

Black Cockatoo Action Management Plan



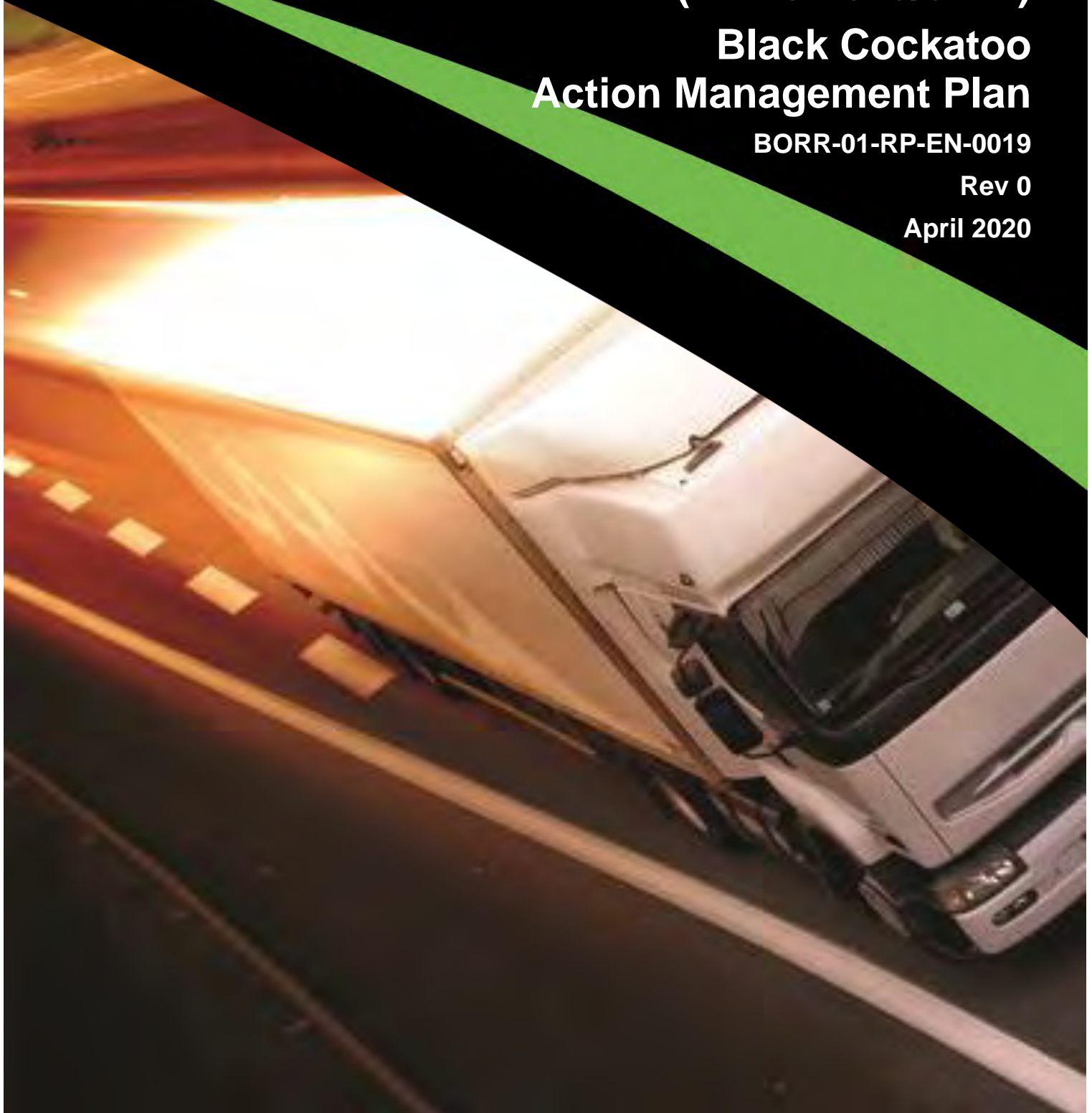
**Bunbury Outer Ring Road
Northern and Central Sections
(EPBC 2019/8471)**

**Black Cockatoo
Action Management Plan**

BORR-01-RP-EN-0019

Rev 0

April 2020



EXECUTIVE SUMMARY

Bunbury Outer Ring Road Project

Main Roads Western Australia (Main Roads) is proposing to construct and operate the Northern and Central sections of the Bunbury Outer Ring Road (BORR) project. BORR is a planned Controlled Access Highway linking the Forrest Highway and Bussell Highway. The completed project will provide a high standard route for access to the Bunbury Port, improve road user safety and facilitate proposed development to the east of the City of Bunbury. BORR provides an effective bypass of Bunbury for inter-regional traffic. The proposed BORR comprises three sections:

- 'BORR Northern Section' – Forrest Highway to Boyanup-Picton Road
- 'BORR Central Section' – Boyanup-Picton Road to South Western Highway (an existing four km section which was completed in May 2013, along with a three km extension of Willinge Drive southwards to South Western Highway)
- 'BORR Southern Section' – South Western Highway (near Bunbury Airport) to Bussell Highway.

The proposed BORR Project occurs within the City of Bunbury and Shires of Capel, Dardanup and Harvey. Construction of the BORR Project is anticipated to commence in year 2021 and continue for a period of up to approximately three years.

Bunbury Outer Ring Road Northern and Central Sections Proposal

This document refers to BORR Northern and Central Sections only (the Proposal). The Proposal includes the construction and operation of 19 km of new freeway standard dual carriageway and associated bridges, interchanges and other road infrastructure. The Proposal is located approximately 200 km south of Perth and, at its closest point, approximately six km south-east of Bunbury.

The 625 ha Proposal Area occurs within the City of Bunbury and Shires of Capel, Dardanup and Harvey. Approximately 87 % of land within the Proposal Area is cleared for agriculture. Pockets of native vegetation occur within the Proposal Area in road reserves, along sections of the Collie, Ferguson and Preston Rivers, or as isolated patches on properties. The Proposal Area excludes areas within BORR Central Section which was constructed in 2013.

The Proposal was formally referred to the then Commonwealth Department of the Environment and Energy (DoEE) on 25 June 2019 (EPBC Act referral 2019/8471) as a potential Controlled Action under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to impacts on Matters of National Environmental Significance (MNES). The DoEE provided advice on 18 October 2019 that the Proposal is considered a Controlled Action and that it would be assessed by Preliminary Documentation (DoEE, 2019).

Under Commonwealth government reforms announced in December 2019, DoEE was consolidated with the Department of Agriculture to form the new Department of Agriculture, Water and Environment (DAWE), effective 1 February 2020. The Additional Information Request for Preliminary Document (BORR IPT, 2020a) and this Action Management Plan will therefore be submitted to DAWE for assessment.

Purpose of this AMP

This Action Management Plan (AMP) has been prepared to support of documentation prepared to address the DAWE request of 18 October 2019 for further information for assessment of the Proposal.

This document sets out the environmental management actions to manage, monitor and mitigate the direct and potential indirect impacts of the Proposal on the following listed fauna taxa listed as 'Threatened' MNES:

- Carnaby's Cockatoo *Calyptorhynchus latirostris* (listed as 'Endangered')
- Baudin's Cockatoo *Calyptorhynchus baudinii* (listed as 'Endangered')
- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* (listed as 'Vulnerable').

This AMP has been prepared consistent with the following guidance documentation:

- Department of the Environment (DotE) (2014) *Environmental Management Plan Guidelines*
- Department of the Environment and Energy (DoEE) (2019) *Action Management Plan Criteria*.

The AMP structure and content has been prepared to align to DotE (2014), with the content then incorporating the additional criteria outlined by DoEE (2019).

Environmental management and monitoring

As outlined within this AMP, the key environmental management and monitoring actions for the Proposal are identified in Table E-1 and Table E-2.

Table E-1 Environmental management measures

TIMING	MANAGEMENT ACTIONS	PERFORMANCE TARGETS
Prior to construction	<ul style="list-style-type: none"> • Habitat to be cleared within the area of the Proposal Area will be demarcated in the field to ensure clearing only occurs within the approved clearing area • The final design will avoid trees with suitable nest hollows where possible • Where any of the three trees with suitable nest hollows for Black Cockatoo will require clearing for the Proposal, the hollow will be visually inspected where safe and practicable. Where not in use the hollow will be 'blocked' to prevent breeding • Where blocking of the nest hollows cannot be undertaken (e.g. timing, access), a pre-clearing fauna assessment will be undertaken by a suitably experienced person to determine if the hollows are being used by Black Cockatoos 	<ul style="list-style-type: none"> • Avoid direct impacts to Black Cockatoos • Avoid clearing outside the approved footprint • Reduce clearing of Black Cockatoo habitat to the extent practicable in final design • Preclude potential breeding within the area of the Proposal prior to construction
During construction	<ul style="list-style-type: none"> • A suitably experienced zoologist / environmental scientist will be on-site at all times during clearing of breeding habitat for Black Cockatoos and must maintain radio communication with machinery operators 	<ul style="list-style-type: none"> • Avoid direct impacts to Black Cockatoos

TIMING	MANAGEMENT ACTIONS	PERFORMANCE TARGETS
	<ul style="list-style-type: none"> • Where a suitable nest hollow within the area of the Proposal has been blocked prior to the Black Cockatoo breeding season, the tree may be felled as part of the standard vegetation clearing process • Where a suitable nest hollow within the area of the Proposal has not been blocked and the pre-clearing fauna assessment has not identified Black Cockatoo occupation of the nest hollow, prior to clearing the tree, the tree will be 'bumped gently' with a machine with the machine operator and zoologist then to wait and observe the tree for a short time after. If no Black Cockatoo appears to be present then the tree may be pushed over slowly to minimise risk of injury to any undetected animal (if present) • Where suitable nest hollows within the area of the Proposal have not been blocked and the pre-clearing fauna assessment identifies Black Cockatoo occupation of the nest hollow (which may include chicks (young)), the tree with the nest hollow will not be cleared until after the chick/s have left the nest. No vegetation within 10 m of the tree will be cleared until after the hollow is vacant • Any Black Cockatoos observed within the Proposal Area showing signs of injury or illness will be promptly taken to an experienced wildlife veterinarian or approved wildlife rehabilitation facility • A post-clearing survey shall be undertaken to ensure no injured Black Cockatoo individuals are present. 	<ul style="list-style-type: none"> • Avoid clearing outside the approved footprint • Avoid abandonment of breeding hollows within the Proposal Area
<p>Post construction</p>	<p>Where space and access allows, revegetation and landscaping of cleared areas within the Proposal Area with suitable endemic native species will be undertaken to provide foraging habitat for Black Cockatoos (excluding 10 m buffer from nearest traffic lane).</p>	<p>Rehabilitation provides suitable foraging habitat within 10 years of completion.</p>

CONTENTS

EXECUTIVE SUMMARY	2
Bunbury Outer Ring Road Project	2
Bunbury Outer Ring Road Northern and Central Sections Proposal	2
Purpose of this AMP	3
Environmental management and monitoring	3
1 COVER PAGE AND DECLARATION OF ACCURACY	7
1.1 Declaration of accuracy	7
1.2 Election to have an action management plan approved	8
1 PROPOSAL DESCRIPTION	9
1.1 Bunbury Outer Ring Road project	9
1.2 Bunbury Outer Ring Road Northern and Central Sections proposal	9
1.3 Environmental assessment and management	9
1.4 Black Cockatoo species' descriptions	10
2 OBJECTIVES	11
2.1 Purpose	11
2.2 Objectives	11
3 ENVIRONMENTAL MANAGEMENT ROLES AND RESPONSIBILITIES	12
4 REPORTING AND ACCOUNTABILITY	12
4.1 Reporting	12
4.2 Environmental training	13
4.3 Emergency contacts and procedures	13
5 POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS	15
5.1 Threats to Black Cockatoos	15
5.2 Assumptions and uncertainties	16
5.3 Potential impacts	16
5.4 Risk assessment	17
6 ENVIRONMENTAL MANAGEMENT MEASURES	20
6.1 Environmental management activities, controls and performance targets	20
6.2 Environmental maps and diagrams	23
6.3 Environmental monitoring	23
6.4 Corrective actions	26
7 AUDIT AND REVIEW	27
7.1 Environmental auditing	27

7.2	Environmental review	28
7.3	Data management	28
8	STAKEHOLDER CONSULTATION	29
8.1	Stakeholder consultation	29
8.2	External communications/concerns	29
9	REFERENCES	30

TABLE INDEX

Table 1	Reporting requirements.....	12
Table 2	Site induction training program content	13
Table 3	Emergency contact details.....	14
Table 4	Environmental impacts of the Proposal.....	16
Table 5	Environmental surveys relevant to this AMP	17
Table 6	Risk assessment	18
Table 7	Management actions and performance targets.....	20
Table 8	SMART performance standards	22
Table 9	Proposed monitoring program	24
Table 10	Corrective actions	26
Table 11	Environmental audit schedule	27
Table 12	AMP review schedule	28
Table 13	Stakeholder consultation.....	29

FIGURES INDEX

Figure 1	Proposal Area
Figure 2	Black Cockatoo Foraging Habitat – Regional, 12 km Radius
Figure 3	Black Cockatoo Foraging Habitat – Survey Area
Figure 4	Black Cockatoo Foraging Habitat – Survey Area (sectional maps)
Figure 5	Black Cockatoo Large Trees (DBH ≥ 500 mm) with Nest Hollows – Survey Area
Figure 6	Black Cockatoo Large Trees (DBH ≥ 500 mm) with Nest Hollows – Survey Area (sectional maps)

APPENDICES

Appendix A Figures

Document Control					
Revision	Date	Description	Prepared	Reviewed	Approved
A		Draft for Internal Review	AH/MJ	FH	FH
0	8/4/20	Final	SH	FH	FH

1 COVER PAGE AND DECLARATION OF ACCURACY

- **EPBC number:** 2019/8471
- **Project name:** Bunbury Outer Ring Road Northern and Central Sections
- **Action management plan title:** Bunbury Outer Ring Road Northern and Central Sections Black Cockatoo Management Plan BORR-02-RP-EN-0000 Rev0 April 2020
- **Proponent /approval holder and ACN or ABN:** Main Roads Western Australia, ABN 50860676021
- **Proposed/approved action:** Construction and operation of the Northern and Central sections of the Bunbury Outer Ring Road (BORR) project
- **Location of the action:** Forrest Highway to South Western Highway, within the City of Bunbury and Shires of Capel, Dardanup and Harvey
- **Date of preparation of the action management plan:** April 2020
- **Person accepting responsibility for the action management plan:** Martine Scheltema, Manager Environment, Main Roads Western Australia

1.1 Declaration of accuracy

I declare that to the best of my knowledge, all the information contained in, or accompanying this document is complete, current and correct. I am duly authorised to sign this declaration on behalf of the proponent/approval holder. I am aware that:

- a) giving false or misleading information is a serious offence under section 137. 1 of the Criminal Code Act 1995 (Cth)
- b) section 137.2 of the Criminal Code Act 1995 (Cth) makes it an offence for a person to produce a document to another person in compliance or purported compliance with a law of the Commonwealth where the person knows that the document is false or misleading;
- c) section 490 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading; and
- d) section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) (EPBC Regulations) where the person knows the information or document is false or misleading.

Signed: _____
Full name: Martine Scheltema, Manager Environment
Organisation: Main Roads Western Australia (ABN 50 860 676 021)
Date: ____/____/____

1.2 Election to have an action management plan approved

Note: Pursuant to section 132B of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), this election must be given to the Minister before the Minister grants an approval of the proposed action under section 133 of the EPBC Act.

Person Proposing to Take Action

Name and Title: Martine Scheltema, Manager Environment

Organisation: Main Roads Western Australia

EPBC Referral Number: EPBC 2019/8471

ACN/ABN: ABN 50860676021

Postal Address: PO Box 6202 EAST PERTH WA 6002

Telephone: 138 138

Email: enquiries@mainroads.wa.gov.au

- I elect to submit an action management plan(s) for approval in accordance with section 132B of the Environment Protection and Biodiversity Conservation Act 1999. I understand that a fee of \$2,690 may apply under the cost recovery arrangements.

Declaration:

- I declare that to the best of my knowledge the information I have given on this form is complete, current and correct.
- I understand that giving false or misleading information is a serious offence.

Signed:

Full name: Martine Scheltema, Manager Environment

Organisation: Main Roads Western Australia (ABN 50 860 676 021)

Date: ____/____/____

1 PROPOSAL DESCRIPTION

1.1 Bunbury Outer Ring Road project

Main Roads Western Australia (Main Roads) is proposing to construct and operate the Northern and Central sections of the Bunbury Outer Ring Road (BORR) project. BORR is a planned Controlled Access Highway linking the Forrest Highway and Bussell Highway. The completed project will provide a high standard route for access to the Bunbury Port, improve road user safety and facilitate proposed development to the east of the City of Bunbury. BORR provides an effective bypass of Bunbury for inter-regional traffic. The proposed BORR comprises three sections:

- 'BORR Northern Section' – Forrest Highway to Boyanup-Picton Road
- 'BORR Central Section' – Boyanup-Picton Road to South Western Highway (an existing four km section which was completed in May 2013, along with a three km extension of Willinge Drive southwards to South Western Highway)
- 'BORR Southern Section' – South Western Highway (near Bunbury Airport) to Bussell Highway.

The proposed BORR Project occurs within the City of Bunbury and Shires of Capel, Dardanup and Harvey. Construction of the BORR Project is anticipated to commence in year 2021 and continue for a period of up to approximately three years.

1.2 Bunbury Outer Ring Road Northern and Central Sections proposal

This document refers to BORR Northern and Central Sections only (the Proposal). The Proposal includes the construction and operation of 19 km of new freeway standard dual carriageway and associated bridges, interchanges and other road infrastructure. The Proposal is located approximately 200 km south of Perth and, at its closest point, approximately six km south-east of Bunbury (Figure 1).

The 625 ha Proposal Area occurs within the City of Bunbury and Shires of Capel, Dardanup and Harvey. Approximately 87 % of land within the Proposal Area is cleared for agriculture. Pockets of native vegetation occur within the Proposal Area in road reserves, along sections of the Collie, Ferguson and Preston Rivers, or as isolated patches on properties. The Proposal Area excludes areas within BORR Central Section which was constructed in 2013.

1.3 Environmental assessment and management

The Proposal was formally referred to the then Commonwealth Department of the Environment and Energy (DoEE) on 25 June 2019 (EPBC Act referral 2019/8471) as a potential Controlled Action under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to impacts on Matters of National Environmental Significance (MNES). In October 2019, DoEE advised that the Proposal would be assessed as a Controlled Action under the assessment approach of Preliminary Documentation, with a request for further information to assist in the assessment of the Proposal (DoEE, 2019).

Under Commonwealth government reforms announced in December 2019, DoEE was consolidated with Department of Agriculture to form the new Department of Agriculture, Water and Environment (DAWE), effective 1 February 2020. The Additional Information Request for Preliminary Document (BORR IPT, 2020a) and this Action Management Plan will therefore be submitted to DAWE for assessment.

This Action Management Plan (AMP) has been prepared to support the documentation prepared to address the DoEE request for further information. The DoEE request identified a requirement for Main Roads to

detail the proposed management measures to achieve the environmental outcomes, including performance indicators, periodic milestones, proposed monitoring and adaptive management, and record keeping, publication and reporting processes.

This AMP sets out the environmental management actions to manage, monitor and mitigate the direct and potential indirect impacts of the Proposal on the following conservation significant fauna taxa:

- Carnaby's Cockatoo *Calyptorhynchus latirostris* (listed as 'Endangered' (*Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) EPBC-E, *Western Australian Biodiversity Conservation Act 2016* (WA) (BC Act) BC-E))
- Baudin's Cockatoo *Calyptorhynchus baudinii* (listed as 'Endangered' (EPBC-E, BC-E))
- Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* (listed as 'Vulnerable' (EPBC-V, BC-V)).

These are collectively referred to herein as Black Cockatoos.

This AMP has been prepared consistent with the following guidance documentation:

- Department of the Environment (DotE) (2014) *Environmental Management Plan Guidelines*
- Department of the Environment and Energy (DoEE) (2019) *Action Management Plan Criteria*.

The AMP structure and content has been prepared to align to DotE (2014), with the content then incorporating the additional criteria outlined by DoEE (2019).

Impacts of the Proposal to other conservation significant fauna taxa are addressed within a separate Conservation Significant Fauna AMP (Bunbury Outer Ring Road Integrated Planning Team (BORR IPT) (2020c)).

1.4 Black Cockatoo species' descriptions

Carnaby's Cockatoo is a large white-tailed cockatoo, endemic to the south-west of Western Australia. It is listed as 'Threatened' fauna under both the Commonwealth EPBC Act and the *Western Australian Biodiversity Conservation Act 2016* (WA) (BC Act) at the level of 'Endangered' (EPBC-E, BC-E) as assessed under the criteria of the IUCN (2012).

Baudin's Cockatoo is a large white-tailed cockatoo, endemic to the south-west of Western Australia. It is listed as 'Threatened' fauna under both the Commonwealth EPBC Act and the State BC Act at the level of 'Endangered' (EPBC-E, BC-E) as assessed under the criteria of the IUCN (2012).

Forest Red-tailed Black Cockatoo is a large red-tailed cockatoo, endemic to the south-west of Western Australia. It is listed as 'Threatened' fauna under both the Commonwealth EPBC Act and the State BC Act at the level of 'Vulnerable' (EPBC-V, BC-V) as assessed under the criteria of the IUCN (2012).

2 OBJECTIVES

2.1 Purpose

This AMP has been developed to support documentation prepared to address the DoEE request of 18 October 2019 for further information for assessment of the Proposal (DoEE, 2019).

This AMP sets out the environmental management actions proposed to manage, monitor and mitigate the direct and potential indirect impacts of the Proposal on Black Cockatoos. It has been prepared consistent with the guidance documentation detailed in Section 1.3.

The AMP structure and content has been prepared to align to DotE (2014), with the content then incorporating the additional criteria outlined by DotEE (2019).

2.2 Objectives

This AMP has been prepared to ensure the impacts of the Proposal to Black Cockatoos are acceptable, minimised and managed. It is a 'management-based' AMP to document management actions required during Proposal implementation and operation. Management measures within this AMP are specific to the Proposal, and include management actions that are 'over and above' standard environmental management practises.

The following management targets have been identified:

- Construct and operate the Proposal to avoid and minimise impacts to Black Cockatoos
- No disturbance to nesting Black Cockatoos (adults and young).

3 ENVIRONMENTAL MANAGEMENT ROLES AND RESPONSIBILITIES

This AMP identifies the environmental management of activities to be undertaken by Main Roads in implementation of the Proposal. Main Roads acknowledges that the environmental management actions contained within this AMP are legal requirements to be met by Main Roads.

The Manager Environment at Main Roads will maintain responsibility for implementation of the management actions outlined within this AMP, on behalf of Main Roads’ Managing Director. Management actions may be undertaken by employees and/or contractors of Main Roads on behalf of Managing Director.

Where management actions are undertaken by employees and/or contractors of Main Roads, these will be communicated and documented to the relevant personnel through relevant environmental training (refer to Section 0).

4 REPORTING AND ACCOUNTABILITY

4.1 Reporting

Main Roads will report to DAWE on the implementation of this AMP as part of annual compliance reporting under the conditions of approval for the Proposal.

Where compliance audits undertaken by Main Roads identify that the environmental management actions and/or the environmental objectives are not being achieved (i.e. non-compliance or an environmental incident), Main Roads will notify DAWE as soon as reasonably practicable. Consistent with standard document control procedures, Main Roads will maintain copies of all reports submitted to DAWE.

The reporting requirements for this AMP are identified in Table 1.

Table 1 Reporting requirements

ASPECT	REPORT FROM	REPORT TO	REPORTING FREQUENCY
Implementation of AMP	Manager Environment	DAWE	Annually (as part of annual compliance reporting)
Non-compliance with AMP or Environmental Incident	Manager Environment	DAWE	As soon as reasonably practicable but not more than seven days

The format and content of annual reporting will be in accordance with the requirements of the annual reporting conditions. The format and content of reporting of a non-compliance event or an environmental incident will be subject to the nature of the non-compliance/incident and will include all requested information from DAWE. In consideration of this, specific templates for reporting these are not provided as part of this AMP.

4.2 Environmental training

Main Roads will ensure that all personnel undertaking works for the Proposal, including visitors, have undertaken a site induction training program, or are escorted to the site. Main Roads will evaluate all personnel undertaking the site induction training program through a written test to ensure that all personnel have an understanding of the environmental requirements for the Proposal.

Where it is identified that personnel have not undertaken the works in accordance with the environmental requirements for the Proposal, Main Roads will require such personnel to repeat the site induction training program.

The general content of the site induction training program for the Proposal is outlined in Table 2.

Table 2 Site induction training program content

ASPECT	SITE INDUCTION TRAINING PROGRAM CONTENT
Site induction training program	Awareness of Main Roads' Environmental Policy
	Identification of the environmental values in the area of the Proposal
	Identification of key environmental risks associated with the Proposal, and the identification of management requirements to control such risks
	Roles and responsibilities of all personnel in the protection and management of the environment, including identification of key personnel that have specific roles or responsibilities
	Awareness of importance of compliance with the environmental requirements (including penalties for non-conformance with the environmental requirements)
	Pegging of the area of works, and other pegging types (for example, trees to be retained)
	Clearing of native vegetation and management of topsoil
	Hygiene procedures for <i>Phytophthora</i> Dieback management and weed management
	Appropriate disposal of wastes
	Environmental incidents, including the requirements for management and reporting
	The environmental benefits of improved personal performance

4.3 Emergency contacts and procedures

Emergency contact details will be signposted at appropriate locations within the area of the Proposal, to enable immediate contact and response in the event of an emergency / environmental incident observed by Main Roads' personnel, contractors or the public.

Emergency response procedures will be followed in the event of an emergency / environmental incident.

Main Roads' general and emergency contacts for the Proposal are provided in Table 3.

Table 3 Emergency contact details

ASPECT	CONTACT DETAILS
<p>General contact</p>	<ul style="list-style-type: none"> • Main Roads Head Office Address: Don Aitken Centre, Waterloo Crescent, EAST PERTH WA 6004 Mail: PO Box 6202, EAST PERTH WA 6002 Email: enquiries@mainroads.wa.gov.au Phone: 138 138 • Main Roads South West Region Address: Robertson Drive, BUNBURY WA 6231 Mail: PO Box 5010, EAST PERTH WA 6231 Email: enquiries@mainroads.wa.gov.au Phone: 138 138 / (08) 9724 5600
<p>Emergency contact</p>	<ul style="list-style-type: none"> • Manager Environment, Main Roads Email: Martine.Scheltema@mainroads.wa.gov.au Phone: (08) 9323 4614 • Regional Manager, Main Roads South West Region Email: robert.barnsley@mainroads.wa.gov.au Phone: (08) 9724 5600

5 POTENTIAL ENVIRONMENTAL IMPACTS AND RISKS

5.1 Threats to Black Cockatoos

The Department of Sustainability Environment Water Protection and Communities (DSEWPac) (2012) identifies the key threats to the Black Cockatoo taxa as comprising:

- Habitat loss and habitat degradation - loss of foraging habitat, nesting hollows, habitat connectivity habitat quality
- Interactions with humans - vehicle strikes, agriculture protection measures, disturbance from noise/light, unauthorised taking (poaching)
- Invasive species - competition for nest hollows with European honey bees and bird invading taxa, injury/death from European honey bees.

A complete assessment of the potential impacts of the Proposal to Black Cockatoos, and impacts to other matters protected under Part 3 of the EPBC Act, is contained within *BORR Northern and Central Sections Additional Information for Preliminary Documentation* (BORR IPT, 2020a).

5.2 Assumptions and uncertainties

This AMP has been prepared on the basis of information provided in the environmental surveys for the Proposal (Table 5), and based upon knowledge of Main Roads' construction and operation of similar linear infrastructure works. The key assumptions and uncertainties relevant to the Proposal and Black Cockatoos are:

- Environmental survey reports have not been independently verified. These surveys were undertaken by suitably qualified individuals experienced in Black Cockatoo fauna ecology and habitats identification and are therefore assumed to have accurately recorded the presence and locations of Black Cockatoo foraging habitat and breeding habitat, including nest hollows. It is acknowledged that fauna survey results may change over time, for example, not all suitable hollows are actively used in all years.
- The Proposal may have the potential for an indirect impact to Black Cockatoo individuals and habitat.

More information on the key assumptions and uncertainties are provided in the appendices of *BORR Northern and Central Sections Additional Information for Preliminary Documentation* (EPBC 2019/8471) BORR IPT (2020a).

5.3 Potential impacts

As outlined in BORR IPT (2020a), implementation of the Proposal will result in clearing of up to 37.8 hectares (ha) of Black Cockatoo foraging habitat within the 625 ha Proposal Area, representing approximately 0.5% of the recorded 7,600 ha of the locally available foraging habitat (suitable remnant vegetation within a 12 km radius) (Figure 2). This area includes three potential nesting trees with a diameter at breast height (DBH) of ≥ 500 millimetres that contain a hollow(s) assessed as potentially suitable for nesting by Black Cockatoos. None of these showed evidence of use by Black Cockatoos (Biota, 2020). The Proposal Area contains 711 large trees without suitable hollows that will be removed by the Proposal, of which approximately seven may form a suitable hollow in the future.

The location and extent of Black Cockatoo habitat, large (potential nesting) trees and large trees with suitable nesting hollows within the Proposal Area are shown in Figures 4-6 (Appendix A).

Direct impacts of the Proposal to Black Cockatoos are outlined in Table 4. These have been informed through targeted environmental surveys undertaken for the Proposal.

Table 4 Environmental impacts of the Proposal

TAXON	IMPACT
Carnaby's Cockatoo (EPBC-E, BC-E) Baudin's Cockatoo (EPBC-E, BC-E) Forest Red-tailed Black Cockatoo (EPBC-V, BC-V)	Clearing of native vegetation comprising: <ul style="list-style-type: none"> • 37.8 ha of foraging habitat • 711 trees with a DBH ≥ 500 mm • three trees with a DBH ≥ 500 mm which contain a potentially suitable nesting hollow(s). None of these showed evidence of use by Black Cockatoos.

Environmental surveys conducted for the Proposal identified evidence of foraging by all three species of Black Cockatoo both within and adjacent to the area of the Proposal, and either Baudin's Cockatoo or Carnaby's Cockatoo were observed flying overhead during field surveys (Biota, 2020). All three species were identified as likely to occur within the area of the Proposal with suitable foraging habitat and potential breeding habitat (trees containing a suitably-sized hollow(s) for nesting) (Biota, 2020).

The environmental surveys also identified habitat quality and vegetation condition (Biota, 2020; BORR IPT, 2020b), which establish the baseline habitat health condition prior to implementation of the Proposal.

19.4 ha of vegetation remaining within the Proposal Area represents high quality foraging habitat, and a further 11.9 ha represents moderate quality foraging habitat (Biota, 2020).

Environmental surveys for the Proposal relevant to the identification of Black Cockatoo habitats and habitat condition are outlined in Table 4.

Table 5 Environmental surveys relevant to this AMP

TAXON	SURVEY / REPORT NAME	LOCATION / EXTENT IN SURVEY AREA	METHODOLOGY
Carnaby's Cockatoo (EPBC-E, BC-E) Baudin's Cockatoo (EPBC-E, BC-E) Forest Red-tailed Black Cockatoo (EPBC-V, BC-V)	<i>Bunbury Outer Ring Road Northern and Central Section Targeted Fauna Assessment (Biota, 2020)</i>	Targeted habitat survey encompassing the 624 ha Proposal Area and an additional 444 ha context area (total field survey area > 1,000 ha)	Targeted field surveys carried out between August - December 2019 to identify the presence of foraging, breeding and roosting habitats for Black Cockatoos
	<i>Bunbury Outer Ring Road Northern and Central Sections Vegetation and Flora Study (BORR IPT, 2020b)</i>	Flora and vegetation survey to identify vegetation types and vegetation condition for the Proposal	Field surveys in accordance with relevant State survey guidelines
	<i>Phytophthora Dieback Occurrence Survey (Great Southern Bio Logic, 2018)</i>	BORR Northern and Central Sections alignment	Visual diagnosis of disease supported by laboratory assessment of soil and tissue samples within areas of assessable remnant vegetation

5.4 Risk assessment

The DotE (2014) and DoEE (2019) identify a requirement for a risk assessment to assess the likelihood and consequence of each potential impact in order to ensure that risks are translated into controls, mitigation and management actions.

Main Roads applies a standard risk assessment matrix to its operations, whereby the 'likelihood' and 'consequence' of events is considered, with monitoring and management actions identified to control the level of risk.

Main Roads has completed a risk assessment in preparation of this AMP. The likelihood and consequence assessment, with the resulting 'risk outcome', have been based upon the residual risk levels after management and monitoring activities are implemented. The assessment has applied the definitions for both likelihood and consequence as prescribed within DoEE (2019).

The outcome of the risk assessment for the Proposal for Black Cockatoos is identified in Table 6.

Table 6 Risk assessment

Objective: To ensure that impacts to Black Cockatoos are avoided and minimised as far as practicable during the construction and operation of the Proposal.				
Key environmental values: Black Cockatoo individuals and foraging/breeding (nesting) habitat				
ENVIRONMENTAL OBJECTIVE	RISK	RISK ASSESSMENT	MANAGEMENT	MONITORING
Minimise impacts to Black Cockatoos	Injury or death of Black Cockatoos during Proposal implementation	Likelihood: Possible Consequence: Moderate Risk outcome: Medium	Nil risk of impact to mature individuals Management required during construction for risk of impact to nesting adults/young	Pre-construction monitoring of nest hollows required
Minimise the area of Black Cockatoo foraging habitat cleared during construction	Clearing of Black Cockatoo habitat outside of the approved clearing area	Likelihood: Unlikely Consequence: Moderate Risk outcome: Low	Standard construction management to control construction clearing (not specific to Black Cockatoo AMP)	Standard construction monitoring to verify construction clearing (not specific to Black Cockatoo AMP)
No significant indirect impacts to Black Cockatoo habitat adjacent to the Proposal attributable to Proposal implementation	Affect to breeding behaviour of Black Cockatoos in identified nest hollows adjacent to the Proposal	Likelihood: Possible Consequence: Moderate Risk outcome: Medium	Management not required (monitoring requirement only)	Construction and post-construction monitoring to identify breeding behaviour in identified nest hollows
	New infestations or spread of existing infestations of Weeds of National Significance (WoNS) in Black Cockatoo habitat adjacent to the Proposal	Likelihood: Possible Consequence: Moderate Risk outcome: Medium	Management to control construction clearing which may introduce or spread WoNS Management to undertake weed spraying / physical removal where infestations of WoNS are identified	Monitoring to verify construction clearing which may introduce or spread WoNS Monitoring to verify control of infestations of WoNS

Objective: To ensure that impacts to Black Cockatoos are avoided and minimised as far as practicable during the construction and operation of the Proposal.

Key environmental values: Black Cockatoo individuals and foraging/breeding (nesting) habitat

ENVIRONMENTAL OBJECTIVE	RISK	RISK ASSESSMENT	MANAGEMENT	MONITORING
	New infestations or spread of existing infestations of <i>Phytophthora</i> Dieback in Black Cockatoo habitat adjacent to the Proposal	Likelihood: Possible Consequence: Moderate Risk outcome: Medium	Management to control construction clearing which may introduce or spread <i>Phytophthora</i> Dieback	Monitoring to verify construction clearing which may introduce or spread <i>Phytophthora</i> Dieback
	Bushfires generated as a result of the Proposal construction	Likelihood: Possible Consequence: Moderate Risk outcome: Medium	Standard construction management to control potential ignition sources construction clearing (not specific to Black Cockatoo AMP)	Standard construction monitoring to verify management of potential ignition sources and fire response during construction clearing (not specific to Black Cockatoo AMP)
	Localised and/or unanticipated erosion impacting on Black Cockatoo habitat that require remediation	Likelihood: Possible Consequence: Minor Risk outcome: Low	Standard construction management to control construction clearing (not specific to Black Cockatoo AMP)	Standard construction monitoring to verify construction clearing (not specific to Black Cockatoo AMP)
	Groundwater drawdown impacts on, or changes in hydrology of, Black Cockatoo habitat	Likelihood: Unlikely Consequence: Moderate Risk outcome: Low	Standard construction management to control groundwater water abstraction consistent with WA Government water supply approvals (not specific to Black Cockatoo AMP)	Standard construction monitoring to verify groundwater water abstraction consistent with WA Government water supply approvals (not specific to Black Cockatoo AMP)

6 ENVIRONMENTAL MANAGEMENT MEASURES

In order to comply with relevant environmental legislation and manage impacts to the local environment, Main Roads has defined objectives, outcomes and management based provisions to ensure that impacts to Black Cockatoos are avoided and minimised as far as practicable during the implementation of the Proposal.

6.1 Environmental management activities, controls and performance targets

As identified in Table 4, direct impacts of the Proposal to Black Cockatoos result from the clearing of:

- 37.8 ha of foraging habitat
- 711 trees with a DBH \geq 500 mm
- three trees with a DBH \geq 500 mm which contain a potentially suitable nesting hollow(s).

Main Roads has taken a 'hierarchical approach' to the mitigation of potential impacts associated with the Proposal, and in the first instance, has sought to avoid areas of Black Cockatoo habitat through route selection and design refinement. Where impacts cannot be avoided, Main Roads has designed the Proposal to reduce the intensity and/or extent of impacts on Black Cockatoo individuals and habitat.

Main Roads has identified a range of management actions to be implemented to control and minimise direct and potential indirect impacts of the Proposal to Black Cockatoos and their habitat. These have been informed by the results of field studies (Table 5), best practice and recent experience on similar road projects in Western Australia. These will minimise potential residual impacts and achieve the identified management targets.

The following species Recovery Plans and referral guidelines have informed the development of this AMP:

- Department of Environment and Conservation (DEC) (2008). *Forest Black Cockatoo (Baudin's Cockatoo Calyptorhynchus baudinii and Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso) Recovery Plan*
- Department of Parks and Wildlife (DPaW) (2013). *Carnaby's Cockatoo (Calyptorhynchus latirostris) Recovery Plan*
- Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) (2012). *Referral guidelines for three species of Western Australian black cockatoos.*

Based on the controls identified above and these management actions Main Roads has developed performance targets to identify the outcomes sought from the management actions. These, along with the proposed management actions, are identified in Table 7.

Table 7 Management actions and performance targets

TIMING	MANAGEMENT ACTIONS	PERFORMANCE TARGETS
Prior to construction	<ul style="list-style-type: none"> • Habitat to be cleared within the area of the Proposal Area will be demarcated in the field to ensure clearing only occurs within the approved clearing area • The final design will avoid trees with suitable nest hollows where possible 	<ul style="list-style-type: none"> • Avoid direct impacts to Black Cockatoos • Avoid clearing outside the approved footprint

TIMING	MANAGEMENT ACTIONS	PERFORMANCE TARGETS
	<ul style="list-style-type: none"> Where any of the three trees with suitable nest hollows for Black Cockatoo will require clearing for the Proposal, the hollow will be visually inspected where safe and practicable. Where not in use the hollow will be 'blocked' to prevent breeding Where blocking of the nest hollows cannot be undertaken (e.g. timing, access), a pre-clearing fauna assessment will be undertaken by a suitably experienced person to determine if the hollows are being used by Black Cockatoos 	<ul style="list-style-type: none"> Reduce clearing of Black Cockatoo habitat to the extent practicable in final design Preclude potential breeding within the area of the Proposal prior to construction
<p>During construction</p>	<ul style="list-style-type: none"> A suitably experienced zoologist / environmental scientist will be on-site at all times during clearing of breeding habitat for Black Cockatoos and must maintain radio communication with machinery operators Where a suitable nest hollow within the area of the Proposal has been blocked prior to the Black Cockatoo breeding season, the tree may be felled as part of the standard vegetation clearing process Where a suitable nest hollow within the area of the Proposal has not been blocked and the pre-clearing fauna assessment has not identified Black Cockatoo occupation of the nest hollow, prior to clearing the tree, the tree will be 'bumped gently' with a machine with the machine operator and zoologist then to wait and observe the tree for a short time after. If no Black Cockatoo appears to be present then the tree may be pushed over slowly to minimise risk of injury to any undetected animal (if present) Where suitable nest hollow within the area of the Proposal has not been blocked and the pre-clearing fauna assessment identifies Black Cockatoo occupation of the nest hollow (which may include chicks (young)), the tree with the nest hollow will not be cleared until after the chick/s have left the nest. No vegetation within 10 m of the tree will be cleared until after the hollow is vacant Any Black Cockatoos observed within the Proposal Area showing signs of injury or illness will be promptly taken to an experienced wildlife veterinarian or approved wildlife rehabilitation facility 	<ul style="list-style-type: none"> Avoid direct impacts to Black Cockatoos Avoid clearing outside the approved footprint Avoid abandonment of breeding hollows within the Proposal Area

TIMING	MANAGEMENT ACTIONS	PERFORMANCE TARGETS
	<ul style="list-style-type: none"> A post-clearing survey shall be undertaken to ensure no injured Black Cockatoo individuals are present. 	
Post construction	Where space and access allows, revegetation and landscaping of cleared areas within the Proposal Area with suitable endemic native species will be undertaken to provide foraging habitat for Black Cockatoos (excluding 10 m buffer from nearest traffic lane).	Rehabilitation provides suitable foraging habitat within 10 years of completion.

6.1.1 SMART performance standards

The DoEE (2019) *Action Management Plan Criteria* identifies the application of ‘SMART’ (specific, measurable, achievable, relevant and time-bound) performance standards to be applied to AMPs, in addition to the management and monitoring actions identified within the DoE (2014) guideline.

SMART performance standards are intended to relate to measurable (numerical) values which can be applied to a Proposal (rather than qualitatively measured management/monitoring actions), and may include measurements such as ‘threshold criteria’, ‘performance indicators’, ‘corrective actions’ and ‘completion criteria’.

In relation to Black Cockatoos, Main Roads has prepared SMART performance standards directly related to the measurable impacts of the Proposal as identified in Table 4. These SMART performance standards complement the management actions and performance targets identified in Table 7, the monitoring actions identified in Table 9, and the corrective actions identified in Table 10.

The proposed SMART performance standards for the Proposal are identified in Table 8.

The ‘threshold criteria’ and ‘completion criteria’ are considered to be achievable, with the risk potential of not achieving the proposed SMART performance standards captured by the risk assessment presented in Table 6.

As the proposed SMART performance standards for ‘threshold criteria’ and ‘completion criteria’ relate to physical measures which can be readily controlled through standard construction management processes, it is considered the proposed SMART performance standards have a low level of uncertainty, with additional margins for safety not required.

The SMART performance standards do not require detailed statistical analysis to determine if the ‘threshold criteria’ and ‘completion criteria’ have been met, nor require statistical power to detect change (for example, seasonal or climatic variability), nor control or reference sites (for comparative purposes).

Table 8 SMART performance standards

THRESHOLD CRITERIA (REFER Table 4)	PERFORMANCE INDICATORS	CORRECTIVE ACTIONS (REFER Table 10)	COMPLETION CRITERIA (REFER Table 4)
Clearing of 37.8 ha of Black Cockatoo foraging habitat	Amount of Black Cockatoo foraging habitat cleared	Record environmental incident Investigate cause	Not more than 37.8 ha of Black Cockatoo foraging habitat cleared

THRESHOLD CRITERIA (REFER Table 4)	PERFORMANCE INDICATORS	CORRECTIVE ACTIONS (REFER Table 10)	COMPLETION CRITERIA (REFER Table 4)
		Update environmental training of personnel (if appropriate) Report incident to DAWE Undertake remediation works (if appropriate, following consultation with DAWE).	
Clearing of 3 trees with a DBH \geq 500 mm which contain a potentially suitable nesting hollow(s)	Number of trees with a DBH \geq 500 mm which contain a potentially suitable nesting hollow(s) cleared	Record environmental incident Investigate cause Update environmental training of personnel (if appropriate) Report incident to DAWE Undertake remediation works (if appropriate, following consultation with DAWE).	Not more than 3 large trees (DBH 500 mm) which contain a potentially suitable nesting hollow(s) cleared

6.2 Environmental maps and diagrams

- Appendix A contains figures showing the Proposal location and the locations of Black Cockatoo foraging/breeding habitats
- Figure 1 identifies the location of the Proposal
- Figure 2 identifies the modelled extent of Black Cockatoo foraging habitat within a 12 km radius of the Proposal
- Figure 3 and Figure 4 identify the modelled extent of Black Cockatoo foraging habitat within a 12 km radius of the Proposal overlain with the mapped extent of Black Cockatoo foraging habitat identified through environmental surveys (field survey) for the Proposal
- Figure 5 and Figure 6 identify the mapped locations of large trees (DBH 500 mm) identified through field surveys conducted for the Proposal. Large trees which contain a hollow potentially suitable for Black Cockatoo nesting are also identified.

6.3 Environmental monitoring

Main Roads has identified key monitoring actions to monitor the potential impacts of the Proposal to Black Cockatoo individuals and habitat during and post construction. These encompass monitoring of both direct and indirect impacts of the Proposal.

Monitoring will be undertaken by suitably qualified individuals for the methodology type specified. For example, the visual assessment of suitable nest hollows will be undertaken by a zoologist / environmental scientist.

The proposed monitoring program for the Proposal is identified in Table 9.

Table 9 Proposed monitoring program

TAXON	PERFORMANCE TARGET(S)	PARAMETER TO BE MONITORED	METHODOLOGY	FREQUENCY	RECORDING AND REPORTING
Carnaby's Cockatoo <i>C. latirostris</i> (EPBC-E, BC-E) Baudin's Cockatoo <i>C. baudinii</i> (EPBC-E, BC-E)	Avoid direct impacts to Black Cockatoos	Injury or death of Black Cockatoos	Pre-clearing assessment Visual inspection	Pre-clearing During construction: Post each clearing event and opportunistically Post construction: Not applicable	Injury or death of Black Cockatoos recorded by construction contractor and reported to Manager Environment within 24 hours of incident occurring Report annually to DAWE as part of annual compliance reporting
	Reduce clearing of Black Cockatoo habitat to the extent practicable in final design Avoid clearing outside the approved footprint	Clearing area (ha) of Black Cockatoo foraging habitat Number of trees with a DBH \geq 500 mm containing a potentially suitable nesting hollow(s) cleared	Field survey of cleared areas with comparison to approved clearing area and mapped Black Cockatoo habitat areas Field survey of cleared areas with comparison to approved clearing area and known Black Cockatoo nest hollow locations	During construction: Quarterly Post construction: Not applicable During construction: Quarterly Post construction: Not applicable	Area of Black Cockatoo habitat cleared recorded by construction contractor and reported to Manager Environment monthly Report annually to DAWE as part of annual compliance reporting Number of suitable DBH trees cleared recorded by construction contractor and reported to Manager Environment monthly Report annually to DAWE as part of annual compliance reporting
	Preclude potential breeding within Proposal Area prior to construction	Black Cockatoo access to potentially suitable nesting hollow(s)	Visual inspection	Pre-clearing	Number of potentially suitable nesting hollow(s) blocked prior to construction recorded by construction contractor and reported to Manager Environment monthly

TAXON	PERFORMANCE TARGET(S)	PARAMETER TO BE MONITORED	METHODOLOGY	FREQUENCY	RECORDING AND REPORTING
	Rehabilitation provides suitable foraging habitat within 10 years of completion	Presence/absence and quality of foraging habitat available in rehabilitated areas	Field survey by suitably experienced personnel	Post construction: Bi-annually	Post construction: bi-annually once rehabilitation works are completed

6.4 Corrective actions

Consistent with the DotE (2014) guideline, triggers and corrective actions have been considered in the event that monitoring/observation identifies that the management actions have not achieved the environmental objectives.

The purpose of the corrective actions is to provide an appropriate remedy to the environmental objectives not being met, and may include changes to equipment, processes and/or management measures. The degree to which the corrective actions will be implemented may depend upon various factors, such as the type and severity of the trigger, the location and condition of the surrounding environment, and the specific location/nature of the works being undertaken for the Proposal.

Changes to processes and/or management may require this AMP to be updated, with additional environmental training to be provided to site personnel.

Corrective actions may incorporate the identification, investigation and reporting of an environmental incident. Environmental incidents are to be reported to the Manager Environment (or delegate) by the person responsible for the incident or the first person to observe the incident. The type and severity of an environmental incident will be assessed in accordance with Main Roads' standard incident procedures. In the event that an environmental incident has resulted in a significant environmental impact to Black Cockatoo individuals or habitat, the environmental incident will be reported to DAWE (as identified within Section 4.1).

The proposed corrective actions for the Proposal are identified in Table 10.

Table 10 Corrective actions

ASPECT	TRIGGER	CORRECTIVE ACTION
Black Cockatoo breeding habitat (nesting)	Injured Black Cockatoo individual within area of Proposal with injury suspected to be a consequence of construction activity	<p>Stop works (temporary) within 50 m of the injured individual.</p> <p>Engage a suitably experienced fauna handling specialist to remove individuals and transport the individual to a native fauna care facility</p> <p>Record environmental incident</p>
	Live individual identified within hollow of a felled tree (despite pre-clearing fauna survey of hollows)	<p>Stop works (temporary) within 50 m of the injured individual.</p> <p>Engage a suitably experienced fauna handling specialist to remove individuals and transport the individual to a native fauna care facility</p> <p>Record environmental incident</p> <p>Modify pre-clearing fauna survey methodology (if appropriate)</p>
Black Cockatoo foraging/breeding habitat quality	Clearing of Black Cockatoo foraging/breeding habitat beyond area of the Proposal	<p>Stop works (temporary)</p> <p>Record environmental incident</p> <p>Investigate cause</p> <p>Update environmental training of personnel (if appropriate)</p>

ASPECT	TRIGGER	CORRECTIVE ACTION
		Report incident to DAWE Undertake remediation works (if appropriate, following consultation with DAWE)
	Failure of rehabilitation	Investigate cause Refine species lists and rehabilitation methodologies (if appropriate) Update environmental training of personnel (if appropriate) Schedule repeat of rehabilitation works or supplementary infill planting in failed areas

7 AUDIT AND REVIEW

This AMP adopts an ‘adaptive management’ approach which seeks to embed a cycle of monitoring, reporting and implementing change, where required. Accordingly, it is intended that this AMP may be updated (as required) over the life of the Proposal to reflect changes in the monitoring and management practices, subject to the results of the monitoring to identify that the environmental objectives are being achieved. The AMP may also be revised to address learnings from the implementation of corrective actions, should this occur.

In addition, auditing and review schedules are necessary to embed a formal process to identify and consider any need to update the AMP in order to achieve improved environmental performance (which may not otherwise be triggered by management or monitoring outcomes).

7.1 Environmental auditing

This AMP will be audited annually by Main Roads during construction for the Proposal to ensure the implementation of the management and monitoring measures, and to confirm the management measures specified are achieving the environmental outcomes.

The proposed auditing schedule for this AMP is identified in Table 11.

Table 11 Environmental audit schedule

TIMING	ACTION	SCHEDULE
Pre-construction	Review of construction procedures to ensure AMP management / monitoring actions are incorporated within works procedures	Prior to construction (single event)
Construction	Inspections by site environmental personnel to identify compliance with AMP	Periodic (generally weekly)
	Independent ‘third-party’ audit for assessment of compliance with AMP	Annually (once per calendar year)

TIMING	ACTION	SCHEDULE
Post construction	Independent 'third-party' audit for assessment of compliance with AMP	Annually (once per calendar year for up to 3 years)

The results of the construction and post construction independent 'third-party' audit findings will be reported by Main Roads to DAWE as part of annual compliance reporting as outlined within Section 2.3.

7.2 Environmental review

Main Roads proposes to review this AMP annually in order to consider:

- the management and monitoring actions
- opportunities for an improvement in environmental performance (for example, changes to construction methodology or timing)
- identify a need to update this AMP to capture changes to the management and/or monitoring actions
- identify any general need to update this AMP (for example, to capture new information on Black Cockatoos knowledge or management).

Main Roads acknowledge that a revision to this AMP may trigger a need for additional approval by DAWE prior to implementing any changes to the specified management or monitoring actions.

The proposed AMP review schedule for the Proposal is identified in Table 12.

Table 12 AMP review schedule

TIMING	ACTION	SCHEDULE
Pre-construction, Construction and Post construction	Review of AMP management and monitoring actions Review of opportunities for an improvement in environmental performance Revise AMP (if appropriate) and seek approval of DAWE for revised AMP	Annually (once per calendar year)

7.3 Data management

Main Roads will maintain records on the implementation of this AMP in accordance with Main Roads' corporate standard document control procedures.

The retention of records held by Main Roads will be maintained and managed in accordance with the Western Australian *State Records Act 2000* (WA).

8 STAKEHOLDER CONSULTATION

8.1 Stakeholder consultation

Main Roads has consulted with a range of stakeholders on the Proposal. These consultations have assisted to inform the development of this AMP.

A list summary of the stakeholders consulted on the Proposal (for which the environmental impact and management of Black Cockatoos were discussed) is identified in Table 13.

Table 13 Stakeholder consultation

TYPE	STAKEHOLDER	CONSULTATION ISSUES
Community	BORR Northern & Central Community Reference Group	<ul style="list-style-type: none"> • Proposal design to minimise impact to Black Cockatoo foraging/breeding habitat • Residual direct and potential indirect impacts to Black Cockatoo foraging/breeding habitat • Management and monitoring of Black Cockatoos • Environmental assessment processes relevant to Black Cockatoos
Government	<ul style="list-style-type: none"> • Commonwealth Department of Agriculture, Water and Environment • State Department of Water and Environment Regulation (EPA Services) • State Department of Biodiversity, Conservation and Attractions 	<ul style="list-style-type: none"> • Proposal design to minimise impact to Black Cockatoo foraging/breeding habitat • Residual direct and potential indirect impacts to Black Cockatoo foraging/breeding habitat • Preparation/implementation of an AMP for the management and monitoring of impacts to Black Cockatoos

8.2 External communications/concerns

Main Roads and /or its Contractors will maintain a register of communications (including any public concerns/complaints) for the Proposal. Records to be obtained for external communications will include:

- Contact details for the person making the complaint (name, address and phone number as a minimum)
- Date, time and relevant location (if specific to part of the Proposal)
- Details of the communication (with sufficient detail to enable investigation/response, if appropriate)

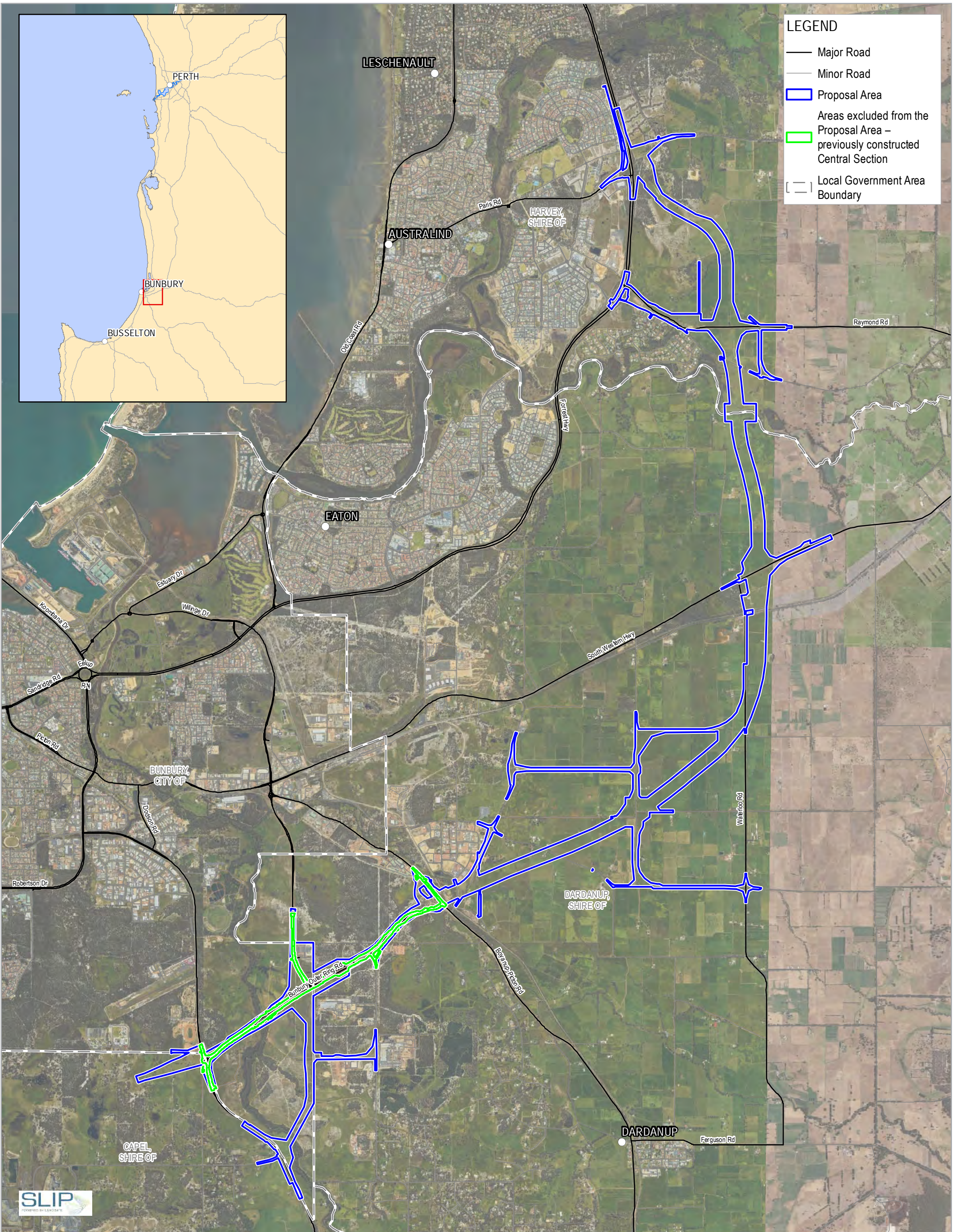
The retention of records held by Main Roads (including external communications) will be maintained and managed in accordance with the Western Australian *State Records Act 2000* (WA).

9 REFERENCES

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Appendix A FIGURES

- Figure 1 Proposal Area
- Figure 2 Black Cockatoo Foraging Habitat – Regional, 12 km Radius
- Figure 3 Black Cockatoo Foraging Habitat – Survey Area
- Figure 4 Black Cockatoo Foraging Habitat – Survey Area (sectional maps)
- Figure 5 Black Cockatoo Large Trees (DBH \geq 500 mm) with Nest Hollows – Survey Area
- Figure 6 Black Cockatoo Large Trees (DBH \geq 500 mm) with Nest Hollows – Survey Area (sectional maps)



LEGEND

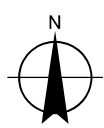
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- Minor Road
- ▭ Proposal Area
- ▭ Areas excluded from the Proposal Area – previously constructed Central Section
- - - Local Government Area Boundary



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Kilometres

Map Projection: Transverse Mercator
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Grid: GDA 1994 Perth Coastal Grid 1994



Main Roads Western Australia
Bunbury Outer Ring Road Northern and Central Section
Response to EPA Notice of Decision to Assess:
Additional Information Request

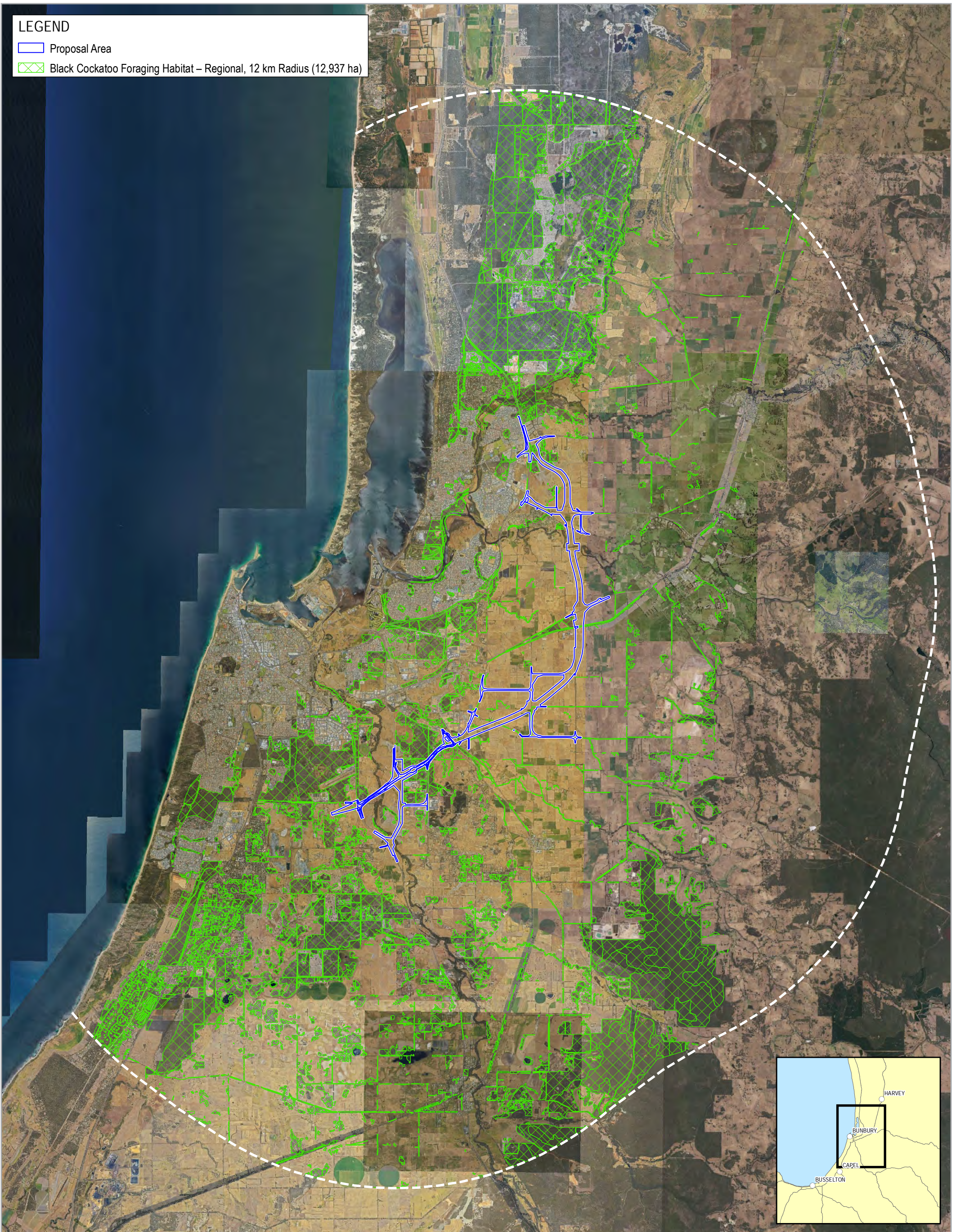
Project No. 61-37041
Revision No. 0
Date 29/01/2020

Proposal Area

FIGURE 1

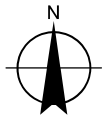
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- Proposal Area
- Black Cockatoo Foraging Habitat – Regional, 12 km Radius (12,937 ha)



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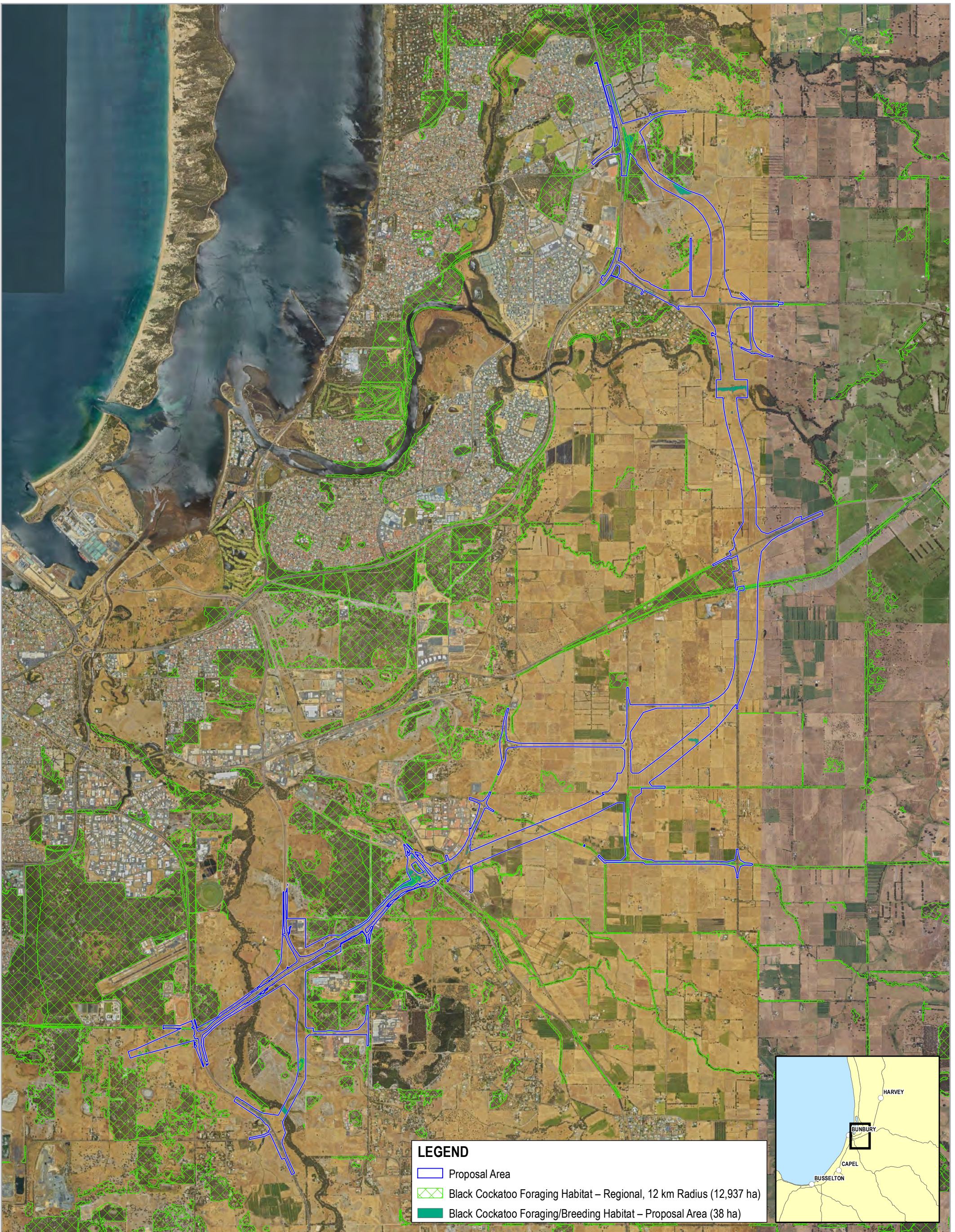
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Main Roads Western Australia
 Bunbury Outer Ring Road North-Central Section

**Black Cockatoo Foraging Habitat,
 Nesting Sites and Roosting Sites**

Project No. 61-37041
 Revision No. 0
 Date 24/03/2020



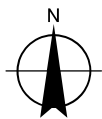
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- Proposal Area
- Black Cockatoo Foraging Habitat – Regional, 12 km Radius (12,937 ha)
- Black Cockatoo Foraging/Breeding Habitat – Proposal Area (38 ha)



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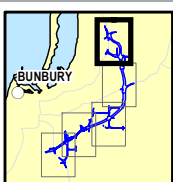
Main Roads Western Australia
 Bunbury Outer Ring Road Northern Section

Black Cockatoos - Carnaby's Cockatoo *Calyptorhynchus latirostris*(EPBC E, BC E), Baudin's Cockatoo *Calyptorhynchus baudinii*(EPBC E, BC E), Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*(EPBC V, BC V)

Project No. 61-37041
 Revision No. 0
 Date 24/03/2020

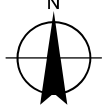
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-  Proposal Area
-  Black Cockatoo Foraging Habitat – Regional, 12 km Radius (12,937 ha)
-  Black Cockatoo Foraging/Breeding Habitat – Proposal Area (38 ha)



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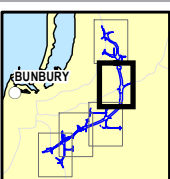
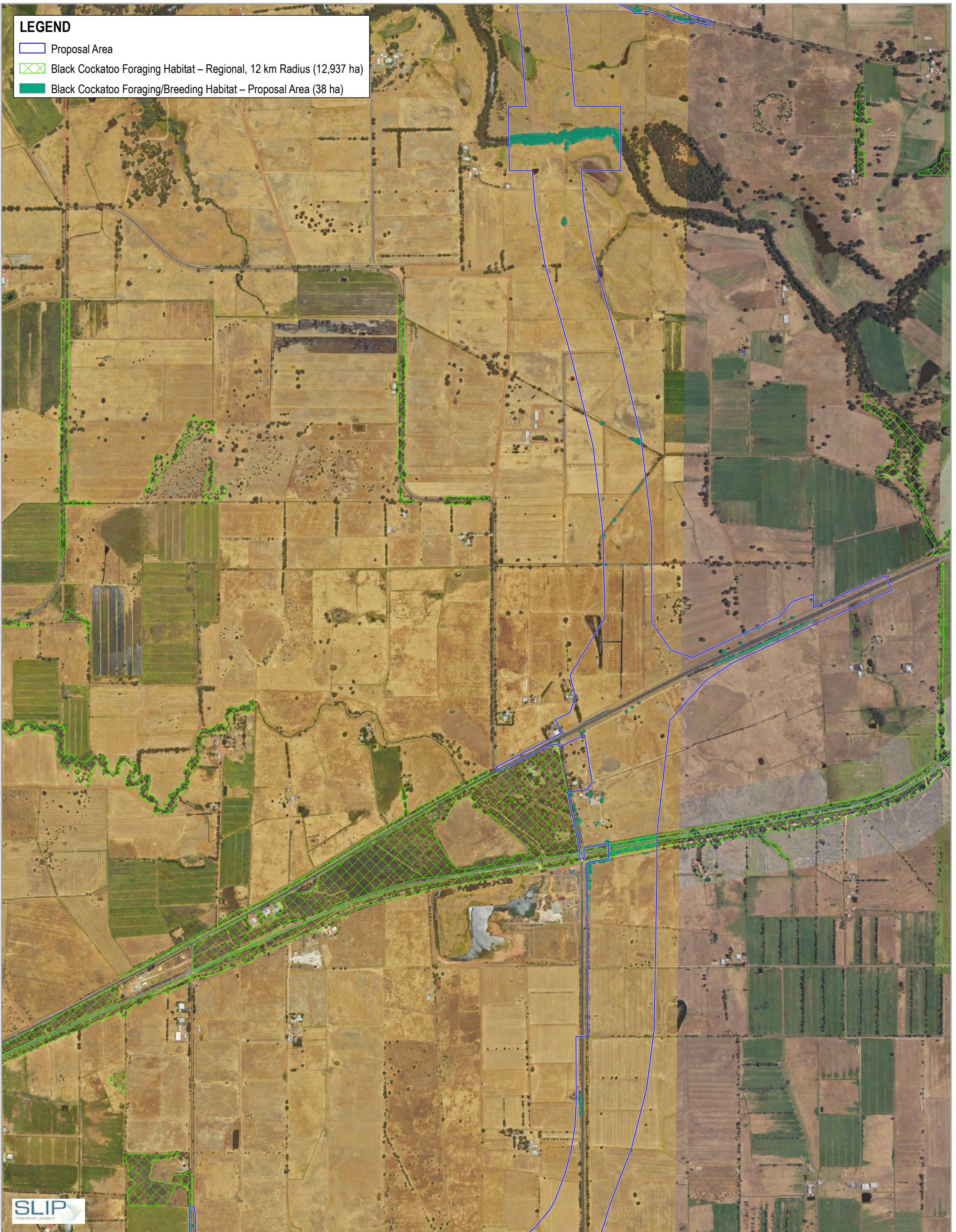
Main Roads Western Australia
Bunbury Outer Ring Road North-Central Section

Black Cockatoos - Carnaby's Cockatoo *Calyptorhynchus latirostris*(EPBC E, BC E), Baudin's Cockatoo *Calyptorhynchus baudinii*(EPBC E, BC E), Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso*(EPBC V, BC V)

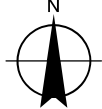
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 Revision No. 0
 Date 25/03/2020

LEGEND

- Proposal Area
- Black Cockatoo Foraging Habitat – Regional, 12 km Radius (12,937 ha)
- Black Cockatoo Foraging/Breeding Habitat – Proposal Area (38 ha)



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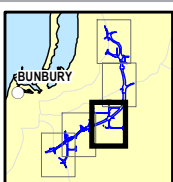
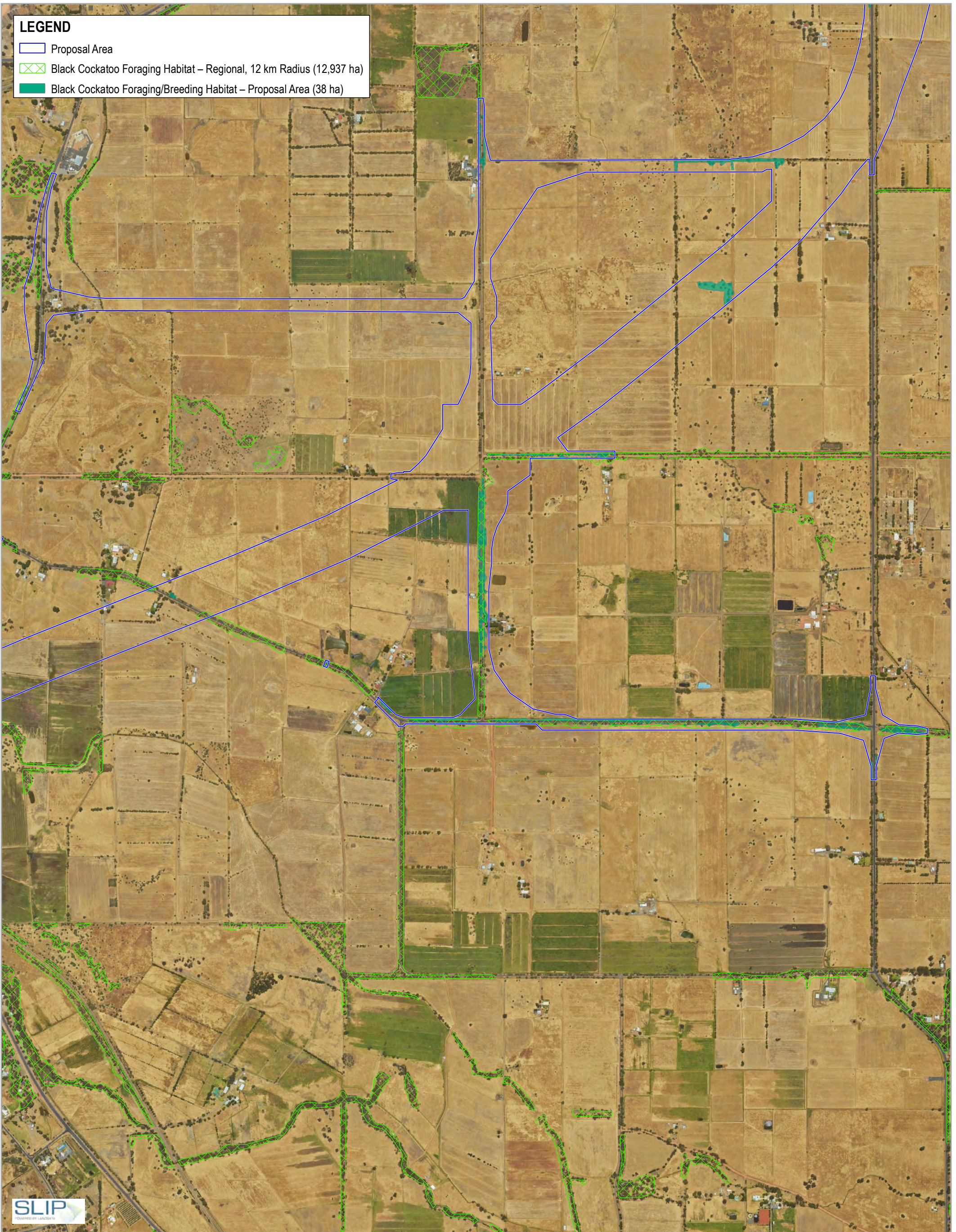
Main Roads Western Australia
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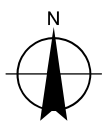
Black Cockatoos - Carnaby's Cockatoo *Calyptorhynchus latirostris* (EPBC E, BC E), Baudin's Cockatoo *Calyptorhynchus baudinii* (EPBC E, BC E), Forest Red-tailed Black Cockatoo *Calyptorhynchus banksii naso* (EPBC V, BC V)

LEGEND

- Proposal Area
- Black Cockatoo Foraging Habitat – Regional, 12 km Radius (12,937 ha)
- Black Cockatoo Foraging/Breeding Habitat – Proposal Area (38 ha)



Paper Size ISO A3
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 Metres
 Map Projection: Transverse Mercator
 Horizontal Datum: GDA 1994
 Grid: GDA 1994 Perth Coastal Grid 1994



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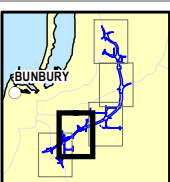
Main Roads Western Australia
Bunbury Outer Ring Road North-Central Section

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Project No. 61-37041
 Revision No. 0
 Date 25/03/2020

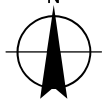
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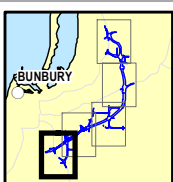
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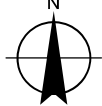
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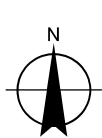
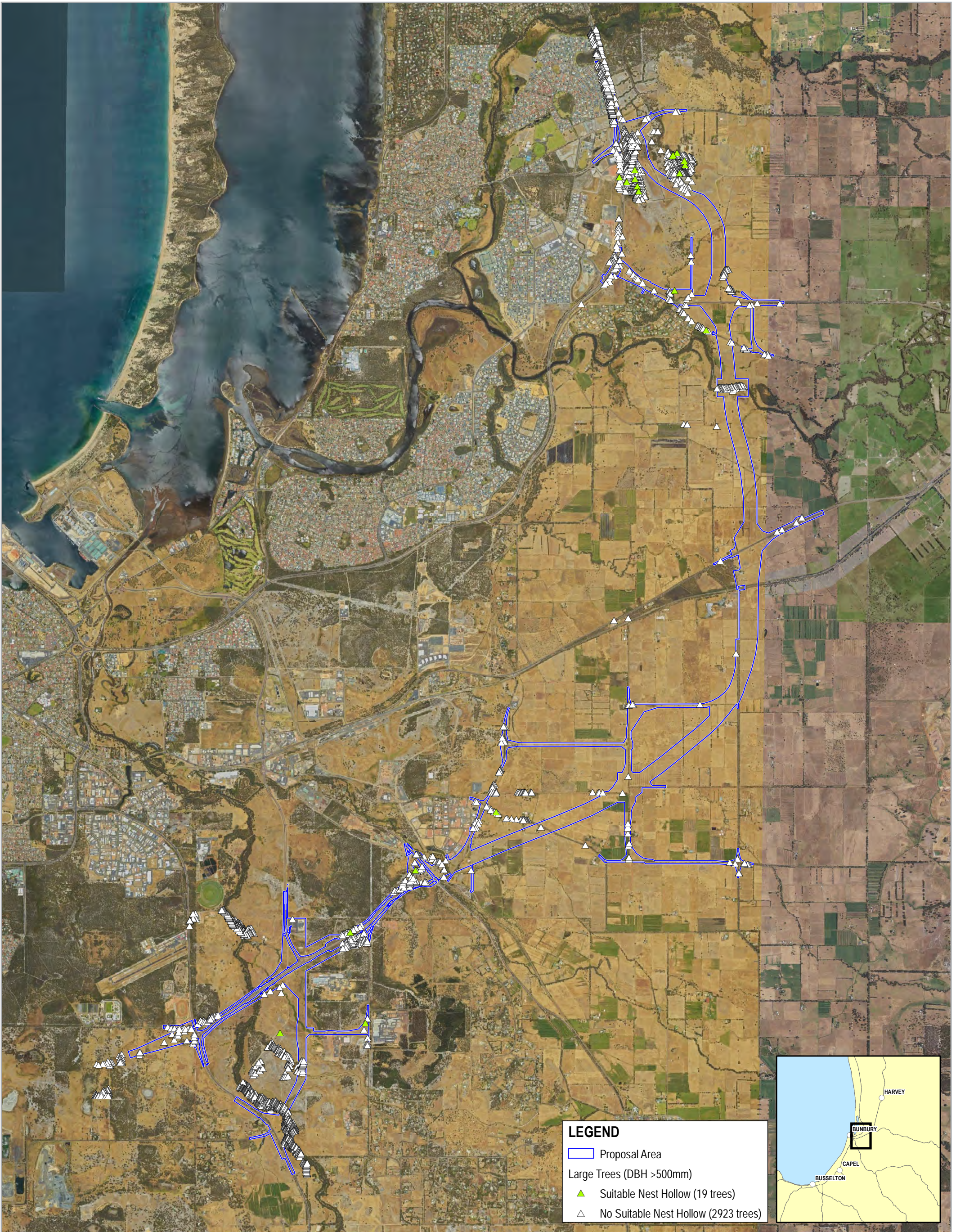
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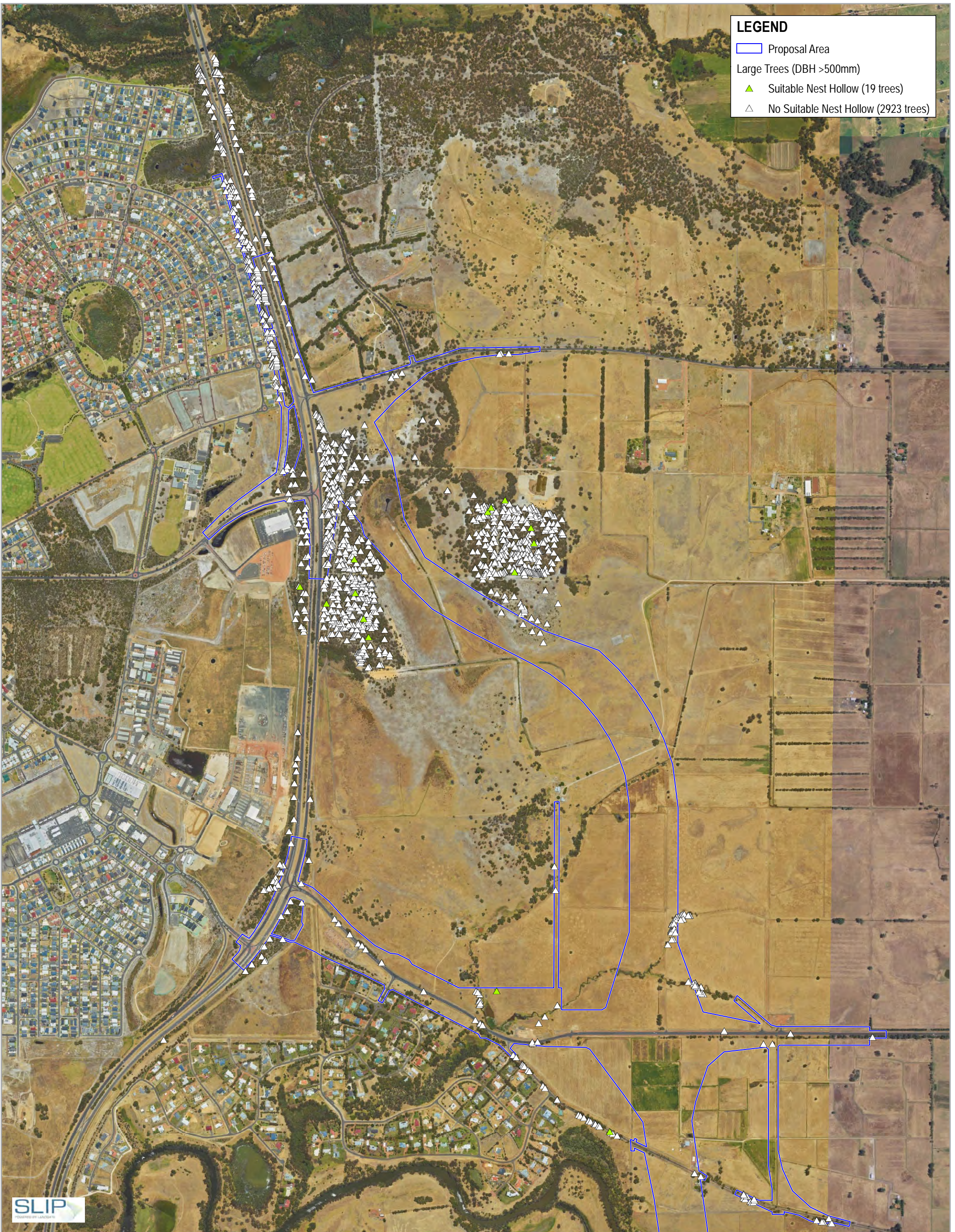


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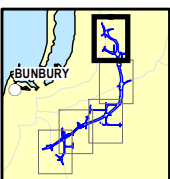
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 Revision No. 0
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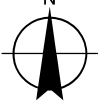
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- Proposal Area
- Large Trees (DBH >500mm)
- ▲ Suitable Nest Hollow (19 trees)
- ▲ No Suitable Nest Hollow (2923 trees)



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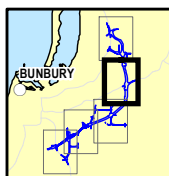
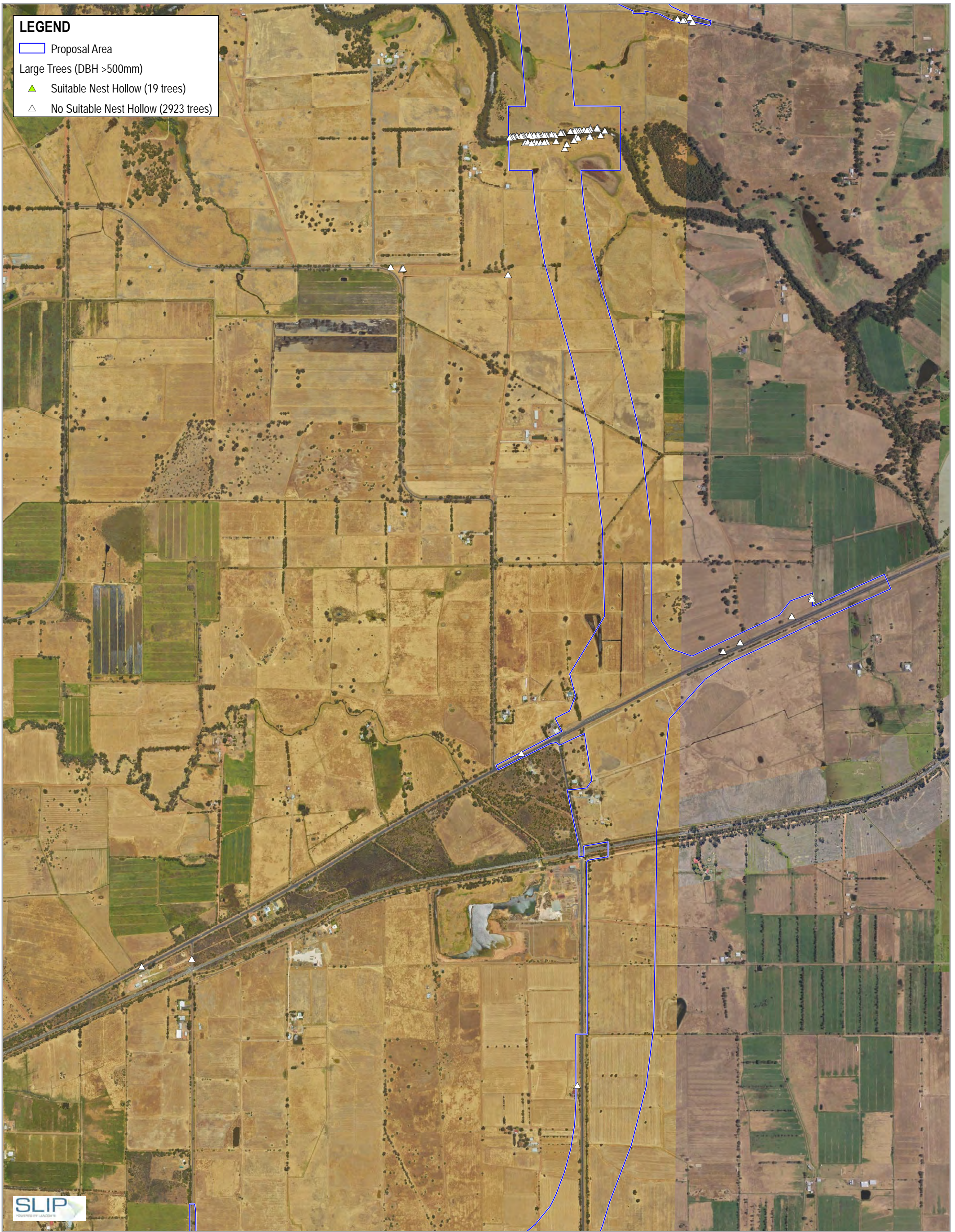
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Project No. **61-37041**
 Revision No. **0**
 Date **30/03/2020**

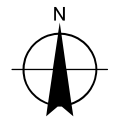
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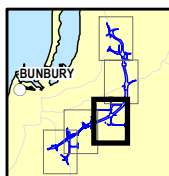
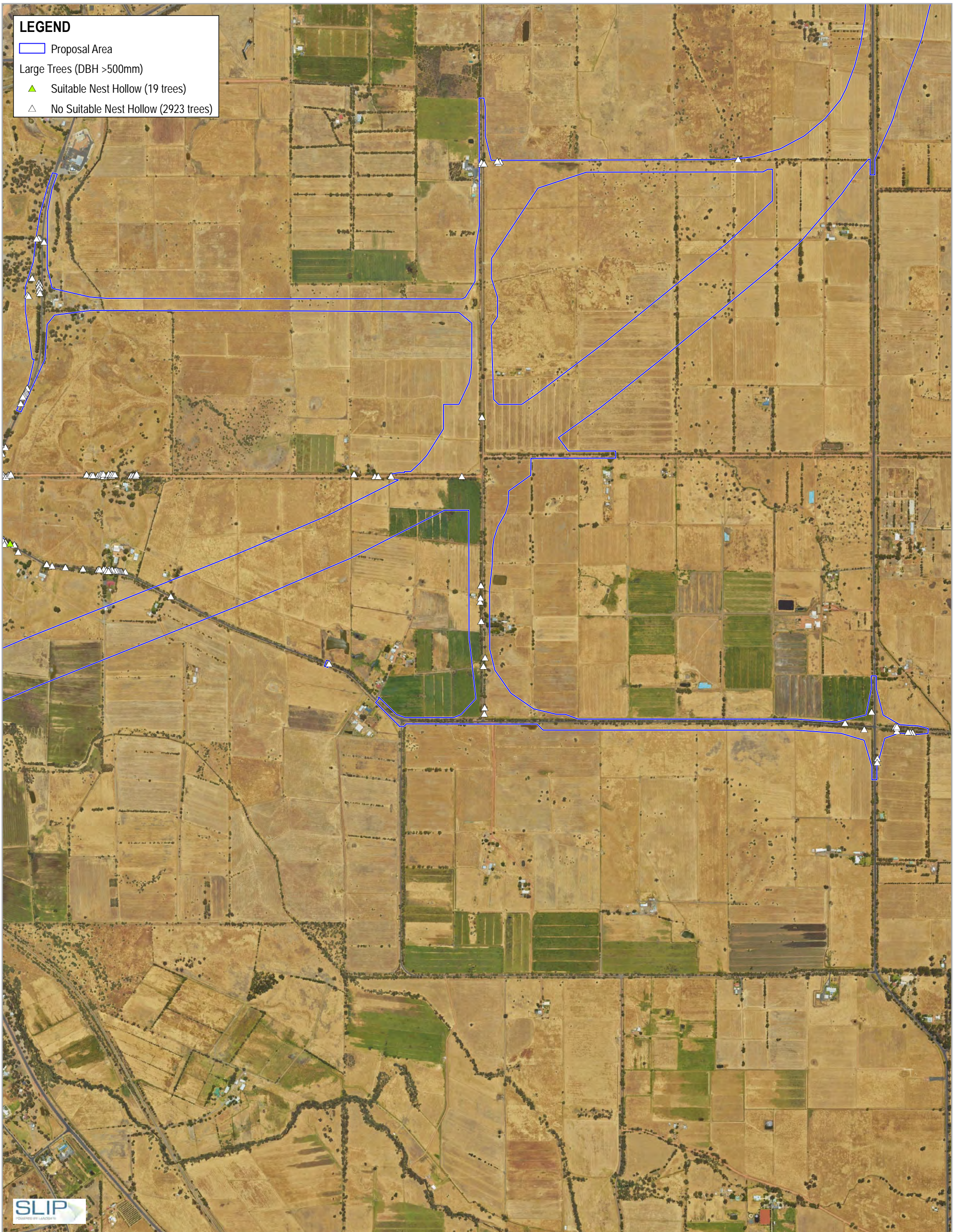
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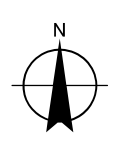
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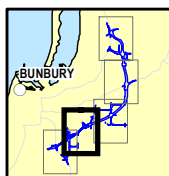
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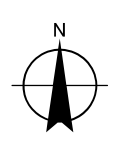
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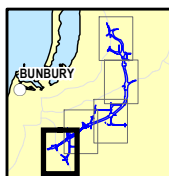
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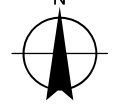
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