Appendix E
Biodiversity Assessment

Transport for NSW

Biodiversity Assessment Report for REF

Oxley Highway Interchange Upgrade

22 July 2025

NSW GOVERNMENT

transport.nsw.gov.au

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4.0		

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Glossary

Table 1.1: Glossary

Definitions	
Biodiversity Assessment Method	The Biodiversity Assessment Method is established under section 6.7 of the BC Act. The BAM is established for the purpose of assessing certain impacts on threatened species and threatened ecological communities (TECs), and their habitats, and the impact on biodiversity values.
Biodiversity offsets	The gain in biodiversity values achieved from the implementation of management actions on areas of land, to compensate for losses to biodiversity values from the impacts of development (DPIE 2020a).
BioNet Atlas	The NSW DCCEEW database of flora and fauna records (formerly known as the NSW Wildlife Atlas). The Atlas contains records of plants, mammals, birds, reptiles, amphibians, some fungi, some invertebrates (such as insects and snails listed under the BC Act) and some fish (NSW DCCEEW 2024a).
BioNet Vegetation classification	Refers to the vegetation community-level classification for use in vegetation mapping programs and regulatory biodiversity impact assessment frameworks in NSW.
Cumulative impact	The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Refer to Clause 228(2) of the EP&A Regulation 2000 for cumulative impact assessment requirements.
Direct impact	Direct impacts on biodiversity values include those related to clearing native vegetation and threatened species habitat, and impacts on biodiversity values prescribed by the Biodiversity Conservation Regulation 2017 (the BC Regulation) (DPIE 2020a).
Habitat	An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.
Indirect impact	Impacts that occur when the proposal affects native vegetation and threatened species habitat beyond the development footprint or within retained areas (e.g., transporting weeds or pathogens, dumping rubbish). This includes impacts from activities related to the construction or operational phase of the proposal and prescribed impacts (DPIE 2020a).
Local population	Local population: the population that occurs in the study area. The assessment of the local population may be extended to include individuals beyond the study area if it can be clearly demonstrated that contiguous or interconnecting parts of the population continue beyond the study area, according to the following definitions:

Definitions	
	The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend into habitat adjoining and contiguous with the study area that could reasonably be expected to be cross-pollinating with those in the study area. The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to utilise habitats in the study area. The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year. (DPIE 2020a).
Locality	Area assessed within the 10km buffer zone.
MNES	A matter of national environmental significance (MNES) protected by a provision of Part 3 of the EPBC Act.
Mitchell landscape	Landscapes with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250,000 (DECC 2002).
Mitigation	Action to reduce the severity of an impact.
Mitigation measure	Any measure that facilitates the safe movement of wildlife and/or prevents wildlife mortality or injury.
Native vegetation	(a) trees (including any sapling or shrub or any scrub). (b) understorey plants. (c) groundcover (being any type of herbaceous vegetation). (d) plants occurring in a wetland. A plant is native to New South Wales if it was established in New South Wales before European settlement (BC Act).
Patch size	An area of native vegetation that: • Occurs on the development study area or biodiversity stewardship study area • Includes native vegetation that has a gap of less than 100 m from the next area of native vegetation (or ≤30 m for non-woody ecosystems). • Patch size may extend onto adjoining land that is not part of the development study area or biodiversity stewardship study area (DCCEEW 2024a).
PlantNET	An online database of the flora of New South Wales which contains currently accepted taxonomy for plants found in the State, both native and exotic.
Population	A group of organisms, all of the same species, occupying a particular area (DCCEEW 2024).
Spatial datasets	• Spatial databases required to prepare a BAR • BioNet NSW (Mitchell) Landscapes – Version 3.1

Definitions	
	• NSW Interim Biogeographic Regions of Australia (IBRA region and sub-regions) – Version 7 • NSW soil profiles • Hydrogeological landscapes • Acid sulfate soils risk • Digital cadastral database
Study area	For the purposes of this assessment, the study area encompasses the broader extent of all land parcels associated with the proposal, including Lot 903 DP1291693 to the south-east, Lot 1 DP1250669 to the north-east, and Lot 1 DP1261690 to the south-west. The study area also includes sections of the Oxley Highway and Pacific Highway road reserves, where proposed works intersect or adjoin these transport corridors.
Proposal	The planned work/activity to be completed.
Proposal area	A conservative investigation area was representing the maximum extent of potential direct impacts associated with the proposal. This area includes a 5-metre (m) buffer surrounding the construction footprint to account for incidental disturbance. The investigation area encompasses portions of the following land parcels: DP1291693 to the south-east, DP1250669 to the north-east, and DP1261690 to the south-west.
Threatened Biodiversity Data Collection	A publicly assessable online database (registration required) which contains information for listed threatened species, populations and ecological communities (NSW DCCEEW 2024b).
Vegetation zone	The condition of native vegetation assessed for each vegetation zone against the benchmark for the PCT. The vegetation integrity score is the quantitative measure of vegetation condition calculated by the BAM-C (DPIE 2020a).

Table 1.2: Abbreviations

Abbreviations	
BAM	Biodiversity Assessment Method (DPIE 2020a)
BC Act	Biodiversity Conservation Act 2016
BC Regulation	Biodiversity Conservation Regulation 2017 (NSW)
BAR	Biodiversity Assessment Report
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	The Biosecurity Act 2015
BOM	Bureau of Meteorology
BOS	Biodiversity Offset Scheme under the BC Act
CAMBA	China-Australia Migratory Bird Agreement
CEMP	Construction Environmental Management Plan
CEEC	Critically Endangered Ecological Community

Abbreviations	
DAWE	Former Commonwealth Department of Agriculture, Water and the Environment
DBH	Diameter at Breast Height
NSW DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
Commonwealth DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DotE	Former Department of the Environment
DPIE	Former NSW Department of Planning, Industry and Environment
DPI	NSW Department of Primary Industries
EEC	Endangered ecological community
EHG	NSW Environment and Heritage Group within the Department of Planning
EIS	Environmental Impact Statement
EP&A Act	Environmental Planning and Assessment Act
EP&A Regulation	Environmental Planning and Assessment Regulation
EPBC Act	Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth).
FM Act	Fisheries Management Act 1994 (NSW)
GIS	Geographical Information System
IBRA	Interim Biogeographically Regionalisation of Australia
Infrastructure SEPP	State Environmental Planning Policy (Infrastructure) 2007
JAMBA	Japan-Australia Migratory Bird Agreement
KPoM	Koala Plan of Management
MNES	Matters of National Environmental Significance
OEH	Former NSW Office of Environment and Heritage
PCT	Plant Community Type
PMST	Protected Matters Tool Search
REF	Review of Environmental Factors
RMS	Routine and Minor Works
RoKAMBA	Republic of Korea-Australia Migratory Bird Agreement
SEPP	State Environmental Planning Policy
SIS	Species Impact Statement
TECs	Threatened Ecological Communities
TBDC	Threatened Biodiversity Data Collection
TfNSW	Transport for NSW

Abbreviations	
VEC	Vulnerable Ecological Community
VIS	Vegetation information system

1 Introduction

1.1 Proposal background

TfNSW is proposing to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie, New South Wales (NSW) (the proposal). The proposal forms part of the Oxley Highway Future Growth Program which starts at Hastings River Drive in Port Macquarie and continues to Billabong Drive 200 m west of the Oxley Highway Interchange. The proposal is considered to be permissible without development consent in accordance with clause 94 of the Infrastructure SEPP.

The construction and operation of the works required to implement the proposal are subject to assessment under Division 5.1 of the NSW EP&A Act. An environmental impact assessment in the form of an REF is required to satisfy TfNSW obligations under the EP&A Act. The REF needs to identify and assess the potential impacts of the proposal.

This report, which forms an appendix to the REF, assesses and documents the potential biodiversity impacts of the proposal. It assesses the potential for impacts on ecological values, with particular emphasis on threatened ecological communities, populations and species listed under the BC Act and *Fisheries Management Act 1994* (FM Act) and Matters of National Environmental Significance (MNES) listed under the Commonwealth EPBC Act.

1.2 The proposal

TfNSW proposes to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie, NSW (Figure 1-1). Key features of the proposal include:

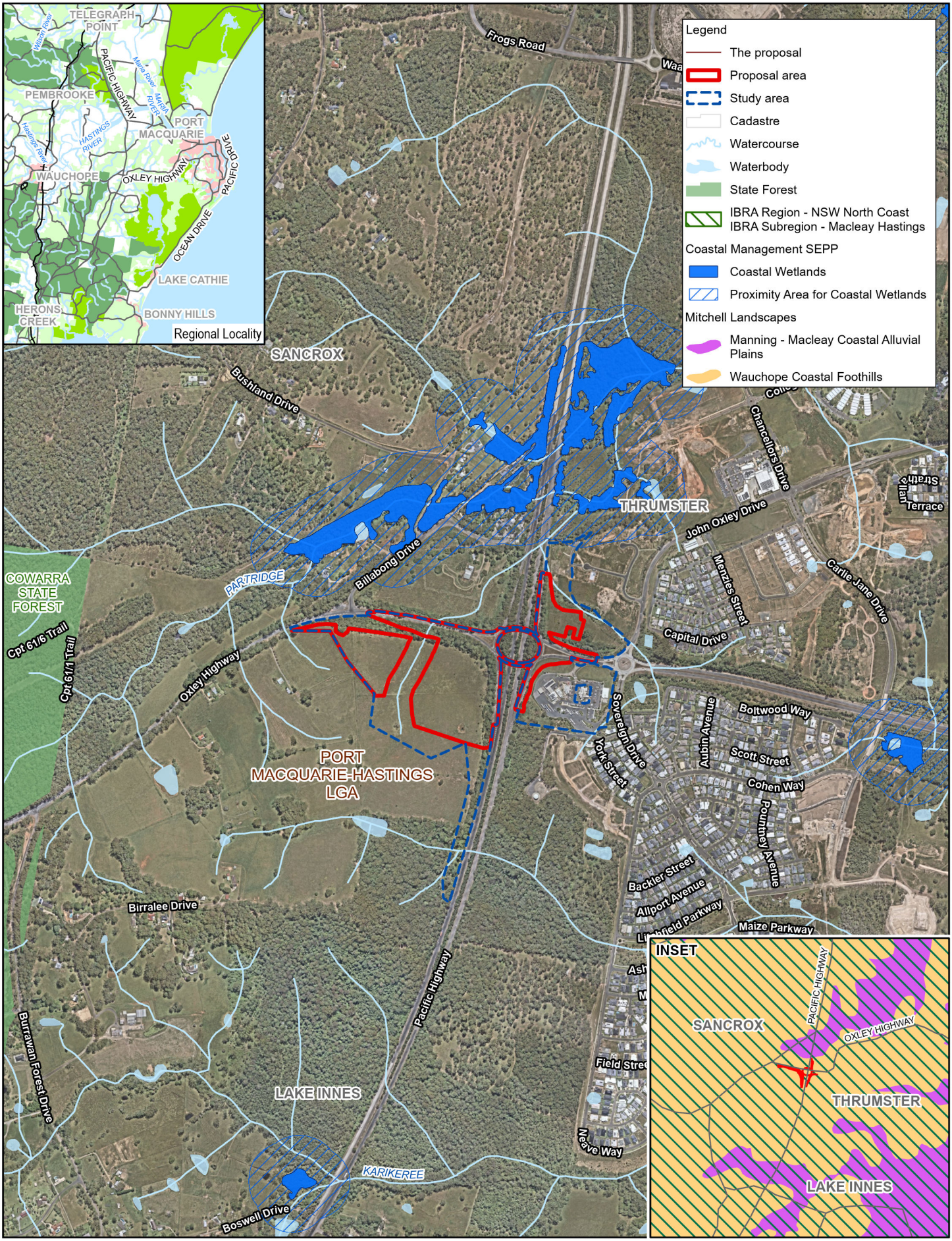
- Additional approach lane to the roundabout on the southbound exit ramp
- Additional approach lane to the roundabout on the northbound exit ramp, as well as a slip lane for westbound vehicles
- A slip lane for southbound vehicles
- Two lanes westbound from the roundabout, including re-line-marking the existing bridge to have two lanes westbound
- Two right turn lanes from the northbound exit ramp, including spiral line-marking.

The location of the proposal is shown in Figure 1-1 and an overview of the proposal is provided in Figure 1-2.

1.2.1 Assessment areas

The assessment areas as per the proposal are defined below:

- **The proposal:** The proposed road upgrades outlined in Section 1.2 between the Oxley and Pacific Highways in Port Macquarie, NSW.
- **The proposal area:** A conservative investigation area was representing the maximum extent of potential direct impacts associated with the proposal. This area includes a 5-metre (m) buffer surrounding the construction footprint to account for incidental disturbance. The investigation area encompasses portions of the following land parcels: Lot 903 DP1291693 to the south-east, Lot 1 DP1250669 to the north-east, and Lot 1 DP1261690 to the south-west.
- **The study area:** For the purposes of this assessment, the study area encompasses the broader extent of all land parcels associated with the proposal, including Lot 903 DP1291693 to the south-east, Lot 1 DP1250669 to the north-east, and Lot 1 DP1261690 to the south-west. The study area also includes sections of the Oxley Highway and Pacific Highway road reserves, where proposed works intersect or adjoin these transport corridors.
- **Locality:** a 10 km radius of the proposal area.



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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

N

Disclaimer: Subject to detailed design

Transport for NSW
Oxley Highway Interchange
Biodiversity Assessment

Proposal context

Project No. **12624683**
Revision No. **A**
Date **21/04/2025**

FIGURE 1-1

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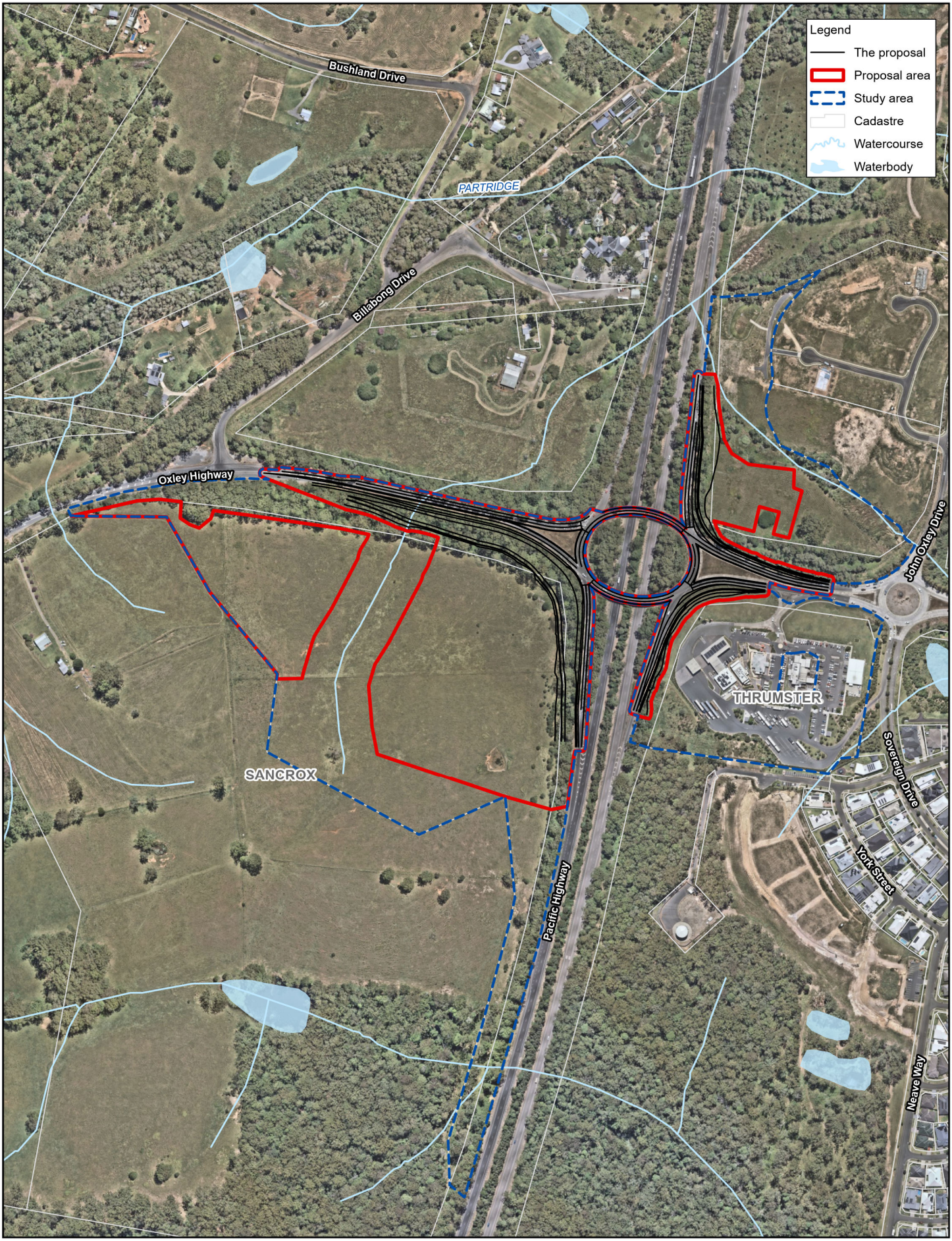
Print date: 21 Apr 2025 - 09:36

Data source: State Forest - FCNSW 2024; Coastal Management SEPP, Mitchell Landscapes, NPWS Reserve, IBRA - DCCEEW 2024; General topography, cadastre: NSW Spatial Services 2024; NPWSTfNSW: The proposal, 2021; Nearmap: Imagery (Date extracted: 21/04/2025)public_NSW_Imagery: © Department of Customer Service 2020 Coastal Management SEPP:
Nearmap WMS Server: public_NSW_Imagery: © Department of Customer Service 2020 Coastal Management SEPP:
Nearmap WMS Server: . Created by: rvillalon



Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Disclaimer: Subject to detailed design

Transport for NSW
Oxley Highway Interchange
Biodiversity Assessment

The proposal

Project No. **12624683**
Revision No. **A**
Date **21/04/2025**

FIGURE 1-2

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Print date: 21 Apr 2025 - 09:37

Data source: General topography, cadastre: NSW Spatial Services 2024; TfNSW: The proposal, 2021; Nearmap: Imagery (Date extracted: 21/04/2025)Nearmap WMS
Server: . Created by: rvillalon

1.3 Legislative context

1.3.1 NSW Environmental Planning and Assessment Act 1979

The EP&A Act forms the legal and policy platform for development assessment and approval in NSW and aims to, amongst other things, 'encourage the proper management, development and conservation of natural and artificial resources. All development in NSW are assessed in accordance with the provisions of the EP&A Act and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation).

The proposal is a Division 5.1 activity under the EP&A Act. The determining authority for the proposal is TfNSW.

Section 5.7 of the EP&A Act requires the determining authority to consider whether an activity is 'likely to significantly affect the environment' (including critical habitat) or threatened species, populations or ecological communities, or their habitats. If a determining authority is of the opinion that an activity would be likely to significantly affect the environment, by virtue of a Ministerial order, the activity would then require the approval of the Minister for Planning.

Factors that need to be taken into account when considering the likely impact of an activity on the environment are outlined in Clause 228 of the EP&A Regulation. A REF has been prepared to assess the environmental impacts of the proposal and satisfy the requirements of Part 5 of the EP&A Act and Clause 228 of the EP&A Regulation. This report forms an attachment to the REF.

1.3.2 NSW Biodiversity Conservation Act 2016

The BC Act provides legal status for biota of conservation significance in NSW and aims to, amongst other things, 'maintain a healthy, productive and resilient environment for the greatest well-being of the community, now and into the future, consistent with the principles of ecologically sustainable development'. It provides for the listing of threatened species and communities, establishes a framework to avoid, minimise and offset the impacts of proposed development, known as the Biodiversity Offsets Scheme (BOS), and establishes the Biodiversity Assessment Method (BAM), which is a scientific method for assessing the likely impacts on biodiversity values and calculating measures to offset those impacts.

Part 7.3 of the BC Act lists five factors that must be considered when determining the significance of potential impacts of a proposed activity on threatened species, populations or ecological communities (or their habitats) listed under the BC Act. The 'five part test' or 'test of significance' is used to determine whether a proposal is 'likely' to impose 'a significant effect' on threatened biota and thus whether a Species Impact Statement (SIS) is required. There is also the option to prepare a Biodiversity Development Assessment Report (BDAR) rather than an SIS, where a significant impact is likely.

The BC Act has been addressed in this assessment through:

- Desktop review to determine the threatened species, populations or ecological communities that have been previously recorded within the locality and hence could occur in the proposal, subject to the habitats present.
- Identification, assessment and mapping of listed threatened communities and threatened species (or their habitat).
- Assessment of potential impacts on listed threatened species, populations and ecological communities.
- Identification of suitable impact mitigation and environmental management measures to minimise potential impacts on threatened biota, where required.

1.3.3 NSW Fisheries Management Act 1994

The objectives of the FM Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. It provides for the listing of threatened species, populations and ecological communities, key threatening processes and requirements or otherwise for the preparation of a Species Impact Statement (SIS). One of the objectives of the FM Act is to 'conserve key fish habitats' which includes aquatic habitats that are important to the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. To assist in the protection of key fish habitats, NSW Department of Primary Industries has produced the Policy and guidelines for fish habitat conservation and management (DPI 2013).

The FM Act has been addressed in this assessment through undertaking:

- A desktop review to determine the threatened species, populations or ecological communities that have been previously recorded within the locality of the proposal and hence could occur in the study area, subject to the habitats present.
- Assessment of potential impacts on aquatic habitats, including identification of key threatening processes of relevance to the proposal, impacts on key fish habitat and fish passage.
- Assessment of the potential for impacts on listed threatened species, populations and ecological communities and the requirement or otherwise for an SIS.
- Identification of suitable impact mitigation and environmental management measures to avoid or mitigate impacts on the aquatic environment.
- Aquatic habitat is discussed in Section 3.5, and potential impacts are identified in Section 4.

1.3.4 NSW Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for risk-based management of biosecurity in NSW. It provides a statutory framework to protect the NSW economy, environment, and community from the negative impact of pests, diseases and weeds.

The primary object of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers, or potential carriers.

In NSW, all plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any biosecurity risk, has a duty to ensure the risk is prevented, eliminated, or minimised, so far as is reasonably practicable.

Legal requirements to minimise the potential for the introduction and/or spread of weeds as a result of the proposal are relevant, as two species classified as priority weeds under the Biosecurity Act occur within the study area.

1.3.5 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

The purpose of the EPBC Act is to ensure that actions likely to cause a significant impact on MNES, or the environment of Commonwealth land, undergo an assessment and approval process. Under the EPBC Act, an action includes a proposal, a development, an undertaking, an activity or a series of activities, or an alteration of any of these things. An action that 'has, will have or is likely to have a significant impact on a MNES or a significant impact to the environment of Commonwealth land is deemed to be a 'controlled action' and may not be conducted without prior approval from the Australian Minister for the Environment.

In September 2015, a 'strategic assessment' approval was granted by the Australian Minister for the Environment in accordance with the EPBC Act. The program applies to TfNSW activities being assessed under Part 5 of the EP&A Act with respect to potential impacts on 'specified protected matters' (nationally listed threatened species, ecological communities, and migratory species). The objective of the program is to ensure that road and traffic management activities undertaken by TfNSW are assessed and delivered in a way that provides protection for these specified protected matters. The 'avoid, minimise, mitigate and offset' hierarchy must be addressed. Potential impacts on specified protected matters are subject to an assessment of significance pursuant to the EPBC Act Significant Impact Guidelines (DotE 2013), however there is no need to refer the proposal to the Minister for the Environment. If a significant impact is considered likely for a specified protected matter, impacts must be offset using an endorsed method (e.g., the BAM).

Potential MNES of relevance to this assessment include:

- Threatened species and ecological communities
- Migratory species.

Relevant MNES have been addressed in this assessment through:

- Desktop review to determine the listed threatened or migratory biota known or predicted to occur within the locality of the proposal which could occur in the study area, subject to the habitats present.
- Field surveys to identify the presence of threatened or migratory species, or potential habitat for listed threatened biota and migratory species.
- Assessment of potential impacts on threatened and migratory biota.
- Identification of suitable impact mitigation and environmental management measures for threatened and migratory biota, where required.

1.3.6 State Environmental Planning Policy (Biodiversity and Conservation) 2022

The amalgamated framework, which commenced on 21 November 2022, consolidated and updated provisions in seven former chapters of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP). This includes the former State Environmental Planning Policy (Koala Habitat Protection) 2021 & 2020.

The proposal area has been assessed against the SEPP using the NSW SEED map (NSW DCCEEW 2025h). The site is:

- Not located on land mapped as Coastal Wetlands or Littoral Rainforest
- No mapped as an area of high biodiversity on the Biodiversity Values Map
- Not located within an Area of Outstanding Biodiversity Value.

The activity is consistent with the principles of the SEPP, with impacts on biodiversity minimised through avoidance and mitigation measures outlined in Chapter 5.1.

1.3.7 Port Macquarie Hastings Council Koala Plan of Management

The Koala Plan of Management (KPoM) aims to support the effective conservation and management of native vegetation that provides habitat for Koalas, with the goal of maintaining a sustainable, free-living population within their current range in designated areas. The proposal area includes land on the western side of the Pacific Highway that is subject to the Thrumster – Area 13 component of the KPoM as Secondary Koala Habitat. For the purpose of this assessment, the potential of all forested vegetation to represent potential Koala habitat has been assessed, regardless of if it falls within Area 13.

Area 13 represents the final stage in the development of an integrated Structure Plan and KPoM for the Area 13 Urban Investigation Area, located to the south west of Port Macquarie, NSW. Conditionally approved by the Department of Planning on 10 January 2008, the KPoM remains in effect for a period of 20 years unless amended or superseded. For land containing mapped secondary habitat, the KPoM requires consideration of habitat connectivity, vegetation retention, movement corridors, and mitigation of threats such as vehicle strike and dog attack. Any proposed activity within mapped habitat areas must demonstrate consistency with the KPoM and address these matters through appropriate planning, design, and mitigation measures. This is addressed in several chapters of the report, including Section 3.8.

Disclaimer

GHD has prepared this report on the basis of information provided by Transport for NSW, which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. study area conditions at other parts of the study area may be different from the study area conditions found at the specific sample points.

study area conditions may change after the date of this report. GHD does not accept responsibility arising from, or in connection with, any change to the study area conditions. GHD is also not responsible for updating this report if the study area conditions change.

2 Methods

2.1 Desktop assessment

2.1.1 Database searches

A desktop database and literature review were undertaken to identify threatened flora and fauna species, populations and ecological communities (biota) listed under the BC Act and FM Act, and MNES listed under the EPBC Act, that could be expected to occur in the locality based on previous records, known distribution ranges, and habitats present. The database review assisted with determining the field survey techniques and effort. Biodiversity databases and information pertaining to the proposal area and locality that were reviewed prior to conducting field investigations included:

- The NSW Department of Climate Change, Energy, the Environment and Water (NSW DCCEEW 2025a) BioNet Atlas for records of threatened species listed under the BC Act and EPBC Act that have been recorded within the locality (search conducted 20 May 2025).
- The Commonwealth Department of Climate Change, Energy, the Environment and Water (Cwlth DCCEEW 2025a) Protected Matters Search Tool (PMST) for MNES listed under the EPBC Act that may occur in the area, as well as nationally important wetlands (search conducted 20 May 2025).
- The BioNet Vegetation Classification Database to identify plant community types (PCTs) present in the study area (NSW DCCEEW 2025c).
- Priority weed declarations for Port Macquarie-Hastings Council LGA (DPI 2021).
- Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (BOM 2024).
- DCCEEW register of declared areas of outstanding biodiversity value (NSW DCCEEW 2025d).
- Aerial imagery of the study area.
- NSW DPI Fisheries Spatial Data Portal (DPI 2024).
- Existing regional-scale vegetation mapping for the Port Macquarie LGA (VIS, 4205; DPIE 2015)
- NSW DCCEEW Atlas of Groundwater Dependent Ecosystems (NSW DCCEEW 2025e).
- Coastal management areas identified by the Resilience and Hazards SEPP 2022.
- Core Koala Habitat identified by the Biodiversity and Conservation SEPP (DAWE 2022a).
- Any previous recent and relevant surveys (e.g., preliminary environmental investigation, options assessments) or studies.
- Coastal Wetlands and Littoral Rainforest mapped under the SEPP (Resilience and Hazards) 2021.
- PMHC Thrumster – Area 13 KPoM (PMHC 2008).

2.1.2 Literature Review

A review of literature relevant to the proposal was undertaken before the commencement of the field surveys to gain information on the biodiversity values of the study area and surrounds. The following documents were reviewed:

- Environmental Values Review of Fernbank Creek and Sancrox Structure Plan (Niche 2020).
- Greater Sancrox Ecological Assessment (Biolink 2011).
- The annual Final Priority Assessment List of nominated species and ecological communities (TSSC 2024).

2.2 Vegetation assessment

Field surveys for the proposal focused on identification of plant community types (PCTs) present and their conservation significance. Given that wholesale clearing of the vacant properties is not proposed, rather that the proposal comprises partial clearing activities, full assessment in accordance with the NSW Biodiversity Assessment (BAM) has not been undertaken. Field surveys included vegetation mapping and vegetation integrity plot surveys. No calculation of patch size or vegetation cover is necessary for this assessment.

2.3 Field survey

2.3.1 Overview

Field surveys in the study area were conducted by a GHD ecologists on 25 May 2021 and by Niche ecologists on 19, 20, 26 April 2024. The field surveys focused on the identification of PCTs, the presence and extent of Threatened Ecological Communities (TECs) within the study area, identification and mapping of threatened species habitat, an assessment of the value of habitats present for threatened biota and tree surveys.

2.3.2 Vegetation mapping

Regional vegetation mapping (NSW DCCEEW, 2025f) was uploaded onto the ArcGIS collector app on a mobile device and the attributes and boundaries of mapped PCTs were ground truthed during the field survey. To assist in classifying PCTs present, notes were taken regarding the observed species composition and vegetation structure throughout the study area. The BioNet Vegetation Classification Database was used to assign the most appropriate PCT to each vegetation type (NSW DCCEEW, 2025c).

Boundaries of vegetation communities were marked using ArcGIS collector and mapped in a Geographical Information System (GIS).

Vegetation within the proposal area was assessed against identification criteria for State and Commonwealth listed TECs. Vegetation and habitats were compared with descriptions provided in published threatened species profiles and management plans (Cwlth DCCEEW, 2025b; NSW DCCEEW, 2025c).

2.3.3 Vegetation survey and classification

The study area retains several steep embankments adjacent to the highway with dense thickets of the exotic weed, *Lantana camara* (see Table 3.3). Given the limited access to the area, floristic plot surveys (i.e. BAM plots) were not able to be completed. Instead, the study area was traversed on foot using a random meander method in accordance with the method described by Cropper (1993). During this meander, all vascular plant species observed were identified and notes were taken regarding dominant species, structure of vegetation, landscape position and soils within each vegetation type. Where access was possible systematic transverses were completed.

The floristic and structural information recorded was used to identify and describe the nominated vegetation types, consider the presence of TECs and determine the conservation status of vegetation types under the BC Act and EPBC Act.

Plant specimens that could not be identified rapidly in the field were collected and subsequently identified using the Flora of NSW (Harden 1993-2002). Plant specimens that were problematic to identify (either insufficient sample collected or no reproductive material available at the time of the survey) were identified to genus level.

Information regarding vegetation structure, disturbance and presence of priority weed species was also recorded throughout the study area.

2.3.4 Nomenclature

Plant nomenclature is in accordance with The Flora of New South Wales Volumes 1 to 4 (Harden, 1993 - 2002) and taxonomic updates in PlantNET – The NSW Plant Information Network System (Royal Botanic Gardens and Domain Trust 2025).

2.3.5 Tree surveys

A tree survey was undertaken by Niche ecologists on 19 April 2023 using methods outlined in Section 3.2.3 and Section 7.2.2 of the latest TfNSW BAR template (TfNSW 2024a). Niche ecologists completed a total of three 0.1 hectare (ha) plots within the mapped *PCT 3161: Mid North Hinterland Wet Forest*. Trees within each plot were identified and counted within each size class identified by TfNSW (2024a). The methodology and findings of this assessment was provided by Niche and is outlined in Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche).

2.3.6 Habitat suitability assessment

General fauna habitat assessments were undertaken within the study area, including active searches for potential shelter, basking, roosting, nesting and/or foraging habitat.

Indicative habitat criteria for targeted threatened species (i.e., those determined as having the potential to occur within the proposal area following the desktop review) were identified prior to fieldwork. Habitat criteria were based on information provided in NSW DCCEEW and Cwlth DCCEEW threatened species profiles, field guides, and the knowledge and experience of GHD field ecologists.

Habitat assessments included searches for resources of potential value to threatened fauna including:

- Vegetation patch size, age, disturbance and structural diversity (important for many threatened birds and mammals)
- Quality of substrate for sheltering frogs and reptiles including rocks, logs, debris, peeling bark, leaf litter and native grassland
- Presence of winter-flowering eucalypts and Koala (Phascolarctos cinereus) feed trees
- Hollow-bearing trees and logs that may provide refuge, nest, and den study areas for a range of threatened fauna species
- Stags and other roost study areas for raptors and owls
- Hydrological features
- Wetlands, moist grassland and other foraging habitat for waterbirds (including migratory birds) and frogs
- Mammal scats
- Nest/den study areas within logs, tree bases or tree trunks
- Guano or moth remains at the base of hollow-bearing trees (diagnostic of the presence of tree-roosting bats)
- Scratches on tree trunks (indicative of Koalas, gliders, or goannas) and worn bark around tree hollows (diagnostic of active use of hollows)
- Owl pellets, whitewash or animal remains beneath trees (diagnostic of owl or raptor roosts)
- Targeted threatened frog surveys for the Green-thighed Frog (Litoria brevipalmata), Green and Golden Bell Frog (Litoria aurea) and Wallum Froglet (Crinia tinnula).

The locations and quantitative descriptions of the above habitat features were captured using a handheld GPS unit.

2.3.7 Opportunistic observations

Opportunistic and incidental observations of fauna species were recorded during the field survey. Survey effort was concentrated on suitable areas of habitat throughout the course of the survey, for instance burrows, diggings and any evidence of animal activity were noted, and mature trees were scanned for roosting birds.

2.3.8 Targeted flora surveys

Opportunistic surveys were undertaken for threatened flora species that could occur within the proposal area given known distributions, previous records in the locality and habitat requirements for each species. Threatened flora searches were carried out by conducting meander traverses within areas of potential habitat within the proposal area. Detailed seasonal targeted surveys with reference to the threatened flora survey guidelines (DPIE 2020c) were not conducted, as they were outside the scope of this assessment. Instead, an assessment of the presence and quality of potential habitat for predicted threatened flora species was completed, and opportunistic observations of threatened flora species were made (Appendix B: Habitat suitability assessment).

Multiple rounds of detailed seasonal surveys in accordance with the BAM were not conducted for all threatened flora with potential to occur in the study area. For those species an assessment of the presence and quality of potential habitat for predicted threatened flora species was completed (Appendix B: Habitat suitability assessment).

2.3.9 Targeted fauna surveys

Diurnal bird surveys were conducted throughout the survey period, with birds identified by sight and call. Surveys generally comprised opportunistic observations within the proposal area. Opportunistic and incidental observations of other fauna species were recorded at all times during field surveys.

Active searches were undertaken for select threatened frog species identified during the desktop review that are considered to have a high likelihood of occurrence within the proposal area. This assessment considered known distributions, previous records in the locality, and habitat requirements for each species. The targeted frog surveys are detailed in Table 2.1 below.

Table 2.1: Targeted threatened fauna survey details

Scientific name	Common name	Required survey period specified in the TBDC	Associated PCTs in the study area	Minimum survey requirements	Survey completed
Litoria aurea	Green and Gold Bell Frog	November - March	Species known to occur in dams within disturbed site (cleared, agricultural etc).	NA	Yes
Crinia tinnula	Wallum Froglet	All year round	Species known to occur in permanent water bodies within disturbed sites.	NA	Yes
Litoria brevipalmata	Green-thighed Frog	September – April	Species is associated with PCT 3161: Mid North Hinterland Wet Forest.	NA	No - Unable to complete due to incorrect conditions (Insufficient rainfall).

2.4 Personnel

Table 2.2: Personnel

Name	Role	Qualifications
Arien Quin	Senior Ecologist / study area survey	Bachelor of Arts / Bachelor of Science (Botany) Accredited BAM assessor
Luke O'Brien	Ecologist (Zoologist) / reporting	Bachelor of Environmental Science and Management Bachelor of Science (Honours)
Felicity Williams	Ecologist (Zoologist) / reporting	Bachelor of Science (Honours)
James Baldry	Senior Ecologist (Botanist) / technical support	Master of Conservation Biology
Rael Hodges	Ecologist (Zoologist)/Reporting	Master of Conservation Biology/Environmental Science
Alexandria Yates	Graduate Ecologist / reporting	Bachelor of Environmental Science and Management

2.5 Limitations

This report has been prepared by GHD for TfNSW and may only be used and relied on by TfNSW for the purpose agreed between GHD and TfNSW as set out in Section XX of this report.

GHD otherwise disclaims responsibility to any person other than TfNSW arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report (refer Section 7 of this report). GHD disclaims liability arising from any of the assumptions being incorrect.

It is likely that some species that occur in the study area either permanently, seasonally, or transiently were not detected during the surveys. These species may include annual, ephemeral or cryptic flora species; nocturnal fauna; birds and frogs that call at other times of year and mobile or transient fauna in general. The timing of the field survey was inappropriate to detect some cryptic threatened flora species, should they occur, with the likelihood of this assessed in Appendix B: Habitat suitability assessment.

The habitat assessment conducted allows for identification of habitat resources for such species, to make an assessment of their likelihood of occurring within the study area. As such, the survey was not designed to detect all species, rather to provide an overall assessment of the ecological values and constraints within the study area. This information was used to predict potential impacts of the proposal on biodiversity values and to assist with the development of a design and approach to construction that specifically avoids and/or reduces impacts on threatened ecological communities and known and potential habitat for threatened species as far as possible.

3 Existing environment

3.1 Location and land-uses

The proposal area is situated at the intersection of the Pacific Highway and Oxley Highway, between Port Macquarie and Wauchope, New South Wales. The area predominantly comprises exotic pasture with limited native vegetation, a result of historical clearing and agricultural improvement activities. The intersection itself, along with associated off-ramps and connecting roads, dissects the study area.

Narrow, linear remnants of native vegetation are present along both highways. These areas, while degraded, are largely inaccessible to the public and retain some ecological value. Much of the surrounding landscape has been cleared for infrastructure, residential, and agricultural purposes. Native vegetation persists in a fragmented mosaic across the area, frequently interrupted by roads, other infrastructure, and development.

Land use in the immediate vicinity of the proposal area is primarily agricultural, with a network of local and major roads. However, much of the area is undergoing rezoning and redevelopment for suburban expansion. Despite increasing urbanisation, several large patches of remnant native forest remain in the broader locality. Notably, one of these patches retains ecological connectivity to the proposal area via a narrow, vegetated corridor running south along the Pacific Highway.

A single unnamed ephemeral waterway crosses the western edge of the study area. Additionally, a farm dam and artificial drainage swale are present within Lot 1 DP1261690, adjacent to the Pacific Highway.

Landscape features within the study area were identified through desktop assessment and initial field surveys. A summary of these features is provided in Table 3.1.

Table 3.1: Landscape context

Landscape feature	Description within study area
Interim Biogeographic regionalisation of Australia (IBRA) bioregion	NSW North Coast
IBRA subregion	Macleay Hastings
Mitchell landscapes	Wauchope Coastal Foothills and Manning - Macleay Coastal Alluvial Plains
Local Government Area	Port Macquarie-Hastings
Hydrology	An unnamed, ephemeral first order waterway intersects Lot 1 DP1261690, to the west of the proposal area, however does not occur within the proposal area. A small farm dam and drainage swale occurs within proposal area. Partridge Creek located about 350 m to the north of the study area and Karikeree Creek located about 1.5 km to the south. Lake Innes is located 3.5 km to south-east of the study area.
Connectivity features	The study area occurs in a highly fragmented landscape and is connected to a remnant patch of vegetation approximately 350 m to the south via a narrow corridor of roadside vegetation. Karikeree Creek lies on the southern boundary of this patch and may be used by select frog species dispersing between Lake Innes and Cowarra State Forest.
Land uses	Infrastructure, agricultural, residential, commercial.
Critical habitat or areas of outstanding biodiversity value	No areas of outstanding biodiversity value are located within the proposal area or surrounds.

3.2 Vegetation and flora

3.2.1 Plant community types and vegetation zones

A total of 76 flora species were recorded within the study area, comprising 50 native and 26 exotic species. A comprehensive species list is provided in Appendix A: Species List.

Native vegetation within the proposal area occurs as narrow, disturbed patches of wet sclerophyll forest along the verges of the Oxley and Pacific Highways. This vegetation is characterised by a canopy dominated by Flooded Gum (*Eucalyptus grandis*), with a lower abundance of Turpentine (*Syncarpia glomulifera*) and Tallowwood (*Eucalyptus microcorys*). The midstorey and understorey layers are disturbed and support a mix of native and exotic species. Based on its structure and floristic composition, this vegetation is consistent with *PCT 3161: Mid North Hinterland Wet Forest*—the only native PCT identified within the proposal area.

In addition to PCT 3161, two small farm dams are present, supporting a mix of native and exotic wetland vegetation. However, the vegetation associated with these dams is not consistent with any defined PCT. All remaining areas within the study area consist of exotic-dominated grassland or areas of existing infrastructure that are, again, not commensurate with a PCT.

All vegetation zones are described in Table 3.2 below, inclusive of their extent within the proposal area and listing status. A description of the key attributes and floristic composition of each zone is provided in Table 3.3 to Table 3.5 and their distribution mapped Figure 3-1.

Table 3.2: Plant community types

PCT ID	Plant community type (PCT)	Threatened ecological community	Extent in the proposal area (ha)
3161	Mid North Hinterland Wet Forest	Not associated with a listed TEC under the BC Act or EPBC Act	2.73
N/A	Exotic grassland	N/A	9.29
N/A	Dam/wetland	N/A	0.08
N/A	Existing infrastructure	N/A	2.12
		Total	14.22

Table 3.3: PCT 3161 - Mid North Hinterland Wet Forest – moderate condition

PCT 3161 Mid North Hinterland Wet Forest – moderate condition		
PCT (NSW DCCEEW 2025c)	Mid North Hinterland Wet Forest	 PLATE 1: PCT 3161: MID NORTH HINTERLAND WET FOREST – MODERATE CONDITION
PCT ID	3161	
Vegetation formation	Wet Sclerophyll Forest (Shrubby sub-formation)	
Vegetation class	North Coast Wet Sclerophyll Forests	
Percentage cleared estimate	55 %	
Area in proposal area	2.73 ha	
Conservation significance	BC Act: Not associated with any listed TECs. EPBC Act: Not associated with any listed TECs.	
Condition	Examples of this community in the proposal area are of moderate condition, consisting of canopy trees over a highly disturbed mid and ground layer with much of the understorey extent comprised of dense thickets of Lantana *(Lantana camara*). Although trees within the canopy are mature and many are up to 30 metres tall, they appear relatively young and have not yet formed hollows.	
Landscape position	Within the proposal area, PCT 3161 occurs on lower slopes, often on the edge of the Pacific and Oxley Highways.	
Structure	Very tall open forest with trees averaging 25- 30 m high, with a dense shrub layer and a mid-dense or dense groundcover. High abundance of mesic ferns, shrubs and graminoids.	
Overstorey	Canopy species include the dominant Flooded Gum (*Eucalyptus grandis*) accompanied by a lower abundance of Tallowwood (*Eucalyptus microcorys*) and Turpentine (*Syncarpia glomulifera*).	
Midstorey	Dominant midstorey species include Fringed Wattle (*Acacia fimbriata*), Cheese Tree (*Glochidion ferdinandi*), Blackwood (*Acacia melanoxylon*), Sweet Pittosporum (*Pittosporum undulatum*) and Coffee Bush (*Breynia oblongifolia*).	
Groundcover	Dominant groundcover species include Basket Grass (*Oplismenus aemulus*), Weeping Grass (*Microlaena stipoides*), Blady Grass (*Imperata cylindrica*), Ivy-leaved	

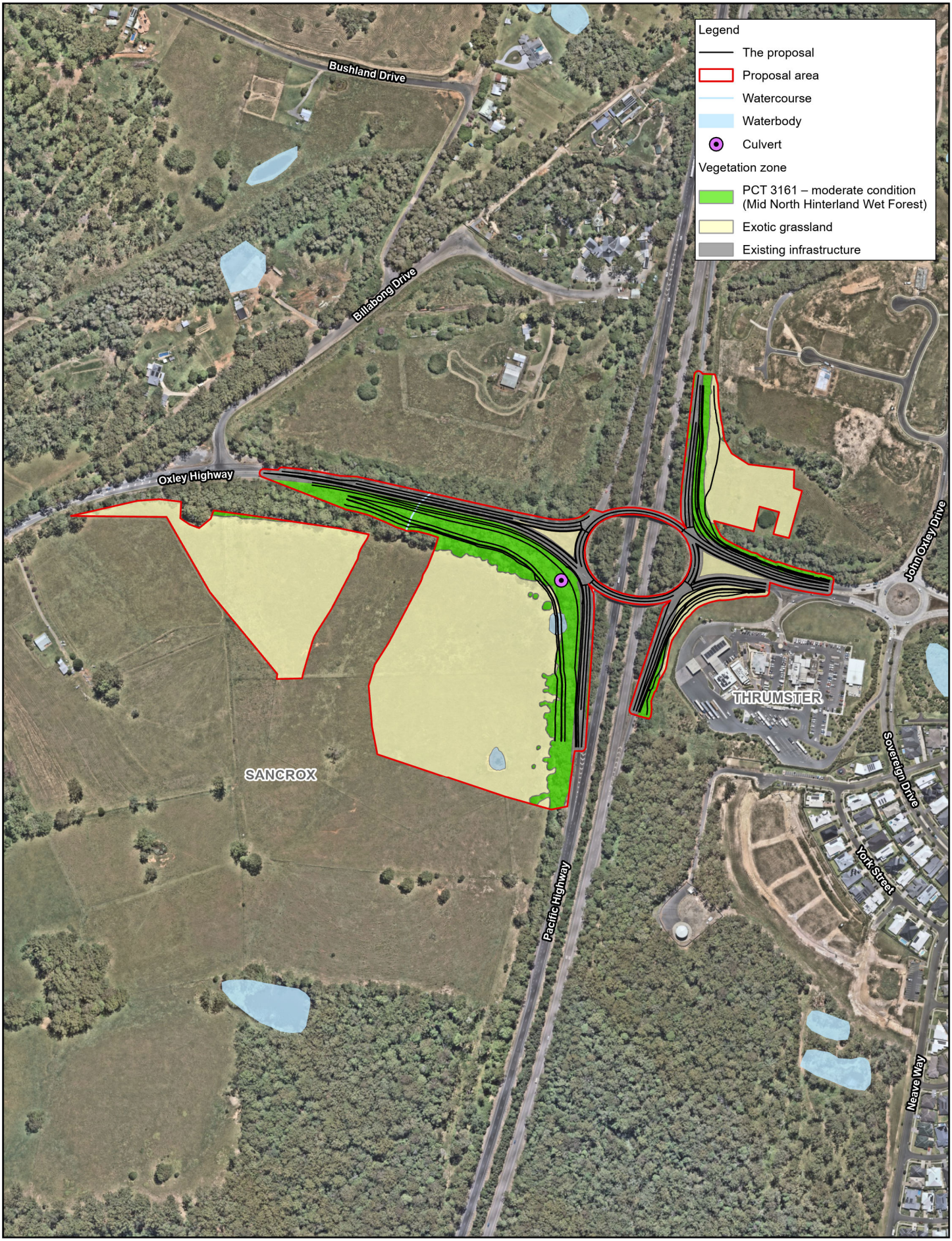
PCT 3161 Mid North Hinterland Wet Forest – moderate condition	
	Violet (*Viola hederacea),* Gristle Fern (*Blechnum cartilagineum*), Bracken Fern (*Calochlaena dubia*).
Exotic	Examples of this community within the proposal area have a high abundance of the exotic shrub species, Lantana (*Lantana camara*). Other common exotic species recorded within the community include Camphor Laurel (*Cinnamomum camphora*), Whisky Grass (*Andropogon virginicus*), Coffee Senna (*Senna occidentalis*), Tobacco bush (*Solanum mauritianum*) and Fireweed (*Senna madagascariensis*).

Table 3.4: Wetland/Dam

Wetland/Dams		
PCT	N/A	 PLATE 2: DAM/WETLAND ON THE EASTERN BOUNDARY OF THE PROPOSAL AREA
PCT ID	N/A	
Area in proposal area	0.08 ha	
Conservation significance	N/A	
Condition	Dams constructed for livestock use; currently in poor condition. Sparse native emergent vegetation present, with low species richness. Margins dominated by exotic grass species.	
Overstorey	Nil	
Midstorey	Nil	
Groundcover	Native species present within small dam area include *Juncus planifolius*, Frogsmouth (*Philydrum lanuginosum*) and Spike Rush (*Eleocharis* sp.). Exotic species include Broadleaf Paspalum (*Paspalum mandiocanum*), Paspalum (*Paspalum dilatatum*) Couch Grass (*Cynodon dactylon*) and Whisky Grass (*Andropogon virginicus*).	

Table 3.5: Exotic vegetation

Exotic vegetation		
PCT	N/A	 PLATE 3: EXOTIC GRASSLAND IN THE PROPOSAL AREA
PCT ID	N/A	
Area in proposal area	9.29 ha	
Conservation significance	N/A	
Condition	Vegetation historically cleared; not consistent with any PCTs of the Macleay Hastings IBRA subregion. Generally in poor condition, dominated by exotic grasses, sedges, and forbs. Subject to periodic grazing.	
Overstorey	Nil	
Midstorey	Nil	
Groundcover	Exotic species found throughout this community include Broadleaf Paspalum (*Paspalum mandiocanum*), Paspalum (*Paspalum dilatatum*), Whisky Grass (*Andropogon virginicus*) Rhodes Grass (*Chloris virgata*), Couch Grass (*Cynodon dactylon*), Fireweed (*Senecio madagascariensis*).	



Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

Disclaimer: Subject to detailed design

Transport for NSW
Oxley Highway Interchange
Biodiversity Assessment

Vegetation zones and habitat

Project No. **12624683**
Revision No. **A**
Date **21/04/2025**

FIGURE 3-1

\\ghdnet\ghd\AU\Newcastle\Projects\22\12624683\GIS\Maps\12624683_BAR.aprx
Print date: 21 Apr 2025 - 09:38

Data source: General topography, cadastre: NSW Spatial Services 2024; TfNSW: The proposal, 2021; Nearmap: Imagery (Date extracted: 21/04/2025)Nearmap
WMS Server: . Created by: rvillalon

3.2.2 Threatened ecological communities

The vegetation community identified within the proposal area, *PCT 3161: Mid North Hinterland Wet Forest*, is not associated with any TECs listed under the BC Act or the EPBC Act. Accordingly, no TECs occur within the proposal area.

3.2.3 Tree surveys

A tree survey was undertaken using methods outlined in Section 2.3.2 and 7.2.2 of the latest TfNSW BAR template (TfNSW 2024a; see Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche) for locations). Results are presented in Table 3.6 below. No hollow-bearing trees were observed in the study area.

Table 3.6: Average counts of trees and hollows estimated per ha

Veg Zone	Impacts (ha)	Plots	Average number of trees in stem size classes (cm) and hollows per ha					Average count of tree and hollows in impact area				
			5-19	20-49	50-99	>100	Hollows	5-19	20-49	50-99	>100	Hollows
PCT 3161	2.73	Plot 1,2 and 3	270	193	63	33	0	610	437	143	75	0

3.2.4 Groundwater dependent ecosystems

According to the Groundwater Dependent Ecosystem Atlas, the southern part of the study area exhibits a moderate likelihood of supporting groundwater-dependent ecosystems (BOM 2024; Plate 4).

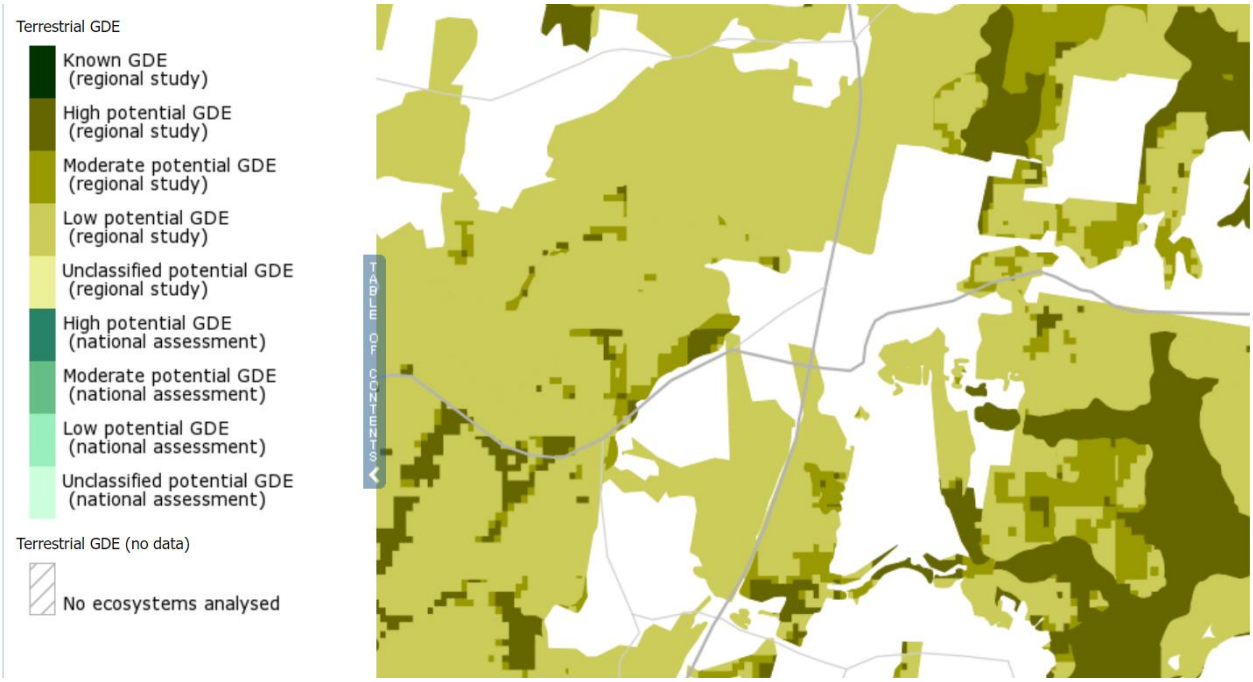


PLATE 4: TERRESTRIAL GROUNDWATER DEPENDENT ECOSYSTEMS PROBABILITY OF OCCURRENCE WITHIN THE STUDY AREA (BOM 2024)

3.2.5 Priority weeds

All priority weeds are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. Any person who deals with any plant, who knows (or ought to know) of any

biosecurity risk, has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practicable.

Several plant species identified as priority weeds for the North Coast Local Landcare region were recorded in the proposal area. The weeds and their management requirements as per the Biosecurity Act are listed in Table 3.7.

Table 3.7: Priority weeds

Scientific name	Common name	Requirements under the Biosecurity Act
Lantana camara	Lantana	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale.
Senecio madagascariensis	Fireweed	**Prohibition on certain dealings** Must not be imported into the state, sold, bartered, exchanged or offered for sale.

3.3 Fauna and habitat resources

3.3.1 Fauna species

A list of fauna species recorded on site during the survey are included in Appendix A: Species List. Species recorded were typically common, widespread species characteristic of disturbed habitats, capable of persisting in fragmented habitats. Key species recorded are discussed in the tables below.

3.3.2 Fauna habitats

The proposal area contains the following broad habitat types for fauna:

- Forest
- Grasslands, dominated by exotic flora species
- Two small water bodies/ a drainage swale with associated culvert.

The various habitats and their biodiversity value are discussed in the following tables.

Table 3.8: Fauna habitats – forest

Forests	
Description	Forest in the proposal area is representative of mature regrowth following historical clearing. Mature canopy trees are present, however they are generally too young to have formed hollows. Ongoing disturbance from surrounding land use is contributing to edge effects, including increased noise, traffic, illegal dumping, and weed invasion. The understorey and midstorey are typically dense with a high abundance of exotic species such as Lantana. Residential development, farmland and transport infrastructure in the locality represent significant barriers to movement of less mobile fauna species. Whilst connectivity is reduced, many of the patches of forest within the proposal area retain some level of connectivity to larger patches of intact native vegetation in the locality, particularly those positioned in the south. Whist the forest in the proposal area provides a range of quality fauna habitats features, the patches are limited in size and condition which would also limit the quality of the habitat for some threatened species. Nevertheless, the mature canopy trees and associated nectar, fruits and leaves as well as flowering small trees and shrubs (including exotic species) provide potential habitat for many fauna species.

Forests	
	The shrub and ground layer comprised a diverse assemblage of native species and habitat features, including woody debris, logs and leaf litter. Where present, these features are representative of shelter and foraging habitat for reptiles, snails, birds and small mammals. Two small water bodies and a drainage swale in the south-western extent of the proposal area would likely provide an adequate and reliable source of drinking water for most bird and mammal species in the area and is suitable habitat for a variety of frog species.
Typical fauna species recorded or likely to occur	Nectarivorous species are likely to attend the site such the Red Wattlebird (*Anthochaera carunculata*) and Rainbow Lorikeet (*Trichoglossus haematodus*). Insectivorous species recorded included the Noisy Miner (*Manorina melanocephala*) and Variegated Fairy-wren (*Malurus lamberti*). Strictly carnivorous species recorded include the Pied Butcherbird (*Cracticus nigrogularis*) however more are likely to utilise the study area. A variety of omnivorous species such as the Laughing Kookaburra (*Dacelo novaeguineae*) and Australian Magpie (*Gymnorhina tibicen*) were also recorded. Only two mammal species were identified during field surveys – an unidentified Bandicoot species and the Swamp Wallaby (*Wallabia bicolor*), however others such as the Brush-tailed Possum (*Trichosurus vulpecula*) may forage across forested areas.
Threatened and migratory fauna species recorded or likely to occur	No threatened species were recorded during the survey. Habitats present within the proposal area represent suitable habitat for a variety of threatened arboreal and terrestrial species. Of particular note is the Koala, as the study area occurs within an Area of Regional Koala Significance (DPIE 2019) and has also been partially mapped as Secondary Koala Habitat in the Thrumster Area 13 KPoM (PMHC 2008). Field assessments confirmed that two Koala food tree species, Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*) are present within the proposal area. Tallowwood is considered a primary food tree species for the North Coast Koala Management Area, and Flooded Gum is a species of 'significant use' within the region (OEH 2018). This is further affirmed by the records of Koalas within the study area and broader locality (NSW DCCEEW 2025a). The proposal area is connected via vegetated corridors to external areas within the locality mapped as suitable Koala habitat (DPIE 2019) south of the proposal area on both the eastern and western sides of the Pacific Highway. West of the highway, connectivity extends to the Cowarra State Forest while east of the highway, habitat linkages extend to Lake Innes and surrounds, an area known to support a genetically important koala source population (PMHC 2018). Roadside vegetation corridors mapped as suitable Koala habitat (DPIE 2019) also extend north of the proposal area providing connectivity with other suitable vegetation patches to the northwest and northeast of the study area. The accessibility of patches north and east of the study area for Koalas however is unclear, given the heavily trafficked Pacific Highway and Oxley Highway that separate these areas of habitat. PMHC (2018) identifies the Pacific Highway between the Oxley Highway and Kew interchanges as a 'black spot' for Koala Road strikes, which is consistent with observation records detailing numerous roadkill incidences in the immediate vicinity (within 1 km) of the study area (DPIE 2019). The number and type of records within the study area indicate that the Oxley Highway and Pacific Highway are likely to dissect a movement corridor for Koalas seeking to access suitable habitat on either side. How many koalas successfully achieve this crossing is unknown. However, as a result of previous highway expansions, various mitigation measures such as dedicated underpasses and fauna fencing were installed to assist in reducing the incidence of vehicle strikes within the locality which has been shown in various studies to have been highly effective (Goldingay et al. 2022).

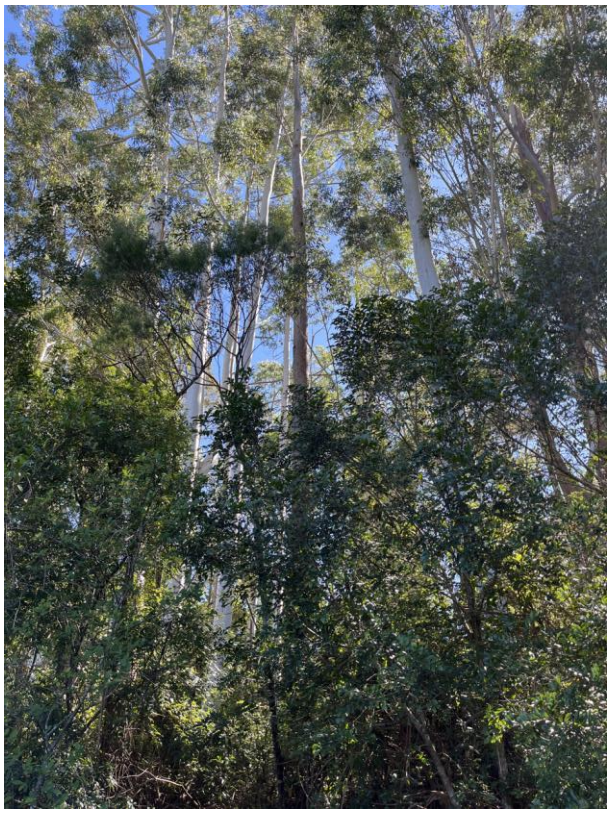
Forests	
	Although the habitats within the proposal area are small, fragmented, and disturbed - making them less likely to support resident Koala populations in the long term due to edge effects, limited resource availability, and increased predation risk, they may still play an important role in the broader landscape. Vegetated links, even if degraded, are recognised as important for facilitating Koala movement and dispersal across otherwise unsuitable areas, such as cleared paddocks (DAWE 2022a). While these habitats are unlikely to support long-term occupancy, they may provide transient resources that contribute to the persistence of local Koala populations (DAWE 2022a). Given the presence of preferred feed trees within the study area, its connectivity with larger areas of suitable habitat (particularly to the south and southwest) and the number of species records in proximity, it is likely that individuals may use forested areas of the proposal area as part of a movement corridor or on a transient basis within a broader home range. A range of threatened birds and bat species such as the Little Bent-winged Bat (*Miniopterus australis*), Little Lorikeet (*Parvipsitta pusilla*) and Grey-headed Flying-fox (*Pteropus poliocephalus*) may also forage in the area on occasion. Decorticating bark from large trees would also provide potential roosting habitat for a variety of microbat species, such as the Southern Myotis (*Myotis macropus*).
Introduced species recorded	One species of exotic bird typical for forest areas of Port Macquarie was identified during field surveys; the Common Myna (*Sturnus tristis*).
Photo	 **PLATE 5: FOREST HABITAT WITHIN PROPOSAL AREA**

Table 3.9: Fauna habitats – exotic grassland

Exotic grassland	
Description	Several areas of exotic-dominated grassland occur in the proposal area, with few native species present. Floral structure and diversity are relatively low. Opportunistic native fauna species may be present in this habitat type on occasion and these areas may provide basking habitat for common and widespread reptile species, as well as feral animals such as cats and foxes, should they occur.
Typical fauna species recorded or likely to occur	Typical bird species recorded in this habitat type include the Magpie-lark (*Grallina cyanoleuca*), Australian Magpie (*Cracticus tibicen*), Australian Raven (*Corvus coronoides*) and Noisy Miner (*Manorina melanocephala*). Grassland areas may provide broadly suitable foraging habitat for raptor species, and there are historical records of various raptor species in the local area, though none were observed during the survey. Insectivorous species such as Variegated Fairy-wren (*Malurus lamberti*) were observed while on site. Grassland areas also provide habitat for a range of reptile species, including snakes and small lizards.
Threatened and migratory fauna species recorded or likely to occur	No threatened or migratory species were recorded on during field surveys. Some threatened species recorded in the area such as the Eastern Grass Owl (*Tyto longimembris*) could utilize the area as nesting habitat due to its proximity to nearby waterways, however the species may favour higher quality habitat in the locality. In the absence of trees, the Koala is known to occasionally navigate through grassland habitats to reach areas of forested habitat with little connectivity.
Introduced species recorded	The Common Myna (*Sturnus tristis*) was observed in the grassland areas of the proposal area.

Exotic grassland	
Photo	

PLATE 6: EXOTIC GRASSLAND IN THE SOUTH-EASTERN SECTION OF THE PROPOSAL AREA

Table 3.10: Fauna habitat – waterbodies/aquatic habitat

Waterbodies/ aquatic habitat	
Description	Two water bodies are present within the proposal area, both located to the east of the Pacific Highway—one in the northern portion and one in the southern portion of the eastern site. An artificial drainage swale also occurs within this area. Habitat resources present include a sparse cover of sedges and surface water. None of these aquatic habitats is considered key fish habitat due to their isolated and ephemeral nature (DPI 2013).
Typical fauna species recorded or likely to occur	Several species of common frog were identified within or surrounding the above-mentioned aquatic systems during targeted surveys including the Eastern Dwarf Tree Frog (*Litoria fallax*), Eastern Froglet (*Crinia signifera*), Striped Marsh Frog (*Limnodynastes peronii*) and the Dusky Toadlet (*Uperoleia fusca;* Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche). It is possible that a number of other species of native amphibian are also present but were not vocalising at the time of survey.
Threatened and migratory fauna species recorded or likely to occur	Both farm dams located within the proposal area represent potential foraging habitat for the Southern Myotis (*Myotis macropus*), although the adjacent drainage swale is considered less suitable due to its narrow and constrained form. The two water bodies also provide theoretically suitable habitat for threatened amphibians, including the Green and Golden Bell Frog (*Litoria aurea*), Green-thighed Frog (*Litoria brevipalmata*), and Wallum Froglet (*Crinia tinnula*). While targeted surveys did not detect any of these species, surveys for the Green-thighed Frog could not be fully completed due to insufficient rainfall during the survey period.
Introduced species recorded	No introduced species were recorded using this habitat while on site, though it is likely that those species mentioned previously within the forest and exotic grassland habitats would use these resources as a drinking source.

Waterbodies/ aquatic habitat	
Photo	

PLATE 7: WATERBODY IN THE PROPOSAL AREA

3.4 Threatened species

3.4.1 Threatened flora

No threatened flora species were recorded within the study area during the field survey.

Habitat assessments and desktop searches have identified that no threatened flora species are considered to have a high likelihood of occurrence within the proposal area (Appendix B: Habitat suitability assessment).

3.4.2 Threatened fauna

No threatened fauna species were recorded within the study area during the field survey or targeted threatened frog surveys (Niche 2024; Table 3.11). Despite this, recent records (last five years) of the Koala occur on the boundary of the proposal area, within the study area and are therefore defined as 'known' as per the *TfNSW No Net Loss Guidelines* (NSW DCCEEW 2025a; TfNSW 2024).

Although surveys were conducted with reference to the Threatened Frog Survey Guidelines, suitable rainfall conditions required to effectively detect the Green-thighed Frog were not present during the survey period (DPIE 2020b). As such, surveys were not completed for this species.

Habitat assessments and desktop searches identified that the threatened fauna outlined in Table 3.12 have a high likelihood of occurrence within the proposal area based on the habitat assessment and proximity of local records (Appendix B: Habitat suitability assessment).

Table 3.11: Threatened frog surveys results

Species name	EPBC Act	BC Act	Identification method (not recorded, assumed, recorded, expert report)	Survey effort compliant?	Results
Litoria brevipalmata		V	Not recorded	No	Survey effort was not undertaken due to insufficient rainfall/improper conditions.
Litoria aurea	E	V	Not recorded	Yes	Not detected
Crinia tinnula		V	Not recorded	Yes	Not detected

Table 3.12: Threatened fauna with a high likelihood of occurrence within proposal area

Species name	Common name	BC Act	EPBC Act	Results/ Habitat in proposal area	Likelihood of occurrence
Mammals					
Phascolarctos cinereus	Koala	E	E	Forested communities in the proposal area contain suitable habitat including primary food trees for the region; Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*).	High
Amphibians					
Litoria brevipalmata	Green-thighed Frog	V		Both farm dams and the drainage swale are representative of suitable breeding habitat for the species. Areas of PCT 3161 and exotic grassland may offer foraging habitat.	High
Woodland birds					
Daphoenositta chrysoptera	Varied Sittella	V		Proposal area contains suitable foraging habitat in eucalypt forest habitat, despite on-going disturbance.	High

*V = Vulnerable, E = Endangered.

3.5 Aquatic habitat

No waterways such as creeks or rivers occur within the proposal area, however several first order waterways intersect, or come in proximity to, the broader study area. There are multiple creeks and one river (Hastings River) within the locality. The two closest creeks to the proposal area are Partridge Creek, located 350 m to the north, and Karikeree Creek, located 1.5 km to the south. Partridge Creek is mapped as Key Fish Habitat (DPI 2025).

Two water features, a small farm dam and drainage swale, occur within the proposal area. Aquatic surveys were limited to the observation of potential habitat for threatened biota within these features. These water bodies are unlikely to provide suitable habitat for any threatened aquatic species listed under the FM Act.

3.6 Areas of outstanding biodiversity value

The proposal area does not contain any Areas of Outstanding Biodiversity Value and is not located within a mapped area of high biodiversity value as identified by the Biodiversity Values Map and Threshold Tool (NSW DCCEEW 2025d).

3.7 Wildlife connectivity corridors

Wildlife corridors are vital for the maintenance of ecological processes, including the movement of animals and the continuation of viable populations. Corridors can consist of a sequence of stepping stones across the landscape (discontinuous areas of habitat such as paddock trees, wetlands and roadside vegetation), continuous lineal strips of vegetation and habitat (such as riparian strips, ridge lines etc.), or they may be parts of an extensive patch of vegetation (DEC 2004).

The study area is situated within a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. Patches of native forest within the proposal area may provide habitat for dispersing fauna; however, the extent of use is likely limited to more mobile species due to the small patch sizes and surrounding disturbance. Larger intact remnants of vegetation, such as Cowarra State Forest and Lake Innes, are located within 3 km of the study area and serve as key habitat refuges in the locality.

Given the presence of primary Koala food trees, Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*), alongside numerous Koala records both within the study area and the broader locality, the vegetation has the potential to function as a corridor for the species. In particular, it may facilitate Koala movement between known core habitat areas in larger vegetated remnants nearby.

3.8 Koala habitat

Koala habitat within the proposal area has been assessed in accordance with the criteria outlined in the Area 13 KPoM. Mapped Koala habitat is present on the eastern extent of the site and comprises vegetation that includes known Koala feed tree species (PMHC 2008). While no direct evidence of Koala occupancy (such as scats or scratch marks) was recorded during field surveys, the presence of mapped habitat and proximity to larger vegetated areas suggests that native forests in the study area may function as corridors facilitating the movement of the species. Additionally, recent Koala records occur on the boundary of the proposal area and within the study area (NSW DCCEEW 2024). As such, forested habitat is considered to hold ecological value for the species and has been factored into the impact assessment and mitigation strategy.

The condition, structure, and strategic value of this habitat are summarised in Table 3.13, which outlines the site's alignment with key habitat criteria specified under the KPoM.

Table 3.13: Assessment Against KPoM Koala Habitat Criteria

Habitat Criterion (KPoM)	Assessment Result	Comment
Presence of Koala feed trees	Yes	Native forest commensurate with PCT 3161 present, with key feed trees including Flooded Gum and Tallowwood (PMHC 2008).
Evidence of Koala occupancy (e.g. scats, scratches)	Yes	Although no evidence of Koala activity (e.g. scats, scratch marks, or sightings) was recorded during field surveys, suitable habitat is present within the study area. Additionally, two Koala records have been documented within the study area, with several other records occurring in the broader locality, indicating the species' known presence and potential use of habitat within and around the proposal area (NSW DCCEEW 2025a).
Mapped core habitat	Yes	Portions of the eastern extent of the proposal area are identified as mapped Koala habitat under the Area 13 - Thrumster KPoM (PMHC 2008).
Proximity to larger habitat areas	Yes	The study area contains narrow bands of vegetation along the Pacific and Oxley Highways, of which select patches retain connectivity to larger areas of native forest in the locality. The proposal area is positioned between more extensive vegetated areas in the locality, the nearest connected patch of which is located approximately 340 m to the south of its southernmost extent.
Potential role as movement corridor	Yes	Select bands of native vegetation within the proposal area maintain some connectivity to larger forested patches to the north, south and west of the study area, suggesting potential corridor value for Koalas and other less mobile fauna species. Notwithstanding, the connectivity of these patches has been reduced, mostly due to local road infrastructure. As such, vegetation removal may hinder or restrict fauna movement and dispersal, particularly in consideration of the largest patch to the southeast of the proposal area. However, direct impacts on breeding habitat are considered less likely due to the fragmented and narrow nature of the remnant vegetation, situated between the Pacific and Oxley Highways.
Vegetation condition	Moderate	Native vegetation within the proposal area is generally of moderate condition. Although all patches have been previously subject to logging, natural regeneration has occurred, resulting in the re-establishment of a mature canopy. However, historic and ongoing disturbance, including adjacent land clearing for agriculture and the construction of the Oxley and Pacific Highways, has contributed to the proliferation of exotic species, particularly within the understorey and midstorey vegetation layers.

3.9 Matters of National Environmental Significance

3.9.1 Migratory species assessment

Migratory species are protected under the international agreements to which Australia is a signatory, including the Japan-Australia Migratory Bird Agreement (JAMBA), the China-Australia Migratory Bird Agreement (CAMBA), the 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 MNES and are protected under the EPBC Act.

The EPBC Act PMST identified 21 migratory terrestrial bird species within 10 km of the proposal area. No migratory bird species are considered to have a high likelihood of occurrence within the proposal area due

to a lack of suitable habitat for species known or predicted to occur in the locality (Appendix B: Habitat suitability assessment). No significant impacts to migratory species are predicted as part of the proposal.

3.9.2 Ramsar wetlands of international importance

No internationally important wetlands occur in the locality of the study area. As such, the proposal is not likely to have an adverse effect on any Ramsar Wetland either directly or indirectly.

4 Impact assessment

4.1 Introduction

The proposal seeks to undertake vegetation clearing that includes the removal of moderate condition native vegetation. These works have the potential to impact to several threatened flora and fauna species listed under the BC Act and EPBC Act. There are no impacts anticipated to any TECs listed under either Act nor any permanent aquatic habitat, key fish habitat or migratory species. A significant impact on biota is unlikely for this proposal if all environmental safeguards are abided by.

4.2 Direct impacts

4.2.1 Clearing of native vegetation

The proposal would impact up to 14.21 ha of vegetation, aquatic systems and infrastructure. Native vegetation is representative of approximately 2.73 ha of this area. Table 4.1 provides a summary of impacts associated with the proposed works less 2.12 ha of existing infrastructure.

Table 4.1: Impacts on vegetation

PCT ID	Plant Community Type	BC Act Status	EPBC Act Status	Removal area (ha)
3161	Mid North Hinterland Wet Forest	No associated listed TEC	No associated listed TEC	2.73
N/A	Exotic grassland	N/A	N/A	9.29
N/A	Dam/wetland	N/A	N/A	0.08
Total				12.09

Table 4.1 represents a worst-case scenario of vegetation clearing, and impacts may end up being less than the amounts proposed above. There may be opportunities to reduce the extent of vegetation removal, for instance, in the site compounds/ laydown areas. Mitigation measures to minimise impacts on native vegetation are recommended in Section 5.2.

4.2.2 Removal of threatened fauna habitat

The proposal would result in the clearing of up to 2.73 ha of native vegetation within the proposal area, specifically affecting several patches of *PCT 3161 – Mid North Hinterland Wet Forest* that are in moderate condition. Impacts would extend across all vegetation strata, including the canopy, midstorey, and understorey. Vegetation within the proposal area includes a variety of habitat features relevant to native fauna, such as intact native vegetation with structural and floristic diversity, dense shrub layers, fallen timber, and accumulations of leaf litter. Despite the presence of anthropogenic disturbance, small areas of suitable habitat persist for multiple threatened species. Groundcover vegetation and woody debris also provide foraging resources including nectar, seeds, and invertebrate prey, particularly for bird species.

Although no roost camps or hollow-bearing trees were identified within the development footprint, feed trees suitable for species such as the Koala would be affected. Select bands of native vegetation within the proposal area maintain some connectivity to larger forested patches to the north, south and west of the study area, suggesting potential corridor value for Koalas and other less mobile fauna species. As such, vegetation removal may hinder or reduce fauna movement and dispersal. However, direct impacts on breeding habitat are considered less likely due to the fragmented and narrow nature of the remnant vegetation, situated between the Pacific and Oxley Highways.

This vegetation may also provide foraging habitat for a range of mobile, canopy-feeding fauna, including the Grey-headed Flying-fox, Varied Sittella, and several microbat species such as the East-coast Freetail Bat, Little Bentwing-bat, Southern Myotis, and Greater Broad-nosed Bat. While these species may utilise the proposal area for foraging or temporary roosting (with the exception of the cave-roosting Little Bentwing-bat), their use of the area, if present, is likely to be intermittent.

A culvert to be extended as part of the proposal offers marginal roosting habitat for microbat species. Given its limited suitability, the proposal is unlikely to result in long-term impacts to fauna that may opportunistically utilise the culvert. The two small waterbodies and drainage swale present in the proposal area are of low overall condition, ephemeral, and disconnected from other aquatic systems. Consequently, they are unlikely to provide habitat for threatened fish species. However, they may provide habitat for a variety of common or threatened frog species.

The exotic grassland within the study area may provide foraging and breeding habitat for a number of common species and for threatened Eastern Grass Owl. Although the species has been recorded within the locality (approximately 5 km northeast near Fernbank Creek), it is unlikely to be resident in the proposal area due to the high levels of disturbance. Should the species occur temporarily, it is expected to relocate to similar habitat elsewhere in the locality that will not be affected by the proposal.

Environmental safeguards to minimise impacts on fauna and habitat loss are outlined in Section 5. These include the implementation of pre-clearance surveys conducted by a suitably qualified ecologist, in accordance with the TfNSW Unexpected Threatened Species Find Procedure and the Roads and Maritime Services Biodiversity Guidelines 2024 – Guide 1: Pre-clearing Process (TfNSW 2024c).

4.2.3 Aquatic impacts

No permanent impacts on natural waterways surrounding the proposal area are anticipated. The proposed works involve the extending of the existing culvert and drainage swale and potential impacts to two farm dams, which are known habitat for a number of common frog species and potential habitat for the threatened Green-thighed Frog. The proposed works have the potential to further degrade this area through the establishment of additional exotic species and increased rates of bank degradation resulting from vegetation removal as a result of new disturbance to the proposal area. Mitigation measures to ensure indirect impacts to downstream waters from potential sediment run-off or fuel/oil spills are discussed in Section 5.

4.2.4 Injury and mortality

During construction, death or injury may occur to any fauna present during the clearing of trees. If birds are present but not nesting during construction, they would generally relocate from the study area to escape the disturbance. Species that take longer to disperse, such as the Koala, are of particular risk given their known presence within and around the study area and the difficulty in detecting the species when high in the canopy. Displaced individuals would be vulnerable to predation since they would be disturbed in daylight hours and would experience increased energy costs, increased risk of predation and increased competition for resources.

Potential impacts to fauna would be avoided through the implementation of pre-clearing safeguards outlined in Section 5.

4.3 Indirect and operational impacts

Potential indirect impacts resulting from construction of the project are discussed in Table 4.2.

Table 4.2: Summary of direct impacts on threatened flora

Impact	Description
Edge effects	'Edge effects' can include increased noise and light or erosion and sedimentation at the interface of intact vegetation and burned areas. Edge effects may result in impacts such as changes to vegetation type and structure, increased growth of exotic plants, increased predation of native fauna or avoidance of habitat by native fauna. Edge effects would affect vegetation and habitats adjoining the new boundary created by the hazard reduction works. Altered environmental conditions along new edges can allow invasion by pest animals specialising in edge habitats and/or change the behaviour of resident animals. Edge zones can be subject to higher levels of predation by introduced mammalian predators and native avian predators. Mitigation measures are provided in Section 5 to limit the potential impacts associated with the creation of a new edge.
Introduction and spread of weeds, pests and pathogens	Disturbance associated with burning increases the potential for the spread, introduction and establishment of weed and pest species, and diseases and pathogens. Weed species have the potential to exclude native species and modify the composition and structure of vegetation communities and can decrease habitat values for native fauna. Works within the proposal area may, in general, have the potential to introduce or spread pathogens such as Phytophthora (*Phytophthora cinnamomi*), Myrtle Rust (*Austropuccinia psidii*) and Chytrid fungus (*Batrachochytrium dendrobatidis*) into adjacent and retained native vegetation through vegetation disturbance and increased visitation. Phytophthora and Myrtle Rust may result in the dieback or modification of native vegetation and damage to fauna habitats. Chytrid fungus may harm frog populations once introduced into an area. Diseases and pathogens can be introduced or spread to site via dirt or organic material attached to machinery, vehicles, equipment and employees. The potential for significant or new impacts associated with these pathogens is considered low given that there is a high level of existing disturbance in the study area. To help mitigate the risk of pathogens being brought onto and/or spread through the site all machinery brought to site will be washed down and inspected to be free of soils, seeds and other organic material.
Aquatic disturbance	The works have the potential to result in sedimentation and erosion within the proposal area and adjoining native vegetation and aquatic habitats. Discharge of sediment laden runoff to waterways can alter water quality and adversely affect aquatic life. The proposal has the potential to result in the mobilisation of contaminated sediments into waterways, or chemical spills from vehicles or plant. Whilst no key fish habitat occurs within the proposal area, a 3rd order waterway occurs directly north of the study area that could be indirectly impacted. The introduction of pollutants from the proposal into the surrounding environment, if uncontrolled, could potentially impact on water quality further downstream.

Impact	Description
Noise, light, dust and vibration	The proposal area currently experiences moderate to high levels of noise impacts, primarily from the Oxley and Pacific Highways. The proposal would increase noise and light levels and vibration in the proposal area during the construction phase, through worker presence and operation of machinery. Mobile native fauna will likely vacate or avoid areas disturbed during construction activities and is unlikely to return in the immediate future given that little native vegetation will remain in the broader study area resulting in the loss of habitat features. There is also the potential for impacts on fauna species in surrounding retained vegetation, which would also be subject to increased noise, light, dust and vibration impacts. The proposal has the potential to generate significant erosion in steep areas of the proposal area following the removal of native vegetation. This may also result in impacts to surrounding landowners, properties and natural processes, if adjacent and retained areas are smothered by soil and dust from within the proposal area. This risk will be managed through the implementation of appropriate erosion prevention infrastructure during construction. Given the temporally nature of the works, the increase in noise levels as a result of the project is unlikely to substantially impact native biota.
Wildlife connectivity and habitat fragmentation	The proposal is located in Port Macquarie, within a semi-fragmented landscape. Fragmentation of native vegetation and associated fauna habitats in the locality has previously occurred through clearing for agriculture, residences and construction of linear infrastructure (such as roads). These land uses have created barriers to movement for some fauna species, particularly those that are limited by dispersal abilities and habitat preferences. More mobile species such as birds and bats can readily traverse this landscape. The proposal area itself supports several patches of native vegetation, that likely represent a habitat corridor throughout the locality for select fauna, such as the Koala as well as permanent habitat for more sedentary species. The proposal would result in the removal of up to 2.73 ha of native vegetation commensurate with PCT 3161. The habitats that would be directly impacted are in moderate condition and support the structural and floristic diversity to support a number of species in the locality. Given the small size of the impacted patches and the extent of surrounding disturbance, this habitat is likely to function as transitional habitat for a range of species. Populations that rely on this vegetation for travel (including arboreal mammals, small ground-dwelling mammals and reptiles) may be impacted by the proposal, however, the complete isolation of populations is not anticipated. Discussion on the proposal, connectivity and the Koala is provided in Section 4.6, Appendix C: Tests of Significance (BC Act) and Appendix D: Assessments of Significance (EPBC Act)
Vehicle strike	The proposal has the potential to increase the risk of vehicle strike during the operational phase of the intersection upgrade, particularly for Koalas. As the species is known to travel considerable distances on the ground and cross roads, it is especially vulnerable to vehicle collisions. This represents a significant threat to the local Koala population known to occur in the Port Macquarie area. To mitigate this risk, appropriate exclusion and crossing infrastructure should be implemented to prevent access to the road and facilitate safe movement.

4.4 Cumulative impacts

Cumulative impacts arise from the interaction of individual elements within the proposal and the additive effects of other external projects. Transport is required under Section 171(2)(o) of the EP&A Regulation, to take into account potential cumulative impacts as a result of the proposal.

Extensive vegetation clearing has occurred historically within the locality for agricultural, forestry and residential purposes. In more recent decades the locality has experienced an increase in residential developments and the construction of the Oxley Highway and Pacific Highway.

The construction of Oxley Highway and Pacific Highway have impacted biodiversity in the locality by removing vegetation and creating barriers for faunal movements between habitat remnants. Since 1996 the Pacific Highway has been upgraded to a dual carriageway and the Oxley Highway was completed in June 2018 (TfNSW 2024b). The construction of the dual carriageway has widened the gap between habitat remnants and increased the risk of vehicle strike. Additionally, further widening the gap between remnants would likely further increase the risk of vehicle strikes and create more barriers for movement between corridors.

During the 2019-2020 megafires, 5.5 million ha of NSW was burnt. The extent and fire intensity were unprecedented and the impacts on flora and fauna will take many years of study to fully understand (NSW DCCEEW 2025g). As a result, unburnt areas of habitat are very important in conserving biodiversity in the short-term and long-term post-bushfire. Areas in the locality of the study area, including the vegetation surrounding Lake Innes have been impacted by bushfire. The state forests to the south and southwest of the study area have not been impacted by fire in recent years (DPIE, 2020d). The removal of 2.73 ha of native vegetation as part of the proposal will slightly increase the cumulative impacts of vegetation loss within the locality.

The far eastern extent of the study area falls within the Thrumster Area 13 Koala Plan of Management (KPoM), with select areas identified as Secondary Koala Habitat (PMHC, 2008). Additionally, native forest within the proposal area may function as a movement corridor for Koalas, facilitating dispersal between larger remnant forest patches located to the north and south. Koala movement in this area has already been substantially impacted by the construction of the Pacific and Oxley Highways, which act as significant barriers to movement for the species. The removal of narrow forested bands, particularly the largest patch located south-west of the Oxley/Pacific Highway intersection, has the potential to contribute to cumulative habitat fragmentation, further constraining movement pathways for the species in the locality. Although the proposal is likely to reduce overall habitat connectivity, it is unlikely to result in complete isolation of any sub-populations. Larger habitat patches will remain connected via alternative corridors in the locality, such as Karikeree Creek to the southwest of the proposal area.

4.5 Impact summary

A summary of details pertaining to the potential impacts of the proposal which have been addressed in this report are presented in Table 4.3.

Table 4.3: Summary of known and potential impacts

Impact	Biodiversity values	Nature of impact	Extent of impact	Duration	Does the proposal constitute or exacerbate a key threatening process?	Confidence in assessment
Clearing of native vegetation	PCT 3161 – moderate condition	Direct	Removal of up to 2.73 ha.	Long-term	Yes 1.1 Clearing of native vegetation 2.1 Removal of dead wood and dead trees	Known
Clearing of threatened fauna habitat	Varied Sittella (*Daphoenositta chrysoptera*) – V-BC Act	Direct/ Indirect	Long term removal of 2.73 ha of foraging/transient habitat.	Long-term	Yes 3.1 Clearing of native vegetation 4.1 Removal of dead wood and dead trees	High
	Green-thighed Frog (*Litoria brevipalmata*) – V-BC Act	Direct/ Indirect	Long term removal of up to 0.08 ha of aquatic habitat	Long-term	Yes 5.1 Clearing of native vegetation	High
	Koala (*Phascolarctos cinereus*) – E-BC Act	Direct/ Indirect	Removal of up to 2.73 ha of habitat, including areas of mapped Koala habitat as outlined in the Area 13 KPoM (PMHC 2008).	Long-term	Yes 6.1 Clearing of native vegetation 7.1 Removal of dead wood and dead trees	High
Injury and mortality of fauna	Applicable to both terrestrial and arboreal fauna species	Direct	Local	Long-term	Yes 8.1 Clearing of native vegetation 9.1 Removal of dead wood and dead trees	High

Impact	Biodiversity values	Nature of impact	Extent of impact	Duration	Does the proposal constitute or exacerbate a key threatening process?	Confidence in assessment
Noise and vibration	Noise sensitive species such as Microbats, Koalas	Direct/ Indirect	Local	Short-term (noise generated by construction) and long-term (increased road traffic following completion of construction)	N/A	Known
	All other fauna species	Direct/ Indirect	Local	Short-term (noise generated by construction) and long-term (increased road traffic following completion of construction)	N/A	Known
Wildlife connectivity and habitat fragmentation	Applicable to both terrestrial and arboreal fauna species	Direct/ Indirect	Potential for impacts in habitat connectivity from larger patches to the north and south of the proposal area.	Long-term	Yes 10.1 Clearing of native vegetation 11.1 Removal of dead wood and dead trees	High

Impact	Biodiversity values	Nature of impact	Extent of impact	Duration	Does the proposal constitute or exacerbate a key threatening process?	Confidence in assessment
Edge effects on adjacent native vegetation and habitat (including invasion and spread of weeds)	Within retained native vegetation in study area	Indirect	Local	Long-term	Yes 12.1 Invasion and establishment of exotic vines and scramblers 13.1 Invasion, establishment and spread of Lantana (*Lantana camara*) 14.1 Invasion of native plant communities by exotic perennial grasses 15.1 Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Known
Invasion and spread of pathogens and disease	Applicable to all flora and fauna species and habitat	Indirect	Local	Long-term	Yes 16.1 Infection of native plants by *Phytophthora cinnamomic* 17.1 Infection of frogs by amphibian chytrid causing the disease chytridiomycosis 18.1 Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	Low

4.6 Assessments of significance

4.6.1 BC Act

A likelihood of occurrence assessment identified three BC Act listed fauna species, the Varied Sittella (*Daphoenositta chrysoptera*), Koala (*Phascolarctos cinereus*) and Green-thighed Frog (*Litoria brevipalmata*), with a high likelihood of occurrence within the proposal area (Table 3.12, Appendix B: Habitat suitability assessment).

An assessment of significance pursuant to Section 7.3 of the BC Act, prepared for each species Appendix C: Tests of Significance (BC Act)), concluded that the proposal is unlikely to have a significant impact on the above species given the following:

- The habitat to be removed is degraded and subject to edge effects given its small size and narrow, linear configuration, and location adjacent to an existing highway, making it unlikely to support resident populations of Koalas or Varied Sittellas.
- Although the largest patch of PCT 3161 in the proposal area may be used on a seasonal or transient basis as part of a movement corridor for the Koala between more suitable, larger patches of habitat, the proposal is unlikely to result in the complete isolation of any large areas of contiguous forest in the locality, as alternative corridors will remain available.
- The proposal is unlikely to affect the lifecycle and long-term persistence of any of the three species given that habitats of equal or greater quality with remain in the locality.
- Populations, if present, are likely part of a larger metapopulation likely to occur within larger remnants in the locality
- Mitigation measures would be implemented to minimise the potential for indirect impacts to threatened species through the implementation of a CEMP as outlined in Section 5 of this report.

4.6.2 EPBC Act

A likelihood of occurrence assessment identified a single EPBC Act listed fauna species, the Koala (*Phascolarctos cinereus*), that has a high likelihood of occurrence within the proposal area (Appendix B).

The EPBC Act Policy Statement 'Matters of National Environmental Significance: Significant impact guidelines 1.1' (DotE 2013) was reviewed when determining if a significant impact is likely on MNES (Appendix D).

The significance assessments concluded that the proposal is unlikely to have a significant impact on the Koala for the following reasons:

- The proposal would remove a small area of habitat (2.73 ha) immediately adjacent to the intersection of two highways, the western portion of which is not listed as 'Core Koala Habitat' under the Port Macquarie-Hastings KPoM and the habitat to the east that is listed, is predominantly cleared or dominated by exotic vegetation.
- The largest patch of PCT 3161, within the proposal area, may function as a movement corridor between more extensive forested habitats and therefore qualifies as critical habitat for the species. Nevertheless, the overall impact of its loss is not expected to be significant. Alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are expected to remain intact and continue to facilitate Koala movement across the broader landscape.
- The habitat to be removed is degraded and subject to edge effects given its small size and narrow, linear configuration, and location adjacent to an existing highway, making it unlikely to support resident Koalas.
- Whilst the largest patch of habitat in the proposal area may represent a movement corridor between larger patches of suitable habitat in the locality, other corridors will persist in the locality. As such the proposal is not considered likely to isolate any large areas of habitat that support a resident population of the species.

5 Avoidance and mitigation

5.1 Avoidance and minimisation

The proposal is limited in its ability to avoid impacts on areas of biodiversity value, given the positioning of the existing intersection between the Oxley and Pacific Highways. Notwithstanding, TfNSW has utilised an iterative design process to avoid impacts on native vegetation in the study area, where possible. Ancillary components of the proposal, including laydown and stockpile areas, have been placed within existing cleared land to minimise additional impacts on native vegetation and associated flora and fauna habitat. While these measures reduce unnecessary clearing, further targeted surveys may assist in determining the significance of the study area as a movement corridor for local Koala populations.

Given the potential presence of Koala in the proposal area, careful management of the clearance works is required. The following is recommended.

- The TfNSW Pre-clearing guideline, Protecting and managing biodiversity on TFNSW projects, should be abided by (TfNSW 2024).
- Ensure all workers are provided with an environmental induction before starting work on-site. This would include information on the ecological values of the study area and measures to be implemented to protect biodiversity.

5.2 Mitigation measures

The safeguards and management measures detailed Table 5.1 below would be implemented to minimise the impacts of the proposal on biodiversity values. These safeguards and management measures would be incorporated into a Construction Environmental Management Plan (CEMP). The CEMP would identify the specific measures to be implemented during the 'Pre-construction', 'Construction' and 'Post-construction' stages of the proposal and would include work methods, contingencies, roles, and responsibilities.

Table 5.1: Mitigation measures

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
General	Ensure all workers are provided with an environmental induction before starting work on-site. This would include information on the ecological values of the study area and measures to be implemented to protect biodiversity.	Prior to onset of construction	Effective	None	Project ecologist/ environment officer
Removal of native vegetation	Native vegetation removal will be minimised through detailed design.	Detailed design	Effective	Loss of 2.73 ha of PCT 3161: Mid North Hinterland Wet Forest	Project design team, environment officer
	Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW, 2024).	Prior to onset of construction	Effective		Contractor
	Vegetation removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW, 2024).	Prior to onset of construction	Effective		Contractor

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
	Native vegetation will be re-established, where applicable, in accordance with Guide 3: Re-establishment of native vegetation of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW, 2024).	Prior to onset of construction	Effective		Contractor
	The unexpected species find procedure is to be followed under *Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects* (TfNSW, 2024) if threatened ecological communities, not assessed in the biodiversity assessment, are identified in the study area.	Prior to onset of construction	Proven		Contractor/ project environment officer
	A policy-based tree replacement would be required as an environmental safeguard in the updated REF as per TfNSW No Net loss Guidelines (2024).	Prior to onset of construction	Proven		Contractor/ project environment officer

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
Removal of threatened fauna habitat and habitat features	Habitat removal will be minimised through detailed design.	Detailed design	Effective	Loss of 2.73 ha of Mid North Hinterland Wet Forest and potential habitat for threatened species such as the Koala.	Contractor
	Pre-clearing surveys will be undertaken in accordance with Guide 1: Pre-clearing process of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW, 2024).	Prior to onset of construction	Proven		Contractor
	Habitat removal will be undertaken in accordance with Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW, 2024).	During construction	Effective		Contractor
	Habitat will be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock and Guide 8: Nest boxes of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW 2024).	During construction	Proven		Project environment officer, contractor

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
Removal of habitat and potential movement corridor for the Koala	Minimise habitat loss, where possible, in the final design.	Prior to and during construction	Effective	Removal of up to 2.73 ha of native forest broadly suitable for the Koala.	Project design team, environmental officer
	Delineate retained native vegetation with no-go zone fencing.	During construction	Effective		Contractor
	Reduce vehicle strike risk through the installation of Koala exclusion fencing and wildlife signage, where appropriate.	At onset of construction	Effective		Contractor, environment officer
	Minimise light and noise impacts through the retention of forested vegetated buffers where possible; limit night works during breeding season (September through to February).	During construction and operation	Effective		Contractor

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
Aquatic impacts	Aquatic habitat will be protected in accordance with Guide 10: Aquatic habitats and riparian zones of the Biodiversity Guidelines: Protecting and managing biodiversity on RTA projects (TfNSW 2024) and Section 3.3.2 Standard precautions and mitigation measures of the Policy and guidelines for fish habitat conservation and management Update 2013 (DPI (Fisheries NSW) 2013).	Prior to onset of construction	Proven	None	Contractor
Injury and mortality of fauna	Fauna will be managed in accordance with Guide 9: Fauna handling of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW 2024).	During construction	Effective	None	Contractor
Edge effects on adjacent native vegetation and habitat	Exclusion zones will be set up at the limit of clearing in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW 2024).	Prior to onset of works	Effective	None	Contractor

Impact	Safeguards and management measures	Timing	Likely efficacy of mitigation	Residual impacts	Responsibility
Invasion and spread of weeds	Weed species will be managed in accordance with Guide 6: Weed management of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW 2024).	During construction	Effective	Potential for new or additional infestations of exotic species in adjacent retained vegetation as a result of creation of new edge.	Contractor
Invasion and spread of pathogens and disease	Pathogens will be managed in accordance with Guide 2: Exclusion zones of the Biodiversity Guidelines: Protecting and managing biodiversity on TFNSW projects (TfNSW 2024).	During construction	Effective	None	Contractor
Exceedance of Transport's no net loss guideline	Prepare a biodiversity offset strategy in line with 'Transport's No Net Loss Guidelines (TfNSW 2024).	Prior to onset of works	Effective	None	Project environment officer

6 Offsets and other measures

6.1 Thresholds

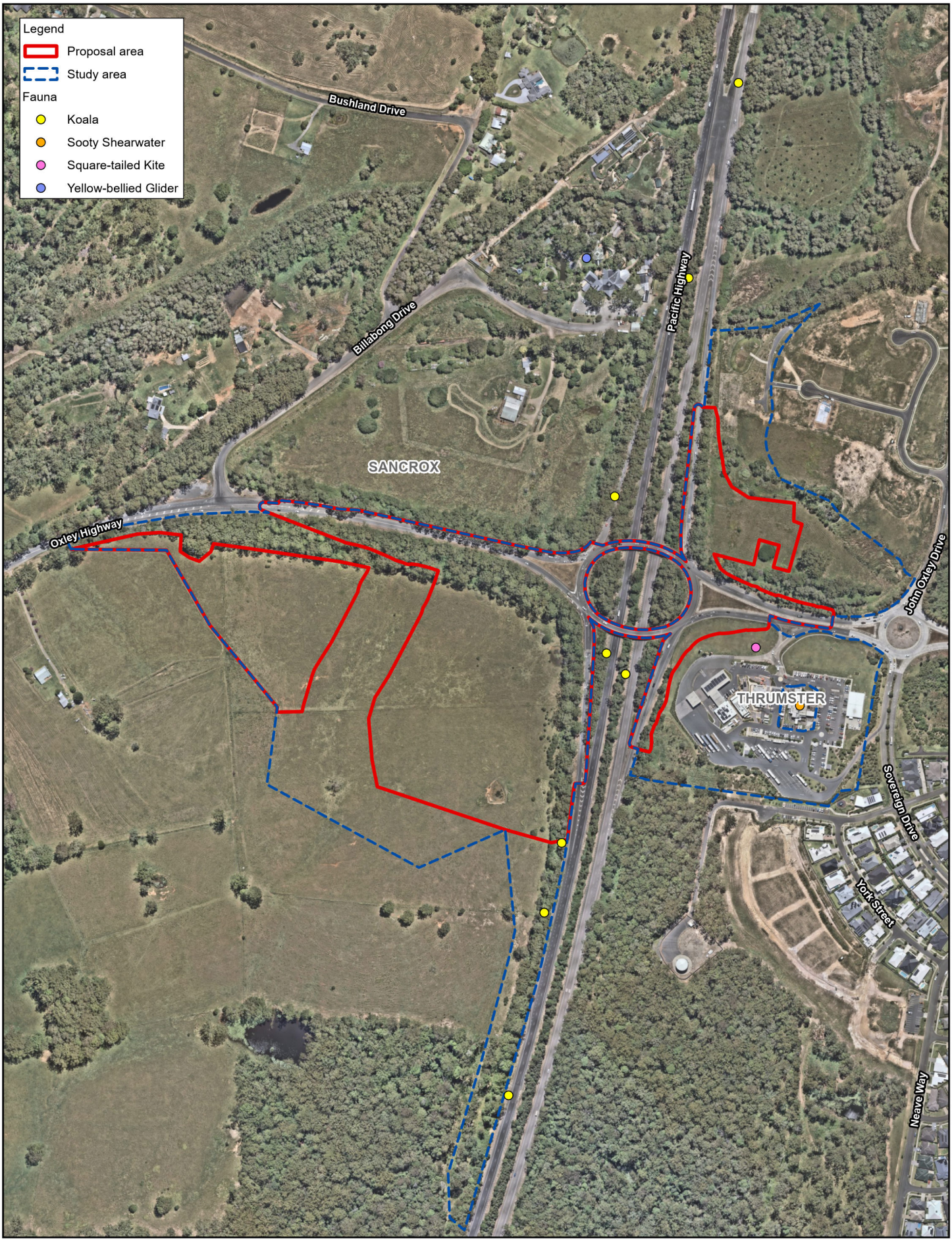
The *Guidelines for Biodiversity Offsets* (TfNSW 2024) outlines several thresholds that trigger the need for biodiversity offsets. A consideration of these thresholds is provided in Table 6.1: where it has been determined that the proposal trigger the need for offsetting due to:

- The clearing of approximately 2.73 ha of Koala habitat
- The clearing of >1 ha of 3161: Mid North Hinterland Wet Forest, which contains primary Koala feed tree species (PMHC 2008).

Table 6.1: Offset thresholds (TfNSW No Net Loss Guidelines - 2024)

Impact	Threshold	Assessment of proposal against thresholds
Works involving clearing of a CEEC	Where there is any clearing of an CEEC in 'moderate to good' condition	No – No CEECs occur within the proposal area.
Works involving clearing of an EEC	Where clearing of a EEC ≥ 2 ha in 'moderate to good' condition	No – No EECs occur within the proposal area.
Works involving clearing of VEC	Where clearing of VEC ≥ 5 ha in 'moderate to good' condition	No – No VECs occur within the proposal area.
Works involving clearing of any habitat for a known species credit fauna species or clearing of breeding habitat (as defined by the TBDC) for dual-credit fauna species (excluding exotic and planted vegetation that cannot be assigned to a plant community type)	Where clearing ≥ 1 ha in 'moderate to good' condition	Yes – The proposal will involve clearing of approximately 2.73 ha of moderate condition Koala habitat. Whilst the species was not detected during surveys, recent records (within the past 5 years) occur in the study area and immediate surrounds (NSW DCCEEW 2025a; Figure 6-1). The occurrences of PCT 3161 contain Koala feed trees and are subsequently representative of suitable habitat.
Works involving removal of known threatened flora species and their habitat	Where loss of individuals is ≥10 or where clearing of habitat is ≥ 1 ha	No – No threatened flora species were identified or are known to occur within the proposal area.
Type 1 or Type 2 key fish habitats	Where there is a net loss of habitat	No – No type 1 or 2 key fish habitat present within proposal area.

Impact	Threshold	Assessment of proposal against thresholds
Any residual biodiversity impact that doesn't require offsets in accordance with the No Net Loss Guideline is to be assessed against the requirements of the Tree and Hollow Replacement Guideline.	Any clearing of hollows and/or trees ≥5cm DBH	No – Tree removal associated with the proposed works is accounted for within the calculated offset obligation for the Koala, a species credit species. No hollow-bearing trees were recorded within the study area, and as such, no additional tree or hollow replacement requirements apply under EMF-BD-GD-0129, despite trees ≥5cm DBH occurring in the proposal area (Table 3.6). No hollow bearing trees were identified in the proposal area.



Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

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Not for external exhibit

Transport for NSW
Oxley Highway Interchange
Biodiversity Assessment

Threatened species records (last 5 years)

Project No. **12624683**
Revision No. **A**
Date **15/05/2025**

FIGURE 6-1

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Print date: 15 May 2025 - 12:55

Data source: Threatened species - Bionet: DCCEEW 2024; General topography, cadastre: NSW Spatial Services 2024; TfNSW: The proposal, 2021; Nearmap: Imagery (Date extracted: 15/05/2025)Nearmap WMS Server: . Created by: rvillalon

Table 6.2: Assessment of vegetation impacts against thresholds

Veg. zone	Plant community type (PCT)	Condition	TEC	Impact area (ha or m2)	Threshold triggered?
Zone 1	PCT 3161: Mid North Hinterland Wet Forest	Moderate	Not associated with a listed TEC	2.73 ha	Yes, Works will require the clearing of >1 ha of moderate condition koala habitat, therefore triggering offset requirements for the species.

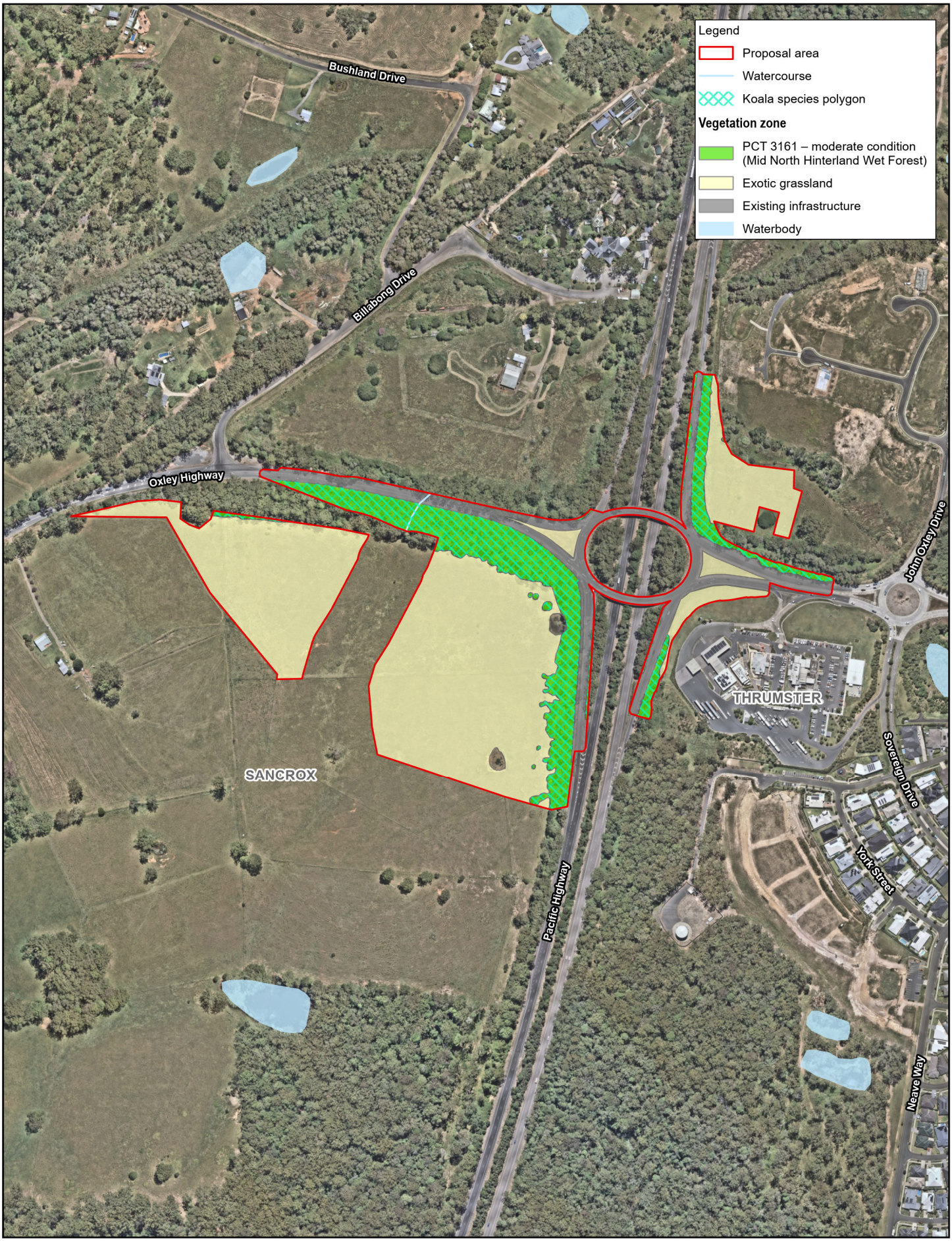
6.2 Preliminary offset and tree/hollow replacement calculations

6.2.1 Preliminary offset calculations

No impacts to any TECs are anticipated as a result of the proposal. Although no species credit species were opportunistically recorded during field surveys, several recent records of the Koala occur along the boundary of the proposal area, within the study area, or in close proximity to it (Figure 6-1). Accordingly, the Koala meets the definition of a 'known' species credit species entity under the Transport for NSW No Net Loss Guidelines, and a corresponding species polygon has been generated (Figure 6-2). Preliminary credit calculations for the Koala have been conservatively calculated using benchmark habitat values for PCT 3161 in the BAM Calculator. These are summarised in Table 6.3.

Table 6.3: Preliminary credit calculations for impacts to the species-credit species, the Koala

Species name	EPBC Act	BC Act	Impact (ha)	Species credits
Phascolartos cinereus - Koala	Endangered	Endangered	2.73ha	137
Total species credits				137



Paper Size ISO A4

0 25 50 75 100

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 56

N

Disclaimer: Subject to detailed design

Transport for NSW
Oxley Highway Interchange
Biodiversity Assessment

Koala *(Phascolarctos cinereus)* species polygon

Project No. **12624683**
Revision No. **A**
Date **15/05/2025**

FIGURE 6-2

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Print date: 15 May 2025 - 12:55

Data source: General topography, cadastre: NSW Spatial Services 2024; TfNSW: The proposal, 2021; Nearmap: Imagery (Date extracted: 15/05/2025)Nearmap
WMS Server: . Created by: rvillalon

6.3 Biodiversity offset strategy

The proposal will result in the removal of native vegetation that meets the criteria for Koala habitat under Category B2 of the *TfNSW No Net Loss Guidelines*. As such, a preliminary offset requirement of 137 species credits has been calculated using the BAM Calculator based on mapped Koala habitat within the subject land (Figure 6-2).

TfNSW will meet this offset obligation through one or more of the following mechanisms:

- Retirement of available Koala species credits from the NSW Biodiversity Credits Register
- Acquisition of suitable credits from a third party
- Payment into the NSW Biodiversity Conservation Fund.

No hollow-bearing trees were recorded in the study area, and the proposal does not trigger any additional tree or hollow replacement requirements under EMF-BD-GD-0129 (Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche)).

7 Conclusion

TfNSW proposes to upgrade the Oxley Highway and Pacific Highway interchange at Port Macquarie. The proposal would result in the removal of 7.19 ha of vegetation, of which 2.26 ha is representative of *PCT 3161: Mid North Hinterland Wet Forest*, aquatic habitat and existing infrastructure.

Primary Koala feed tree species are present within the study area. While the study area is unlikely to support a resident Koala population due to its narrow configuration and limited extent, it may function as a movement corridor within the local landscape, owing to its connectivity with adjacent, larger areas of suitable habitat. The proposed removal of vegetation may alter Koala movement in the locality and result in the loss of feed trees that could be used on a seasonal or transient basis. However, such impacts are not considered significant, as landscape-scale connectivity between larger forested patches in the locality will be retained via other habitat corridors that will remain unaffected by the proposal.

A likelihood of occurrence assessment identified three threatened fauna species with a high likelihood of occurring within the study area: the Koala (*Phascolarctos cinereus*), Varied Sittella (*Daphoenositta chrysoptera*), and Green-thighed Frog (*Litoria brevipalmata*). Assessments of significance under both the Biodiversity Conservation Act 2016 (BC Act) and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), where applicable, concluded that the proposal is unlikely to result in significant impacts on these species for the following reasons:

- The habitat to be removed is degraded and subject to edge effects given its small size and narrow, linear configuration, and location adjacent to an existing highway, making it unlikely to support resident populations of Koalas or Varied Sittellas.
- Although the largest patch of PCT 3161 in the proposal area may be used on a seasonal or transient basis as part of a movement corridor for the Koala between more suitable, larger patches of habitat, the proposal is unlikely to result in the complete isolation of any large areas of contiguous forest in the locality, as alternative corridors will remain available.
- The proposal is unlikely to affect the lifecycle and long-term persistence of any of the three species given that habitats of equal or greater quality with remain in the locality.
- Populations, if present, are likely part of a larger metapopulation likely to occur within larger remnants in the locality.
- Mitigation measures would be implemented to minimise the potential for indirect impacts to threatened species through the implementation of a CEMP as outlined in Section 5 of this report.
- The proposal will result in the removal of native vegetation that supports habitat for the Koala, a species credit species under the Biodiversity Assessment Method. As the area of impact exceeds the threshold under Category B2 of the Transport for NSW No Net Loss Guidelines, an offset requirement of 137 Koala species credits has been identified. This offset obligation will be met in accordance with Transport's biodiversity policy through the retirement of biodiversity credits, acquisition from the market, or payment into the Biodiversity Conservation Fund. No hollow-bearing trees were recorded within the study area, and as such, no additional tree or hollow replacement is required.

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Appendix A: Species List

Table A.1 Flora species list

Family	Exotic	Species Name	Common Name
Adiantaceae		*Adiantum formosum*	Giant Maidenhair
Apocynaceae		*Parsonsia straminea*	Common Silkpod
Araliaceae		*Polyscias sambucifolia*	Elderberry Panax
Asteraceae	Yes	*Ageratina adenophora*	Crofton Weed
Asteraceae	Yes	*Bidens pilosa*	Cobbler's Pegs
Asteraceae	Yes	*Hypochaeris radicata*	Catsear
Asteraceae	Yes	*Senecio madagascariensis*	Fireweed
Blechnaceae		*Blechnum cartilagineum*	Gristle Fern
Caryophyllaceae	Yes	*Stellaria media*	Common Chickweed
Casuarinaceae		*Allocasuarina littoralis*	Black She-Oak
Convolvulaceae	Yes	*Ipomoea cairica*	-
Cyatheaceae		*Cyathea australis*	Rough Treefern
Cyperaceae		*Carex appressa*	Tall Sedge
Cyperaceae		*Carex fascicularis*	Tassel Sedge
Cyperaceae		*Eleocharis* sp.	Spike-rush, Spike-sedge
Cyperaceae		*Gahnia sieberiana*	Red-fruit Saw-sedge
Cyperaceae		*Schoenoplectus mucronatus*	-
Dennstaedtiaceae		*Hypolepis muelleri*	Harsh Ground Fern
Dennstaedtiaceae		*Pteridium esculentum*	Bracken
Dicksoniaceae		*Calochlaena dubia*	Rainbow Fern
Ericaceae		*Leucopogon juniperinus*	Prickly Beard-heath
Ericaceae		*Trochocarpa laurina*	Tree Heath
Fabaceae (Caesalpinioideae)	Yes	*Senna occidentalis*	Coffee Senna
Fabaceae (Caesalpinioideae)	Yes	*Senna pendula* var. *glabrata*	-
Fabaceae (Faboideae)		*Desmodium rhytidophyllum*	-
Fabaceae (Faboideae)		*Glycine clandestina*	Twining glycine
Fabaceae (Faboideae)	Yes	*Trifolium repens*	White Clover
Fabaceae (Mimosoideae)		*Acacia fimbriata*	Fringed Wattle

Family	Exotic	Species Name	Common Name
Fabaceae (Mimosoideae)		*Acacia melanoxylon*	Blackwood
Gleicheniaceae		*Gleichenia dicarpa*	Pouched Coral Fern
Juncaceae		*Juncus* sp.	A Rush
Juncaceae		*Juncus planifolius*	-
Lauraceae	Yes	*Cinnamomum camphora*	Camphor Laurel
Lobeliaceae		*Pratia purpurascens*	Whiteroot
Lomandraceae		*Lomandra longifolia*	Spiny-headed Mat-rush
Luzuriagaceae		*Geitonoplesium cymosum*	Scrambling Lily
Malvaceae	Yes	*Sida rhombifolia*	Paddy's Lucerne
Malvaceae		*Hibiscus heterophyllus* subsp. *heterophyllus*	Native Rosella
Moraceae		*Ficus fraseri*	Sandpaper Fig
Moraceae		*Ficus obliqua*	Small-leaved Fig
Myrtaceae		*Leptospermum polygalifolium*	Tantoon
Myrtaceae		*Eucalyptus grandis*	Flooded Gum
Myrtaceae		*Syncarpia glomulifera*	Turpentine
Myrtaceae		*Melaleuca styphelioides*	Prickly-leaved Tea Tree
Myrtaceae		*Eucalyptus microcorys*	Tallowwood
Myrtaceae		*Callistemon salignus*	Willow Bottlebrush
Myrtaceae		*Eucalyptus pilularis*	Blackbutt
Oleaceae	Yes	*Ligustrum lucidum*	Large-leaved Privet
Oleaceae		*Notelaea longifolia*	Large Mock-olive
Oleaceae	Yes	*Ligustrum sinense*	Small-leaved Privet
Passifloraceae	Yes	*Passiflora suberosa*	Cork Passionfruit
Philydraceae		*Philydrum lanuginosum*	Frogsmouth
Phyllanthaceae		*Breynia oblongifolia*	Coffee Bush
Phyllanthaceae		*Glochidion ferdinandi*	Cheese Tree
Pittosporaceae		*Pittosporum undulatum*	Sweet Pittosporum
Plantaginaceae	Yes	*Plantago lanceolata*	Lamb's Tongues
Poaceae	Yes	*Andropogon virginicus*	Whisky Grass

Family	Exotic	Species Name	Common Name
Poaceae	Yes	*Setaria sphacelata*	South African Pigeon Grass
Poaceae	Yes	*Chloris gayana*	Rhodes Grass
Poaceae		*Cynodon dactylon*	Common Couch
Poaceae		*Imperata cylindrica*	Blady Grass
Poaceae	Yes	*Paspalum mandiocanum*	Broadleaf Paspalum
Poaceae	Yes	*Sporobolus africanus*	Parramatta Grass
Poaceae		*Microlaena stipoides*	Weeping Grass
Poaceae		*Oplismenus imbecillis*	-
Poaceae	Yes	*Paspalum dilatatum*	Paspalum
Rosaceae	Yes	*Rubus* sp.	-
Sapindaceae		*Guioa semiglauca*	Guioa
Solanaceae	Yes	*Solanum mauritianum*	Wild Tobacco Bush
Solanaceae	Yes	*Solanum nigrum*	Black-berry Nightshade
Verbenaceae	Yes	*Lantana camara*	Lantana
Violaceae		*Viola hederacea*	Ivy-leaved Violet

Table A.2: Fauna species list

Family	Exotic	Species Name	Common Name
Acanthizidae		*Acanthiza pusilla*	Brown Thornbill
Acanthizidae		*Gerygone olivacea*	White-throated Gerygone
Acanthizidae		*Smicrornis brevirostris*	Weebill
Alcedinidae		*Dacelo novaeguineae*	Laughing kookaburra
Artamidae		*Cracticus nigrogularis*	Pied Butcherbird
Artamidae		*Cracticus tibicen*	Australian Magpie
Artamidae		*Strepera graculina*	Pied currawong
Cacatuidae		*Cacatua galerita*	Sulphur-crested Cockatoo
Cacatuidae		*Calyptorhynchus funereus*	Yellow-tailed Black-Cockatoo
Cacatuidae		*Eolophus roseicapillus*	Galah
Corvidae		*Corvus coronoides*	Australian Raven
Cuculidae		*Scythrops novaehollandiae*	Channel-billed cuckoo
Limnodynastidae		*Limnodynastes peronii*	Brown-striped Frog
Macropodidae		*Wallabia bicolor*	Swamp Wallaby
Maluridae		*Malurus lamberti*	Variegated Fairy-wren
Meliphagidae		*Entomyzon cyanotis*	Blue-faced Honeyeater
Meliphagidae		*Lichenostomus chrysops*	Yellow-faced Honeyeater
Meliphagidae		*Manorina melanocephala*	Noisy Miner
Monarchidae		*Myiagra sp.*	Flycatcher sp.
Myobatrachidae		*Crinia signifera*	Common Eastern Froglet
Pelodryadidae		*Litoria fallax*	Eastern Dwarf Tree Frog
Peramelidae		*Isoodon/Perameles* sp.	unidentified Bandicoot
Psittaculidae		*Platycercus eximius*	Eastern Rosella
Psophodidae		*Psophodes olivaceus*	Eastern Whipbird
Rhipiduridae		*Rhipidura albiscapa*	Grey Fantail
Scincidae		*Lampropholis delicata*	Dark-flecked Garden Sunskink
Sturnidae	Yes	*Sturnus tristis*	Common Myna

Appendix B: Habitat suitability assessment

Habitat suitability assessment

Table B.1 Habitat suitability assessment criteria

Likelihood	Criteria
Present	The species was observed in the study area during the current survey.
High	A species is considered highly likely to occur in the study area if: 19.1 There are previous credible records on BioNet within the study area from the last 10 years and suitable habitat is present. OR 20.1 The species is dependent on identified suitable habitat within the study area (i.e., for breeding or important life cycle periods such as winter flowering resources) and has been recorded recently (within five years) on BioNet in the locality. This also includes species known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the study area. Species unlikely to maintain sedentary populations, however, may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the study area but may have been recorded recently in the locality (10 km). It may be an occasional visitor (fauna), but habitat similar to the study area is widely distributed in the local area, meaning that the species is likely not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat OR Targeted surveys did not detect the species. OR Specific habitat within study area is marginally suitable for the threatened species.
Nil	Suitable habitat is absent from the study area.

Table B.2 Habitat suitability assessment table – threatened flora

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Acronychia littoralis	Scented Acronychia	E	E	22 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (NSW DCCEEW 2025a)	Scented Acronychia is found between Fraser Island in Queensland and Port Macquarie on the north coast of NSW, within 2km of the coast on sandy soil. Scented Acronychia occurs in transition zones between littoral rainforest and swamp sclerophyll forest; between littoral and coastal cypress pine communities; and margins of littoral forest.	Low. Readily identifiable species not identified during surveys. No records in the locality. Lack of suitable habitat relating to vegetation type in the proposal area.
Allocasuarina defungens	Dwarf Heath Casuarina	E	E	3 records within 10km, last recorded 2011 (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2024a)	Occurs only in NSW, from the Nabiac area, north-west Forster to Byron Bay, NSW. Dwarf Heath Casuarina grows mainly in tall heath on sand, but can also occur on clay soils and sandstone. The species also extends onto exposed nearby-coastal hills or headlands adjacent to sandplains.	Low. Lack of suitable habitat relating to vegetation type in the proposal area.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Allocasuarina thalassoscopica			E	1 record within 10km, last recorded 2014 (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2024a)	Widespread along the North Coast as far south as Diamond Head, extending north to the Noosa Heads area of SE Queensland. The species is restricted to low closed heathland communities.	Nil Lack of suitable habitat relating to vegetation and habitat type in the proposal area.
Arthraxon hispidus	Hairy-joint Grass	V	V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Scattered locations through SE QLD and northern coast and tablelands of NSW to Kempsey and inland to Glen Innes. Found in or on the edges of rainforest and wet eucalypt forest, often near creeks or swamps. Also recorded in woodland, or around freshwater springs on coastal foreshore dunes, gullies and creek banks and on creek beds in open forests.	Low No records in the locality. Proposal area contains some marginal wet eucalypt forest, however, occurs south of known range. Unlikely to occur for this reason.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Asperula asthenes	Trailing Woodruff	V	V	2 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs in scattered locations from Bulahdelah to Kempsey. Some records from Port Stephens/Wallis Lakes area. Occurs in damp sites, often along riverbanks.	Low A first order waterway occur within proximity to the proposal area however it has been cleared of canopy/ midstorey vegetation and represents low quality habitat due to exposed conditions.
Cryptostylis hunteriana	Leafless Tongue-orchid		V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a	Occurs in coastal areas from East Gippsland to southern Queensland. Habitat preferences not well defined. Grows mostly in coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest. Prefers open areas in the understorey and is often found in association with Large Tongue Orchid and the Bonnet Orchid. Soils include moist sands, moist to dry clay loam and occasionally in accumulated eucalypt leaves.	Low No records in the locality. Degraded habitats in the proposal area are unlikely to support the species.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					Flowers November-February.	
Cynanchum elegans	White-flowered Wax Plant	E	E	1 record within 10km, last recorded 2006 (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs from Gerroa (Illawarra) to Brunswick Heads and west to Merriwa in the upper Hunter. Most common near Kempsey. Usually occurs on the edge of dry rainforest or littoral rainforest, but also occurs in Coastal Banksia Scrub, open forest and woodland, and *Melaleuca* scrub. Soil and geology types are not limiting. Flowering occurs between August and May, with the peak in November.	Low No records in the locality. Proposal area does not support any rainforest communities.
Dendrobium tetragonum* var. *melaleucaphilum	Spider orchid	E		3 records within 10km (NSW DCCEEW 2025a)	Occurs in coastal districts and nearby ranges, extending from Queensland to its southern distributional limit in the lower Blue Mountains. Grows frequently	Low Few records in locality however the proposal area does support a low abundance of the

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					on *Melaleuca styphelioides*, less commonly on rainforest trees or on rocks in coastal districts. Flowers July–October.	associated species *M. styphelioides*. The species was not identified in proposal area during surveys.
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	5 records within 10km (NSW DCCEEW 2025a)	Naturally occurs only in New England Tablelands from Nundle to north of Tenterfield. Widely planted as urban street tree well outside its range. Grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	Low Few records in the locality. Species generally associated with grassy woodland which is not present in the proposal area.
Eucalyptus scoparia	Wallangarra White Gum	E	V	1 record within 10km (NSW DCCEEW 2025a)	Known from only three locations in NSW, near Tenterfield, including Bald Rock National Park. Found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes. At lower elevations can occur in	Low Single record in the locality. Species generally associated with grassy woodland and heathland which is not present in the proposal area.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					less rocky soils in damp situations.	
Euphrasia arguta		CE	CE	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Recently rediscovered near Nundle on the north-western slopes and tablelands, once known from scattered locations between Sydney, Bathurst and Walcha. Known populations occur in eucalypt forest with a mixed grass/shrub understorey, while previous records are described as occurring in open forest, grassy country and river meadows. Dense stands observed in cleared firebreak areas, suggesting it may respond well to disturbance.	Low Proposal area contains potential eucalypt and mixed grass/shrub understorey habitat associated with this species. The proposal area is also disturbed which correlates with this species persistence. However, the proposal area currently falls out of the known area of occupancy for the species.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Leichhardtia longiloba	Clear Milkvine		V	Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Clear Milkvine is known from scattered sites on the NSW north coast from Hastings River northwards to Mount Nebo in Queensland (Forster, 1996). It is conserved within the Lamington National Park (NP), Main Range NP, Mt Barney NP, and Toonumbar NP (Briggs & Leigh, 1996; NSW NPWS, 2005). This species occurs within the Hunter–Central Rivers, Northern Rivers (NSW) and South East Queensland Natural Resource Management Regions. Clear Milkvine grows in open eucalypt forest, or margins of subtropical and warm temperate rainforest, and in areas of rocky outcrops.	Low Proposal area contains suitable eucalypt forest habitat; albeit marginal given the historical and ongoing disturbance in the area.
Lindsaea incisa	Slender Screw Fern	E		3 records within 10km (NSW DCCEEW 2025a)	Known only from a few locations between Woombah and just south of Coffs Harbour. Occurs on dry eucalypt forest on sandstone and moist shrubby eucalypt	Low Low number of records in the locality. Marginal habitat present within

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					forest on metasediments. Usually found in waterlogged or poorly drained sites along creeks where ferns, sedges and shrubs grow thickly.	intermittently damp sites of the proposal area such as the drainage swale or farm dams. Habitat suitability is reduced due to the degraded conditions within the proposal area.
Macadamia integrifolia	Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak		V	4 records within 10km (NSW DCCEEW 2025a), Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Found in remnant rainforest in northern NSW and south-east Queensland, preferring partially open areas such as rainforest edges. While specimens have been collected from the North Coast of NSW, this species is not known to occur naturally in NSW.	Nil Readily identifiable species not identified during surveys. Proposal area does not contain the associated rainforest habitat for this species.
Marsdenia longiloba	Slender Marsdenia	E	V	2 records within 10km (NSW DCCEEW 2025a)	Scattered sites on the north coast of NSW north from Barrington Tops to QLD. Grows in subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest and in areas with rocky outcrops. Associated species include *Eucalyptus crebra, E.*	Low The proposal area contains some marginal moist eucalypt forest associated with this species as well as associated species*; E. microcorys*. Habitat is however highly degraded,

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					microcorys, E. acmenoides, E. saligna, E. propinqua, Corymbia intermedia and *Lophostemon confertus.*	fragmented and does not adjoin rainforest or rocky outcrops. Species was not identified during surveys.
Maundia triglochinoides		V		10 records within 10km (NSW DCCEEW 2025a)	Restricted to coastal NSW current southern limit at Wyong. Grows on heavy clay, low nutrient soil in swamps, lagoons, dams, channels, creeks or shallow freshwater 30-60 cm depth. Associated with wetland species e.g. *Triglochin procerum*.	Low The species was not detected during surveys, nor the similar genus, *Triglochin*. Drainage swales within the proposal area do not retain water for extended periods and are unlikely to support this aquatic species. Both farm dams are degraded and are unlikely to support the species.
Melaleuca biconvexa	Biconvex Paperbark	V	V	75 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area	Scattered, disjunct populations in coastal areas from Jervis Bay to Port Macquarie, with most populations in the Gosford-Wyong areas. Grows in damp places, often near streams or	Low Despite a high number of records in the locality, the Biconvex Paperbark is a readily identifiable species

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
				(Commonwealth DCCEEW 2025a)	low-lying areas on alluvial soils of low slopes or sheltered aspects.	that was not identified during surveys. Native vegetation on site (PCT 3161) is not associated with the species may may represent marginal habitat due to moist conditions provided.
Melaleuca groveana	Grove's Paperbark	V		4 records within 10km, last recorded 2011 (NSW DCCEEW 2025a)	Grows in heath, often in exposed sites; rare, restricted to higher areas, coastal districts north from Howes Valley and Port Stephen.	Low Readily identifiable species not identified during surveys. Species generally occurs within heathland communities that are not present in the proposal area.
Oberonia titania	Red-flowered King of the Fairies	V		6 records within 10km (NSW DCCEEW 2025a)	Occurs on the NSW north coast, north from Kendall. Found in littoral and subtropical rainforest and paperbark swamps, but can also occur in eucalypt-forested gorges and in mangroves.	Low While recorded in the locality, this orchid is predominantly associated with rainforest and paperbark communities which

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
						do not occur in the proposal area.
Parsonsia dorrigoensis	Milky Silkpod	V	E	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Scattered populations on the north coast between Kendall and Woolgoolga. Grows on brown clay soils in subtropical and warm temperate rainforest, on rainforest margins and in moist eucalypt forest up to 800m asl. Has a preference for more open areas and forest edges.	Low Species not detected during surveys, No records in the locality. Proposal area contains some suitable moist habitat for this species.
Persicaria elatior	Knotweed, Tall Knotweed	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Low Not recorded during surveys, and no records occur in the locality. Damp areas along swales and farm dams present marginal habitat for species.
Phaius australis	Lesser Swamp-orchid	E	E	Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Grows in swampy grassland or swampy forest including	Nil Proposal area does not contain swampy habitat associated with this species,

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					rainforest, eucalypt or paperbark forest, mostly in coastal areas.	nor the associated species, *Melaleuca quinquenervia*.
Rhodamnia rubescens	Scrub Turpentine	CE	CE	155 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs in coastal districts north from Batemans Bay in New South Wales, to areas inland of Bundaberg in Queensland. Populations typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000 -1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils. Highly to extremely susceptible to infection by Myrtle Rust.	Moderate Species associated with native vegetation within the proposal area (PCT 3161) and has a high number of records in the locality. Despite this, the species was not detected during surveys, and is less likely to persist due to habitat degradation.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Rhodomyrtus psidioides	Native Guava	CE	CE	157 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs from Broken Bay, approximately 90 km north of Sydney, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation and also occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines. Extremely susceptible to infection by Myrtle Rust.	Moderate Species associated with native vegetation within the proposal area (PCT 3161) and has a high number of records in the locality. Despite this, the species was not detected during surveys, and is less likely to persist due to habitat degradation.
Sarcochilus fitzgeraldii	Ravine Orchid	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Occurs north-east NSW, north of the Macleay River, to Maleny in south-east Queensland. Grows mainly on rocks, amongst organic matter, in cool, moist, shady ravines, gorges and on cliff faces in dense subtropical rainforest at altitudes between 500 and 700 m. Occasional clumps are found	Nil No records in the locality. Proposal area does not have the associated rocky, rainforest habitat for this species. Proposal area also does not meet the altitude requirement of 500-700 m.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					on the bases of fibrous-barked trees.	
Senna acclinis	Rainforest Cassia	E		1 record within 10km, last recorded 2010 (NSW DCCEEW 2025a)	Coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland. Grows in or on the edges of subtropical and dry rainforest.	Low Single record in the locality. PCT 3161 is only representative of marginal habitat for this species, which generally grows on ecotonal boundaries of rainforest, which is not present in the proposal area.
Sophora tomentosa	Silverbush	E		1 record within 10km (NSW DCCEEW 2025a)	Occurs in coastal areas in northern NSW and Queensland. Previously common north of Port Stephens but now uncommon and only known north of Taree. Largest known population is at Port Macquarie. Occurs on coastal dunes.	Nil Despite having been recorded in the locality, no coastal dune habitat occurs in the study area.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Syzygium paniculatum	Magenta Lilly Pilly	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a	Occurs in narrow coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast, the species occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast, it occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Low Readily identifiable species not identified during surveys. Proposal area does not contain the associated rainforest habitat for this species, however wet sclerophyll vegetation may offer marginal habitat.

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
Thesium australe	Austral Toadflax, Toadflax	V	V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland or grassy woodland and is often found in association with Kangaroo Grass.	Low Proposal area contains some suitable habitat for the species. However, grasslands in the proposal area are highly disturbed and dominated by exotic species. Not records of the species in the locality. Associated species, Kangaroo Grass, was not identified in the proposal area.
Vincetoxicum woollsii			E	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Occurs from southern QLD into central NSW, as far south near Temora with the majority of records occurring in the central western region. Records from Goonoo, Pillaga West, Pillaga East, Bibblewindi, Cumbil and Eura State Forests, Coolbaggie NR, Goobang NP and Beni SCA. Also has been recorded Hiawatha State Forest near West Wyalong in the south	Nil No records in the locality. Proposal area does not meet the associated altitude requirement of 300-400 m

Scientific Name	Common Name	NSW Status	Cwlth Status	Source	Habitat Association	Likelihood of occurrence in proposal area
					and there are old records as far north as Crow Mountain near Barraba and near Glenmorgan in the western Darling Downs. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of *Eucalyptus fibrosa, Eucalyptus sideroxylon, Eucalyptus albens, Callitris endlicheri, Callitris glaucophylla* and *Allocasuarina luehmannii.* Also grows in association with *Acacia hakeoides, Acacia lineata, Melaleuca uncinata, Myoporum* species and Casuarina species. Flowers in spring, with flowers recorded in November or May and is suspected to be related to rainfall, with fruiting probably 2 to 3 months later. Altitudes are generally in the range of 300 - 400 m a.s.l.	

Table B.3 Habitat suitability assessment table - threatened fauna

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Birds						
Anseranas semipalmata	Magpie Goose	V		31 records within 10km (NSW DCCEEW 2025a)	Still relatively common in the Australian northern tropics but had disappeared from south-east Australia by 1920 due to drainage and overgrazing of reed swamps used for breeding. Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW. Inhabits shallow wetlands containing dense rushes or sedges, and nearby dry land used for grazing. Feeds on grasses, bulbs and rhizomes and roosts in tall vegetation within wetland areas. Breeding occurs predominately in monsoonal areas and is unlikely in SE NSW. Nests are formed in trees over deep water.	Moderate Marginal aquatic habitat aquatic present in the proposal area, 6 records within 10 km of proposal area. Proposal area does not contain associated nesting habitat for this species (trees above deep water). Highly mobile species.
Anthochaera phrygia	Regent Honeyeater	CE	CE	11 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. Very patchy distribution in NSW, mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests. Inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany.	Low No records of the species in the locality. Proposal area is not mapped as habitat for this species. Despite this, forested communities represent marginal foraging habitat for the species.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V		25 records within 10km (NSW DCCEEW 2025a)	Occurs throughout most of NSW, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. It has also been recorded in shrublands, heathlands and very occasionally in moist forest or rainforest. Also found in farmland, usually at the edges of forest or woodland.	
Atrichornis rufescens	Rufous Scrub-bird	V	E	1 record within 10km (NSW DCCEEW 2025a)	Found above 600 m sea level in north-eastern NSW, including subtropical, warm temperate and cool temperate rainforests, and nearby moist and wet eucalypt forests. Requires dense ground cover, a moist microclimate at ground level and abundant leaf litter, which is usually restricted to ecotones, forested watercourses and wetlands, and areas regenerating from fires, storms or along roadsides.	Low PCT 3161 is representative of marginal habitat for this species, which prefers rainforest over wet eucalypt forest.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Botaurus poiciloptilus	Australasian Bittern	E	E	3 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Widespread but uncommon over south-eastern Australia. Found over most of NSW except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spike rushes (*Eleocharis* spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. May construct feeding platforms over deeper water from reeds trampled by the bird; platforms are often littered with prey remains.	Low No records of the species in the locality. The dams within the proposal area represent marginal habitat for the species as they are degraded from ongoing land use.
Burhinus grallarius	Bush Stone-curlew	E		6 records within 10km (NSW DCCEEW 2025a)	Found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights and nests on the ground in a scrape or small bare patch.	Low Species recorded in the locality. Exotic grassland and dense forest vegetation associated with PCT 3161 are representative of marginal habitat for this species that has a preference for open woodland habitat.
Calidris ferruginea	Curlew Sandpiper	E	CE	21 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (DCCEW 2024a)	Distributed around most of the Australian coastline. Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. Migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts in NSW. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	Moderate Species known to inhabit littoral/shore habitat, however may utilise freshwater habitat in transit. The species is known to occur within the area.
Calidris canutus	Red Knot, Knot		V	18 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (DCCEW 2024a)	Breeds in northern hemisphere. Occurs in coastal areas around Australia, with important sites in VIC, SA, WA, NT and Qld. Mainly inhabits intertidal mudflats, sandflats and sandy beaches. Occasionally seen in terrestrial saline wetlands but rarely in freshwater wetlands. Forage in soft substrates in intertidal areas.	Low Species known to inhabit saline terrestrial habitats. On rare occasions has been recorded in freshwater habitat.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	112 records within 10 km (NSW DCCEEW 2025a), Species or species habitat known to occur within (Commonwealth DCCEEW 2025a)	Uncommon although widespread throughout suitable forest and woodland habitats. Occurs from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Feeds almost exclusively on the seeds of several species of she-oak (*Casuarina* and *Allocasuarina* species).	Moderate Proposal area contains suitable foraging habitat with a low abundance of *Allocasuarina littoralis.* Breeding habitat in the form of large hollows are absent.
Circus assimilis	Spotted Harrier	V		26 records within 10km (NSW DCCEEW 2025a)	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. Found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Moderate Moderate number of records in the locality. Grassed habitats in the proposal area represent suitable aerial foraging habitat for the species. Forested communities are unlikely to be utilised as breeding habitat given ongoing disturbance from both adjacent highways.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	V	8 records within 10km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	The western boundary of the species range runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell. Often found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. Also found in mallee and River Red Gum Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Usually not found in woodlands with a dense shrub layer. Fallen timber is an important habitat component for foraging. Also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	Low Single record in the locality. The primary extent of the proposal area has been cleared with remaining areas of native forest degraded and subject to ongoing disturbance. Remnant vegetation is representative of marginal foraging habitat.
Coracina lineata	Barred Cuckoo-shrike	V		18 records within 10km (NSW DCCEEW 2025a)	Coastal eastern Australia from Cape York to the Manning River in NSW. Generally uncommon in their range, and are rare in NSW. Prefers rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses.	Moderate Species known to occur in the locality. PCT 3161 is representative of marginal foraging habitat due to its position near infrastructure, small patch size and vegetation condition.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	CE	CE	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Currently only known in the wild from a low number of reliable records in QLD and NSW. Recorded between Rockhampton to the Richmond River in north-eastern NSW, and west to the Bunya Mountains, Main Ranges, Richmond Range and Koreelah Range. Additional plausible but unconfirmed records have been reported from further south in NSW. Records in NSW are from Cougal, Dunoon, Huonbrook, Richmond Range National Park and the Limpinwood Nature Reserve. Most observations are of single birds or pairs feeding in fruiting trees or flying above the forest canopy. Often only detected by the continual stream of fruit debris, the unwanted pulp of figs falling to the ground. Primary habitat is lowland subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, sub-littoral mixed scrub, riparian corridors in woodland, open woodland and across cleared land, and urbanised and agricultural areas with fig trees Ficus spp. The nest is placed in a chamber that is excavated in the rotting wood of a decaying limb or trunk of a living or dead tree. It has been suggested that areas with abundant fig trees appears to be an important habitat component for the species.	Nil Proposal area is outside of species range. Species NSW distribution occurs no further South than the Northern Rivers, Lismore region of Northern NSW.
Daphoenositta chrysoptera	Varied Sittella	V		102 records within 10 km (NSW DCCEEW 2025a)	Sedentary species, inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Found in eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and *Acacia* woodland.	High A high number of records occur in the locality. Proposal area contains suitable foraging habitat in eucalypt forest habitat, despite on-going disturbance.
Ephippiorhynchus asiaticus	Black-necked Stork	E		65 records within 10 km (NSW DCCEEW 2025a)	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland away from breeding areas). Species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the species. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Moderate There are a high number of records within the locality. Farm dams and the drainage swale represent marginal foraging habitat given on-going disturbance and small size.
Epthianura albifrons	White-fronted Chat	V		1 record within 10km, last recorded 2006 (NSW DCCEEW 2025a)	Found mostly in temperate to arid climates and very rarely sub-tropical areas. Occurs mostly in the southern half of NSW, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Typically, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs.	Low Single record in the locality. Vegetated areas of the proposal area are representative of marginal foraging habitat for the species given disturbed vegetation condition and on-going disturbance.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Esacus magnirostris	Beach Stone-curlew	CE		11 records within 10km (NSW DCCEEW 2025a)	Occurs regularly to about the Manning River, and the small population of north-eastern NSW is at the limit of the normal range of the species in Australia. Found exclusively along the coast, on a wide range of beaches, islands, reefs and in estuaries, and may often be seen at the edges of or near mangroves. Forages in the intertidal zone of beaches and estuaries, on islands, flats, banks and spits of sand, mud, gravel or rock, and among mangroves. Breeds above the littoral zone, at the backs of beaches, or on sandbanks and islands, among low vegetation of grass, scattered shrubs or low trees; also among open mangroves.	Nil Species recorded in the locality. Despite this, suitable habitat is largely absent from the study area.
Erythrotriorchis radiatus	Red Goshawk	E	E	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. Preferred habitats include mixed subtropical rainforest, Melaleuca swamp forest and riparian Eucalyptus forest of coastal rivers.	Low Proposal area is located outside of species range. Species most southerly distribution does not extent past Nambucca Heads/ Gumbaynggirr National Park of Mid North Coast NSW. There is the potential for vagrant individuals to use exotic grassland as foraging habitat.
Falco hypoleucos	Grey Falcon	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Low Species uncommon east of the Great Dividing Range. No records in the locality. Marginal foraging habitat present in the proposal area.
Parvipsitta pusilla	Little Lorikeet	V		87 records within 10 km (NSW DCCEEW 2025a)	Distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year. Forages primarily in the canopy of open *Eucalyptus* Forest and woodland, yet also finds food in *Angophora, Melaleuca* and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity.	Moderate Species previously recorded in the locality. Forested habitat within the proposal area is representative of suitable foraging habitat for the species. Breeding habitat absent.
Grantiella picta	Painted Honeyeater	V	V	1 record within 10 km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Nomadic species occurring at low densities throughout its range. Most commonly found on the inland slopes of the Great Dividing Range in NSW, where almost all breeding occurs. More likely to be found in the north of its distribution in winter. Inhabits Boree/ Weeping Myall (*Acacia pendula*), Brigalow (*A. harpophylla*) and Box-Gum Woodlands and Box-Ironbark Forests. Specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus *Amyema.*	Low Single record of the species in the locality. Forested components of the proposal area are representative of suitable foraging and breeding habitat for the species, albeit at a reduced capacity due to reduced vegetation condition. Species rarely occurs east of the Great Dividing Range.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Antigone rubicunda	Brolga	V		20 records within 10 km (NSW DCCEEW 2025a)	Formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. Very sparse distribution across the southern part of its range. Dependent on wetlands for foraging, especially shallow swamps, but also feed in dry grassland, ploughed paddocks and even desert claypans.	Moderate Low number of records in the locality. Proposal area contains some marginal habitat; the two small farm dams and associated ploughed grassland/paddocks.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V		319 records within 10 km (NSW DCCEEW 2025a)	Widespread along the NSW coast, and along all major inland rivers and waterways. Habitats characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat.	Moderate High number of records in the locality. Proposal area contains suitable aerial foraging habitat for the species. No large stick nests were identified, and as such the proposal area is not considered likely to represent breeding habitat.
Hieraaetus morphnoides	Little Eagle	V		46 records within 10km (NSW DCCEEW 2025a)	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Also found in Sheoak or Acacia woodlands and riparian woodlands of inland NSW. Nests in tall living trees within a remnant patch, where pairs build a large stick nest in winter.	Moderate High number of records in the locality. Proposal area contains suitable aerial foraging habitat for the species. No large stick nests were identified, and as such the proposal area is not considered likely to represent breeding habitat.
Irediparra gallinacea	Comb-crested Jacana	V		116 records within 10 km (NSW DCCEEW 2025a)	Known to occur mainly in coastal and subcoastal regions along the east coast to the Hunter region, with stragglers recorded in south-eastern NSW. Inhabits permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	Moderate High number of records in the locality. Degraded farm dams and drainage lines within the proposal area are representative of marginal foraging habitat for the species.
Ixobrychus flavicollis	Black Bittern	V		9 records within 10 km (NSW DCCEEW 2025a)	Scattered records along the east coast of NSW, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. May occur in flooded grassland, forest, woodland, rainforest and mangroves, where permanent water is present.	Low Low number of records in the locality. Degraded farm dams and drainage lines within the proposal area may be representative of marginal foraging habitat for the species.
Lathamus discolor	Swift Parrot	E	CE	120 records within 10 km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Migrates from Tasmania to south-eastern Australia in the autumn and winter months. Mostly occurs on the coast and southwest slopes in NSW. Occurs on the mainland in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood, Forest Red Gum, Mugga Ironbark, and White Box.	Moderate High number of records in the locality. The proposal area is not mapped as habitat for the species on the Important Habitat Map. Highly mobile species. Proposal area does not contain any of the preferred feed trees for the species but is representative of marginal foraging habitat for the species.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Lophoictinia isura	Square-tailed Kite	V		137 records within 10 km (NSW DCCEEW 2025a)	Ranges along coastal and subcoastal areas from south-western to northern Australia. Scattered records throughout NSW indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. Summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March. Found in a variety of timbered habitats including dry woodlands and open forests and shows a particular preference for timbered watercourses. Observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland in arid north-western NSW.	Moderate High number of records in the locality. Proposal area contains suitable aerial foraging habitat for the species. No large stick nests were observed in remnant eucalypt communities. As such, the proposal area is unlikely to support breeding individuals.
Melanodryas cucullata cucullata	South-eastern Hooded Robin, Hooded Robin (south-eastern)		E	1 record within 10km, last recorded 2006 (NSW DCCEEW 2025a), Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Found throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies *picata*. Prefers lightly wooded country, usually open eucalypt woodland, Acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Low No records in the locality. The proposal area is dominated by areas of cleared grassland with remaining wooded areas subject to high levels of disturbance from agricultural activities, urbanisation and the Oxley/Pacific Highway interchange.
Neophema chrysostoma	Blue-winged Parrot	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	During the non-breeding period, from autumn to early spring, birds are recorded in western NSW, with some reaching south-eastern NSW, particularly on the southern migration. Inhabits a range of habitats from coastal, sub-coastal and inland areas, through to semi-arid zones. Tends to favour grasslands and grassy woodlands, often found near wetlands both near the coast and in semi-arid zones. Sometimes seen in altered environments such as airfields, golf-courses and paddocks. Pairs or small parties forage mainly near or on the ground for seeds of a wide range of native and introduced grasses, herbs and shrubs.	Low No records in the locality. Forested components of the proposal area are representative of marginal foraging habitat for the species. Species is highly mobile and may use the vegetation on site on a transient basis, if present in the locality.
Ninox connivens	Barking Owl	V		8 records within 10 km (NSW DCCEEW 2025a)	Found throughout continental Australia except for the central arid regions. Occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests. Sometimes extends home range into urban areas. Inhabit woodland and open forest, including fragmented remnants and partly cleared farmland. Flexible in its habitat use, hunting can extend in to closed forest and more open areas. Typically roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Moderate Species known to occur in the locality. Grassland and forest components of the proposal area represent suitable foraging habitat for the species. The proposal area may offer marginal roosting habitat for the species however breeding habitat in the form of large hollows is absent.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Ninox strenua	Powerful Owl	V		44 records within 10km (NSW DCCEEW 2025a)	Widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains. Inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. Requires large tracts of forest or woodland habitat but can also occur in fragmented landscapes. Breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. Roosts by day in dense vegetation comprising species such as Turpentine, Black She-oak, Blackwood, Rough-barked Apple, Cherry Ballart and a number of eucalypt species.	Moderate Species recorded in the locality. Grassland and forest components of the proposal area may represent suitable foraging habitat for the species. The proposal area may also offer marginal roosting habitat for the species however breeding habitat in the form of large hollows is absent.
Oxyura australis	Blue-billed Duck	V		1 record within 10km, last recorded 2008 (NSW DCCEEW 2025a)	Widespread in NSW, but most common in the southern Murray-Darling Basin area. Disperses during the breeding season to deep swamps up to 300 km away, and generally seen in coastal areas only during summer or in drier years. Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.	Single record of the species in the locality. Ephemeral water bodies and drainage line in the study area are representative of marginal habitat for the species that prefers permanent aquatic systems.
Pandion cristatus	Eastern Osprey	V		303 records within 10 km (NSW DCCEEW 2025a)	Found right around the Australian coast line, except for Victoria and Tasmania. Common around the northern coast, especially on rocky shorelines, islands and reefs. Uncommon to rare or absent from closely settled parts of south-eastern Australia. Rare records from inland areas. Favours coastal areas, especially the mouths of large rivers, lagoons and lakes. Breeds in NSW from July to September. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Moderate High number of records in the locality. Roosts and breeds along major rivers, none of which intersect the proposal area. Often associated with rocky shores. May aerially forage over the proposal area, on occasion.
Petroica boodang	Scarlet Robin	V		8 records within 10km, last recorded 2014 (NSW DCCEEW 2025a)	Occurs from the coast to the inland slopes in NSW. Disperses to the lower valleys and plains of the tablelands and slopes after breeding. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. Found in dry eucalypt forests and woodlands with usually open and grassy understorey with few scattered shrubs. Lives in both mature and regrowth vegetation and occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Abundant logs and fallen timber are important components of its habitat.	Low Species recorded in the locality. PCT 3161 is representative of marginal foraging habitat given overall condition, density and on-going disturbance.
Petroica phoenicea	Flame Robin	V		5 records within 10km (NSW DCCEEW 2025a)	Breeds in upland areas in NSW and moves to the inland slopes and plains in winter. Likely two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys.	Low Species recorded in the locality. PCT 3161 is representative of marginal foraging habitat given overall condition, density and on-going disturbance.
Pezoporus wallicus wallicus	Eastern Ground Parrot	V		6 records within 10 km (NSW DCCEEW 2025a)	Found in relatively large numbers on the north coast (Broadwater, Bundjalung, Yuraygir and Limeburners Creek NPs) and in smaller numbers at Myall Lakes on the central coast. Large populations on the NSW south coast, particularly Barren Grounds NR, Budderoo NP, the Jervis Bay area and Nadgee NR. Occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover).	Low Few records in the locality. Grassland components of the proposal area may represent marginal foraging habitat for the species.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Ptilinopus magnificus	Wompoo Fruit-Dove	V		30 records within 10km (NSW DCCEEW 2025a)	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. Rare south of Coffs Harbour, it used to occur in the Illawarra, though there are no recent records. Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests. Feeds on a diverse range of tree and vine fruits and is locally nomadic - following ripening fruit.	Moderate Moderate number of records in the locality. PCT 3161 is representative of suitable habitat for the species however ongoing disturbance and proximity to two highways renders it less suitable.
Ptilinopus regina	Rose-crowned Fruit-Dove	V		3 records within 10km (NSW DCCEEW 2025a)	Occurs from Newcastle north to Cape York, with vagrants occasionally as far south as Victoria. Occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. Thought to be locally nomadic in response to fruit availability.	Moderate Dew records in the locality. PCT 3161 is representative of suitable habitat for the species however ongoing disturbance and proximity to two highways renders it less suitable.
Pyrrholaemus sagittatus	Speckled Warbler	V		1 record within 10km, last recorded 2010 (NSW DCCEEW 2025a)	Patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. Most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. Lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	Low Single record in the in the locality. PCT 3161 is representative of marginal habitat for the species which prefers open forest.
Rostratula australis	Australian Painted Snipe	E	E	Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River, the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Forages nocturnally on mudflats and in shallow water.	Low No records of the species in the locality. Species have been recorded foraging in dams in paddocks. The dam and grassland in the proposal area represent marginal foraging habitat for the species.
Stagonopleura guttata	Diamond Firetail	V	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. Scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland, and in secondary grassland derived from other communities, and often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland.	Low No records in the locality. Preferred vegetation types absent from proposal area however forested areas are representative of marginal foraging habitat for the species.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Stictonetta naevosa	Freckled Duck	V		14 records within 10km (NSW DCCEEW 2025a)	Found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. Breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and Lachlan Rivers, and other rivers within the Riverina. Forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. May also occur as far as coastal NSW and Victoria during such times. Prefers permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds.	Moderate. Species known to occur in the locality. Aquatic areas are representative of marginal habitat for the species, which prefers a high abundance of emergent vegetation.
Turnix maculosus	Red-backed Button-quail	V		1 record within 10 km (NSW DCCEEW 2025a)	Recorded only infrequently in NSW, with most records from the North Coast Bioregion. Historical records south as far as Sydney and three outlying records from western NSW. The population around Sydney was last recorded in 1912. Said to occur in grasslands, heath and crops in NSW and to prefer sites close to water, especially when breeding. Associated with the following grasses (in various vegetation formations): speargrass *Heteropogon*, Blady Grass *Imperata cylindrica*, *Triodia,* Sorghum, and Buffel Grass *Cenchrus ciliaris*.	Low Single record in the locality. Proposal area contains associated species *Imperata cylindrica* and some suitable grassland habitat. Forest and grassland habitat is degraded and less suitable for the species.
Tyto longimembris	Eastern Grass Owl	V		36 records within 10 km (NSW DCCEEW 2025a)	More likely to be resident in the north-east of NSW. Numbers can fluctuate greatly, increasing especially during rodent plagues. Found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. Always breeds on the ground. Nests are found in trodden grass, and often accessed by tunnels through vegetation.	Moderate High number of records in the locality. Proposal area is representative of suitable foraging and breeding habitat for the species, however surrounding infrastructure and land-use reduce overall suitability.
Tyto novaehollandiae	Masked Owl	V		8 records within 10 km (NSW DCCEEW 2025a)	Often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Low Species recorded in the locality. Proposal area contains suitable foraging habitat, however associated hollow tree roosting/breeding habitat was not recorded within the proposal area.
Mammals						
Chalinolobus dwyeri	Large-eared Pied Bat	V	E	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Found mainly in areas with extensive cliffs and caves, from Rockhampton to Bungonia in the NSW Southern Highlands. Generally rare with a very patchy distribution in NSW and scattered records from the New England Tablelands and North West Slopes. Roosts in caves, crevices in cliffs, old mines, frequenting low to mid-elevation dry open forest and woodland close to these features.	Low No records in the locality. Wooded components of the proposal area are degraded and subject to ongoing disturbance but may represent marginal foraging habitat for the species. Suitable rocky habitat absent for the proposal area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Cercartetus nanus	Eastern Pygmy-possum	V		3 records within 10km (NSW DCCEEW 2025a)	Distribution extents from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes in NSW. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes and is an important pollinator of heathland plants such as banksias.	Low Few records in the locality. PCT 3161 is representative of marginal habitat for the species, due to reduced habitat connectivity and disturbance associated with the Pacific and Oxley Highways.
Chalinolobus nigrogriseus	Hoary Wattled Bat	V		3 records within 10 km (NSW DCCEEW 2025a)	Species distribution extends from Port Macquarie to the Queensland border, recorded as far west as Armidale and Ashford. Occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. The species roosts in hollows and rock crevices.	Low Few records in the locality. Proposal area may offer marginal foraging habitat for the species.
Dasyurus maculatus	Spotted-tailed Quoll	V	E	18 records within 10 km (NSW DCCEEW 2025a). Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Found in eastern NSW, the species has been recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Uses hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites. Females occupy home ranges of 200-500 ha, while males occupy very large home ranges from 500 to over 4000 ha. Known to traverse their home ranges along densely vegetated creek lines.	Low Proposal area contains some marginal foraging habitat for the species, however proposal area does not contain suitable breeding or roosting habitat in the form of caves or hollows. Proposal area is also heavily disturbed, and has reduced connectively to larger patches of vegetation in the locality.
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V		11 records within 10 km (NSW DCCEEW 2025a)	Found on the south-east coast and ranges of Australia, from southern Queensland to Victoria. Prefers moist habitats, with trees taller than 20 m. Generally, roosts in eucalypt hollows but also found under loose bark on trees or in buildings.	Moderate Species known to occur in the locality. Proposal area contains some suitable, albeit degraded, wet eucalypt habitat, that may offer roosting habitat.
Notamacropus parma	Parma Wallaby	V	V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Range confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Prefers moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	Low No records in the locality. Proposal area lacks connectivity with larger patches of native forest in the locality. Notwithstanding, the proposal area contains moist eucalypt forests with dense understory habitat for this species.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V		27 records within 10 km (NSW DCCEEW 2025a)	Found along the east coast from south Queensland to southern NSW. Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roosts mainly in tree hollows but will also roost under bark or in man-made structures.	Moderate Recorded in the locality. Proposal area contains associated forest habitat for this species, albeit degraded by surrounding development. Proposal area may also offer some roosting habitat under bark of trees and in the identified culvert.
Miniopterus australis	Little Bent-winged Bat	V		87 records within 10 km (NSW DCCEEW 2025a)	Occurs along the east coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Prefers moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Roosts in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day. Forages for small insects beneath the canopy of densely vegetated habitats.	Moderate Large number of records in the locality. Proposal area contains associated wet eucalypt forest, however overall suitability for foraging is reduced by surrounding disturbance and reduced vegetation condition. No hollow-bearing trees, caves etc were identified in the proposal area however a drainage culvert may offer some roosting habitat.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V		57 records within 10 km (NSW DCCEEW 2025a)	Occurs along the east and north-west coasts of Australia. Uses caves as the primary roosting habitat, but also uses derelict mines, storm-water tunnels, buildings and other man-made structures. Hunts in forested areas, catching moths and other flying insects above the treetops.	Moderate Large number of records in the locality. Proposal area contains associated wet eucalypt forest, however overall suitability for foraging is reduced by surrounding disturbance and reduced vegetation condition. No hollow-bearing trees, caves etc were identified in the proposal area however a drainage culvert may offer some roosting habitat.
Myotis macropus	Southern Myotis	V		26 records within 10 km (NSW DCCEEW 2025a)	Mainly coastal but may occur inland along large river systems. Usually associated with permanent waterways at low elevations in flat/undulating country, usually in vegetated areas. Forages over streams and watercourses feeding on fish and insects from the water surface. Roosts in a variety of habitats including caves, mine shafts, hollow-bearing trees, stormwater channels, buildings, under bridges and in dense foliage, typically in close proximity to water.	Moderate Species recorded in the locality. Associated habitat in the form of dense vegetation and a drainage culvert is present in the proposal area. Species may aerially forage over the farm dams within the proposal area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Petauroides volans	Southern Greater Glider	E	E	3 records within 10 km (NSW DCCEEW 2025a). Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria. Feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. Shelter during the day in tree hollows and will use up to 18 hollows in their home range. Occupy a relatively small home range with an average size of 1 to 3 ha.	Low Low number of records in the locality. Species may use the proposal area for foraging; however, proposal area lacks suitable breeding/residence habitat in the form of hollows. Additionally, the overall connectivity of remnant forest patches within the proposal area to larger contiguous patches in the locality is limited.
Petaurus australis	Yellow-bellied Glider	V	V	15 records within 10 km (NSW DCCEEW 2025a). (Commonwealth DCCEEW 2025a)	Found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occurs in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south.	Low Species recorded in the locality. Species may use the proposal area for foraging; however, proposal area lacks suitable breeding/residence habitat in the form of hollows. Additionally, the overall connectivity of remnant forest patches within the proposal area to larger contiguous patches in the locality is limited.
Petaurus norfolcensis	Squirrel Glider	V		32 records within 10 km (NSW DCCEEW 2025a)	Widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites.	Low Species recorded in the locality. The species may use the proposal area for foraging; however, proposal area lacks suitable breeding/residence habitat in the form of hollows. Additionally, the overall connectivity of remnant forest patches within the proposal area to larger contiguous patches in the locality is limited.
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. It typically shelters or basks during the day in rock crevices, caves and overhangs and are most active at night when foraging. Browse on vegetation in and adjacent to rocky areas.	Low No records in the locality. No suitable rocky outcrop habitat for this species occurs within the proposal area, however forested communities within the footprint are represent suitable foraging habitat for the species. Species access to the study area is limited by reduced existing infrastructure in the locality.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Phascogale tapoatafa	Brush-tailed Phascogale	V		1 record within 10km, last recorded 2006 (NSW DCCEEW 2025a)	Mainly found east of the Great Dividing Range in NSW, with occasional records west of the divide. Prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Forages preferentially in rough barked trees of 25 cm DBH or greater.	Low Single record in the locality. Wet-sclerophyll vegetation representative of PCT 3161 in the proposal area is representative of marginal habitat for the species. Species prefers dry-sclerophyll vegetation
Phascolarctos cinereus	Koala	E	E	10039 records within 10 km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests of NSW, with some smaller populations on the plains west of the Great Dividing Range. Inhabits eucalypt woodlands and forests, and feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species but will select preferred browse species in any one area.	High Very large number of records in the locality. Forested communities in the proposal area contain suitable habitat including primary food trees for the region; Tallowwood (*Eucalyptus microcorys*) and Flooded Gum (*Eucalyptus grandis*). Forested habitat on site, whilst suitable, has been degraded and fragmented through on-going disturbance. Accessibility of the proposal area may be reduced due to existing infrastructure.
Phoniscus papuensis	Golden-tipped Bat	V		1 record within 10km, last recorded 2006 (NSW DCCEEW 2025a)	Distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Roosts mainly in rainforest gullies on small first- and second-order streams in usually abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests modified with an access hole on the underside. Bats may also roost under thick moss on tree trunks, in tree hollows, dense foliage and epiphytes.	Low Single record in the locality. Wet-sclerophyll vegetation representative of PCT 3161 in the proposal area is representative of marginal foraging habitat due to on-going disturbance associated with adjacent infrastructure.
Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)	V	V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grasstrees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	Low No records in the locality. Native vegetation in the proposal area retains little connectivity with larger patches of forested vegetation in the locality, potentially limiting movement of this species. Some associated wet sclerophyll habitat with a relatively dense understorey occurs on proposal area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Pseudomys gracilicaudatus	Eastern Chestnut Mouse	V		8 records within 10 km (NSW DCCEEW 2025a)	Mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. Isolated records in the Jervis Bay area. Found in heathland in low numbers and most common in dense, wet heath and swamps. Optimal habitat appears to be in vigorously regenerating heathland burnt from 18 months to four years previously.	Moderate Species recorded in the locality. The proposal area contains wet sclerophyll forest that may offer suitable habitat for the species however it is disjunct from larger patches in the locality and is degraded from ongoing disturbance. As such, forested areas of the study are likely to represent marginal habitat for the species.
Pseudomys novaehollandiae	New Holland Mouse		V	Species or species habitat may occur within area (Commonwealth DCCEEW 2025a)	Largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes. Known from Royal National Park (NP), the Kangaroo Valley, Kuringai Chase NP, and Port Stephens to Evans Head near the Queensland border. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. Soil type may be an important indicator of suitability of habitat, with deeper top soils and softer substrates being preferred for digging burrows.	Low No records in the locality. Proposal area contains wet sclerophyll forest that may offer suitable habitat for the species. Despite this, the proposal area has reduced connectivity to larger patches of native forest in the locality due to surrounding infrastructure. This may prevent the species from accessing the study area.
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	333 records within 10 km (NSW DCCEEW 2025a), Roosting known to occur within locality (Commonwealth DCCEEW 2025a).	Generally found within 200 km of the eastern coast of Australia, from Rockhampton to Adelaide. May be found in unusual locations in times of natural resource shortage. Occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Moderate High number of records in the locality. Species may forage in wooded areas of the proposal area however no breeding camps were observed.
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V		7 records within 10 km (NSW DCCEEW 2025a)	Wide-ranging species found across northern and eastern Australia. Rare visitor of south-western NSW in late summer and autumn. Scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. It forages in most habitats across its very wide range, with and without trees.	Moderate Low number of records in the locality. Species is highly adaptive and could utilise a range of habitats inclusive of the drainage culvert within the proposal area. Forested areas are representative of suitable foraging habitat, although at a reduced capacity due to surrounding infrastructure and edge effects.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Scoteanax rueppellii	Greater Broad-nosed Bat	V		16 records within 10 km (NSW DCCEEW 2025a)	Found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. Extends to the coast over much of its range. Widespread on the New England Tablelands in NSW, however, does not occur at altitudes above 500 m. Found in a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, most commonly found in tall wet forest. Usually roosts in tree hollows but also found in buildings.	Moderate Recorded in the locality. Proposal area is representative of suitable foraging habitat for the species. Roosting and breeding habitat is absent.
Syconycteris australis	Common Blossom-bat	V		1 record within 10km (NSW DCCEEW 2025a)	Found in coastal areas of eastern Australia from Hawks Nest in NSW to Cape York peninsula in Queensland. In areas, the distribution extends inland to coastal foothills. Often roosts in littoral rainforest and feed on nectar and pollen from flowers in adjacent heathland and paperbark swamps. Also recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests. Generally roost individually in dense foliage and vine thickets of the sub-canopy, staying in the same general area for a season.	Low Single record in the locality. Wet-sclerophyll vegetation representative of PCT 3161 in the proposal area is representative of marginal foraging habitat for the species which has a preference for heathland and paperbark swamps.
Vespadelus troughtoni	Eastern Cave Bat	V		12 records within 10 km (NSW DCCEEW 2025a)	Found on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. Cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; recorded roosting in disused mine workings. Occasionally found along cliff-lines in wet eucalypt forest and rainforest. Forage over a small area but are capable of flying 500 m over clear paddocks.	Moderate Recorded in the locality. Proposal area is representative of marginal foraging habitat for the species. Roosting and breeding habitat is absent.
Amphibians						
Crinia tinnula	Wallum Froglet	V		58 records within 10 km (NSW DCCEEW 2025a)	Found along the coastal margin from Litabella National Park in south-east QLD to Kurnell in Sydney. Found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. Typically occur in sedgelands and wet heathlands. Also found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests. Breeds in swamps with permanent water as well as shallow ephemeral pools and drainage ditches. Breeding is thought to peak in the colder months.	Low High number of records in the locality. Both farm dams are representative of suitable habitat, however targeted surveys did not detect the species (Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche)). They are isolated from areas of larger wetland habitat in the locality and are not surrounded by eucalypt forest following historical vegetation clearing.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Litoria aurea	Green and Golden Bell Frog	E	V	17 records within 10 km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. Large populations are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast. Only one known population on the NSW Southern Tablelands. Inhabits marshes, dam and stream-sides, particularly those containing bullrushes (*Typha* spp.) or spikerushes (*Eleocharis* spp.). Optimal habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (*Gambusia holbrooki*), have a grassy area nearby and diurnal sheltering study areas available. Also recorded in highly disturbed areas.	Low Recorded in the locality. Despite this, farm dams in the study area are representative of suitable habitat containing emergent vegetation. Overall suitability of this habitat for the species is reduced due to ongoing disturbance and isolation from areas of larger habitat in the locality. Species not detected during targeted surveys (Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche)).
Litoria brevipalmata	Green-thighed Frog	V		3 records within 10 km (NSW DCCEEW 2025a)	Isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland. Occurs in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. Prefers wetter forests in the south of its range but extends into drier forests in northern NSW.	High Few records in the locality. Farm dams represent suitable habitat. Overall suitability of this habitat for the species is reduced due to ongoing disturbance and isolation from areas of larger habitat in the locality. Targeted surveys were not able to be completed for this species due to insufficient rainfall, as required by the survey guidelines (DPIE 2020b; Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche)).
Mixophyes balbus	Stuttering Frog, Southern Barred Frog (in Victoria)	E	V	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	Occurs along the east coast of Australia from southern Queensland to north-eastern Victoria. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Most recent records are from the north of its range, with few records south of Sydney. The Stuttering Frog is an obligate stream breeder. Eggs are deposited in very shallow, slow-flowing riffle sections of the main channel of streams. Tadpoles forage amongst stones and leaf litter in riffle and pool sections of the stream channel and may take up to 12 months for to reach metamorphosis.	Low No records in the locality. Species is an obligate stream breeder; No streams occur within the proposal area, however three ephemeral streams occur in the broader study area. All have been subject to a high level of disturbance and are considered unlikely to represent habitat for this species.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Mixophyes iteratus	Giant Barred Frog, Southern Barred Frog	V	V	2 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Stronghold in northern NSW, particularly the Coffs Harbour-Dorrigo area. Typically found along freshwater streams with permanent or semi-permanent water, generally at lower elevation. Favours moist riparian habitats such as rainforest or wet sclerophyll forest for the deep leaf litter which provides shelter and foraging. Sometimes occur in other riparian habitats with drier forest or degraded riparian remnants, and occasionally around dam.	Low Few records in the locality. No streams occur within the proposal area, however several ephemeral streams occur in or in the vicinity of the broader study area. All have been subject to a high level of disturbance and are ephemeral. As such they are considered marginal habitat for this species.
Reptiles						
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V	V	Species or species habitat may occur within area (NSW DCCEEW 2025a)	Occurs on the coast and ranges from the Macleay valley in NSW to south-eastern Queensland. Very uncommon south of Grafton. Inhabits rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. Lives in loose soil, leaf litter and rotting logs, and feeds on earthworms and beetle grubs. Recorded in garden beds and urban yards under leaf litter on alluvial soils.	Low No records in the locality. Proposal area contains suitable wet eucalypt habitat associated with this species, however, falls south of Grafton where the species is very uncommon.
Invertebrates						
Argynnis hyperbius inconstans	Australian Fritillary		CE	Species or species habitat likely to occur within area (Commonwealth DCCEEW 2025a)	The Australian fritillary has been recorded in scattered locations across south-eastern Queensland and north-eastern New South Wales. The subspecies appears to have had a core distribution between Gympie in Queensland and Port Macquarie in NSW, although there are historical records which extend beyond this range. The Australian fritillary is restricted to areas where its larval food plant, *Viola betonicifolia* (the arrowhead violet), occurs (NSW Scientific Committee 2002). The arrowhead violet is widespread throughout Queensland and NSW, at both high and low altitudes. However, the Australian fritillary appears to only occupy lower altitude sites (<600m), and in these lower altitude regions there has been significant clearing for urban expansion.	Nil No records of the species in the locality. Larval host plant, *Viola betonicifolia* was not recorded within the proposal area.
Petalura gigantea	Giant Dragonfly	E		3 records within 10km (NSW DCCEEW 2025a)	Found along the east coast of NSW from the Victorian border to northern NSW, not found west of the Great Dividing Range. Known occurrences in the Blue Mountains and Southern Highlands, in the Clarence River catchment, and on a few coastal swamps from north of Coffs Harbour to Nadgee in the south. Lives in permanent swamps and bogs with some free water and open vegetation. Adults emerge from late October and are short-lived, surviving for one summer after emergence. Adults spend most of their time settled on low vegetation on or adjacent to swamps.	Low Few records in the locality. Species has a preference for permanent swamps, which are absent in the study area. Ephemeral aquatic systems in the proposal area are representative of marginal foraging habitat.
Migratory species						

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Apus pacificus	Fork-tailed Swift		C,J,K	32 records within 10km (NSW DCCEEW 2025a)	Almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher. Many records occur east of the Great Divide, however, a few populations have been found west of the Great Divide. Mostly occur over inland plains but sometimes above foothills or in coastal areas. Mostly found over dry or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh. Also found at treeless grassland and sandplains covered with spinifex, open farmland and inland and coastal sand-dunes. Sometimes occur above rainforests, wet sclerophyll forest or open forest or plantations of pines. Also found over settled areas, including towns, urban areas and cities.	Low High number of records in the locality. Highly mobile species that utilises a range of habitat types. Proposal area may represent marginal foraging habitat the species.
Actitis hypoleucos	Common Sandpiper		C,J,K	3 records within 10km (NSW DCCEEW 2025a)	Found in Australia during non-breeding season, on all coastlines and in inland areas, but is concentrated in the north and west with important areas in WA, the NT and QLD. Utilises a wide range of coastal and inland wetlands with varying salinity levels.	Low. Few records in the locality. Species has a preference for wetland habitat. Waterbodies and drainage swale in the proposal area are representative of marginal foraging habitat.
Calidris acuminata	Sharp-tailed Sandpiper		C, J, K	29 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Most of the population migrates to Australia during non-breeding season, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	Moderate Species previously recorded in the locality. Farm dams and the associated swale may offer marginal habitat to the species.
Calidris canutus	Red Knot		E, C, J, K	18 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Breeds in northern hemisphere. Occurs in coastal areas around Australia, with important sites in VIC, SA, WA, NT and Qld. Mainly inhabits intertidal mudflats, sandflats and sandy beaches. Occasionally seen in terrestrial saline wetlands but rarely in freshwater wetlands. Forage in soft substrates in intertidal areas.	Nil Species previously recorded in the locality. Suitable habitat in the form of mudflats and saline wetlands absent from the proposal area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Calidris ferruginea	Curlew Sandpiper	E	CE, C, J, K	21 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Distributed around most of the Australian coastline. Occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. Migrates to Australia for the non-breeding period, arriving between August and November, and departing between March and mid-April. Generally occupies littoral and estuarine habitats, and is mainly found in intertidal mudflats of sheltered coasts in NSW. Also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	Nil Species previously recorded in the locality. Suitable habitat in the form of mudflats or coastal wetlands absent from the proposal area.
Calidris tenuirostris	Great Knot	V	V,C,J,K	6 records within 10km (NSW DCCEEW 2025a)	Recorded at scattered sites along the coast down to about Narooma in NSW. Also been observed inland at Tullakool, Armidale, Gilgandra and Griffith. Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons and often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms.	Nil Species previously recorded in the locality. Suitable habitat in the form of mudflats and coastal wetlands absent from the proposal.
Charadrius leschenaultii	Greater Sand Plover	V	V, C, J, K	1 record within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Breeds in central Asia from Armenia to Mongolia, moving further south for winter. In Australia the species is commonly recorded in parties of 10-20 on the west coast, with the far northwest being the stronghold of the population. The species is apparently rare on the east coast, usually found singly. In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. The species is almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	Nil Single record in the locality. Suitable habitat in the form of mudflats and coastal wetlands absent from the proposal area.
Charadrius mongolus	Lesser Sand Plover	V	E, C, J, K	4 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Breeds in central and north eastern Asia, migrating further south for winter. Found around the entire coast of Australia but is most common in the Gulf of Carpentaria, and along the east coast of Queensland and northern NSW. Rarely recorded south of the Shoalhaven estuary, with only a few inland records. Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms.	Nil Species previously recorded in the locality. Suitable habitat in the form of mudflats and coastal wetlands absent from the proposal.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Hirundapus caudacutus	White-throated Needletail	V	V,C,J,K	189 records within 10 km (NSW DCCEEW 2025a), Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Migrates to eastern Australia from October to April. Almost exclusively aerial and most often seen before storms, low pressure troughs and approaching cold fronts and occasionally bushfire. Occurs over most types of habitat, but mostly recorded above wooded areas, including open forest and rainforest. May also fly between trees or in clearings, below the canopy. Recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows.	Moderate High number of records in the locality. Proposal area may represent marginal aerial foraging habitat. Although uncommon, the species could utilise wooded areas of the proposal area as roosting habitat.
Gallinago hardwickii	Latham's Snipe	V	V, J, K	Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Non-breeding migrant to the south east of Australia. Breeds in Japan and on the east Asian mainland. Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. Found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. Also uses crops and pasture.	Low No records of this species occur in the locality. Suitable habitat is limited to farm dams and pasture. Both may represent marginal foraging habitat for the species.
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit		E	94 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (DCCEW 2024a)	Recorded in the coastal areas of all Australian states. Widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria. Regular migrant to Christmas Island, Norfolk Island, Lord Howe Island. During the non-breeding period, distribution is predominately New Zealand, northern and eastern Australia. Mainly occur along the north and east coasts.	Low High number of records in the locality. Proposal area may represent marginal aerial foraging habitat.
Limosa limosa	Black-tailed Godwit	V	E,C,J,K	1 record within 10km (NSW DCCEEW 2025a)	Most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland in NSW. May occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. Also recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	Nil Single record in the locality. Suitable habitat absent in the study area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	E	CE, C, J, K	96 records within 10km (NSW DCCEEW 2025a). Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. Generally occupies coastal lakes, inlets, bays and estuarine habitats, and is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts in NSW. Rarely seen inland.	Nil Despite high number of records in the locality, suitable saline habitat is absent in the development footprint.
Pluvialis fulva	Pacific Golden Plover		C,J,K	28 records within 10km (NSW DCCEEW 2025a)	Breeds on the Arctic tundra in western Alaska. It winters in South America and islands of the Pacific Ocean to India, Indonesia and Australia. Widespread along the coastline in Australia. Found on muddy, rocky and sandy wetlands, shores, paddocks, saltmarsh, coastal golf courses, estuaries and lagoons.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.
Pluvialis squatarola	Grey Plover		V	16 records within 10km (NSW DCCEEW 2025a), Roosting known to occur within area (DCCEW 2024a)	Breeds around the Arctic regions and migrates to the southern hemisphere, being a regular summer migrant to Australia, mostly to the west and south coasts. Almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.
Stercorarius pomarinus	Pomarine Jaeger		C,J,K	2 records within 10km (NSW DCCEEW 2025a)	Breeds on Arctic tundra, spends the rest of the year at sea. The species feeds on fish, carrion, scraps, smaller birds up to the size of common gull and rodents, especially lemmings.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.
Sternula albifrons	Little Tern	E	C,J,K	41 records within 10km (NSW DCCEEW 2025a)	Migrates to NSW from September to November, occurring mainly north of Sydney. Breeds in spring and summer along the entire east coast from Tasmania to northern Queensland, and is seen until May, with only occasional birds seen in winter months. Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers. Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.
Tringa brevipes	Grey-tailed Tattler		C,J,K	10 records within 10km (NSW DCCEEW 2025a)	In NSW occurs along the coast from the Queensland border south to Tilba Lake, and has been recorded as far south as Gippsland. Recorded more frequently north of Sydney. Found on sheltered coasts with reefs and rock platforms or with intertidal mudflats. Inland records are rare. Forages in shallow water in intertidal areas. Usually roosts in the branches of mangroves or rocks which may be partly submerged. Also rarely recorded in dense shrubs, on driftwood or sand dunes.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.

Scientific name	Common name	NSW status	Comm status	Source	Habitat association	Likelihood of occurrence in proposal area
Tringa stagnatilis	Marsh Sandpiper		C,J,K	2 records within 10km (NSW DCCEEW 2025a)	Found on coastal and inland wetlands throughout Australia. Recorded in all regions of NSW but especially the central and south coasts and (inland) on the western slopes of Great Divide and western plains. The Hunter River Estuary and the Macquarie Marshes are internationally important sites for this species. Lives in permanent or ephemeral wetlands of varying salinity, including swamps, lagoons, billabongs, saltpans, saltmarshes, estuaries, pools on inundated floodplains, and intertidal mudflats and also regularly at sewage farms and saltworks. Less often recorded at reservoirs, waterholes, soaks, bore-drain swamps and flooded inland lakes. It is a summer migrant to Australia, from about August to April.	Nil Species recorded in the locality, however suitable habitat is largely absent from the study area.
Tringa nebularia	Common Greenshank, Greenshank	E	E, C, J, K	Species or species habitat known to occur within area (Commonwealth DCCEEW 2025a)	Common throughout Australia in the summer and recorded in most coastal regions in NSW. Widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions. Found both on the coast and inland, in estuaries and mudflats, mangrove swamps and lagoons, and in billabongs, swamps, sewage farms and flooded crops.	Low No records in the locality. Farm dams within the proposal area represent marginal habitat for the species.
Xenus cinereus	Terek Sandpiper	V	V, C, J, K	Roosting known to occur within area (Commonwealth DCCEEW 2025a)	Found in two main sites, the Richmond River estuary and the Hunter River estuary. Recorded on coastal mudflats, lagoons, creeks and estuaries, and favours mudbanks and sandbanks located near mangroves, but may also be observed on rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	Nil Species is typically associated with littoral, intertidal and or estuarine habitat.

* Strictly marine or pelagic species have been omitted from this assessment due to a lack of suitable habitat.

Appendix C: Tests of Significance (BC Act)

Tests of Significance (BC Act)

Section 7.3 of the BC Act lists five factors that must be taken into account in the determination of the significance of potential impacts of an activity on 'threatened species, populations or ecological communities (or their habitats)' listed under the BC Act. The test of significance ('five-part test') is used to determine whether an activity is 'likely' to impose 'a significant effect' on threatened biota and thus whether a SIS or BDAR is required.

Tests of significance have been completed in accordance with the Threatened species assessment Test of Significance Guidelines to determine the significance of the potential impacts of the proposal on threatened flora, fauna and communities listed under the BC Act (DPIE 2018). The assessments of significance have been conducted for those threatened flora, fauna and communities that have been recorded or have a high likelihood of occurrence and could potentially be impacted by the proposal (based on results of the likelihood of occurrence assessment provided in Appendix B: Habitat suitability assessment. Where possible, threatened fauna have been grouped based on similar habitat requirements. The following threatened biota are included in these assessments:

- Koala (Phascolarctos cinereus)
- Green-thighed Frog (Litoria brevipalmata)
- Varied Sittella (Daphoenositta chrysoptera).

C-1 Koala (Phascolarctos cinereus)

Distribution

The Koala (*Phascolarctos cinereus*) occurs in a range of forest and woodland communities throughout NSW. The Koalas (combined populations of Qld, NSW and ACT) distribution has significantly decreased since the 2019-2020 bushfires, where approximately 3.5 million ha or 23% of Koala habitat was burnt (DAWE 2021). The study area occurs in the NSW North Coast Bioregion, 30% of which was burnt during the 2019-2020 bushfires.

578 records of the Koala occur in the locality which are part of a priority population identified in the Priority Populations for NSW Koala Strategy 2021-2026 (NSW DCCEEW, 2022; NSW DCCEEW 2025a). Priority populations identified under the Koala Strategy are being targeted by NSW DCCEEW for immediate investment and protection. Consequently, any proposal that impact these priority populations are of increased importance.

Habitat requirements

Habitat occupied by the Koala is associated with vegetation containing nutritionally desirous Myrtaceous species (i.e. preferred feed tree species) capable of maintaining a positive nitrogen balance of slightly above 1%. In this respect higher value foraging habitat is often associated with vegetation on fertile soils and reliable access to water resources for drought affected regions. Up to 120 feed tree species are known to provide suitable foliage for the Koala although regional, local and seasonal preferences are exhibited (TSSC 2022).

The size of an individual Koala's home range varies in accordance with the abundance of preferentially utilised food trees, and gender (i.e., males have larger home ranges than females). Koala home ranges across the species' distribution are highly variable, varying between 3 and 500 ha in Queensland and NSW (Wilmott 2020). Stable populations are characterised by a well-structured network of overlapping adult Koala home ranges. Landscapes exceeding 60-70% native vegetation cover also appear to be linked with population stability, with 150 ha being the minimum habitat patch area supporting non-declining populations (McAlpine *et al*. 2006).

Males and females disperse from natal home ranges. Dispersal generally occurs between June and December, with the dispersal of males commencing in July and August and that of females commencing between September and November. Dispersal is likely to be a social behaviour and mating systems of Koala populations providing mechanisms for young Koalas to disperse (Dique *et al*. 2003).

The Koala is identified as requiring urgent management intervention as a result of the 2019-2020 bushfires. The Koala has a poor ability to flee during fire events and has no shelter sites during wildfires. Long-term additional actions for this species include avoiding clearing of Koala habitat and careful management of unburnt areas (Legge *et al*. 2021).

Koalas carry a range of pathogens and parasites. In particular, infections by the bacterium *Chlamydia pecorum* that leads to chlamydial disease and the Koala retrovirus. Chlamydia causes conjunctivitis leading to blindness, urinary tract disorders, pneumonia and infertility in females. Given it commonly causes infertility, chlamydial disease is considered a major cause of decline in many Koala populations and is exacerbated by other factors including climate change (DAWE 2022a).

Habitat in the study area

Remnants of PCT 3161 within the proposal area are representative of transient foraging and movement habitat for the Koala. The largest remnant retains partial connectivity to other vegetation in the locality, although this connectivity has been reduced due to adjacent land clearing and degradation of the associated PCT. Despite this, it maintains linkage, albeit diminished, with extensive native forest to the north, west, and south of the study area.

The proposal would remove up to 2.73 ha of potential foraging and movement corridor habitat for the Koala as per the Thrumster Area 13 KPoM. Select areas of the northeast and east western portions of the study area fall under areas listed as Secondary Koala Habitat. Whilst the corridor to the northwest and southwest

corners of the proposal area are not listed under the KPoM surveys and desktop assessments have determined it is representative of suitable foraging habitat for the species.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction
The proposal will result in the removal of 2.73 ha of habitat for this species, comprising disturbed vegetation dominated by Flooded Gum (*Eucalyptus grandis*), with a lower abundance of Tallowwood (*Eucalyptus microcorys*). This habitat is located immediately adjacent to the Pacific Highway and Oxley Highway and occurs as several patches separated by the highways, on and off ramps and associated roundabout. As part of the highway upgrades over recent years, various mitigation measures including dedicated underpasses and fauna fencing have been installed to limit access to the highways by Koalas and to minimise mortality through vehicle strike. Koalas have been recorded using culverts on the Pacific Highway north of the Oxley Highway, and there were no Koala roadkill records during 2022-2023 Koala monitoring surveys for this section of the highway (Niche, 2023). Recent records of the species (within the last 20 years) occur within and surrounding the study area indicating that the proposal is likely to impact suitable habitat for the species. The study area is situated within a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. Larger intact remnants of vegetation, such as Cowarra State Forest and Lake Innes, are located within 3 km of the study area and serve as key habitat refuges in the locality. Given the presence of primary Koala food tree species and numerous records within both the study area and the broader locality, vegetation representative of PCT 3161 may function as a movement corridor for the species. This is particularly relevant to the largest remnant of PCT 3161 located to the south-west of the proposal area, which may facilitate connectivity between larger vegetation patches to the north and south of the study area. However, due to its limited extent and proximity to major infrastructure, this vegetation is unlikely to support a resident Koala population long term. As such, the proposal is likely to contribute to further habitat fragmentation within the locality, potentially reducing Koala movement between larger vegetation patches located to the north, south, and west of the study area. Nevertheless, this reduction is not expected to significantly impact the species' life cycle, as alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are likely to persist and continue to facilitate movement within the broader landscape. While these alternative routes may require Koalas to travel greater distances between habitat patches during the breeding season or when foraging, they are expected to maintain functional connectivity. Given the existing extent of habitat fragmentation and the continued presence of other vegetation corridors in the locality, the proposal is not considered likely to result in a significant impact to the lifecycle of the Koala such that it is put at further risk of extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
N/A
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
N/A
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
The proposal would result in the removal of approximately 2.73 hectares of Koala habitat containing two preferred feed tree species (PMHC 2008). Although this vegetation is unlikely to support a resident Koala population due to its narrow configuration and limited extent, it may function as transient or supplementary habitat for individuals moving between larger habitat patches within the locality.

(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
Koalas are known to utilise vegetated corridors for movement through the landscape (DAWE, 2022a). Loss and fragmentation of habitat is recognised as a significant factor in the decline of Koalas as it can result in decreased dispersal and recruits of populations (DAWE, 2022a). Reduced dispersal can also have genetic implications, increasing inbreeding and genetic bottlenecks, which ultimately reduces the resilience of a population to adapt to a changing environment (DAWE, 2022a). The proposal would result in the removal of up to 2.73 ha of habitat for the species in the form of PCT 3161. This represents a small portion of available habitat that persists in a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. As a result, many of the patches of native vegetation within the proposal area are isolated from larger patches of suitable vegetation in the locality. The largest patch to the south-west of the Oxley and Pacific Highways retains connectivity to larger patches of remnant forest in the locality, such as the Cowarra State Forest and as such, it may facilitate the movement of the Koala to larger patches of native forest in the locality. The proposal is likely to contribute to further habitat fragmentation within the locality, potentially reducing Koala movement between larger vegetation patches located to the north, south, and west of the study area. Nevertheless, this reduction is not expected to be significant as alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are likely to persist and continue to facilitate movement of sub-populations within the broader landscape. While these alternative routes may require Koalas to travel greater distances between habitat patches during the breeding season or when foraging, they are expected to maintain functional connectivity. Given the above, the proposed works are unlikely to result in further fragmentation of Koala habitat to a significant degree and are not expected to isolate any substantial patches of forest within the locality from other areas of suitable habitat.
(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
The far eastern extent of the study area falls within the Thrumster Area 13 Koala Plan of Management (KPoM), with select areas identified as Secondary Koala Habitat (PMHC, 2008). Furthermore, native forest within the proposal area may function as a movement corridor for Koalas, facilitating dispersal between larger remnant forest patches located to the north and south. Given the small size, and the disturbed nature of the site, it is unlikely that the habitat within the study area would support a thriving resident population. Koala movement in the area has already been substantially affected by the construction of the Pacific and Oxley Highways, which present significant barriers to dispersal. Nevertheless, the proposed removal of narrow forested bands (PCT 3161), particularly the largest patch, may contribute to cumulative habitat fragmentation, further restricting movement pathways for the species. While the proposal is expected to reduce overall habitat connectivity, it is unlikely to result in complete isolation of any sub-populations. Larger habitat patches are expected to remain connected via alternative corridors in the locality, such as Karikeree Creek to the southwest of the proposal area. Therefore, while areas of PCT 3161 within the proposal area are likely to be used by Koalas, they are unlikely to be of critical importance, given the availability of larger, less fragmented forest patches and viable movement corridors nearby.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)
The proposal does not occur within an area of outstanding biodiversity value. The proposal is not anticipated to impact, either directly or indirectly, on any areas of outstanding biodiversity value.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
The proposal would contribute to the following KTPs: a) Clearing of native vegetation. The proposal would remove 2.73 ha of native vegetation containing two preferred Koala feed tree species as well as act as a potential movement corridor between habitat for the species b) Infection of native plants by *Phytophthora cinnamomi*

The proposal will consider include environmental management measures, such as specific consideration of potential impacts on soil, water, native vegetation, weeds and pathogens to mitigate against these KTPs.
Conclusion
The proposal is unlikely to result in a significant impact to Koalas for the following reasons: 21.1 Impacts to suitable habitat are limited to 2.73 ha of moderate condition PCT 3161. 22.1 The habitat to be removed has been degraded from historical and on-going disturbance and subject to edge effects given its small size and narrow, linear configuration, and location adjacent to an existing highway. As such, it is unlikely to support a resident Koala population. 23.1 Although the largest patch of PCT 3161 in the proposal area may be used on a seasonal or transient basis as part of a movement corridor to more suitable, larger patches of habitat, the proposal is unlikely to result in the complete isolation of any large areas of contiguous forest in the locality, as alternative corridors will remain available. 24.1 Various mitigation measures including dedicated underpasses and fauna fencing have been previously installed to limit access to the highways by Koalas and to minimise mortality through vehicle strike have already been implemented from the previous upgrade, which have shown to significantly reduce the incidence of Koala vehicle strikes. 25.1 The proposal is unlikely to affect the lifecycle and long-term persistence of this species in the locality as habitat connectivity would be maintained in the wider area in the form of existing vegetated corridors and the dedicated fauna underpasses which will not be impacted by the proposal. Consequently, a species impact statement or further assessment according to the BC Act would not be required for this species.

C-2 Green-thighed Frog (Litoria brevipalmata)

Green-thighed Frogs occur in a range of habitats from rainforest and moist eucalypt forest to dry eucalypt forest and heath, typically in areas where surface water gathers after rain. It prefers wetter forests in the south of its range, but extends into drier forests in northern NSW and southern Queensland (DPIE 2021j).

This species may occur occasionally within the vegetated drainage swale within the study area. The habitat within the study area is marginal for this species due to the proximity to a highly trafficked road and lack of rainforest habitat. The species has been recorded in the drainage lines in Cowarra State Forest approximately 3.5 km to the southwest of the study area.

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction
Potential breeding and foraging habitat for the Green-thighed Frog is present within the proposal area. The species is known to utilise both exotic vegetation and moist native forests, into which individuals disperse after breeding in search of food and shelter (Lemckert and Slatyer 2002). Core habitat within the proposal area includes a drainage line at the base of a road embankment and a small ephemeral waterbody. The species has conservatively been assumed present within the proposal area despite a single record of this threatened species within 10 km of the study area as broadly suitable habitat is present within the proposal footprint. Additionally, targeted surveys were unable to be completed due to unsuitable conditions at the time of assessment. While some disturbance to aquatic and terrestrial habitats is expected, alternative habitat, including a second farm dam and broader areas of exotic vegetation, will be retained. Given the species' known capacity to move between habitat patches when required, it is likely that individuals would relocate to adjacent suitable habitat within the broader study area (Lemckert and Slatyer, 2002). Consequently, any impacts to the species' lifecycle, should it be present, are expected to be short-term. Potential long-term impacts, such as the introduction of Chytrid fungus, will be mitigated through the implementation of a Construction Environmental Management Plan (CEMP). As such, the proposal is considered unlikely to result in significant impacts to a local population of the Green-thighed Frog, should one be present within the study area.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
N/A
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
N/A
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
The proposal will impact up to 12.09 ha of broadly suitable foraging and/or breeding habitat for the Green-thighed Frog inclusive of a drainage line, farm dam, native vegetation (PCT 3161) and exotic grassland. Breeding habitat for the species is limited to 0.08 ha of aquatic habitat. with the remaining area representing suitable foraging habitat. Exotic grassland is within the proposal area (9.29 ha) is representative of marginal foraging habitat for the species. The habitat within the study area represents a small portion of the available habitat within the locality, which is subject to regular disturbance associated by surrounding infrastructure and land-use.
(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

The habitat surrounding the study area is already highly fragmented due to ongoing agricultural practices, recent residential development, and the presence of major roadways. Given this existing fragmentation, the proposal area is unlikely to function as an important dispersal or movement corridor for the species. Vegetation retained within the broader study area will continue to provide connectivity to other areas of potential habitat at a level consistent with current conditions. As such, the removal of vegetation within the study area is unlikely to result in further isolation or fragmentation of remnant habitat patches.
(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
Suitable habitat for the Green-thighed frog in the study area includes patches of PCT 3161, exotic grassland, two farm dams and a drainage line. Breeding habitat is limited to the farm dams and drainage line (0.08 ha). The habitat represents and small portion of the available more suitable habitat for the species within the locality in areas such as Lake Innes, Fernbank Creek and Cowarra State Forest. Given the extent of higher quality Koala habitat within the surrounding landscape, the proposed removal of up to 12.09 hectares of broadly suitable foraging and/or breeding habitat is unlikely to significantly affect the persistence of the species in the locality. This assessment considers that approximately 9.29 hectares of the area proposed for clearing comprises exotic grassland that provides only marginal foraging value for the species.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)
There are no areas of outstanding biodiversity value mapped within the study area. The proposal is unlikely to have an adverse effect on any areas of outstanding biodiversity value either directly or indirectly.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
The proposed action would contribute to the operation of one key threatening process as follows: Figure 1. Clearing of vegetation – the proposal would remove about 2.73 ha of native vegetation and vegetated aquatic systems (0.08 ha) that represents suitable foraging and/or breeding habitat Green-thighed Frog. As previously discussed, the vegetation to be removed represents a small proportion of suitable habitat within the locality. The proposal would therefore represent a minor increase in the operation of this key threatening process.
Conclusion
The proposal is unlikely to have a significant impact on threatened frogs; given that: Figure 2. Impacts to suitable breeding habitat will be limited to up to 0.08 ha within the proposal area/ This is representative of a small area of suitable habitat in the locality. Figure 3. The proposal will not isolate any areas of habitat for the species. Overall fragmentation is not expected to be significant given the existing level of fragmentation in the locality. Figure 4. There is only a single record a locality, suggesting the species is not common.

C-3 Varied Sittella (Daphoenositta chrysoptera)

- The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. It inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. This species feeds on arthropods gleaned from crevices in rough or decorticating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy (DPIE 2021).

a) In the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction
Potential impacts to the Varied Sittella within the proposal area may include the loss of nest trees, reduction in foraging habitat, and increased habitat fragmentation. Suitable habitat within the proposal area is limited to small patches of PCT 3161, which are unlikely to support a resident population but may serve as transient foraging or movement habitat. The proposal will involve the removal of trees, primarily juvenile and regrowth specimens (<20 cm DBH) that may provide limited foraging, or movement opportunities. Associated understory elements, such as grasses, leaf litter, saplings, and shrubs, may also be cleared, though this represents a minor proportion of available habitat within the locality. The vegetation to be removed consists largely of regrowth woodland along disturbed trail margins. Importantly, connectivity between remaining patches of PCT 3161 and adjoining forested habitats will be maintained. Given the species' high mobility, the minor increase in fragmentation is not expected to create a significant barrier to movement or foraging. While noise and vibration during construction may temporarily disturb individuals, such disturbance is expected to be minimal due to the existing high ambient noise levels from the adjacent highways. Individuals are likely to relocate to nearby suitable habitat during construction. Given the limited and likely transient nature of habitat within the proposal area and the availability of higher-quality habitat in the broader locality, the proposal is unlikely to significantly impact the lifecycle of the Varied Sittella or increase its risk of local extinction.
b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
N/A
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.
N/A
c) In relation to the habitat of a threatened species or ecological community: (i) The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
The proposal would remove 2.73 ha of potential Varied Sittella habitat, represented by moderate condition PCT 3161. This habitat is fragmented and occurs as several small patches adjacent to both existing highways. The species is not likely to rely on habitat resources contained within the study area due to their mobility, small area of habitat, and the availability of similar and higher quality habitat resources within the greater locality.
(ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
The proposal will result in the removal of forest vegetation that has been subject to ongoing disturbance from surrounding land use and infrastructure. The vegetation to be cleared consists of mature regrowth

following historical clearing and represents only a minor proportion of the available habitat within the locality. Given the Varied Sittella's high mobility and ability to access adjacent habitat, the limited fragmentation resulting from the proposal is unlikely to create barriers to movement or lead to habitat isolation. Larger, higher-quality patches of forested habitat remain intact within the broader locality.
(iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality
The habitat proposed for removal consists of small, edge-affected patches of vegetation located adjacent to the existing highway. While the Varied Sittella may utilise this habitat opportunistically for foraging or movement, it is unlikely to support permanent occupancy or breeding due to the high level of ongoing disturbance. Several larger, more contiguous areas of forest within the locality provide higher-quality habitat that is more likely to support the species' long-term requirements. As such, the habitat to be removed is considered to be of low importance to the long-term survival of the Varied Sittella in the locality.
d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)
The proposal is not anticipated to impact any area of outstanding biodiversity value.
e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
The proposal is consistent with two key threatening processes: Figure 5. Clearing of native vegetation The proposal has potential to introduce or exacerbate the following key threatening processes: Figure 6. Invasion of native plant communities by exotic perennial grasses Figure 7. Infection of native plants by *Phytophthora cinnamomi* As previously discussed, the vegetation to be removed represents a small proportion of suitable habitat within the locality. The proposal would therefore represent a minor increase in the operation of this key threatening process.
Conclusion
The proposal is unlikely to have a significant impact on the Varied Sittella based on: Figure 8. The habitat to be removed comprises small patches of edge-affected vegetation located adjacent to the existing highway Figure 9. Habitats of equal or greater quality will remain within the locality Figure 10. Populations, if present, are likely part of a larger metapopulation likely to occur within larger remnants in the locality Figure 11. The proposal is unlikely to significantly increase habitat fragmentation in the locality.

Appendix D: Assessments of Significance (EPBC Act)

D-1 Koala (Phascolarctos cinereus)

	An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:	
a)	Lead to a long-term decrease in the size of a population	The proposal will result in the removal of 2.73 ha of habitat (PCT 3161) for this species, comprising disturbed vegetation dominated by Flooded Gum (*Eucalyptus grandis*), with a lower abundance of Tallowwood (*Eucalyptus microcorys*). This habitat is located immediately adjacent to the Pacific Highway and Oxley Highway and occurs as several patches separated by the highway, on and off ramps and an associated roundabout. Additionally, select patches of PCT 3161 are identified as Secondary Koala Habitat in the far eastern extent of the study area which falls within the Thrumster Area 13 Koala Plan of Management (PMHC 2008). Recent records of the species (within the last 20 years) occur within and surrounding the study area indicating that the proposal is likely to impact suitable habitat for the species. Given their small size, remnant patches of forest in the proposal area are not considered likely to support a resident population of the Koala, which requires larger contiguous patches for foraging and breeding (DAWE 2022b). Notwithstanding, native forest within the proposal area may function as a movement corridor for Koalas, facilitating dispersal between larger remnant forest patches located to the north and south of the study area. Although the proposal is likely to reduce overall habitat connectivity, it is unlikely to result in complete isolation of any sub-populations. Larger habitat patches will remain connected via alternative corridors in the locality, such as Karikeree Creek to the southwest of the proposal area. Given the above, the proposal is unlikely to result in a significant decrease in the size of the local population.
b)	Reduce the area of occupancy of the species	The proposal would result in the removal of approximately 2.73 hectares of Koala habitat containing two preferred feed tree species (PMHC 2008). Although this vegetation is unlikely to support a resident Koala population due to its narrow configuration and limited extent, it may function as transient or supplementary habitat for individuals moving between larger habitat patches within the locality. Given the small area of Koala habitat proposed for removal and that alternative corridors persist between large patches in the locality, the proposal is not anticipated to reduce the overall area of occupancy of the species.

c) Fragment an existing population into two or more populations	Koalas are known to utilise vegetated corridors for movement through the landscape. Loss and fragmentation of habitat is recognised as a significant factor in the decline of Koalas as it can result in decreased dispersal and recruiting of populations (DAWE 2022a). Reduced dispersal can also have genetic implications, increasing inbreeding and genetic bottlenecks, which ultimately reduces the resilience of a population to adapt to a changing environment (DAWE, 2022a). The proposal would result in the removal of up to 2.73 ha of habitat for the species represented by PCT 3161. The study area is situated within a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. As a result, some of the patches of native vegetation within the proposal area are isolated from larger patches of suitable vegetation in the locality. Despite this, the largest patch to the south-west of the Oxley and Pacific Highways retains connectivity to larger patches of remnant forest in the locality, such as the Cowarra State Forest, often through narrow bands of riparian vegetation. This vegetation may facilitate the movement of the Koala to larger patches of native forest in the locality. The proposal is likely to contribute to further habitat fragmentation within the locality, potentially reducing Koala movement between larger vegetation patches located to the north, south, and west of the study area. Nevertheless, this reduction is not expected to be significant as alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are likely to persist and continue to facilitate movement of sub-populations within the broader landscape. While these alternative routes may require Koalas to travel greater distances between habitat patches during the breeding season or when foraging, they are expected to maintain functional connectivity.
d) Adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the Koala is defined as habitat that provides sufficient resources and connectivity to support a functional biological population, including gene flow between habitat patches (DCCEEW 2022). The proposal will result in the removal of approximately 2.73 ha of habitat containing Koala food tree species, located within an area that supports a known Koala population and has multiple recent records (NSW DCCEEW 2025a). However, the vegetation proposed for clearing is highly fragmented and affected by edge effects, and constrained by the adjacent Pacific and Oxley Highways. The patches are generally narrow, small, and in some cases isolated, making them unlikely to support resident Koalas. The largest patch of PCT 3161, within the proposal area, may function as a movement corridor between more extensive forested habitats and therefore qualifies as critical habitat for the species. Nevertheless, the overall impact of its loss is not expected to be significant. Alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are expected to remain intact and continue to facilitate Koala movement across the broader landscape. Although these alternative pathways may require Koalas to travel longer distances for foraging or during the breeding season, they are likely to maintain functional landscape connectivity. As such, the proposal will impact habitat that meets the definition of habitat critical to the survival of the species, however this impact is unlikely to prevent Koalas from moving between the large remnant patches in the locality.

e) Disrupt the breeding cycle of a population	As previously outlined, the proposal will result in the removal of 2.73 ha of habitat for this species, comprising disturbed vegetation dominated by Flooded Gum. with a lower abundance of Tallowwood, both of which are regarded as key feed trees for the species in the North Coast region (PMHC 2008). This habitat is located immediately adjacent to the Pacific Highway and Oxley Highway and occurs as several patches separated by the highways, on and off ramps and associated roundabout. Recent records of the species (within the last 20 years) occur within and surrounding the study area indicating that the proposal is likely to impact suitable habitat for the species. The study area is situated within a fragmented landscape characterised by agricultural land, major road infrastructure, and adjacent residential and commercial development. Larger intact remnants of vegetation, such as Cowarra State Forest and Lake Innes, are located within 3 km of the study area and serve as key habitat refuges in the locality. Given the presence of primary Koala food tree species and numerous records within both the study area and the broader locality, vegetation representative of PCT 3161 may function as a movement corridor for the species. This is particularly applicable to the largest remnant of PCT 3161 located to the south-west of the proposal area, which may facilitate connectivity between larger vegetation patches to the north and south of the study area. However, due to its limited extent and proximity to major infrastructure, this vegetation is unlikely to support resident Koala populations over long term periods. As such, the proposal is likely to contribute to further habitat fragmentation within the locality, potentially reducing Koala movement between larger vegetation patches located to the north, south, and west of the study area. Nevertheless, this reduction is not expected to significantly impact the species' life cycle, as alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are likely to persist and continue to facilitate movement within the broader landscape. While these alternative routes may require Koalas to travel greater distances between habitat patches during the breeding season or when foraging, they are expected to maintain functional connectivity. Given that the patches of PCT 3161 are unlikely to represent breeding habitat for the Koala, and considering the existing level of habitat fragmentation and the continued availability of alternative vegetation corridors in the locality, the proposal is not considered likely to significantly impact the species' lifecycle or place the local population at further risk of extinction.
f) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal would result in the removal of approximately 2.73 hectares of Koala habitat containing two preferred feed tree species (PMHC 2008). Although this vegetation is unlikely to support a resident Koala population due to its narrow configuration and limited extent, it may function as transient or supplementary habitat for individuals moving between larger habitat patches within the locality. Other vegetation corridors, such as that on Karikeree Creek are likely to continue to provide individuals of the species access to alternative vegetation and therefore alternative foraging and breeding habitat. As such, the removal of PCT 3161 is unlikely to further exacerbate the decline of this species in the locality due to habitat loss.

g) result in invasive species That are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Vegetated areas within the study area have been subject to extensive historical disturbance from land management practices, vegetation clearing, and the construction of the Oxley and Pacific Highways. As a result, there is a high abundance of weed species, including the Priority Weed, *Lantana camara*. Construction activities associated with the proposal have the potential to facilitate the spread of weed propagules into adjacent retained vegetation, which could, over time, degrade Koala habitat quality. However, this risk will be effectively managed through the implementation of a CEMP, and is therefore not considered likely to pose a significant threat to the species. The proposal is also not anticipated to increase predation risk for the Koala, as the species will be excluded from the active construction area through appropriate management measures.
h) Introduce disease that may cause the species to decline	Koalas are susceptible to Chlamydia disease, a long-standing condition within Koala populations. However, its impacts have been exacerbated in recent years by increased deforestation, urbanisation, and the effects of the 2019-2020 bushfires, particularly in the Port Macquarie region (Koala Conservation Australia n.d.). The proposal is considered unlikely to contribute to the spread or severity of Chlamydia in local populations, as the habitat within the proposal area is limited in extent, highly disturbed, and unlikely to support a resident Koala population.
i) Interfere with the recovery of the species	Habitat fragmentation and degradation are recognised as key threats to the recovery of the Koala. These processes disrupt dispersal and movement patterns, reduce the availability of feed trees, and create barriers to movement, which can lead to reduced gene flow and the breakdown of social structures; factors that ultimately hinder population recovery (Commonwealth DCCEEW 2022). The study area is situated within an already fragmented landscape, characterised by agricultural land, major road infrastructure, and nearby residential and commercial development. Vegetation within the proposal area comprises small, narrow patches of PCT 3161, representing mature regrowth following historical clearing. These patches are unlikely to support a resident Koala population. The largest patch of PCT 3161, located to the south-west of the Oxley and Pacific Highways, maintains some connectivity to larger forested areas in the locality, including Cowarra State Forest, through riparian vegetation corridors. This vegetation may serve as a movement corridor, facilitating the dispersal of Koalas between larger patches in the locality. While the proposal will contribute to further habitat fragmentation, this is not expected to significantly interfere with Koala recovery efforts in the region. No large, intact forest areas will be isolated, and alternative movement corridors, such as those adjacent to Karikeree Creek, will remain intact and are expected to continue supporting Koala movement across the landscape. Although Koalas may need to travel greater distances between patches for foraging or breeding, overall functional connectivity will be maintained. Given the limited scale and degraded condition of habitat to be removed, and the availability of viable alternative corridors, the proposal is not expected to interfere substantially with the recovery of the Koala.

j) Conclusion	Based on the consideration of the above criteria, the proposal is unlikely to have a significant impact the Koala, given: 26.1 The proposal would remove a small area of habitat (up to 2.73 ha) immediately adjacent to the intersection of two highways, the western portion of which is not listed as 'Core Koala Habitat' under the Port Macquarie-Hastings Koala Plan of Management. The habitat to the east that is listed, is predominantly cleared or dominated by exotic vegetation 27.1 The largest patch of PCT 3161, within the proposal area, may function as a movement corridor between more extensive forested habitats and therefore qualifies as critical habitat for the species. Nevertheless, the overall impact of its loss is not expected to be significant. Alternative forested corridors, such as those adjacent to Karikeree Creek to the south-west, are expected to remain intact and continue to facilitate Koala movement across the broader landscape. 28.1 The habitat to be removed is degraded and subject to edge effects given its small size and narrow, linear configuration, and location adjacent to two existing highways, making it unlikely to support resident Koalas. 29.1 Whilst the largest patch of habitat in the proposal area may represent a movement corridor between larger patches of suitable habitat in the locality, other corridors will persist in the locality. As such the proposal is not considered likely to isolate any large areas of habitat that support a resident population of the species.
k)	

Appendix E: Targeted Surveys for Threatened Frog Species and Habitat Tree Assessments (Niche)

Creating a sustainable future.

09 April 2024

Dharini Collaguazo

GHD
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Newcastle 2300

dharini.collaguazo@ghd.com

Dear Dharini,

Re: Oxley Highway Interchange Upgrade – Ecological Surveys (Niche ref: #8536)

This letter acts to detail the ecological surveys undertaken at the Oxley Highway Interchange Upgrade (the project) Study Area on the 19, 20 and 26 March 2024. Niche was engaged to undertake targeted frog and tree surveys at the Oxley Highway and Pacific Highway intersection within the project Study Area, as provided by GHD and shown on Figure 1-2 in the Biodiversity Assessment Report (BAR) (GHD 2021) (the Site).

Targeted Frog Surveys

Target species were those identified within the BAR, including the Green-thighed Frog (*Litoria brevipalmata*), Green and Golden Bell Frog (*Litoria aurea*) and Wallum Froglet (*Crinia tinnula*). Surveys were required within the habitat identified for each target species within the impact area, as described in the BAR (GHD 2021). Suitable habitat included a vegetated farm dam for the Green and Golden Bell Frog and drainage swale for the Wallum Froglet and Green-thighed Frog.

Targeted frog surveys (Green and Golden Bell Frog and Wallum Froglet) were undertaken over two consecutive nights on the 19 and 20 March 2024 following sufficient rainfall (over 31.8 mm in the previous 24 hours at Port Macquarie Airport (060183) weather station). Surveys targeting the Green-thighed Frog at the Site were not completed at this time due to insufficient rainfall for this species. However, extensive surveys for this species were completed on 5 April 2024 as part of the Oxley Highway to Kempsey Pacific Highway Upgrade Project following extensive rainfall (78.2mm in 24hours) at a number of sites with a known population. The species was not observed or heard calling during the survey. Therefore, it was determined that surveys following this rainfall event would be ineffective in determining their potential presence at the Site.

Surveys included the following methods:

- Target species: Green and Golden Bell Frog. Surveys included the following:
    - Spotlighting of the Dam
    - Tadpole survey of the Dam for Green and Golden Bell Frog
    - Call playback during spotlight surveys
    - Diurnal habitat search during tadpole survey.
- Target species: Wallum Froglet. Surveys included the following:
    - Spotlighting of the Swale
    - Call playback during spotlight surveys.

No target species were detected during surveys. At the time of the surveys a total of four frogs were recorded within the Site including *Litoria fallax, Crinia signifera, Limnodynastes peronii* and *Uperoleia fusca*.

Tree Survey

As requested, the tree survey was undertaken using methods outlined in section 2.3.2 and 7.2.2 of the latest Transport for NSW (TfNSW) BAR template (TfNSW 2024). Niche completed a total of three 0.1 hectare (ha) plots within the mapped PCT 827 vegetation as shown in Figure 1. Trees within each plot were identified and counted within each size class identified in the BAR template (TfNSW 2024). Results are presented in the table below and field data is presented in Annex 1. No hollow-bearing trees were observed at the Site.

Table 1: Average counts of trees and hollows and estimates per ha (based on table 7-5 of the TfNSW BAR template)

Veg. zone	Impact (ha)	Plots	Average number of trees in stem size classes (cm) and hollows per ha[1]					Average count of tree and hollows in impact area[2]				
			5-19	20-49	50-99	>100	Hollows	5-19	20-49	50-99	>100	Hollows
PCT 827	2.26	Plot 1, 2 and 3	270	193	63	33	0	610	437	143	75	0

NOTE 1: Calculated by the average from the plot data (assuming standard 0.1 ha plot) multiplied by a factor of 10

NOTE 2: Calculated by the average/ha multiplied by the impact

I trust that the above information will be sufficient to support your project. Please contact me on 0488 774 081 or jdanvers@niche-eh.com should you require any further information or wish to discuss the results.

Yours sincerely,

Jodie Danvers

Ecology Consultant

Niche

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T – 0488 224 106

References

GHD 2021. *Biodiversity Assessment Oxley Highway Interchange*. Prepared by GHD for Transport for NSW.

TfNSW NSW 2024. *Biodiversity assessment report for review of environmental factors (REF). Transport for NSW.* Document EMF-BD-GD-0010-TT4.

Annex 1 – tree survey field data

Plot ID	Location	Common name	Tree species	Number of trees in stem size classes (cm) per plot				
				5-19	20-49	50-99	>100	Hollows
1	NE	Flooded Gum	*Eucalyptus grandis*	7	4	7		
1	NE	Bottlebrush	*Callistemon salignas*	5	1			
1	NE	Forest Oak	*Allocasuarina torulosa*	2				
1	NE	Tallowwood	*Eucalyptus microcorys*		1			
1	NE	Paperbark	*Melaleuca stypheliodes*		3			
1	NE	Blackbutt	*Euclayptus pilularis*			3		
Total				14	9	10	0	0
2	SW	Flooded Gum	*Eucalyptus grandis*	2	6	1	7	
2	SW	Turpentine	*Syncarpia glomulifera*	10	6			
2	SW	Paperbark	*Melaleuca stypheliodes*	2				
2	SW	Cheese Tree	*Glochidion ferdinandi*	7	5			
2	SW	Tallowwood	*Eucalyptus microcorys*	20	13	1		
2	SW	Fringed Wattle	*Acacia fimbriata*	2				
2	SW	Grey Gum	*Eucalyptus propinqua*	1				
2	SW	Bottlebrush	*Callistemon salignas*	1				
2	SW	Forest Oak	*Allocasuarina torulosa*	14	7	1		
2	SW	White Cedar	*Melia azedarach*	2				
2	SW	White Mahogany	*Eucalyptus umbra*		1			
Total				61	38	3	7	0
3	SW	Grey Gum	*Eucalyptus propinqua*	1	1	1		
3	SW	Turpentine	*Syncarpia glomulifera*					
3	SW	Tallowwood	*Eucalyptus microcorys*	2	2			
3	SW	Forest Oak	*Allocasuarina torulosa*	1				
3	SW	Flooded Gum	*Eucalyptus grandis*	2	5	3	3	
3	SW	Blackbutt	*Euclayptus pilularis*		2	2		
3	SW	Fringed Wattle	*Acacia fimbriata*		1			
Total				6	11	6	3	0
Average Number of trees in stem size classes (cm) per 0.1 ha				27.0	19.3	6.3	3.3	0
Average Number of trees in stem size classes (cm) per 1 ha				270	193	63	33	0
Average number of trees in stem size classes (cm) for impact area (PCT 827 = 2.26ha)				610	437	143	75	0

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Subject area
Impact Area
Spotlighting track

Survey method
Call playback

Tree count plots

Vegetation zone
Dam / wetland
Exotic grassland

PCT 827 Flooded Gum - Tallowood - Brush Box moist open forest of the coastal ranges of the North Coast
Swale

Transport
Road
FunctionHierarchy
Major road
Minor road

Hydrography
Watercourse
PERENNIALITY
Non Perennial Stream
Waterbody

Administrative and Property Boundaries
Property
Lot
Local Government Area

Suburb

0 80
m
WGS 1984 Web Mercator Auxiliary Sphere

Drawn by: MatthewZajackowski File: C:\OneDriveSyncFolder\Niche\GIS - APRX\a8500\a8536_OxleyHighway_NSW\Pro\a8536_OxleyHighway_NSW.aprx Last updated: 8/04/2024 2:03 PM

Niche

Figure 1

Oxley Highway Interchange Upgrade Ecological Surveys

Oxley Highway Interchange Upgrade

Niche PM: Jodie Danvers
Niche Proj. #: 8536
Client: GHD

NSW GOVERNMENT