

Prepared for Gamuda and DTI Joint Venture

Richmond Road Upgrade – RRM7 Pre-clearance Survey Report Final V2.0

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Acronyms and abbreviations

AWS	Australian National Weeds Strategy 2017-2027
BC Act	Biodiversity Conservation Act 2016 (NSW)
Biosecurity Act	<i>Biosecurity Act 2015</i> (NSW)
CPCP	Cumberland Plain Conservation Plan
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
ha	Hectares
HBT	Hollow-bearing tree
km	Kilometres
LGA	Local Government Area
m	Metres
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NWGA	North West Growth Area
PCT	Plant Community Type
REF	Review of Environmental Factors
Sp.	Species
SVTM	State Vegetation Type Map
TEC	Threatened ecological community
TfNSW	Transport for NSW
WoNS	Weeds of National Significant

1 Introduction

Gamuda and DTI Joint Venture (GDJV) engaged NGH for the provision of post approval ecology support, associated with the Transport for NSW (TfNSW) Richmond Road Upgrade M7 to Townson Road (RRM7) (the Project), located in Marsden Park, NSW. The Project forms part of Transport for NSW's (TfNSW) North West Growth Area (NWGA) Transport Strategy, which was developed to support the substantial population growth anticipated across North-west Sydney. The Project involves upgrading approximately 3 km of Richmond Road between the M7 Motorway and Townson Road to improve traffic capacity, reduce congestion and provide infrastructure capable of supporting future residential and employment growth within the region.

Key components of the approved upgrade include widening of Richmond Road from four to six lanes, construction of a new flyover bridge connecting the M7 Motorway, Rooty Hill Road North off-ramp to Richmond Road northbound, construction of a new northbound bridge over Bells Creek, upgrades to existing intersections, and improvements to pedestrian and cyclist connectivity along the corridor. The Project location is shown in Figure 1.

The Project area is located within Blacktown City Council Local Government Area (LGA) in the Sydney Basin Bioregion and is situated largely within certified lands of the NWGA and Cumberland Plain Conservation Plan (CPCP). These areas have been strategically assessed and certified under the *Biodiversity Conservation Act 2016* (BC Act) and approved under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), with biodiversity impacts addressed through the relevant certification framework. Detailed biodiversity investigations were undertaken between 2023 and 2024 and included vegetation mapping, habitat assessments, targeted threatened species surveys and aquatic habitat assessments. Surveys identified a highly modified road corridor containing generally low biodiversity values, reflecting the long history of disturbance associated with existing transport infrastructure and surrounding urban development.

Two Plant Community Types (PCTs) were identified across the broader study area, both of which are consistent with Threatened Ecological Communities (TECs) listed under the BC Act and/or EPBC Act. These include; the Cumberland Red Gum River Flat Forest (PCT4025) and Cumberland Shale Plain Woodland (PCT 3320). A PCT map is provided in Figure 2 which shows the State Vegetation Type Map (SVTM) layer. In addition to these PCTs, vegetation within the corridor includes planted native trees, landscaped native vegetation, mixed native-exotic riparian vegetation and areas dominated by exotic species. Aquatic habitat assessments identified Bells Creek as Class 2 (moderate) fish habitat, while an unnamed tributary was assessed as highly disturbed and representative of Class 3 (minimal) fish habitat.

Targeted surveys recorded six threatened species within the broader study area, comprising Juniper grevillea (*Grevillea juniperina* subsp. *juniperina*), Cumberland Plain land snail (*Meridolum corneovirens*), Eastern coastal free-tailed bat (*Micronomus norfolkensis*), Large bent-winged bat (*Miniopterus orianae oceanensis*), Southern myotis (*Myotis macropus*), and Grey-headed flying-fox (*Pteropus poliocephalus*). Subsequent assessments considered an additional suite of threatened flora and fauna species with a moderate or greater likelihood of occurrence. Threatened species locations and extents are shown in Figure 3.

The approved Project was assessed as requiring the removal of native vegetation and limited fauna habitat, predominantly occurring within a narrow and disturbed roadside corridor. No active breeding habitat for threatened fauna species was identified during previous investigations, and impacts were largely confined to foraging habitat and vegetation of relatively low habitat value. Biodiversity assessment outcomes concluded

that impacts could be appropriately managed through standard environmental controls and mitigation measures.

The road upgrade proposes the removal of up to 1.76 ha of native vegetation associated with the forementioned PCTs located outside of certified lands. The Project's Review of Environmental Factors (REF) (TfNSW 2024) summarised the potential biodiversity impacts associated with construction activities which was informed by biodiversity assessments, targeted threatened flora and fauna surveys.

Clearing and grubbing activities associated with these works will be undertaken in accordance with the TfNSW specifications G36 (TfNSW 2020a) and G40 (TfNSW 2020b) and will involve the;

- removal of hollow-bearing trees (HBTs)
- removal of other fauna habitat (including dense foliage, and other habitat features)
- changes to and removal of drainage infrastructure
- removal and disposal of weed infestations
- selective pruning of amenity trees following a tree integrity assessment
- mulching of vegetated material not suitable for habitat salvage and reuse and free of contaminated weed matter.

The Project is not likely to result in significant impacts to threatened species or ecological communities protected under the State and Commonwealth legislation however the REF outlines environmental safeguards to manage potential impacts to threatened fauna and flora to include:

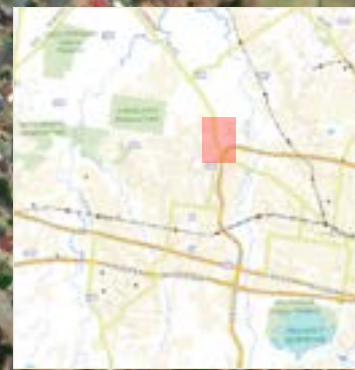
- The development of a Flora and Fauna Management Plan in accordance with Transport for NSW Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW 2024) and relevant State and Commonwealth legislations.
- Detailed design review wherever possible to further avoid and minimise impacts.
- Protection of aquatic habitat and watercourses in accordance with Guide 10: Aquatic habitat and riparian zones (TfNSW 2024).
- Pre-clearance surveys (this report) in accordance with Guide 1: Pre-clearing process (TfNSW 2024)
- Sensitive clearing of vegetation and habitat in accordance with Guide 4: Clearing of vegetation and removal of bushrock (TfNSW 2024).
- Re-establishment of native vegetation in accordance with Guide 3 Re-establishment of native vegetation (TfNSW, 2024).
- An unexpected finds procedure applied according to Biodiversity Guidelines (TfNSW 2024).
- A Tree and Hollow Replacement Plan would be developed, in accordance with the guidelines, to detail obligations under the Biodiversity Policy (TfNSW 2022).
- Habitat would be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock and Guide 8: Artificial hollows of the Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW 2024)
- Management of fauna in accordance with Guide 9 Fauna handling.
- Management of weed species in accordance with Guide 6 Weed management.
- Management of pathogens in accordance with Guide 2: Exclusion zones.
- Management of Noise, light and vibration in accordance with Australian standards.

This report outlines the details of the pre-clearance survey undertaken of the Project site between 2 February and 3 August 2026 and includes survey methodology, results and recommendations (Sections 0 and 0).



LEGEND

-  DM-01 Site Clearing Boundary
-  SR41-2 Proposed Boundary
-  REF Construction Boundary



Datum: GDA2020 / MGA Zone 56

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0 100 200 m

Richmond Road Upgrade Ecology Surveys

Figure 1 Project location map



Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 2 Plant Community Types (PCT) Author: Eric Briones Date created: 26.03.2026 © NGH 2026 © ESRI 2022

LEGEND

DM-01 Site Clearing Boundary

SR41-2 Proposed Boundary

REF Construction Boundary

Cumberland Red Gum Riverflat Forest

Cumberland Shale Plains Woodland

Planted Native Vegetation

Mixed Native Exotic Instream Vegetation

Exotic

Landscaped Natives

Datum: GDA2020 / MGA Zone 56

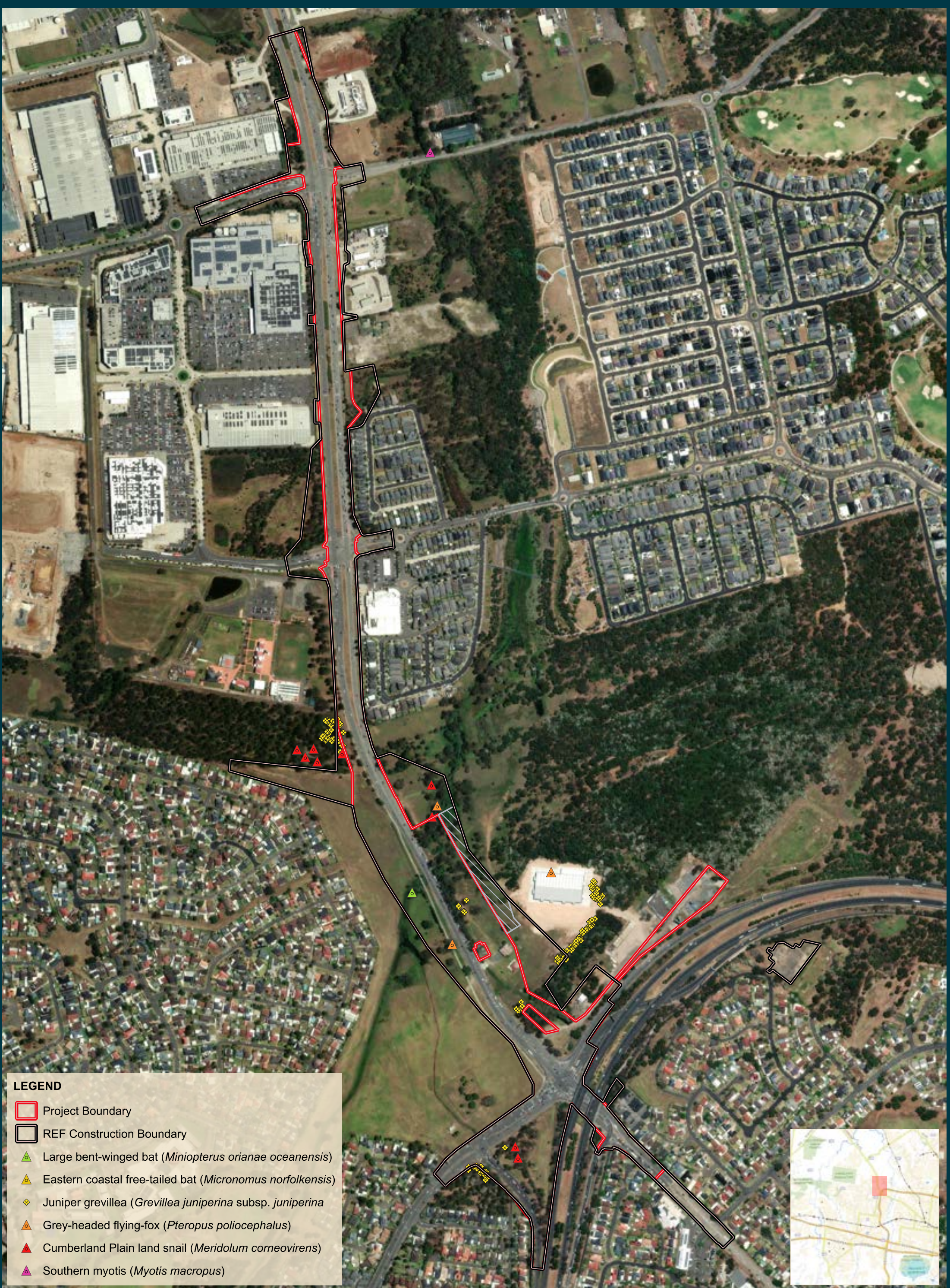
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100

200 m

Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 3 Threatened spp location and extent Date created: 24.08.2026 © NGH 2026 © ESRI 2022



Datum: GDA2020 / MGA Zone 56

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Richmond Road Upgrade Ecology Surveys

Figure 3 Threatened species locations and extent

2 Survey methods and results

A pre-clearance flora and fauna assessment was completed within the Project clearing boundary between 2 February and 3 August 2026, by NGH Ecologist Tristan Varman. The purpose of the survey was to identify ecological values that may be impacted by proposed clearing activities and to inform environmental management measures prior to the commencement of works.

A small section of the Project, identified as Area 4B, was subject to a separate pre-clearance assessment and has since been cleared. As a result, the pre-clearance survey findings for Area 4B have been removed from the main body of this report and are provided in Appendix A.

The pre-clearance assessment of Area 4B identified two areas of *Lomandra* sp. clumps within the clearing boundary. Given the limited extent of vegetation removal and the low potential for impacts to fauna habitat features, the presence of an Ecologist/Fauna Spotter Catcher (FSC) was not considered necessary during clearing works.

The primary assessment area for this report comprises the approved clearing boundary (DM-01 site clearing boundary). After the initial project design, an additional assessment area (SR41-2) adjacent to the approved clearing boundary was incorporated into the proposed disturbance footprint. This area was assessed concurrently with the approved clearing boundary to ensure that all vegetation, habitat values, and relevant environmental constraints were adequately assessed. Unless otherwise stated, the findings presented in this report apply to both the approved clearing boundary and the additional assessment area. References to the Project Clearing Footprint throughout this report collectively refer to the combined extent of the approved clearing boundary and additional assessment area.

Survey effort focused on locating habitat features, environmental constraints and sensitive ecological values within the area proposed for disturbance. The assessment involved traversing the clearing footprint on foot and undertaking visual inspections of vegetation, habitat features and existing infrastructure.

The survey included:

- Searches for threatened flora species and other plant species of conservation significance within the Project Clearing Footprint, with locations recorded where relevant.
- Assessment of fauna habitat values, including the identification and mapping of hollow-bearing trees (HBTs), nests, fallen timber, dense vegetation, and other features capable of supporting native fauna.
- Inspection of potential breeding habitat to determine whether active or inactive breeding places were present within areas proposed for clearing.
- Evaluation of culverts, drainage structures and bridge assets that may provide suitable habitat for Southern Myotis, including evidence of potential roosting opportunities.
- Assessment of habitat for the Cumberland Plains land snail.
- Assessment of habitat features previously identified during earlier biodiversity investigations, with particular focus on HBTs and other fauna habitat likely to have changed since previous surveys.
- Recording of trees proposed for removal, including observations of tree size and habitat value where relevant to clearing activities.
- Identification and mapping of Priority weed infestations and areas where weed cover was concentrated.

- Identification of locations suitable for the release of displaced fauna should fauna rescue and relocation be required during vegetation clearing.
- Confirmation of environmental constraints, including retained vegetation, exclusion areas and habitat linkages that require protection during construction activities.
- Opportunistic fauna observations were also recorded throughout the survey, including direct sightings and indirect evidence such as nests, scats, tracks, hollows or other indicators of habitat use.

All significant records and habitat features identified during the assessment were mapped using GPS field applications and used to inform the impact assessment and management recommendations presented in this report.

Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 4 Pre-clearance survey results - threatened flora Author: Eric Briones Date created: 24.08.2026 © NGH 2026



LEGEND

- DM-01 Site Clearing Boundary
- SR41-2 Proposed Boundary
- REF Construction Boundary
- Juniper grevillea (*Grevillea juniperina*)

Datum: GDA2020 / MGA Zone 56



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0 100 200 m

Richmond Road Upgrade Ecology Surveys

Figure 4 Pre-clearance survey results - threatened flora



LEGEND

-  DM-01 Site Clearing Boundary
-  SR41-2 Proposed Boundary
-  REF Construction Boundary
-  Hollow bearing trees (HBTs)
-  Nests/dreys

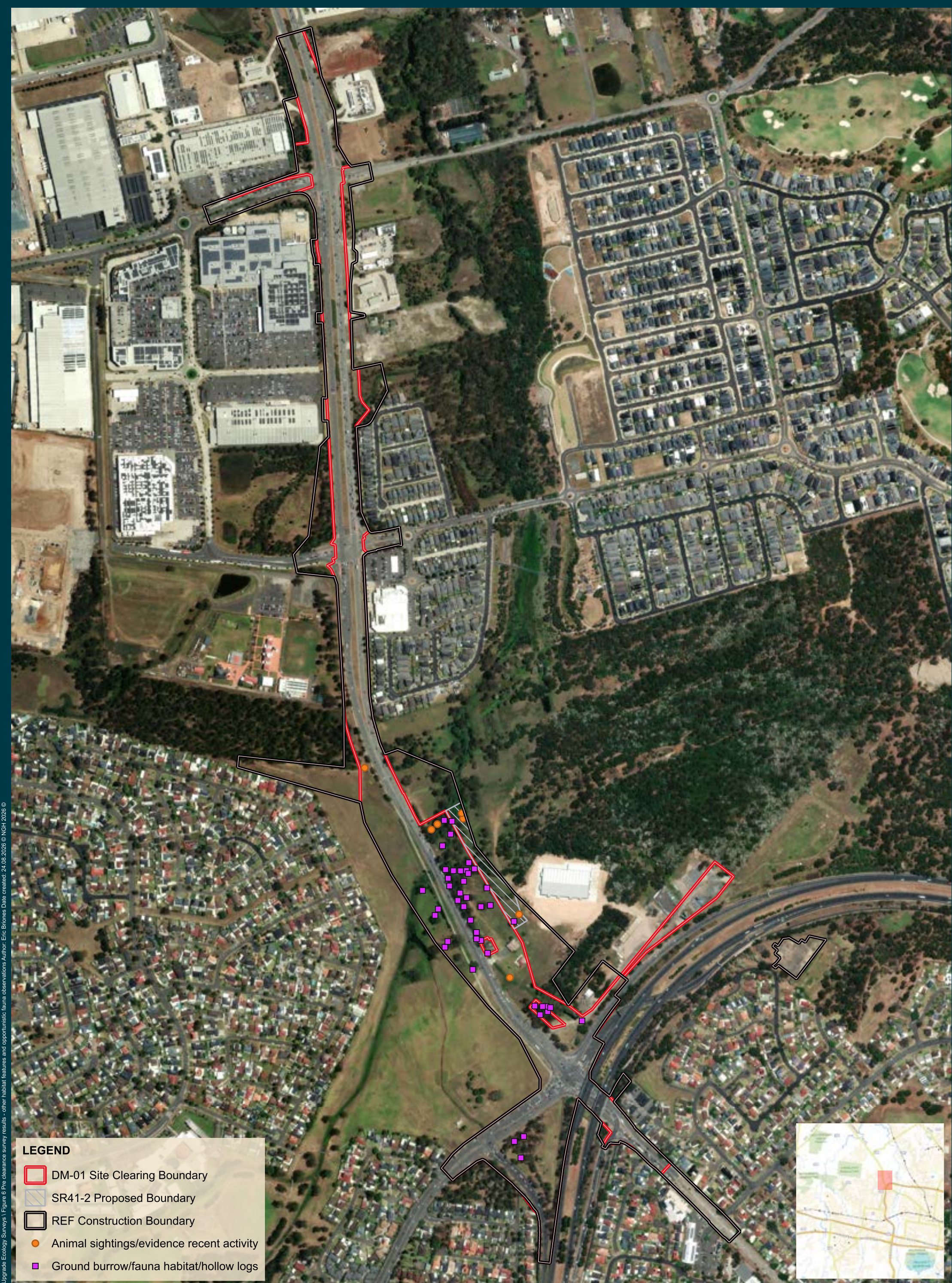
Datum: GDA2020 / MGA Zone 56



Richmond Road Upgrade Ecology Surveys

Figure 5 Pre-clearance survey results - HBTs and confirmed breeding places

Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 6 Pre clearance survey results - other habitat features and opportunistic fauna observations Author: Eric Briones Date created: 24.08.2026 © NGH 2026 © ESRI 2022



Datum: GDA2020 / MGA Zone 56

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Richmond Road Upgrade Ecology Surveys
Figure 6 Pre clearance survey results - other habitat features and opportunistic fauna observations

2.1 Matters of National and State Environmental Significance

2.1.1 Threatened flora

The Project Clearing Footprint was surveyed for the presence of threatened flora species or vegetation communities listed under the EPBC Act and the BC Act. One threatened flora species, Juniper grevillea (*Grevillea juniperina*), listed as vulnerable under the BC Act, was identified within the approved clearing boundary, with recorded details and locations provided in Table 1 below. Twenty-five individuals were identified during the pre-clearance survey that would be directly impacted by proposed clearing.

Table 1 Threatened flora identified during the pre-clearance survey.

Date	Species	Approx number	Location		Comments / photos
			Latitude	Longitude	
02/07/2026	Juniper grevillea <i>Grevillea juniperina</i>	9	-33.7318502	150.8478768	 9 Juniper grevillea plants located within clearing boundary.
23/07/2026	Juniper grevillea <i>Grevillea juniperina</i>	10	-33.7299165	150.8465521	 10 Juniper grevillea plants located within clearing boundary.

Date	Species	Approx number	Location		Comments / photos
			Latitude	Longitude	
23/07/2026	Juniper grevillea <i>Grevillea juniperina</i>	1	-33.730143	150.8467229	 Flowering Juniper grevillea identified within the clearing boundary.
03/08/2026	Juniper grevillea <i>Grevillea juniperina</i>	5	-33.734076	150.8473398	 Dead Juniper grevillea located within clearing boundary

2.1.2 Threatened fauna

The Project Clearing Footprint was surveyed for the presence of EPBC Act and BC Act listed threatened fauna species identified as occurring or considered likely to occur on site.

Targeted searches for Cumberland Plain land snail were undertaken during the pre-clearance survey within areas identified as potential habitat in the REF and in locations associated with historic records of the species. Survey effort focused on habitat features known to provide suitable shelter and foraging resources for the species, including accumulated woody debris, coarse organic litter, dense tussock grass, fallen timber, and moist soil conditions.

No Cumberland Plain land snails were identified during the pre-clearance survey, and no evidence of the species was recorded within the Project Clearing Footprint. However, the Cumberland Plain land snail habitat previously mapped in the REF remains consistent with current site conditions. These areas retain substantial woody debris, dense ground cover, leaf litter and soil moisture, providing suitable habitat for the species.

Given the cryptic nature of Cumberland Plain land snails and their tendency to shelter beneath logs, litter and other ground-level refugia, the absence of observations during the survey does not confirm absence from the site. Accordingly, the habitat identified in the REF remains valid and should continue to be managed in accordance with the mitigation measures and clearing protocols outlined in the REF.

Culverts, drainage structures and bridge assets within and adjacent to the Project Clearing Footprint were assessed for their potential to provide roosting habitat for Southern myotis, however, no individuals, roosts, or evidence of species occupancy were identified during the survey. No culverts, drainage structures or bridge assets providing suitable Southern myotis habitat were identified within the Project Clearing Footprint.

2.2 Significant habitat features

2.2.1 Hollow Bearing Trees

Pre-clearance surveys identified 17 HBTs within the survey area, comprising both live trees and dead standing trees (stags) in varying condition classes. 14 HBTs were identified within the approved clearing boundary and an additional three HBTs were identified within the additional assessment area. Hollow entrances ranged from small (<10 cm) to extra-large (>25 cm) and were located within trunks, branches, snapped stems and dead standing stems. Of the recorded HBTs, eight were dead standing trees (stags) and six were live trees, highlighting the importance of both living and dead vegetation in providing habitat resources within the site.

No direct evidence of fauna occupancy, such as scats, scratches, feathers, nesting material or sightings of hollow-dependent fauna, was recorded in any of the identified HBTs at the time of inspection. However, several hollows were assessed as having the potential to provide suitable habitat for a range of hollow-dependent fauna, including birds, microbats, arboreal mammals and reptiles.

Although no fauna was observed utilising the hollows during the pre-clearance survey, the presence of multiple HBTs represents potential habitat resources. Consequently, where removal of HBTs is proposed, clearing should be undertaken in accordance with the project fauna management and pre-clearance procedures, including pre-felling inspections by a suitably qualified Ecologist and/or Fauna Spotter Catcher (FSC) and staged clearing where required to minimise impacts on any fauna that may subsequently occupy these habitat features.

Table 2 provides HBT data and locations.

2.2.2 Other confirmed breeding places

The Project Clearing Footprint was assessed for the presence of additional animal breeding places not including HBTs. Confirmed breeding places were identified as a bower, burrow, nest or other habitat feature that is known to have been used by an animal to incubate or rear offspring. A total of four inactive bird nests were identified within the approved clearing boundary during pre-clearance inspections. One nest, located within the additional assessment area was identified as a Jacky winter (*Microeca fascians*) nest. Species

identification of the other nests could not be confirmed; however, nest size and structure indicate that one nest was likely constructed by a medium to large bird species, while the remaining two nests were consistent with those of small bird species. No evidence of breeding activity was observed at the nest located in the clearing footprint at the time of inspection. As such, all nests were assessed as inactive. Table 3 provides nest details and locations

Table 2 Hollow Bearing Trees identified during pre-clearance survey.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
02/07/2026	90	Grey box <i>Eucalyptus microcarpa</i>	7	Medium hollow (11-20 cm)	Snap off	Moderate	Additional area	-33.729921	150.847326	No	 Located in additional area.
03/07/2026	162	Forest red gum <i>Eucalyptus tereticornis</i>	10	Extra-large hollow (>25 cm)	Trunk	Good	Clearing boundary	-33.7321951	150.8483636	No	 Vertical split in trunk with cavity visible behind it.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
23/07/2026	286	Forest red gum <i>Eucalyptus tereticornis</i>	7	Medium hollow (11-20 cm)	Branch	Good	Clearing boundary	- 33.7295761	150.8464618	No	 Large (175cm DBH) red gum. One visible hollow. Likely more hollows given the size and probable age of tree.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
23/07/2026	658	Forest red gum <i>Eucalyptus tereticornis</i>	7	Large hollow (21-25 cm)	Trunk	Dead	Clearing boundary	- 33.7287283	150.8460747	No	 At least five entries into the same hollow/dead section of tree.
23/07/2026	693	Forest red gum <i>Eucalyptus tereticornis</i>	8	Extra-large hollow (>25 cm)	Whole trunk	Good	Clearing boundary	- 33.7287497	150.8459323	No	 Whole trunk hollow.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
24/07/2026	376	Forest red gum <i>Eucalyptus tereticornis</i>	8	Large hollow (21-25 cm)	Trunk	Good	Clearing boundary	-33.7302961	150.8460221	No	 One possible visible hollow in dead branch.
24/07/2026	407	Forest red gum <i>Eucalyptus tereticornis</i>	7	Medium hollow (11-20 cm)	Stag	Dead	Clearing boundary	-33.734176	150.8476719	No	 Large hollow stag. Lots of visible small entry points to hollow.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
24/07/2026	302	Forest red gum <i>Eucalyptus tereticornis</i>	8	Medium hollow (11-20 cm)	Trunk	Poor	Clearing boundary	-33.730649	150.8464603	No	 Located near the path and creek. Hollow in trunk. Potential very suitable hollow for birds and bats.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
24/07/2026	375	Forest red gum <i>Eucalyptus tereticornis</i>	5	Large hollow (21-25 cm)	Snap off / trunk	Moderate	Clearing boundary	- 33.7304796	150.8460705	No	 Unique snap off. Hollow located in the fixed position snap off down the trunk.
24/07/2026	489	Forest red gum <i>Eucalyptus tereticornis</i>	8	Medium hollow (11-20 cm)	Stag	Dead	Clearing boundary	- 33.7343511	150.8479868	No	 Hollows located in limbs.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
											Dropped limbs on ground also hollow.
24/07/2026	403	Forest red gum <i>Eucalyptus tereticornis</i>	3	Small hollow (0-10 cm)	Stag	Dead	Clearing boundary	- 33.7346126	150.8480025	No	 Multiple small holes and cracks at ground level. Hollow located in large stag.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
24/07/2026	409	Forest red gum <i>Eucalyptus tereticornis</i>	8	Medium hollow (11-20 cm)	Stag	Dead	Clearing boundary	- 33.7345161	150.8480263	No	 No clear visible entries but visible crack in dead stag.
24/07/2026	412	Forest red gum <i>Eucalyptus tereticornis</i>	5	Medium hollow (11-20 cm)	Stag	Dead	Clearing boundary	- 33.7347078	150.848157	No	 Very large stag with lots of small access points.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
24/07/2026	408	Forest red gum <i>Eucalyptus tereticornis</i>	10	Medium hollow (11-20 cm)	Stag	Dead	Clearing boundary	-33.734404	150.847926	No	 No visible entries. Potential hollow cavities.
24/07/2026	405	Forest red gum <i>Eucalyptus tereticornis</i>	9	Small hollow (0-10 cm)	Stag	Dead	Clearing boundary	-33.7345981	150.8480704	No	 Evident cracking and fissures.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
05/08/2026	713	Mulberry sp. <i>Morus</i> sp.	1	Small hollow (0-10 cm)	Trunk	Poor	Clearing boundary	- 33.7290846	150.8462578	No	 Potential rotted cavities creating very hollow tree. Hollow one for Tree ID 713.
05/08/2026	713	Mulberry sp. <i>Morus</i> sp.	1	Medium hollow (11-20 cm)	Trunk	Good	Clearing boundary	- 33.7290845	150.8461663	No	Potential rotted cavities creating very hollow tree. Hollow two for Tree ID 713.

Date	Tree ID #	HBT species	Height from ground (m)	Hollow size (cm)	Hollow shape / location	HBT condition	HBT location	HBT coordinates		HBT evidence of fauna	Comments / photos
								Latitude	Longitude		
05/08/2026	483	Forest red gum <i>Eucalyptus tereticornis</i>	5	Medium hollow (11-20 cm)	Snap off	Moderate	Additional area	-33.728791	150.846765	No	 Located in additional area.
05/08/2026	716	Forest red gum <i>Eucalyptus tereticornis</i>	1	Medium hollow (11-20 cm)	Crack	Moderate	Additional area	-33.729072	150.846777	No	 Located in additional area.

Table 3 Nests identified during pre-clearance survey.

Date	Breeding place type	Approx. number	Status	Fauna species (if known)	Location	Breeding place coordinates		Comments / photos
						Latitude	Longitude	
03/07/2026	Nest	1	Inactive	Unknown sp.	Clearing boundary	-33.73209893	150.8484479	 Nest for medium to large bird.
23/07/2026	Nest	1	Inactive	Unknown sp.	Clearing boundary	-33.7288868	150.8463197	 Nest for small bird.

Date	Breeding place type	Approx. number	Status	Fauna species (if known)	Location	Breeding place coordinates		Comments / photos
						Latitude	Longitude	
23/07/2026	Nest	1	Inactive	Unknown sp.	Clearing boundary	-33.7308566	150.8470901	 Nest for small bird.
05/08/2026	Nest	1	Inactive	Jacky winter <i>Microeca fascinans</i>	Additional area	-33.728794	150.846692	 Jacky winter nest located in additional area in black thorn bush.

2.2.3 Other significant habitat features

The Project Clearing Footprint was assessed for the presence of habitat features additional to animal breeding places. Examples of fauna habitat features include fallen timber, piles of debris, aquatic habitat, culverts, dense or grassy vegetation, rocky habitat.

A summary and example photographs are provided in Table 4.

Table 4 Other significant habitat features observed at the project area during the pre-clearance survey.

Feature	Potential habitat value provided	Location	
		Latitude	Longitude
Aquatic habitat	Drainage lines, aquatic pools and associated reed beds provide foraging, shelter and refuge habitat for aquatic and semi-aquatic fauna, support macroinvertebrate communities, and contribute to habitat connectivity, water quality and riparian ecosystem function.	-33.7306063	150.8468643
		-33.732145	150.8489937
		-33.7299165	150.8465521
Ground logs / woody debris including large logs and stick piles.	Breeding, basking and feeding grounds for many species of reptile. Protective cover for amphibians, reptiles and mammals.	-33.7295097	150.8462669
		-33.7318749	150.848033
		-33.7300417	150.8465046
		-33.7303838	150.8467565
		-33.7295075	150.846857
		-33.7295324	150.8464267
		-33.7295322	150.8466919
		-33.7299165	150.8465521
		-33.7299969	150.8466845
		-33.7306063	150.8468643
		-33.7286854	150.8464184
		-33.7296599	150.8463157
		-33.7286334	150.8459707

Feature	Potential habitat value provided	Location	
		Latitude	Longitude
		-33.7289059	150.846384
		-33.7293994	150.8467442
		-33.7295363	150.8465717
		-33.731886	150.8481922
		-33.7319069	150.848354
		-33.728685	150.846418
Lose bark	Trees with loose bark provide shelter and refuge habitat for a range of fauna, particularly arboreal mammals, reptiles and microbats, and offer roosting opportunities that contribute to habitat diversity within the site.	-33.7301568	150.8469742
		-33.7301373	150.8471674
		-33.7162666	150.8434135
		-33.7297911	150.8463397
		-33.730421	150.847644
Rocks and rock features	Isolated rocks and rock cage infrastructure provide limited shelter and refuge opportunities for small reptiles and invertebrates, contributing minor habitat complexity within the site.	-33.7307062	150.8468687
		-33.7309538	150.8470905
Garbage material	Accumulations of discarded materials (e.g. drums, plastic, rubber mats and other debris) provide incidental shelter and refuge opportunities for some fauna, including reptiles, but are artificial features and do not represent natural habitat. A deceased water dragon was observed beneath debris during the survey.	-33.732026	150.8481389
		-33.716598	150.8436475
		-33.7301568	150.8469742
		-33.7301373	150.8471674
		-33.7162666	150.8434135
		-33.7297911	150.8463397

Feature	Potential habitat value provided	Location	
		Latitude	Longitude
		-33.728685	150.846418
Arboreal termite nest	Arboreal termite nests provide shelter and refuge opportunities for a range of fauna, particularly reptiles, invertebrates and some arboreal mammals, while also contributing to structural habitat complexity within the vegetation community.	-33.728668	150.846261
Vegetation thicket	Dense vegetation thickets provide shelter, refuge and nesting habitat for a range of fauna, particularly small birds, reptiles and small mammals, while also offering protection from predators and contributing to habitat connectivity within the site.	-33.7301373	150.8471674
		-33.7162666	150.8434135
		-33.7297911	150.8463397
		-33.7318855	150.8482626
		-33.7295097	150.8462669
		-33.7318749	150.848033
		-33.7300417	150.8465046
		-33.7303838	150.8467565

Figure 7 Photographic examples of habitat features identified during the pre-clearance survey.



Aquatic pools



Rocks and rock features



Dense reed thicket



Garbage pile of old plastic containers

2.2.4 Opportunistic fauna observations and evidence of fauna activity

The Project Clearing Footprint was assessed for evidence of fauna activity. Fauna activity was considered to include:

- Fauna that is sighted or heard
- Diggings
- Animal tracks
- Fresh or high quantity scats.

Observations included old feeding scars consistent with glider activity (*Petauroides* sp.), an active fauna track most likely used by feral deer in the additional assessment area and Eastern dwarf tree frog (*Litoria fallax*) vocalisations.

Other opportunistic sightings of native fauna included Eastern grey kangaroos (*Macropus giganteus*) and a Rakali (*Hydromys chrysogaster*). Evidence of substantial small bird activity was also observed. The recorded fauna activity indicates that the assessment area provides habitat, foraging resources and movement corridors for a range of native fauna species.

Table 5 Opportunistic fauna observations and evidence of habitat use.

Date	Evidence type	Species	Location	Coordinates		Comments
				Latitude	Longitude	
02/07/2026	Feeding scar	Glider sp. <i>Petauroides</i> sp.	Clearing footprint	-33.7313789	150.8475354	Old glider feeding marks observed.
02/07/2026	Animal track	Feral deer	Additional area	-33.730302	150.847753	Fauna track identified. Most likely formed and frequently used by known feral deer population.
23/07/2026	Opportunistic auditory amphibian observation	Eastern dwarf tree frog <i>Litoria fallax</i>	Clearing footprint	-33.7287298	150.8461171	Vocalisations heard. Possibly up to ten individuals.
23/07/2026	Opportunistic bird activity observation	Unknown sp.	Additional area	-33.728551	150.846621	Evidence of heavy small bird activity.
23/07/2026	Opportunistic animal sighting	Eastern grey kangaroo <i>Macropus</i>	Additional area	-33.728645	150.846647	Observed inside additional area.

Date	Evidence type	Species	Location	Coordinates		Comments
				Latitude	Longitude	
		<i>giganteus</i>				
24/07/2026	Opportunistic animal sighting	Eastern grey kangaroo <i>Macropus giganteus</i>	Clearing footprint	-33.7277412	150.8446546	Observed inside clearing boundary.
05/08/2026	Opportunistic animal sighting	Rakali <i>Hydromys chrysogaster</i>	Clearing footprint	-33.7288197	150.8459923	Observed inside clearing boundary.

2.3 Weed species location and management

2.3.1 Priority weeds & Weeds of National Significance (WoNS)

The Project Clearing Footprint was assessed for the presence of pest plant species and significant infestations. A number of introduced and environmental weed species were recorded within the Project Clearing Footprint, including several species identified as State and Regional Priority Weeds. Regional Priority Weeds relevant to the Richmond Road project were identified based on the Greater Sydney Lweed classification (NSW WeedWise 2025).

One Weeds of National Significance (WoNS) species, African boxthorn (*Lycium ferocissimum*), was recorded within the Project Clearing Footprint, with four individuals identified across two locations. Several other State and Regional Priority Weed species were also recorded, including African olive (*Olea europaea* subsp. *cuspidata*), Broad-leaf privet (*Ligustrum lucidum*), Camphor laurel (*Cinnamomum camphora*), Moth vine (*Araujia sericifera*), Privet (*Ligustrum* spp.), and Scotch thistle (*Onopordum acanthium*).

Privet (*Ligustrum* spp.) was the most abundant weed recorded, with approximately 117 individuals observed throughout the Project Clearing Footprint. Scotch thistle was also relatively widespread, with 16 individuals recorded. African boxthorn, Broad-leaf privet, and Camphor laurel were recorded in low numbers, while single occurrences of African olive and Moth vine were identified. All recorded weed species are subject to the General Biosecurity Obligation under the NSW *Biosecurity Act 2015* (the Act), requiring reasonable and practical measures to minimise the risks associated with their spread.

Details of the significant weed species identified during the pre-clearance survey including abundance, locations, and recommended management actions are provided in Table 6.

2.3.2 Weed management protocol

Transport for NSW (TfNSW) have legislative obligations to manage weeds in accordance with the Act and the BC Act. This is outlined in Guide 6: Weed Management of the Biodiversity Management Guidelines (TfNSW 2024).

Key aspects of the construction activities on the Project site that could result in the introduction of weeds to the site, spread of weeds within the site, or transportation of weeds from the site, include:

- Movement of vehicles, plant, equipment and personnel on, off and around the Project site.
- Movement and stockpiling of weed infested topsoil.
- Clearing, grubbing and stockpiling of weed infested mulch.
- Inappropriate disposal of weeds.

Potential impacts associated with weeds at the Project site include:

- Spread of weeds into previously non-infested areas (both inside and outside the Project area).
- Degradation of native flora and fauna habitat, including remnant vegetation and TECs.
- Introduction of new weeds to the Project site

General mitigation measures to manage weeds include:

- Identification and mapping of Priority weeds occurring in construction areas prior to disturbance with monitoring occurring as part of the pre-clearance survey. This will determine “clean” and ‘infested’ construction zones to assist in weed management.
- Where Priority weeds are recorded within the disturbance footprint (including stockpile locations); treat or remove weeds progressively prior to construction commencing in each area, using appropriate weed management and disposal methods. Further information for individual species is available from NSW Weed Wise.
- Minimise any soil disturbance within weed infested areas.
- Topsoil recovered from areas of low weed infestation can be re-used onsite with treatment (composting) but should be stockpiled separately. After composting and a seed viability test shows no seed growth, the mulch can be used onsite subject to conformance with TfNSW QA Specification R178 - Vegetation.
- Training staff and contractors in weed identification and vehicle hygiene procedures. Location-specific EWMS (and associated mapping) will specify any weed issues and their management.
- Minimising vehicle movements across the Project site and securely cover loads of weed-contaminated material to prevent the spread of material during transportation.
- Restrict construction vehicles to existing tracks or access roads, where possible.
- Implementing weed hygiene protocols.
- Any imported soil is to be inspected and recorded as weed free and/or sourced from a weed free location
- Implementing vehicle hygiene procedures, including the utilisation of designated brush down and spray down areas.
- Ongoing weed control and monitoring.



Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 7 Significant weeds Author: Eric Briones Date created: 24.08.2026 © NGH 2026 © ESRI 2022

LEGEND

DM-01 Site Clearing Boundary

SR41-2 Proposed Boundary

REF Construction Boundary

Weed species

African boxthorn (*Lycium ferocissimum*)

African olive (*Olea europaea subsp. cuspidata*)

Broad leaf privet (*Ligustrum lucidum*)

Camphor laurel (*Cinnamomum camphora*)

Moth vine (*Araujia sericifera*)

Privet (*Ligustrum sp.*)

Scotch thistle (*Onopordum acanthium*)

Datum: GDA2020 / MGA Zone 56

Table 6 Significant weeds identified during pre-clearance survey.

Weed species	Approx. numbers	Location		WoNS+	NSW State Priority Weed ^	Regional Priority Weed *	Biosecurity duty	Management control	Photo
		Latitude	Longitude						
African boxthorn <i>Lycium ferocissimum</i>	4	-33.732026	150.8481389	✓	✓	✓	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Mechanical removal and herbicide treatment, with ongoing monitoring and follow-up control of regrowth and seedlings. Prevent seed production and dispersal.	
		-33.7345543	150.8483556						
African olive <i>Olea europaea</i> subsp. <i>cuspidata</i>	1	-33.7310328	150.846767	X	✓	✓	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Hand-pull seedlings; control mature plants using cut-and-paint, stem injection, basal bark or foliar herbicide application; undertake follow-up monitoring and control.	

Weed species	Approx. numbers	Location		WoNS+	NSW State Priority Weed ^	Regional Priority Weed *	Biosecurity duty	Management control	Photo
		Latitude	Longitude						
Broad leaf privet <i>Ligustrum lucidum</i>	2	-33.731243	150.8467287	X	✓	X	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Hand removal of seedlings; cut-and-paint, stem injection or foliar herbicide treatment of established plants; ongoing follow-up required to control bird-dispersed seedlings.	
Camphor laurel <i>Cinnamomum camphora</i>	2	-33.731916	150.8482061	X	✓	X	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Remove seedlings and saplings; control mature trees by cut-and-paint, stem injection or basal bark application; monitor for seedling recruitment.	
		-33.7311868	150.8468217						
		-33.7287734	150.8459236						
		-33.730619	150.8469119						
		-33.7343869	150.8478692						

Weed species	Approx. numbers	Location		WoNS+	NSW State Priority Weed ^	Regional Priority Weed *	Biosecurity duty	Management control	Photo
		Latitude	Longitude						
Moth vine <i>Araujia sericifera</i>	1	-33.7227784	150.8446578	X	✓	✓	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Hand-pull seedlings and tubers where practicable; cut and treat stems with herbicide; remove seed pods before maturity; follow-up monitoring required.	
Privet <i>Ligustrum</i> spp.	117	-33.7308084	150.8470121	X	✓	✓	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Hand removal of seedlings; cut-and-paint, stem injection or foliar herbicide treatment of mature plants; ongoing control of seedling recruitment.	
		-33.7309947	150.8464809						
		-33.7291241	150.8465266						
		-33.729246	150.8463294						
		-33.728587	150.846688						

Weed species	Approx. numbers	Location		WoNS+	NSW State Priority Weed ^	Regional Priority Weed *	Biosecurity duty	Management control	Photo
		Latitude	Longitude						
Scotch thistle <i>Onopordum acanthium</i>	16	-33.7308263	150.8470159	X	✓	X	General Biosecurity Obligation applies to prevent, eliminate or minimise any biosecurity risk they may pose. Reasonable and practical steps must be taken to minimise risks associated with the species.	Hand removal prior to seed set, cultivation where appropriate, or targeted herbicide treatment; prevent flowering and seed production.	
		-33.7302809	150.846064						
		-33.7308085	150.8469981						

+ Weed of National Significance (WoNS)

^ NSW Biosecurity Act 2015

* Priority weeds for Greater Sydney Region

2.4 Suitable habitat for fauna release and habitat relocation

Suitable habitat areas for fauna release and habitat relocation were identified by the Ecologist during the pre-clearance survey (refer to Figure 9). Where fauna is displaced during clearing activities, individuals will be released into a suitable location outside of the construction impact zone and as close as practicable to the location where they were encountered, within the same TEC wherever possible. Selected release areas comprise retained native vegetation that is well connected to adjoining habitat, allowing fauna to disperse into the broader landscape. Where access is permissible, the Ecologist will determine the most suitable release location at the time of capture and release.

Where practicable, salvaged habitat features such as hollow logs and coarse woody debris will also be relocated to these identified habitat areas outside the construction impact zone to maintain habitat values and refuge opportunities for displaced fauna.

See section 3.5 Recommended Cumberland Plain land snail habitat clearing protocol for translocation protocol recommendation and suitable release locations for the Cumberland Plain land snail.



Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 9 Suitable habitat for fauna release and habitat relocation Author: Eric Briones Date created: 27.08.2026 © NGH 2022

LEGEND

 DM-01 Site Clearing Boundary

 SR41-2 Proposed Boundary

 REF Construction Boundary

 Suitable habitat for fauna release and habitat relocation

Datum: GDA2020 / MGA Zone 56



Richmond Road Upgrade Ecology Surveys

Figure 9 Suitable habitat for fauna release and habitat relocation

3 Clearing mitigation measures

Key findings of the pre-clearance survey are outlined in Table 7 below. The following mitigation measures are recommended to be implemented during clearing activities, to address survey findings, and to ensure best practice clearing methods are carried out, in accordance with the methodology outlined below.

Table 7 Key findings from the pre-clearance survey.

Features	Type
Threatened flora	Juniper grevillea
Threatened fauna	None identified during pre-clearance survey. Suitable habitat present for Cumberland Plains land snail, comprising leaf litter, fallen timber and ground debris within native vegetation.
HBTs	17
Other confirmed breeding places	4 (nests)
Other significant habitat features	Aquatic habitat, ground logs/woody debris, loose bark, rock/rock features, garbage piles, arboreal termite nest, vegetation thicket.
Opportunistic fauna observations and evidence of habitat use	Glider feeding scars, Eastern dwarf tree frog vocalisations, Eastern grey kangaroo and Rakali sightings, small bird activity, and feral goat movement tracks.
WoNS	1 species (African boxthorn (<i>Lycium ferocissimum</i>))
Priority Weeds	Regional Priority Weeds: African olive (<i>Olea europaea</i> subsp. <i>cuspidata</i>), Broad-leaf privet (<i>Ligustrum lucidum</i>), Camphor laurel (<i>Cinnamomum camphora</i>), Moth vine (<i>Araujia sericifera</i>), and Privet (<i>Ligustrum</i> spp.)

3.1 Site preparation and training

Habitat removal and vegetation clearing are to be undertaken as per the TfNSW Specification G40 and the Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW, 2024).

Biodiversity management during clearing provides a precautionary approach to mitigating potential impacts to threatened flora and fauna species, colonial breeders and animal breeding places.

Prior to vegetation clearing, it is ensured:

1. Limits of clearing and exclusion zones are clearly defined by survey and marked at 10m intervals on each side of the road formation shown on the design drawings. Refer also Guide 2: Exclusion zones of the Biodiversity Guidelines (TfNSW, 2024).
2. All areas outside of the approved disturbance footprint especially in areas of dense vegetation or other high-risk areas (such as within riparian vegetation) are designated as no-go areas and protected as follows:
 - a) Plant operators to be made aware of vegetation disturbance footprint within their area of works via spatial data (if technology available) or ii). to be walked through work area prior to commencement of operations or when entering a new working area.

- b) Physical demarcation e.g. surveyor's pegs with brightly coloured flagging, temporary fencing (or equivalent) delineated the disturbance footprint. These are placed and located so that contractors can easily discern the area to be cleared.
 - c) Trees are felled away from retained vegetation, to ensure retained vegetation is not damaged.
 - d) No materials are stockpiled and no vehicles parked or operated under the canopy of any trees marked for protection.
 - e) Excavation or the placing of fill near any protected tree must be avoided or by advice from an Ecologist.
 - f) Haul roads and access tracks must be routed clear of any protected tree canopy.
- 3. Habitat trees to be retained outside of the clearing zone are marked with TPZ fencing, to protect them throughout clearing.
- 4. Watercourses and drainage lines are delineated and clearly marked.
- 5. Any branch which overhangs the road formation, must be cut back flush with the tree trunk in accordance with AS 4373.
- 6. An Ecologist has undertaken a pre-clearance survey of the disturbance footprint in accordance with Guide 1: Preclearing process of the Biodiversity Guidelines (TfNSW, 2024), and where applicable had completed the following tasks (this report):
 - a) Confirmed the location of significant biodiversity features.
 - b) Check for the presence of threatened species, identified in the ecological assessment, as likely to occur within the project area.
 - c) Identify any potential fauna that may be disturbed during clearing activities.
 - d) All habitat features and hollow bearing trees within the disturbance footprint have been clearly marked for protection during clearing and details recorded.
 - e) Habitat features to be retained for relocation are marked and mapped accordingly.
 - f) Suitable fauna relocation sites are pre-determined.
 - g) Identified the species and location of any weeds growing within the area to be cleared and grubbed.
- 7. A plan for the management of weeds is established.
- 8. All contractors and employees involved in the clearing are trained via toolbox talks or pre-starts on the environmental risks and aspects to be considered during clearing. This includes:
 - a) Sensitive clearing technique
 - b) Threatened species
 - c) Habitat tree salvage and relocation
 - d) Exclusion zones.

3.2 Clearing and grubbing

Clearing and grubbing is to be undertaken in accordance with the TfNSW QA Specification G40 and Guide 4: Clearing of vegetation and removal of bushrock of the Biodiversity Guidelines (TfNSW, 2024). Removal should be carried out in an ecologically sensitive manner using best practice methods below:

1. A pre-clearance check will be undertaken by an ecologist where works involve the presence and potential impact to known fauna habitat features or there is a likelihood of encountering fauna during construction activities or habitat removal
2. Known or potential breeding places are to be retained and protected where practicable. Where works unavoidably affect a breeding place, a qualified Ecologist will oversee the implementation of appropriate fauna management measures, including the relocation of fauna and breeding habitat where feasible.
3. Clearing of vegetation and/or removal of bushrock must be contained within the limits of clearing for the project demarcated by exclusion zone fencing or similar.
4. Aquatic habitats within areas proposed for disturbance, including waterways mapped under the *Water Management Act 2000* (Hydroline mapping), wetlands, farm dams, drainage lines containing standing water, and other permanent or semi-permanent waterbodies, must be assessed by a qualified Ecologist prior to clearing where aquatic fauna may be present and any aquatic fauna salvaged.
5. Where cleared vegetation has suitable habitat features (such as rocky outcrops and woody ground debris), these are salvaged and relocated for use as replacement habitat outside the disturbance footprint and within the REF approved construction boundary as advised by the Ecologist.
6. Existing grasses and other ground cover must be retained within 15 m of rivers, creeks and watercourses and in all drainage lines until immediately before construction commences in the area. An access track may be constructed across these areas on an alignment that will minimise erosion. Notwithstanding the retention of the ground cover, soil erosion and sedimentation controls for the area must be installed in accordance with TfNSW G38. All trees in these areas must be felled manually, leaving grasses and small understorey species wherever possible.
7. Considering the assumed risk for encounter of threatened species, and to help increase visibility of fauna and reduce risk to fauna during clearing, it is recommended that vegetation removal be undertaken in stages. The first stage should involve careful removal of understorey vegetation, with weed-infested material separated into designated stockpiles where practical and where infestations have been identified, while progressively moving back towards cleared or bare ground to improve visibility. Ground habitat features (e.g. hollow logs) should then be removed. The second stage should involve removal of non-hollow-bearing trees, followed by the third stage involving removal of hollow-bearing trees through staged clearing.
8. Separation of weeds from native vegetation is a requirement of TfNSW Guide 6, which states that weeds are to be separated from native vegetation where native vegetation is to be used for mulch, and that weeds should not be used for mulch unless appropriately composted to prevent regrowth. This measure is to be implemented where native vegetation is being mulched, with weed material managed separately to minimise the risk of weed spread in accordance with the objective of Guide 6 to prevent or minimise the spread of priority weed species.

3.3 Hollow Bearing Trees

1. A FSC/Ecologist will undertake a visual inspection of all hollows and habitat features within 24 hours of clearing to identify resident fauna species that might require relocation.

2. All clearing requires a pre-clearance survey and an Ecologist/suitably qualified person to ensure no impacts to fauna will occur.
3. Removal of HBTs is not to occur in spring to avoid the main breeding period for hollow dependent fauna. During the pre-clearing assessment, potential hollow-dependent fauna were identified as likely to utilise the hollows present within the identified HBTs. As these hollows may provide breeding, nesting and shelter habitat during the spring breeding season, removal of HBTs should be avoided during this period where practicable. Delaying removal until the breeding season will reduce the risk of adversely impacting potential fauna occupying the identified hollows and is consistent with the TfNSW avoidance and minimisation principles, which requires consideration of the seasonal requirements of fauna species and implementation of measures to avoid and minimise biodiversity impacts. This measure also aligns with the objective of Guide 4 to minimise biodiversity impacts associated with habitat loss during clearing activities and to ensure habitat removal is undertaken in a manner that minimises loss and damage to native fauna and flora habitat.
4. During summer/hot days (greater than 30°C), HBT are to be left in situ until temperatures lower, so any captured animals are not subjected to heat stress before release. Wildlife is not to be held in a vehicle on hot days unless the engine and air conditioning is on.
5. Nocturnal animals (if captured) are not to be released until nightfall as they are vulnerable to predation if released during the day.
6. Prior to works commencing, the FSC/Ecologist is to undertake a brief site inspection to ensure that each HBT to be removed is clearly marked so that machinery operators and site construction workers are aware. This is to avoid any indirect impacts occurring beyond, or in a manner not consistent with the methodology specified in this or other regulatory documents. Marking of the HBTs that will be removed and/or retained is to be clear and must differentiate between removed/retained trees such as through the use of different coloured flagging tape or spray paint.
7. TfNSW Biodiversity Management Guideline Guide 9: Fauna Handling, prior to the commencement of clearing works the Environment Manager should contact local veterinarians to confirm their willingness and capacity to receive and treat any injured fauna encountered during clearing.
8. The FSC/Ecologist must assess the surrounding area for alternative hollows suitable for fauna relocation. Hollows deemed suitable for relocation will be carefully cut out of the trees following tree felling and relocated into trees deemed suitable outside of the construction footprint.

3.3.1 Staged clearing of habitat trees

1. The FSC/Ecologist must have appropriate catching, handling, and housing equipment present on site in the event of the need to detain fauna. This includes enclosures suitable for common and suspected threatened species of varying needs and sizes. Housing and transport of wildlife must be in accordance with the Code of Practice for Injured, Sick and Orphaned Protected Fauna: <https://www.environment.nsw.gov.au/research-and-publications/publications-search/code-of-practice-for-injured-sick-and-orphaned-protected-fauna>.
2. **Stage 1: Mechanically disturb HBTs**
HBTs will be disturbed using an excavator (preferable) or loader to tap/shake the trunk several times. This will encourage any fauna to vacate from the area into adjacent habitat. These disturbance

actions will be performed at the end of the day to encourage nocturnal species to relocate overnight. Ensure that the entire area within the drop radius of the HBT has been cleared of debris.

3. **Stage 2: Clear HBTs**

Prior to clearing the HBTs, employ the mechanical disturbance protocol again. An excavator (preferable) or loader will be used to tap/shake the tree as high as possible on the trunk. This process should be repeated several times. Waiting 30 seconds between each tap/shake. Stage 2 clearing is to be completed within 24 hours of Stage 1 to maximise the effectiveness of staged habitat removal and reduce the likelihood of fauna reoccupying disturbed habitat. Where a hollow-bearing tree has remained in place for more than 24 hours following mechanical disturbance, it is to be repeated at least one day prior to its removal to provide any fauna that may have reoccupied the habitat with an opportunity to disperse. TfNSW Biodiversity Management Guideline (2024), Guide 4 supports staged habitat removal as a means of reducing impacts to fauna during vegetation clearing. The guidance focuses on the progressive removal of habitat features to provide fauna with opportunities to disperse from the impact area prior to the removal of key habitat elements such as HBTs.

4. A FSC/Ecologist will be required to supervise the removal of HBTs and check for signs of animal activity in or around the tree during clearing. The FSC must be able to communicate directly with plant operators, using a UHF radio.
5. The excavator or equivalent machinery operator will slowly lower the HBT. HBTs must not be pushed and left to fall under their own weight as this can cause direct injury or death to resident fauna.
6. If taking the tree down in stages by an Arborist, remove non-hollow-bearing limbs first, followed by hollow-bearing limbs
7. Once the hollow-bearing limbs or HBT are on the ground, the FSC/Ecologist must check each hollow for signs of wildlife before the next limb/tree is removed. Remove any fauna into a handling bag or suitable secure housing. The FSC will release any adult uninjured fauna into the designated release area (a distance of ~50 metre outside the clearing footprint at the appropriate time of day for the species).
8. Where practical, relocate fauna in their hollow by relocating entire hollow sections to areas of retained vegetation.
9. If dependent young or injured fauna are discovered following or during tree felling, WIRES or similarly qualified and licensed Wildlife care organisation will be contacted to treat any injured or orphaned individuals. If no wildlife handler is available, the fauna must be delivered to a licensed wildlife veterinarian (previously notified of the works).
10. Records of any animals removed or injured must be retained in a register.
11. Once felling, if uninjured nocturnal fauna is detected within the felled tree and the hollow is in good condition, the fallen tree will be marked and left in situ over night to allow the fauna to self-relocate if safe to do so. The following day fallen trees will be left in place or moved to a nearby area to retain fauna habitat once the fauna has relocated.

3.3.2 Handling wildlife

1. Handling Wildlife should be undertaken in accordance with Guide 9: Fauna Handling of the Biodiversity Guidelines (TfNSW, 2024).
2. Direct contact with any wildlife will be avoided wherever possible. Wildlife will be encouraged to leave hollows through controlled disturbance as detailed above.
3. Any uninjured wildlife that does not include dependent young (unless in the company of its healthy parent) must be encouraged to leave the Project site.
4. As per section 3.3 and TfNSW Biodiversity Management Guideline Guide 9: Fauna Handling, prior to the commencement of clearing works the Environment Manager should contact local veterinarians to confirm their willingness and capacity to receive and treat any injured fauna encountered during clearing.
5. Handling of microbats must only be undertaken by a trained fauna handler, vaccinated for Australian Bat Lyssavirus with current titre levels.
6. The Site Manager and environment staff are to be notified when unexpected animals are found.
7. Handling of frogs should follow Guide 9: Fauna Handling and Guide 7: Pathogen Management (TfNSW, 2024) as well as the Hygiene Guidelines for wildlife (DPIE 2020) e.g. the use of disposable gloves, appropriate decontaminated storage containers, cross contamination avoided.

3.4 Salvage of hollows and other habitat features

Wherever possible, branch and trunk hollows from HBTs brought down during the clearing phase will be carefully cut from the tree, relocated and placed on the ground to create new habitat, outside of the construction footprint, for ongoing use by fauna.

3.5 Recommended Cumberland Plain land snail habitat clearing protocol

To minimise impacts on Cumberland Plain land snail habitat, the following measures are recommended prior to and during clearing activities in Cumberland Plain land snail associated TECs:

- 1 A suitably qualified Ecologist should undertake a preclearing inspection of all areas containing potential snail habitat, including accumulations of leaf litter, fallen timber, coarse woody debris, rocks, bark and dense native groundcover.
- 2 Habitat features proposed for removal should be progressively inspected by hand immediately prior to clearing. Any Cumberland Plain land snails encountered should be carefully collected and relocated to suitable retained habitat adjacent to the impact area in associated TEC. Relocation habitat should contain comparable shelter resources, including leaf litter, fallen timber and native groundcover.
 - a) Any Cumberland Plain land snails identified during clearing should be transported in clean plastic containers that have not previously been used for food storage. Containers should be lined with moist paper towel to maintain humidity and prevent desiccation during handling and relocation.

- b) A suitable release location is the creek line immediately outside the impact area within the floodplain habitat where fallen logs and other shelter resources are present. This area provides appropriate refuge habitat, including woody debris and moisture-retaining microhabitats, for the successful relocation of any individuals.
- 3 Clearing should be undertaken in a staged and directional manner, progressing from areas of disturbance towards retained vegetation where fauna can disperse naturally. Broadscale clearing of all habitats in a single operation should be avoided where practicable.
- 4 Where feasible, habitat features such as logs, coarse woody debris, rocks and leaf litter should be retained in situ. If removal is unavoidable, suitable material should be salvaged and relocated into adjacent retained vegetation to maintain shelter and microhabitat resources. Retention of ground-level habitat features is an important management action for the species.
- 5 Machinery access should be restricted to designated work areas to minimise unnecessary disturbance to retained habitat, compaction of soils and loss of leaf litter within adjacent vegetation.
- 6 Stockpiling of materials, machinery parking and construction-related activities should not occur within retained habitat areas or conservation zones.
- 7 Following clearing, retained habitat areas should be protected from further disturbance and managed to maintain ground cover, leaf litter and woody debris resources that provide ongoing habitat for the species.

3.4 Post clearing

Upon completion of clearing work, a post clearance report will be prepared that includes:

- Habitat feature type and location (include unique ID and GPS coordinates).
- Number of hours between first and second stage of habitat removal.
- Fauna species present, captured and relocated including numbers.
- Release location and condition/behaviour of animal upon release.
- Fauna injured or killed.
- Number of trees / hollows removed. Record the entrance diameter and cavity size of each individual hollow removed

Vegetation stockpiles should be removed as soon as practicable and not be left undisturbed for extended periods to minimise the likelihood of native fauna using the material as habitat. Where vegetation stockpiles have remained undisturbed for more than 48 hours, it is recommended that an FSC/Ecologist inspect the stockpile prior to removal to identify and manage any fauna that may be present. This recommendation is consistent with the intent of the TfNSW Biodiversity Guidelines, which seek to minimise opportunities for stockpiled vegetation to become habitat for fauna and to ensure fauna occupying habitat features are appropriately managed during clearing activities.

3.4.1 Threatened fauna – unexpected find procedure

In the instance that a new threatened species is encountered on site (i.e. species that has not been recorded during previous fauna surveys), vegetation clearing in that area must cease, and the Ecologist must inform the Site Manager immediately.

The principal will facilitate contact with the appropriate authority in relation to a required course of action.

Clearing of the specific area of concern will not recommence until approval has been granted by the relevant agency.

4 References

NSW WeedWise (2025), *Priority weeds for the Greater Sydney*, Department of Primary Industries & Regional Development, Sydney, NSW.

Transport for NSW (TfNSW) (2020a), *IC-QA-G36 Environmental Protection*, Edition 4 Revision 8, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2020b), *IC-QA-G40 Clearing and Grubbing*, Edition 1 Revision 2, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2022), *Biodiversity Policy*, Policy No. CP22004, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2024), *Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects*. EMF-BD-GD-0039. Transport for NSW, Sydney, NSW.

Appendix A Pre-clearance report (Area 4B)

Prepared for Gamuda and DTI Joint Venture

**Richmond Road Upgrade – RRM7 Area 4B
Pre-clearance Survey Report Final V1.1**

July 2026

Project Number: 260366

Document verification

Project Title: Richmond Road Upgrade - RRM7 Area 4B – Pre-clearance Survey Report

Project Number: 260366

Project File Name: 260366 RRM7_Area 4B Pre-clearance Survey_Final_V1.1

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NGH is committed to environmentally sustainable practices, including fostering a digital culture and minimising printing. Where printing is unavoidable, NGH prints on 100% recycled paper.

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

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Acronyms and abbreviations

AWS	Australian National Weeds Strategy 2017-2027
BC Act	Biodiversity Conservation Act 2016 (NSW)
Biosecurity Act	<i>Biosecurity Act 2015</i> (NSW)
CPCP	Cumberland Plain Conservation Plan
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
ha	Hectares
HBT	Hollow-bearing tree
km	Kilometres
LGA	Local Government Area
m	Metres
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
NWGA	North West Growth Area
PCT	Plant Community Type
REF	Review of Environmental Factors
Sp.	Species
SVTM	State Vegetation Type Map
TEC	Threatened ecological community
TfNSW	Transport for NSW
WoNS	Weeds of National Significant

1 Introduction

Gamuda and DTI Joint Venture (GDJV) engaged NGH for the provision of post approval ecology support, associated with the Transport for NSW (TfNSW) Richmond Road Upgrade M7 to Townson Road (RRM7) (the Project), located in Marsden Park, NSW. The Project forms part of Transport for NSW's (TfNSW) North West Growth Area (NWGA) Transport Strategy, which was developed to support the substantial population growth anticipated across North-west Sydney. The Project involves upgrading approximately 3 km of Richmond Road between the M7 Motorway and Townson Road to improve traffic capacity, reduce congestion and provide infrastructure capable of supporting future residential and employment growth within the region.

Key components of the approved upgrade include widening Richmond Road from four to six lanes, construction of a new flyover bridge connecting the M7 Motorway, Rooty Hill Road North off-ramp to Richmond Road northbound, construction of a new northbound bridge over Bells Creek, upgrades to existing intersections, and improvements to pedestrian and cyclist connectivity along the corridor. The Project location is shown in Figure 1.

The Project area is located within Blacktown City Council Local Government Area (LGA) in the Sydney Basin Bioregion and is situated largely within certified lands of the NWGA and Cumberland Plain Conservation Plan (CPCP). These areas have been strategically assessed and certified under the *Biodiversity Conservation Act 2016* (BC Act) and approved under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), with biodiversity impacts addressed through the relevant certification framework. Detailed biodiversity investigations were undertaken between 2023 and 2024 and included vegetation mapping, habitat assessments, targeted threatened species surveys and aquatic habitat assessments. Surveys identified a highly modified road corridor containing generally low biodiversity values, reflecting the long history of disturbance associated with existing transport infrastructure and surrounding urban development.

Two Plant Community Types (PCTs) were identified across the broader study area, both of which are consistent with Threatened Ecological Communities (TECs) listed under the BC Act and/or EPBC Act. These include; the Cumberland Red Gum River Flat Forest (PCT4025) and Cumberland Shale Plain Woodland (PCT 3320). A PCT map is provided in Figure 2 which shows the State Vegetation Type Map (SVTM) layer. In addition to these PCTs, vegetation within the corridor includes planted native trees, landscaped native vegetation, mixed native-exotic riparian vegetation and areas dominated by exotic species. Aquatic habitat assessments identified Bells Creek as Class 2 (moderate) fish habitat, while an unnamed tributary was assessed as highly disturbed and representative of Class 3 (minimal) fish habitat.

Targeted surveys recorded six threatened species within the broader study area, comprising Juniper grevillea (*Grevillea juniperina* subsp. *juniperina*), Cumberland Plain land snail (*Meridolum corneovirens*), Eastern coastal free-tailed bat (*Micronomus norfolkensis*), *Miniopterus orianae oceanensis* (Large bent-winged bat), Southern myotis (*Myotis macropus*), and Grey-headed flying-fox (*Pteropus poliocephalus*). Subsequent assessments considered an additional suite of threatened flora and fauna species with a moderate or greater likelihood of occurrence. Threatened species locations and extents are shown in Figure 3.

The approved Project was assessed as requiring the removal of native vegetation and limited fauna habitat, predominantly occurring within a narrow and disturbed roadside corridor. No active breeding habitat for threatened fauna species was identified during previous investigations, and impacts were largely confined to foraging habitat and vegetation of relatively low habitat value. Biodiversity assessment outcomes concluded

that impacts could be appropriately managed through standard environmental controls and mitigation measures.

The road upgrade proposes the removal of up to 1.76 ha of native vegetation associated with these PCTs outside certified lands. The Project's Review of Environmental Factors (REF) (TfNSW 2024) summarised the potential biodiversity impacts associated with construction activities which was informed by biodiversity assessments, targeted threatened flora and fauna surveys.

Clearing and grubbing activities associated with these works will be undertaken in accordance with the TfNSW specifications G36 (TfNSW 2020a) and G40 (TfNSW 2020b) and will involve the;

- removal of hollow-bearing trees (HBTs)
- removal of other fauna habitat (including dense foliage, and other habitat features)
- changes to and removal of drainage
- removal and disposal of weed infestations
- selective pruning of amenity trees following a tree integrity assessment
- mulching of vegetated material not suitable for habitat salvage and reuse and free of contaminated weed matter.

The Project is not likely to result in significant impacts to threatened species or ecological communities protected under the State and Commonwealth legislation however the REF outlines environmental safeguards to manage potential impacts to threatened fauna and flora to include:

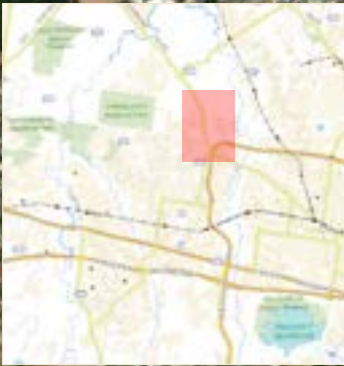
- The development of a Flora and Fauna Management Plan in accordance with Transport for NSW Biodiversity Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW 2024) and relevant State and Commonwealth legislations.
- Detailed design review wherever possible to further avoid and minimise impacts.
- Protection of aquatic habitat and watercourses in accordance with Guide 10: Aquatic habitat and riparian zones (TfNSW 2024).
- Pre-clearance surveys (this report) in accordance with Guide 1: Pre-clearing process (TfNSW 2024)
- Sensitive clearing of vegetation and habitat in accordance with Guide 4: Clearing of vegetation and removal of bushrock (TfNSW 2024).
- Re-establishment of native vegetation in accordance with Guide 3 Re-establishment of native vegetation (TfNSW, 2024).
- An unexpected finds procedure applied according to Biodiversity Guidelines (TfNSW 2024).
- A Tree and Hollow Replacement Plan would be developed, in accordance with the guidelines, to detail obligations under the Biodiversity Policy (TfNSW 2022).
- Habitat would be replaced or re-instated in accordance with Guide 5: Re-use of woody debris and bushrock and Guide 8: Artificial hollows of the Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects (TfNSW 2024)
- Management of fauna in accordance with Guide 9 Fauna handling.
- Management of weed species in accordance with Guide 6 Weed management.
- Management of pathogens in accordance with Guide 2: Exclusion zones.
- Management of Noise, light and vibration in accordance with Australian standards.

This report outlines the details of the pre-clearance survey undertaken of Area 4B of the Project site on the 03/07/2026 by NGH Ecologist and includes survey methodology, results and recommendations (Sections 2 and 3). Refer Figure 4 for map of Area 4B pre-clearance survey extent and results.



LEGEND

-  Project Boundary
-  Clearing Boundary



Datum: GDA2020 / MGA Zone 56



Richmond Road Upgrade Ecology Surveys

Figure 1 Richmond Road upgrade project location map



LEGEND

-  Project Boundary
-  Cumberland Red Gum Riverflat Forest (PCT 4025)
-  Cumberland Shale Plains Woodland (PCT 3320)
-  Exotic
-  Landscaped Natives
-  Mixed Native Exotic Instream Vegetation
-  Planted Native Vegetation

Datum: GDA2020 / MGA Zone 56





Datum: GDA2020 / MGA Zone 56



Ref: 260366 Richmond Road Upgrade Ecology Surveys \ Figure 4 Preclearance survey extent and results - Area 4B Author: Rebecca Sims-Castley Date created: 08.07.2026 © NGH 2026 © ESRI 2022



LEGEND

-  Project Boundary
-  Clearing Boundary
-  Lomandra species
-  Area 4B

Datum: GDA2020 / MGA Zone 56



Richmond Road Upgrade Ecology Surveys

Figure 4 Preclearance survey extent and results - Area 4B

2 Survey methods and results

A pre-clearance flora and fauna survey was conducted within Area 4B of the Richmond Road Project clearing boundary on the 03 July 2026, by NGH qualified Ecologist Tristan Varman. The site was assessed for the presence of threatened species, significant fauna habitat, breeding places and Priority weeds.

The survey also assessed the presence of the following:

- Matters of National and State Environmental Significance (MNES & MSES)
 - Threatened flora
 - Threatened fauna
- Significant habitat features
 - Animal breeding places (including HBTs)
 - Other habitat features
 - Opportunistic fauna observations and evidence of habitat use
- Significant weeds.

2.1 Matters of National and State Environmental Significance

2.1.1 Threatened flora

The Project Area 4B was surveyed for the presence of threatened flora species or vegetation communities listed under the EPBC Act and the BC Act.

No threatened flora species were observed within Area 4B of the Project clearing boundary, during the pre-clearance survey.

2.1.2 Threatened fauna

The Project Area 4B was surveyed for the presence of EPBC Act and BC Act listed threatened fauna species identified as occurring or considered likely to occur on site.

No threatened fauna species were observed within Area 4B of the Project clearing boundary, during the pre-clearance survey.

2.2 Significant habitat features

2.2.1 Confirmed breeding places

The Project Area 4B was assessed for the presence of animal breeding places. Confirmed breeding places were considered to be a bower, burrow, nest or other thing that is known to have been used by an animal to incubate or rear offspring.

No animal breeding places were located within Area 4B of the Project clearing boundary, during the pre-clearance survey.

2.2.2 Hollow bearing trees

The Project Area 4B was assessed for the presence of HBTs which are often used by fauna such as birds, possums, gliders and microbats as shelter and to incubate or rear offspring.

No HBTs were observed within Area 4B of the Project clearing boundary, during the pre-clearance survey.

2.2.3 Other significant habitat features

The Project Area 4B was assessed for the presence of habitat features additional to animal breeding places. Examples of fauna habitat features include fallen timber, piles of debris, aquatic habitat, culverts, dense or grassy vegetation, rocky habitat.

Two areas within Area 4B of the Project clearing boundary were noted to be densely vegetated with between 25-40 clumps of native *Lomandra sp.* presumably planted by Council to enhance the street verge. Clumps of grass can provide potential habitat for ground dwelling species e.g. lizards or nesting birds. A summary and example photographs are provided in Table 1.

Table 1 Other significant habitat features observed at the project area during the pre-clearance survey.

Feature	Approx no.	Potential habitat value provided	Location		Notes	Photos
			Latitude	Longitude		
Dense clumps of native <i>Lomandra</i> sp.	40	Potential refuge for mammals, birds, reptiles and amphibians. Potential breeding habitat for some birds.	-33.7162666	150.8434135	Hedged <i>Lomandra</i> sp. clumps. Area heavily disturbed and surrounding area is managed mowed grass.	

Feature	Approx no.	Potential habitat value provided	Location		Notes	Photos
			Latitude	Longitude		
Dense clumps of native <i>Lomandra</i> sp.	25	Potential refuge for mammals, birds, reptiles and amphibians. Potential breeding habitat for some birds.	-33.716598	150.8436475	Hedged <i>Lomandra</i> sp. clumps. Maintained area and heavily disturbed. Located near busy urban area with foot traffic. Creek in nearby proximity.	

2.2.4 Evidence of habitat use

The Project Area 4B was assessed for evidence of fauna activity. Fauna activity was considered to include:

- Fauna that is sighted or heard
- Diggings
- Animal tracks
- Fresh or high quantity scats.

No fauna activity was observed within Area 4B of the Project clearing boundary, during the pre-clearance survey.

2.3 Weed species location and management

2.3.1 Priority weeds & Weeds of National Significance (WoNS)

The Project Area 4B was assessed for the presence of pest plant species and significant infestations.

No Priority Weeds (for the Hawksbury local council area and regional strategic plan), listed under the *Biosecurity Act 2015* (NSW) (the Act) were noted as present within Area 4B of the Project clearing boundary, during the pre-clearance survey.

No Weeds of National Significance (WoNS) listed under the Australian National Weeds Strategy 2017-2027 (AWS), were noted as present within the Project clearing boundary, during the pre-clearance survey.

2.3.2 Weed management

Transport for NSW (TfNSW) have legislative obligations to manage weeds in accordance with the Act and the BC Act. This is outlined in Guide 6: Weed Management of the Biodiversity Management Guidelines (TfNSW 2024).

Key aspects of the construction activities on the Project site that could result in the introduction of weeds to the site, spread of weeds within the site, or transportation of weeds from the site, include:

- Movement of vehicles, plant, equipment and personnel on, off and around the Project site.
- Movement and stockpiling of weed infested topsoil.
- Clearing, grubbing and stockpiling of weed infested mulch.
- Inappropriate disposal of weeds.

Potential impacts associated with weeds at the Project site include:

- Spread of weeds into previously non-infested areas (both inside and outside the Project area).
- Degradation of native flora and fauna habitat, including remnant vegetation and TECs.
- Introduction of new weeds to the Project site

General mitigation measures to manage weeds include:

- Identification and mapping of Priority weeds occurring in construction areas prior to disturbance with monitoring occurring as part of the pre-clearance survey. This will determine “clean” and ‘infested’ construction zones to assist in weed management.

- Where Priority weeds are recorded within the disturbance footprint (including stockpile locations); treat or remove weeds progressively prior to construction commencing in each area, using appropriate weed management and disposal methods. Further information for individual species is available from NSW Weed Wise.
- Minimise any soil disturbance within weed infested areas.
- Topsoil recovered from areas of low weed infestation can be re-used onsite with treatment (composting) but should be stockpiled separately. After composting and a seed viability test shows no seed growth, the mulch can be used onsite subject to conformance with TfNSW QA Specification R178 - Vegetation.
- Training staff and contractors in weed identification and vehicle hygiene procedures. Location-specific EWMS (and associated mapping) will specify any weed issues and their management.
- Minimising vehicle movements across the Project site and securely cover loads of weed-contaminated material to prevent the spread of material during transportation.
- Restrict construction vehicles to existing tracks or access roads, where possible.
- Implementing weed hygiene protocols.
- Any imported soil is to be inspected and recorded as weed free and/or sourced from a weed free location
- Implementing vehicle hygiene procedures, including the utilisation of designated brush down and spray down areas.
- Ongoing weed control and monitoring.

3 Clearing mitigation measures

Key findings of the pre-clearance survey are outlined in Table 2 below. The following mitigation measures are recommended to be implemented during clearing activities, to address survey findings, and to ensure best practice clearing methods are carried out, in accordance with the methodology outlined below.

Table 2 Key findings from the pre-clearance survey at the Richmond Road (Area 4B) Project site.

Features	Type
Threatened flora	None observed
Threatened fauna	None observed
HBTs	None observed
Confirmed breeding places	None observed
Other significant habitat features	Native <i>Lomandra</i> sp. clumps
Animal activity	None observed
WoNS	None observed
Priority Weeds	None observed

3.1 Site preparation and training

Habitat removal and vegetation clearing are to be undertaken in accordance with TfNSW QA Specification G40: Clearing and Grubbing (TfNSW 2020b) and the TfNSW Biodiversity Guidelines: Protecting and Managing Biodiversity on Transport for NSW Projects (TfNSW 2024).

Biodiversity management during clearing provides a precautionary approach to mitigating potential impacts to threatened flora and fauna species, colonial breeders and animal breeding places.

Prior to vegetation clearing, it is confirmed:

1. Limits of clearing and exclusion zones are clearly defined by survey and marked at no more than 2 m intervals adjacent to any critical habitat or environmental high-risk areas and no more than 25 m intervals elsewhere on each side of the road formation and bridges shown on the design drawings. Refer also Guide 2: Exclusion zones of the Biodiversity Guidelines (TfNSW 2024).
2. All areas outside of the approved disturbance footprint especially in areas of dense vegetation or other high-risk areas (such as within riparian vegetation) are designated as no-go areas and protected as follows:
 - a) Plant operators to be made aware of vegetation disturbance footprint within their area of works via spatial data (if technology available) or to be walked through work area prior to commencement of operations or when entering a new working area.
 - b) Physical demarcation e.g. surveyor's pegs with brightly coloured flagging, temporary fencing (or equivalent) delineated the disturbance footprint. These are placed and located so that contractors can easily discern the area to be cleared.
 - c) Trees are felled away from retained vegetation, to ensure retained vegetation is not damaged.

- d) No materials are stockpiled and no vehicles parked or operated under the canopy of any trees marked for protection.
 - e) Excavation or the placing of fill near any protected tree must be avoided or by advice from an Ecologist.
 - f) Haul roads and access tracks must be routed clear of any protected tree canopy.
3. Habitat trees to be retained outside of the clearing zone are marked with TPZ fencing, to protect them throughout clearing.
 4. Watercourses and drainage lines are delineated and clearly marked.
 5. Any branch which overhangs the road formation, must be cut back flush with the tree trunk in accordance with AS 4373–2007 Pruning of Amenity Trees (TfNSW 2020).
 6. An Ecologist has undertaken a pre-clearance survey of the disturbance footprint in accordance with Guide 1: Preclearing process of the Biodiversity Guidelines (TfNSW, 2024), and where applicable had completed the following tasks (this report):
 - a) Confirmed the location of significant biodiversity features.
 - b) Check for the presence of threatened species, identified in the ecological assessment, as likely to occur within the project area.
 - c) Identify any potential fauna that may be disturbed during clearing activities.
 - d) All habitat features and hollow bearing trees within the disturbance footprint have been clearly marked for protection during clearing and details recorded.
 - e) Habitat features to be retained for relocation are marked and mapped accordingly.
 - f) Suitable fauna relocation sites are pre-determined.
 - g) Identified the species and location of any weeds growing within the area to be cleared and grubbed.
 7. A plan for the management of weeds is established if required.
 8. All contractors and employees involved in the clearing are trained via toolbox talks or pre-starts on the environmental risks and aspects to be considered during clearing. This includes:
 - a) Sensitive clearing technique
 - b) Threatened species
 - c) Habitat tree salvage and relocation
 - d) Exclusion zones.

3.2 Clearing and grubbing

Clearing and grubbing to be undertaken in accordance with the TfNSW QA Specification G40 (TfNSW 2020b) and the Biodiversity Guidelines: Guide 4 – Clearing of Vegetation and Removal of Bushrock (TfNSW, 2024). The vegetation within the proposed disturbance area is highly modified and provides limited habitat value for native fauna. While clumps of *Lomandra* sp. are present and may provide opportunistic shelter for small fauna, the overall likelihood of fauna occupancy at the time of clearing is considered low.

Given the low habitat value of the impact area and low potential for fauna to be present, ecological supervision during clearing is not considered necessary. However, clearing should be undertaken in a staged and environmentally sensitive manner to allow any fauna that may be present to disperse from the work area.

The following measures are recommended during clearing and grubbing:

1. Clearing and grubbing must be restricted to the approved limits of disturbance, which should be clearly delineated prior to works commencing.
2. Vegetation should be removed progressively, commencing from the edges of the impact area and moving toward adjacent retained vegetation where practicable, to encourage fauna to move away from the works area.
3. *Lomandra* sp. clumps should be visually inspected by the GDJV Environmental team clearing contractor immediately prior to removal. If any native fauna is encountered, works in the immediate vicinity should cease and the animal allowed to self-disperse or be managed in accordance with applicable fauna handling procedures.
4. Any non-cleared native vegetation adjacent to the work area should be protected from accidental disturbance.
5. Standard erosion and sediment control measures should be implemented prior to and during clearing activities in accordance with Projects Progressive Erosion and Sediment Control Plan.
6. Vegetation stockpiles should be left in situ for 24 hours to allow animals to relocate then not be left undisturbed for extended periods to minimise the likelihood of native fauna using the material as habitat. Where vegetation stockpiles have remained undisturbed for more than 48 hours, it is recommended that an FSC/Ecologist inspect the stockpile prior to removal to identify and manage any fauna that may be present. This recommendation is consistent with the intent of the TfNSW Biodiversity Guidelines (TfNSW 2024), which seek to minimise opportunities for stockpiled vegetation to become habitat for fauna and to ensure fauna occupying habitat features are appropriately managed during clearing activities.

3.3 Handling wildlife

Wildlife handling and management should be undertaken in accordance with Guide 9: Fauna Handling of the TfNSW Biodiversity Guidelines (TfNSW 2024). Given the low likelihood of fauna occurring within the disturbance area, direct handling of wildlife is not anticipated. No routine fauna salvage or ecological supervision is considered necessary for the proposed clearing works due to the low habitat value of the impact area and low likelihood of fauna occupancy. However, if fauna is encountered during clearing works, the following measures should be implemented:

1. Where fauna is encountered, works in the immediate vicinity should cease and the animal should be given the opportunity to self-relocate naturally from the work area.
2. If an animal does not disperse independently, the Site Supervisor should be notified and advice sought from the project environmental representative. Where required, a suitably qualified FSC or Ecologist may attend site to assess the situation and assist with the safe relocation of fauna.
3. Any injured wildlife must be reported immediately to the Site Supervisor. Injured or orphaned animals are to be transferred to WIRES or another suitably licensed wildlife rehabilitation organisation for treatment and care.
4. Unexpected fauna encounters are to be recorded and communicated to the Site Supervisor and environmental personnel in accordance with project environmental procedures.

3.4 Post clearing

As Area 4B is considered low-quality fauna habitat with no FSC required to supervise clearing, upon completion of works a post clearance survey will be undertaken by GDJV, to confirm hold points have been satisfied and that clearing activities are compliant with the Project's conditions of approval.

3.4.1 Threatened fauna – unexpected find procedure

1. In the instance that a new threatened species is encountered on site (i.e. species that has not been recorded during previous fauna surveys), vegetation clearing in that area must cease, and the Ecologist must inform the Site Manager immediately.
2. The principal will facilitate contact with the appropriate authority in relation to a required course of action.
3. Clearing of the specific area of concern will not recommence until approval has been granted by the relevant agency.

4 References

Transport for NSW (TfNSW) (2020a), *IC-QA-G36 Environmental Protection*, Edition 4 Revision 8, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2020b), *IC-QA-G40 Clearing and Grubbing*, Edition 1 Revision 2, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2022), *Biodiversity Policy*, Policy No. CP22004, Transport for NSW, Sydney, NSW.

Transport for NSW (TfNSW) (2024), *Biodiversity Management Guidelines: Protecting and managing biodiversity on Transport for NSW projects*. EMF-BD-GD-0039. Transport for NSW, Sydney, NSW.

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