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Gwynneville Estate - Preliminary Biodiversity Assessment

Homes NSW

20 February 2025





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Preliminary Biodiversity Assessment

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Prepared for:

Homes NSW

Prepared by:

Stantec Pty Ltd.



GWYNNEVILLE PRECINCT REDEVELOPMENT: PRELIMINARY BIODIVERSITY ASSESSMENT

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GWYNNEVILLE PRECINCT REDEVELOPMENT: PRELIMINARY BIODIVERSITY ASSESSMENT

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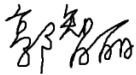
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GWYNNEVILLE PRECINCT REDEVELOPMENT: PRELIMINARY BIODIVERSITY ASSESSMENT

The Gwynneville precinct has been identified as a location capable of supporting more social, affordable and diverse private market housing for the Illawarra community, and to contribute to addressing NSW's housing crisis.

The site currently comprises approximately 131 residential lots, consisting of:

- A total of 79 social dwelling units on 75 individual lots owned by Homes NSW; and
- Approximately 56 privately owned dwelling units on 56 individual lots.

Over 60% of the homes in the precinct are owned by Homes NSW, providing an opportunity to consider additional density while taking into account key constraints such as traffic, views to and from Mount Keira as well potential to increase and embellish existing areas of open space.

Redevelopment of the Gwynneville precinct requires a formal rezoning process to confirm an amended land use zone; increased FSR and building heights, and result in improvements to the current street network, pedestrian connectivity, open space / parkland, and public amenity.

Homes NSW propose amending the Wollongong Local Environmental Plan 2009 (WLEP) to help deliver a diverse range of housing typologies which will include additional social and affordable housing, market housing products and seniors housing, as well as opportunities to develop build-to-rent, key worker housing and student accommodation.

The planning proposal intends to change the current zone of the land from R2 Low Density Residential to R4 High Density Residential, with new and expanded areas of RE1 Public Recreation. This will create the opportunity for more low to mid- rise apartments in the precinct.

The base FSR of 0.5:1 and the height control of 9 m that currently applies to the precinct is not proposed change. However, building height and FSR incentives will facilitate site amalgamation to create lots more capable of accommodating increased density and providing amenity. Height and FSR bonuses will be contingent upon achieving design excellence outcomes, providing public benefits such as social and affordable housing, and increased public open space within the precinct.

Homes NSW aims to create a high-amenity, walkable residential neighbourhood with an increased density and choice of affordable and diverse housing options that provide for a broad range of community needs and family types - including students, people on low incomes, people with disability and seniors.

New residential development will enable increased housing choices within in a well-connected location benefiting from frequent free shuttle bus services operating between University of Wollongong, North Wollongong railway station and a multitude of destinations including the city centre and hospital.



Executive Summary

This Preliminary Biodiversity Assessment (PBA) has been prepared on behalf the Homes NSW to support a planning proposal to amend the Wollongong Local Environmental Plan 2009 to accommodate urban renewal of land at Gwynneville, NSW. The redevelopment of the Gwynneville precinct will require rezoning to facilitate an amended land use zone; increased floor space ratio and building heights, and result in improvements to the current street network, pedestrian connectivity, open space / parkland, and public amenity. This PBA focuses on determining what biodiversity values are present on site.

The PBA included a desktop review of relevant information and a site inspection to ground-truth vegetation mapping to support the identification of key ecological values within the Study Area. The Study Area contains one Plant Community Type (PCT), PCT 3153- Illawarra Escarpment Bangalay x Blue Gum Wet Forest. No Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act 2016* (BC Act) or the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) occurred within the Study Area.

Common native fauna species were identified within the Study Area during the site inspection. Predominately, birds were observed foraging or transiting through. One threatened bird species was detected during the site inspection, a little lorikeet (*Glossopsitta pusilla*). No threatened flora species were detected during the site inspection.

A likelihood of occurrence assessment was conducted and found eight species that had at least a moderate likelihood of occurring within the Study Area and could potentially use the available habitat within the Study Area. These species were: gang-gang cockatoo (*Callocephalon fimbriatum*), little lorikeet (*Glossopsitta pusilla*), little bent-winged bat (*Miniopterus australis*), large bent-winged bat (*Miniopterus orianae oceanensis*), grey-headed flying fox (*Pteropus poliocephalus*), knotweed (*Persicaria elatior*) rufous fantail (*Rhipidura rufifrons*) and yellow-bellied sheath-tail-bat (*Saccolaimus flaviventris*).

The riparian zone and surrounding vegetation in the south of the Study Area present the highest ecological value in the Study Area, however, remnant and planted vegetation throughout the Study Area may also be important for fauna.

The revised masterplan (Gyde, 2025) has not altered the conclusion and recommendations found within this report.



Recommendations

1.1.1 CONCEPT DESIGN

The Concept design proposed in the Gyde (2025) plans, proposed an east to west 'Green Spine' across the central area of the Study Area. This environmental measure would see an improvement to habitat connectivity and biodiversity corridors to maintain that transient habitat for species such as the Little Lorikeet (*Glossopsitta pusilla*). The plan would seek to expand on the riparian zone within Spearing Reserve and retain and increase the number of street trees within the Study Area. These measures would ensure that a significant impact to locally occurring threatened species would be unlikely from the implementation of the Projects concept design.

1.1.2 GENERAL

As this assessment is informing a Planning Proposal and the extent of the proposed works is currently at a concept stage, Stantec have provided general recommendations as to what could be done to assist with planning for the proposed development. Proponents of any proposed project should, as a priority, aim to avoid impacts upon biodiversity values as a general principle. Where avoidance is impossible or impractical, proponents should then aim to minimise impacts. Further detail of this process is given below:

Avoid: Modify the project so no significant impact on resident biodiversity values would occur. This is typically impractical, especially given the already developed nature of the Study Area but can help guide mitigation measures.

Minimise: Modify the project to reduce the significant impacts on biodiversity values to the maximum extent possible. This is typically achieved through measures such as modification of proposed development footprint to avoid removing vegetation and areas with high biodiversity value.

Mitigate: Include measures for the proposed development to manage potential impacts to biodiversity values present within the Study Area and the locality. Measures for rezoning may include the installation of sediment fencing to avoid sediment migration to downstream environments, pre-clearance surveys and measures to avoid the introduction of weed and novel biota contaminated in fill, etc.

1.1.3 FURTHER ASSESSMENT

A future Part 4 development (under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) has three triggers that may require the proponent to enter into the BOS through a Biodiversity Development Assessment Report (BDAR):

- **Clearing of native vegetation on land mapped on the Biodiversity Values (BV) map:** A review of the Biodiversity Values Map and Threshold Tool (BVMATT) on July 2024 shows the Study Area does not contain any mapped biodiversity values land.
- **Clearing thresholds are exceeded for the subject land:** The clearing threshold is 0.25 ha for the Study Area.
- **There is likely to be a significant impact on any threatened species, population and/or community:** The impacts associated with the Concept Plan (Gyde, 2025) it is considered unlikely that the rezoning and development would lead to a significant impact on any threatened species.



GWYNNEVILLE PRECINCT REDEVELOPMENT: PRELIMINARY BIODIVERSITY ASSESSMENT

If the final re-development footprint requires removal of native vegetation an assessment of triggers to the biodiversity offsets scheme (BOS) would be required. Where the BOS is triggered, preparation of a BDAR by an Accredited Assessor as per the Biodiversity Assessment Method (BAM) may be required.

Should entry into the BOS be a requirement for development approval, the BAM – Calculator would identify a list of ‘Candidate Species’ to which would require consideration in the BDAR. The following methods of assessment may be considered when applying the BAM to Candidate Species:

- Targeted surveys in accordance with relevant State and Commonwealth survey guidelines.
- Expert report.
- Assumed presence.

It should be noted that under the BC Act, the Little Lorikeet (*Glossopsitta pusilla*) is considered an ecosystem credit species and targeted surveys in accordance with the Biodiversity Assessment Method (BAM) are not required should entry into the Biodiversity Offsets Scheme (BOS) be required for the project.

Stantec also recommend the following additional requirements:

- Weed management is implemented to prevent the spread of exotic species.
- Further ecological assessment is to be undertaken subsequent to finalisation of the proposed development footprint and design which may require entry into the BOS.
- As far as practicable, any proposed development should avoid the riparian zone and surrounding Illawarra Escarpment Bangalay x Blue Gum Wet Forest in the south of the Study Area.
- As far as practicable, remnant trees and large planted native trees should be retained.

The revised masterplan (Gyde, 2025) has not altered the conclusion and recommendations found within this report.



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Abbreviations

AOBV	Area of Outstanding Biodiversity Value
AoS	Assessment of Significance
asl	Above Sea Level
BC Act	NSW Biodiversity Conservation Act 2016
Bio Act	NSW Biosecurity Act 2015
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
FM Act	Fisheries Management Act 1994
HTW	High Threat Weed
IBRA	Interim Biogeographic Regionalisation for Australia
LEP	Local Environmental Plan
LGA	Local Government Area
PBA	Preliminary Biodiversity Assessment
PCT	Plant Community Type
PW	Priority Weed
TEC	Threatened Ecological Community
ToS	Test of Significance
WoNS	Weed of National Significance



2.0 INTRODUCTION

2.1 BACKGROUND

Homes NSW, proposes to rezone the Gwynneville Precinct to facilitate an amended land use zone; increased floor space ratio and building heights and likely improvements to the current street network and public amenity. The amended controls will facilitate the delivery of a diverse range of housing typologies which will include additional social and affordable housing, market housing products and seniors housing, as well as opportunities to develop build-to-rent and student accommodation. The proposal will allow for approximately 1,250 dwellings, 50% of which will be social and affordable housing. This Preliminary Biodiversity Assessment (PBA) is required to inform the planning proposal for this rezoning.

The planning proposal was submitted to Wollongong City Council on 19 July 2024, which was then placed on preliminary notification for public and agency comment. Following this notification period, Council and Homes NSW worked together to establish key amendments to the proposal and master plan that formed the basis of the reporting to Council in November 2024. The planning proposal was unanimously approved by Council on 25 November 2024 to proceed to the next step in the approval process, i.e. Gateway Determination. The revised proposal and masterplan included revisions which relate to key sites and implementation, built form outcomes, and public open space delivery. This report has been updated to reflect the outcomes of the amended planning proposal and master plan, current as at February 2025.

A Concept Plan showing a proposed layout has been prepared by Gyde (2025) to form the basis of the Planning Proposal. The Concept Plan is shown below in **Plate 1**.



Plate 1 Concept Plan (Gyde Consulting, 2025)



2.2 STUDY AREA

The Study Area is located in Gwynneville, NSW, a suburb approximately 2km north-west of the Wollongong CBD. Study Area specific particulars are summarised in **Table 1**.

Table 1 Study Area Particulars

Attribute	Study Area Particular
Locality	The Study Area is located in Gwynneville, a suburb approximately 2km north-west of Wollongong CBD (Figure 1)
LGA	Wollongong
LEP	The Study Area is included within the Wollongong Local Environmental Plan 2009.
Land Use Zone	The majority of the Study Area is zoned R2- Low Density Residential. Sparring Reserve, on the southern edge of the Study Area, is zoned RE1- Public Recreation.
Study Area	11.26 ha
Current Land Use	The Study Area contains mostly single storey residential dwellings. There is a public park in the south of the Study Area.
Topography	The Study Area gently rises from 10m asl at the south-east corner to 30m asl at the north-west corner.
Interim Biogeographic Regionalisation for Australia (IBRA) bioregion and subregion	IBRA region: Sydney Basin IBRA subregion: Illawarra
NSW landscape regions (Mitchell landscapes)	Lake Illawarra Barrier
Watercourses and Waterbodies	An unnamed first order stream flows though the southern edge of the Study Area.
Geology	The Study Area occurs on fine-to-medium grained bioturbated andesitic sandstone and alluvium, gravel beach and dune sand.
Conservation Reserves	The Study Area is adjacent to the Wollongong Botanic Gardens which, while not a conservation reserve, does assist in the conservation of native flora. The Illawarra Escarpment State Conservation Area is the closest conservation reserve, approx. 1.5km away.
Connectivity features	The Study Area is in a heavily developed urban area and does not have any direct connectivity.
Areas of Outstanding Biodiversity Value (AOBVs)	There are four declared areas of outstanding biodiversity value (AOBV) in NSW: • Gould's Petrel; • Little Penguin population in Sydney's North Harbour; • Mitchell's Rainforest Snail in Stotts Island Nature Reserve; and • Wollemi Pine. The Little Penguin population in Sydney's North Harbour; is the closest AOBV to the Study Area, approximately 75km away.
Local Land Services (LLS) Region	South East LLS region for application of the NSW Biosecurity Act 2015.



2.3 SCOPE OF WORKS

This PBA aims to identify biodiversity values present within the Study Area and identify constraints and opportunities for repurposing the site and provide advice on assessment pathways and requirements in accordance with State and Commonwealth legislative obligations.

The PBA addresses the following legislative planning requirements relevant to biodiversity:

- Determine presence and assess proposal impacts to threatened species, populations or threatened ecological communities (TECs) listed under the NSW *Biodiversity Conservation Act 2016* (BC Act), *Fisheries Management Act 1994* (FM Act) and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) in the Study Area
- Biosecurity obligations under the NSW *Biosecurity Act 2015* (Bio Act) for Priority Weeds for the South East region.



3.0 METHODOLOGY

3.1 DESKTOP REVIEW

A desktop review was undertaken to identify current records of threatened flora, fauna and ecological communities, migratory species, and Key Threatening Processes (KTP) within 5 km of the Study Area (i.e. the locality). This included searches of online databases and a review of available spatial data and literature relevant to the Study Area, including:

- Existing vegetation mapping as available in NSW BioNet Vegetation Information System;
- Local threatened species records within the NSW BioNet Atlas;
- Relevant Threatened Ecological Community (TEC) description and assessment guidelines (DEC, 2004; DPE, 2021);
- Freshwater threatened species distribution mapping (DPI, 2021);
- Predicted Matters of National Environmental Significance (MNES), including threatened species and ecological communities as per the Commonwealth's Protected Matters Search Tool (PMST);
- The Commonwealth Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (GDE) (BOM, 2023b) and;
- Other relevant literature for the Study Area and its surrounds.

3.2 FIELD SURVEY

A field survey of the Study Area was undertaken on 19 May 2023. The site inspection was informed by the desktop findings and a summary of the survey effort and environmental conditions during the field survey is presented in **Table 2** and **Table 3**.

Table 2 Site Inspection Effort

Date	Staff	Hours	Survey Method	Survey Effort
19/05/2023	Ecologists: Dane Fogliada and Jackson McCutchen	4	Random Meander (RM), Rapid Biodiversity Assessment (RBA), Vegetation integrity plots, Diurnal Bird Survey, opportunistic observations	8 hours

Table 3 Environmental Conditions During Site Inspection

Date	Temperature (°C)		Rainfall (mm)	Other Observations
	Minimum	Maximum		
19/05/2023	10.7	16.9	0.0	N/A
Data as per Bureau of Meteorology (BOM) nearest meteorological station (Station 068228 Bellambi AWS at				

3.2.1 SURVEY METHODS

3.2.1.1 RANDOM MEANDER AND RAPID ASSESSMENT

A Random Meander (RM) and Rapid Biodiversity Assessment (RBA) was conducted to ground-truth vegetation mapping and identify potential habitat in the Study Area. Biodiversity values and conditions within the Study Area were recorded. Field data was used to generate an updated map of the vegetation communities in the Study Area. Incidental flora observations were also recorded.

Fauna habitat features were collected as part of the site inspections. The availability and quality of habitat within the Study Area was assessed with respect to the following factors:

- Flora diversity and structure;
- Type and extent of habitat types;
- Habitat connectivity, including continuity with similar habitats within the Study Area;
- Occupancy of key habitat features including hollow-bearing trees and creeks, where possible;
- Degree of disturbance and degradation; and
- Topographic features such as aspect and slope.

Fauna encountered opportunistically during the site inspection were also recorded.

3.2.1.2 DIURNAL BIRD SURVEY

A diurnal bird survey was completed in accordance with the 'Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Draft' (DEC, 2004). The diurnal survey consisted of ecologists conducting an area search of approximately two hectares for at least 20 minutes whilst actively listening and looking for bird species. The diurnal bird survey was completed before 9am to optimise detection.

3.2.1.3 VEGETATION INTEGRITY PLOT

A vegetation integrity plot was carried out in the native vegetation in Spearing Reserve in the south of the Study Area in accordance with Biodiversity Assessment Method 2020 Operational Manual – Stage 1 (DPE, 2020). This consisted of a 50m x 20m plot to assess vegetation structure and a nested 20m x 20m plot where all vascular plants were identified. This allowed for the assignment of a Plant Community Type (PCT).

3.3 SURVEY LIMITATIONS

The methodology presented here provides a limitation on describing the biodiversity values of the Study Area. The biodiversity values of the Study Area recorded from this site inspection should not be seen as a complete/comprehensive inventory.

The site inspection has sampled the Study Area at a point in time. A period of several seasons or years is often required to identify all species in an area. Given the short period of time spent on site, the detection of certain species may be affected by:



- Seasonal migration (particularly migratory birds);
- Seasonal flowering periods (some species are cryptic and are unlikely to be detected outside of the known flowering period);
- Seasonal availability of food, such as blossoms for some fauna;
- Weather conditions during the survey period (some species may go through cycles of activity related to specific weather conditions, for example some microbats, reptiles and frogs can be inactive during cold weather); and
- Species lifecycle (cycles of activity related to breeding).

These potential limitations have been addressed by applying the precautionary principle in cases where the survey methodology may have given a false negative result (e.g., a species that could reasonably be expected to occur, based on previous records and available habitat, was not observed). All species have been assessed on the basis of the presence of suitable habitat and the likely significance of that habitat to support a viable local population.

The vegetation extent within the Study Area has been mapped as accurately as possible, although some boundary errors may still exist. The vegetation within the Study Area has been assigned to the most likely Plant Community Type (PCT) described in the BioNet Vegetation Classification database. In many cases there are no sharp boundaries defining the transition between PCTs and communities are naturally variable. The vegetation boundaries on the Study Area have been mapped as best as possible based on observations during the site inspection and based on aerial imagery. It is likely that the boundaries of PCTs and vegetation zones will change with time and in response to long-term variation in environmental conditions such as rainfall, surface drainage patterns and anthropogenic disturbance.

3.3.1 LIMITED SITE ACCESS

This site inspection was conducted in the publicly accessible areas within the Study Area and, as a result, may have not detected native flora, fauna, or habitat features present in the private residences within the Study Area.



4.0 DESKTOP RESULTS

4.1 DESKTOP SEARCHES AND LITERATURE REVIEW

4.1.1 BIONET ATLAS SEARCH

The results from the BioNet Atlas database search (**Appendix A**), undertaken on 15 July 2024, indicated that 75 threatened or migratory species have been recorded within 5 km of the Study Area, including three amphibians, 44 birds, 14 mammals, four reptiles, and 10 flora species.

4.1.2 PROTECTED MATTERS SEARCH TOOL

The results of the Commonwealth EPBC Protected Matters Search Tool (PMST), undertaken on the 15 July 2024, indicated that three Matters of National Environmental Significance (MNES) are predicted to occur within the 5km locality, as listed in **Table 4**.

The full PMST report is provided in **Appendix B**.

Table 4 Predicted Matters of National Environmental Significance.

MNES	Applicability to the Study Area	Addressed in:
World Heritage Places	Not identified within the Study Area.	NA
National Heritage Places	Not identified within the Study Area.	NA
Wetlands of International Importance	Not identified within the Study Area.	NA
Great Barrier Reef Marine Park	Not identified within the Study Area.	NA
Commonwealth Marine Area	Not identified within the Study Area.	NA
Threatened Ecological Communities (TECs)	Six TECs are predicted as likely or known to occur within the 5km locality: - Coastal Swamp Oak (<i>Casuarina glauca</i>) Forest of New South Wales and South East Queensland ecological community– listed as endangered under the EPBC Act; - Coastal Upland Swamps in the Sydney Basin Bioregion– listed as endangered under the EPBC Act; - Illawarra and south coast lowland forest and woodland ecological community- listed as critically endangered under the EPBC Act; - Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion- listed as critically endangered under the EPBC Act; - River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria- listed as critically endangered under the EPBC Act; and - Subtropical and Temperate Coastal Saltmarsh– listed as vulnerable under the EPBC Act.	Further assessment is presented in Section 4.2.



MNES	Applicability to the Study Area	Addressed in:																																													
Threatened Species	A total of 112 listed threatened species were predicted to occur within the 5km locality, as per the table below. <table> <tr> <th>Group</th><th colspan="4">Number of species predicted</th></tr> <tr> <td></td><td>Conservation Dependent</td><td>Vulnerable</td><td>Endangered</td><td>Critically Endangered</td></tr> <tr> <td>Birds</td><td>-</td><td>31</td><td>12</td><td>5</td></tr> <tr> <td>Fish</td><td>2</td><td>2</td><td>2</td><td>-</td></tr> <tr> <td>Frogs</td><td>-</td><td>3</td><td>2</td><td>-</td></tr> <tr> <td>Mammals</td><td>-</td><td>6</td><td>7</td><td>-</td></tr> <tr> <td>Plants</td><td>-</td><td>12</td><td>14</td><td>3</td></tr> <tr> <td>Reptiles</td><td>-</td><td>3</td><td>3</td><td>-</td></tr> <tr> <td>Sharks</td><td>2</td><td>2</td><td>-</td><td>1</td></tr> </table>	Group	Number of species predicted					Conservation Dependent	Vulnerable	Endangered	Critically Endangered	Birds	-	31	12	5	Fish	2	2	2	-	Frogs	-	3	2	-	Mammals	-	6	7	-	Plants	-	12	14	3	Reptiles	-	3	3	-	Sharks	2	2	-	1	Further assessment is presented in Section 4.2.
Group	Number of species predicted																																														
	Conservation Dependent	Vulnerable	Endangered	Critically Endangered																																											
Birds	-	31	12	5																																											
Fish	2	2	2	-																																											
Frogs	-	3	2	-																																											
Mammals	-	6	7	-																																											
Plants	-	12	14	3																																											
Reptiles	-	3	3	-																																											
Sharks	2	2	-	1																																											
Migratory Species	A total of 60 migratory species were predicted to occur within the 5km locality.	Further assessment is presented in Section 4.2.																																													

4.1.3 GROUNDWATER DEPENDENT ECOSYSTEMS

The level of groundwater dependence of PCTs in the subject land has been determined using the Atlas of Groundwater Dependent Ecosystems (GDE) (BOM, 2023b). The Atlas of Groundwater Dependent Ecosystems provides broad-scale mapping of potential GDEs and has been used with contemporary, location-specific data collected as part of this PBA to determine the presence of GDEs. PCT characteristics, including vegetation class based on the Ocean Shores to Desert Dunes: The Native Vegetation of New South Wales and the ACT (Keith, 2004), were used to determine and categorise GDEs in the Study Area.

There are no terrestrial GDEs identified in the locality. Therefore, it is unlikely that any GDEs would be directly impacted by the proposal.

4.1.4 LOCAL VEGETATION MAPPING

No PCT are mapped within the Study Area within the NSW State Vegetation Type Map (SVTM) (DPE, 2022)

4.2 LIKELIHOOD OF OCCURRENCE

4.2.1 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

three MNES are various TECs, threatened species and migratory species. This information, along with local knowledge and information gathered from the Study Area during the site inspection was used to assess the likelihood of occurrence on MNES (**Appendix D**). Any MNES with the potential to be impacted by the proposed development must be subject to Assessment of Significance (AoS), under the EPBC Act, which would determine if the proposal would result in significant impacts. Given that the final project design is yet to be defined, likely impacts on these species will require further assessment based on the final project design footprint and to determine if significant impacts are likely to occur.

4.2.1.1 LISTED THREATENED ECOLOGICAL COMMUNITIES

The PMST indicated that six TECs were potentially present within the 5km locality:

- Coastal Swamp Oak (*Casuarina glauca*) Forest of New South Wales and South East Queensland ecological community– listed as endangered under the EPBC Act;
- Coastal Upland Swamps in the Sydney Basin Bioregion– listed as endangered under the EPBC Act;
- Illawarra and south coast lowland forest and woodland ecological community- listed as critically endangered under the EPBC Act;
- Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion- listed as critically endangered under the EPBC Act;
- River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria- listed as critically endangered under the EPBC Act; and
- Subtropical and Temperate Coastal Saltmarsh– listed as vulnerable under the EPBC Act.

None of these TEC are associated with PCT 3153- Illawarra Escarpment Bangalay x Blue Gum Wet Forest. These TEC were identified as being unlikely to occur in the Study Area due to a lack of associated PCTs, lack of characteristic trees and/or suitable habitat. As none of the TEC were determined to have a likelihood of occurrence of moderate or higher, no AOs/ToS were conducted.

4.2.1.2 LISTED THREATENED SPECIES

The PMST indicated that 112 threatened species, listed under the EPBC Act, are known, or predicted to occur within the 5km locality. The threatened species included 48 bird, six fish, five frog, 13 mammal, 29 plant, six reptile, and five shark species.

A likelihood of occurrence assessment was undertaken on 112 threatened species, listed under the EPBC Act (**Appendix D**). Three EPBC listed threatened species were considered to have a moderate or higher likelihood of occurrence within the Study Area (**Table 5**).

4.2.1.3 LISTED MIGRATORY SPECIES

The PMST report indicated that 60 migratory species are known or predicted to occur within the 5km locality. The Rufous Fantail (*Rhipidura rufifrons*) was the only migratory species considered to have a moderate or higher likelihood of occurrence within the Study Area (**Appendix D**). Any listed migratory species likely to be impacted by the proposed development must be

will require further assessment based on the final project design footprint and to determine if significant impacts are likely to occur.

4.2.2 THREATENED SPECIES, POPULATIONS AND ECOLOGICAL COMMUNITIES

Threatened biodiversity (e.g., TECs, threatened species and their habitats) listed under the BC Act and EPBC Act with known records within 5km of the Study Area was determined using the BioNet Atlas (**Appendix A**) and the PMST (**Appendix B**). Subsequent to site inspections, an assessment of likelihood of occurrence was undertaken for all threatened biodiversity identified with potential to occur within 5km of the Study Area (**Appendix D**). Generally, threatened biodiversity identified in the assessment as having a moderate or higher ranking are subject to further analysis of significance.

A total of 7 threatened species and (**Table 5**) have been identified as having moderate, high or known likelihood of occurrence. Any threatened entity likely to be impacted by the proposed development must be subject to an analysis of significance (i.e., Test of Significance (BC Act) and/or Assessment of Significance (EPBC Act)) which would determine if the proposal would result in significant impacts. Given that the final project design is yet to be defined, likely impacts on these species will require further assessment based on the final project design footprint and to determine if significant impacts are likely to occur.

Table 5 Threatened Species with a Moderate or Higher Likelihood of Occurrence

Species	BC Act	EPBC Act	Likelihood of occurrence
Birds			
Gang-gang Cockatoo (<i>Callocephalon fimbriatum</i>)	V	E	Moderate
Little Lorikeet (<i>Glossopsitta pusilla</i>)	V	-	Known
Mammals			
Little Bent-winged Bat (<i>Miniopterus australis</i>)	V	-	Moderate
Large Bent-winged Bat (<i>Miniopterus orianae oceanensis</i>)	V	-	Moderate
Grey-headed flying fox (<i>Pteropus poliocephalus</i>)	V	V	Moderate
Yellow-bellied Sheath-tail-bat (<i>Saccolaimus flaviventris</i>)	V	-	Moderate
Flora			
Knotweed, Tall Knotweed (<i>Persicaria elatior</i>)	V	V	Moderate
V- Vulnerable, E- Endangered, CE- Critically End			

5.0 FIELD SURVEYS

5.1 VEGETATION

The extents of each vegetation type located within the Study Area is given in **Table 6** below and illustrated in **Figure 2**. Descriptions of the vegetation types are provided in the sections below.

Table 6 Vegetation Types within the Study Area (Stantec 2023)

Vegetation Type	PCT	Potential TEC	Area within Study Area (ha)
PCT 3153	Illawarra Escarpment Bangalay x Blue Gum Wet Forest	No associated TEC	0.50
Remnant Native Vegetation	-	-	0.11
Planted Native Vegetation	-	-	0.22
Planted Native and Exotic Vegetation	-	-	0.99
Total Area			1.82



5.2 FLORA SPECIES

A total of 68 flora species were recorded within the Study Area, including 38 native species (56%) and 30 exotic species (44%) across 33 families. A full list of flora species recorded during the site inspection is provided in **Appendix C**.

No threatened flora species were detected within the Study Area during the site inspection.

5.2.1 WEEDS

A total of 30 exotic species were recorded within the Study Area during the site inspection. This included 11 exotic species which have been listed at a State and/or Commonwealth level. The following identifies weed categorisation and legislative context of each species:

- Priority Weed (PW) – Identified by Local Land Services (LLS) for each LLS Region under the NSW *Biosecurity Act 2015*. The Study Area falls in the North Coast LLS Region. Each species identified has specific biosecurity duties to be considered;
- Weeds of National Significance (WoNS) – Identified in the National Weeds Strategy 2017-2027 (2016) by the Commonwealth Government; and
- High Threat Weeds (HTW) – Identified in the Biodiversity Assessment Method (BAM) under the *Biodiversity Conservation Act 2016*.

Table 7 identifies these species and their legislative context.

Table 7 State and/or Commonwealth Listed Exotic Species

Species Name	Common Name	Legislative Context		
		PW	WoNS	HTW
<i>Arundo donax</i>	Giant Reed	-	-	✓
<i>Asparagus aethiopicus</i>	Asparagus fern	✓	✓	✓
<i>Bidens pilosa</i>	Cobbler's Pegs	-	-	✓
<i>Colocasia esculenta</i>	Taro	-	-	✓
<i>Erharta erecta</i>	Panic Veldtgrass	-	-	✓
<i>Hedera helix</i>	English Ivy	-	-	✓
<i>Lantana camara</i>	Lantana	✓	✓	✓
<i>Ligustrum lucidum</i>	B			

5.3 FAUNA SPECIES

A total of 20 fauna species were detected within the Study Area during the site inspection (**Table 8**). Most species detected were native (80%). One threatened fauna species was detected during the site inspection, a Little Lorikeet (*Glossopsitta pusilla*).

Table 8 Fauna Species Detected During the Site Inspection

Class	Family	Scientific Name	Common Name	BC Act	EPBC Act
Actinopterygii	Poeciliidae	<i>Gambusia holbrooki</i>	Plague Minnow*	-	-
Aves	Artamidae	<i>Cracticus tibicen</i>	Australian Magpie	-	-
Aves	Artamidae	<i>Cracticus torquatus</i>	Grey Butcherbird	-	-
Aves	Cacatuidae	<i>Cacatua galerita</i>	Sulphur-crested Cockatoo	-	-
Aves	Cacatuidae	<i>Zanda funerea</i>	Yellow-tailed Black Cockatoo	-	-
Aves	Climacteridae	<i>Coracina novaehollandiae</i>	White-throated Tree Creeper	-	-
Aves	Columbidae	<i>Columbidae sp.</i>	Pidgeon sp.*	-	-
Aves	Corvidae	<i>Corvus coronoides</i>	Raven	-	-
Aves	Maluridae	<i>Malurus cyaneus</i>	Superb Fairy Wren	-	-
Aves	Meliphagidae	<i>Anthochaera carunculata</i>	Red Wattlebird	-	-
Aves	Meliphagidae	<i>Manorina melanocephala</i>	Noisy Miner	-	-
Aves	Monarchidae	<i>Grallina cyanoleuca</i>	Magpie Lark	-	-
Aves	Petroicidae	<i>Eopsaltria australis</i>	Yellow Robin	-	-
Aves	Psittaculidae	<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-

The species is listed as vulnerable under the BC Act. This species distribution within NSW represents a large portion of the species core habitat extending west to Dubbo from the NSW east coast. Key foraging habitat includes open eucalypt forest and woodland, particularly in riparian habitats where higher soil fertility is present. Nests in proximity to feeding areas, if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m).

There are 5 records from within the 5 km buffer area identified by the NSW BioNet database, the closest of which is on the University of Wollongong grounds in 2020 of an individual flying over the campus.

The Study Area offers marginal habitat, particularly that provided in PCT 3153 in the south. It is likely that the species would infrequent the site, stopping in transit as it makes its way through to higher quality habitat of the Illawarra Escarpment. No evidence of long-term habitation including suitable roost sites as hollow-bearing trees were not detected within the Study Area.

Threats to this species include vegetation clearing and the loss of hollow-bearing trees. It is important to maintain transient 'resting' habitat for this species as it travels across the Study Area to higher quality habitat of the Illawarra Escarpment.

5.3.2 MICROBAT HABITAT

There was a culvert where the unnamed creek crossed Irvine Street which is potential microbat habitat. The culvert consists of 3 concrete pipes, each approximately 50cm in diameter. The pipes were inspected for evidence of microbat habitation, but no evidence was found. The unnamed creek did not present ideal foraging habitat for fishing bats (i.e. Southern Myotis (*Myotis macropus*)) as it was choked by riparian and in-stream vegetation where it flowed through the Study Area, limiting access to the surface of the water.

5.3.3 FAUNA HABITAT

Suitable fauna habitat within the Study Area includes hollow-bearing trees and woody debris. Available habitat has been summarised in **Table 9**.

Table 9 Fauna Habitat Values

Habitat Value	Description
Foraging habitat	Trees and shrubs within the Study Area may provide foraging habitat, particularly for fruit eating species.
Connectivity	The study is in a heavily modified urban landscape Most vegetation in the area existed in isolated patches and is poorly connected.
Burrows, nests and other fauna habitat	No hollow-bearing trees (HBT), nests, burrows or rocky outcrops were detected within the Study Area.
Leaf litter	There was leaf litter in the native vegetation in Spearing Reserve. The remainder of the Study Area had no accumulation

Habitat Value	Description
Logs	Fallen trees and branches (i.e. logs) were present within the native vegetation in Spearing Reserve the Study Area. Logs provide habitat and temporary refuge to fauna species (e.g. reptiles, amphibians and insects).
Human-made fauna habitat	There was a culvert where the unnamed creek crossed Irvine Street which is potential microbat habitat, however no evidence of it being utilized by bats was observed. There is potential for human made structures in the yards of private residences within the Study Area to be utilized as habitat, however these areas could not be accessed for assessment.
Aquatic habitat	An unnamed 1 st order creek flows through the south of the Study Area.



DPI (NSW Department of Primary Industries) (2021). Freshwater threatened species distribution maps. NSW Department of Primary Industry. On-line resources accessed via: <https://www.dpi.nsw.gov.au/fishing/species-protection/threatened-species-distributions-in-nsw/freshwater-threatened-species-distribution-maps>

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Invasive Plants and Animals Committee 2016, Australian Weeds Strategy 2017 to 2027, Australian Government Department of Agriculture and Water Resources, Canberra.

Keith D. A. (2004) Ocean Shores to Desert Dunes: The native vegetation of New South Wales and the ACT. Department of Environment and Conservation, Sydney.

OEH (NSW) (2018) 'Species credit' threatened bats and their habitats. Office of Environment and Heritage. Available from: <https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Threatened-species/species-credit-threatened-bats-survey-guide-180466.pdf>



APPENDICES

Gwynneville Planning Proposal PBA

Appendix A BIONET ATLAS SEARCH

Table 11 BioNet Atlas Search Results

Family	Scientific Name	Common Name	BC Act	EPB C Act	Records
Amphibia					
Limnodynastidae	<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	3
Hylidae	<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	14
Myobatrachidae	<i>Pseudophryne australis</i>	Red-crowned Toadlet	V	-	1
Aves					
Meliphagidae	<i>Anthochaera phrygia</i>	Regent Honeyeater	E	CE	2
Procellariidae	<i>Ardenna carneipes</i>	Flesh-footed Shearwater	V	J, K	2
Ardeidae	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	1
Cacatuidae	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	2
Burhinidae	<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	17
Accipitridae	<i>Circus assimilis</i>	Spotted Harrier	V	-	1
Campephagidae	<i>Coracina lineata</i>	Barred Cuckoo-shrike	V	-	1
Dasyornithidae	<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	1
Diomedidae	<i>Diomedea exulans</i>	Wandering Albatross	E	E	12
Ciconiidae	<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	2
Psittacidae	<				

GWYNNEVILLE ESTATE - PRELIMINARY BIODIVERSITY ASSESSMENT

Appendix A BioNet Atlas Search

Family	Scientific Name	Common Name	BC Act	EPB C Act	Records
Psittacidae	<i>Neophema pulchella</i>	Turquoise Parrot	V	-	1
Strigidae	<i>Ninox connivens</i>	Barking Owl	V	-	2
Strigidae	<i>Ninox strenua</i>	Powerful Owl	V,	-	34
Anatidae	<i>Oxyura australis</i>	Blue-billed Duck	V	-	1
Pachycephalidae	<i>Pachycephala olivacea</i>	Olive Whistler	V	-	2
Accipitridae	<i>Pandion cristatus</i>	Eastern Osprey	V	-	1
Petroicidae	<i>Petroica phoenicea</i>	Flame Robin	V	-	2
Psittacidae	<i>Polytelis anthopeplus monarchoides</i>	Regent Parrot (eastern subspecies)	E	V	1
Procellariidae	<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	V	E	1
Columbidae	<i>Ptilinopus magnificus</i>	Wompoo Fruit-Dove	V	-	1
Columbidae	<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V	-	3
Columbidae	<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	4
Procellariidae	<i>Puffinus assimilis</i>	Little Shearwater	V	-	1
Dasyornithidae	<i>Pycnoptilus floccosus</i>	Pilotbird	-	V	5
Diomedidae	<i>Thalassarche cauta</i>	Shy Albatross	E	E	1
Diomedidae	<i>Thalassarche impavida</i>	Campbell Albatross	-	V	1
Diomedidae	<i>Thalassarche melanophris</i>	Black-browed Albatross	V	V	3
Charadriidae					

GWYNNEVILLE ESTATE - PRELIMINARY BIODIVERSITY ASSESSMENT

Appendix A BioNet Atlas Search

Family	Scientific Name	Common Name	BC Act	EPBC Act	Records
Mammalia					
Otariidae	<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	V	-	4
Otariidae	<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	V	-	7
Burramyidae	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V		4
Dasyuridae	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	1
Vespertilionidae	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	1
Miniopteridae	<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	3
Miniopteridae	<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	8
Vespertilionidae	<i>Myotis macropus</i>	Southern Myotis	V	-	2
Petauridae	<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	4
Phascolarctidae	<i>Phascolarctos cinereus</i>	Koala	E	E	15
Physeteridae	<i>Physeter macrocephalus</i>	Sperm Whale	V	-	2
Pteropodidae	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	416
Emballonuridae	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat			1
Vespertilionidae	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V		4
Reptillia					
Cheloniidae	<i>Caretta caretta</i>	Loggerhead Turtle	E		

Appendix B PMST REPORT





Australian Government

Department of Climate Change, Energy,
the Environment and Water

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 15-Jul-2024

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

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