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CONSTRUCTION BIODIVERSITY MANAGEMENT PLAN

Albury to Illabo | A2I (Stage A)

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GLOSSARY

Term	Definition
A2I	Albury to Illabo section of the Inland Rail project
ARTC	Australian Rail Track Corporation
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016* (NSW)
BCS	Biodiversity, Conservation and Science Directorate of DCCEEW
BDAR	Biodiversity Development Assessment Report
CAMBA	China–Australia Migratory Bird Agreement
CBMP	Construction Biodiversity Management Plan (this Plan) – Stage A
CCS	Community Communications Strategy
CEMF	Construction Environmental Management Framework
CEMP	Construction Environmental Management Plan – Stage A
CCHMP	Construction Heritage Management Plan – Stage A
CMS	Complaints Management System
CoA	Conditions of Approval
Construction	Includes work required to construct the CSSI as defined in the Project Description described in the documents listed in Condition A1 including commissioning trials of equipment and temporary use of any part of the CSSI but excluding Low Impact Work which is carried out or completed prior to approval of the CEMP.
CPESC	Certified Professional in Erosion and Sediment Control
CSSI	Critical State Significant Infrastructure
CSWMP	Construction Soil and Water Management Plan – Stage A
CWMS	Construction Work Method Statement
CWCHMMP	Construction Waste, Contamination and Hazardous Materials Management Plan – Stage A
DAWE	Department of Agriculture, Water and Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DCCEEW (Cth)	Commonwealth Department of Climate Change, Energy, the Environment and Water
DEC	Department of Environment and Conservation
DIPNR	Department of Infrastructure, Planning and Natural Resources
DPE	NSW Department of Planning and Environment
DPHI	Department of Planning, Housing and Infrastructure

Term	Definition
DPI	Department of Primary Industries
DPIE	Department of Planning, Industry and Environment
EAD	Environmental Assessment Documentation that includes: Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022); Albury to Illabo Response to Submissions (ARTC, November 2023); Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023); Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024); Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024); Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024); Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024).
EHG	Environment and Heritage Group
EIS	Environmental Impact Statement
EMS	Environmental Management System
Environmental Representative (ER)	The Environmental Representative(s) for the CSSI approved by the Planning Secretary
EPA	Environmental Protection Authority (NSW)
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (Federal)
EPL	Environmental Protection License
ESCP	Erosion and Sediment Control Plan
EWMS	Environmental Work Method Statement
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
ISC	The Infrastructure Sustainability Council
JAMBA	Japan Australia Migratory Bird Agreement
KFH	Key Fish Habitat
km	Kilometre
LGA	Local Government Area
Local road	Any road that is not defined as a classified road under the Roads Act 1993
m	metre
MNES	Matters of National Environmental Significance
MR	Martinus Rail
MR ESM	Martinus Rail Environment, Approvals and Sustainability Manager
NPWS	National Parks and Wildlife Service

Term	Definition
NSW	New South Wales
OEH	Office of Environment and Heritage
PCT	Plant Community Type
PDCA	Plan-Do-Check-Act
PIR	Preferred Infrastructure Report
Planning Secretary	Secretary of the NSW Department of Infrastructure, Housing and Infrastructure, or delegate
PMST	Protected Matters Search Tool
Primary CoA/UMM	CoA and/or UMMs that are specific to the development of this Plan
Project, the	Albury to Illabo section of the Inland Rail project
RoKAMBA	Republic of Korea–Australia Migratory Bird Agreement
RtS	Response to Submissions
SAP	Sensitive Area Plans
SAII	Serious and Irreversible Impact
SEM	Site Environmental Maps
SEMP	Site Establishment Management Plan
SMART	Specific, measurable, achievable, relevant and time-based
SSI	State Significant Infrastructure
SuMP	Sustainability Management Plan
TEC	Threatened Ecological Community
TfNSW	Transport for New South Wales (formerly Roads and Maritime Services)
UMM	Updated Mitigation Measures (PIR RtS)
WoNS	Weeds of National Significance

1 INTRODUCTION

1.1 Project overview

Inland Rail is an approximate 1,600 kilometres (km) freight rail network that will connect Melbourne and Brisbane via regional Victoria, New South Wales (NSW) and Queensland. The Inland Rail route would involve using approximately 1,000 km of existing track (with enhancements and upgrades where necessary) and 600 km of new track, passing through 30 local government areas (LGAs). Inland Rail will accommodate double-stacked freight trains up to 1,800 metres (m) long and 6.5 m high.

The Australian Government has confirmed that Inland Rail is an important project to meet Australia's growing freight task, improve road safety and help decarbonise the economy. Inland Rail will enhance our national freight and supply chain capabilities, connecting existing freight routes through rail, roads and ports, and supporting Australia's growth. Inland Rail is being delivered by Australian Rail Track Corporation (ARTC) and Inland Rail Pty Ltd (IRPL).

Comprising 12 sections, a staged approach is being undertaken to deliver Inland Rail. Each of these projects can be delivered and operated independently with tie-in points to the existing railway. Work south of Parkes has been prioritised, which will enable Inland Rail to initially connect to existing rail networks between Melbourne, Sydney, Perth and Adelaide via Parkes and Narromine. The Parkes to Narromine and Narrabri to North Star Phase 1 sections are complete.

The Inland Rail program will enable enhancement works to structures and sections of track along 185 km of the existing operational standard-gauge railway in the Albury to Illabo (A2I) section (the project). Enhancement works are required to provide the increased vertical and horizontal clearances required for double-stacked freight trains. Works would include track realignment, lowering and/or modification within the existing rail corridor, modification, removal or replacement of bridge structures (rail, road and/or pedestrian bridges), raising or replacing signal gantries, level-crossing modifications and other associated works.

A detailed Project description is provided in Section 4 of the Construction Environmental Management Plan (CEMP).

1.2 Planning context

The Inland Rail – Albury to Illabo Project (the Project) is declared State significant infrastructure (SSI) and critical State significant infrastructure (CSSI) under Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act). The Project is permissible without development consent and is subject to assessment and approval by the NSW Minister for Planning and Public Spaces.

An environmental impact statement (EIS) was prepared to support ARTC's application for approval of the Project in accordance with the requirements of the EP&A Act and the environmental assessment requirements of the Secretary of the (then) NSW Department of Planning, Industry and Environment (the SEARs) (now the Department of Planning, Housing and Infrastructure (DPHI)).

The EIS was placed on public exhibition from 17 August 2022 to 28 September 2022. During the exhibition period, interested stakeholders and members of the community were able to review the EIS online, participate in consultation and engagement activities held by ARTC, and make a written submission to the DPE for consideration in its assessment of the Project.

In accordance with section 5.17 (6) (b) of the EP&A Act, on 13 April 2023 the Planning Secretary directed ARTC to submit a Preferred Infrastructure Report (PIR) that provides a further assessment of traffic and transport, noise and vibration, and air quality impacts. The PIR was also prepared to consider changes to the exhibited Project that have arisen as a consequence of these further assessments and related submissions.

1.3 Statutory context and approval

The Inland Rail – Albury to Illabo project (the project) was assessed as part of the following documents:

- Inland Rail – Albury to Illabo Environmental Impact Statement (ARTC, August 2022);
- Albury to Illabo Response to Submissions (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report (ARTC, November 2023);
- Albury to Illabo Preferred Infrastructure Report Response to Submissions (ARTC, February 2024);
- Inland Rail – Albury to Illabo (SSI-10055) Response to request for additional information – Air Quality Assessment (letter dated 1 May 2024);
- Part 1 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024);
- Part 2 - Revised Technical Paper 8: Biodiversity Development Assessment Report (WSP, February 2024).

Together these documents are referred to as the Environmental Assessment Documentation (EAD).

Approval for the project under the EP&A Act was granted by the Minister for Planning on 8 October 2024.

1.4 Scope of this Plan

The scope of this Construction Biodiversity Management Plan (this Plan or this CBMP) is to describe how potential biodiversity impacts will be managed during Stage A construction of the project.

This Plan addresses the requirements of the EAD that related to the Stage A activities including incorporating the relevant updated mitigation measures (UMMs), and Conditions of Approval (CoAs). SMART (Specific, Measurable, Achievable, Realistic and Timely) principles, as required by CoA C7(d), have been considered and applied during the preparation of this Plan which will be implemented for the duration of construction.

All Martinus Rail staff and sub-contractors are required to comply with and operate fully under the requirements of this Plan and related environmental management plans, over the full duration of the construction program.

1.4.1 Staging

The Staging Report describes how the construction and operation of the project will be staged in accordance with CoA A9, A10 and A11. A staged approach has been primarily adopted for the project to prioritise critical activities that are reliant upon infrequent and fixed rail possessions. It overall de-risks the construction program for the project, ensuring that the project is operational within the timeframe committed to by the NSW Government.

As required by CoA A14 and C16, a Construction Environmental Management Framework (CEMF) has been prepared to be consistent with the Staging Report. The CEMF has been prepared to facilitate the preparation and approval of CEMPs, Sub-plans, and construction monitoring plans (CMPs) during the construction phase of the project. It includes a guide to the general environmental, stakeholder and community management requirements which will be implemented during construction and provides a road map for environmental management documentation.

In accordance with CoA C16, the CEMF must be endorsed by the Environmental Representative (ER) and then submitted to the Planning Secretary (for approval) no later than one (1) month before the lodgement of any CEMP, CEMP Sub-plan, or Construction Monitoring Program (CMP).

This Plan has been prepared to be consistent with the Staging Report and the CEMF, as required by CoA A11 and A12, as well as C16. This Plan has therefore been prepared to address how Martinus Rail will manage potential biodiversity impacts during construction of the first stage of the project – Stage A.

Stage A, as described in Section 2.1.2 of the Staging Report will comprise preparation activities for the March 2025 rail possession (Substage A1), the rail possession activities themselves (Substage A2), and post-possession activities (Substage A3). No construction works will occur at the follow enhancement sites as part of Stage A:

- Murray River Bridge;
- Albury Station pedestrian bridge;
- Albury Yard clearances;
- Riverina Highway bridge;
- Billy Hughes bridge;
- Culcairn pedestrian bridge;
- Culcairn Yard clearances;
- Uranquinty Yard clearances;
- Pearson Street bridge (with exception of short-term utility works);
- Cassidy Parade pedestrian bridge (with exception of short-term utility works);
- Edmondson Street bridge (with exception of short-term utility works);
- Wagga Wagga Station pedestrian bridge;
- Wagga Wagga Yard clearances;
- Bomen Yard clearances;
- Kemp Street bridge;
- Junee pedestrian bridge.

This plan applies to the entirety of Stage A.

Based on the approved CEMF approach, this Plan will be approved by the Planning Secretary.

Construction work during Stage A will generally include:

- Utility works, including drainage;
- Site establishment and operation;
- Traffic management and access, including material haulage;
- Minor clearing, grubbing and topsoil strip;
- Earthworks including preparation of pads and stockpiling;
- Track work including realignment and lowering;
- Gantry and signalling work.

1.5 Interactions with other management plans and strategies

This Plan has the following interrelationships with other management plans and documents:

- Albury to Parkes (A2I) Construction Environmental Management Framework (CEMF) (A2P CEMF) (0-0000-900-EEC-00-SP-0002_2);
- Sensitive Area Plans (SAPs) detailed in Appendix A8 of the CEMP which highlight sensitive environmental areas to be managed during construction, including mapped native vegetation adjacent to the project alignment and highlight 'no-go zones' where vegetation is to be retained on site;
- The Stage A Construction Waste and Resources Management Plan (CWRMP) provides a framework for waste management including the disposal of weeds; and
- Community Communication Strategy (CCS) which details procedures and processes for community notification, consultation and complaints management.
- The Sustainability Management Plan (SuMP) which outlines the required sustainability goals and deliverables of the project, and how the Contractor intends to achieve these outputs during design, delivery and operation of the project under the Infrastructure Sustainability Council (ISC) rating system.

A Biodiversity Assessment Method (BAM) Biodiversity Credit Report has been prepared and will be implemented by IRPL in accordance with CoA E21, E23 and E24.

Where a reference to another document is made, this is assumed to be the most recent version, unless otherwise stated.

1.6 Consultation

1.6.1 Consultation for this Plan

The project's CEMP and Sub-plans are subject to the consultation requirements as identified in CoA C6. In accordance with CoA C6, this CBMP has been prepared in consultation with Department of Primary Industries – Fisheries (DPI Fisheries), Department of Climate Change, Energy, the Environment and Water (DCCEEW) – Biodiversity, Conservation and Science Directorate (BCS) and relevant councils:

- Albury City Council;
- Great Hume Shire Council;
- Lockhart Shire Council;
- Wagga Wagga City Council;
- Junee Shire Council.

The consultation report prepared for this Plan in accordance with CoA C6 outlines what feedback was provided (if any), and where stakeholders' responses have been addressed in this Plan. Table 1 summarises consultation undertaken and outlines how stakeholders' responses have been addressed.

TABLE 1: CONSULTATION SUMMARY – STAGE A

Stakeholder	Dates	Feedback provided	How Addressed
BCS	15/11/24	Various comments were received from BCS on the CBMP including the following topics: • Pre-clearing surveys and the clearing process • Weeds and pests • Unexpected finds protocol • Vegetation clearing	Responses were provided to BCS and various updates

Stakeholder	Dates	Feedback provided	How Addressed
		• The Sloane's froglet survey	were made throughout the plan,
DPI Fisheries	4/11/24	A number of items were noted in the feedback acknowledging the Projects commitments to appropriate management of fish passage and waterways. No specific comments or requests were provided by Fisheries.	N/A
Albury City Council	N/A	Not received	N/A
Greater Hume Shire Council	8 November 2024	No comments on CBMP	N/A
Junee Shire Council	12 November 2024	Various comments were received from Council on the CBMP including the following topics: • Habitat fragmentation • Weeds and pests • Water pollution • Vegetation clearing	Responses were provided to Junee Shire Council and various updates were made throughout the plan,
Wagga Wagga City Council	4 November 2024	No comments on CBMP	N/A
Lockhart Shire Council	4 November 2024	No comments on CBMP	N/A

1.6.2 Ongoing consultation during construction

Ongoing consultation between Martinus Rail, IRPL, other construction projects, stakeholders, the community and relevant agencies regarding the management of biodiversity impacts on the environment will be undertaken during the construction of the project as required.

The process for consultation is described in the Community Communication Strategy (CCS).

Biodiversity management information where required will be communicated to the community and stakeholders in accordance with the principles and procedures outlined in the CCS. The project will provide timely, accurate, relevant and accessible information about construction activities that may have biodiversity impacts, with provision for feedback through a complaints line during construction.

2 PURPOSE AND OBJECTIVES

2.1 Purpose

The purpose of this Plan is to describe how potential biodiversity impacts will be managed during Stage A construction of the project.

2.2 Objectives

The key objective of this CBMP is to ensure that impacts to the local community and the built environment from biodiversity associated with the project are minimised. To aid in achieving this objective, this CBMP incorporates the relevant biodiversity management measures from the following sources:

- The project EAD;
- Inland Rail – Albury to Illabo Infrastructure Approval CoA (SSI-10055);
- All relevant legislation and other requirements described in Section 3 of this Plan.

As discussed further in Section 3.1.5, sustainability is integral to the project. The Sustainability Management Plan (SuMP) (5-0052-210-PMA-00-PL-0001) includes environment and biodiversity theme targets. In relation to biodiversity, the relevant target is that ecological values impacted by Martinus will be at least maintained.

In addition to the above, a Social Impact Management Plan (SIMP) has been developed for the project. The SIMP identifies desired outcomes for the project, including 'the project adequately manages and enhances aesthetic values in the social locality'. Although there are limited opportunities for rehabilitation in Stage A, the implementation of the CBMP supports this outcome through the implementation of management measures including seed collection, and establishing the framework for rehabilitation in later phases of the project.

2.3 Targets

Targets for the management of biodiversity impacts during the project include:

- Full compliance with the relevant legislative requirements (CoAs);
- Ensure clearing allowances as per CoA C20 are adhered to;
- Be generally in accordance with the UMMs;
- Ensure controls and procedures are implemented during construction activities to avoid, minimise or manage potential adverse impacts to biodiversity within and adjacent to the project corridor;
- No increase in the distribution of weeds currently existing within the project areas;
- No new weeds introduced to the project areas or transferred from project areas;
- No transfer of plant diseases or pathogens to or from the project work areas;
- All fauna species encountered during construction are handled humanely in accordance with industry standards;
- No pollution or siltation of aquatic ecosystems, wetlands, endangered ecological communities or threatened species habitat.
- Sustainability target in relation to construction biodiversity – Ecological values impacted by Martinus will be at least maintained.

2.4 Performance outcomes

Performance outcomes identified in Section 27.4 of the EIS that are relevant to the management of biodiversity during construction of the project are identified in Table 2.

TABLE 2: PERFORMANCE OBJECTIVES (CONSTRUCTION BIODIVERSITY)

Performance outcomes	How performance outcome will be achieved
Avoids and minimises, as far as practicable, impacts to terrestrial and aquatic biodiversity, including clearing of native vegetation	Implement this CBMP, particularly the management measures in Section 6, which have been developed to consider the requirements in Section 3.
Offsets biodiversity impacts in accordance with the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the offset strategy for the Inland Rail program.	

Performance outcomes	How performance outcome will be achieved
Does not contribute to key threatening processes associated with weeds and pathogens.	Undertake training, monitoring and inspections as summarised in Section 7.3 and Section 7.4, respectively.
Incorporates best-practice principles into the design of waterway crossings.	
Minimises, as far as practicable, significant impacts to flow regimes in receiving waterways.	
Integrates mitigation measures in design, where practicable, to maintain or enhance ecological connectivity	
Manages impacts on biodiversity in accordance with relevant legislation.	

2.5 SMART principles

This Plan has been developed with the consideration of SMART principles. This was achieved as follows:

- **Specific**: The measures listed in Section 6.11 of this Plan are specific to flora and fauna management during construction. They include the development and implementation of plans and procedures tailored to address flora and fauna impacts, identification, and management of specific issues like unexpected finds of threatened species and threatened ecological communities and weed and pathogen control;
- **Measurable**: The document provides specific measures, requirements, and references that enable the evaluation and measurement of the effectiveness of each control measure. Monitoring program and reporting requirements are outlined, allowing for the assessment of impacts to flora and fauna;
- **Achievable**: The control measures outlined in the document are practical and achievable within the construction context. They involve the implementation of plans, investigations, and management strategies that can be feasibly executed during the construction phase;
- **Relevant**: The measures are directly relevant to flora and fauna management during construction. They address potential impacts, such as those associated with vegetation clearing, fauna encounters and impacts to aquatic habitats. These measures are designed to mitigate or prevent these impacts on flora and fauna;
- **Time-bound**: The document specifies when each measure should be implemented, such as prior to and during construction. It also assigns responsibilities to specific roles, indicating the timeline and accountability associated with each measure.

3 ENVIRONMENTAL REQUIREMENTS – STAGE A

3.1 Legislation

Legislation and regulations relevant to biodiversity management include:

- *Environmental Planning and Assessment Act 1979* (EP&A Act);
- *Protection of the Environment Operations Act 1997* (POEO Act);
- *National Parks and Wildlife Act 1974*;
- *BC Act 2016* (Under Part 7 (Clause 27) of the Threatened Species Conservation Act (TSC Act));
- *Biosecurity Act 2015*;
- *Local Land Services Act 2013*;
- *Pesticides Act 1999*;
- *Fisheries Management Act 1994*; and

A register of legal requirements for the project is contained in Appendix A1 of the CEMP.

3.2 Guidelines and standards

The main guidelines, specifications, and policy documents relevant to this Plan include:

- Environmental Management Plan Guideline – Guideline for Infrastructure Projects (DPIE, April 2020);
- NSW Biodiversity Offsets Policy for Major Projects (OEH, 2014b);
- Department of Primary Industries 'Policy and Guidelines for Fish Habitat Conservation and Management (DPI, 2013);
- Hygiene protocol for the control of disease in frogs (DECCW, 2008);
- Australian Standard AS 4373 Pruning of Amenity Trees;
- Biodiversity Assessment Method (Department of Planning, Industry and Environment (DPIE), 2020a) (the Biodiversity Assessment Method);
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities (Department of Environment and Conservation (DEC), 2004);
- NSW Guide to Surveying Threatened Plants (Office of Environment and Heritage (OEH), 2016b), 'Species credit' threatened bats and their habitats (OEH, 2018);
- Australian Department of Agriculture, Water and the Environment's survey guidelines for threatened species under the EPBC Act;
- Risk assessment guidelines for groundwater-dependent ecosystems (Serov, et al., 2012);
- Matters of National Environmental Significance—significant impact guidelines 1.1 (Department of the Environment, 2013);
- Draft Referral guideline for 14 birds listed as migratory species under the EPBC Act (Department of the Environment, 2015b);
- EPBC Act Condition-setting Policy (Department of Agriculture, Water and Environment (DAWE), 2020);
- Policy and guidelines for fish habitat conservation and management (Department of Primary Industries (DPI), 2013c);
- Why do fish need to cross the road? Fish passage requirements for waterway crossings (Fairfull and Witheridge, 2003);
- Aquatic ecology in Environmental Impact Assessment – EIA Guideline (Department of Planning, 2003);
- Guideline for controlled activities on waterfront land (DPI, 2012b);
- NSW Sustainable Design Guidelines (Transport for NSW (TfNSW), 2017b);
- Freshwater threatened species distribution maps (DPI, 2016–2021).
- Inland Rail Sustainability Strategy (0-0000-900-ESS-00-RP-0003)
- Inland Rail Sustainability Requirements – Albury to Parkes, sustainability requirements specified in 3-0000-210-ESS-00-SP-0001

3.3 Minister's Conditions of Approval

The requirements of the CoA relevant to the development of this Stage A Plan are shown in Table 3. These are defined as primary CoA and are specifically related to the development of this Plan.

A cross-reference is also included to indicate where the CoA is addressed in this Plan or other project management document.

TABLE 3: COA RELEVANT TO THIS PLAN – STAGE A

No.	Requirement	Where addressed
C5	CEMP(s) (and relevant CEMP sub-plans) not requiring the Planning Secretary's approval, but requiring ER endorsement, must be submitted to the ER no later than one (1) month before the commencement of construction or where construction is staged no later than one (1) month before the commencement of that stage. The CEMPs (and relevant CEMP sub-plans) must be endorsed by the ER as being consistent with the conditions of this approval and all undertakings made in the documents listed in Condition A1.	This CBMP
C6	Except as provided by Condition C16 the following CEMP Sub-plans must be prepared in consultation with the relevant government agencies identified for each CEMP Sub-plan. Details of all information requested by an agency during consultation must be provided to the Planning Secretary as part of any submission of the relevant CEMP Sub-plan, including copies of all correspondence from those agencies as required by Condition A8. **Required CEMP Sub-plan** / **Relevant government agencies to be consulted for each CEMP Sub-plan** (d) Biodiversity — DPI Fisheries, BCS, and relevant councils	This CBMP Section 1.6
C7	The **CEMP Sub-plans** must state how:	-
	(a) the environmental performance outcomes identified in the documents listed in **Condition A1** will be achieved;	Section 2.4 Section 1.3
	(b) the mitigation measures identified in the documents listed in Condition A1 will be implemented;	Section 6
	(c) the relevant terms of this approval will be complied with; and	Section 2 Section 6 Section 7 Appendix A
	(d) issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.	Section 6 Section 7 Section 8
C10	The Biodiversity Management Sub-plan must include, but not limited to details of the:	-
	(a) measures to avoid and minimise disturbance and impacts to terrestrial and aquatic threatened species and their habitat;	Section 6.11

No.	Requirement	Where addressed
	(b) Measures to protect riparian corridors and erosion and sediment control measures to be implemented identified in accordance with Condition E173 and E174 and	Section 5.2.2 Section 6.3 Section 6.11
	(c) Riparian and watercourse rehabilitation measures to be implemented in accordance with Condition E34	Section 6.7 Section 5.2.3
C15	Construction must not commence until the relevant CEMP(s) and CEMP Sub-plans have been approved by the Planning Secretary or endorsed by the ER, (as applicable and as identified in the CEMF approved under Condition C16). The CEMP and CEMP Sub-plans, as approved by the Planning Secretary, including any minor amendments approved by the ER, must be implemented for the duration of construction. Where the CSSI is being staged, construction of that stage is not to commence until the relevant CEMP and sub-plans have been endorsed by the ER and approved by the Planning Secretary or ER.	Section 1.4
C25	Except as provided by Condition C16 the following Construction Monitoring Programs must be prepared in consultation with the relevant government agencies identified for each to compare actual performance of construction of the CSSI against the performance predicted in the documents listed in Condition A1 or in the CEMP: **Required Construction Monitoring Programs** / **Relevant government agencies to be consulted for each Construction Monitoring Program** c) Biodiversity — BCS (NSW DCCEEW)	Section 7.3
C26	Each Construction Monitoring Program (CMP) must have consideration of SMART principles and provide:	-
	(a) details of baseline data available;	Section 4
	(b) details of baseline data to be obtained and when;	Section 4
	(c) details of all monitoring of the project to be undertaken;	Section 7.3
	(d) the parameters of the project to be monitored;	Section 7.3
	(e) the frequency of monitoring to be undertaken;	Section 7.3
	(f) the location and justification of monitoring locations.	Section 7.3
	(g) the reporting of monitoring results and analysis results against relevant criteria	Section 7.3
	(h) details of the methods that will be used to analyse the monitoring data;	-
	(i) procedures to identify and implement additional mitigation measures where the results of the monitoring indicate unacceptable project impacts; and	Section 8.1
	(j) any consultation to be undertaken in relation to the monitoring programs.	Section 1.6

<table>
<tr><th>No.</th><th>Requirement</th><th>Where addressed</th></tr>
<tr><td>C33</td><td>The results of the CMP(s) must be submitted to the Planning Secretary, and relevant regulatory agencies, for information in the form of a Construction Monitoring Report at the frequency identified in the relevant CMP.</td><td>Section 7.6</td></tr>
<tr><td>E19</td><td>The clearing of native vegetation must be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities, threatened species and their habitat.</td><td>Sections 6.1 and 6.11</td></tr>
<tr><td>E20</td><td>Impacts to plant community types and threatened species habitat must not exceed the impacts specified in Table 6 and Table 7 below:
Table 6 Plant community type impacts and ecosystem credit requirements
<table>
<tr><th>Name of Plant Community Type/ID</th><th>Area of impact</th><th>Ecosystem credits to be retired</th></tr>
<tr><td>277 – moderate – Blakely’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</td><td>0.5</td><td>22</td></tr>
<tr><td>277 – poor - Blakely’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</td><td>1.3</td><td>28</td></tr>
<tr><td>277 – derived - Blakely’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</td><td>2.3</td><td>78</td></tr>
<tr><td>277 – Native plantings - Blakely’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</td><td>0.26</td><td>7</td></tr>
<tr><td>277 – Non-native - Blakely’s Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion</td><td>30.5</td><td>0</td></tr>
<tr><td>5 - River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South- Western Slopes Bioregion and the eastern Riverina Bioregion</td><td>0.04</td><td>2</td></tr>
<tr><td>Total</td><td></td><td>136</td></tr>
</table>
Table 7 Threatened species habitat impacts and species credit requirements
<table>
<tr><th>Fauna Species</th><th>Area (ha)</th><th>Credits to be retired</th></tr>
<tr><td>Lower Slopes IBRA Subregion</td><td></td><td></td></tr>
<tr><td>Sloane’s Froglet (Crinia sloanei)</td><td>0.03</td><td>2</td></tr>
<tr><td>Squirrel Glider (Petaurus norfolcensis)</td><td>0.16</td><td>3</td></tr>
<tr><td>Superb Parrot (Polytelis swainsonii)</td><td>0.16</td><td>3</td></tr>
<tr><td>Inland Slopes IBRA Subregion</td><td></td><td></td></tr>
<tr><td>Sloane’s Froglet (Crinia sloanei)</td><td>0.23</td><td>5</td></tr>
<tr><td>Key’s Matchstick Grasshopper (Keyacris scurra)</td><td>0.21</td><td>4</td></tr>
</table></td><td>Sections 6.1, 6.1.6 and 6.8</td></tr>
</table>

No.	Requirement	Where addressed
	Squirrel Glider (*Petaurus norfolcensis*) 1.82 41 **Superb Parrot (*Polytelis swainsonii*)** 1.82 41 **Total** **99**	
E21	Prior to impacts on the biodiversity values of the CSSI, the number and classes of ecosystem credits and species credits (like-for-like) as set out in the BAM Biodiversity Credit Report which forms part of the BDAR Revision M, must be retired. The number of biodiversity offset species credits obligations that must be retired (prior to impacting the biodiversity values) in each of the CSSI as detailed in Table 6 and Table 7.	Section 6.8
E22	On the discovery of potential or actual impacts to any threatened communities or species not listed in Condition E20, all work which may impact the identified species or community must stop to prevent further impact and the Planning Secretary and DCCEEW (NSW) (and DCCEEW (Cth) where relevant) notified in writing. Work must not recommence until the relevant agencies have been consulted and any required approvals have been obtained.	Sections 6.1.6, 6.5, and 6.8
E23	The retirement of the credits must be carried out in accordance with the Biodiversity Conservation Act 2016, and can be achieved by: a) acquiring and retiring "biodiversity credits" within the meaning of the BC Act; and / or b) making a payment into the Biodiversity Conservation Fund of an amount equivalent to the class and number of ecosystem and species credits, as calculated by the Biodiversity Conservation Fund (BCF) Charge System; and/or c) funding a biodiversity conservation action that benefits the entity impacted and is listed in the ancillary rules of the Biodiversity Offset Scheme. d) Where evidence of compliance with the Ancillary rules: Reasonable steps to seek like-for-like biodiversity credits for the purpose of applying the variation rules has been provided to, and approved by the Planning Secretary, the variation rules may be applied to retire the relevant ecosystem credits and species credits as set out in the BAM Biodiversity Credit Report (Variation). The variation rule does not apply to biodiversity credits for threatened species or threatened ecological communities that are listed as critically endangered under the Biodiversity Conservation Act 2016 or listed in any capacity under the Environment Protection and Biodiversity Conservation Act 1999. ***Note:*** *"Impacted site" in the application of the like-for-like offset rules is taken to be the subject land described in the Biodiversity Development Assessment Report referred to in Condition A1. The subject land is the disturbance footprint subject to assessment under the Biodiversity Assessment Method.*	Section 6.8
E24	Evidence of the retirement of credits in satisfaction of Condition E23 must be provided to the Planning Secretary prior to impacts to the biodiversity values	Section 6.8
E25	Prior to the commencement of works, the Proponent must complete targeted surveys during July and/ or August for Sloane's Froglet (*Crinia sloanei*) in all areas where that species was assumed present in the documents listed in Condition A1. The results of the targeted surveys are to be provided to DCCEEW and the Planning Secretary for information.	Sloanes Froglet targeted surveys found no froglets present.

No.	Requirement	Where addressed
E26	In all locations where the Sloane's Froglet is recorded, a site-specific Sloane's Froglet Management Plan(s) must be prepared and implemented in consultation with DCCEEW and landowners to manage work within and adjacent to Sloane's Froglet habitat. The Sloane's Froglet Management Plan must include: a) details of proposed detention basins to manage stormwater consistent with the Sloane's Froglet Stormwater Wetland Design Guidelines (Spire, 2017); b) measures to prevent Sloane's Froglet habitat from being impacted by sediment; and c) regular monitoring.	Sloanes Froglet targeted surveys found no froglets present.
E27	The Sloane's Froglet Management Plan must be submitted to and approved by the Planning Secretary. No work that could impact the areas identified with Sloane's Froglet (*Crinia sloanei*) are to be carried out prior to: a) the completion of the targeted surveys required in Condition E29; and b) the implementation of the approved Sloane's Froglet Management Plan required by Condition E26.	Sloanes Froglet targeted surveys found no froglets present.
E28	In all remaining areas that assumed the presence of Sloane's Froglet (*Crinia sloanei),* erosion and sediment control measures and protection of riparian areas must be installed in accordance with Conditions C10, E173 and E174 prior to work in these areas.	Sloanes Froglet targeted surveys found no froglets present.
E29	Prior to construction, at Billy Hughes Bridge and Uranquinty Creek, existing fauna movement corridors, pathways and connectivity for the squirrel Glider at Billy Hughes Bridge and Uranquinty Creek must be determined by a suitably qualified and experienced expert in consultation with DCCEEW including evidence of existing fauna movement corridors, pathways and connectivity including analysis of existing studies or baseline monitoring.	Fauna Connectivity Strategy – N/A (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.
E30	The design of fauna connectivity measures must have regard to: a) existing fauna movement corridors, pathways and connectivity identified in accordance with Condition E29; b) the Sloane's Froglet Stormwater Wetland Design Guidelines (Spire, 2017), relevant threatened species guidelines, species biology and the results of on-ground surveys; c) Fauna Sensitive Road Design Manual Volume 2 (Queensland Government, 2010); d) Fauna Sensitive Road Design Guidelines (VicRoads, 2012); and e) industry best practice measures.	Fauna Connectivity Strategy – N/A (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.
E31	The Proponent must prepare and implement a Fauna Connectivity Strategy for the Squirrel Glider and Sloane's Froglet for Billy Hughes Bridge and Uranquinty Creek prior to the commencement of Work that has the potential to impact on the Squirrel Glider and Sloane's Froglet. The strategy must: a) include details of existing fauna movement corridors, pathways and connectivity informed by Condition E29; b) be consistent with the Sloane's Froglet Stormwater Wetland Design Guidelines (Spire, 2017); c) justify the design, location and spacing of fauna connectivity structures and measures;	Fauna Connectivity Strategy – N/A (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.

No.	Requirement	Where addressed
	d) demonstrate the effectiveness of connectivity structures and measures for the targeted species to maintain or improve connectivity and movement pathways of species within regional, local and riparian corridors; and i. a map showing the location and design of all fauna connectivity measures to be implemented ii. the maintenance activities for all connectivity structures and measures for the life of the impact of the CSSI, including timing and frequency of maintenance actions, including after flood and bushfire events; iii. include the Operational Fauna Connectivity Monitoring and Adaptive Mitigation Program required by Condition D12.	
E32	The Fauna Connectivity Strategy must be prepared by a suitably qualified and experienced person(s) who has expertise in the relevant targeted species, in consultation with, BCS, DPI Fisheries and approved by the Planning Secretary.	Fauna Connectivity Strategy – N/A (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.
E33	There are to be no works to the substructure of the Murray River Bridge or instream works in the Murray River or Oddies Creek.	Sections 6.3 and 6.11
E34	Riparian land and watercourses disturbed during construction must be rehabilitated and revegetated with native species of local provenance from the relevant native vegetation community on completion of Work impacting the riparian land in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (DPE 2022) and A Rehabilitation Manual of Australian Streams (Rutherfurd et al. 2000).	Section 6.7 N/A (Stage B only) Stage A will present little opportunity for permanent rehabilitation works as the end state of Stage A would not be the completion of works at any site.
E35	An exclusion zone must be established to protect riparian vegetation adjoining Billy Hughes Bridge (the eastern compound and track lowering works) and Murray River Bridge adjacent to the surface road works before construction commences in this area. The exclusion zone must be maintained until construction is completed in the area.	Sections 6.3 and 6.11
E36	Seed from native plants to be removed must be collected before clearing and used in revegetation and rehabilitation across the Project area. Plant propagation must ensure that native species of local provenance from the relevant native vegetation community are available for successful revegetation and landscaping.	Sections 6.1.1, 6.7 and 6.11 N/A (Stage B only) Stage A will present little opportunity for permanent

No.	Requirement	Where addressed
		rehabilitation works as the end state of Stage A would not be the completion of works at any site
E37	Cleared native vegetation and other landscape features must be reused as part of the CSSI. If reuse is not practicable, consultation with the relevant council(s), land-care groups and relevant government agencies must be undertaken to determine if: a) hollows, tree trunks, mulch, bush rock and root balls; and b) collected plant material, seeds and/or propagated plants, can be used by others in habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options.	Sections 6.2 and 6.11

3.4 Updated Mitigation Measures

Relevant Updated Mitigation Measures (UMMs), as identified in Appendix B of the PIR, are listed in Table 4 below. A cross-reference is also included to indicate where and how the conditions are addressed in this CBMP or other project management documents.

TABLE 4: UMMS RELEVANT TO THIS PLAN – STAGE A

Ref.	Issue/Impact	Mitigation Measure	Where addressed
BD1	Avoiding impacts on biodiversity	Detailed design and construction planning will seek to identify refinements that further avoid or minimise the need to further impact or disturb native vegetation, fauna habitat and riparian habitat.	This Plan Table 19:
BD2	Connectivity and fauna passage	During detailed design, provision of one glider pole on each side of the rail corridor will be further investigated to enhance habitat connection between patches of remnant vegetation for squirrel glider at the Billy Hughes bridge enhancement site.	Table 19: Fauna Connectivity Strategy (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.
BD3	Connectivity and fauna passage	A Project connectivity strategy will be prepared and implemented with reference to the Fauna Design Guidelines for the Inland Rail Project (2022) to consider further enhancements, including beyond the proposal site.	Fauna Connectivity Strategy (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.

Ref.	Issue/Impact	Mitigation Measure	Where addressed
BD4	Fish passage	Fish passage will be maintained at Jeralgambeth Creek (Junee to Illabo clearances) during construction.	Table 19: Fauna Connectivity Strategy (Stage B only) No works occur at Billy Hughes Bridge or Uranquinty Creek as part of Stage A.
BD5	Avoidance of fauna impacts	Pre-clearance surveys will be carried out prior to construction by a suitability qualified ecologist in accordance with the biodiversity management sub-plan. This would include: ▪ inspections of structures that provide potential microbat habitat. If bats are identified roosting in these structures, individuals will be excluded from this habitat (meaning bats can exit the habitat unharmed during their nocturnal activity period but not re-enter) ▪ native aquatic fauna salvage in watercourses of residual pools directly impacted by construction. All salvaged aquatic fauna will be relocated to similar habitat nearby.	Table 19: Section 6.1
BD6	Managing the potential for biodiversity impacts during construction	Exclusion areas will be established and maintained around native vegetation and riparian vegetation to be retained, particularly areas of biodiversity value adjoining the proposal site that are located in close proximity to work areas.	Table 19: Section 6.1
BD7	Managing the potential for biodiversity impacts during construction	Construction workforce will be supplied with sensitive area maps (showing clearing boundaries and exclusion zones), including updates as required.	Table 19: Appendix C – Sensitive Area Mapping-Biodiversity
BD8	Riparian vegetation and aquatic habitats	Activities within vegetated riparian zones will be managed to minimise impacts to aquatic environments as far as practicable. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated.	Table 19: Stage A will present little opportunity for permanent Riparian rehabilitation works as the end state of Stage A would not be the completion of works at any site. Section 6.3 Section 6.7

Ref.	Issue/Impact	Mitigation Measure	Where addressed
BD9	Sloane's froglet	Temporary frog exclusion fencing will be considered where construction compounds/laydown areas occur adjacent to potential Sloane's froglet breeding habitat.	Table 19:
BD10	Instream impacts	Instream works at Sandy Creek (Uranquinty Yard clearances) and Jeralgambeth Creek (Junee to Illabo clearances) will be undertaken in dry conditions as far as practicable. Where works cannot be conducted in the dry, appropriate erosion and sediment control would be installed (i.e. a silt curtain or sediment boom around the work area and attached to the same side of the bank to maintain fish passage). Appropriate erosion and sediment control will be installed and maintained. Aquatic habitat will be returned to pre-works condition (or better) in accordance with the rehabilitation strategy.	Section 6.1 Watercourse Rehabilitation Strategy- (Stage B)
BD11	Instream impacts	Any instream habitat features (woody debris, large rocks and boulders) at the temporary creek crossing location at Sandy Creek (Uranquinty Yard clearances) is to be removed and placed up or downstream of the construction area in consultation with a suitably qualified aquatic ecologist. Any such aquatic features will be reinstated within the watercourse at the completion of construction.	Section 6.1 N/A (Stage B)
BD12	Unexpected finds (biodiversity)	A species UFP will be implemented if TECs, flora and fauna species, not assessed in the biodiversity assessment, are identified in the proposal site. This will include stop work orders in the immediate area and notifying the Department of Planning and Environment (DPE).	Unexpected Finds Protocol
BD13	Instream impacts	Refuelling will be conducted outside of waterfront land, so far as it practicable, with appropriate measures in place to avoid impacts to waterways, aquatic habitats and groundwater. This includes spill kits always kept with maintenance vehicles and or machinery within 100 m of a watercourse.	Table 19:
BD14	Fish-passage impacts	Instream structures (bridges and culverts) that provide for the flow of watercourses will be inspected and maintained to address any issues that may contribute to the blockage of fish passage.	Fauna Connectivity Strategy (Stage B only)

3.5 Infrastructure Sustainability Council

Martinus Rail will aim to achieve a certified minimum rating of 'Excellent' under the Infrastructure Sustainability Council (ISC) IS Technical Manual version 1.2. For further information, please refer to the SuMP.

The specific IS biodiversity related target is provided in Section 2.2. Table 5 lists the relevant IS credits and indicates where they are addressed in this plan or references external documents that fulfill the ISC credit criteria. Further information on compliance with the ISC credits is provided in Appendix D.

TABLE 5: RELEVANT IS CREDITS

ISC Credit	Where addressed
Ecological Value – Eco-1	
Level 1	
The ecological value of the infrastructure site is maintained.	Section 3.4 Section 6.10

ISC Credit	Where addressed
Level 2 & 3	
The ecological value of infrastructure site is enhanced by 0 to 20%. Fractions of Levels may be achieved on a sliding scale up to 20% for Level 3.	Section 6.7 A rehabilitation strategy will be developed for Stage B of the project. The strategy will be based on the Inland Rail Landscape and Rehabilitation Strategy, the Inland Rail Landscape and Rehabilitation Framework and property-specific reinstatement commitments.
Habitat connectivity – Eco-2	
Level 1	
There is a low or moderate degree of existing habitat connectivity identified. **AND**	Section 5.2.4
The existing degree of habitat connectivity is enhanced (offsetting allowed).	Section 6.8
Level 2	
There is a low or moderate degree of existing habitat connectivity identified. **AND**	Section 5.2.4
The existing degree of habitat connectivity is enhanced (offsetting allowed).	Section 6.8
OR	
There is a high degree of existing habitat connectivity identified. **AND**	Section 5.2.4
The existing degree of habitat connectivity is maintained (offsetting allowed).	Section 6.8

4 EXISTING ENVIRONMENT

4.1 Environmental aspects

This section summarises the existing biodiversity within and adjacent to the whole project. The key reference documents include:

- Chapter 16 of the EIS;
- PIR RtS Appendix G – BDAR 1 and 2; and
- PIR Appendix F – Revised Technical Paper 8: BDAR.

Appendix C provides mapping indicating the location of the Stage A enhancement sites and indicative Stage A work areas as well as location of PCTs and Sloanes Froglet assumed habitat.

4.1.1 Threatened ecological communities

Native vegetation recorded within the study area is considered to meet the final determination of one threatened ecological community listed under the BC Act:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland.

White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland is listed as Critically Endangered under the BC Act. A summary of the extent of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland threatened ecological community within the study area is provided in Table 6.

TABLE 6: EXTENT OF WHITE BOX – YELLOW BOX – BLAKELY'S RED GUM GRASSY WOODLAND AND DERIVED NATIVE GRASSLAND THREATENED ECOLOGICAL COMMUNITY WITHIN THE STUDY AREA

Threatened ecological community	Vegetation type and zone	BC Act	IBRA Subregion		Study area extent (ha)	Project site extent (ha)
			Lower slopes	Inland slopes		
White Box – Yellow Box – Blakely's Red Gum grassy woodlands	PCT 277 – Moderate condition	Critically Endangered	0	3.22	3.22	0.50
	PCT 277 – Derived condition		0	4.08	4.08	2.34
Total extent of threatened ecological communities					**7.30**	**2.84**

4.1.2 Threatened or otherwise significant flora species

A total of nine threatened flora species were considered to have potential associated habitats within the study area and were the subject of targeted surveys. No threatened flora species were recorded during targeted surveys.

4.1.3 Fauna habitat

Section 5 of the BDAR assessed the habitat suitability for threatened species in accordance with Chapter 5 of the BAM and has been prepared in accordance with Part 3 of the BAM 2020 Operational Manual – Stage 1 (EES 2020a). Likelihood of occurrence assessments were undertaken for all threatened species, populations and migratory species identified through database searches.

Ecosystem credit threatened species were assessed using information about site context, PCTs and vegetation integrity attributes collected during the field surveys, and data from the Threatened Biodiversity Data Collection (EES, 2021) as required by subsections 5.2.1 and 5.2.2 of the BAM and Part 3 of the BAM 2020 Operational Manual – Stage 1 (EES 2020a). Initial desktop assessment to determine ecosystem (predicted) and species (candidate) credit species involved entering the identified vegetation types and zones into BAM-C. This allowed predicted and candidate species reports to be generated for the associated PCTs within the study area.

Fauna habitat assessments were undertaken to assess the likelihood of threatened species of animal (candidate species identified in desktop review) occurring within the study area.

Table 7 outlines the habitat features suitable for a species credit species within the Project site (BAM s. 5.2.5). Detailed figures for threatened fauna recorded and candidate species polygons are presented in Appendix C-4, Appendix C-6 and Appendix C-7 of the BDAR (PIR 2024).

TABLE 7: SPECIES WITH SUITABLE HABITAT WITHIN THE PROJECT SITE

Scientific name	Common name	BC Act[1]	SAII[2]	PCT and Habitat features	IBRA Subregion	
					Lower Slopes (ha)	Inland slopes (ha)
Crinia sloanei	Sloanes Froglet	V	No	PCT 5 (poor condition) and PCT 277 (poor condition and native plantings)[3]	0.03	0.23
Keyacris scurra	Key's Matchstick Grasshopper	E	No	PCT 5 (poor) and PCT 277 (poor, moderate, derived and native plantings)[3]	-	0.21
Polytelis swainsonii	Superb Parrot	V	No	PCT 5 (poor) and PCT 277 (poor and moderate)	0.16	1.82
Petaurus norfolcensis	Squirrel Glider	V	No	PCT 5 (poor) and PCT 277 (poor and moderate)	0.16	1.82

(1) Threat status under the BC Act: V = Vulnerable, E = Endangered.

(2) SAII = serious and irreversible impact.

(3) The assessment relies on assumed presence for Sloane's Froglet and Key's Matchstick Grasshopper

It was determined that the Sloane's Froglet (*Crinia sloanei)* potential species habitat will occur in the Project site, where the mapped potential habitat (including a 15-metre buffer) occurs in association with a native vegetation community (PCT) and is not dissected by a road, rail corridor or urban development.

The Matchstick Grasshopper (*Keyacris scurra)* species is predicted to occur within the Inland Slopes IBRA subregion. Targeted surveys for this species were completed in December 2022 and the species was not recorded. In areas that have not been surveyed due to access limitations this species was conservatively assumed to be present within potential habitats at the Junee to Illabo dual track clearances area in PCT 277 Blakely's Red Gum – Yellow Box grassy tall woodland (poor and moderate).

The Superb Parrot (*Polytelis swainsonii)* and Squirrel Glider (*Petaurus norfolcensis)* potential species habitat has been mapped using a precautionary principle where all available habitats for this species have been used to map species polygons, being all PCT 5 and 277 patches with the exception of derived and native plantings.

4.1.4 Threatened fauna

In accordance with the BAM threatened species have been assessed as predicted or ecosystem credit species and species credit species. Threatened fauna surveys completed within the BDAR study area were carried out as described in Section 5.5.3 of the BDAR.

A total of six threatened fauna species identified as predicted or ecosystem credit species and species credit species were recorded during surveys. These are presented in Table 8.

TABLE 8: THREATENED FAUNA RECORDED IN THE STUDY AREA

Scientific name	Common name	BC Act	Credit type	Outcome of targeted surveys
Circus assimilis	Spotted Harrier	Vulnerable	Predicted ecosystem credit species	One individual was observed in grasslands adjacent to the study area at Marinna. Likely to occur seasonally in low

Scientific name	Common name	BC Act	Credit type	Outcome of targeted surveys
				numbers across open landscapes associated with the study area. Study area habitats are not considered to represent important foraging habitats, but may provide trees for breeding purposes
Hieraaetus morphnoides	Little Eagle	Vulnerable	Dual credit species	Although potential breeding habitat was recorded during habitat assessments and one individual was recorded during the breeding season adjacent to Billy Hughes bridge, no breeding activity or nest trees were observed in the study area. Given that targeted survey did not locate breeding activity or nest trees, breeding habitat for the Little Eagle is unlikely to be affected by the Project, and as such, this species was not considered further.
Petaurus norfolcensis	Squirrel Glider	Vulnerable	Candidate species credit	Species was recorded during field surveys within the study area. Study area provides habitat features (i.e. hollow-bearing trees) that the species is likely to use. The study area will be utilised for both foraging and breeding purposes.
Polytelis swainsonii	Superb Parrot	Vulnerable	Dual credit species	Species was recorded during field surveys within the study area. Study area provides habitat features (i.e. hollow-bearing trees) that the species is likely to use. The study area will be utilised for both foraging and breeding purposes.
Pteropus poliocephalus	Gery-headed Flying-fox	Vulnerable	Predicted ecosystem credit species	Species recorded foraging on blossom resources within the study area vegetation. There are no known Flying-fox camps associated with the study area. Due to the lack of the important breeding habitat features the species is not considered to be a candidate species.
Stagonopleura guttata	Diamond Firetail	Vulnerable	Predicted ecosystem credit species	Species recorded in the study area. May occasionally occur in the study area where more suitable habitat adjoins. The study area habitats are considered of generally poor quality to support this species over much of its length.

4.1.5 Aquatic habitat

The study area includes 26 watercourses and three (3) waterbodies, of which 12 were ranked as medium to high priority watercourses and were subject to field survey and habitat assessment. The ranking of watercourses was based on Key Fish Habitat (KFH) mapping (DPI, 2007a), threatened species distribution mapping (DPI, 2016) and Strahler stream order (Strahler, 1952).

Aquatic habitat assessment in the field found that except for the Murray River, all other watercourses were ephemeral with only four (4) sites containing small, shallow remnant pools:

- Oddies Creek;
- Eight Mile Creek;
- Buckaringah Creek;
- Jeralgambeth Creek.

The remaining watercourses were completely dry within the Project site at the time of surveys. The Murray River (which is perennial and contains moderate flows) and Oddies Creek both contain habitat features such as woody debris, instream macrophytes, riparian vegetation and bank overhang. Eight Mile Creek contained instream macrophytes and

Buckaringah Creek contained large woody debris. The remaining watercourses lacked important fish habitat features. First and second-order drainage lines and tributaries that were visited usually lacked riparian or aquatic vegetation and were dry. All watercourses and riparian zones were significantly modified by agricultural land practices.

Targeted threatened fauna surveys were undertaken using bait traps in medium to high-priority watercourses where water and/or remnant pools were present. Pelagic species and/or larger-bodied fish species were not targeted in the Murray River and were assumed present and considered further in a likelihood of occurrence assessment.

Targeted surveys did not result in the capture of any threatened species and only the exotic Mosquitofish were captured.

4.2 Weeds and biosecurity

4.2.1 Weeds

Two exotic flora species recorded within the study area during field surveys were listed under the Biosecurity Act as priority weeds for the Murray and Riverina region (Department of Planning, Industry and Environment, 2020).

These two species are also listed as Weeds of National Significance (WONS) (Australian Weeds Committee, 2020). All priority weeds and weeds of National Significance are outlined below in Table 9.

TABLE 9: PRIORITY WEEDS AND WEEDS OF NATIONAL SIGNIFICANCE

Species Name	Priority Weeds	WONS
Asparagus asparagoides (Bridal Creeper)	Prohibition on dealings. Must not be imported into the State or sold.	Yes
Rubus fruticosus agg. (Blackberry)	Prohibition on dealings Must not be imported into the State or sold.	Yes

In addition to priority weeds and weeds of National Significance the following high-threat weeds were also recorded:

- *Acer negundo* (Box-elder Maple);
- *Agrostis capillaris* (Browntop Bent);
- *Alternanthera pungens* (Khaki Weed);
- *Bromus diandrus* (Great Brome);
- *Cyperus eragrostis* (Umbrella Sedge);
- *Eragrostis curvula* (African Love Grass);
- *Fraxinus angustifolia* (Narrow-leaved Ash);
- *Hypericum perforatum* (St. John's Wort);
- *Ligustrum lucidum* (Large-leaved Privet);
- *Ligustrum sinense* (Small-leaved Privet);
- *Paspalum dilatatum* (Paspalum);
- *Romulea rosea* (Onion Grass);
- *Vinca major* (Greater Periwinkle).

4.3 Matters of National Environmental Significance

4.3.1 Threatened species and ecological communities

Ecological communities

Based on broad-scale state vegetation mapping and database searches, a total of one candidate threatened ecological community listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was considered likely to occur, being:

- White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grasslands.

A comparative assessment of native vegetation recorded within the Project site against this EPBC Act listed threatened ecological community was completed as part of the BDAR. The assessment concluded that only patches of moderate

condition PCT 277 meet the criteria of the EPBC Act listing for White Box – Yellow Box – Blakely's Red Gum Grassy Woodlands and Derived Native Grasslands.

Threatened flora species

A total of 18 EPBC Act listed threatened flora species are known to occur or are predicted to occur within the locality of the study area. Of these, four were identified as having a moderate likelihood of occurrence based on previous records and availability of potential habitat.

No individuals of these species were recorded during targeted surveys undertaken as part of the BDAR.

Threatened fauna species

Thirty-one EPBC Act listed threatened fauna species are known to occur or are predicted to occur within the locality of the study area. This comprised three species of amphibians, 12 birds, eight mammals, two reptiles, two invertebrates and four fish (Appendix C-2 of the BDAR). Of these, six were identified to have a moderate or higher likelihood of occurrence based on previous records and the availability of potential habitat.

Two threatened fauna species listed under the EPBC Act, including Superb Parrot and Grey-headed Flying-fox, were recorded in the study area during targeted surveys.

4.3.2 Migratory species

Migratory species are protected under international agreements, to which Australia is a signatory, including Japan-Australia Migratory Bird Agreement (JAMBA), China Australia Migratory Bird Agreement (CAMBA), Republic of Korea Australia Migratory Bird Agreement (RoKAMBA) and the Bonn Convention on the Conservation of Migratory Species of Wild Animals. Migratory species are considered Matters of National Environmental Significance (MNES) and are protected under the EPBC Act.

A total of 14 EPBC Act listed migratory species are known or predicted to occur within the locality of the study area based on the results of database searches completed. One species, the White-throated Needletail, is considered to have a moderate likelihood of occurrence within the study area. As the White-throated Needletail is listed as migratory and threatened under the EPBC Act, an assessment of significance was carried out for the BDAR using the threatened species criteria.

4.3.3 Wetlands of national and international importance

Nationally important wetlands

One nationally important wetland was identified by the Protected Matters Search Tool (PMST) as occurring in proximity to the study area; being Doodle Comer Swamp. This wetland is located approximately 1 kilometre southwest of the enhancement site. The wetland is located 2.3 kilometres downstream of Buckaringah Creek, which is located about 150 metres north of the Henty Yard clearance enhancement site.

Wetlands of international importance (Ramsar Wetlands)

Seven Ramsar wetlands or Wetlands of International importance were identified by database searches completed within a 20-kilometre buffer of the project. These include:

- Banrock station wetland complex – located 600–700 kilometres upstream of the Murray River bridge enhancement site;
- Barmah forest – located approximately 100–150 kilometres upstream of the Murray River enhancement site;
- Gumbower forest – located approximately 150–200 kilometres upstream of the Murray River enhancement site;
- Hattah-kulkyne lakes – located approximately 400–500 kilometres upstream of the Murray River enhancement site;
- NSW central Murray state forests – located approximately 100 kilometres upstream of the Murray River enhancement site;
- Riverland – located 500–600 kilometres upstream of the Murray River enhancement site;
- The Coorong, and Lakes Alexandra and Albert wetland – located 500–600 kilometres from the Murray River enhancement site.

All these Wetlands of International Significance are located more than 100 kilometres from the study area and are unlikely to be directly or indirectly impacted by the project.

4.3.4 World and National heritage

Based on the Protected Matters Search Tool (PMST), no World Heritage Properties are located within or near the study area and therefore will not be impacted by the project. One listed National Heritage property was identified in the PMST which included:

- Bonegilla Migrant Camp – Block 19.

Bonegilla Migrant Camp does not occur within the study area (located about 10km east of the Murry River bridge enhancement site) and as such will not be impacted by the project.

5 ENVIRONMENTAL ASPECTS AND IMPACTS – STAGE A

5.1 Construction activities

Key activities associated with Stage A of the project that could result in impacts to terrestrial and aquatic flora and fauna include:

- Clearing of native vegetation (including habitat);
- Works around watercourses;
- Dewatering of dams;
- Noise, vibration, and light impacts from ancillary facilities and construction works;
- Fencing and property boundary adjustment work;
- General earthworks near vegetation, resulting in disturbance of soils, consequential erosion and the mobilisation of sediment;
- Establishment of ancillary facilities;
- Heavy and light vehicle movements;
- Earthworks, including stockpiling of material;
- Utility and drainage works;
- Use of chemicals/fuels (potential for spills).

5.2 Ecological impacts

This section summarises the impacts to biodiversity within and adjacent to the project.

The BDAR provides information on how impacts to biodiversity values were avoided and minimised through the planning and design phase of the project. In accordance with Section 7.1.1 of the BAM, efforts to avoid and minimise direct impact on native vegetation and habitat through project design are addressed in Table 8.1 of the BDAR.

In accordance with CoA E22, in the event that potential or actual impacts to any threatened communities or species not listed in CoA E20 are discovered, all work that may impact the identified species or community will stop to prevent further impact and the Planning Secretary and DCCEEW (NSW) (and DCCEEW (Cth) where relevant) will be notified in writing. Work will not recommence until the relevant agencies have been consulted and any required approvals have been obtained.

Table 10 identifies Threatened Ecological Communities mapped within each Stage A site. Table 10 also identified species polygons mapped at each Stage A site.

TABLE 10 MAPPED TEC AND ENDANGERED SPECIES WITHIN STAGE A SITES

Stage A Site	Threatened Ecological Communities	Endangered Fauna /Flora Polygons present
Table Top Yard	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered.	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present) - Key's Matchstick grasshopper
Henty Yard	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered.	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present)
Yerong Creek Yard	None	- Sloane's Froglet (Sloane's Froglet Survey identified none present)

Stage A Site	Threatened Ecological Communities	Endangered Fauna /Flora Polygons present
The Rock Yard	None	None
Pearson St Bridge	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered.	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present)
Cassidy Parade	None	- Sloane's Froglet (Sloane's Froglet Survey identified none present)
Edmonson St Bridge	None	- Sloane's Froglet (Sloane's Froglet Survey identified none present)
Harefield Yard	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered.	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present)
Junee Yard Clearances	None	- Sloane's Froglet (Sloane's Froglet Survey identified none present)
Olympic Highway Underbridge	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered.	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present) - Key's Matchstick grasshopper
Junee to Illabo	BC Act - White Box - Yellow Box -Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highlands, NSW South Western Slopes, South East Corner and Riverina Bioregions – Critically Endangered. EPBC Act - White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland – Critically Endangered	- Superb Parrot - Squirrel Glider - Sloane's Froglet (Sloane's Froglet Survey identified none present) - Key's Matchstick grasshopper

5.2.1 Clearing of non-native vegetation

Non-native vegetation occurs within and adjacent to the proposal site. Two non-native vegetation communities were identified. Some removal of non-native vegetation including, urban exotic/native landscape plantings may result because of the proposal. Where non-native vegetation occurred adjacent to areas of PCT 277 in moderate-good and derived broad condition states along the Junee to Illabo clearances for the Inland Slopes IBRA subregion these were assigned to vegetation zone 277_non-native.

TABLE 11: DIRECT IMPACTS ON NON-NATIVE VEGETATION WITHIN THE INLAND SLOPES IBRA SUBREGION AND THE CORRESPONDING PRECINCT AND ENHANCEMENT SITES – STAGE A

Vegetation Type	Vegetation zone	Precinct	Enhancement Site	Direct Impact (ha)
PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Non-Native	Junee	Junee to Illabo clearances	30.5

5.2.2 Clearing of native vegetation

Stage A of the Project has the potential to impact on 4.34 hectares of native vegetation, comprising 0.02ha of PCT5 and 4.32ha of PCT 277. These impacts on native vegetation as they relate to Stage A, including each PCT, for each IBRA subregion and the corresponding precinct and enhancement sites are outlined in Table 12 and Table 13.

TABLE 12: DIRECT IMPACTS ON NATIVE VEGETATION WITHIN THE LOWER SLOPES IBRA SUBREGION AND THE CORRESPONDING PRECINCT AND ENHANCEMENT SITES – STAGE A

Vegetation Type	Vegetation zone	Precinct	Enhancement Site	Direct Impact (ha)
PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Poor condition	Junee	Harefield Yard clearances	0.11
PCT 5 – River Red Gum herbaceous grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South Western Slopes Bioregion and the eastern Riverina Bioregion	Poor condition	Junee	Harefield Yard clearances	0.02
Total native vegetation impact				**0.13**

TABLE 13: DIRECT IMPACTS ON NATIVE VEGETATION WITHIN THE INLAND SLOPES IBRA SUBREGION AND THE CORRESPONDING PRECINCT AND ENHANCEMENT SITES – STAGE A

Vegetation Type	Vegetation zone	Precinct	Enhancement site	Direct impact (ha)
PCT 277 – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate condition	Junee	Junee to Illabo clearances	0.47
	Poor condition	Albury	Tabletop Yard clearances	0.01
		Junee	Olympic Highway underbridge	0.02
			Junee to Illabo clearances	1.11
	Derived condition		Junee to Illabo clearances	2.34
	Native plantings	Junee	Junee to Illabo clearances	0.07

Vegetation Type	Vegetation zone	Precinct	Enhancement site	Direct impact (ha)
			Olympic Highway underbridge	0.19
Total native vegetation impact				**4.21**

Removal of threatened ecological communities

Stage A of the project will impact on a total of 4.09 hectares of threatened ecological community in the form of White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland. Potential direct impacts on threatened ecological communities due to the Stage A of the project for each IBRA subregion are outlined in Table 14.

All Moderate and Derived condition TEC is located within or adjacent to the Junee to Illabo clearances enhancement site.

Impacts to the threatened ecological communities will not exceed the limits set out in CoA E20.

TABLE 14: DIRECT IMPACTS ON THREATENED ECOLOGICAL COMMUNITIES DUE TO THE PROJECT FOR EACH IBRA SUBREGION – STAGE A

Threatened ecological community	Vegetation type and zone	BC Act	IBRA Subregion		Project site extent (ha)
			Lower slopes	Inland slopes	
White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland	PCT 277 – Moderate condition	Critically Endangered	0	0.5	0.50
	PCT 277 – Poor condition		0.11	1.14	1.25
	PCT 277 – Derived condition		0	2.34	2.34
Total direct impact on threatened ecological communities					**4.09**

Removal of threatened flora

No threatened flora was identified as existing within the BDAR study area during the field surveys undertaken as part of the BDAR.

Removal of threatened fauna species habitat and habitat features

The removal of the vegetation communities described in Table 12 and Table 13 would impact fauna habitats due to the removal of foraging and breeding habitats of fauna species. The predicted impact to species credit threatened fauna due to the removal of habitat is outlined in Table 15. Impacts to threatened species' habitats will not exceed the limits set out in CoA E20.

TABLE 15: DIRECT IMPACTS ON THREATENED SPECIES CREDIT SPECIES WITHIN THE PROJECT – STAGE A

Scientific name	Common name	BC Act1	SAII	PCT and Habitat features	Direct impact (ha)
Lower Slopes IBRA Sub-region					
Crinia sloanei	Sloanes Froglet*	V	No	PCT 5 (poor condition) and PCT 277 (poor condition)	0.02
Polytelis swainsonii	Superb Parrot	V	No	PCT 5 (poor condition) and PCT 277 (poor condition)	0.07

Scientific name	Common name	BC Act1	SAII	PCT and Habitat features	Direct impact (ha)
Petaurus norfolcensis	Squirrel Glider	V	No	PCT 5 (poor condition) and PCT 277 (poor condition)	0.07
Inland Slopes IBRA Sub-region					
Crinia sloanei	Sloanes Froglet*	V	No	PCT 5 (poor condition), PCT 277 (native plantings) and PCT 277 (poor condition)	0.19
Keyacris scurra	Key's Matchstick Grasshopper	V	No	PCT 277 (poor condition), PCT 277 (moderate condition)	0.21
Polytelis swainsonii	Superb Parrot	V	No	PCT 5 (poor condition) and PCT 277 (poor and moderate condition)	0.9
Petaurus norfolcensis	Squirrel Glider	V	No	PCT 5 (poor condition) and PCT 277 (poor and moderate condition)	0.9

Threat status under the BC Act: V = Vulnerable, E = Endangered.

*Potential Sloanes Froglet habitat was not found to support any Froglets during targeted surveys undertaken in accordance with CoA E25

Existing development and land uses, such as agriculture and road infrastructure, have created barriers to movement for some fauna species, particularly those that are limited by dispersal abilities and habitat preferences. Vegetation removal for the Project may exacerbate fragmentation for the Squirrel Glider (*Petaurus norfolcensis*), whose movement is limited by gliding distances between areas of habitat. This species was recorded foraging in woodland patches at the Billy Hughes bridge enhancement site and in areas located 3 km to the north of the Uranquinty Yard clearances enhancement site. Potential impacts during Stage A would be limited as works are not occurring at the Billy Hughes Bridge site.

5.2.3 Impacts to aquatic biodiversity

Direct impacts from the Project on aquatic biodiversity would include the removal of riparian vegetation, temporary barriers to fish passage and potential mortality to aquatic flora and fauna from poor water quality.

Indirect impacts to aquatic biodiversity relate to the mobilisation of poor-quality stormwater runoff from construction activities including vegetation removal, earthworks, establishment and use of construction compounds as well as riverbank and streambed disturbance that would result in sedimentation and pollution downstream.

The potential impacts during construction are considered to be a moderate risk at one watercourse during Stage A works:

- Jeralgambeth Creek north arm (Junee to Illabo clearances) – this watercourse is defined as type 2 moderately sensitive KFH through the presence of some habitat features such as remnant pools and aquatic vegetation and a class 2 ephemeral watercourse. Potential impacts on this watercourse would be indirect during Stage A.

The aquatic biodiversity impact assessment prepared for the project as part of the EAD concluded that the impacts of the Project would not significantly compromise the functionality, long-term connectivity or viability of habitats, or ecological processes within watercourses in the study area. It was determined that most of the potential construction impacts are associated with indirect impacts on water quality and would therefore be temporary and managed through the adoption of appropriate erosion and sediment control measures. The Construction Soil and Water Management Plan (CSWMP) details how erosion and sedimentation would be controlled during construction. Site specific Erosion and Sedimentation Control Plans (ESCPs) will be developed for each enhancement site.

5.2.4 Habitat fragmentation

The BDAR concluded the project is considered unlikely to result in a large increase to landscape scale fragmentation and to further limit connectivity and movement corridors above what already exists in the project site. This is as the project occurs within an already highly fragmented landscape with limited large patches of remnant vegetation. The impacts from the project would largely involve small areas of disturbance of vegetation patches, which would not result in significant habitat fragmentation.

The predicted level of fragmentation from the project is not expected to be enough to prevent the breeding and dispersal of plant pollinators or the dispersal of plant propagules (i.e. seed or other vegetative reproductive material) between

habitat patches. The existing functional connectivity for many species would remain in the project site and be alleviated with connectivity mitigation measures.

5.2.5 Injury and mortality of fauna

A Fauna Handling and Rescue Procedure has been prepared as part of this plan and is attached as Appendix B. This Procedure applies to the handling of any fauna encountered during construction if required.

Injury and mortality of fauna could occur during construction activities. Injury and mortality may occur:

- During construction when vegetation and habitat are being cleared;
- During construction when machinery and plant are moved to, from and on-site;
- During construction with open excavations.

All roads and rail have the potential to result in the mortality of native animals. The risk is higher where roads and rail:

- Traverse areas of substantial animal habitat;
- Are located near natural or artificial water bodies;
- Contain food sources (e.g. mown grass verges, nectar-producing shrubs) which attract animals to the road edge;
- Have high-speed limits;
- Provide poor visibility of wildlife (e.g. due to bends, crests and poor lighting).

While it is not possible to eliminate the risk of roadkill and train strikes occurring, it is possible to minimise this through consideration of the above factors in the design of roads/access routes, landscaping, fauna connectivity structures and infrastructure and the implementation of road signs and speed limits. The provision of fauna crossings such as glider poles, incorporated into the design will reduce the likelihood of crossing attempts at inappropriate or dangerous locations and minimise operational train strike risk.

Measures to minimise roadkill will be delivered in the concept and detailed design processes of the roads and rail infrastructure including use of fauna crossings and landscaping plans.

During construction there would also be risks of wildlife strikes during workforce travelling to and from site. A driver code of conduct will be put in place for all vehicle drivers on the project to address safe driving behaviour. The project fauna handling and rescue procedure would apply to any wildlife strikes that happen during travel to and/or from construction sites. It is unlikely that the project would contribute significantly to vehicle strikes to native fauna, and the BDAR determined that the consequences of impacts to species are likely to be negligible.

5.2.6 Invasion and spread of weeds and pests

Thirteen high-threat weeds were recorded during field surveys, along with two (2) priority WoNS. Typically, weed invasion and spread is an indirect impact of projects that are often generated during construction by clearing vegetation and moving contaminated plant/equipment throughout the area. Other activities, including earthworks and movement of soil, can also result in the dispersal and introduction of weeds throughout the area.

5.2.7 Invasion and spread of pathogens and disease

The project has the potential to increase the spread of pathogens that threaten native biodiversity values, such as the soil-borne pathogen *Phytophthora cinnamomi* (Phytophthora) and *Austropuccinia psidii* (Myrtle rust). Phytophthora infects root systems whereas Myrtle Rust deforms leaves and leads to heavy defoliation. Both pathogens are associated with damage and death to native plants and may be dispersed over large distances.

Phytophthora can be spread through flowing water, such as storm runoff, or may spread within a site via mycelial growth from infected roots to roots of healthy plants. Propagules of Phytophthora may also be dispersed by vehicles (e.g. cars and earth-moving equipment), animals, walkers and movement of soil. Myrtle rust spores can be spread easily via contaminated clothing, hair, skin and personal items, infected plant material, and equipment as well as by insect/animal movement and wind dispersal.

The Project also has the potential to introduce or spread Amphibian Chytrid Fungus (Chytrid Fungus) (*Batrachochytrium dendrobatidis*). The accidental introduction or spread of Chytrid Fungus has the potential to adversely affect frog populations. Chytrid Fungus is a lethal and highly contagious frog disease that is detrimental to frogs and tadpoles. Chytrid is a water-borne fungus that may be spread as a result of handling frogs or through cross-contamination of water bodies, including through mud or moist soil.

The proposed construction activities could lead to an increased risk of dispersal of Phytophthora, Myrtle Rust and Chytrid Fungus through works involving soil disturbance, importation of fill and through the movement of water.

5.2.8 Water pollution

There is potential for sedimentation and spills to affect water quality in the waterways during the construction phase which could also affect native fish and frogs, including downstream of the construction footprint. Water pollution may also result from hydrocarbon leaks or spills from vehicles or equipment used during construction adjacent to waterways.

The CSWMP details how erosion and sedimentation would be controlled during construction. Site specific ESCPs will be developed for each enhancement site.

5.2.9 Noise, vibration, dust, light and contaminants

Construction in the project area may result in adverse impacts on locally occurring fauna species as a result of noise, vibration, dust and light. Increased noise, vibration, dust and light levels in the rail corridor and immediate surroundings are likely during construction.

Noise, vibration and light from construction sites would potentially disturb fauna and may disrupt foraging, reproductive, or movement behaviours, and may result in fauna temporarily avoiding habitats adjacent to the project site. Elevated levels of dust may be deposited onto the foliage of vegetation adjacent to the project area, resulting in reduced growth rates and decreases in the overall health of the vegetation.

Fauna are currently subject to varying levels of disturbance from noise, vibration and light as the Project site mostly encompasses an existing operational rail corridor that is located adjacent to existing roads in urban centres, rural townships and agricultural settings. Thus, there would be some habituation of fauna to noise and vibration in the study area. Given the project's ecological setting, the impacts from noise, vibration, dust and light emissions during construction are likely to be highly localised to the rail corridor and intermittent, with low impacts to flora and fauna species.

6 MANAGEMENT AND MITIGATION

A range of environmental requirements and mitigation measures are identified in the EAD. Specific safeguards and management measures to address impacts to biodiversity are identified within Section 6.1 to Section 6.11 and summarised in Table 19:.

6.1 Vegetation clearing process

Impacts to threatened ecological communities, threatened species and their habitat, including clearing of native vegetation, will be avoided and minimised to the greatest extent practicable during detailed design and construction planning for the project.

The following tasks are required to occur before clearing commencement:

- A clearing and grubbing work pack, Environmental Work Method Statement (EWMS) and/or sensitive area plans will be developed for construction teams;
- Opportunities to retain and protect native vegetation, fauna habitat and riparian habitat will be identified during construction planning through a review of design and construction methodologies;
- The predicted extent of clearing of native vegetation will be checked against the extent of clearing as permitted by CoA E20. The predicted extent of clearing will also consider the type of clearing (e.g. temporary or permanent);
- The extent of clearing required for construction of infrastructure is to be surveyed and marked out on site;
- The Martinus Rail Site Supervisor is to ensure the clearing limits and any exclusion and protection zones are delineated in accordance with the following requirements before clearing works commence. In areas that are not adjacent to biodiversity exclusion zones (refer below), the clearing limits will be delineated using regularly placed pegs or identification markers at a maximum distance of three (3) metres apart. In locations adjacent to biodiversity exclusion zones or where pegs and identification markers will not be suitably visible (for example, if obscured by existing vegetation), highly visible barrier or star pickets with tape such as colour-coded UV-stabilised rope, bunting, nightline, or other similarly robust and durable materials will be used ensuring a clear marking line;
- Biodiversity Exclusion Zones – include areas of retained vegetation, including riparian, retained threatened species habitats, habitat trees and areas of biodiversity value adjoining the project that are located in close proximity to work areas. Delineation of these areas will be completed per the requirements above and the extent will be verified by a suitably qualified ecologist prior to the commencement of clearing or any site activity that could damage the vegetation within the exclusion zone;
- Any habitat trees to be retained within and adjacent to the clearing extents are to be prominently marked and tagged;
- The Martinus Rail Environment, Sustainability and Approvals Manager (ESM) or delegate will ensure delineation installed is consistent with the requirements detailed above to reduce the risk of error or misinterpretation of boundaries and that exclusion zones are consistent with those identified as no-go zones within the SAPs.

6.1.1 Pre-clearing survey

The pre-clearing survey will undertake a pre-clearing survey within the proposed clearing extent prior to the commencement of clearing. The pre-clearing survey will include:

- Confirmation of the location and extent of any biodiversity exclusion zones (No-go zones) as well as verify the clearing extent as permitted by CoA E20;
- Identification and demarcation of all habitat trees within the proposed clearing extent with flagging (typically yellow), unique identifier numbers indicated by identification tags and GPS coordinates. Identification and demarcation may also occur during earlier surveys. If this is the case, the ecologist will confirm that habitat trees are prominently marked/tagged;
- Inspections of structures that provide potential microbat habitat;
- Identification of fauna that require relocation (including wild bees);
- Identification of nearby habitats for suitable release of fauna;
- Identification of suitable resources for salvage and beneficial reuse including, for example, hollows, tree trunks, logs, mulch, bush rock and root balls;
- Recording of GPS coordinates for all identified habitat trees, nests and habitat features during the pre-clearing survey;

- Native aquatic fauna salvage in watercourses of residual pools directly impacted by construction;
- Survey and identify weed species targeted at listed species under the *Biosecurity Act 2015*;
- Collection of seeds from native plants to be removed for use in revegetation and rehabilitation across the Project area.
- Manually disturbing Keys Matchstick Grasshopper habitat in areas of assumed presence by physical separation of grass tussocks and other refugia to encourage self-relocation outside the proposed clearing extents.

Additional consideration will be given to hollow-bearing trees that are identified as having a high-likelihood of containing threatened microbats or gliders. In particular, trees should be thoroughly inspected for scars, claw marks or staining in proximity to hollow-bearing trees scheduled for removal.

Where the project ecologist identifies hollow-bearing trees, with a high-likelihood to be occupied by threatened microbats or gliders, the project ecologist will carry out a dusk stag-watch. If there is no evidence of threatened microbat or glider activity, then no further consideration is recommended. In the event that any pre-clearing surveys or stag-watch indicates the presence of these species, their exclusion from habitat would be undertaken by the project ecologist.

The results of the pre-clearing surveys will be used to update and confirm the accuracy of the GIS and SAPs and these will be communicated and distributed to the construction team.

6.1.2 Management of fauna during pre-clearing

The project ecologist will capture and/or remove fauna that have the potential to be disturbed as a result of clearing activities and relocate any captured fauna into nearby suitable habitats documenting the location of any fauna release sites per the Fauna Handling and Rescue Procedure (Appendix B). If any unexpected finds are identified, the Unexpected Finds Protocol (Appendix A) will be followed.

Prior to the demolition of any structures a diurnal pre-clearing survey is to be undertaken for microbats. Roost searches are to be carried out in a manner consistent with the methodologies provided in the NSW survey guide for the Biodiversity Assessment Method: 'Species credit' threatened bats and their habitats'. Diurnal surveys will consist of:

- Visual examination using a torch or extendable inspection camera (endoscope) of cavities in structures and hollows for roosting microbats
- Visual inspection of the structure for evidence of microbat usage (scat)
- Ultrasonic detection using Echo-meter, or similar hand-held device.

Immediately prior (24 hours) to construction works at a structure, a diurnal pre-clearing survey is required to determine whether the structure is free of microbats. A list of potential microbat roosting habitat is provided in Table 18.

TABLE 16 POTENTIAL MICROBAT ROOSTING HABITAT

Potential habitat feature to inspect	Southern Myotis	Bent-winged Bats
CONCRETE STRUCTURES		
Grab holes in culverts and bridge decking and girders	X	X
Expansion joints in concrete plank and Super-T bridges	X	X
Parapet of Super-T girders on bridges	X	X
Semi-open concrete abutments	X	X
Under concrete bridge piles	X	X
Scuppers on bridges and culverts	X	X
Join seals between reinforced concrete box culverts and BEBO arches	X	X
Aggregate/roughened sections of concrete and exposed steel reinforcement in culverts and stormwater drains	X	X
Roughened exposed areas and uneven surfaces including closure pours and the space between concrete girders and diaphragms under bridges	X	X
Purpose-built microbat habitat	X	X

Potential habitat feature to inspect	Southern Myotis	Bent-winged Bats
Fairy Martin, Welcome Swallow and Paper/Mud Wasp nests under bridges or in culverts	X	X
Cavities below pile caps in bridges	X	X
Bridges and wharves with protected concrete joins between decking, girders and/or headstock	X	X
TIMBER STRUCTURES		
Timber jetties and wharves with cavities from rotting timber or design features. Habitat not exposed to rain or direct sunlight	X	
Bridges – including the timber decking, split stringers, secondary stringers, cross girders, truss and support beams	X	X

Individual microbats are typically not clearly visible, but evidence of microbat activity may include:

- audible sounds of bat calls 'squeaking'
- bat scats/guano
- roosting bats concealed within the structure e.g. between culvert joins, lift holes or cracks
- discolouration or staining from urine
- presence of parasitic bat flies (Nycteribiid and Streblid)
- musty animal smells.

If there is no evidence of microbat activity and thorough inspection was possible, then no further consideration of microbats is recommended. In the event that any pre-clearing surveys or assessments and inspections of structures and vegetation indicates the presence of roosting/ hibernating bats or micro-bats, in the structures or elsewhere, their exclusion from habitat would be undertaken by the project ecologist.

Areas requiring demolition inspection will be identified by the Environment and Sustainability Manager, or delegate, in consultation with the Construction Manager, Area Manager or Foreperson and any specialist ecology consultants required.

Additionally, all native aquatic fauna salvaged from construction-impacted watercourses and residual pools will be relocated to similar habitat nearby.

6.1.3 Pre-clearing survey report

Following the completion of all pre-clearing surveys, a pre-clearing survey report is to be prepared which will include:

- Description of the presence of threatened flora species;
- Description of the presence or evidence of threatened fauna species (including fresh scats, scratches and remains of prey);
- Description and locations of identified habitat trees;
- Description and photographs of identified suitable resources for salvage and beneficial reuse;
- Description of identified weeds including the location of identified weeds;
- Details of weed management measures and controls for each of the weeds identified;
- Details of any fauna including aquatic fauna, salvaged and relocated;
- Details of native plant seeds collected.

6.1.4 Staged or non-staged clearing

All areas that need to be cleared will be subject to staged or non-staged clearing. Staged clearing occurs in locations where the ecologist identifies habitat and is typically referred to as 'two-stage clearing'. Areas where no habitat is identified by the ecologist may be cleared in one step. The project ecologist must be onsite to supervise the clearing

works during two stage clearing and in areas of known and assumed present threatened species habitat (i.e. species polygons).

Clearing – No habitat features identified (one-stage clearing)

If no habitat features have been identified by the Project ecologist in the pre-clearing surveys, then a two-stage clearing process is not required and clearing can be undertaken in a single step without the ecologist present. Examples include cropland/agricultural pasture areas and areas outside of known and assumed present threatened species habitat (i.e. species polygons).

All other demarcation and flagging are to occur as required for biodiversity exclusion zones or retained vegetation.

Clearing – Habitat features identified (two-stage clearing)

Two-stage clearing is required where habitat features have been identified by the Project ecologist during the pre-clearing surveys and in areas of known and assumed present threatened species habitat (i.e. species polygons). For these locations, the clearing area must be surveyed by the project ecologist within 24 hours or immediately before clearing to:

- Obtain updated information on fauna and flora habitat that is present, including:
  - Inspection of identified habitat features for evidence of fauna occupation;
  - Identify any fauna that will require relocation before clearing (including wild bees);
  - Document the location of any fauna release sites off easement;
  - Demarcate any newly identified habitat and confirm that habitat trees are prominently marked/tagged;
  - Confirm that habitat trees to be retained within and adjacent to the clearing extents are prominently marked/tagged;
  - Capture and relocate any identified non-mobile fauna;
  - Collect data on any newly identified threatened species in the area.
  - Identify any habitat features appropriate for salvage (See Section 6.2)

Initial clearing – Removal of non-habitat vegetation

In this first stage, non-habitat vegetation will be removed, and all marked habitat features will be retained until the final stage of clearing. This allows respite between the initial disturbance and the final removal of habitat. The changed environment and the disturbance from non-habitat vegetation clearing should encourage residing fauna to relocate voluntarily without human handling.

A respite period of a minimum of 24 hours after the removal of non-habitat vegetation is required to allow resident fauna the opportunity to vacate the remaining habitat before final clearing commences.

Final clearing – Removal of habitat vegetation

The project ecologist must be onsite to supervise the final clearing works. The project ecologist will:

- Thoroughly inspect all hollows that are accessible from the ground immediately before clearing;
- Carefully determine the appropriate felling methodology and supervise the removal of habitat features and hollows when trees are dropped to the ground;
- Ensure detected fauna are encouraged to self-relocate or capture and relocate any encountered fauna to pre-identified release sites;
- Ensure that any injured wildlife is transported to a veterinarian or wildlife carer;
- Where breeding fauna or dependent young are detected during the clearing works, consult with a licensed carer to determine whether the animal/s require ongoing care or can be safely relocated to an adjacent habitat.

Locations of fauna release (including GPS coordinates) will be recorded in a post-clearing report. Once all fauna habitat inspections and any required fauna removal are complete, the remaining vegetation clearing will commence.

6.1.5 Post-clearing Report

At the completion of clearing, the project ecologist will prepare a Post-Clearing Report. The report will include:

- Confirm the final area cleared, the number and identity of all vegetation removed, and specifically, the post-clearance abundance and density count of hollow-bearing trees;
- Information on clearing operations, dates, procedures, and areas;
- A breakdown of the spatial extent and type of clearing of each mapped Plant Community Type (PCT);

- A breakdown of the spatial extent and type of clearing of mapped threatened ecological communities and threatened flora;
- Fauna, nests or other fauna habitats were impacted by clearing works;
- Live animal sightings, captures, any releases or injured/shocked wildlife;
- The location of any fauna relocations;
- Fauna that may have died as a result of clearing;
- Photographs of any rescued fauna (where obtained);
- Reuse, relocation or disposal of snags, hollows or coarse woody debris will be included in the post-clearing report.

The spatial extent of clearing will be recorded in GIS file format. The clearing of native vegetation will be monitored and recorded to inform any final biodiversity offset requirements within the biodiversity offset package.

6.1.6 Vegetation clearing limits

All vegetation clearing will be undertaken in accordance with the requirements in this section. Clearing limits for threatened fauna species and plant community types will be limited to the area of impact allowed by CoA E20 detailed in Table 17 and Table 18.

In accordance with CoA E22, if potential or actual impacts to any threatened communities or species not listed in CoA E20 are discovered, all work that may impact the identified species or community will stop to prevent further impact and the Planning Secretary and DCCEEW (NSW) (and DCCEEW (Cth) where relevant) will be notified in writing. Work will not recommence until the relevant agencies have been consulted and any required approvals have been obtained. As noted above, no clearing of Sloane's Froglet habitat will be cleared in Stage A.

To manage the clearing of endangered native vegetation, all clearing of mapped threatened plant community types will be assessed by an ecologist prior to vegetation being removed. This information will then be tracked in a register with a corresponding GIS tool to ensure that the PCT impacts are in accordance with the limits outlined in the EAD.

TABLE 17: PLANT COMMUNITY TYPES CLEARING LIMITS

Name of Plant Community Type/ID	Area of impact (ha) per CoA E20	Expected area of impact Stage A
277 – Moderate – Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.5	0.50
277 – Poor - Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	1.44	1.25
277 – Derived - Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	2.3	2.3
277 – Native plantings - Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	0.26	0.26
277 – Non-native - Blakely's Red Gum – Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	30.5	30.5
5 - River Red Gum herbaceous-grassy very tall open forest wetland on inner floodplains in the lower slopes sub-region of the NSW South- Western Slopes Bioregion and the eastern Riverina Bioregion	0.04	0.02
Total	**34.78**	**34.81**

TABLE 18: CLEARING LIMITS FOR THREATENED FAUNA SPECIES

Fauna Species	Area of impact (ha) per CoA E20	Expected area of impact Stage A
Lower Slopes IBRA Subregion		
Sloane's Froglet (*Crinia sloanei*)	0.03	0.02
Squirrel Glider (*Petaurus norfolcensis*)	0.16	0.07
Superb Parrot (*Polytelis swainsonii*)	0.16	0.07
Inland Slopes IBRA Subregion		
Sloane's Froglet (*Crinia sloanei*)	0.23	0.19
Key's Matchstick Grasshopper (*Keyacris scurra*)	0.21	0.21
Squirrel Glider (*Petaurus norfolcensis*)	1.82	0.9
Superb Parrot (*Polytelis swainsonii*)	1.82	0.9
Total	**4.43**	**2.15**

6.1.7 Unexpected Finds Protocol

If during construction activities the project ecologist (or other project personnel) identify a threatened species or threatened ecological community that has not been (or is suspected to have not been) assessed as a part of the Project assessment, the Unexpected Finds Protocol (Appendix A) will be followed.

6.2 Re-use of woody debris and landscape features

Woody debris and snags (branches, trunks and whole trees that fall into rivers and streams) provide important habitat for aquatic and terrestrial flora and fauna.

In accordance with CoA E37, cleared native vegetation and other landscape features will be reused as part of the Project. If reuse is not practicable, consultation with the relevant council(s), land-care groups and relevant government agencies will be undertaken to determine if hollows, tree trunks, mulch, bush rock, root balls and collected plant material, seeds and/or propagated plants, can be used by others in habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options.

Suitable resources for salvage and beneficial reuse including hollows, tree trunks, logs, mulch, bush rock and root balls will be identified within pre-clearing surveys. Within the project, the following re-use would occur where practicable as directed by the project ecologist:

- Large woody debris will be retained for creek crossing works;
- Woody debris may also be used for terrestrial habitat creation;
- Snags removed as part of construction will be returned as close as possible to their original location;
- Coarse woody debris will be relocated within receiving sites determined to be suitable by the project ecologist during pre-clearing surveys.

The re-use of woody debris and snags in waterways would require approval from landowners and DPI Fisheries in the event of snags being proposed in waterways.

6.2.1 Fauna habitat transportation and placement

The transportation and placement of fauna habitat will depend on the amount and size of selected fauna habitat to be relocated. Pre-clearing survey reports will include the description and photographs of identified fauna habitat.

The Martinus Rail Area Manager and/or MR ESM or delegate will ensure the following best-practice methods are undertaken when relocating woody debris, bush rock, and other fauna habitat:

- Removal, stockpiling, transportation, and relocation of woody debris and bush rock will be carried out in a manner that minimises disturbance to native vegetation, including the canopy, shrubs, dead trees, fallen timber and groundcover species;
- The spread of any weeds or pathogens that may be in the soil will be avoided when relocating woody debris and bush rock from stockpiles;
- An ecologist will be engaged to provide advice on positioning fauna habitats such as woody debris and bush rock in designated relocation areas;
- Vegetation will not be cleared, and trees will not be felled to place habitat in a wooded area. If habitat cannot be easily placed in an area without clearing trees or shrubbery, an alternate recipient site will be sought;
- Topsoil disturbance will be kept to a minimum and will not be heaped up against woody debris and bush rock because of the potential to provide habitat for rabbits;
- Woody debris and bush rock will be placed appropriately for the target species as dictated by the project ecologist.

The re-use of woody debris would only be considered where landowner approval is granted.

6.3 Aquatic and riparian habitat

No instream works are permitted to occur during Stage A works, however works in vegetation riparian areas may occur during Stage A.

Activities within vegetated riparian zones will be managed to minimise impacts to aquatic environments as far as practicable. The project must protect the integrity of riparian corridors in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (DPE 2022) when carrying out work within 40 metres of a watercourse. Additionally, appropriate erosion and sediment control will be installed and maintained in accordance with *Managing Urban Stormwater: Soils and Construction (Landcom 2004).*Aquatic and riparian habitat will be managed during construction in accordance with Section 3.3.2 of the *Policy and Guidelines for Fish Habitat Conservation and Management Update* (DPI, 2013) including:

- Consideration of timing of clearing to avoid flooding risks;
- Retaining of tree roots or staged removal on the bank of a waterway in order to maintain bank stability;
- Existing trees, grasses and other ground cover will be retained within 15 metres of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area;
- Maintaining minimum flows and preventing barriers to fish passage;
- Developing a process for de-watering farm dams and the relocation of aquatic fauna;
- Avoidance of activities in aquatic habitats and riparian zones as much as practicable;
- Establishment of exclusion zones for vehicles, plant and equipment, and provision of exclusion fencing around sensitive areas;
- Keeping vehicles and machinery away from the banks of a waterway where possible;
- Preventing refuelling of vehicles and plant, and chemical storage and decanting within 50 metres of aquatic habitats;
- Temporary application of mulch will be managed to avoid the potential for material and tannin run-off into waterways, including limiting the application of mulch near waterways where practicable;
- Removal of all temporary works, flow diversion barriers and sediment control barriers within aquatic habitats as soon as practicable and in a manner that does not promote future channel erosion.

Works on waterfront land will be carried out in accordance with controlled activity guidelines. Where work is required within waterways, an EWMS for the work(s) will be prepared. The EWMS will detail the control measures to avoid or minimise erosion and any adverse impact on water quality and riparian fauna and flora as detailed in Section 6 of the CSWMP. Discharged water quality will be managed in accordance with Section 6.6 of the CSWMP. Clearing within riparian corridors impacted by the project will be undertaken in accordance with the vegetation-clearing process outlined in Section 6.1.

As per UMM BD10, instream works at Jeralgambeth Creek (Junee to Illabo clearances) will be undertaken in dry conditions as far as practicable. Where works cannot be conducted in the dry, appropriate erosion and sediment control will be installed in line with a site specific ESCP (i.e., a silt curtain or sediment boom around the work area and attached to the same side of the bank to maintain fish passage).

6.3.1 Permanent and temporary waterway crossings

Temporary waterway crossings will be required for the project however are not anticipated to be required during Stage A works. The Construction Contractors will design, construct and maintain temporary waterway crossings consistent with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) and maintain fish passage in accordance with DPI Fisheries guideline *"Why do Fish Need to Cross the Road? Fish Passage Requirements for Waterway Crossings.*

The design of temporary waterway crossings, stream diversions, drainage swales and depressions will be carried out by a suitably qualified and experienced professional in consultation with DPI Fisheries. During the construction of permanent waterway crossings, Martinus Rail will ensure that all reasonable and practicable measures are taken to prevent or minimise environmental harm including:

- Minimising restrictions of fish passage;
- Minimising the release of sediment into the stream;
- Minimising damage to, or the removal of, bank vegetation, particularly vegetation that shades the low-flow channel.

Where practical, construction works across the bed of a waterway should be staged to minimise the total disturbance at any given time and to allow the full bypassing of stream flows around the works to maintain fish passage. Instream structures (bridges and culverts) that provide for the flow of watercourses will be inspected and maintained to address any issues that may contribute to the blockage of fish passage.

6.4 Weed, pest and pathogen control

Weed, pest and pathogen management and control practices will be implemented throughout construction, including weed monitoring, to minimise the risk of spread into and out of the Project and between construction sites during construction of the project.

Construction personnel and subcontractors will be inducted in the importance of preventing weeds from entering the Project and the measures that must be taken for vehicles, machinery and plant used on the project.

Washdown bays will be established at designated points along the project and compounds. Washdown bays will contain apparatus to clean vehicles, plant, equipment and footwear. The location of washdown bays will be dependent on the biosecurity risks identified in that location. Water from washdown bays will drain to a contained sump/low point and materials (sediments) from washdown bays will be contained and disposed of in accordance with the Construction Waste, Contamination and Hazardous Materials Management Plan (CWCHMMP).

All vehicles and mobile plant will be inspected on arrival on site or at the construction compounds. If plant or equipment arrives on the project site unclean it will either be washed down at the site compound or be removed from the project site by the supplier/owner and cleaned an appropriate facility. This process would also occur where plant is transferred between enhancement sites.

6.4.1 Biosecurity

The Biosecurity Regulation 2017 (Regulation) includes requirements for the notification of certain weeds, pests and diseases that are found in NSW and could have a severe effect on the economy, environment or community if not managed appropriately.

Weeds that require notification to sell or import into NSW are identified in Schedule 3 of the Regulation.

Pests and diseases that require notification are listed in:

- Schedule 2 of the Act;
- Schedule 1 of the Regulation.

The list of notifiable pests and diseases in the *Biosecurity Act 2015* and *Regulation* is large and they typically require specialist knowledge to identify. The list is not, therefore, repeated within this plan. No notifiable pests or diseases were identified as occurring or likely to occur in the project area.

As per the A2P CEMF, any movement restrictions (e.g. fire ant zone restrictions) will be assessed prior to undertaking the movement of high-risk material (e.g. soil, gravel, ballast).

Biosecurity incident

A biosecurity incident on the project means the detection of a terrestrial contaminant or terrestrial species on freight, people, plant, or equipment on the Project that was not previously identified in the EAD. In the event of a biosecurity incident that has occurred as a result of construction activities, the process outlined in the CEMP will be implemented.

Incident management and response will be undertaken in accordance with the incident reporting procedures detailed within the CEMP.

Several instances require notification in accordance with the *Biosecurity Act 2015* and *Biosecurity Regulation 2017*. These include the requirement to notify a biosecurity event and the requirement to notify a certain pest or disease as outlined above.

6.5 Unexpected threatened species finds

If any threatened species or threatened ecological community are unexpectedly encountered, the Unexpected Threatened Species Finds Procedure (Appendix A) will be implemented.

6.6 Fauna rescue and release procedure

Handling of fauna during the project may be required if fauna is encountered during construction and is required to be relocated or transported to a vet or wildlife carer in the case of injury. Fauna encountered will be managed in accordance with the Fauna Handling and Rescue Procedure (Appendix B) The purpose of the Procedure is to detail the actions to be implemented in the event that fauna (including injured, shocked, dependent juvenile or other) is discovered that requires handling during construction of the project.

6.7 Vegetation rehabilitation

Stage A will present little opportunity for permanent rehabilitation works as the end state of Stage A would not be the completion of works at any site. There will also be no decommissioning of project infrastructure or sites undertaken as part of Stage A. Where there is a gap in construction at enhancement sites between Stage A and Stage B erosion and sediment controls would be put in place in accordance with Managing Urban Stormwater: Soils and Construction Vol 1 4th ed. by Landcom, 2004 (The Blue Book).The site stabilisation principles presented in Chapter 7 of the Blue Book would be generally followed to minimise potential erosion and sediment impacts and stabilise the enhancement sites between stages. This may include revegetation of select areas to reduce runoff.

As further disturbance would occur at all sites during Stage B rehabilitation opportunities in Stage A are unlikely.

A rehabilitation strategy will be developed for Stage B of the project. The strategy will be based on the Inland Rail Landscape and Rehabilitation Strategy, the Inland Rail Landscape and Rehabilitation Framework and property-specific reinstatement commitments. The strategy would incorporate the following Project CoAs and UMMs related to vegetation rehabilitation:

- In accordance with CoA E34 riparian land and watercourses disturbed during construction will be rehabilitated and revegetated with native species of local provenance from the relevant native vegetation community on completion of Work impacting the riparian land in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (DPE 2022) and *A Rehabilitation Manual of Australian Streams* (Rutherfurd et al. 2000);
- In accordance with CoA E36 seeds from native plants to be removed will be collected before clearing ideally during spring through to mid-summer and used in revegetation and rehabilitation across the project area. This will be undertaken as part of the pre-clearing survey detailed in Section 6.1.1. Plant propagation must ensure that native species of local provenance from the relevant native vegetation community are available for successful revegetation and landscaping;
- As per UMM BD8 and BD9, riparian areas subject to disturbance will be progressively stabilised and rehabilitated and aquatic habitat will be returned to pre-works condition (or better) in accordance with the rehabilitation strategy.

Resources that may be available within the enhancement sites subject to Stage A works will be identified for salvage where possible per Section 6.1. This includes vegetative and soil resources which may be reused beneficially during the rehabilitation and restoration of the site. Seed collection would ideally take place from Spring through to mid-Summer.

6.8 Biodiversity offsets

As required by CoA E20 and E21, biodiversity offsets will be made in the form of the retirement of ecosystem and species credits. These offsets are documented separately in the BAM Biodiversity Credit Report which forms part of the BDAR. The number of biodiversity offset species credit obligations that must be retired (prior to impacting the biodiversity values).

In accordance with CoA E23, the retirement of the credits will be carried out in accordance with the BC Act prior to impact. Evidence of the retirement of credits in satisfaction of CoA E24 will be provided to the Planning Secretary prior to impacts to the biodiversity values.

6.9 Sloane's Froglet Surveys

Sloane's Froglet was listed as having the potential to occur within the Project site in Appendix D2.8 of the Albury to Illabo (A2I) Project Environmental Impact Statement Technical Paper 8 - Biodiversity Development Assessment Report (BDAR) (ARTC, 2022a). As seasonal survey timeframes could not be met prior to the publishing of the Albury to Illabo Environmental Impact Statement (EIS), the species was assumed present in areas where suitable habitat values were present (ARTC, 2022b).

Per CoA E25 targeted surveys were undertaken by NGH during July and/or August for Sloane's Froglet in all areas where that species was assumed present. The Methods and Results report for these surveys is attached as Appendix D of this CBMP.

Overall, the survey effort for the Albury to Illabo (A2I) section of Inland Rail was completed in accordance with CoA E25 and the NSW Survey Guide for Threatened Frogs (DPIE, 2020). The target species, Sloane's Froglet (*Crinia sloanei*), was not detected aurally or visually at any site. The survey report noted that based on the results, a Sloane's Froglet Management Plan is not required as the species does not occur in the project area. Condition E25 of the CoA has been satisfied and there is no further survey or other work required for Sloane's Froglet to fulfill this condition.

6.10 Fauna Connectivity Strategy

The Fauna connectivity strategy would be prepared for Stage B works at Billy Hughes Bridge and Uranquinty. Monitoring to inform this strategy would occur during Stage A works.

6.11 Management and mitigation measures

A range of environmental requirements and management measures are identified in the EAD and CoA. Specific measures and requirements to address biodiversity impacts are outlined in Table 19. The following mitigation measures have been developed with consideration of SMART (specific, measurable, achievable, relevant and time-based) principles.

TABLE 19: BIODIVERSITY MANAGEMENT AND MITIGATION MEASURES – STAGE A

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
General						
CB-01	Training will be provided to all project personnel, including relevant sub-contractors on biodiversity management practices and the requirements from this Plan through inductions, toolbox talks and activity-specific training.	All	Pre-construction	MR ESM	Good Practice	Toolbox Talks Project Induction Training Records
CB-02	Construction workforce will be supplied with sensitive area maps (showing clearing boundaries and exclusion zones), including updates as required.	All	Pre-Construction Construction	MR ESM	UMM BD7 A2P CEMF	Sensitive Area Plans
CB-03	All personnel must drive to the conditions, speed limits and road rules. Any fauna strikes must be reported to IRPL as soon as possible.	All	Pre-Construction Construction	MR ESM MR Safety Manager All personnel	Good Practice	Fauna Handling Record Sheet
CB-04	Should changes to the project's design or construction methodology or additional field surveys result in increased impacts to biodiversity that have not been included in the Final BDAR, these will be assessed in accordance with the requirements of the BAM by an accredited assessor.	All	Detailed Design Pre-Construction Construction	MR ESM Project ecologist	CoA E21	Additional BDAR (if required)
CB-05	Detailed design and construction planning will identify refinements that further avoid or minimise the need to further impact or disturb native vegetation, fauna habitat and riparian habitat.	All	Detailed Design Pre-Construction Construction	MR ESM MR Design Manager	UMM BD1	Detailed Design Reports Environmental Work Method Statements Construction Work Methods Statements
CB-06	Impacts to plant community types and threatened species habitat must not exceed the impacts identified in CoA E20. Prior to impacts on the biodiversity values of the CSSI, the number and classes of	All	Pre-Construction Construction	MR ESM MR Design Manager	CoA E20 CoA E21 CoA E25 CoA E26	Detailed Design Reports Post-clearing Report Project Clearing Register Retirement Evidence per CoA E24

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	ecosystem credits and species credits (like-for-like) as set out in the BAM Biodiversity Credit Report which forms part of the Final BDAR, will be retired in accordance with the BC Act. Evidence of retirement be provided to DPHI prior to impact.			MR Project Manager MR Site Supervisor MR Engineers		
CB-07	Works within the Tree Protection Zones of retained trees within or immediately adjacent to the disturbance area will be planned with consideration of the tree protection measures outlined in managed in accordance with AS4970–2009 Protection of Trees on Development Sites. Where practicable, appropriate measures will be implemented to minimise the impact of the works on the long–term health of these trees.	All	Pre-Construction Construction	MR ESM MR Site Supervisor MR Engineers	Good Practice AS4970–2009 Protection of Trees on Development Sites.	Weekly Environmental Inspection Checklist Sensitive Area Plans Environmental Work Method Statements Construction Work Methods Statements
CB-08	The project disturbance footprint/construction boundary to be delineated by a surveyor before works commence.	All	Pre-Construction	MR ESM MR Site Supervisor MR Engineers	Good Practice	Project disturbance footprint survey/GIS layer
CB-09	The project's fauna handling and rescue procedure would be implemented for: ▪ All activities conducted by site personnel (including sub-contractors) that have the potential to encounter fauna that will need to	All	Pre-Construction Construction	MR ESM Project ecologist	Good Practice	Fauna Handling Record Sheet

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	be relocated or removed from site; and ▪ Vegetation clearing and land disturbance. Handling of fauna may be necessary for fauna to be relocated or, if injured, taken to a vet or wildlife carer. A wildlife licence and/or scientific licence must be held by any staff handling fauna and should be undertaken either by the Project Ecologist or a person skilled in handling the species of fauna encountered.					
Pre-clearing and clearing						
CB-10	The clearing of native vegetation will be minimised to the greatest extent practicable with the objective of reducing impacts to threatened ecological communities, threatened species and their habitat.	All	Detailed Design Pre-Construction Construction	MR ESM MR Design Manager MR Project Manager MR Site Supervisor MR Engineers	CoA E19	Detailed Design Reports Pre-clearing Survey Reports Environmental Work Method Statements Construction Work Methods Statements

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
CB-11	Pre-clearance surveys will be carried out prior to construction by a suitability qualified ecologist. This would include but not be limited to: ▪ Inspections of artificial and natural structures that provide potential microbat habitat. If bats are identified roosting in these structures, individuals will be excluded from this habitat (meaning bats can exit the habitat unharmed during their nocturnal activity period but not re-enter); ▪ Native aquatic fauna salvage in watercourses of residual pools directly impacted by construction, including but not limited to Sloane's Froglet mapped habitat areas. All salvaged aquatic fauna will be relocated to similar habitat nearby; ▪ Pre-clearance disturbance survey including mapping of weeds and development of suitable controls to manage them Verification that the area cleared is correct and within the boundary and GIS data provided to IRPL.	All	Pre-Construction Construction	MR ESM Project ecologist	UMM BD5	Pre-clearing Survey Reports Fauna Handling Record Sheet

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
CB-12	The project ecologist must be onsite to supervise the clearing works during two stage clearing and in areas of known and assumed present threatened species habitat (i.e. species polygons). They will: ▪ Thoroughly inspect all hollows that are accessible from the ground immediately before clearing; ▪ Carefully determine the appropriate felling methodology and supervise the removal of habitat features and hollows when trees are dropped to the ground; ▪ Ensure detected fauna are encouraged to self-relocate or capture and relocate any encountered fauna to pre-identified release sites; ▪ Ensure that any injured wildlife is transported to a veterinarian or wildlife carer; ▪ Where breeding fauna or dependent young are detected during the clearing works, consult with a licensed carer to determine whether the animal/s require ongoing care or can be safely relocated to an adjacent habitat. Locations of fauna release (including GPS coordinates) will be recorded in a post-clearing report. Once all fauna habitat	All	Pre-Construction Construction	MR ESM Project ecologist	Good practice	Pre-clearing Survey Reports Fauna Handling Record Sheet Post-clearing report

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	inspections and any required fauna removal are complete, the remaining vegetation clearing will commence.					
CB-13	At the completion of clearing, the project ecologist will prepare a Post-Clearing Report.	All	Pre-Construction Construction	MR ESM Project ecologist	Good practice	Post-clearing report
Exclusion zones						
CB-14	Exclusion areas will be established and maintained around native vegetation and riparian vegetation identified for retention	All	Pre-Construction	MR ESM Project ecologist	UMM BD6	Weekly Environmental Inspection Checklist Sensitive Area Plans

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	and protection, particularly areas of biodiversity value adjoining the project site that are located in close proximity to work areas and identified on the Sensitive Areas Maps for consideration.		Construction	MR Site Supervisor MR Engineers		Pre-clearing Survey Report Environmental Work Method Statements Construction Work Methods Statements
CB-15	No works to the substructure of the Murray River Bridge or instream works in the Murray River or Oddies Creek will be undertaken.	Murray River Bridge Oddies Creek	Detailed Design Pre-Construction Construction	MR ESM MR Design Manager MR Project Manager MR Site Supervisor MR Engineers	CoA E33	Detailed Design Reports Weekly Environmental Inspection Checklist Sensitive Area Plans Environmental Work Method Statements Construction Work Methods Statements
Threatened species management						
CB-16	A species Unexpected Finds Protocol will be implemented if TECs, flora and fauna species, not assessed in the biodiversity assessment, are identified in the project site and will include stop work orders in the immediate area and notifying the Department of Planning and Environment (DPE).	All	Pre-construction Construction	MR ESM MR Site Supervisor MR Engineers	UMM BD14	Unexpected Finds Protocol
CB-17	Construction workforce will be supplied with sensitive area maps (showing clearing boundaries and exclusion zones), including updates as required.	All	Pre-Construction Construction	MR ESM MR Site Supervisor MR Engineers	UMM BD7	Sensitive Area Plans

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
CB-18	Temporary frog exclusion fencing will be considered where construction compounds/laydown areas occur adjacent to mapped potential Sloane's froglet breeding habitat. [Feedback received during the preparation of this plan identified that frog fencing is not recommended by BCS as a mitigation for Sloane's Froglet.]	Areas adjacent to Sloanes Froglet habitat.	Detailed Design Pre-Construction Construction	MR ESM Project ecologist MR Site Supervisor MR Engineers	UMM BD9	Weekly Environmental Inspection Checklist Sensitive Area Plans Temporary Work Designs Environmental Work Method Statements Construction Work Methods Statements
CB-19	If potential or actual impacts to any threatened communities or species not listed in Condition E20 are discovered, all work that may impact the identified species or community must stop to prevent further impact. The Planning Secretary and DCCEEW (NSW) (and DCCEEW (Cth) where relevant) will be notified in writing. Work will not recommence until the relevant agencies have been consulted and any required approvals have been obtained.	All	Detailed Design Pre-Construction Construction	MR ESM Project ecologist MR Project Manager MR Site Supervisor MR Engineers	CoA E22	Communications with the Planning Secretary and DCCEEW (NSW) (and DCCEEW (Cth) where relevant). Monitoring Report
CB-20	In all remaining areas that assumed the presence of Sloane's Froglet (*Crinia sloanei*), erosion and sediment control measures and protection of riparian areas must be installed in accordance with **Conditions C10, E173, and E174** prior to work in these area.	Identified Sloanes Froglet habitat.	Stage B Pre-Construction/ Construction	MR ESM Project ecologist MR Site Supervisor MR Engineers	CoA E28	CSWMP Sensitive Area Plans Erosion and Sediment Control Plans Weekly Environmental Inspection Checklist

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
Habitat retention						
CB-21	Seed from native plants to be removed will be collected before clearing and used in revegetation and rehabilitation across the project area. Plant propagation must ensure that native species of local provenance from the relevant native vegetation community are available for successful revegetation and landscaping.	All areas where seed can be collected.	Stage A Pre-Construction/ Construction	MR ESM Project ecologist	CoA E36	Pre-clearing Survey Reports Rehabilitation Strategy (Stage B)
CB-22	Cleared native vegetation and other landscape features will be reused. If reuse is not practicable, consultation with the relevant council(s), land-care groups and relevant government agencies will be undertaken to determine if hollows, tree trunks, mulch, bush rock, root balls, collected plant material, seeds and/or propagated plants, can be used by others in habitat enhancement, beneficial re-use and rehabilitation work, before pursuing other disposal options.	All	Stage B Construction	MR ESM Project ecologist	CoA E37	Pre-clearing Survey Reports Rehabilitation Strategy (Stage B)
CB-23	Riparian land and watercourses disturbed during construction will be rehabilitated and revegetated with native species of local provenance from the relevant native vegetation community on completion of Work impacting the riparian land in accordance with the Controlled activities – Guidelines for riparian corridors on waterfront land (DPE 2022) and A	All	Stage B Construction	MR ESM MR Design Manager Project ecologist MR Site Supervisor MR Engineers	CoA E34	Pre-clearing Survey Reports Rehabilitation Strategy (Stage B)

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	Rehabilitation Manual of Australian Streams (Rutherfurd et al. 2000).					
Lighting						
CB-24	Where works are undertaken at night, direction lighting will be used and directed away from vegetated areas where practicable.	All	Detailed Design Construction	MR ESM Project ecologist MR Site Supervisor MR Engineers	Good Practice	Weekly Environmental Inspection Checklists Temporary Lighting Designs Construction Work Method Statements
Soil and water quality						
CB-25	Before undertaking any work and during maintenance or construction activities, erosion and sediment controls will be implemented and maintained to prevent water pollution consistent with Managing Urban Stormwater: Soils and Construction Vol 1 4th ed. by Landcom, 2004 (The Blue Book).	All	Pre-Construction Construction	MR ESM MR Site Supervisor MR Engineers	CoA E174	CSWMP Erosion and Sediment Control Plans Weekly Environmental Inspection Checklist
CB-26	Soil and water quality management measures will be implemented in accordance with the Soil and Water Management Plan to minimise erosion during clearing.	All	Pre-Construction Construction	MR ESM MR Site Supervisor MR Engineers	Good Practice	CSWMP Erosion and Sediment Control Plans Weekly Environmental Inspection Checklist
Biosecurity						
CB-27	Where weeds are present in locations that are accessed for construction activities,	All	Pre-Construction	MR ESM Project ecologist	Good Practice	Weed Monitoring Report Weekly Environmental Inspection Checklists

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	they will be managed in consultation with the relevant landholder. Consultation would also occur with the relevant authority (LLS Local Land Services, the relevant local council, or NSW DPI) in relation to notifiable weeds.		Construction	MR Site Supervisor	Biosecurity Regulation 2017 Biosecurity Act 2015	
CB-28	In the event of new infestations of notifiable weeds as a result of construction activities, the relevant control authority will be notified as per the *Biosecurity Act 2015* and *Biosecurity Regulation 2017.*	All	Construction	MR ESM Project ecologist MR Site Supervisor	Good Practice Biosecurity Regulation 2017 Biosecurity Act 2015	Weed Monitoring Report Weekly Environmental Inspection Checklists
Working in waterways and on waterfront land						
CB-29	Refuelling will be conducted outside of waterfront land, so far as is practicable, with appropriate measures in place to avoid impacts to waterways, aquatic habitats and groundwater. This includes spill kits always kept with maintenance vehicles and or machinery within 100 m of a watercourse.	All	Construction	MR Site Supervisor	UMM BD15	Weekly Environmental Inspection Checklist Sensitive Area Plans Temporary Work Designs Environmental Work Method Statements Construction Work Methods Statements
CB-30	Fish passage will be maintained at Jeralgambeth Creek (Junee to Illabo clearances) during construction.	Junee to Illabo clearances	Construction	MR ESM MR Design Manager	UMM BD4	Weekly Environmental Inspection Checklist Temporary Work Designs Environmental Work Method Statements Construction Work Methods Statements
CB-31	Activities within vegetated riparian zones will be managed to minimise impacts to	All	Detailed Design	MR ESM	UMM BD8	Detailed Design Reports

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
	aquatic environments as far as practicable. Riparian areas subject to disturbance will be progressively stabilised and rehabilitated.		Construction	MR Design Manager MR Site Supervisor MR Engineers		Weekly Environmental Inspection Checklist Environmental Work Method Statements Construction Work Methods Statements Landscape Design Reports Rehabilitation Strategy (Stage B)
CB-32	Instream works at Jeralgambeth Creek (Junee to Illabo clearances) will be undertaken in dry conditions as far as practicable. Where works cannot be conducted in the dry, appropriate erosion and sediment control will be installed (i.e. a silt curtain or sediment boom around the work area and attached to the same side of the bank to maintain fish passage). Appropriate erosion and sediment control will be installed and maintained. Aquatic habitat will be returned to pre-works condition.	Junee to Illabo clearances	Detailed Design Construction	MR ESM MR Site Supervisor MR Engineers	UMM BD10	Weekly Environmental Inspection Checklist CSWMP Erosion and Sediment Control Plans Environmental Work Method Statements Construction Work Methods Statements Rehabilitation Strategy (Stage B) Landscape Design Reports
CB-33	Instream structures (bridges and culverts) that provide for the flow of watercourses will be inspected and maintained to address any issues that may contribute to the blockage of fish passage.	All	Construction	MR ESM MR Site Supervisor MR Engineers	UMM BD14	Weekly Environmental Inspection Checklist
CB-33	When carrying out work within 40 metres of a watercourse the integrity of riparian corridors would be protected in accordance with the *Controlled activities – Guidelines for riparian corridors on waterfront land* (DPE 2022).	All	Detailed Design Construction	MR ESM MR Design Manager MR Site Supervisor	CoA E173	Detailed Design Reports Weekly Environmental Inspection Checklist Environmental Work Method Statements Construction Work Methods Statements

ID	Management measure	Location	When to implement	Responsibility for implementation	Reference or source	Evidence of implementation
				MR Engineers		Landscape Design Reports Rehabilitation Strategy (Stage B)
Monitoring						
CB-34	Clearing of native vegetation will be monitored to confirm actual impacts to biodiversity values to inform any final biodiversity offset requirements.	All	Construction	MR ESM Project ecologist	Good Practice	Project Clearing Register
CB-35	Biodiversity monitoring will be undertaken in accordance with the Biodiversity Monitoring Program detailed in Section 7.3.	All	Pre-construction Construction	MR ESM Project ecologist	CoA C26	Monitoring Records and Reports per Section 7.3

7 COMPLIANCE MANAGEMENT

7.1 Roles and responsibilities

The project's organisational structure and overall roles and responsibilities are outlined in the CEMP. Specific responsibilities for the implementation of environmental controls are detailed in Table 19: of this BMP.

7.2 Training

To ensure that this Plan is effectively implemented, all site personnel (including sub-contractors) will undergo site induction training that includes construction biodiversity management issues prior to construction commencing. The induction training will address elements related to biodiversity management including:

- Existence and requirements of this Plan;
- Relevant legislation, regulations and conditions (where applicable);
- Existence of the SAPs;
- Clearing procedures;
- No-go/exclusion zones;
- Threatened species within the project area;
- Unexpected finds procedures for threatened species; and
- Biosecurity and weeds procedures.

Targeted training in the form of toolbox talks or specific training will also be provided to personnel with a key role in biodiversity management or those undertaking an activity with a high risk of environmental impact.

Daily pre-start meetings conducted by the Martinus Rail Foreman/Site Supervisor will inform the site workforce of any environmental issues relevant to biodiversity that could potentially be impacted by, or impact on, the day's activities.

Further details regarding staff induction and training are outlined in the CEMP.

7.3 Monitoring

The Construction Monitoring Program will be prepared in consultation with the relevant identified government agencies in order to compare the actual performance of construction against the predicted performance. This process informs management measures and is detailed in Table 20. Monitoring would occur at various locations along the Stage A alignment as required.

TABLE 20: CONSTRUCTION MONITORING REQUIREMENTS

Item	Scope	Frequency	Responsibility	Records/reporting
Weekly inspections	Inspection of the performance and effectiveness of exclusion zones when works are being undertaken in the Stage A areas.	Weekly	MR ESM MR Site Supervisors	Weekly environmental inspection checklist
Pre-clearing inspection	Inspecting Stage A work areas before clearing per Section 6.1.	Prior to clearing commencement	Project ecologist MR ESM	Pre-clearing Report Clearing Permit
During clearing supervision	Supervision of clearing operations and removal of habitat trees during two-stage clearing approach per Section 6.1.	Within 24 hours or immediately before clearing During the second stage of two-stage clearing	Project ecologist MR ESM	Pre-clearing report Clearing Permit
Monitoring vegetation clearing	Clearing of native vegetation will be monitored to confirm actual impacts to biodiversity values to inform any final biodiversity offset	Prior to and during clearing	MR ESM IRPL (offsets) Project ecologist	Project Clearing Register

Item	Scope	Frequency	Responsibility	Records/reporting
	requirements within the biodiversity offset package			
Fauna handling and rescue	Handling and rescue of fauna in accordance with the Fauna Handling Procedure	As discovered	MR Site Supervisor MR ESM	Fauna Handling Record Sheet
Weed Monitoring	The presence of weeds within the Project alignment	Annually	Project ecologist MR ESM	Weed Monitoring Report
Rehabilitation monitoring	Determine the success of rehabilitation efforts for riparian land and watercourses.	During the Stage B construction period	MR ESM MR Site Supervisor	Erosion and Sediment Control Maps Sensitive Area Plans Environmental Work Method Statements Weekly Environmental Inspection Checklists Landscape Design Reports
Vehicle hygiene inspections	Carry out inspection of all new vehicles and plant upon entering the site.	Inspection for all new vehicles and plant entering site	MR Site supervisors MR Plant supervisors MR ESM	Vehicle inspection forms. Vehicle hygiene register.

7.4 Inspections

Regular inspections of sensitive areas and activities will occur for the duration of the project. The project will carry out weekly site inspections. Weekly and other routine inspections by the ER will occur throughout construction. Details on the nature and frequency of these inspections are documented in the CEMP.

The inspections will check the implementation and effectiveness of the management measures identified in Section 6 and the environmental performance of the project relevant to biodiversity. Visual monitoring of delineated/fenced disturbance boundaries will be undertaken.

7.5 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of biodiversity management measures, compliance with this Plan, conditions of approval and other relevant approvals, licenses and guidelines. Audit requirements are detailed in Section 9 of the CEMP.

7.6 Reporting and identified records

Reporting requirements and responsibilities are documented in Section 10 of the CEMP. Additionally, in the event of an incident or non-compliance, the Planning Secretary will be notified in writing of the findings of the review conducted by the project relating to the incident or non-compliance.

The project will maintain accurate records substantiating all construction activities associated with the project or relevant to the conditions of approval, including measures taken to implement this Plan. Records will be made available to the Planning Secretary upon request, within the timeframe nominated in the request.

Monitoring reports will be submitted for information 60 days after the reporting period ends.

Reporting requirements and responsibilities specific to this CBMP are documented in Table 21.

TABLE 21: REPORTING REQUIREMENTS AND RESPONSIBILITIES

Item	Scope	Frequency	Responsibility	Recipient
Pre-clearing Report	Report that identifies the quantum of habitat (in hectares) of all protected matters and indicates the management measures to avoid or minimise impacts.	Within three (3) months of the commencement of the relevant activity	MR ESM Project ecologist	IRPL
Post-clearing report	Report summarising clearing details and outcomes provided within two (2) months of clearing completion.	Following the completion of clearing works	MR ESM	IRPL
Monitoring reporting	Reporting of biodiversity matters on the project in accordance with CoA C33.	Six monthly	MR ESM	IRPL ER Planning Secretary
Weed Monitoring Report	Weed survey results from weed monitoring.	Annually	MR ESM Project ecologist	IRPL
Rehabilitation Monitoring Record	Reporting of rehabilitation outcomes and results.	Annually	MR ESM Project ecologist	IRPL
Audit reports	Independent audits undertaken in accordance with the Infrastructure Approval will include audits of biodiversity measures (based on the Independent Auditor's program). Audit reports will be prepared. Further detail in relation to auditing is provided within Section 9 of the CEMP.	No greater than two (2) months from the date of the initial Independent Audit or as otherwise agreed by the Planning Secretary	MR ESM Independent Auditor	IRPL Planning Secretary

8 REVIEW AND IMPROVEMENT

8.1 Continuous improvement

Continuous improvement of this Plan will be achieved by the ongoing evaluation of environmental management performance against environmental policies, objectives and targets to identify opportunities for improvement.

Issues requiring management during construction (including cumulative impacts), as identified through ongoing environmental risk analysis, will be managed through SMART principles.

The continuous improvement process will be designed to:

- Identify areas of opportunity for improvement of environmental management and performance;
- Identify environmental risks not already included in the risk register;
- Determine the cause or causes of non-conformances and deficiencies;
- Develop and implement a plan of corrective and preventative action to address any non-conformances and deficiencies;
- Verify the effectiveness of the corrective and preventative actions;
- Document any changes in procedures resulting from process improvement;
- Make comparisons with objectives and targets.

Martinus Rail will be responsible for ensuring that project environmental risks are identified and included in the risk register and that appropriate mitigation measures are implemented throughout the construction of the project, as part of the continuous improvement process as outlined in Section 6 of the CEMP.

8.2 Update and amendment

The processes described in Section 10 of the CEMP may result in the need to update or revise this Plan.

Any revisions to this Plan will be in accordance with the process outlined in Section 10 of the CEMP. A copy of the updated Plan and changes will be distributed to all relevant stakeholders in accordance with the approved document control procedure.

The review and document control processes for this Plan are described in Section 10 of the CEMP.

APPENDICES

APPENDIX A

Unexpected Threatened Species Finds Procedure

Discovery of unexpected threatened entity i.e.
(a) any additional impact to threatened species or ecological communities that were included in the assessment but have been found at a new location
(b) to any threatened entity that was not offset.

Stop all work which is likely to impact on the threatened entity.
The person who discovered the find is to notify all project personnel woking in the immediate vicinity of the find(s) so that any potential disturbance activity can be halted.

Notify Site Supervisor and Environmental Manager

All personnel

Notify and consult the project ecologist and install deliniation (for flora and/ or fauna habitat)
Project ecologist to confirm if the threatened entity would be potentially impacted and confirm appropriateness of deliniation/ initial measures.

Is the species or community a listed threatened entity under State or Commonwealth legislation?

No

Yes

Has impact to the species or community in that location been assessed in the EAD and will the absolute clearing extent be within the restrictions posed by Condition E23?

Yes

The impact to the species or community was a assessed by the EAD and is permissible in that location (Any conditions of the Infrastructure Approval must also be considered). **The impact is therefore permissible**

Notify DPHI and BCS in writing on any additional mitigation measures to be implemented

No

The impact to the species or community was NOT addressed in the EAD , follow up investigation is required

Martinus Rail to consult with the Project Ecologist and ARTC when developing actions to assess and manage the find.

For EPBC Act species (and as required under the BC Act) conduct and assessment of significance and review controls to mitigate impacts. Where relevant consider additional controls to minimise impacts to the unexpected find

Consult with DPHI/BCS as relevant regarding propsed measures, impacts and follow up actions

Record find and follow up actions

Confirm with DPHI/BCS (as relevant) that proposed controls are adequate to proceed.

Records of the find to be submitted to BioNet.

Biodiversity assessment to be prepared and implemented (or alternatively the BDAR is to be updated with new impacts) and additional approval documents to be prepared as required.

Measures which can be implemented prior to impact are to be implemented.

Measures required to be implemented at a later date (i.e. any revision to the offsets) with be implemented following impacts

Records of the find to be submitted to BioNet

Martinus Rail Environment Manager or delegate authorises Unexpected Finds Hold Point Release

Recommence works with updated controls where necessary

APPENDIX B

Fauna Handling and Rescue Procedure

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FAUNA HANDLING AND RESCUE PROCEDURE – BIODIVERSITY

Albury to Illabo

CONTRACT NUMBER: 0052

PROJECT DOCUMENT NUMBER: 6-0052-210-PES-00-PR-0001

Document Control

DOCUMENT TITLE:	Fauna Handling and Rescue Procedure – Biodiversity		
DOCUMENT OWNER:	Chris Standing – Environment, Approvals and Sustainability Manager		
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SIGNATURE:		**DATE:**	13 August 2024
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Approved by

NAME	TITLE	SIGNATURE	DATE

Revision History

REVISION	REVISION DATE	AMENDMENT	DATE TO CLIENT
A	13 August 2024	First revision for client and ER review	13 August 2024
B	10 October 2024	Second revision for client and ER review and consultation	10 October 2024
0	10 December 2024	Third revision in response to BCS comments	10 December 2024

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1 INTRODUCTION

This Fauna Handling and Rescue Procedure (this Procedure) forms part of the Construction Biodiversity Management Plan (CBMP) prepared for the Albury to Illabo Inland Rail project and forms part of the overall environmental management framework for the project.

This Procedure applies to the handling of any fauna encountered during construction if required.

1.1 Induction and training

All Project personnel are to be inducted on the existence of this Procedure during the Project Induction and in more detail as required in Site Inductions and regular Toolbox Talks. Records of all training, including inductions, will be maintained. Records will include the name and role of the attendee, the date of training/induction as well as the name of the course.

1.2 Scope

This procedure is applicable for the following:

- All activities conducted by site personnel (including sub-contractors) that have the potential to encounter fauna that will need to be relocated or removed from site and;
- Vegetation clearing and land disturbance.

Handling of fauna may be necessary for fauna to be relocated or, if injured, taken to a vet or wildlife carer. A wildlife licence and/or scientific licence must be held by any staff handling fauna and should be undertaken either by the project ecologist or a person skilled in handling the species of fauna encountered.

Should any threatened species be identified, the Unexpected Threatened Species Finds Procedure (Appendix A of the CBMP) will be implemented.

1.3 Permits and Licenses

A Scientific Licence under Part 2 of the *Biodiversity Conservation Act 2016* (BC Act) (including Animal Ethics Approval under the Animal Research Act 1985) is required for fauna handling/rescue and survey work. Where rescued fauna requires rehabilitation and care, only wildlife rehabilitation organisations authorised under Part 2 of the BC Act may be used. A wildlife licence and/or scientific licence must be held by any staff handling fauna.

2 GENERAL FAUNA HANDLING AND RESCUE PROCEDURE

This Procedure will be implemented only if intervention is necessary (i.e. where fauna is injured or otherwise unable to leave the site without intervention), or to minimise stress to native fauna and/ or remove the risk of further injury.

Fauna may be encountered in a variety of situations during delivery of the project. During staged clearing activities, any fauna handling will be carried out by the Project Ecologist or a trained fauna handler. During other construction activities or non-staged clearing (when the Project Ecologist or fauna handler may not be present on site), fauna may require handling by other Project personnel. Wherever possible, the Project Ecologist or trained fauna handler will be used.

Due to the remoteness and large distances between work sites, there may be times when the Project Ecologist or fauna handler is not present on-site, and it is more important to move the fauna from danger or harm. In these circumstances, Martinus Rail personnel may be required to handle the fauna (i.e. where that movement removes the fauna from danger or harm). Appropriate animal handling gear, as described below and in Section 3, should be kept at the site offices and in site vehicles where possible.

The Project must contact local veterinary clinics and/or wildlife carers at least seven days in advance of clearing works commencement to confirm their willingness to treat injured wildlife and advise them of the upcoming clearing schedule.

If wildlife (including aquatic) is discovered on the project site during construction activities that may harm the animal or pose a risk to site personnel, the following steps will be taken:

1. Stop all work in the vicinity of the fauna, turn off all machinery, and immediately notify the Foreman who is then to notify the Environment Manager. The Environment Manager is then to immediately notify the Project Ecologist to discuss the best course of action, e.g. if the animal is injured then take it to a wildlife rescue organisation or the closest Veterinary clinic;
2. Preferably allow fauna to leave the area without intervention if it is not injured or in shock and if safe to do so (i.e. no machinery in the immediate vicinity). In the event the Project Ecologist or local wildlife rescue cannot be contacted, the injured animal will be delivered to the closest vet as soon as possible. The contact details for available vets and WIRES are provided in Table 1;
3. Where necessary, to minimise stress to native fauna and/ or remove the risk of further injury before the appropriate rescue agency arrives onsite, Martinus Environmental Personnel shall cover the animal with a towel or blanket and place it in a cardboard box and/or hessian bag. Appropriate temporary housing for fauna is species-dependent. Gliders, possums, bats, snakes and lizards can be held individually in a calico bag until released in adjacent habitat. Healthy frogs are to be placed in separate, partially inflated single-use plastic bags and include a small amount of leaf litter or clean (i.e. washed in a 0.1 per cent concentration of a benzalkonium chloride-based disinfectant solution such as F10SC at 1:250 dilution and not re-used) damp cloth bag containing a small amount of leaf litter. Nesting birds and eggs are best placed in a covered cardboard box equipped with soft cloth.
    a. Place small animals in a cotton bag, tied at the top;
    b. Rescued fauna must be protected from exposure to heat and removed from the areas undergoing clearing activities to minimise noise exposure. Keep the animal in a quiet, cool, ventilated and dark place. A designated site would be decided upon in advance of any construction work;
    c. Aquatic fauna to be placed in a plastic aquarium or plastic bag with a sufficient amount of water sourced from the point of collection. Frogs would be transported without water or debris in recognition of the risk of transporting disease and the minimal transport time. Any frog handling would be undertaken in accordance with the Hygiene Guidelines (DPIE, 2020) (see Section 3.6);
    d. Some animals require particular handling (e.g. venomous reptiles, raptors) and should only be handled by appropriately qualified personnel;
    e. If handling bats, the handler must be vaccinated against the Australian Bat Lyssavirus (ABLV), which is a form of rabies and have appropriate licences to handle;
    f. Equipment for fauna rescue (including but not limited to a hessian sack, calico bags, cloths/ towels, single-use, non-latex, non-powdered (i.e. nitrile) disposable gloves, suitable animal handling gloves and transport boxes) will be kept in designated locations for emergency use by site staff if required. The fauna specialist will carry a fauna rescue kit in a site vehicle, and an additional kit will be located in the site office;
    g. Ensure a fully equipped standard first aid kit is on their person at all times, which should include a minimum of two snake bandages. Any animal handling must be undertaken by, or under the supervision of, a person with first-aid training;
4. If the animal cannot be handled but appears to be injured or in shock and has not moved on of its own accord, exclude personnel from the vicinity, record the exact location of the animal and contact the Project Ecologist and/ or rescue agency who will advise on a case-by-case basis;
5. If the fauna species is identified as a threatened species that is not a species identified in the CBMP, the Environment Manager must:

a. Immediately cease all work likely to affect the threatened species;
b. If the fauna is injured, call the rescue agency and notify the Project Ecologist; and
c. Implement the Unexpected Threatened Species Find procedure in Appendix A of the CBMP.

6. If the fauna is to be released, the Project Ecologist must identify suitable fauna release locations within or near the project site.

All relevant project documentation would be updated to display the new findings and subsequent management measures where required. This would include such documents as CBMP (and associated documents) and Sensitive Area Plans (SAPs).

If fauna is handled or moved during clearing activities, this will be recorded in post-clearing reports. Due to the linear nature of the Project, there will be a range of different roads and access tracks in which Project personnel or subcontractors may encounter fauna. The likelihood of encountering fauna during dawn and dusk is increased. If fauna is struck by a vehicle, the general fauna handling and rescue procedure is to be followed and the incident is to be recorded by the MR Environment team in the Incident Reporting Protocol (Table 2) and requires reporting via the incident management database per the Safety Management Plan.

3 SPECIFIC HANDLING REQUIREMENTS

3.1 Birds

General rescue approach for birds:

- If habitat trees are found to contain nestlings or juveniles prior to felling, then it would be preferable to leave trees intact until such a time that juveniles have vacated the nest or den. However, if construction timing does not permit this then attempts should be made to rescue juveniles for possible captive rearing and subsequent release into relocation sites;
- Where possible and safe to do so, gain access to nests/hollows and relocate to nearby safe areas avoiding the direct handling of eggs and chicks where possible. Nest platforms/poles and nest boxes will be considered on a case-by-case basis where they provide benefit to a threatened species and as advised by the project ecologist;
- Capture and remove any nestlings;
- Place nestlings in cotton capture bags and assess for injuries. Store bags containing nestlings in a pet-carrying cage or ventilated cardboard box. The animal container will be covered to reduce stress on the bird. Deliver to specialist wildlife carer;
- If adult birds are captured, they will be released away from construction activities; and
- Raptors should only be handled by experienced fauna handlers and with welders' gloves for the talons.

3.2 Small ground-dwelling mammals

General rescue approach for ground-dwelling mammals:

- If a small mammal is within the construction zone, activities in the area that may impact the animal may need to cease;
- Small mammals should be calmly encouraged or left to leave the work area;
- If small mammals are found during habitat removal, they will need to be captured and relocated;
- If an echidna is found, dig it out by hand or carefully by shovel to the side of the echidna. The aim is to get a hand(s) beneath the animal and to lift it from the soil. Ensure thick gloves are used if handling;
- If native rodents or bandicoots are found, capture them using your gloved hands or with a net and place them in a cloth bag;
- Handling of small mammals will be undertaken by suitably trained and qualified animal handlers; and
- Place small mammals in a larger container, such as a pet carry case. Captive mammals will be kept in a cool, well-ventilated location, out of direct sun. Uninjured small mammals will be translocated to adjacent un-impacted bushland and released as soon as possible.

3.3 Large ground-dwelling mammals

General rescue approach for kangaroos, wallabies, wombats and introduced pests:

- If a large mammal is within the construction zone, activities in the area that may impact the animal may need to cease;
- Large mammals should be calmly encouraged, or left, to leave the work area;
- In the event that a juvenile is displaced (thrown from a pouch) and cannot be reunited with its parent, it will be taken to a vet or wildlife carer;
- Gloves should be worn at all times when handling mammals to mitigate risks from kicking and scratching; and
- Introduced pests such as goats, deer and pigs should not be handled. All pest species should be corralled/ directed out of the project.

3.4 Arboreal mammals

General rescue approach for arboreal mammals:

- If arboreal mammals are found during vegetation clearing, the Project Ecologist/ fauna handler will determine if capture and relocation are warranted;
- Animals will be captured either by hand or net and placed into a suitable cage;
- If uninjured, captured animals will be released at a location deemed suitable by the Project Ecologist, and;

- In the event that juvenile possums/ gliders are displaced and cannot be reunited with their mother, they will be managed in accordance with the recommendations of the Project Ecologist or fauna handler. As required, the juvenile will be taken to a vet or wildlife carer.

3.5 Reptiles

General rescue approach for reptiles:

- Snakes will only be captured and relocated if they present a potential threat to construction personnel or are likely to be harmed by the works. In most cases, snakes will attempt to move away from a disturbed area;
- Reptiles will be captured by the Project Ecologist (when they are available) or by a person who is licensed under the Biodiversity Conservation Act 2016 to catch and release reptiles;
- Snakes will only be handled by approved personnel who are qualified and trained to do so;
- No contact handling techniques (i.e. use a snake hook and bag as opposed to manually handing the snake) are recommended for all snakes, and;
- Lizards will be released as soon as possible after capture into suitable habitats outside of the construction zone;

3.6 Amphibians

The Hygiene Guidelines (DPIE, 2020) must be followed for all frog handling to prevent pathogen spread amongst individuals and between catchments. General rescue approach for frogs:

- If there is no option other than to handle amphibians, single-use, non-latex, non-powdered (i.e. nitrile) disposable gloves must be worn when handling individuals. If gloves are not available, then avoid touching the frog with bare hands by using implements to transfer to a container;
- Healthy frogs are to be placed in separate single-use plastic bags which should be partially inflated or clean (i.e. washed in a 0.1 per cent concentration of a benzalkonium chloride-based disinfectant solution such as F10SC at 1:250 dilution and not re-used) damp cloth bag;
- Sick or injured individuals would be euthanised immediately unless there is a high probability of recovery, in which case treatment would be as for healthy frogs;
- Handling equipment, hands and boots to be cleaned of all soil and sprayed with a 0.1 per cent concentration of a benzalkonium chloride-based disinfectant solution (i.e. F10SC at 1:250 dilution) or a Chlorhexidine-based product (e.g. Halamid©) and rinsed when moving between water bodies. Hands may be disinfected using 70 per cent methylated spirits in water;
- Frogs and tadpoles are not to be moved between catchments;
- Dead frogs would be handled only using single-use gloves and buried in situ to avoid movement of pathogens.

3.7 Other mammals: Bats

General rescue approach for bats:

- Bats must only be handled by a qualified ecologist or wildlife carer experienced in bat handling and vaccinated against the Australian Bat Lyssavirus (ABLV);
- Gloves must be worn when handling bats;
- As soon as possible, captured microbats will be placed into a cloth/calico bag hung vertically in a quiet, cool, dark place until released at night;
- Larger bats would be handled by wearing elbow length puncture proof gloves, wrapped in a large towel and placed in a large cloth/calico bag;
- All bats will be relocated into adjacent suitable habitat at night;
- In the event that a juvenile bat is displaced and cannot be reunited with its parent, orphaned animals will be managed in accordance with the recommendations of the Project Ecologist or fauna handler. As required the juvenile will be taken to a vet or wildlife carer.

4 EUTHANASIA

4.1 When to euthanise

In some cases, rehabilitation and/ or relocation of fauna will not be possible. When it is not possible to transport an injured animal to a wildlife carer or veterinarian (e.g. when injuries are so extreme that survival is not possible), injured fauna must be assessed by the Project Ecologist or Martinus ER and a decision made regarding euthanasia. In keeping with the NSW Code of Practice for Injured, Sick and Orphaned Protected Fauna (Office of Environment and Heritage, 2011), fauna must be euthanised without exception when:

- Death is imminent or highly likely regardless of the treatment provided;
- The animal is suffering from chronic, un-relievable pain or distress;
- The animal is carrying (or suspected to be carrying) an incurable disease that may pose a health risk to wild animals;
- Its ability to consume food unaided is permanently impaired due to a missing or injured jaw, teeth or beak.

Fauna must be euthanised when one or more of the following circumstances apply:

- Its ability to locomote normally (i.e. run, climb, crawl, hop, fly or swim) is permanently impaired due to a missing or injured limb, wing, foot, backbone or tail;
- Its ability to sense its environment (i.e. see, hear, smell, taste or feel) is permanently impaired due to a missing or injured organ (e.g. eye, ear or nose);
- Its ability to catch or handle food is permanently impaired due to missing or injured digits (e.g. missing rear toe in raptors);
- Its advanced age renders it unable to survive in its natural habitat.

4.2 Euthanasia methods

A method appropriate for the species and circumstances should be utilised to ensure minimal pain and suffering. These methods could include:

- Stunning followed by decapitation and/or destruction of the brain for reptiles and amphibians;
- Stunning followed by cervical dislocation for small birds and mammals (less than 0.5 kg)
- Euthanasia carried out by a veterinarian for any other animal.

Any euthanasia methods utilised will be in accordance with those identified in the NSW Code of Practice for Injured, Sick and Orphaned Protected Fauna (Office of Environment and Heritage, 2011).

Fauna that requires euthanasia should not be exposed to additional stressors such as large numbers of onlookers, people touching it, loud noises or extreme temperatures.

Death must be confirmed prior to disposal of the carcass. The absence of a heartbeat and the loss of corneal reflexes indicate death has occurred.

The decision to euthanise an animal can only be made by the Project Ecologist and/or fauna handler. Euthanasia should be carried out by a licenced wildlife carer, veterinarian or the Project Ecologist.

5 CONTACT DETAILS

The contact details for the Project Ecologist and WIRES are provided within Table 1.

TABLE 1: CONTACT DETAILS

Role	Organisation	Location	Contact details
Project Ecologist	East Coast Ecology	Sydney, NSW	The contact details for the Project Ecologist will be retained by the MR project staff and available to personnel upon request
Wildlife Carers	WIRES	National service utilising local volunteers	1300 094 734
Veterinarian	Albury Animal Hospital	323 Wagga Rd, Lavington NSW 2641	(02) 6040 6995
Veterinarian	Wagga Wagga Veterinary Hospital	132 Urana St, Turvey Park NSW 2650	(02) 6926 0900
Veterinarian	Lake Road Vet on Broadway	113 Broadway, Junee NSW 2663	(02) 6926 2289

6 INCIDENT REPORTING PROTOCOL

For any incidents involving fauna, this form (Table 2) is to be completed and provided to the Environment Manager and filed appropriately.

TABLE 2: FAUNA RESCUE RECORDING SHEET.

Item	Detail
Date fauna located	
Time fauna located	
Weather (temperature, wind, cloud cover, precipitation)	
Location (Coordinates and description i.e. in tree hollow; under stockpile, open area etc)	
Fauna type (Mammal, bird, reptile etc)	
Species (if known)	
Visual signs of behaviour	
Condition, general health signs, description of injuries, note if a dead specimen	
Is the fauna injured (YES / NO)	
If YES, please complete Section A; If NO please complete Section B	
A – Injured Fauna Reporting	
What time was a fauna specialist (qualified ecologist or wildlife handler) called	
What time did the fauna specialist arrive?	
Fauna specialist name and contact	
What was the outcome? (e.g. Animal euthanized; animal in care; animal taken to vet; treated and relocated)	
B – Non-injured Fauna Reporting	
Where was the fauna relocated? (Coordinates and description) NB Only a qualified fauna ecologist or wildlife handler is to relocate fauna	
Time the fauna relocated?	
Name and qualification of fauna handler	
Visual signs of behaviour on release	
Condition – general health signs – on release	
General	
Other comments	
Completed by	
Signed	



MARTINUS

Head Office | 1/23-27 Waratah Street | KIRRAWEE NSW 2232

APPENDIX C

Sensitive Area Mapping - Biodiversity



Inland Rail - Albury to Illabo

Table Top Yard

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Keys Matchstick Grasshopper Polygons
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 30 60 m



Inland Rail - Albury to Illabo

Henty yard

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 50 100 m

INLAND RAIL MARTINUS



Inland Rail - Albury to Illabo

Yerong Creek Yard

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 50 100 m

INLAND RAIL MARTINUS


DAY STREET
MITCHELL STREET
DAVIDSON STREET
DRAPER-MISSEN STREET
RAILWAY STREET
URANA STREET
URANA STREET
LGH - The Rock Yard
OLYMPIC HIGHWAY
RAILWAY STREET
SCOTT STREET
MANGOPLAH ROAD
Inland Rail - Albury to Illabo
The Rock Yard
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
20
40 m
Rossmore
The Rock Recreation Ground
Marrocka Emus
The Rock
The Rock Cemetery
INLAND RAIL
MARTINUS


Junee - Harefield Yard
BYRNES ROAD
Inland Rail - Albury to Illabo
Harefield Yard
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
River Red Gum herbaceous
0
50
100 m
Harefield
Wallacetown



Inland Rail - Albury to Illabo

Junee Yard Clearances

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

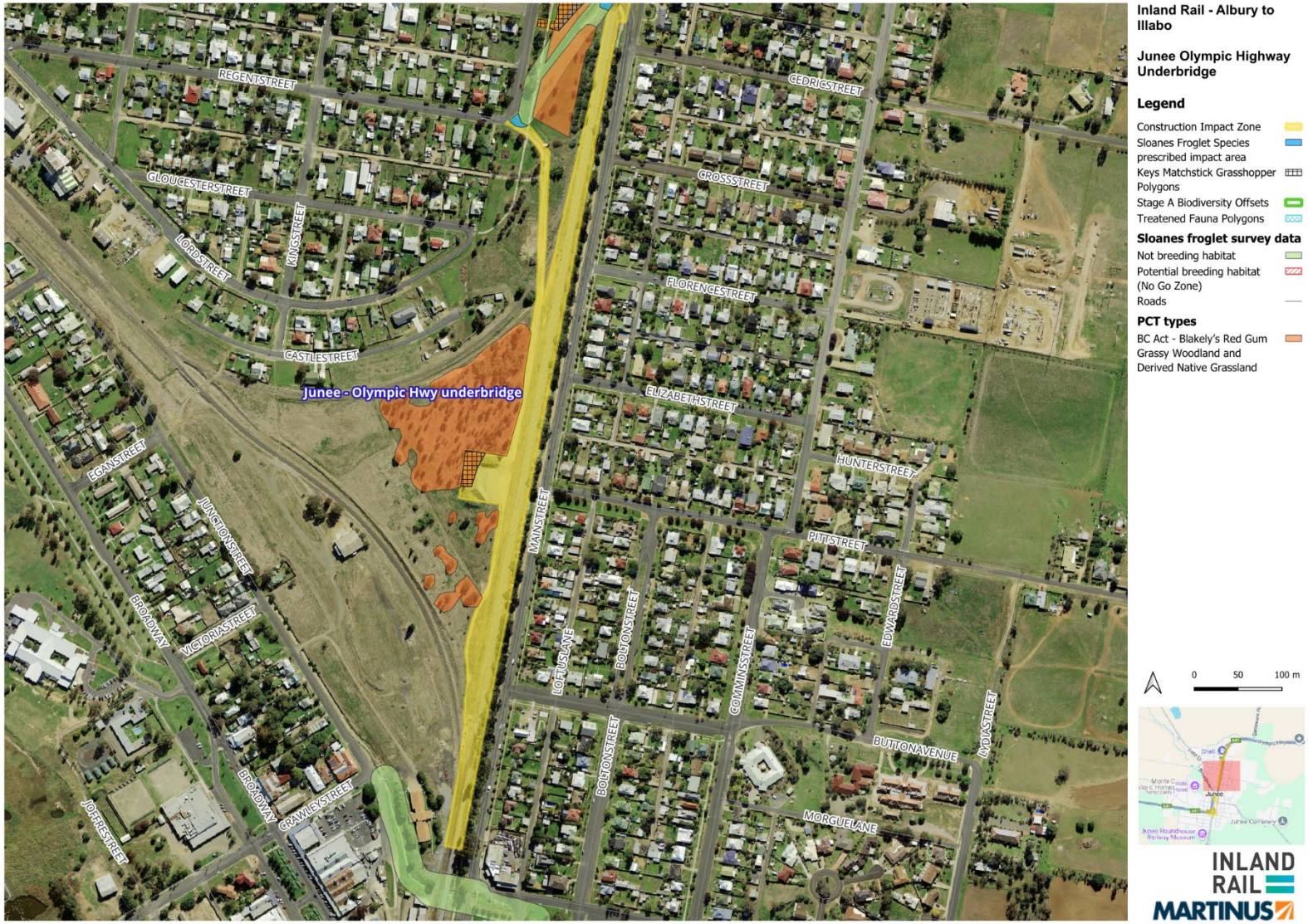
- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 40 80 m

INLAND RAIL MARTINUS


REGENTSTREET
GLOUCESTERSTREET
LORDSTREET
KINGSTREET
CASTLESTREET
Junee - Olympic Hwy underbridge
EGANSTREET
JUNCTIONSTREET
BROADWAY
VICTORIASTREET
JOHNSTREET
CRAWLEYSTREET
MAINSTREET
LOFTUSLANE
BOLTONSTREET
GEDRICSTREET
GROSSSTREET
FLORENCESTREET
ELIZABETHSTREET
HUNTERSTREET
PITTSTREET
COMMINSSTREET
EDWARDSTREET
INDIASTREET
BUTTONAVENUE
MORGUELANE
Inland Rail - Albury to Illabo
Junee Olympic Highway Underbridge
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Keys Matchstick Grasshopper Polygons
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
50
100 m
Junee
INLAND RAIL
MARTINUS



Inland Rail - Albury to Illabo

Junee Olympic Highway Underbridge

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Keys Matchstick Grasshopper Polygons
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 50 100 m

INLAND RAIL
MARTINUS


Junee - Junee to I2S dual track section
OLYMPIC HIGHWAY
WATERWORKS ROAD
Junee - Junee to I2S dual track section
MARINNA ROAD
OLYMPIC HIGHWAY
BAILLENGOARRA LANE
Inland Rail - Albury to Illabo
Junee to Illabo Clearances
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Keys Matchstick Grasshopper Polygons
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
100
200 m
Illabo Cemetery
Junee Cemetery
INLAND RAIL
MARTINUS


Junee - Junee to I2S dual track section
WORNES CREEK LANE
Junee - Junee to I2S dual track section
Inland Rail - Albury to Illabo
Junee to Illabo Clearances
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Keys Matchstick Grasshopper Polygons
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
100
200 m
Marinna
Illabo Cemetery
INLAND RAIL
MARTINUS


Junee - Junee to I2S dual track section
BRABINSROAD
OLYMPICHIGHWAY
MORRISSTREET
EURONGILLYROAD
Junee - Junee to I2S dual track section
BRABINSROAD
Inland Rail - Albury to Illabo
Junee to Illabo Clearances
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Keys Matchstick Grasshopper Polygons
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
100
200 m
INLAND RAIL
MARTINUS


OLYMPIC HIGHWAY
TURLANDS TREET
Junee - Junee to I2S dual track section
WARRENS LANE
Junee - Junee to I2S dual track section
OLYMPIC HIGHWAY
Inland Rail - Albury to Illabo
Junee to Illabo Clearances
Legend
Construction Impact Zone
Sloanes Froglet Species prescribed impact area
Keys Matchstick Grasshopper Polygons
Stage A Biodiversity Offsets
Treatened Fauna Polygons
Sloanes froglet survey data
Not breeding habitat
Potential breeding habitat (No Go Zone)
Roads
PCT types
BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland
0
100
200 m
INLAND RAIL
MARTINUS



Inland Rail - Albury to Illabo

Pearson St Bridge- Utilities

Legend

- Construction Impact Zone
- Sloanes Froglet Species prescribed impact area
- Keys Matchstick Grasshopper Polygons
- Stage A Biodiversity Offsets
- Treatened Fauna Polygons

Sloanes froglet survey data

- Not breeding habitat
- Potential breeding habitat (No Go Zone)
- Roads

PCT types

- BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 50 100 m

INLAND RAIL MARTINUS



Inland Rail - Albury to Illabo

Cassidy Parade and Edmonson Street Bridge- Utilities

Legend

Sloanes Froglet Species prescribed impact area

Sloanes froglet survey data

Not breeding habitat

Potential breeding habitat (No Go Zone)

Construction Impact Zone (CIZ)

CIZ

Stage A Biodiversity Offset

Treatened Fauna Polygons

Roads

PCT types

BC Act - Blakely's Red Gum Grassy Woodland and Derived Native Grassland

0 50 100 m

INLAND RAIL MARTINUS

APPENDIX D

Sloane's Froglet Survey

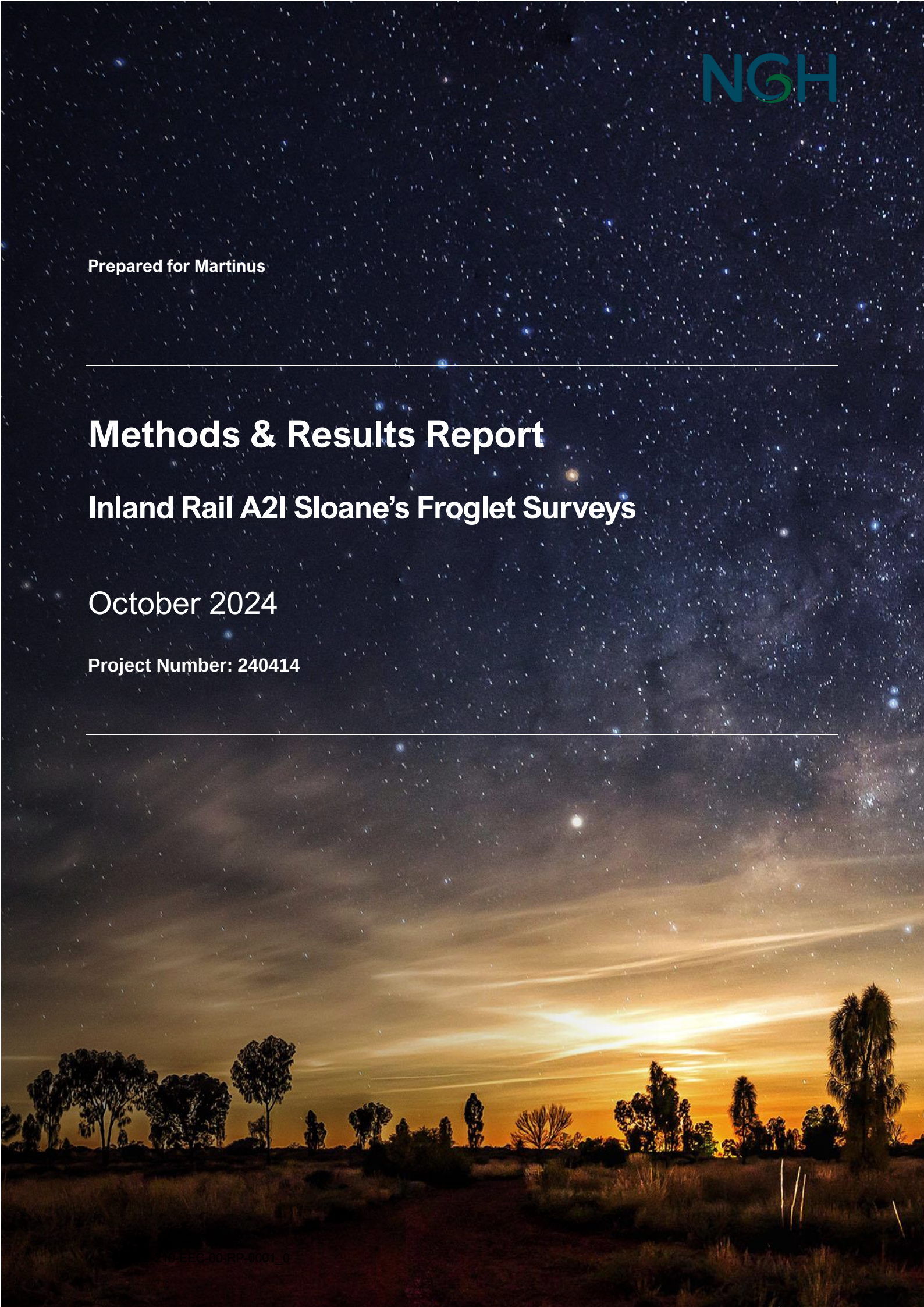
Prepared for Martinus

Methods & Results Report

Inland Rail A2l Sloane's Froglet Surveys

October 2024

Project Number: 240414



Document verification

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We acknowledge the traditional owners of this land and pay our respect to Elders past, present and emerging. We recognise that the First Nations peoples of Australia have traditionally managed the resources of this land in a sustainable way, and that they are the original stewards of the Australian environment.

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Acronyms and abbreviations

BC Act	*NSW Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
BOM	Bureau of Meteorology
CoA	Conditions of Approval
Cwth	Commonwealth
DPIE	(Former) Department of Planning, Industry and Environment (NSW) (now DPE)
EIS	Environmental impact statement
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
GDA	Geographic Datum of Australia
GIS	Geographic information system
GPS	Geographical positioning system
km	kilometres
m	metres
Sp/spp	Species/multiple species

1. Introduction

Martinus engaged NGH to undertake targeted amphibian surveys for the Albury to Illabo (A2I) section of Inland Rail. The A2I scope broadly includes works to enhance 185 kilometres (km) of existing rail corridor between Albury and Illabo, New South Wales (NSW). Surveys were conducted for one target species, Sloane's Froglet (*Crinia sloanei*) which is listed as Endangered at both state and commonwealth levels, under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwth) (EPBC Act). This memo details the Sloane's Froglet surveys undertaken by NGH on the proposed Project site on behalf of Martinus. Surveys were completed between 15 July – 22 August 2024.

2. Background

Sloane's Froglet was listed as having the potential to occur within the Project site in Appendix D2.8 of the *Albury to Illabo (A2I) Project Environmental Impact Statement Technical Paper 8 - Biodiversity Development Assessment Report* (BDAR) (ARTC, 2022a). As seasonal survey timeframes could not be met prior to the publishing of the *Albury to Illabo Environmental Impact Statement* (EIS), the species was assumed present in areas where suitable habitat values were present (ARTC, 2022b).

The surveys detailed in this memorandum were undertaken in response to the NSW Government Conditions of Approval (CoA), which stated that the Proponent must complete targeted surveys during July and/or August for Sloane's Froglet in all areas where that species was assumed present (condition E25) (NSW Government, n.d.). The CoA also stated that no works impacting areas where Sloane's Froglet presence was assumed are to be carried out prior to the completion of the targeted surveys. If the target species is identified on site, a *Sloane's Froglet Management Plan* must be prepared. Sloane's Froglet habitat mapping, demonstrating potential breeding habitat surrounding and within the Project site, was published in Appendix C-5 of the BDAR.

3. Methods

3.1. Survey methodology

Sloane's Froglet surveys were two-phased. First, areas of potential habitat illustrated within Appendix C-5 of the Albury to Illabo BDAR (ARTC, 2022a) were assessed by NGH ecologists in the field to determine the presence or absence of 'breeding habitat' as prescribed within the NSW Guidelines. Breeding habitat is defined as *"still or very slow sections of permanent and temporary streams as well as pools (e.g. farm dams) with vegetation located on the subject land"* p.15 (DPIE, 2020).

Where potential breeding habitat was confirmed, surveys were conducted using the aural-visual survey technique described in *NSW Survey Guide for Threatened Frogs* ('the guidelines') (DPIE, 2020). Aural-visual surveys are a combination of active listening for the calls of frogs and searching for individuals along a transect. The surveys included a call-playback component where a loudspeaker was used to broadcast the advertisement calls of the target frog species to elicit a response from any resident individuals who may not be actively calling.

Four replicates of Sloane's Froglet aural-visual surveys were undertaken after sundown within the July-August survey window, in accordance with the CoA and the NSW Government BioNet Atlas (NSW Government, 2008), to optimise the likelihood of recording Sloane's Froglet if present at a site.

Five hundred metre transects were located along potential breeding habitat, such as permanent and ephemeral streams and farm dams. Surveys were conducted between 6:00pm (or following full sun-down) and 1:00am. Observers actively listened for target species calls for 5-minutes during the aural survey. Where there was suitable breeding habitat, a call-playback (2 mins broadcast + 2 mins listening) was conducted. This was followed by five minutes of visual surveying covering 50 m of the transect using head lamps and hand-held torches to scan for frogs within 10 m of either side of the transect, making 15 mins of active survey per point. Sightings of non-target species were recorded opportunistically. Where there was less than 500 m of potential habitat, all available habitat was surveyed.

All field data was collected via Mergin Maps and recorded using NGH field forms. All survey data was georeferenced, and date and time of entries recorded. GPS tracks were collected with a handheld GPS or tracking app. These were used to compile GIS maps.

3.2. Survey team

The surveys were completed by:

- Jonathon Sweeney (Senior Ecologist)
- Michael Cleland (Ecologist)
- Stella O'Dwyer (Ecologist)
- Maddie Robertson (Ecologist)
- Marcus Hoskins (Ecologist)
- Ben Sloggett (Ecologist)
- Taylor Hume (Ecologist)
- Julia Chabros (Graduate Ecologist)
- Justin Solomons (Graduate Ecologist)
- Evan Creek (Graduate Ecologist).

3.3. Survey effort

Survey dates at each of the 21 sites are show in Table 3-1. For aural-visual surveys of Sloane's Froglet, the guidelines require 480 minutes (eight hours) of survey per 500 m of suitable breeding habitat (with call playback points approximately 50 m apart) over four replicates. The replicate requirement was met at all sites where potential breeding habitat was confirmed. Survey points along breeding habitat transects are shown in figures in Appendix A. Survey dates, number of survey points and the length of potential breeding habitat at each site is listed in Table 3-1. Overall, there was 9311 m of breeding habitat surveyed over 201 hours. The effort in parts of the Murray River, Albury, Billy Hughes, Uranquinty, Harefield, Junee 2 Illabo 3 and Junee 2 Illabo 4 sites did not meet the 480 minutes per 500 m survey effort requirement, however, the overall effort achieved for the sites significantly exceeded the effort required.

Table 3-1 Survey effort

No.	Site name	Survey dates	Length of confirmed potential breeding habitat (m)	No. of survey points	Survey time achieved in 1 night (min)	Survey time achieved in full effort (4 nights) (min)	Required survey effort achieved?
Total habitat inside Study Area: 3114 m **Total habitat outside Study Area:** 6197 m **Total breeding habitat:** 9311 m			**Effort required:** 2989 min inside Study Area, 5949 min outside Study Area **Effort undertaken:** 3480 min inside Study Area, 8580 min outside study area			**Total effort required:** 8938 min (149 hours) **Total effort undertaken:** 12,060 min (201 hours)	
1	Murray River Bridge	22-25 July 2024 12 August 2024	Inside Study Area: 28 m Outside Study Area: 245 m	Inside Study Area: 2 Outside Study Area: 2	Inside Study Area: 2 points x 15 min = 30 min Outside study Area: 2 points x 15 min = 30 min	Inside Study Area: 30 min x 4 reps = 120 min Outside Study Area: 30 min x 4 reps = 120 min	Inside Study Area: effort exceeded by 93 minutes Outside Study Area: effort insufficient by 115 min
2	Albury	15-18 July 2024	Inside Study Area: 664 m Outside Study Area: 0 m	10	10 points x 15 min = 150 min	150 min x 4 reps = 600 min	Effort insufficient by 37 min
3	Billy Hughes Bridge	15-18 July 2024 12-15 August 2024	Inside Study Area: 245 Outside Study Area A: 370 Outside Study Area B: 210	Inside Study Area: 4 Outside Study Area A: 9 Outside Study Area B: 3	Inside Study Area: 60 Outside Study Area A: 135 Outside Study Area B: 45	Inside Study Area: 240 Outside Study Area A: 540 Outside Study Area B: 135	Inside Study Area: effort achieved Outside Study Area A: effort exceeded Outside Study Area B: effort insufficient by 25

No.	Site name	Survey dates	Length of confirmed potential breeding habitat (m)	No. of survey points	Survey time achieved in 1 night (min)	Survey time achieved in full effort (4 nights) (min)	Required survey effort achieved?
							min
4	Table Top	15-18 July 2024 13-15 August 2024 21 August 2024	Inside Study Area: 16 Outside Study Area: 568	Inside Study Area: 1 Outside Study Area: 6	Inside Study Area: 15 Outside Study Area: 240	Inside Study Area: 60 Outside Study Area: 960	Inside Study Area: effort exceeded Outside Study Area: effort exceeded
5	Culcairn	22-25 July 2024	Inside Study Area: 61 Outside Study Area: 0	Inside Study Area: 1	Inside Study Area: 15	Inside Study Area: 60	Inside Study Area: effort satisfied
6	Henty	22-25 July 2024 6 August 2024 13-15 August 2024 20 August 2024	Inside Study Area: 0 Outside Study Area: 600	Outside Study Area: 12	Outside Study Area: 180	Outside Study Area: 720	Outside Study Area: effort exceeded
7	Yerong Creek	22 July 2024 29 July-1 August 2024 19-22 August 2024	Inside Study Area: 0 Outside Study Area: 160	Outside Study Area: 9	Outside Study Area: 135	Outside Study Area: 540	Outside Study Area: effort exceeded
8	The Rock	22-25 July 2024 29 July 2024 19-22 August 2024	Inside Study Area: 6 Outside Study Area: 387	Inside Study Area: 1 Outside Study Area: 13	Inside Study Area: 15 Outside Study Area: 195	Inside Study Area: 60 Outside Study Area: 780	Inside Study Area: effort exceeded Outside Study Area:

No.	Site name	Survey dates	Length of confirmed potential breeding habitat (m)	No. of survey points	Survey time achieved in 1 night (min)	Survey time achieved in full effort (4 nights) (min)	Required survey effort achieved?
							effort exceeded
9	Uranquinty	22-25 July 2024 29 July 2024	Inside Study Area: 148 Outside Study Area: 611	Inside Study Area: 3 Outside Study Area: 8	Inside Study Area: 45 Outside Study Area: 120	Inside Study Area: 180 Outside Study Area: 480	Inside Study Area: effort exceeded Outside Study Area: effort insufficient by 100 min
10	Pearson Street	22-25 July 2024	Inside Study Area: 300 Outside Study Area: 141	Inside Study Area: 8 Outside Study Area: 4	Inside Study Area: 120 Outside Study Area: 60	Inside Study Area: 480 Outside Study Area: 240	Inside Study Area: effort exceeded Outside Study Area: effort exceeded
11	Wagga Yard	Assessed on 22 July 2024, no suitable habitat	-	-	-	-	-
12	Bomen	29 July-1 August 2024 19-22 August 2024	Inside Study Area: 21 Outside Study Area: 344	Inside Study Area: 1 Outside Study Area: 14	Inside Study Area: 15 Outside Study Area: 210	Inside Study Area: 60 Outside Study Area: 840	Inside Study Area: effort exceeded Outside Study Area: effort exceeded
13	Harefield	29 July-1 August 2024 19-22 August 2024	Inside Study Area: 55 Outside Study Area: 540	Inside Study Area: 2 Outside Study Area: 7	Inside Study Area: 30 Outside Study Area: 105	Inside Study Area: 120 Outside Study Area: 420	Inside Study Area: effort exceeded Outside Study Area:

No.	Site name	Survey dates	Length of confirmed potential breeding habitat (m)	No. of survey points	Survey time achieved in 1 night (min)	Survey time achieved in full effort (4 nights) (min)	Required survey effort achieved?
							effort insufficient by 98 min
14	Kemp Street	Assessed on 29 July 2024, no suitable habitat	-	-	-	-	-
15	Junee Yard	Assessed on 29 July 2024, no suitable habitat	-	-	-	-	-
16	Olympic Highway	Assessed on 29 July 2024, no suitable habitat	-	-	-	-	-
17	Junee 2 Illabo 1	30 July-1 August 2024 5 August 2024 19-22 August 2024	Inside Study Area: 0 Outside Study Area: 40	Outside Study Area: 2	Outside Study Area: 30	Outside Study Area: 120	Effort exceeded
18	Junee 2 Illabo 2	30 July-1 August 2024 5 August 2024 19-22 August 2024	Inside Study Area: 72 Outside Study Area: 226	Inside Study Area: 2 Outside Study Area: 7 Surveys in unsuitable habitat: 6	Inside Study Area: 30 Outside Study Area: 105	Inside Study Area: 120 Outside Study Area: 420	Inside Survey Area: effort exceeded Outside Study Area: effort exceeded
19	Junee 2 Illabo 3	30 July-1 August 2024 5 August 2024	Inside Study Area: 1175 Outside Study Area: 284	Inside Study Area: 17 Outside Study Area: 11	Inside Study Area: 255 Outside Study Area: 165	Inside Study Area: 1020 mins Outside Study Area: 660	Inside Study Area: effort insufficient by 108 min Outside Study Area:

No.	Site name	Survey dates	Length of confirmed potential breeding habitat (m)	No. of survey points	Survey time achieved in 1 night (min)	Survey time achieved in full effort (4 nights) (min)	Required survey effort achieved?
		19-22 August 2024					effort exceeded
20	Junee 2 Illabo 4	5-8 August 2024 19-22 August 2024	Inside Study Area: 150 Outside Study Area: 942	Inside Study Area: 2 Outside Study Area: 12	Inside Study Area: 30 Outside Study Area: 180	Inside Study Area: 120 Outside Study Area: 720	Inside Study Area: effort insufficient by 24 min Outside Study Area: effort insufficient by 184 min
21	Junee 2 Illabo 5	5-8 August 2024 19-22 August 2024	Inside Study Area: 173 Outside Study Area: 529	Inside Study Area: 4 Outside Study Area: 14 Plus 1 survey point of extra effort in area later determined unsuitable	Inside Study Area: 60 Outside Study Area: 210	Inside Study Area: 240 Outside Study Area: 840	Inside Study Area: effort exceeded Outside Study Area: effort exceeded Additional extra effort = 60 mins

3.4. Weather conditions

Weather conditions during survey influence survey success (DPIE, 2020). Generally, ideal conditions for amphibian surveys are warm (>18ºC) and moist (recent rainfall). However, particular species may differ such as Sloane's Froglet with the peak calling period occurring in winter. The weather data in Table 3-2 was drawn from Wagga Wagga AMO, station 072150 (Bureau of Meteorology, 2024). Weather during the survey period was cold to mild with variable rainfall. The weather conditions satisfied the guidelines' requirement to sample across a variety of conditions.

Table 3-2 Daily weather conditions for the duration of the surveys

Week	Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)	Max. wind gust (km/h)	RH 9am[1](%)
Week 1	15/07/2024	0.5	10.0	0.2	39	97
	16/07/2024	3.3	11.8	13.6	46	98
	17/07/2024	6.0	11.6	6.2	20	99
	18/07/2024	1.0	10.8	0.2	33	80
Week 2	22/07/2024	6.7	14.9	0.8	30	99
	23/07/2024	2.1	16.3	0	15	89
	24/07/2024	1.8	15.2	0	19	68
	25/07/2024	6.5	13.4	0	33	99
Week 3	29/07/2024	-1.5	12.1	0	33	77
	30/07/2024	-2.8	13.2	0.2	17	78
	31/07/2024	-2.2	14.7	0	19	78
	1/08/2024	-2.5	14.7	0	15	86
Week 4	5/08/2024	5.9	13.9	0	28	98
	6/08/2024	2.2	15.2	0.4	31	95
	7/08/2024	-0.8	16.1	0	24	81
	8/08/2024	0.7	16.9	0	28	96

[1] RH = relative humidity. Provided for 9am the following morning as best matches site conditions on survey night.

Week	Date	Temp min (°C)	Temp max (°C)	Rainfall (mm)	Max. wind gust (km/h)	RH 9am[1](%)
Week 5	12/08/2024	5.4	19.9	0	26	80
	13/08/2024	5.4	20.5	0	22	96
	14/08/2024	10.4	18.8	15.4	19	91
	15/08/2024	6.1	20.7	0.4	17	91
Week 6	19/08/2024	3.6	18.4	0	26	77
	20/08/2024	7	18.8	0.2	39	90
	21/08/2024	8.5	14.7	0	31	92
	22/08/2024	6.1	17.9	0	26	88

3.5. Limitations

The discussion on limitations below is based on the approach of the guidelines as well as particular limitations of the site.

Optimise time of year and meteorological conditions

Targeted surveys were taken at the optimal time of year and in mostly optimal conditions in terms of rainfall and temperature. However, some nights of surveys were conducted at low temperatures (Table 3-2). As some frog species can become less active in these lower temperatures, this may impact results for cold nights. As the surveys were taken across a range of conditions, as per the guidelines, this limitation has not affected the efficacy of the survey.

Identified potential habitat

Despite available research on habitat characteristics and key microhabitat components required for Sloane's Froglet (Knight A. , 2015; Knight, Watts, Allan, McDonald, & Lappin, 2024), we opted for the most conservative definition of potential breeding habitat as defined by the guidelines. This likely resulted in more areas categorised as potential breeding habitat than may actually occur. This limitation has ensured high survey coverage of the proposal area and a high confidence that Sloane's Froglet would be detected should it occur.

Some areas that were mapped as potential habitat in Appendix C-5 of the Albury to Illabo BDAR were not surveyed after habitat assessment (see Table 4-1). The sites that did not contain suitable habitat and were excluded completely were Wagga Yard, Kemp Street, Junee Yard and Olympic Highway. Other sites had areas that were excluded, such as a large concrete drainage spillway in Pearson Street that was filled with concrete slabs, or a depression with exotic grass and no water in Junee to Illabo 4. These areas lacked water and/or vegetation, and as a result do not meet the prescribed criteria for suitable Sloane's Froglet habitat.

Access

Visual surveying was difficult to accomplish in some areas where the watercourse was inaccessible due to steep drainage line walls, particularly in the southern section of the Albury site. In these instances, transects were completed along the verge or the drain, as close to the waterline as possible. As frogs were heard from these locations, this limitation has not affected the efficacy of survey.

Access to the areas identified in the BDAR was organised by Martinus, including entry into rail corridors and onto privately-owned land. There were several potential habitat areas that were inaccessible due to non-agreeance by private landholders: Some areas of private property at sites Junee 2 Illabo 1, Junee 2 Illabo 2, Junee 2 Illabo 3 and Junee 2 Illabo 4 were inaccessible for survey. Likewise, several dams and survey points at the Harefield, Bomen and Yerong Creek sites were inaccessible directly.

An assessment of habitat was made from closest access points (e.g. property fencelines) and where breeding habitat could not be observed, no surveys were undertaken. Where breeding habitat was observed or considered likely to occur, aural-playback surveys were conducted at points along the fence-line closest to the waterbody. Visual surveys were not possible; however, aural surveys confirmed the presence of conspecific frogs (e.g. Eastern Sign Bearing Froglet and Bibron's Froglet). This indicates a capacity for assessors to identify calling frogs present at the site, despite not having physical access. Sloane's Froglet were not recorded calling or responding to call-playback efforts across the four survey nights. This limitation is not considered to have affected the efficacy of the survey.

Site conditions

Proximity to roads and highways may have limited the efficacy of call playback at some sites due to noise competition with passing traffic. This was prevalent at all sites where survey points were within approximately 30 m of roadways. Some points were not surveyed due to proximity to main highway. For example, the southern habitat area for Billy Hughes Bridge ought to have had an additional survey point but due to proximity to Hume Freeway, this point was not utilised. This may have impeded the ability for local frogs to hear broadcast calls. This limitation is likely mitigated by the repetitive structure of the survey methodology giving multiple opportunities for call-playback within and across survey nights to maximise the opportunity for a successful response call were the target species present. Thus, the efficacy of the survey is satisfactory.

4. Results

Sloane's Froglet was not recorded at any of the 21 sites across the entire survey period. A summary of each site is provided in the Table 4-1. Details from each site are given in Appendix B.

Table 4-1 Results of *Crinia sloanei* targeted surveys

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
1	Murray River Bridge	This site had juvenile *Eucalyptus sp.* on the water's edge with some scattered *Acacia sp.* The understorey was made up mostly of Kikuyu grass (*Cenchrus clandestinus*). Several logs and debris were within the river. Eastern Sign-bearing Froglets (*Crinia parinsignifera*) recorded aurally. Murray River Bridge A contained fast flowing water and a strong current. The faster flow and small amount of riparian vegetation made this sub-site unsuitable breeding habitat for the target species. Murray River Bridge B had slow-moving water near the bank, which made the habitat suitable for the target species. Murray River C was made up of a string of ponds with overgrown vegetation, also suitable breeding habitat.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
2	Albury	The site consisted mainly of concrete drainage areas with stagnant or slow-moving water. Vegetation surrounding the water was predominantly exotic, and included Kikuyu (*Cenchrus clandestinus*), Privet (*Ligustrum lucidum*), Ash (*Fraxinus* sp.), and *Phalaris* sp. Native species included *Austrostipa sp*. No frog species were recorded aurally or visually. Albury A had a low level of slow flowing water in concrete drain, and vegetation along banks. Albury B was a concrete drain with no water, therefore, no habitat for the target species. Albury C had slow moving water with algae in deep concrete drain algae present. Albury D was a wide concrete drain, with shallow flowing or still water, and some vegetation surrounding it.	Absent	

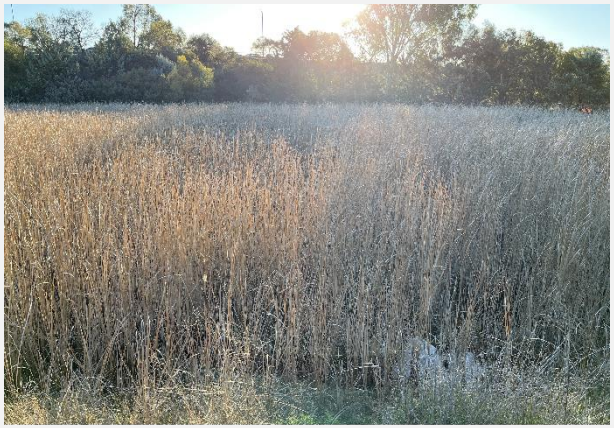
Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
3 & 4	Billy Hughes Bridge	Potential breeding habitat present; surveys undertaken. This site consisted of a dam and dry creek beds, as well as some riparian vegetation along the western side of the Hume Highway. The overstorey of the site consisted of *Eucalyptus melliodora, Eucalyptus camaldulensis* and *Eucalyptus bridgesiana.* With the understorey consisting of *Typha sp.,* Drain Sedge (*Cyperus eragrostis), Juncus sp.,* and *Phalaris sp.* Eastern Sign-bearing Froglets (*Crinia parinsignifera*), Spotted Marsh Frog (*Limnodynastes tasmaniensis*), Victorian Tree Frog (*Litoria paraewingi)* and Common Eastern Froglet (*Crinia signifera*) were recorded aurally. Potential Sloane's Froglet habitat occurred at Billy Hughes Bridge A, C, D and G. Billy Hughes Bridge A consisted of a dam surrounded by dead grass and weeds. Billy Hughes Bridge C was an ephemeral waterway, culvert and dam with nearby vegetation. Billy Hughes Bridge G consisted of a farm dam with pasture grasses, and Billy Hughes Bridge D was a natural waterway with groundcover and canopy layer vegetation. Billy Hughes Bridge B, D, E, F, H and I did not contain suitable breeding habitat. Billy Hughes Bridge E was a depression no water. Billy Hughes Bridge E was also a depressions with no water, and was situated around exotic pasture grasses and box gum woodland. Billy Hughes Bridge B consisted of a dry ephemeral creek bed. Billy Hughes Bridge H did not contain any	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
		water, and Billy Hughes Bridge I consisted of a very small puddle with still, murky water, unsuitable for breeding habitat.		
5	Table Top	The Northern area of the site contained two dams within private properties with agricultural land use, as well as a culvert under the roadway and train corridor that connected them. Vegetation around this area was sparse with weed species such as *Circium sp.* present. Potential breeding habitat occurred at Table Top B, D and F. Table Top D and F consisted of farm dams, and non-target frog species were heard calling. Table Top B contained water in the form of muddy puddles. Bibron's Toadlet (*Pseudophryne bibronii),* Spotted Marsh Frog (*Limnodynastes tasmaniensis*), Eastern Sign-Bearing Froglet (*Crinia parinsignifera*) recorded visually and aurally. Table Top A C and E did not contain water, and were predominantly dry pasture areas.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
6	Culcairn	Culcairn C was considered potential habitat as it contained a small stagnant pool of water that showed signs of previous flooding (flood lines on trees). Pool contained Cumbungi (*Typha sp.*) that had died off. No frog species were recorded visually or aurally. Not breeding habitat occurred in Culcairn A or Culcairn B. Culcairn A was a small standing pond with a strong sulphuric smell and no frogs. Culcairn B did not contain water.	Absent	
7 & 8	Henty	Site contained concrete culverts, as well as areas with water adjacent to revegetation areas as well as along a vegetated creek line with exotic understorey and a *Eucalyptus* dominant canopy. No frog species were recorded visually or aurally. Henty A consisted of a culvert with no water, and was unsuitable as breeding habitat. Henty B was considered suitable, as it consisted of a creek line lined with *Eucalyptus camaldulensis* and other native vegetation. Henty C and D could not be inspected due to access issues, and habitat suitability was assumed.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
9 & 10	Yerong Creek	Surveys were undertaken at Yerong Creek A, C, D and E. Yerong Creek A and D were dams that were clear of vegetation around the water and surrounded by exotic pastural grasses. Yerong Creek C was a small standing pool at a culvert, with *Juncus* sp. being the dominant vegetation. Yerong Creek E was a farm dam surrounded by exotic pasture grasses. Eastern Sign-Bearing Froglet (*Crinia parinsignifera*) recorded aurally. Yerong Creek B did not contain suitable habitat as it was a large concrete culvert that spanned under the railway corridor as well as the roadway, and a private property dam. The culvert area was dominated with Kikuyu (*Cenchrus clandestinus*).	Absent	
11	The Rock	Potential breeding habitat present; surveys undertaken. The site consisted of a stagnant drainage line with water underneath the train line at the wester end of the site. This area consisted mostly of exotic grasses, *Paspalum sp.* and Drain Sedge (*Cyperus eragrostis*). This connected to a drain that proceeded north, which was vegetated with *Typha sp.* which led to several larger dams on the other side of the tracks. These dams had a canopy cover consisting of Cootamundra Wattle (*Acacia baileyana*) and Pepper Tree (*Schinus molle*). Edges of dams were steep with deep water and Cumbungi (*Typha sp.*) prevalent. No frog species were recorded visually or aurally.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
12	Uranquinty	Uranquinty A was predominantly exotic groundcover and some canopy cover in northern edge. Uranquinty B consisted of small pools of water, and frogs were heard calling from the adjacent dam. Uranquinty D and E had small amounts of water. Eastern Sign-bearing Frog (*Crinia paringisnifera)* was visually and aurally recorded on site. No suitable habitat occurred at Uranquinty C, F and G, as no water was present at those sub-sites. Understorey vegetation at the southern end of the site consisted of exotic grasses, Kikuyu (*Cenchrus clandestinus*), *Phalaris sp.* and Drain Sedge (*Cyperus eragrostis*). Overstorey consisted of River Red-Gum (*Eucalyptus camaldulensis).* The middle of the site consisted of a drainage line, next to Pearson Street roadside. This area consisted of planted vegetation including Red Ironbark (*Eucalyptus sideroxylon*), Privet (*Ligustrum lucidum*), and Bamboo (*Bambusa sp.*). Understorey consisted of *Phalaris sp.* and some smaller Cootamundra wattles (*Acacia baileyana*). The northern portion of the site was vegetated with mostly weed species including; *Phalaris sp.* with some juvenile Ash (*Fraxinus sp.*).	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
13	Pearson Street	One part of this site was a large concrete drainage spillway that was filled with concrete slabs and was not suitable as habitat. Other areas; potential breeding habitat present and surveys undertaken. Pearson St E consisted of a dam and eroded drainage line. Pearson St B and D were also drainage lines, with limited to no vegetation. Pearson St A was not suitable as it contained fast flowing water. Pearson St C was potential habitat as it consisted of pools of stagnant water with frogs calling. Pearson St H and F were roads and dry road verges. Pearson St G was not able to be inspected and was assumed suitable. This site contained a dam that was vegetated with *Typha sp.* with planted overstorey surrounding the water. Understorey consisted of Silky Blue-Grass (*Dichanthium sericeum*), and exotic grasses (*Phalaris sp., Paspalum sp.*). Other areas of the site contained exotic overstorey consisting of Ash species (*Fraxinus sp.*) with Pampas Grass (*Cortaderia sp.*) and *Typha sp.* within the drainage lines. Eastern Sign-bearing Froglet (*Crinia parinsignifera*) and Common Eastern Froglet (*Crinia signifera*) were recorded aurally on site.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
14	Wagga Yard	No available breeding habitat. This site consisted of a gravel pile with no standing water present.	NA	NA
15	Bomen	This site consisted of several farm dams, within private properties and concrete culverts that drain from underneath the railway corridor. Some dams contained stags, as well as some *Eucalypts sp.* and *Juncus sp.* near the water's edge. Eastern Sign Bearing Frog (*Crinia parinsignifera*) recorded aurally on site. Bomen G contained dirty, odorous water which showed signs of chemical contamination and had some reeds, and was considered unsuitable breeding habitat. Bomen F was a dam with muddy water, bare banks, and pasture and swamp vegetation within 2 m of the water. Bomen E could not be accessed, and suitability was assumed. Bomen B consisted of a road and built up area, and was not suitable. Bomen C was a small dam with high water, fringing vegetation and frog activity, and was considered suitable habitat. Bomen D was a small dam with water, muddy banks, and vegetation. Bomen A was a temporary pond with water, and considered potentially suitable habitat.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
16 & 17	Harefield	The site consisted primarily of culverts that ran under the railway corridor and roadways, with minimal water found in these areas. Some Dams in private property were also surveyed, these areas had minimal riparian vegetation around the banks. Eastern Sign-bearing Froglet (*Crinia parinsignifera*) and Common Eastern Froglet (*Crinia signifera*) recorded aurally on site. Harefield D was a farm dam with low water and *Juncus* sp. on border. Harefield B was not suitable as it did not have water and consisted of gravel. Harefield C was not accessible and highly industrial and suitability was assumed. Harefield G consisted of a dam with water; highly disturbed (light, road noise, little vegetation). Harefield A was considered unsuitable as it has no watercourse or standing water, and no frogs were heard calling. Harefield F was considered suitable as it contained a farm dam and road drains. Harefield E consisted of shallow, temporary water in culverts and drains and was considered to be potentially suitable habitat.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
18	Kemp Street	No available breeding habitat. This site consisted of concrete drains running through the township of Junee, with no vegetation on either side. Water in these drains was minimal.	NA	
19	Junee Yard	No available breeding habitat. This site consisted of concrete drains running through the township of Junee with no vegetation on either side. Water in these drains was minimal.	NA	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
20	Olympic Highway	No available breeding habitat. This site consisted of a drain coming from underneath the Olympic Highway in north Junee, that flowed into a grass reserve depression which continued to another drain. Minimal water was found on site.	NA	
22	Junee 2 Illabo 1	This site contained 2 dams within private property farms along the Olympic Highway between Junee township and Illabo Township. Dams were absent of riparian vegetation with exotic pastural grass surrounding or cropped species. Other areas were made up of concrete and brick culverts, sometimes with still water within, other times dry of any water. These areas were covered in exotic vegetation mostly *Phalaris sp.* and *Paspalum sp.,* however some areas contained native Black-anther Flax-lily *(Dianella revoluta).* Overstorey in these areas were cleared within the rail corridor, yet some *Eucalyptus sp.* remained within private properties. Eastern Sign-bearing Froglet (*Crinia parinsignifera*) and Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally on site.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
		Junee 2 Illabo 1 A was a degraded farm dam and had no suitable vegetation, however, as water was present, it was considered to have suitable habitat. Junee 2 Illabo 1 B was a cropped wheat paddock with no water and no depressions, and was unsuitable. Junee 2 Illabo 1 D consisted of a farm dam with dirty stagnant water and no fringing vegetation and was considered unsuitable. Junee 2 Illabo 1 C had no water and exotic non-aquatic pasture species and was also determined to be unsuitable for breeding habitat.		
23, 24, 25 & 26	Junee 2 Illabo 2	Two private property dams were located on this site, other areas consisted of concrete drainage culverts, underneath the railway line and roadway. These locations had mostly disturbed habitat with exotic grasses being the dominant vegetation found. Some private property dams containing exotic vegetation and cropped vegetation surrounding water edges. Toward the northern end of the site within private property, there were some native trees within proximity to the water, these species were Blakely's Red Gum (*Eucalyptus blakelyi*) and Yellow Box (*Eucalyptus melliodora*), *Juncus sp.* Eastern Sign-bearing Froglet (*Crinia parinsignifera*) and Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally on site. Junee 2 Illabo 2 A was a culvert with temporary water and limited native vegetation, therefore, was considered not suitable. Junee 2 Illabo 2 B consisted of a drainage area with puddles of	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
		water and vegetation and was considered suitable habitat. Junee 2 Illabo 2 C consisted of rail and road culverts no vegetation, therefore, was unsuitable. Junee 2 Illabo 2 D was a farm dam with water, and was considered suitable habitat. Junee 2 Illabo 2 E consisted of culverts, muddy puddles and wet depressions in paddocks. Junee 2 Illabo 2 F consisted of cropped and pasture paddocks with no water, farm dam no vegetation. Junee 2 Illabo 2 G consisted of cropped and pasture paddocks with no water, farm dam no vegetation. Junee 2 Illabo 2 J contained puddles in vegetated drain beside rail track with frogs calling, therefore, potential suitable habitat. Junee 2 Illabo 2 H consisted of a road and cropped and pasture paddocks with no water. Junee 2 Illabo 2 I contained cropped and pasture paddocks with no water.		

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
26, 27, 28, & 29	Junee 2 Illabo 3	This site also contains public properties and concrete culverts along the Olympic Highway, these sites contained mostly exotic grasses *Phalaris sp.* and *Paspalum sp.* Private properties within this site consisted of a long-vegetated drainage line that connected to a concrete culvert within the railway corridor. This patch of habitat contained *Juncus sp.* around areas of water. This area also contained some native upper storey such as Yellow Box (*Eucalyptus melliodora*). Eastern Sign Bearing (*Crinia parinsignifera*) and Bibron's Froglet (*Pseudophryne bibronii*) and Suddell's Frog (*Neobatrachus sudelli)* were recorded aurally on site. Junee 2 Illabo 3 A contained water and fringing vegetation, with some canopy trees. Junee 2 Illabo 3 B did not contain water, therefore, was unsuitable for the target species. Junee 2 Illabo 3 D was a grassy overflow area that was temporarily inundated. Junee 2 Illabo 3 E was a farm dam with fringing vegetation. Junee 2 Illabo 3 F consisted of farms dams and adjoining creek with fringing vegetation (pasture grass and *Juncus* sp.). Junee 2 Illabo 3 C was a rail culvert with some water and minimal vegetation.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
30, 31 & 32	Junee 2 Illabo 4	Depression with exotic grass and no water not suitable habitat. Other areas are potential breeding habitat present; surveys undertaken. Sites along this section consist of private property dams with exotic vegetation surrounding, as well as drainage lines close to the southern borders of the Illabo township. Some private property dams and large water ways that flowed along the railway corridor could not be accessed. Eastern Sign Bearing (*Crinia parinsignifera*) and Bibron's Froglet (*Pseudophryne bibronii*) were recorded aurally on site. Junee 2 Illabo 4 A consisted of a farm dam, and was considered to be marginal habitat due to lack of vegetation. Junee 2 Illabo 4 B contained railway culverts with a concrete floor no vegetation. Junee 2 Illabo 4 C was a vegetated drain and farm dam with frogs calling. Junee 2 Illabo 4 I contained a Box Gum Woodland but no water. Junee 2 Illabo 4 D consisted of a farm dam with no vegetation near the water and exotic groundcover vegetation. Junee 2 Illabo 4 E consisted of muddy puddles and a vegetated culvert. Junee 2 Illabo 4 F consisted of culverts with stagnant water and without vegetation. Junee 2 Illabo 4 H was an overgrown ephemeral drainage line. Some areas of this sub-site were inaccessible. Junee 2 Illabo 4 G consisted of a road. Junee 2 Illabo 4 J contained small ephemeral puddles with exotic pasture species. Junee 2 Illabo 4 K contained inaccessible dams and vegetated drainage lines between.	Absent	

Map ID	Site	Habitat assessment	*C. sloanei* presence	Site photo
		Suitability was assumed and the area was surveyed from multiple points along the fence line, where frog calls were audible and multiple common frog species were recorded. Junee 2 Illabo 4 L consisted of stagnant water in pasture. Dams were inaccessible but appeared unsuitable (no vegetation).		
33 & 34	Junee 2 Illabo 5	This site contained some private property dams, one such dam was surrounded by planted Pine trees (*Pinus sp.)* with an exotic understorey made up of *Phalaris sp.* up until the banks which were sandy and clear. A vegetated drain ran the length of one side of this dam mainly *Phalaris sp.* with some *Juncus sp.* in areas with water. Eastern Sign Bearing (*Crinia parinsignifera*) and Bibron's Froglet (*Pseudophryne bibronii*) were recorded aurally on site. Junee 2 Illabo 5 A, B, C, D, F and H consisted of areas without water, therefore, were unsuitable for breeding habitat. Junee 2 Illabo 5 E consisted of a dam no vegetation, vegetated drainage lines, wet paddocks and culverts. Junee 2 Illabo 5 G was a drainage line with some water present. Junee 2 Illabo 5 J has water present in patches and native dominated vegetation, but no aquatic vegetation. Junee 2 Illabo 5 I was a farm dam with no vegetation. It was surrounded by dry grassy groundcover and the rail corridor and determined to be unsuitable habitat.	Absent	

5. Conclusion

In summary, the survey effort for the Albury to Illabo (A2I) section of Inland Rail was completed in accordance with Condition E25 of the CoA and the *NSW Survey Guide for Threatened Frogs* (DPIE, 2020). Identified limitations such as site conditions and access did not reduce the efficacy of surveys. Surveys were conducted during the appropriate survey window during July – August, as per the CoA and the guidelines with the appropriate number of replicates (four). The target species, Sloane's Froglet (*Crinia sloanei*), was not detected aurally or visually at any site.

Based on survey results, a Sloane's Froglet Management Plan is not required as the species does not occur in the project area. Condition E25 of the CoA has been satisfied and there is no further survey or other work required for Sloane's Froglet to fulfill this condition.

6. References

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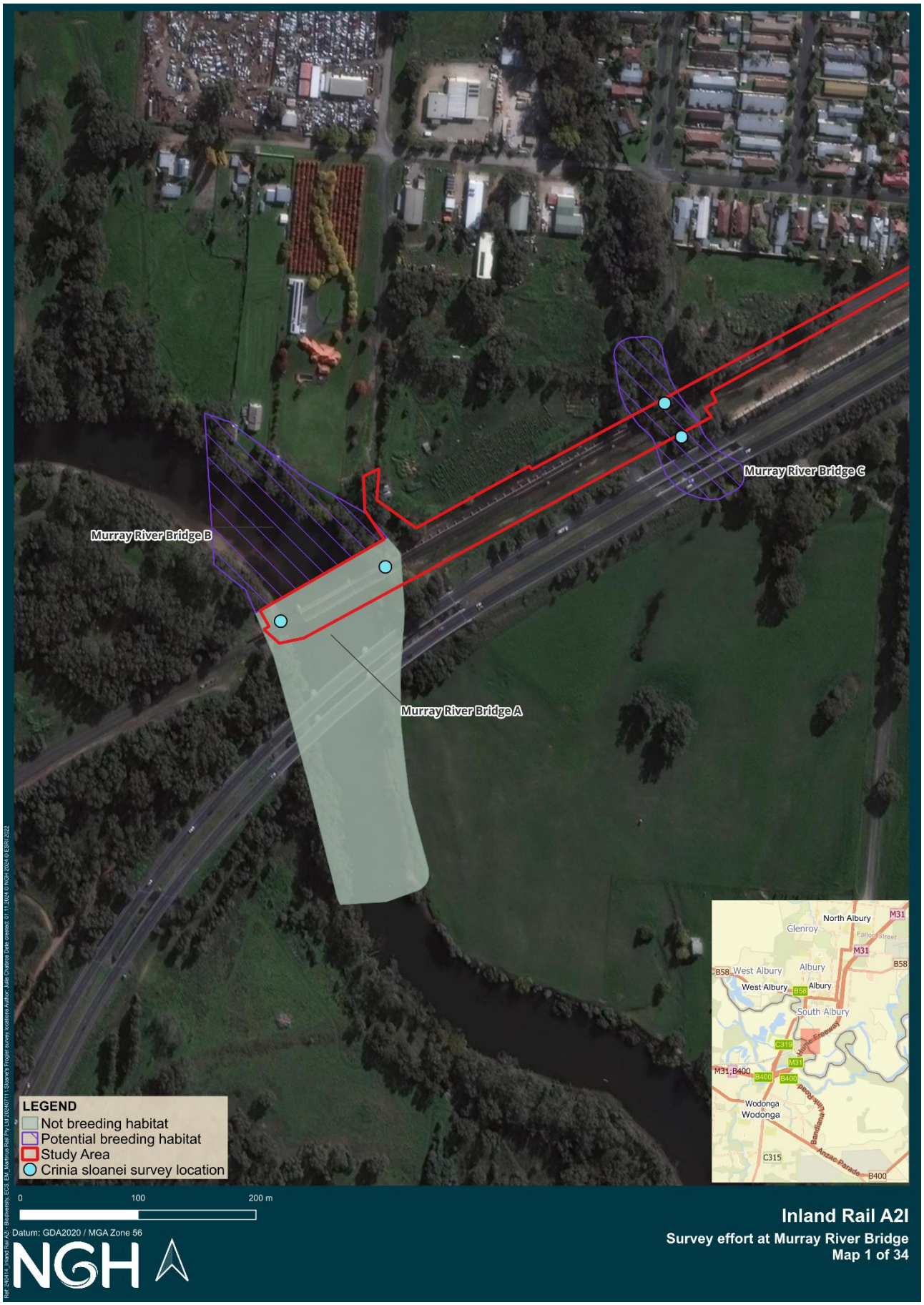
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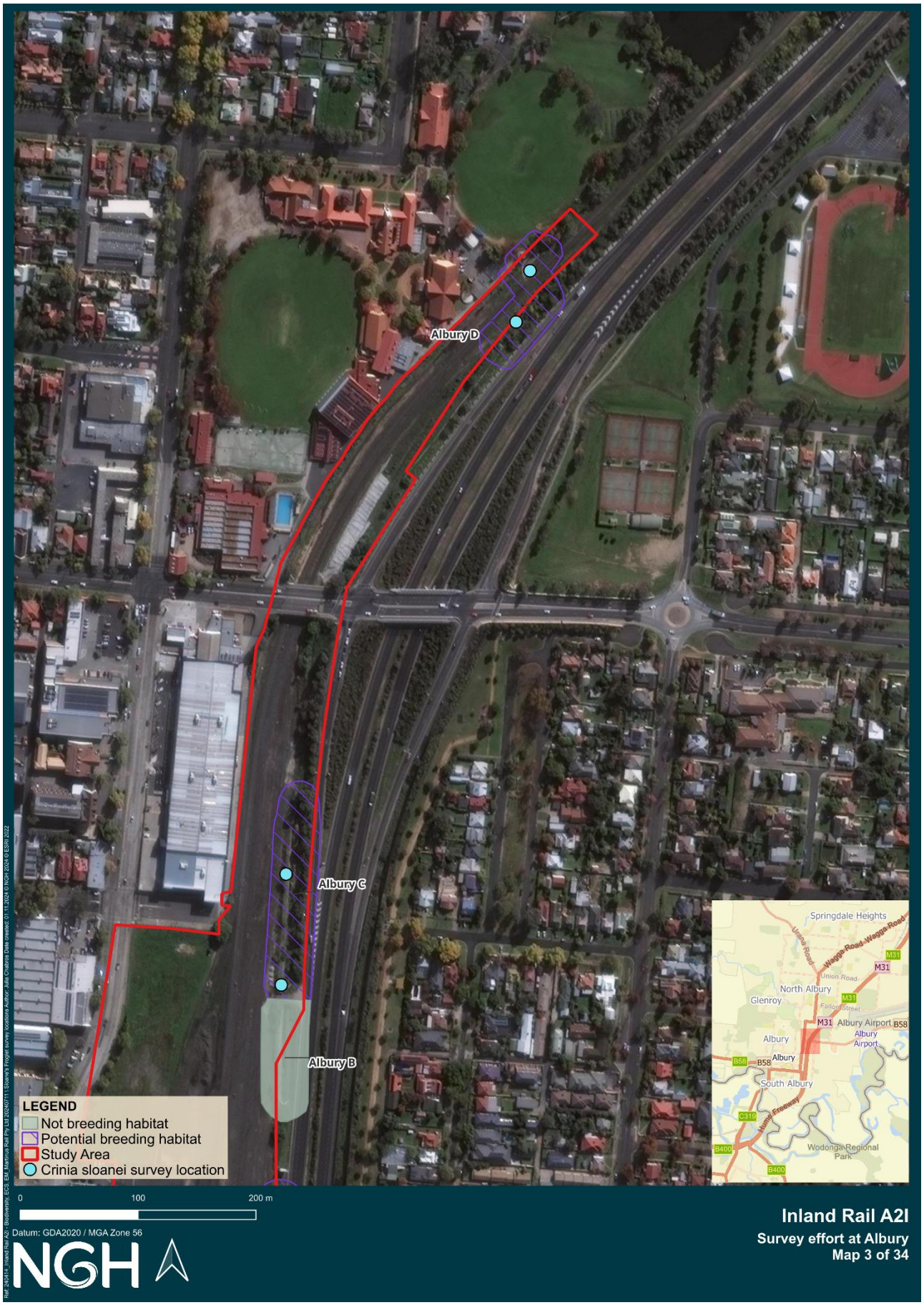
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Appendix A Survey effort atlas maps


Murray River Bridge C
Murray River Bridge B
Murray River Bridge A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Inland Rail A2I
Survey effort at Murray River Bridge
Map 1 of 34


Albury C
Albury B
Albury A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Inland Rail A2I
Survey effort at Albury
Map 2 of 34


Albury D
Albury C
Albury B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Springdale Heights
Wagga Road
North Albury
Glenroy
Albury Airport
Albury
South Albury
Hume Freeway
Wodonga Regional Park
Inland Rail A2I
Survey effort at Albury
Map 3 of 34

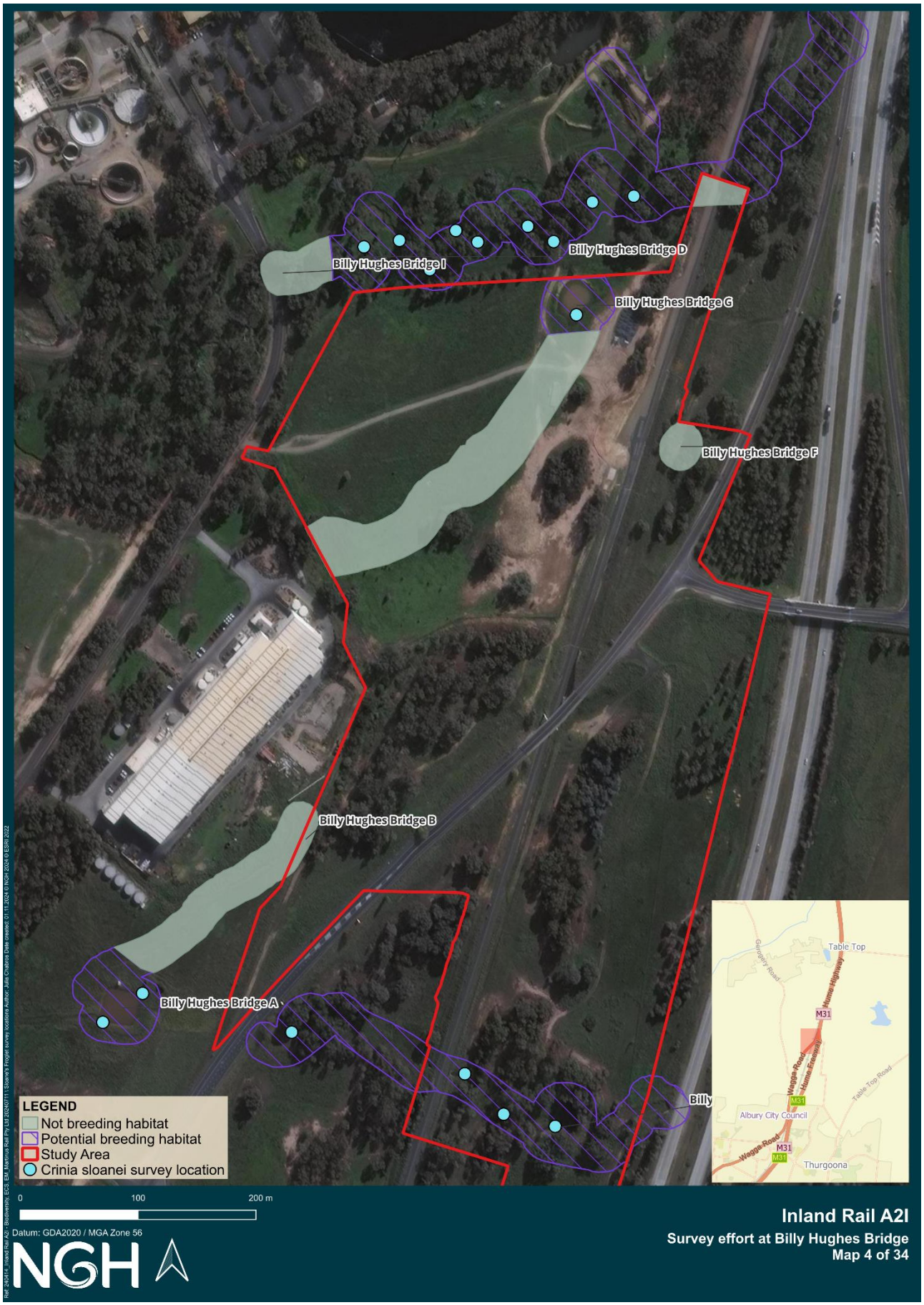

Billy Hughes Bridge I
Billy Hughes Bridge D
Billy Hughes Bridge G
Billy Hughes Bridge F
Billy Hughes Bridge B
Billy Hughes Bridge A
Billy
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Table Top
Albury City Council
Thurgoona
M31
Inland Rail A2I
Survey effort at Billy Hughes Bridge
Map 4 of 34


Table Top D
Table Top B
Table Top A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
A41
M31
Table Top
Inland Rail A2I
Survey effort at Table Top
Map 5 of 34


Culcairn B
Culcairn C
Culcairn A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Olympic Highway
A41
Culcairn
Walbundrie Road
Cummings Road
Inland Rail A2I
Survey effort at Culcairn
Map 6 of 34

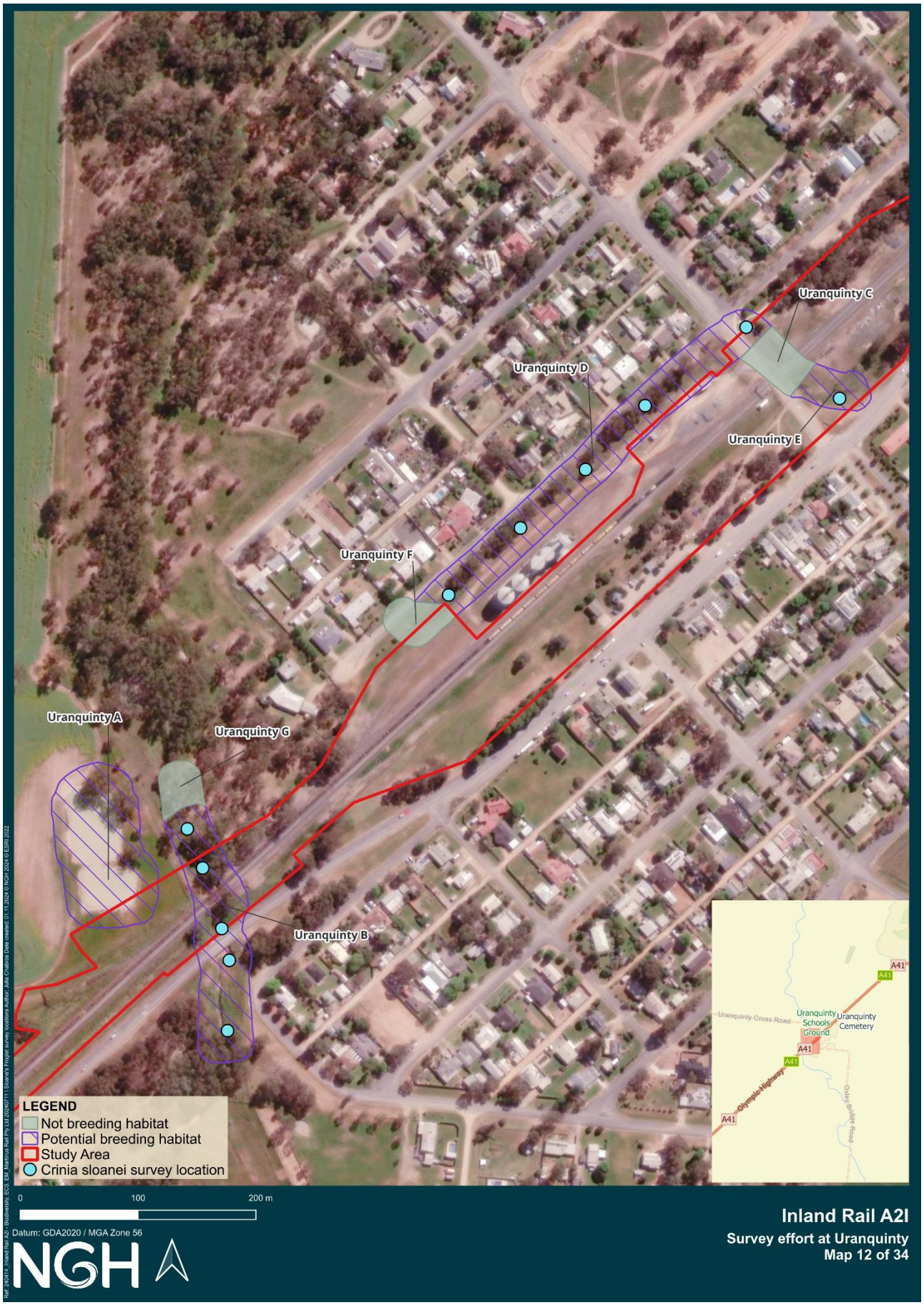

Henty A
Henty D
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Henty Pleasant Hills Road
Cookardinia Road
A41
Henty
A41
Olympic Highway
Henty Walla Road
Inland Rail A2I
Survey effort at Henty
Map 7 of 34

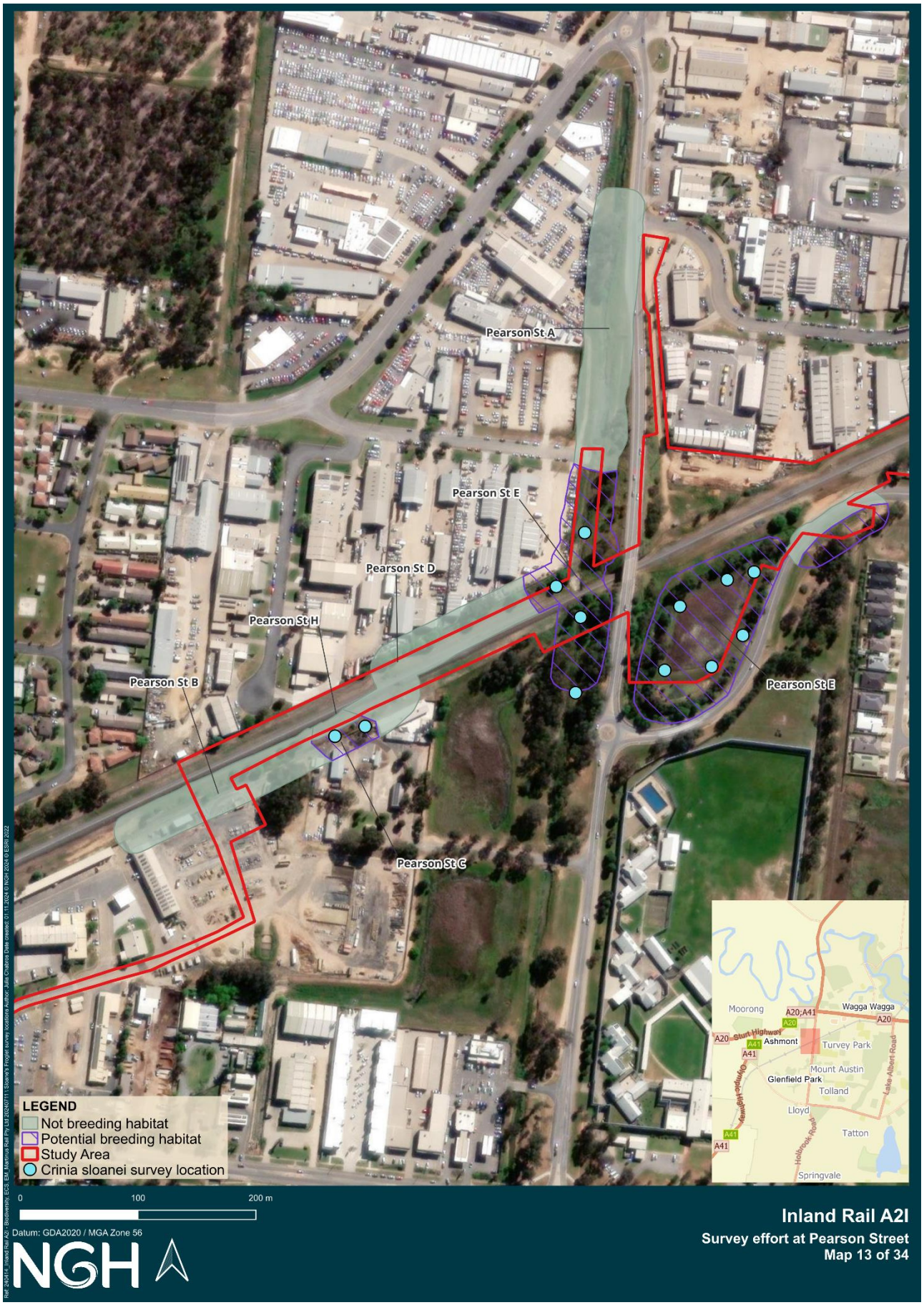

Henty C
Henty B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Olympic Highway
Henty Pleasant Hills Road
Cookardinia Road
A41
Henty
A41
Doodle Corner Swamp Nature Reserve
Inland Rail A2I
Survey effort at Henty
Map 8 of 34


Yerong Ck D
Yerong Ck C
Yerong Ck B
Yerong Ck A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Osborne Yerong Creek Road
Grubben Swamp
Yerong Creek Recreation Ground
Olympic Highway
A41
A41
A41
Inland Rail A2I
Survey effort at Yerong Creek
Map 9 of 34


Yerong Ck E
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Olympic Highway
A41
Yerong Creek Recreation Ground
Grubben Swamp
Inland Rail A2I
Survey effort at Yerong Creek
Map 10 of 34


The Rock A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Bennett Hill
314 m
The Rock
Collingullie Road
The Rock Bullenbong Road
Olympic Highway
A41
Inland Rail A2I
Survey effort at The Rock
Map 11 of 34

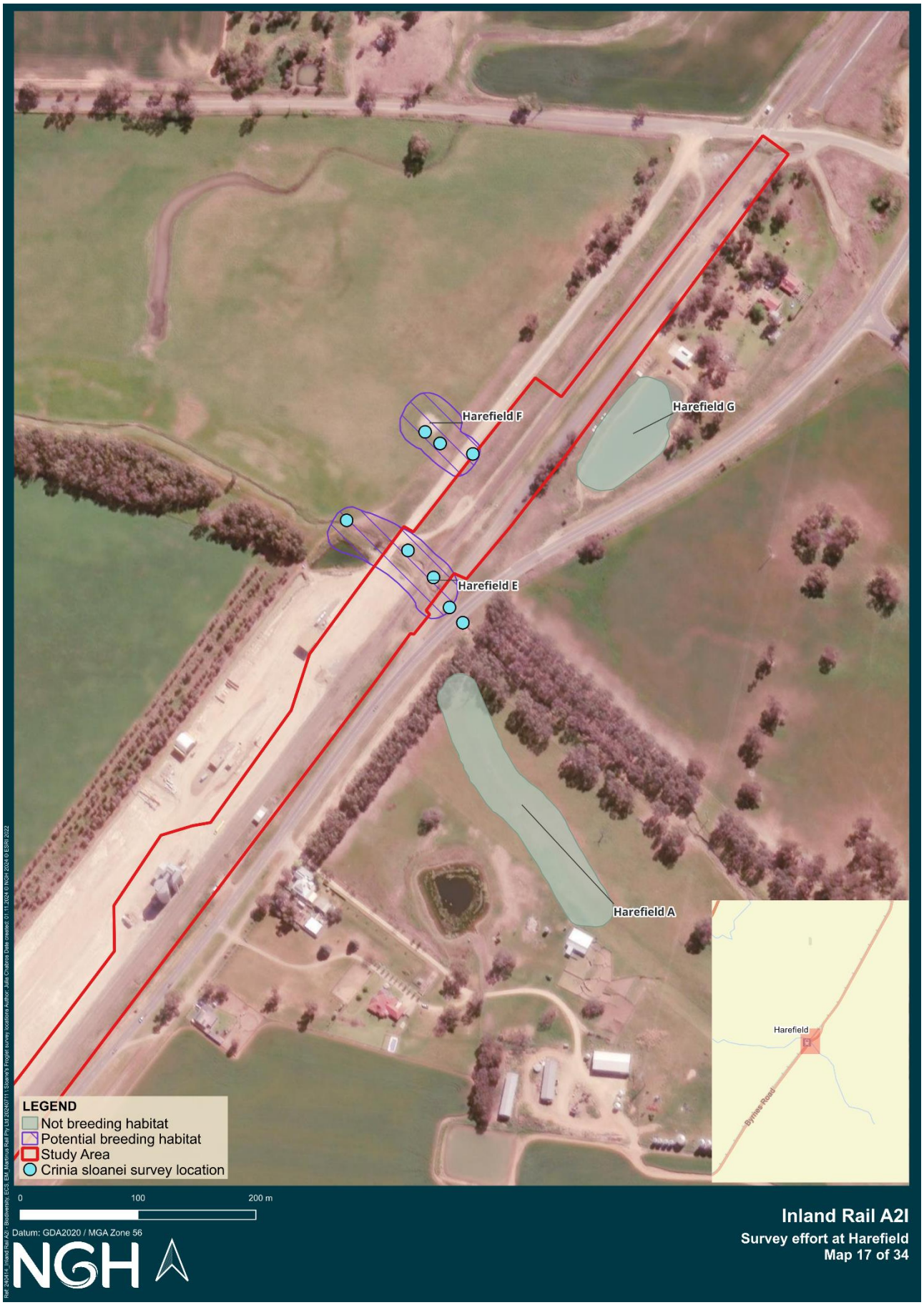

Uranquinty C
Uranquinty D
Uranquinty E
Uranquinty F
Uranquinty A
Uranquinty G
Uranquinty B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
NGH
Inland Rail A2I
Survey effort at Uranquinty
Map 12 of 34
A41
Uranquinty Cross Road
Uranquinty Schools Ground
Uranquinty Cemetery
Olympic Highway
Ohlys Bridge Road


Pearson St A
Pearson St E
Pearson St D
Pearson St H
Pearson St B
Pearson St E
Pearson St C
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Moorong
Wagga Wagga
A20;A41
A20
Sturt Highway
Ashmont
Turvey Park
Mount Austin
Glenfield Park
Tolland
Lloyd
Tatton
Springvale
Olympic Highway
Lake Albert Road
Holbrook Road
A41
Inland Rail A2I
Survey effort at Pearson Street
Map 13 of 34


Wagga Yard A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Gobbagombalin
Boorooma
Cartwrights Hill
A41
North Wagga Wagga
Olympic Highway
Byrnes Road
Murrumbidgee River
Edward Street
A20;A41
A20
Ashmont
Turvey Park
Glenfield Road
Kooringal Road
Red Hill Road
Tolland
Kooringal
Holbrook Road
Tatton
Lake Albert
Inland Rail A2I
Survey effort at Wagga Yard
Map 14 of 34


Bomen E
Bomen F
Bomen C
Bomen B
Bomen A
Bomen D
Bomen G
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Brucedale
Cartwrights Hill
Bomen
Olympic Highway
Byrnes Road
Mill Street
Oura Road
Hampden Avenue
Murrumbidgee River
Inland Rail A2I
Survey effort at Bomen
Map 15 of 34

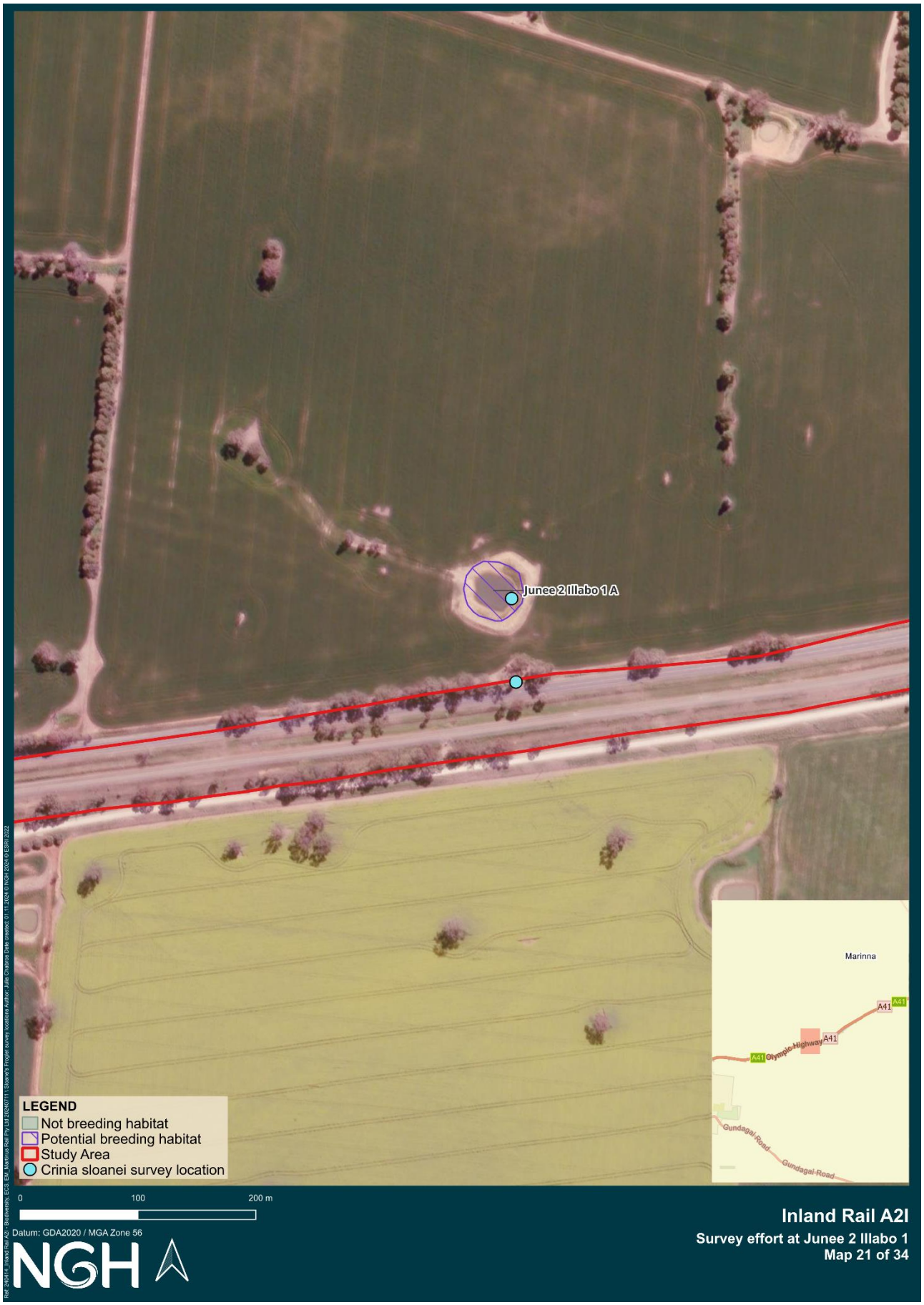

Harefield C
Harefield B
Harefield D
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
A41
Harefield
Byrnes Road
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Inland Rail A2I
Survey effort at Harefield
Map 16 of 34


Harefield F
Harefield G
Harefield E
Harefield A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Harefield
Byrnes Road
Inland Rail A2I
Survey effort at Harefield
Map 17 of 34


Kemp Street A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Old Junee Road
Olympic Highway
Junee North
A41
Junee
Junee
A41
Gundagai Road
Byrnes Road
Inland Rail A2I
Survey effort at Kemp Street
Map 18 of 34


Junee Yard A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Old Junee Road
Olympic Highway
A41
Junee North
Junee
Junee
A41
Gundagai Road
Byrnes Road
Inland Rail A2I
Survey effort at Junee Yard
Map 19 of 34


Olympic Hwy A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Old Junee Road
Olympic Highway
A41
Junee North
Junee
Junee
A41
Gundagai Road
Byrnes Road
Inland Rail A2I
Survey effort at Junee Yard and Olympic Highwway
Map 20 of 34


Junee 2 Illabo 1 A
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
Marinna
A41
Olympic Highway
Gundagai Road
0
100
200 m
Datum: GDA2020 / MGA Zone 56
NGH
Inland Rail A2I
Survey effort at Junee 2 Illabo 1
Map 21 of 34

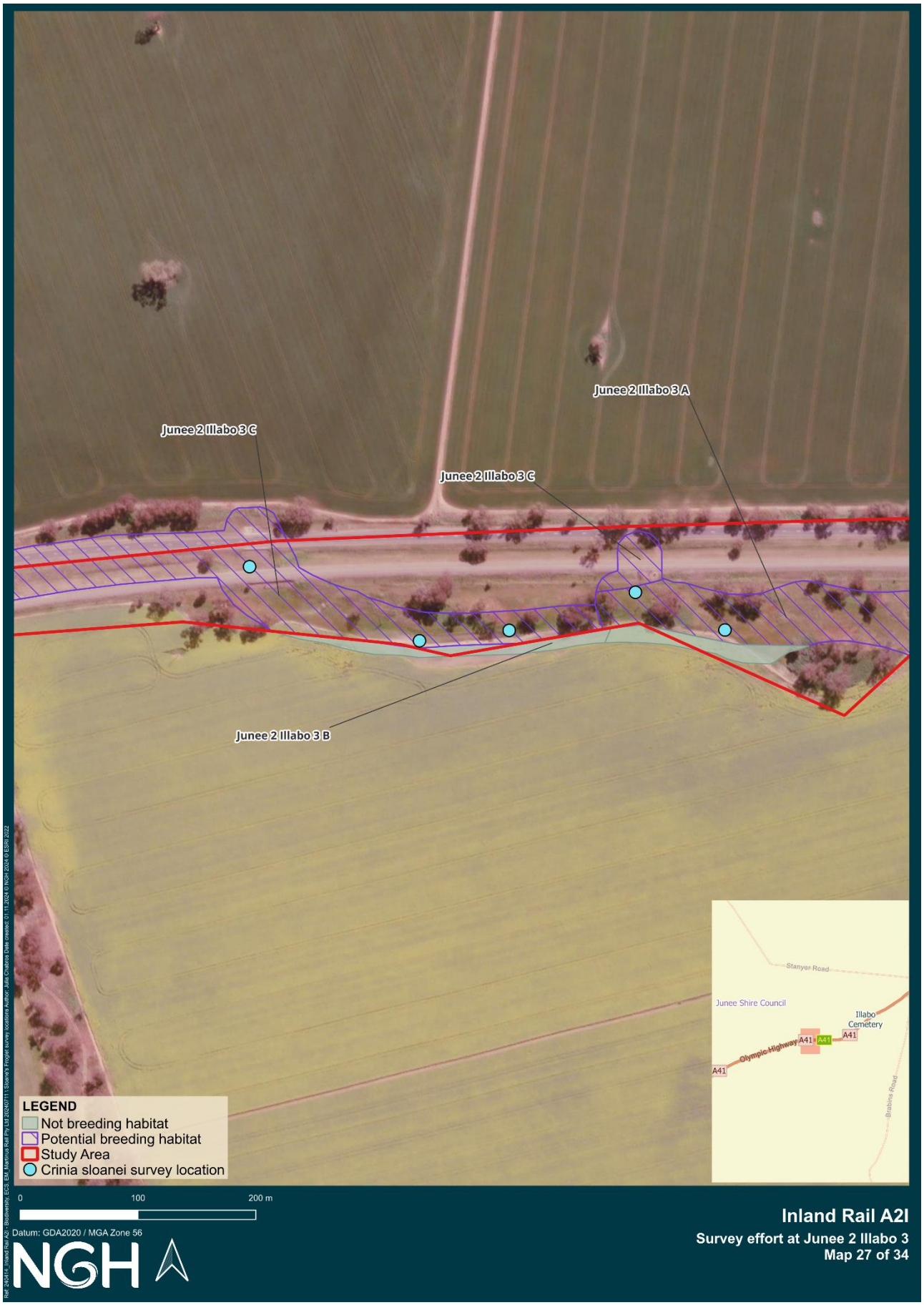

Junee 2 Illabo 1 D
Junee 2 Illabo 1 C
Junee 2 Illabo 1 B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Junee Shire Council
A41
Olympic Highway
Gundagai Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 1
Map 22 of 34


Junee 2 Illabo 2 C
Junee 2 Illabo 2 D
Junee 2 Illabo 2 B
Junee 2 Illabo 2 A
Marinna
Slattery Road
Olympic Highway
A41
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Inland Rail A2I
Survey effort at Junee 2 Illabo 2
Map 23 of 34


Junee 2 Illabo 2 E
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Junee Shire Council
Olympic Highway
A41
Inland Rail A2I
Survey effort at Junee 2 Illabo 2
Map 24 of 34


Junee 2 Illabo 2 I
Junee 2 Illabo 2 G
Junee 2 Illabo 2 F
Stanyer Road
Junee Shire Council
A41
Olympic Highway
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Inland Rail A2I
Survey effort at Junee 2 Illabo 2
Map 25 of 34


Junee 2 Illabo 3 C
Junee 2 Illabo 2 J
Junee 2 Illabo 2 I
Junee 2 Illabo 2 H
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Marinna
Illabo Cemetery
Olympic Highway
A41
Brabins Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 2
Map 26 of 34

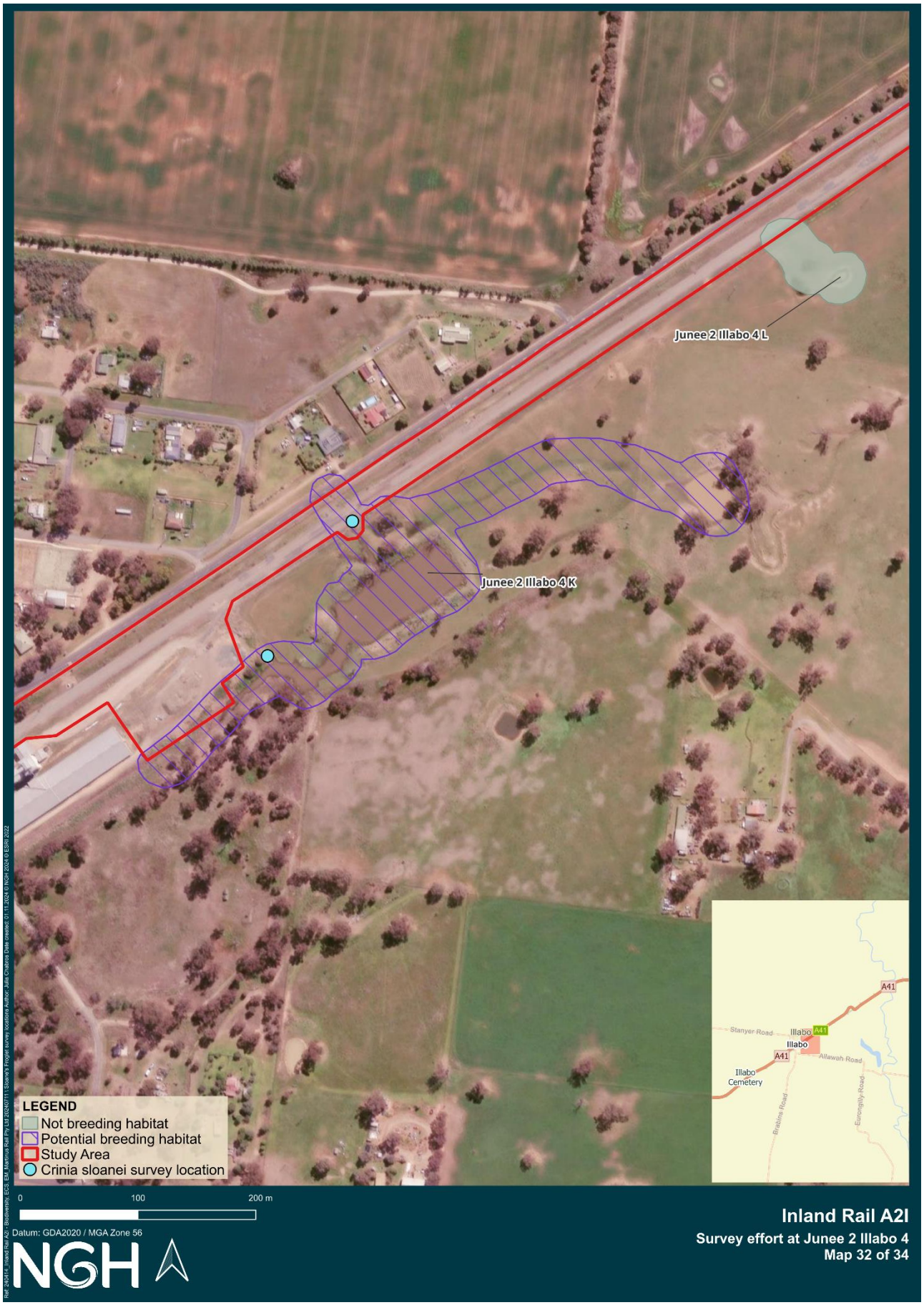

Junee 2 Illabo 3 A
Junee 2 Illabo 3 C
Junee 2 Illabo 3 C
Junee 2 Illabo 3 B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Junee Shire Council
Illabo Cemetery
Olympic Highway
A41
Brabins Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 3
Map 27 of 34


Junee 2 Illabo 3 D
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Illabo Cemetery
Olympic Highway A41
A41
Brabins Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 3
Map 28 of 34


Junee 2 Illabo 3 E
Junee 2 Illabo 3 F
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Illabo
A41
Illabo
A41
Illabo Cemetery
Olympic Highway
Brabins Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 3
Map 29 of 34


Junee 2 Illabo 4 A
Junee 2 Illabo 4 B
Junee 2 Illabo 4 C
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Illabo
Illabo
A41
Allawah Road
Illabo Cemetery
Olympic Highway
Brabins Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 4
Map 30 of 34


Junee 2 Illabo 4 G
Junee 2 Illabo 4 J
Junee 2 Illabo 4 E
Junee 2 Illabo 4 H
Junee 2 Illabo 4 I
Junee 2 Illabo 4 F
Junee 2 Illabo 4 D
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Stanyer Road
Illabo
A41
Illabo
Allawah Road
Illabo Cemetery
Brabins Road
Eurongilly Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 4
Map 31 of 34


Junee 2 Illabo 4 L
Junee 2 Illabo 4 K
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
NGH
Inland Rail A2I
Survey effort at Junee 2 Illabo 4
Map 32 of 34
A41
Illabo
Illabo Cemetery
Stanyer Road
Allawah Road
Brahins Road
Eurongilly Road


Junee 2 Illabo 5 E
Junee 2 Illabo 5 A
Junee 2 Illabo 5 F
Junee 2 Illabo 5 G
Junee 2 Illabo 5 D
Junee 2 Illabo 5 C
Junee 2 Illabo 5 J
Junee 2 Illabo 5 B
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Olympic Highway
A41
Illabo
Illabo Showground
Allawah Road
Brabins Road
Eurongilly Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 5
Map 33 of 34


Junee 2 Illabo 5 H
Junee 2 Illabo 5 I
Junee 2 Illabo 5 F
Junee 2 Illabo 5 G
Junee 2 Illabo 5 C
LEGEND
Not breeding habitat
Potential breeding habitat
Study Area
Crinia sloanei survey location
0
100
200 m
Datum: GDA2020 / MGA Zone 56
Olympic Highway
A41
Illabo
Illabo Showground
Niawah Road
Brabins Road
Eurongilly Road
Inland Rail A2I
Survey effort at Junee 2 Illabo 5
Map 34 of 34

Appendix B Raw habitat assessment data

Map ID	Site	Result	Site sub-name	Comment
2	Albury	Potential breeding habitat	Albury A	Slow flowing low level in concrete drain, vegetation along banks
2	Albury	Not breeding habitat	Albury B	Concrete drain, no water present
2	Albury	Potential breeding habitat	Albury C	Slow moving water in deep concrete drain, algae present. Marginal
3	Albury	Potential breeding habitat	Albury D	Wide concrete drain, shallow flowing or still water, some vegetation nearby
4	Billy Hughes Bridge	Potential breeding habitat	Billy Hughes Bridge A	Dam surrounded by dead grass and weeds
4	Billy Hughes Bridge	Not breeding habitat	Billy Hughes Bridge B	Dry ephemeral creek bed
4	Billy Hughes Bridge	Potential breeding habitat	Billy Hughes Bridge C	Ephemeral waterway, culvert and dam with nearby vegetation
4	Billy Hughes Bridge	Potential breeding habitat	Billy Hughes Bridge D	Natural waterway with vegetation
4	Billy Hughes Bridge	Not breeding habitat	Billy Hughes Bridge E	Depressions with no water, exotic pasture grasses and box gum woodland
4	Billy Hughes Bridge	Not breeding habitat	Billy Hughes Bridge F	Depression no water
4	Billy Huges Bridge	Potential breeding habitat	Billy Hughes Bridge G	Farm dam with pasture grasses
4	Billy Hughes Bridge	Not breeding habitat	Billy Hughes Bridge H	No habitat present
4	Billy Hughes Bridge	Not breeding habitat	Billy Hughes Bridge I	Tiny puddle with still murky water, unlikely to be suitable
15	Bomen	Potential breeding habitat	Bomen A	Temporary pond
15	Bomen	Not breeding habitat	Bomen B	Road and built up area
15	Bomen	Potential breeding habitat	Bomen C	Small dam with high water, fringing vegetation and frog activity

15	Bomen	Potential breeding habitat	Bomen D	Small full dam, muddy banks, vegetation
15	Bomen	Potential breeding habitat	Bomen E	Not accessed, suitability assumed
15	Bomen	Potential breeding habitat	Bomen F	Muddy water, bank bare, pasture and swamp veg within 2m of water
15	Bomen	Not breeding habitat	Bomen G	Dirty, odorous water, no frogs, some reeds
6	Culcairn	Not breeding habitat	Culcairn A	Small standing pond, stagnant, strong sulphuric smell. No frogs
6	Culcairn	Not breeding habitat	Culcairn B	Dry area
6	Culcairn	Potential breeding habitat	Culcairn C	Large pond with surrounding vegetation
17	Harefield	Not breeding habitat	Harefield A	No watercourse or body. No frogs present.
16	Harefield	Not breeding habitat	Harefield B	Gravel and industrial, no water
16	Harefield	Potential breeding habitat	Harefield C	Not accessible, highly industrial, suitability assumed
16	Harefield	Potential breeding habitat	Harefield D	Farm dam, low water, Juncus sp. on border
17	Harefield	Potential breeding habitat	Harefield E	Shallow temporary water in culverts and drains
17	Harefield	Potential breeding habitat	Harefield F	Part no accessible but surveyed from distance. Habitat farm dam and road drains
17	Harefield	Not breeding habitat	Harefield G	Dam with water; highly disturbed (light, road noise, little vegetation)
7	Henty	Not breeding habitat	Henty A	Culvert no water, unsuitable habitat
8	Henty	Potential breeding habitat	Henty B	Creek line lined with River Red Gum and other native vegetation
8	Henty	Potential breeding habitat	Henty C	Not inspected, suitability assumed
7	Henty	Potential breeding habitat	Henty D	Not inspected, suitability assumed
21	Junee 2 Illabo 1	Potential breeding habitat	Junee 2 Illabo 1 A	Degraded farm dam, no suitable vegetation, water present
22	Junee 2 Illabo 1	Not breeding habitat	Junee 2 Illabo 1 B	Cropped wheat paddock, no water, no depressions

22	Junee 2 Illabo 1	Not breeding habitat	Junee 2 Illabo 1 C	No water, exotic non-aquatic pasture species
22	Junee 2 Illabo 1	Not breeding habitat	Junee 2 Illabo 1 D	Farm dam, dirty stagnant water, no fringing vegetation
23	Junee 2 Illabo 2	Not breeding habitat	Junee 2 Illabo 2 A	Culvert with temporary water, limited native vegetation, not suitable
23	Junee 2 Illabo 2	Potential breeding habitat	Junee 2 Illabo 2 B	Drainage area with puddles of water and vegetation
23	Junee 2 Illabo 2	Not breeding habitat	Junee 2 Illabo 2 C	Rail/road culverts no vegetation
23	Junee 2 Illabo 2	Potential breeding habitat	Junee 2 Illabo 2 D	Farm dam
24	Junee 2 Illabo 2	Potential breeding habitat	Junee 2 Illabo 2 E	Culverts, muddy puddles and wet depressions in paddocks
25	Junee 2 Illabo 2	Not breeding habitat	Junee 2 Illabo 2 F	Cropped and pasture paddocks with no water, farm dam no vegetation
25	Junee 2 Illabo 2	Potential breeding habitat	Junee 2 Illabo 2 G	Cropped and pasture paddocks with no water, farm dam no vegetation
26	Junee 2 Illabo 2	Not breeding habitat	Junee 2 Illabo 2 H	Road, cropped and pasture paddocks with no water
25 & 26	Junee 2 Illabo 2	Not breeding habitat	Junee 2 Illabo 2 I	Cropped and pasture paddocks with no water, farm dam no vegetation
26	Junee 2 Illabo 2	Potential breeding habitat	Junee 2 Illabo 2 J	Puddles in vegetated drain beside rail track with frogs calling
27	Junee 2 Illabo 3	Potential breeding habitat	Junee 2 Illabo 3 A	Excellent quality habitat
27	Junee 2 Illabo 3	Not breeding habitat	Junee 2 Illabo 3 B	Dry
26 & 27	Junee 2 Illabo 3	Potential breeding habitat	Junee 2 Illabo 3 C	Rail culvert some water, minimal habitat, culverts and puddles with some vegetation
28	Junee 2 Illabo 3	Potential breeding habitat	Junee 2 Illabo 3 D	Grassy overflow area temporarily inundated
29	Junee 2 Illabo 3	Potential breeding habitat	Junee 2 Illabo 3 E	Farm dam with fringing vegetation
29	Junee 2 Illabo 3	Potential breeding habitat	Junee 2 Illabo 3 F	Farms dams and adjoining creek with fringing vegetation (pasture grass and Juncus sp.)
30	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 A	Farm dam, marginal habitat due to lack of vegetation
30	Junee 2 Illabo 4	Not breeding habitat	Junee 2 Illabo 4 B	Railway culverts, concrete floor no vegetation

30	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 C	Vegetated drain and farm dam with frogs calling
31	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 D	Farm dam with no vegetation near water. Thistles around top
31	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 E	Muddy puddles and vegetated culvert
31	Junee 2 Illabo 4	Not breeding habitat	Junee 2 Illabo 4 F	Non vegetated culverts with stagnant water
31	Junee 2 Illabo 4	Not breeding habitat	Junee 2 Illabo 4 G	Road
31	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 H	Overgrown ephemeral drainage line. Some areas inaccessible. Marginal habitat
31	Junee 2 Illabo 4	Not breeding habitat	Junee 2 Illabo 4 I	Box Gum Woodland no water
31	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 J	Small ephemeral puddles with exotic pasture species. Marginal
32	Junee 2 Illabo 4	Potential breeding habitat	Junee 2 Illabo 4 K	Dams inaccessible. Vegetated drainage lines between. Suitability assumed.
32	Junee 2 Illabo 4	Not breeding habitat	Junee 2 Illabo 4 L	Lying water in pasture. Dams inaccessible but appear unsuitable (no vegetation)
33	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 A	Not water or habitat present
33	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 B	Channel with no water, not suitable
33	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 C	Dry channel not suitable
33	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 D	Habitat not viable for frogs
33	Junee 2 Illabo 5	Potential breeding habitat	Junee 2 Illabo 5 E	Diverse potential habitat. Dam no vegetation; vegetated drainage lines, wet paddocks & culverts
33	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 F	Unsuitable for frogs
33	Junee 2 Illabo 5	Potential breeding habitat	Junee 2 Illabo 5 G	Quality habitat present
34	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 H	Dry grassy groundcover and rail corridor
34	Junee 2 Illabo 5	Not breeding habitat	Junee 2 Illabo 5 I	Farm dam with no vegetation; surrounding dry grassy groundcover and

				rail corridor
33	Junee 2 Illabo 5	Potential breeding habitat	Junee 2 Illabo 5 J	Water present in patches, native dominated vegetation but no aquatic vegetation.
19	Junee Yard	Not breeding habitat	Junee Yard A	No water present
18	Kemp Street	Not breeding habitat	Kemp Street A	No water present
1	Murray River Bridge	Not breeding habitat	Murray River Bridge A	Fast flowing water, strong current. Assume unsuitability south - little riparian veg; flow faster
1	Murray River Bridge	Potential breeding habitat	Murray River Bridge B	Slow moving water present near bank. Assume suitability beyond.
1	Murray River Bridge	Potential breeding habitat	Murray River Bridge C	Strings of ponds, overgrown vegetation. Traffic noise loud.
20	Olympic Hwy	Not breeding habitat	Olympic Hwy A	No water present
13	Pearson Street	Not breeding habitat	Pearson St A	Fast flowing water; unsuitable
13	Pearson Street	Not breeding habitat	Pearson St B	Drain line, no frogs over 3 nights
13	Pearson Street	Potential breeding habitat	Pearson St C	Pools of stagnant water with frogs calling
13	Pearson Street	Not breeding habitat	Pearson St D	Drainage line, limited to no vegetation, no frogs 3 nights
13	Pearson Street	Potential breeding habitat	Pearson St E	Dam and eroded drainage line
13	Pearson Street	Not breeding habitat	Pearson St F	Road
13	Pearson Street	Potential breeding habitat	Pearson St G	Unable to inspect, assume suitable
13	Pearson Street	Not breeding habitat	Pearson St H	Road and dry verge
14	Wagga Yard	Not breeding habitat	Wagga Yard A	Gravel pile, no water, no suitable habitat
5	Table Top	Not breeding habitat	Table Top A	No riparian vegetation
5	Table Top	Potential breeding habitat	Table Top B	Muddy puddles
5	Table Top	Not breeding habitat	Table Top C	Dry habitat

5	Table Top	Potential breeding habitat	Table Top D	Farm dam, access limited, suitability assumed
5	Table Top	Not breeding habitat	Table Top E	Dry pasture
5	Table Top	Potential breeding habitat	Table Top F	Farm dam, lots of frogs heard
11	The Rock	Potential breeding habitat	The Rock A	Dams with water, connected by channels. Groundcover vegetation growing up to water's edge.
12	Uranquinty	Potential breeding habitat	Uranquinty A	Predominantly exotic groundcover and some canopy cover in northern edge.
12	Uranquinty	Potential breeding habitat	Uranquinty B	Small pools of water, can hear frogs at adjacent dam also
12	Uranquinty	Not breeding habitat	Uranquinty C	No water present
12	Uranquinty	Potential breeding habitat	Uranquinty D	Small volume of water
12	Uranquinty	Potential breeding habitat	Uranquinty E	Small volume of water
12	Uranquinty	Not breeding habitat	Uranquinty F	Dry
12	Uranquinty	Not breeding habitat	Uranquinty G	Dry
9	Yerong Ck	Potential breeding habitat	Yerong Ck A	Dam with heavy stock use and bare edges. Marginal
9	Yerong Ck	Not breeding habitat	Yerong Ck B	Dry river bed and dry concrete culverts
9	Yerong Ck	Potential breeding habitat	Yerong Ck C	Small standing pool at culvert, Juncus sp. surrounding
9	Yerong Ck	Not breeding habitat	Yerong Ck D	Dried dam, no habitat
10	Yerong Ck	Potential breeding habitat	Yerong Ck E	Farm dam

Appendix C Survey memos

240414 Inland Rail Sloane's Froglet surveys. - Survey Memo 15/7/24-19/07/24

By Julia Chabros, written on 02/08/2024

Fieldwork team

- Michael Cleland (Ecologist)
- Julia Chabros (Graduate Ecologist)

Fieldwork dates

- 15/7/24-19/07/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - Albury Yard
    - Billy Hughes Bridge
    - Table Top

Fieldwork Methodology

- The following methodology was conducted every 50 metres of confirmed potential habitat:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone. Each site was surveyed for 4 nights. Areas that did not contain water were marked as "no suitable habitat" and were not re-surveyed.

Survey Results

Site	Results	Sloane's Froglet Presence	Other frog species recorded
Albury Yard	All areas surveyed. Lots of light and noise pollution, concrete drains and exotic veg.	*Absent*	Nil

Billy Hughes Bridge	The dam in the north and the waterway+dam in the south had lots of frogs (Eastern sign bearing and Common Eastern Froglets only).	*Absent*	Eastern sign bearing and Common Eastern froglets in the NW dam and southern dam and waterway
Table Top	The dam was not accessible or visible due to a fence. Surveys were taken from the road. No frogs were heard calling. The culvert has a small puddle of water only, but one Eastern Sign Bearing froglet was heard calling on the last survey night.	*Absent*	One Eastern Sign bearing froglet on the last day calling from the culvert

Incidental pest animal species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

All sites were surveyed 4 times, and do not need to be re-visited.

240414 Inland Rail Sloane's Froglet surveys Field Memo 22/7/24-27/7/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across four survey sites.:
    - Murray River Bridge
    - Culcairn
    - Henty
    - Yerong Creek

Yerong Creek was not surveyed after the first night as time constraints did not allow it. It is to be surveyed in later surveys.

Fieldwork Methodology

- Stella O'Dwyer and Evan Creek to attend sites listed above and conduct:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone.

Survey Results

Date	Site	Results	Sloane's Froglet Presence
22/07/24	Murray River Bridge	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
22/07/24	Culcairn	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*

Date	Site	Results	Sloane's Froglet Presence
22/07/24	Henty	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
22/07/24	Yerong Creek	*Hatched blue areas mapped within project area.*	*Absent*
23/07/24	Murray River Bridge	*Hatched blue areas mapped within project area* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
23/07/24	Culcairn	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
23/07/24	Henty	*Hatched blue areas mapped outside of the project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
24/07/24	Murray River Bridge	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
24/07/24	Culcairn	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Date	Site	Results	Sloane's Froglet Presence
24/07/24	Henty	*Hatched blue areas mapped outside of the project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. 1 recorded visually. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
25/07/24	Murray River Bridge	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally and visually	*Absent*
25/07/24	Culcairn	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
25/07/24	Henty	*Hatched blue areas mapped outside of the project area.* Eastern sign-bearing frog *(Crinia parasignifiera)* recorded aurally.	*Absent*

Incidental pest species found on sites: Nil

Incidental species found on sites:

- Pacific Black Duck (*Anas superciliosa):* Murray River bridge

Follow Up

Vegetation photos were taken on the 23/07/24 (Murray River bridge south side), 24/07/24 (Murray River bridge north side) and on 25/07/24 (Culcairn and Henty).

All sites were surveyed only within the project area for surveys on 22/07/24. Areas outside the project area were surveyed for only 3 nights (may require an additional night survey).

240414 Inland Rail Sloane's Froglet surveys Field Memo 22/7/24-27/7/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - The Rock
    - Uranquinty
    - Pearson Street– Wagga Wagga

Fieldwork Methodology

- Maddie Robertson and Justin Solomons to attend sites listed above and conduct:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone.

Survey Results

Date	Site	Results	Sloane's Froglet Presence
22/07/24	The Rock	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
22/07/24	Uranquinty	*Hatched blue areas mapped within project area.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
22/07/24	Pearson Street	*Hatched blue areas mapped*	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		within project area. Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	
23/07/24	The Rock	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
23/07/24	Uranquinty	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. 1 individual visually recorded.	*Absent*
23/07/24	Pearson Street	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
24/07/24	The Rock	*All accessible hatched blue areas mapped (including outside project area).*	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	
24/07/24	Uranquinty	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
24/07/24	Pearson Street	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
25/07/24	The Rock	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. 1 recorded visually. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
25/07/24	Uranquinty	*All accessible hatched blue areas mapped (including outside project area).*	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	
25/07/24	Pearson Street	*All accessible hatched blue areas mapped (including outside project area).* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Incidental pest species found on sites: Nil

Incidental species found on sites:

- Unidentified Owl : Pearson Street
- Unidentified fish, maybe carp : Pearson Street
- Pacific Black Duck (*Anas superciliosa):* The Rock

Follow Up

Vegetation photos were planned to be taken on the afternoon of the final day of surveys. However, the PO for team 2 was changed with late notice and work commenced an hour after the planned start time. Vegetation photos were completed at the southern end of the Uranquinty site. After these were taken, there was not enough daylight to take quality photos.

All sites were surveyed only within the project area for surveys on 22/07/24. Therefore, some sites were surveyed for only 3 nights (may require an additional night survey).

240414 Inland Rail Sloane's Froglet surveys Field Memo 29/7/24-01/08/24

By Julia Chabros, written on 02/08/2024

Fieldwork team 1

- Jonny Sweeney (Senior Ecologist)
- Julia Chabros (Graduate Ecologist)

Fieldwork dates

- 29/7/24-01/08/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - Yerong Creek
    - Bomen
    - Harefield

Fieldwork Methodology

- The following methodology was conducted every 50 metres of mapped potential habitat:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone. Each site was surveyed for 4 nights. Areas that did not contain water were marked as "no suitable habitat" and were not re-surveyed.

Survey Results

Site	Results	Sloane's Froglet Presence	Other frog species recorded
Yerong Creek	The northernmost dam was surveyed from the road due to fence blocking access. The middle dam did not contain habitat and was excluded from surveys.	*Absent*	*No frogs calling.*

Site	Results	Sloane's Froglet Presence	Other frog species recorded
	The southern long patch was surveyed in a culvert from both sides of the road. In the western area of that patch, a fence blocked access further. To the east, no habitat was present and no surveys were required. Even more east was not accessible due to a fence, so it is uncertain whether there is habitat or not.		
Bomen	NE dam likely contains polluted water from adjacent industrial plant. NW was not accessible. Central dam was not accessible or visible due to fence, but lots of non-target frogs (Eastern sign bearing froglets) were calling. No frogs calling and barely any water in the culverts. Lots of eastern sign bearing froglets calling, but dam not accessible due to fence. It appeared to have lots of wetland veg.	*Absent*	*Eastern sign bearing froglets calling from the central and southern dams.*
Harefield	The northernmost dam, between Byrnes road and Junee Harefield Road, was accessible and traversed around on foot. The smaller dam to the west was not accessible due to a fence.	*Absent*	*Eastern sign bearing froglets calling from the northernmost dam only.*

Site	Results	Sloane's Froglet Presence	Other frog species recorded
	The culvert running under Junee Harefield road and the train tracks was accessible but contained only small patches/puddles of water. The long linear survey area SE of Junee Harefield road was not accessible due to a fence. From the fence line, it looked like the paddock did not contain habitat so it was not surveyed from the road. The large, L-shaped survey area further south did not contain suitable habitat where we could see, but parts of it were not accessible. The southernmost dam was surveyed from the road, from behind a fence.		

Incidental pest animal species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

All sites were surveyed 4 times, and do not need to be re-visited.

240414 Inland Rail Sloane's Froglet surveys Field Memo 29/7/24-01/8/24

Memo completed by **Justin Solomons** 26/07/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - Junee Yard
    - Olympic Highway
    - Kemp Street
    - Junee 2 Illabo 1
    - Junee 2 Illabo 2
    - Junee 2 Illabo 3

Fieldwork Methodology

- Stella O'Dwyer and Justin Solomons to attend sites listed above and conducted:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone.

Survey Results

Date	Site	Results	Sloane's Froglet Presence
29/07/24	Junee Yard	Ruled out site as appropriate habitat for Frogs.	*Absent*
29/07/24	Olympic Highway	Ruled out site as appropriate habitat for Frogs.	*Absent*
29/07/24	Kemp Street	Ruled out site as appropriate habitat for Frogs.	*Absent*
29/07/24	The Rock (week 2 site)	*Follow up from missed survey effort from week 2* Eastern sign-bearing frog	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		(*Crinia parasignifiera)* recorded aurally.	
29/07/24	Uranquinty (week 2 site)	*Follow up from missed survey effort from week 2* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally.	*Absent*
30/07/24	Junee 2 Illabo 1	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
30/07/24	Junee 2 Illabo 2	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Date	Site	Results	Sloane's Froglet Presence
30/07/24	Junee 2 Illabo 3	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
30/07/24	Pearson Street (Week 2 site)	*Follow up from missed survey effort from week 2* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
31/07/24	Junee 2 Illabo 1	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Date	Site	Results	Sloane's Froglet Presence
31/07/24	Junee 2 Illabo 2	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
31/07/24	Junee 2 Illabo 3	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
01/08/24	Junee 2 Illabo 1	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		(*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	
01/08/24	Junee 2 Illabo 2	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
01/08/24	Junee 2 Illabo 3	*All accessible hatched blue areas mapped (including outside project area). Some areas were not possible to access as they were inside private property. These sites were surveyed with Call-playback at fence line.* Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Incidental pest species found on sites: Nil

Incidental species found on sites:

- Unidentified Owl: Junee 2 Illabo 2

Follow Up

Vegetation photos were taken across all sites and follow up vegetation photos for Uranquinty and Pearson Street were also taken.

One survey point at the Eastern end of the Junee 2 Illabo sites was missed on night 3 of surveys.

240414 Inland Rail Sloane's Froglet surveys Field Memo 05/08/24-09/08/24

Memo completed by **Justin Solomons** 08/08/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - Junee 2 Illabo 1 (one additional night survey)
    - Junee 2 Illabo 2 (one additional night survey)
    - Junee 2 Illabo 3 (one additional night survey)
    - Henty (one additional night survey)

Fieldwork Methodology

- Jonny Sweeney and Justin Solomons to attend sites listed above and conducted:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone.

Survey Results

Date	Site	Results	Sloane's Froglet Presence
05/08/24	Junee 2 Illabo 1	One additional night survey picked up from week 3 Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
05/08/24	Junee to Illabo 2	One additional night survey picked up from week 3 Eastern sign-bearing frog (*Crinia parasignifiera)*	*Absent*

Date	Site	Results	Sloane's Froglet Presence
		recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	
05/08/24	Junee to Illabo 3	One additional night survey picked up from week 3 Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
05/08/24	Junee to Illabo 4	Assisted team 2 with southern sites	*Absent*
06/08/24	Junee to Illabo 4 Day time obs	Day obs	*Absent*
06/08/24	Henty	One additional night survey picked up from week 2	*Absent*
07/08/24	Junee 2 Illabo 1-3 Day time obs	Fieldwork plans changed due to lack of permission to enter private properties.	*Absent*
08/08/24	Demobilisation	Demobilised as land access was not organised and only two sites were available for night time surveys.	

Incidental pest species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

Day time observations and night surveys may be required in private property areas that have adequate habitat within Junee to Illabo 1-3.

240414 Inland Rail Sloane's Froglet surveys Field Memo 05/08/24-08/08/24

By Julia Chabros, written on 12/08/2024

Fieldwork team 2

- Michael Cleland (Ecologist)
- Julia Chabros (Graduate Ecologist)

Fieldwork dates

- 05/08/24-08/08/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites:
    - Junee to Illabo 4
    - Junee to Illabo 5

Fieldwork Methodology

- The following methodology was conducted every 50 metres of mapped potential habitat:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone. Each site was surveyed for 4 nights. Areas that did not contain water were marked as "no suitable habitat" and were not re-surveyed, but were photographed during daytime habitat assessments.

Survey Results

Site	Results	Sloane's Froglet Presence	Other frog species recorded
Junee to Illabo 4	All 5 dams were accessed from the road only – not accessible due to fences. Sections of the long polygons were ruled out as "no available habitat". The largest dam had a high abundance of common frog species, as well as native veg and trees surrounding it.	*Absent*	*Eastern Sign Bearing and Common Eastern Froglets calling.*
Junee to Illabo 5	The NE site was not suitable habitat. The central site (a small dam) was surveyed from the road, and not accessible due to a fence. The large survey area, SW in Junee to Illabo 5: southern side of the tracks was surveyed in full. Some areas were marked as not suitable habitat. The northern side of the tracks was not fully accessible due to a fence. Surveys were conducted on one side of the dam only (but ~20 metres from the edge), and following the drainage line.	*Absent*	*Eastern sign bearing froglets calling from the central and southern dams.*

Incidental pest animal species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

All accessible sites were surveyed 4 times and do not need to be re-visited.

240414 Inland Rail Sloane's Froglet surveys Field Memo 19/08/24-22/08/24

By Julia Chabros, written on 29/08/2024

Fieldwork team 2

- Marcus Hoskin (Ecologist)
- Julia Chabros (Graduate Ecologist)

Fieldwork dates

- 19/08/24-22/08/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites, in places previously not accessible due to private property boundaries:
    - Yerong Creek
    - The Rock
    - Bomen (1 night by Team 1 and 3 nights by Team 2)
- Plus one night of surveys at the following sites:
    - Table Top
    - Henty

Fieldwork Methodology

- The following methodology was conducted every 50 metres of mapped potential habitat:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone. Each site was surveyed for 4 nights, except for Table Top and Henty, where 3 nights were already surveyed in the previous week and only one survey per site was required. Bomen was surveyed once by Team 1 and three times by Team 2. Areas that did not contain water were marked as "no suitable habitat" and were not re-surveyed, but were photographed during daytime habitat assessments.

Survey Results

Site	Results	Sloane's Froglet Presence	Other frog species recorded
Yerong Creek	All dams had water in them. Many common species calling from the southernmost dam.	*Absent*	*Eastern Sign Bearing Froglets and Bibron's Toadlets calling.*
The Rock	Lots of common frogs calling, particularly from the stream that led away from the dams and was just outside of the survey area. Lots of veg on the banks of the dams, including cumbungi and juncus. Waterbirds, such as white-faced heron and ducks were observed during day obs.	*Absent*	*Eastern sign bearing froglets, Bibron's toadlets and Spotted Marsh Frogs,*
Bomen	Common frogs calling and observed. One of the dams had dirty water covered in scum and a bad small, and this was excluded from the surveys (no frogs calling from this one).	*Absent*	
Table Top	Common species recorded, 4/4 survey nights are now completed. Crayfish observed in the water, indicating good water quality.	*Absent*	
Henty	Common species recorded, 4/4 survey nights are now completed.	*Absent*	

Incidental pest animal species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

4 survey nights and day observations have now been completed at all sites.

240414 Inland Rail Sloane's Froglet surveys Field Memo 19/08/24-22/08/24

Memo completed by **Justin Solomons** 23/08/24

Fieldwork scope

- To conduct targeted surveys for Sloane's Froglet across three survey sites.:
    - Junee 2 Illabo 3 Private property areas
    - Junee 2 Illabo 4 Private property areas
    - Junee 2 Illabo 5 Private property areas
    - Junee 2 Illabo 2 (pick up from team 2)

Fieldwork Methodology

- Jonny Sweeney and Justin Solomons to attend sites listed above and conducted:
    - Active listening (5 minutes)
    - Call playback (2 minutes)
    - Active listening (2 minutes)
    - Active searching (5 minutes)

*Where acceptable habitat is available**

This methodology was applied in areas of habitat that contained water (standing / flowing) and vegetation within the ephemeral zone.

Survey Results

Date	Site	Results	Sloane's Froglet Presence
19/08/24	Junee 2 Illabo 3 - 5	Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
20/08/24	Junee to Illabo 3-5 Day obs	Day obs Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*

Date	Site	Results	Sloane's Froglet Presence
21/08/24	Junee to Illabo 2	Assisted Team 2 with J2I – 2 Northern sites Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
21/08/24	Junee 2 Illabo 3-5 Day time obs	Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
22/08/24	Junee to Illabo 2	Assisted Team 2 with J2I – 2 Northern sites Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally.	*Absent*
22/08/24	Junee to Illabo 3-5	Eastern sign-bearing frog (*Crinia parasignifiera)* recorded aurally. Bibron's Froglet (*Pseudophryne bibronii)* recorded aurally. Sudell's Frog (*Neobatrachus sudelli)* recorded aurally.	*Absent*
23/08/24	Demobilisation	Demobilised back home	

Incidental pest species found on sites: Nil

Incidental species found on sites: Nil

Follow Up

Nil

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APPENDIX E

ISC Rating

ISC Credit		Where addressed
Ecological Value – Eco-1		
Level 1		
Benchmark	The ecological value of the infrastructure site is maintained.	▪ Section 3.4 ▪ Section 6.10
Must Statement from v1.2 ISC Technical Manual	'An ecological management plan (or similar) must be developed and implemented that prioritises minimising ecological impacts, and is managed, reviewed or audited by a suitably qualified professional.	▪ Whole document
Level 2 & 3		
Benchmark	The ecological value of infrastructure site is enhanced by 0 to 20%. Fractions of Levels may be achieved on a sliding scale up to 20% for Level 3.	▪ Section 6.7
Must Statement from v1.2 ISC Technical Manual	There are two methods for ecological assessment which are allowed under this credit. The first is a simple assessment using an 'Ecological Value Calculator'. This approach may be used where Ecology has low or medium Materiality.	▪ Note second method is used (see below).
Must Statement from v1.2 ISC Technical Manual	The second method is a more sophisticated approach using 'Ecological Impact Assessment' (EcIA). This method must be used where Ecology has medium, high or very high Materiality and/or to claim offsets.	▪ Appendix G: Revised Technical Paper 8: Biodiversity Development Assessment Report Part 1&2
Must Statement from v1.2 ISC Technical Manual	EcIA must be managed, reviewed or audited by a suitably qualified professional.	▪ Appendix G: Revised Technical Paper 8: Biodiversity Development Assessment Report Part 1, Section 1.6
Must Statement from v1.2 ISC Technical Manual	It must be demonstrated that it is "probable" (at least a 50% chance) that the enhancement can be achieved.	▪ A rehabilitation strategy will be developed for Stage B of the project. The strategy will be based on the Inland Rail Landscape and Rehabilitation Strategy, the Inland Rail Landscape and Rehabilitation Framework and property-specific reinstatement commitments.
Must Statement from v1.2 ISC Technical Manual	Offsets used under this credit must be calculated and assessed, as a priority, in accordance with any existing regional policy that sets out specific measurement criteria.	▪ Appendix F Biodiversity Credit Report of Appendix G: Revised Technical Paper 8: Biodiversity Development Assessment Report Part 2
Must Statement from v1.2 ISC Technical Manual	Evidence must be provided that demonstrates how ecological values have been maintained or enhanced, using quantifiable metrics where possible. These metrics must be specific to the features and values impacted and developed by a suitably qualified professional.	▪ Section 6.7 ▪ A rehabilitation strategy will be developed for Stage B of the project. The strategy will be based on the Inland Rail Landscape and Rehabilitation Strategy, the Inland Rail Landscape and Rehabilitation Framework and property-specific reinstatement commitments.
Must Statement from v1.2 ISC Technical Manual	If financial or indirect offsets are proposed, evidence must be provided that the offset provided will benefit the impacted matter/s.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	Evidence must also be provided that demonstrates how the offset area will be protected and managed in perpetuity for conservation purposes.	▪ Section 6.8 ▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	If it is desired to exceed the requirements in any existing region policy or such processes do not exist, then: It must be demonstrated that the offsets are permanent and that management regimes are	▪ IR Biodiversity Offset Strategy and evidence of credit retirement

ISC Credit		Where addressed
	in place to ensure stated outcomes are achieved or maintained.	
Must Statement from v1.2 ISC Technical Manual	The extent of the enhancement must be quantified by a SQP. It must be demonstrated that the ecological value of the entire site is maintained or enhanced.	▪ SQPs are engaged for the project to undertake their specific tasks
Habitat connectivity – Eco-2		
Level 1		
Benchmark	There is a low or moderate degree of existing habitat connectivity identified. **AND** The existing degree of habitat connectivity is enhanced (offsetting allowed).	▪ Section 5.2.4 ▪ Section 6.8 ▪ Section 6.10 ▪ Fauna Connectivity strategy
Must Statement from v1.2 ISC Technical Manual	Offsets used under this credit must be calculated and assessed, as a priority, in accordance with any existing regional policy that sets out specific measurement criteria.	▪ Appendix F Biodiversity Credit Report of Appendix G: Revised Technical Paper 8: Biodiversity Development Assessment Report Part 2
Must Statement from v1.2 ISC Technical Manual	It must be demonstrated that the offsets are permanent and that management regimes are in place to ensure stated outcomes are achieved or maintained.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	If financial or indirect offsets are proposed, evidence must be provided that the offset provided will benefit the impacted matters.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	Evidence must be provided that shows how the offset achieves a maintenance or enhancement outcome using accepted metrics that are currently in use in various jurisdictions or are developed by a SQP.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	If land-based offsets are proposed, evidence must also be provided that shows what actions will be implemented on the offset site to achieve maintenance or enhancement.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	Evidence must also be provided that demonstrates how the offset area will be protected in perpetuity for conservation purposes.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Level 2		
Benchmark	There is a low or moderate degree of existing habitat connectivity identified. AND The existing degree of habitat connectivity is enhanced (offsetting allowed).	▪ Section 5.2.4 ▪ Section 6.8 ▪ Section 6.10 ▪ Fauna Connectivity strategy
	OR	
	There is a high degree of existing habitat connectivity identified. **AND** The existing degree of habitat connectivity is maintained (offsetting allowed).	▪ Section 5.2.4 ▪ Section 6.8 ▪ Section 6.10 ▪ Fauna Connectivity strategy
Must Statement from v1.2 ISC Technical Manual	Offsets used under this credit must be calculated and assessed, as a priority, in accordance with any existing regional policy that sets out specific measurement criteria.	Appendix F Biodiversity Credit Report of Appendix G: Revised Technical Paper 8: Biodiversity Development Assessment Report Part 2

ISC Credit		Where addressed
Must Statement from v1.2 ISC Technical Manual	It must be demonstrated that the offsets are permanent and that management regimes are in place to ensure stated outcomes are achieved or maintained.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	If financial or indirect offsets are proposed, evidence must be provided that the offset provided will benefit the impacted matters.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	Evidence must be provided that shows how the offset achieves a maintenance or enhancement outcome using accepted metrics that are currently in use in various jurisdictions or are developed by a SQP.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	If land-based offsets are proposed, evidence must also be provided that shows what actions will be implemented on the offset site to achieve maintenance or enhancement.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Must Statement from v1.2 ISC Technical Manual	Evidence must also be provided that demonstrates how the offset area will be protected in perpetuity for conservation purposes.	▪ IR Biodiversity Offset Strategy and evidence of credit retirement
Level 3		
Benchmark	There is a low or moderate degree of existing habitat connectivity identified. **AND** The existing degree of habitat connectivity is enhanced (with no offsetting)	▪ Not targeting
	OR	
	There is a high degree of existing habitat connectivity identified. **AND** The existing degree of habitat connectivity is maintained (with no offsetting).	

