- Lodged Place ID 4111: Tortoise Swamp - Artefacts/Scatter, located 4.0 km west of the Site.

No direct or indirect impacts to sites within the surrounding areas are expected as a consequence of future development consistent with the proposed scheme amendment.

7.1.3 Other Heritage

No other heritage sites are located within the Site or surrounding area.

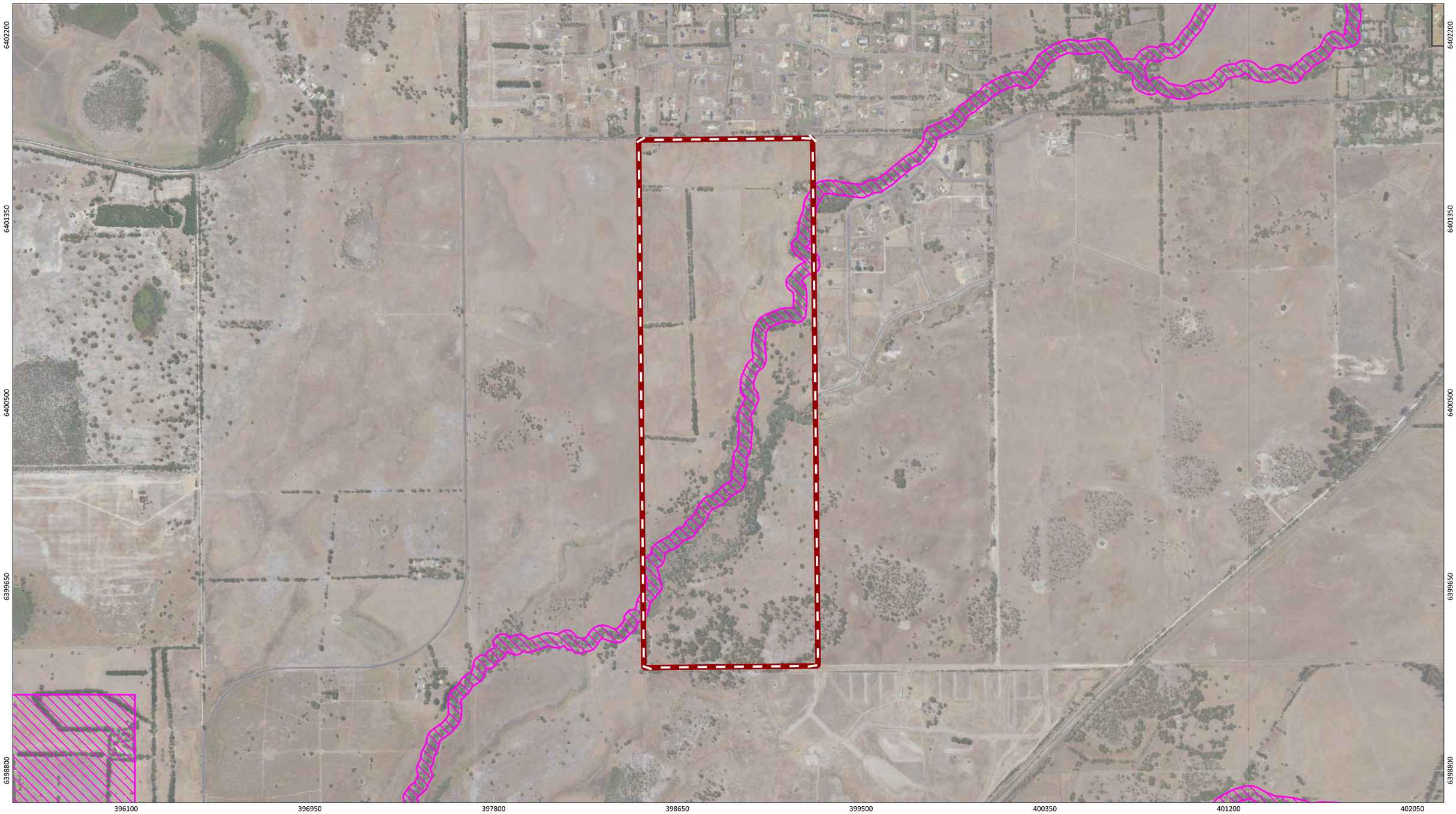

Figure 19: Heritage

N 0 250 500 750 1,000 m	PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
SCALE: 1:17,000	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0
DATA SOURCE: LANDGATE AERIAL IMAGERY NOW	DRAWN BY / REVIEWED BY: JP / JB	DATE: 29/7/2025

Legend

- Survey Area
- Aboriginal Cultural Heritage - Register (DPLH-099)

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

Cadastral boundary from LANDGATE 2022. UFID stands for Unique Identifier

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8. Other Environmental Matters

8.1 Bushfire Risk

The Department of Fire and Emergency Services (DFES) Map of Bushfire Prone Areas (DFES, 2024) indicates much of the southern and eastern portions of the Site is mapped as bushfire prone (Figure 20).

Designated bush fire prone areas have been identified by the Fire and Emergency Services Commissioner as being subject, or likely to be subject, to bushfire attack. Additional planning and building requirements may apply to development within these areas. A further assessment of the bushfire risk may also be required under the *Planning and Development (Local Planning Scheme) Regulations* 2015 and the Building Code of Australia.

A Bushfire Management Plan (BMP) has been prepared to identify the strategic ability to address bushfire risk and the consideration of bushfire protection criteria to support the development of the Site (WEPL, 2025b). The BMP should be read in conjunction with this EAR.

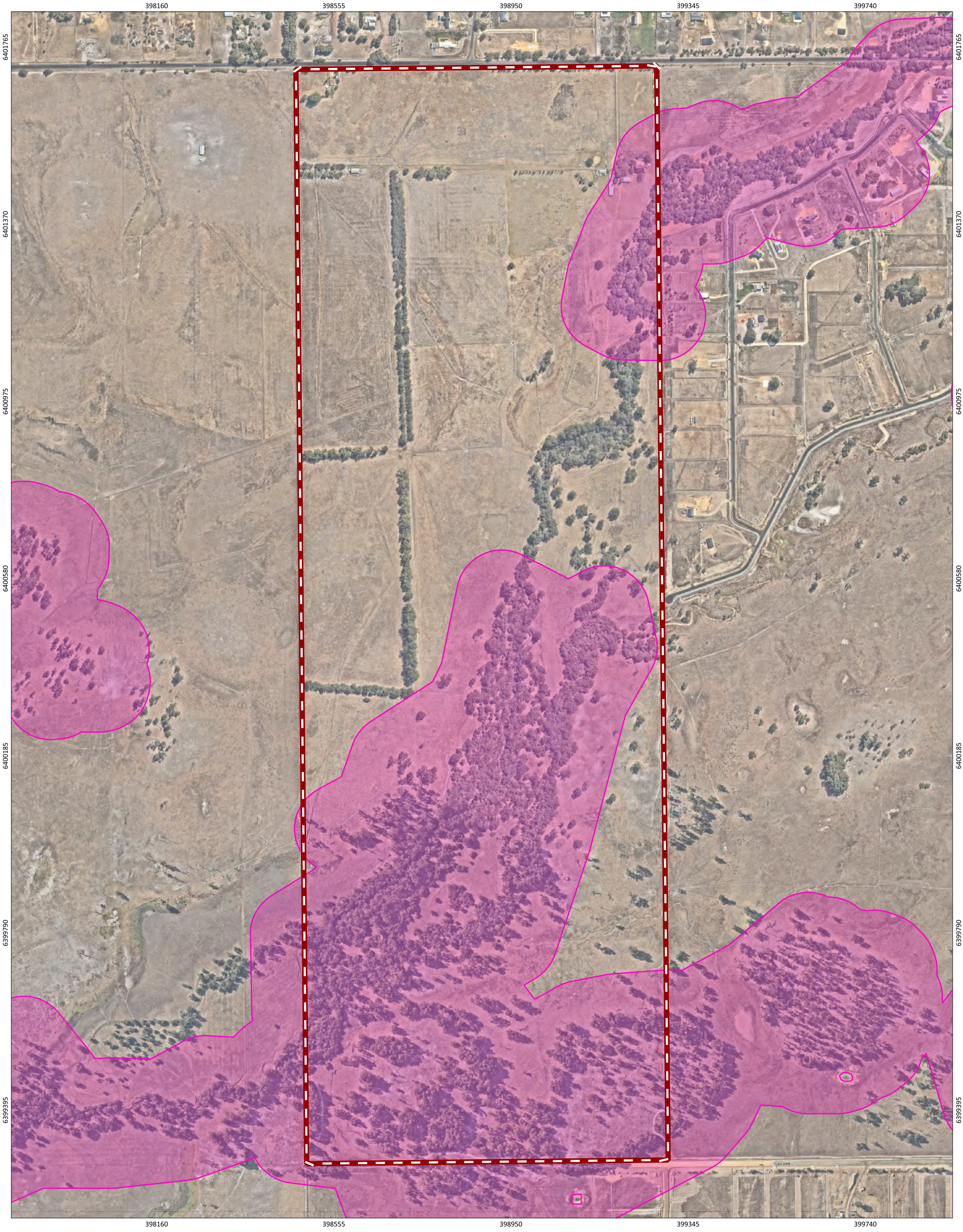

Figure 20: Bush Fire Prone Areas

N 0 50 100 150 200 m		PROJECT/REPORT NAME: Environmental Assessment Report Local Scheme Amendment: Lot 39 Lakes Road, North Dandalup	
SCALE: 1:7,900	SHEET SIZE: A3 COLOUR	CLIENT: Harley Dykstra	
COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 50	PROJECT NUMBER: A25.034	VERSION: 0	
DATA SOURCE: NEARMAPS	DRAWN BY / REVIEWED BY: JP/JB	DATE: 29/7/2025	

Legend

- Project Area

Bush Fire Prone Area Planning (OBRM-023)

- Bushfire Prone Area 2

No	Description	Drawn	Approved	Date
A	Original issue	JP	JB	29/7/2025

NOTES:

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9. Avoidance and Mitigation

9.1 Avoidance Measures

A foreshore area study has been undertaken by Bailey Environmental (2025) to identify the foreshore area boundaries (Appendix C). The results of this study have been used to inform the current Concept Design, which proposes retention of the foreshore reserve as shown in Figure 4. The following values contained within the retained foreshore reserve will be avoided:

- 34.26 ha of native vegetation.
- 32.61 ha of suitable foraging habitat (of which has not been assessed in detail but is expected to provide suitable foraging habitat).
- 48 potential nesting trees with a DBH ≥ 500 mm (30 marri, 12 flooded gum, three jarrah and three dead trees). More trees are expected to occur within the unassessed portion of FHT-08 and FHT-09, comprising the majority of fauna habitat contained within the foreshore reserve.
- Two mapped CCWs (excluding minimal impacts due to required construction of one connecting road through the foreshore).
- Registered Aboriginal heritage site ID 27937 (excluding minimal impacts due to required construction of one connecting road through the foreshore).

Impacts within the area are limited to clearing required to construct a road passing through the foreshore area. The road is planned within an area where the width and density of vegetation is low compared to the remainder of the Site.

9.2 Mitigation Measures and Avoidance Opportunities during Future Planning Stages

The proponent acknowledges the ecological values present within the Site and the risk of impacts during future planning stages.

The proponent has attached the following scheme requirements to the LPS amendment application, which will act as conditions of future subdivision approvals to minimise the risk of future environmental impacts:

a. “An Environmental Management Plan shall be prepared by the subdivider to the requirements of the Shire of Murray.”

b. “Environmental management requirements as outlined in an endorsed Environmental Management Plan are to be implemented.”

c. “Any clearing for the purposes of Asset Protection Zones is to be in accordance with the specific requirements as identified within an endorsed Bushfire Management Plan."

The proponent seeks to retain as many potential black cockatoo nesting trees and foraging habitat as possible. The most material risk to those values is the development of residential buildings and associated bushfire requirements. The southern portion of the Site contains areas of dense remnant native vegetation, which constitutes a bushfire risk rating of 'Extreme'.

Bushfire risks to future subdivision designs and dwellings will be managed through the implementation of Asset Protection Zones (APZs). APZs are required to meet the technical requirements outlines in the DPLH (2024b) *Planning for Bushfire Guidelines*.

A summary of vegetation requirements is presented in Table 17.

Table 17: Technical Requirements for Vegetation within Asset Protection Zones as per Planning for Bushfire Guidelines (2024)

Object	Requirement
Trees (more than 6 m in height)	• Trunks at maturity should be a minimum distance of six metres from all elevations of the building. • Branches at maturity should not touch or overhang a building or powerline. • Lower branches and loose bark should be removed to a height of two metres above the ground and/or surface vegetation. • Canopy cover within the APZ should be less than 15 per cent of the total APZ area. • Tree canopies at maturity should be at least 5 m apart to avoid forming a continuous canopy. Stands of existing mature trees with interlocking canopies may be treated as an individual canopy provided the total canopy cover within the APZ does not exceed 15 per cent and is not connected to the tree canopy outside the APZ.
Shrub and scrub (0.5 m to 6 m in height). Shrub and scrub more than 6 m in height are to be treated as trees.	• Should not be located under trees or within three metres of buildings • Should not be planted in clumps more than five square metres in area • Clumps should be separated from each other and any exposed window or door by at least 10 metres.
Ground cover (less than 0.5 m in height. Ground cover more than 0.5 m in height is to be treated as shrub)	• Can be planted under trees but must be maintained to remove dead plant material, defined as ‘Fine fuel load’. • Can be located within two metres of a structure but three metres from windows or doors if more than 100 mm in height.
Grass	• Grass should be maintained at a height of 100 mm or less, at all times. • Wherever possible, perennial grasses should be used and well-hydrated with regular application of wetting agents and efficient irrigation.

During subdivision planning, a spatial analysis will be undertaken to determine the minimal amount of clearing required for the creation of APZs in coherence with bushfire guidelines.

10. Preliminary Environmental Impact Assessment

In accordance with the proposed scheme provisions detailed in section 9.2, impacts of future development will be limited to the minimum required to provide for dwellings and APZs.

Further, if significant impacts to Matters of National Environmental Significance (MNES) are likely to occur at any future planning stage, the relevant action will be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act.

The following environmental factors are considered relevant to the proposed LPS amendment:

- Flora and vegetation.
- Terrestrial fauna.
- Inland waters.
- Social surroundings.

A Concept Plan has been prepared (Figure 4) which provides for the following land uses:

- Foreshore reserve: 49.81 ha.
- Public Open Space/Drainage: 2.19 ha.
- Proposed Special Rural: 129.69 ha.
- Roads and infrastructure easements: 14.80 ha.

A detailed impact assessment cannot be undertaken at this stage of the planning procedure as site designs have not been finalised yet. This will however be further investigated at future planning stages when impacts can be accurately defined and quantified. The scheme requirements listed above provide security that a detailed impact assessment will be undertaken and that avoidance and mitigation measurements will be implemented to minimise residual impacts.

10.1 Flora and Vegetation

Flora and vegetation surveys that have informed planning for the Site have been conducted in accordance with the *Environmental Factor Guideline: Flora and Vegetation* (EPA, 2016a) and the *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016c).

A minimum of 34.26 ha remnant native vegetation, including 31.71 ha riparian vegetation, will be retained within the proposed foreshore reserve. The balance of the Site is proposed to be allocated for Special Rural land use where some clearing of native vegetation will occur within building envelopes and APZs to be determined. Development of the Site may result in direct and indirect impacts to vegetation as a result of:

- The clearing of native vegetation to facilitate construction of building envelopes, APZs, roads, and services.
- Intensified land use.

No conservation significant flora species are anticipated to be impacted through the development of the Site.

The following management measures have been identified and will be implemented to ensure impacts to flora and vegetation are appropriately managed through subsequent stages of planning and development:

- Retention and protection of the proposed foreshore reserve.
- Designation of suitable building envelopes and APZs to avoid impacts to native vegetation where possible.
- Implementation of scheme provisions as described in section 9.2.

Direct, indirect and cumulative impacts to flora and vegetation are considered minor at a local and regional scale given that the highest value vegetation will be retained within the proposed foreshore reserve and that ultimate land use will be Special Rural in nature with scheme provisions relating to environmental management.

10.2 Terrestrial Fauna

Basic fauna and black cockatoo surveys that have informed planning for the Site have been conducted in accordance with the *Environmental Factor Guideline: Terrestrial Fauna* (EPA, 2016d), the *Technical Guidance - Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment* (EPA, 2020) and the *Referral guideline for 3 threatened black cockatoo species* (DAWE, 2022).

Retention of the proposed foreshore reserve avoids impacts on:

- 49.81 ha of fauna habitat, including 29.36 ha FHT-09, which has been assessed as suitable core habitat for all conservation significant species with a medium likelihood of occurrence within the Site.
- A minimum of 32.61 ha suitable black cockatoo foraging habitat.
- 48 potential nesting trees with a DBH ≥ 500 mm (30 marri, 12 flooded gum, three jarrah and three dead trees). More trees are expected to occur within the unassessed portion of FHT-08 and FHT-09, comprising the majority of fauna habitat contained within the foreshore reserve (29.36 ha).

The balance of the Site is proposed to be allocated for Special Rural land use where some clearing of native vegetation will occur within building envelopes and APZs to be determined. Development of the Site may result in direct and indirect impacts to vegetation as a result of:

- The clearing of native vegetation providing potential fauna habitat, including potential black cockatoo nesting trees and foraging habitat, to facilitate construction of building envelopes, APZs, roads, and services.
- Intensified land use.

The following management measures have been identified and will be implemented to ensure impacts to terrestrial fauna are appropriately managed through subsequent stages of planning and development:

- Retention and protection of the proposed foreshore reserve, which provides suitable core habitat for all conservation significant species with a medium likelihood of occurrence within the Site.
- Designation of suitable building envelopes and APZs to avoid impacts to significant black cockatoo habitat trees where possible.
- Implementation of scheme provisions as described in section 9.2.

The direct, indirect and cumulative impacts to terrestrial fauna species are considered minor at a local and regional scale given that the highest value vegetation will be retained within the proposed foreshore reserve and that ultimate land use will be Special Rural in nature with scheme provisions relating to the clearing or native vegetation.

10.3 Inland Waters

A biophysical assessment was undertaken by Bayley Environmental (2025; Appendix C) to delineate the North Dandalup River foreshore area and inform the Site design, including alignment of the foreshore reserve.

The proposed foreshore reserve comprises a total area of 49.81 ha, which will be retained and protected. Impacts within this area are limited to:

- The construction of a road connecting the portion north-west of North Dandalup River with the south-eastern portion of the Site. Impacts will include limited clearing of riparian vegetation.
- The alignment of bushfire emergency access way within the southern portion of the foreshore reserve (refer to BMP in Appendix B).
- Indirect impacts due to intensified land use.

The following management measures have been identified and will be implemented to ensure impacts to inland waters are appropriately managed through subsequent stages of planning and development:

- Access to the foreshore reserve will be controlled via fencing. Allocated walk paths and emergency access ways to provide for required bushfire management services will be incorporated in a way that minimal clearing will be required.
- Preparation of a Stormwater Management Plan during future planning stages to minimise indirect impacts to North Dandalup River and its tributaries.
- If the construction of the road will lead to disturbances of North Dandalup River, a permit to interfere with beds and banks of a watercourse under the *Rights in Water and Irrigation Act 1914* may be required.

As both CCWs as well as values associated with the North Dandalup River foreshore area will be retained, the direct, indirect and cumulative impacts to inland waters are considered minor at a local and regional scale.

10.4 Social Surroundings

Registered Aboriginal heritage site ID 27937 is associated with North Dandalup River. The implementation of the defined foreshore reserve extending 30 m to 265 m to each side of the river is considered to provide for the protection of environmental and heritage values associated with the watercourse.

Impacts to the heritage site are limited to:

- The construction of a road connecting the portion north-west of North Dandalup River with the south-eastern portion of the Site. Impacts will include limited clearing of riparian vegetation.
- The alignment of bushfire emergency access way within the southern portion of the foreshore reserve (refer to BMP in Appendix B).
- Indirect impacts due to intensified land use.

The following management measures have been identified and will be implemented to ensure impacts to the Aboriginal heritage site ID 27937 are appropriately managed through subsequent stages of planning and development:

- Authorisation under Section 18 of the *Aboriginal Heritage Act 1972* will be required for the construction the road passing through the heritage site.
- Preparation of a Stormwater Management Plan during future planning stages to minimise indirect impacts to North Dandalup River and its tributaries.
- If the construction of the road will lead to disturbances of North Dandalup River, a permit to interfere with beds and banks of a watercourse under the *Rights in Water and Irrigation Act 1914* may be required.

As a result of the retention of site ID within a 30-265 m wide foreshore area, and future mitigation measures the direct, indirect and cumulative impacts to heritage values are considered minor at a local and regional scale.

11. Conclusion

This EAR presents the results of an environmental desktop assessment and biological surveys undertaken in April 2025. The findings suggest that there are no major constraints present on the Site that would preclude the proposed LPS amendment. Key outcomes are summarised below:

- The Site is mapped as moderate to low risk of Acid Sulfate Soils occurring within 3 m of the natural soil surface. Further investigation and potential management may be required during future development and earthwork phases if excavation or dewatering should occur.
- No contaminated sites are located within the Site, and the nearest is 7.5 km away.
- No conservation significant flora species or ecological communities were recorded within the Site.
- Four vegetation types were identified within the Site (63.77 ha), of which three were considered to represent native vegetation, comprising a total area of 54.10 ha. The balance of the Site is pasture paddock. All vegetation is in Degraded to Completely Degraded condition.
- The proposed North Dandalup River foreshore reserve (49.81 ha) occurs through the centre of the Site where environmental values will be retained and protected. A minimum of 34.26 ha of native vegetation will be retained within the foreshore area.
- The Site provides potential foraging and breeding habitat for black cockatoos, however no evidence of roosting was recorded. Black cockatoo habitat was not assessed within the 32.69 ha foreshore area due to planned retention. The remainder of the Site provides the following black cockatoo habitat values:
    - One nesting tree (containing a suitable breeding hollow).
    - 852 potential nesting trees (without suitable hollows). More trees are expected to occur within the unassessed portion of FHT-08 and FHT-09, comprising the majority of fauna habitat contained within the foreshore reserve.
    - Foraging evidence for black cockatoo species (within FHT-03 marri woodland).
    - 41.96 ha of suitable foraging habitat for Baudin's black cockatoo (9.27 ha assessed, 32.69 ha inferred), of which
        - 7.43 ha is of very high foraging value.
        - 1.84 ha is of low to moderate value.
        - Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.
    - 41.96 ha of suitable foraging habitat for Carnaby's black cockatoo (9.27 ha assessed, 32.69 ha inferred), of which

- 7.43 ha is of very high foraging value.
- 1.84 ha is of low to moderate value.
- Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.

o 45.60 ha of suitable foraging habitat for Forest red-tailed black cockatoo (12.91 ha assessed, 32.69 ha inferred), of which

- 9.26 ha is of very high foraging value.
- 3.65 ha is of low to moderate value.
- Additional 32.69 ha within the foreshore area are expected to provide suitable foraging habitat scoring a weighted average of 3/7 (low to moderate value) or above.

- No evidence for other conservation significant fauna was recorded within the Site. FHT-09, which is associated with the riparian vegetation along North Dandalup River, was assessed to provide potential core habitat for Carter's freshwater mussel, south-western brush-tailed phascogale, quenda and western brush wallaby. This habitat type will be retained within the planned foreshore reserve.

- North Dandalup River and one associated tributary pass through the Site from the northeastern to the southwestern corner. A Stormwater Management Plan may be required during future planning stages to manage potential indirect impacts to the North Dandalup River.

- Two CCWs (UFID 13313 and UFID 6018) are mapped within North Dandalup River foreshore area. Both wetlands will be retained within the foreshore reserve.

- The Site is located within a bushfire prone area. A BMP has been prepared by WEPL (2025b) to address bushfire safety considerations and should be read in conjunction with this EAR.

- A registered Aboriginal heritage site (ID 27937), North Dandalup River, is mapped as intersecting the Site. Implementation of the foreshore area as defined in Bayley (2025) and the current concept plan (Figure 4) is considered sufficient to protect ecological and heritage values associated with the watercourse.

Avoidance Measures

A foreshore reserve (49.81 ha) has been determined to be retained, containing 34.26 ha of native vegetation, mainly comprised of VT 03 - Riparian vegetation. This vegetation type contains scattered patches of marri, which provide high value foraging habitat for black cockatoo. A detailed assessment of black cockatoo habitat has not been undertaken within this area yet due to the planned retention. The retained area of black cockatoo foraging habitat was inferred to be 32.61 ha. Additionally, 48 potential nesting trees with a DBH ≥ 500 mm are contained within the foreshore reserve. Significantly more trees are expected to occur within the unassessed portion of FHT-08 and FHT-09 (30.25 ha), comprising the majority of fauna habitat contained within the foreshore reserve. A detailed assessment of black cockatoo habitat values within the foreshore

reserve will be undertaken during future planning stages once site designs are finalised and impacts as well as retained values can be accurately quantified.

Further, two mapped CCWs and Aboriginal heritage site ID 27937 are located within the retained foreshore reserve and will be avoided. Impacts are limited to the construction of one road passing through the reserve.

The proponent has committed to the provision of an Environmental Management Plan to accompany any subdivision application that will provide for future protection of ecological values within the Site.

Preliminary Impact Assessment

No detailed impact assessment can be undertaken at this stage as site designs have not been finalised yet. This will be undertaken during future planning stages when further information is applicable.

Expected impacts are limited to:

- The clearing of native vegetation, providing potential fauna habitat, including potential black cockatoo nesting trees and foraging habitat, to facilitate construction of building envelopes, APZs, roads, and services.
- Impacts necessitated by the construction of a road connecting the portion north-west of North Dandalup River with the south-eastern portion of the Site. Impacts will include limited clearing of riparian vegetation along North Dandalup River within the foreshore area.
- Impacts necessitated for the alignment of bushfire emergency access way within the southern portion of the foreshore reserve (refer to BMP in Appendix B).
- Indirect impacts due to intensified land use.

The following mitigation measures have been identified and will be implemented to ensure impacts to the are appropriately managed through subsequent stages of planning and development:

- Protection of the proposed foreshore reserve, including access control via the installation of fencing and allocated walk paths.
- Designation of suitable building envelopes and APZs to avoid impacts to native vegetation where possible.
- Implementation of scheme provisions as described in section 9.2.
- Preparation of a Stormwater Management Plan during future planning stages to minimise indirect impacts to North Dandalup River and its tributaries and protect ecological as well as heritage values associated with the watercourse.
- Authorisation under Section 18 of the *Aboriginal Heritage Act 1972* will be required for the construction the road passing through the heritage site.

- If the construction of the road will lead to disturbances of North Dandalup River, a permit to interfere with beds and banks of a watercourse under the *Rights in Water and Irrigation Act 1914* may be required.

- If significant residual impacts to MNES should be identified during the detailed impact assessment, the project will be formally referred under the EPBC Act.

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Appendix A
Biological Survey Report (WEPL, 2025a)