475 Badgerys Creek Road, Bradfield – Wildlife Hazard Assessment

Ingham Property Group Pty Ltd

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DOCUMENT TRACKING

Project Name	**Badgerys Creek Master Plan – Wildlife Hazard Assessment**
Project Number	23SYD5218
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Approved by	David Bonjer
Status	Final
Version Number	4
Last saved on	21 June 2024

This report should be cited as 'Eco Logical Australia 2022. *475 Badgerys Creek Road, Bradfield – Wildlife Hazard Assessment*. Prepared for Ingham Property Group Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Ingham Property Group (IPG).

Template 2.8.1

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Abbreviations

Abbreviation	Description
AAWSF	Aerotropolis Aviation Wildlife Safeguarding Framework
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
DPIE	NSW Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
FM Act	NSW *Fisheries Management Act 1994*
GIS	Geographic Information System
GPS	Global Positioning System
IBRA	Interim Biogeographic Regionalisation for Australia
LGA	Local Government Area
NSW	New South Wales
PCT	Plant Community Type
SEPP	State Environmental Planning Policy
SSD	State Significant Development
TEC	Threatened Ecological Community
WM Act	NSW *Water Management Act 2000*
WSA	Western Sydney Airport

Executive Summary

Eco Logical Australia Pty Ltd was engaged by Ingham Property Group to prepare a Wildlife Hazard Assessment for the proposed Master Plan at 475 Badgerys Creek Road, Bradfield. The study area is located within the Badgerys Creek Precinct of the Western Sydney Aerotropolis (WSA).

The proposed development is to be assessed as a Master Plan under the SEPP Western Parkland City. The master plan must address aviation safeguarding as required in the Aerotropolis SEPP, Aerotropolis Precinct Plan, and the Aerotropolis DCP Phase 2 and relevant guidelines.

Clause 4.19 of the *State Environmental Planning Policy (Precincts - Western Sydney Parkland City) 2021* provides controls to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport. The Master Plan includes water bodies which are 'relevant development', therefore clause 4.19 of the SEPP applies.

The report describes the existing wildlife attraction properties of the site and the proposed development, followed by mitigation measures and strategies to mitigate the potential impacts of wildlife to the safe operation of WSA.

The Master Plan has several landscape elements that can be attractive to wildlife, including wetlands, revegetated riparian corridors and landscaping within development lots. These elements are required to address objectives and performance measures from the Precinct Plan and DCP relating to stormwater management, riparian corridors, and tree canopy targets.

The Master Plan and its approach to landscape mitigates the above wildlife risk to airport operations by:

- Restricting on-lot tree species to the lower risk species listed in Appendix B of the Aerotropolis DCP, whilst still delivering a tree canopy that will provide shade to typical heat-generating areas such as car parks and roads.
- design of waterbodies to reduce their attractiveness to waterbirds (ie, vertical banks and minimising roosting habitat)
- ensuring no fig trees are planted and thus avoiding significant attractor to flying fox
- undertaking monitoring and adaptive management of birds and bats

By incorporating the above measures, the Master Plan meets the Precinct Plan and DCP requirement to mitigate wildlife risk.

1. Introduction

1.1. Outline of the Wildlife Risk Assessment

This report contains the following chapters:

- Chapter 2 - description of the project and an overview of the Western Sydney Airport operations
- Chapter 3 - legislative and policy context for assessing wildlife hazards of the Master Plan
- Chapter 4 - description of areas that may provide habitat for birds & bats under the Master Plan
- Chapter 5 - methodology for identifying the risk posed by bird and bat species that are found in western Sydney
- Chapter 6 provides an assessment of risk, mitigation measures and monitoring
- Chapter 7 describes the consistency between Master Plan and the planning framework
- Chapter 8 provides a conclusion

1.2. Site Description

The site is located at 475 Badgerys Creek Road, Bradfield NSW, within the local government area (LGA) of Liverpool City Council. The subject land is approximately 15 km west of the Liverpool Central Business District (CBD). The study area is 184 ha in size and is legally defined as Lots 99 and 100 in DP 1287207. The subject land is situated within the Western Sydney Aerotropolis, with a direct interface with the Western Sydney International Airport (WSI).

It is predominately zoned ENT (Enterprise) under the *State Environmental Planning Policy (Precincts – Western Parkland City) 2021* (Western Parkland City SEPP). The majority of the subject land is under the ownership of IPG, with a small portion of land earmarked for the North Bradfield Zone Substation owned by Endeavour Energy.

The study area is largely cleared of vegetation and is currently used for agricultural purposes. It consists of pasture-improved exotic grassland, scattered paddock trees, native vegetation, farm dams, built form and has a historical land use for agricultural purposes. There is an internal road network which had previously connected the now demolished sheds and ancillary structures dispersed across the area. The study area is bound by two significant riparian corridors – South Creek to the east and Badgerys Creek to the north-west.

1.3. Project description

The IPG Master Plan has been endorsed by the Technical Assurance Panel (TAP) on 3 May 2024. The Master Plan process is an optional design process established under the Western City Parkland SEPP to amend the Aerotropolis Precinct Plan as it applies to the site. The IPG Master Plan was informed by a detailed assessment of the site-specific considerations through preliminary site investigations. The Master Plan breaks down the general application of the Enterprise zone across the site and provides a more granular approach to land use planning with considerations made to the opportunities and constraints of the site. The structure plan is made up of four key land uses which include enterprise and light industry, business and enterprise, and employment zone centres. The Master Plan is to provide for the staged construction of roads, warehouses, commercial/retail spaces, trade units, amenities and cycleway with ancillary car parks, landscaping, stormwater management and utility infrastructure.

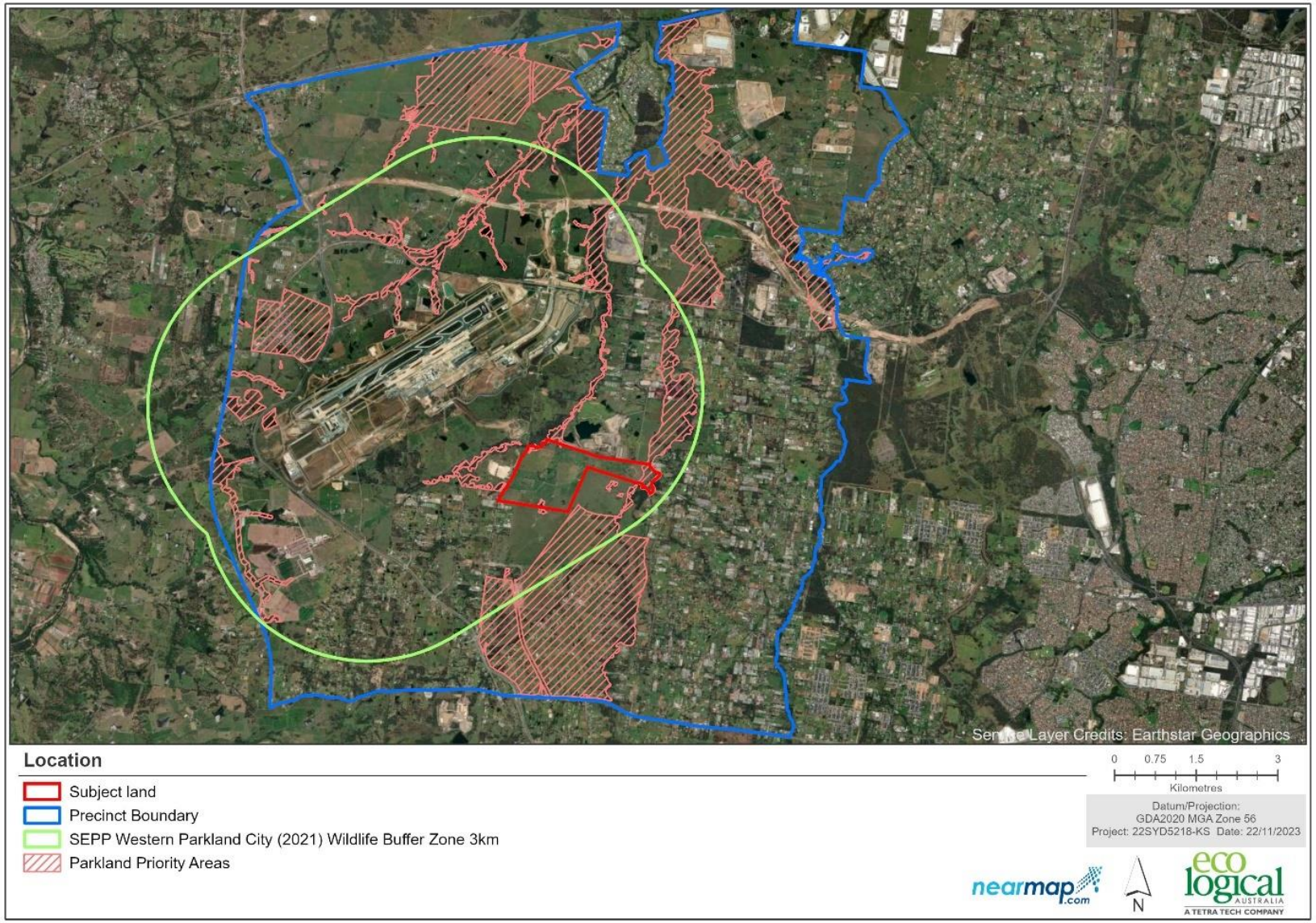


Figure 1 Location in relation to Wildlife Buffer Zones and Parkland Priority Areas

Figure 2 Landscape Master Plan (Public Domain Landscape Strategy, 6 June 2024 by Site Image)

1.4. Western Sydney International (Nancy-Bird Walton) Airport

The new Western Sydney International (Nancy-Bird Walton) Airport (WSA) is under construction and due to begin operation in 2026. Sydney's aviation demand is set to double over the next 20 years and the airport will provide critical infrastructure to address this demand.

WSA will be a full-service airport, catering for domestic and international passengers, as well as freight services. The airport will open with a single runway and facilities to handle 10 million passengers and is expected to accommodate approximately 82 million passengers annually by 2063. The airport will operate 24/7 and be curfew free, as planning has provided a 10 km buffer between the airport and suburban areas by prohibiting noise sensitive development in areas subject to aircraft noise.

WSA is the catalyst for the development of the Western Sydney Parkland City. The Aerotropolis will be the bustling commercial centre of the Parkland City providing a home for technology, science and creative industries. The proposal will contribute to the development of the city by providing commercial and industrial areas.

The *Western Sydney Airport Plan 2021,* which has been produced by the Federal Government, estimates the aircraft movements associated with the airport. The plan estimates the airport could achieve the following max capacity (per hour) with both runways operational (DITRDC 2021):

- 45 landing operations
- 58 departure operations
- 103 total Air Traffic Movements (ATM)

The predicted airport activity forecasts area presented in Table 1.

Table 1 Airport Activity Forecasts (DITRDC, 2021)

	Stage 1	First runway at capacity (c.2050)	Long Term (c.2063)
Annual passengers (arrivals and departures) Presented in Million Annual Passengers (MAP)	10 MAP	37 MAP	82 MAP
Busy hour passengers (international and domestic)	3,300	9,500	18,700
Total annual ATM (passenger and freight)	63,000	185,000	370,000
Total busy hour ATM	21	49	85

Airport operations are planned to commence around mid-2026. Initial demand forecast is expected to be modest with 5 million annual passengers (MAP) but is expected to increase (DITRDC, 2021). This means that the risk of strike will increase during the operation of the airport and monitoring and mitigation measures should be reviewed periodically to adapt to the changing airport demand profile.

1.5. Wildlife issues

Occurrences involving aircraft striking wildlife, in particular birds and bats, are the most common aviation occurrence reported to the Australian Transport Safety Bureau (ATSB). Bird strike is a term that encompasses any occurrence of a bird, or bat, colliding with an aircraft. Bird strike can cause significant damage to aircrafts and in some instance causes catastrophic crashes resulting in casualties. Bird strike has been calculated to cost the global aviation industry approximately $US3 billion annually (ATSB, 2002)

and from 1912 to 2002 had contributed to the death of 276 people and destroyed 108 aircrafts (Thorpe, 2003). Bird strikes most commonly occur during take-off and landing.

Wildlife issues associated with land-based animals (primarily terrestrial mammals) are rare and have generally been effectively mitigated though the implementation of stringent security fencing around airports. This report will focus on bird and bat strikes.

Between 2008 and 2017, there were 16,626 confirmed bird strikes in Australia reported to the ATSB. The number of reported bird strikes has increased in recent years, with 2017 having the highest on record with 1,921 bird strikes. However, COVID19 pandemic has impacted this trend as air traffic levels in 2020 were 40% below the air traffic levels of the previous year (ICAO, 2022). It is estimated that air travel will return to pre COVID levels by 2024, which is prior to the predicted full operation of the WSA in 2026.

Nearly 40% of bird strike data recorded by the ATSB between 2008 and 2017 involved a bird of an unknown species or the bird was not identified. During this period the most commonly struck identifiable types of flying animal were galahs (801), plovers (602), bats (582), magpies (575) and flying foxes (464) (ATSB, 2019). Galahs were more commonly involved in bird strikes of multiple birds, with more than 38 per cent of Galah strikes involving more than one Galah (ATSB, 2019). The extent of damage to aircraft in these occurrences generally corresponds to the size and number of animals struck, the larger bird the more likely it is to result in aircraft damage. Large animals or animals that occur in larger groups or flocks have the ability to destroy engines, windshields and cause significant damage to components and the aerodynamic surfaces of an aircraft such as leading-edge surfaces. It is noted that while bird strike incidents are often fatal for the animal, aircraft damage is rare with two to eight percent (2-8%) of strikes resulting in any aircraft damage (Metz et al, 2020).

The probability of bird strike is a function of a number of variables, for example, the specific location of the airport, in particular the availability of habitat for birds and bats near the airport. Species have different strike profiles such as the ability to avoid aircraft (Avisure, 2020). The airport operations contribute to the strike risk through variables such as aircraft type, number of aircraft movements, flight paths and the time of flights (ATSB, 2019). Using this information and the study of the surrounding area, airports can generally be categorised as having a low, moderate or high overall bird strike risk. It is generally accepted that airports with a high number of aircraft movements located in close proximity to optimal habitat, diversity of habitats for birds and bats have a higher probability of bird strike compared to those with fewer aircraft movements and poor to sub-optimal habitat and less diverse habitats for bird and bat species. It is important to note that some man-made habitats can have high attractant properties for specific bird and bat species. Species such as the Australian White Ibis, Ravens/Crows, Pelicans, Gulls and Pigeons are commonly found in large numbers in urban environments particularly around putrescible waste facilities and locations with poor waste management.

Due to the risk associated with bird strike, international and national regulations, standards and guidelines have been developed to provide a framework to reduce the impact of bird strike around airports. This framework is discussed in Section 2. This report is directed by these documents as a basis for the approach to assess the wildlife risk.

2. Planning Framework

Legal and regulatory frameworks have been developed to provide guidance on wildlife management regarding the safe operation of airports. The framework in Australia is comprised of international standards and national regulations. Furthermore, planning instruments in NSW have been developed to manage the wildlife management risks associated to developments adjacent to airports.

2.1. International standards

Australia is a member state of the International Civil Aviation Organisation (ICAO), a United Nations agency that acts as the regulatory body for international aviation. As such Australia must adhere to the rules and regulations specified by the ICAO. In the case of wildlife hazard management, *Section 9.4 of Annex 14, Volume 1, Aerodrome Design and Operation* specifies the management requirements for airports and adjacent land. The controls of this document are summarised in Table 2.

Table 2 ICAO Annex 14, Volume 1, Aerodrome Design and Operation – Wildlife Hazard Management Controls

Section	Controls
9.4	The wildlife strike hazard on, or near, an aerodrome shall be addressed through: a. The establishment of a national procedure for recording and reporting wildlife strikes to aircraft b. The collection of information from aircraft operators, aerodrome personnel and other sources on the presence of wildlife on or around the aerodrome constituting a potential hazard to aircraft operations c. Ongoing evaluation of the wildlife hazard by competent personnel.
9.4.3	Action shall be taken to decrease the risk associated to aircraft operations by adopting measures to minimise the likelihood of collisions between wildlife and aircrafts.
9.4.4	The appropriate authority shall take action to eliminate or to prevent the establishment of garbage disposal dumps or any other source which may attract wildlife to the aerodrome, or its vicinity, unless an appropriate wildlife assessment indicate that they are unlikely to create conditions conducive to a wildlife hazard problem. Where elimination of existing sites is not possible, the appropriate authority shall ensure that any risk to aircraft posed by these sites is assessed and reduced to as low as reasonably practicable.
9.5	Recommendation – States should give due consideration to aviation safety concerns related to land development in the vicinity of the aerodrome that may attract wildlife.

More specific guidance is provided in the *Airport Service Manual part 3, Wildlife Control and Reduction* (ICAO, 2012) in relation to the management responsibilities of airport wildlife control, guidance for the implementation of wildlife management programs and details on how to assess the attractiveness of a site for wildlife.

The ICAO standards and guidelines directly inform the actions and framework established by the Australian Civil Aviation Safety Authority (CASA) for wildlife management on and adjacent to airports in Australia. Thus, making it relevant to this assessment.

2.2. National regulations

2.2.1. Australian Civil Aviation Safety Authority

The Australian Civil Aviation Safety Authority's document, the *Manual of Standard Part 139* (MoS) stipulates the requirements for aerodrome operations and developments in Australia. The document presents methods and instructions for aerodrome operators to work with planning authorities to consider wildlife hazard management when determining applications. It also provides guidance to aerodromes and planning authorities to work with adjacent landowners to monitor and manage wildlife.

CASA *Advisory Circular 139.C-16v1.0* provides further guidance for wildlife hazard management which involves influencing wildlife behaviour on or in the vicinity of an aerodrome, in order to achieve a specific goal with regards to altering behaviour, population or geographic distribution of birds or wildlife. Key elements of the Circular are:

- Preparation of Wildlife Hazard Management Plans
- Wildlife Hazard Monitoring
- Data collection, reporting and recording data on wildlife activities
- Wildlife risk assessment
- Wildlife hazard mitigation
- Training wildlife hazard management personnel

2.2.2. National Airport Safety Framework

In 2012 the National Airport Safety Framework (NASF) was released by the Department of Infrastructure and Transport. It is a generic framework for land use planners to incorporate into land use planning frameworks to achieve airport safety outcomes. Guideline C of the NASF, *Managing the Risk of Wildlife Strikes in the Vicinity of Airports,* provides wildlife management guidelines to landowners, planning/impact assessment professionals and determining authorities.

This document has been utilised to create Aerotropolis Aviation Wildlife Safeguarding Framework (AAWSF) which aims to safeguard WSA against wildlife hazards. It is important to note that restrictions presented in the framework does not require development applications to be refused but instead requires landowners to apply more stringent mitigation measures. The application of the AAWSF for the proposal is presented in Section 4, and mitigation measures are presented in Section 5.

2.3. NSW Planning framework

2.3.1. Aviation Safeguarding Guidelines – Western Sydney Aerotropolis and surrounding areas.

The Aviation Safeguarding Guidelines provide a consolidated set of aviation safeguarding planning guidelines for the Western Sydney Aerotropolis (Aerotropolis). It was developed by the NSW Government with input and data from the Department of Infrastructure, Transport, Regional Development, Communications and the Arts (DITRDCA); Western Sydney Airport (WSA); and other relevant stakeholders.

The purpose of the guidelines is to assist relevant planning authorities, consultants and proponents when assessing and preparing development applications which are impacted by aviation safeguarding controls. The Guidelines also aim to protect community safety and amenity as well as safeguard the 24-hour operations of the Western Sydney International (Nancy-Bird Walton) Airport (WSI).

The guidelines can be used by relevant planning authorities to help inform land use planning decisions and by proponents to prepare applications on land impacted by aviation safeguarding controls. The Guidelines include information about managing impacts for various aviation planning constraints including aircraft noise, building windshear and turbulence, operational airspace, lighting, wildlife, wind turbines and communication, navigation, and surveillance facilities.

Of relevance to this study is Chapter 4: Managing the risk of wildlife in the vicinity of airports. This Chapter's objective is to:

- Assesses developments on land surrounding Western Sydney International where wildlife may present a risk to the operation of WSI; and
- Ensure planning authorities consider wildlife management provisions when undertaking land use planning for the Aerotropolis and other airports.

Chapter 4 describes the provisions that have been incorporated into the Western Parkland City SEPP and the Aerotropolis Development Control Plan (DCP), including the prohibition of certain land uses within 3 km buffer zone; referral of certain development applications to WSA (accompanied by a wildlife hazard assessment and wildlife management plan incorporating mitigation and monitoring measures; requirement for waste management plans for developments within 13 km buffer zone to be accompanied by a waste management plan; and appropriate landscape species being planted within these buffer zones.

2.3.2. State Environmental Planning Policy (Precincts - Western Sydney Parkland City) 2021

The Western Sydney Parkland SEPP is the primary planning instrument for regulating development around Western Sydney Airport. The development site is zoned ENT Enterprise and ENZ: Environment and Recreation under the Western Sydney Parkland SEPP.

Clause 4.19 of the Western Sydney Parkland SEPP provides controls to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport. The clause states that development consent must not be granted to relevant development on land within 13 km Wildlife Buffer Zone, unless the consent authority has consulted with the relevant Commonwealth body and considered a written assessment of the wildlife present and the risk it poses to airport operation. Relevant development includes the following;

- agricultural produce industries,
- aquaculture,
- camping grounds,
- eco-tourist facilities,
- garden centres,
- intensive livestock agriculture,
- intensive plant agriculture,
- livestock processing industries,
- plant nurseries,
- recreation facilities (major),
- recreation facilities (outdoor),
- sewage treatment plants,
- waste or resource management facilities that consist of outdoor processing, storage or handling of organic or putrescible waste,
- water storage facilities.

The proposal includes water storage facilities, therefore clause 4.19 does apply to the proposed development. Clause 4.19(2), states:

(2) Development consent must not be granted to relevant development on land in the 13 km wildlife buffer zone unless the consent authority—

(a) has consulted the relevant Commonwealth body, and

(b) has considered a written assessment of the wildlife that is likely to be present on the land and the risk of the wildlife to the operation of the Airport provided by the applicant, which includes—

(i) species, size, quantity, flock behaviour and the particular times of day or year when the wildlife is likely to be present, and

(ii) whether any of the wildlife is a threatened species, and

(iii) a description of how the assessment was carried out, and

(c) is satisfied that the development will mitigate the risk of wildlife to the operation of the Airport, including, for example, measures relating to—

(i) waste management, landscaping, grass, fencing, stormwater or water areas, or

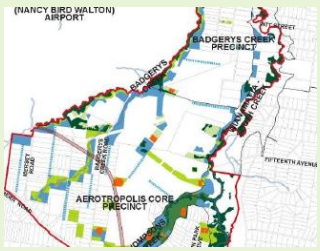
(ii) the dispersal of wildlife from the land by the removal of food or the use of spikes, wire or nets

2.3.3. Aerotropolis Precinct Plan May 2023

The Western Sydney Parklands SEPP allows for the preparation of Precinct Plans. The Aerotropolis Precinct Plan was developed to utilise the features of the Aerotropolis as it is today: the creeks and tributaries, undulating topography and view lines, and places of Aboriginal and European significance. The Precinct Plan will build upon these features to develop a world class city in a parkland setting, integrating urban development with city shaping infrastructure and blue-green corridors.

There are no specific objectives or requirements within the Aerotropolis Precinct Plan 2023 for wildlife management in relation to airport safeguarding, however there are several Objectives and Requirements that relate to the creation of potential habitat for birds and bats.

Table 3 Objectives and requirements of the Aerotropolis Precinct Plan (2023)

Western Sydney Aerotropolis Precinct Plan – May 2023	
2.1 Objectives	Selected objectives of the Precinct Plan that relate directly to wildlife risk include: (02) Celebrate culture by reflecting the cultural landscape and continuous connection of Aboriginal people and Country through: a. the design of the public domain; b. preservation and rehabilitation of the natural environment and systems; c. the alignment of movement networks with culturally significant spaces; d. the design of buildings; and e. keeping language alive in the naming of places. (03) Integrate development and the delivery of infrastructure to maintain a supply of developable land that maximises the efficiency of infrastructure investment. (04) Protect Airport operations, including 24-hour operations, and protect future communities from aircraft noise. (07) Implement a landscape-led approach to designing the Aerotropolis, utilising the blue-green grid and natural topography of the Aerotropolis as the defining elements. (011) Design an urban environment that responds to the climate extremes of Western Sydney and mitigates and adapts to urban heat. (012) Manage water in the landscape to facilitate urban cooling, improve waterway health and biodiversity and promote sustainable water use. (014) Reinstate and rehabilitate natural landscape connections and systems to sustain biodiversity and allow natural systems to function sustainably.
4.5 Blue-Green Infrastructure Framework	Objectives: BG01: To integrate blue and green systems across the Aerotropolis for water quality management, biodiversity and recreation. Requirements: BG1: Development is to contribute to the establishment of the blue-green infrastructure framework for the Aerotropolis in accordance with Figure 5. An extract from Figure 5 below shows three riparian corridors within the IPG Badgerys Creek site that provide for open space and stormwater infrastructure. 

Western Sydney Aerotropolis Precinct Plan – May 2023	
4.5.1 Total water cycle management	BGO1 Protect, maintain and/or restore waterways, riparian corridors, water bodies and other water dependent ecosystems. BGO2 Provide a landscape-led approach to integrated stormwater management and water sensitive urban design. BGO3 Establish a network of multifunctional stormwater assets that support stormwater management and contribute to broader objectives for waterway health, biodiversity, urban greening and cooling, recreation and amenity.
4.5.2 Riparian Corridors	BG1 Waterways and riparian corridors of Strahler Order 2 (refer to Figure 5) and higher are to be retained and rehabilitated to a natural state (unless minor realignment can be justified), in accordance with the requirements of the *Guidelines for Riparian Corridors on Waterfront Land* published by the Department of Primary Industries (Office of Water), or other relevant guidelines adopted and in operation at the time.
4.5.3 Public domain and canopy cover	BG3 Tree canopy is to be provided on Sub-arterial Roads and Collector Streets shown on Figure 9 to achieve a minimum of 40% tree canopy cover at maturity, measured as a percentage of the area of the road reserve.
5.5.4 Biodiversity and vegetation corridors	Objectives BGO3 Protect areas of high biodiversity value including watercourses and riparian zones, Existing Native Vegetation and remnant vegetation and habitat of the Cumberland Plain. BGO4 Increase and improve landscape connectivity through conservation and restoration of native vegetation to enable plant and animal communities to survive in the long term. BGO5 Support long-term viability and ecological connectivity by ensuring development does not encroach on protected land and any ecological restoration program selects species that are resilient to a changing climate. Requirements BG3 Revegetation and landscaping are designed and managed to account for future climatic conditions and include climate ready species. Resources relating to climate-ready species

2.3.4. Western Sydney Aerotropolis Development Control Plan 2022

Section 2.10.3 of the DCP addresses Wildlife Hazard. The objective of this part of the DCP is to safeguard the airport from incompatible development that could compromise safe operations. These objectives and benchmark solutions are provided in Table 4.

Table 4 Performance Outcomes of the Aerotropolis DCP Phase 2

	Performance Outcome	Benchmark Solution
PO1	Development does not attract wildlife which would create a safety hazard to the operations of the Airport.	1. All waste bins are designed and installed with fixed lids. 2. Any bulk waste receptacle or communal waste storage area is contained within enclosures that cannot be accessed by birds or flying foxes. 3. Any stormwater detention within the 3km and 8km wildlife buffer is designed to fully drain within 48 hours after a rainfall event. 4. Buildings and structures are designed to minimise the opportunity for roosting areas.
PO2	Landscaping does not attract wildlife that could create a safety	1. Refer to Appendix B for a list of suitable landscape species. 2. In areas within the 3 km wildlife buffer but outside of the Parkland Priority Areas shown in Figure 8, a report prepared by a suitability qualified

	Performance Outcome	Benchmark Solution
	hazard to the operations of the Airport.	and experienced ecologist is to be submitted with any application when the landscaping plan: a. Incorporates alternative landscape species not listed within Appendix B; b. Incorporates landscape species denoted within the landscape species list; c. Will result in more than 5 trees being planted in 1 group (group refers to touching mature canopies); and/or d. Provides a spacing between a group of 5 or more trees that is less than 100 m. 3. The ecologist report is to consider building, site, and water body design outcomes and/or landscape maintenance measures that will mitigate bird and flying fox attraction and roosting areas
DCP Appendix B	Appendix B: Western Sydney Aerotropolis Landscape Species List The species list in Table 1 applies to land inside the Western Sydney Parkland Commitment Areas and beyond the 3km wildlife buffer (Figure 1). Any alternative landscaping species and/or groupings and spacing (as specified in the DCP) outside the Western Parkland Vision Government Commitment Areas and within the 3 km wildlife buffer will require an ecologist report submitted with the landscape plan. The report will need to discuss wildlife attraction in proximity to the airport and will be subject to a merit-based assessment. The proponent will need to demonstrate suitability in relation to wildlife management and/or encroachments into operational airspace. Within Table 1 where an additional requirement is provided against a species that states "Only within 3km wildlife buffer, where supported by ecologist report, confirming landscape design minimises wildlife attraction", this only applies to the use of those species within the 3km buffer that are outside of the government commitment areas	
Appendix D7	Applications for water storage facility must be accompanied by a Wildlife Hazard Assessment and Wildlife Management Plan. Wildlife Hazard Assessment Reports must assess the wildlife attraction risk of the land use, the design of the building and ancillary works including proposed landscaping, water facilities (incl. stormwater infrastructure), waste management, and temporary risks associated construction activity. • The Wildlife Management Plan must respond to the findings and recommendations of the wildlife hazard assessment. • Where monitoring is required to be undertaken in accordance with the Management Plan, copies of the report are to be submitted to the airport lessee company within 28 days of completion. Landscaping within the Enterprise Zone and Agribusiness Zone must comply with Appendix B: Western Sydney Aerotropolis Landscape Species List, except where the property is subject to biodiversity certification conditions or identified as one of the key government commitments.	

The DCP also has other objectives and performance measures which also relate to landscaping as shown in Table 5 below.

Table 5 Other DCP controls

Western Sydney Aerotropolis Development Control Plan – November 2022	
2.3 Waterway Health and Riparian Corridors	**O1.** Protect and restore native and riparian vegetation to improve the connectivity, ecological condition, and function of ecosystems. **1.** Development maintains and protects waterways in accordance with the following guidelines: **a.** Strahler Order 1 watercourses with a catchment area of less than 15 hectares can be re-constructed and /or piped, providing stormwater modelling demonstrates the pipe and street network is capable of accommodating flows up to and including the 100 year AEP storm event. **b.** Naturalised trunk drainage paths are to be provided when the contributing catchment exceeds 15 hectares or when 1% AEP overland flows cannot be safely conveyed overland as described in Australian Rainfall and Runoff – 2019. **c.** Waterways of Strahler Order 2 and higher will be maintained in a natural state, including the maintenance and restoration of riparian areas and habitat, such as fallen debris. **d.** Where a development is associated with, or will affect, a waterway of Strahler Order 2 or higher, rehabilitation will occur to return that waterway to a natural state. **4.** Retain areas of the Proteaceae shrubs for the Eastern Pygmy Possum *Cercartetus nanus* along or adjacent to riparian areas to improve and maintain habitat connectivity. **5.** Weeds from creeks, streams and riparian areas are removed and replaced with appropriate native planting. **6.** Locate stormwater infrastructure including pipelines and detention basins wholly on certified-urban capable land consistent with the Plan's biodiversity consistent with the Plan's biodiversity certification approvals. Stormwater infrastructure is not to be located within land identified as avoided or land managed as a reserve.
2.4 Vegetation and Biodiversity 2.4.1 Deep Soil and Tree Canopy	**P01.** Consolidate areas of deep soil and tree canopy and provide minimum dimensions which allow for sufficient tree planting. **Benchmark Solution:** 1. Tree Canopy and deep soil is provided in accordance with Table 2 of the DCP*. Applicants must also have regard for the site coverage and relevant pervious surface targets outlined in this SCP. 2. Deep soil areas are to be a minimum 3 m x 3 m in dimension. 3. Consolidate deep soil areas by establishing them right to abutting boundary walls and fence lines. 4. Consolidate deep soil in setback areas and locate with adjoining properties. 5. Other than Urban Park available under the Aerotropolis Precinct Plan, a minimum tree canopy of 45% for open space is to be achieved. Where open spaces included sports courts or fields, the 45% tree canopy shall be provided outside the space identified for the court or field area. 6. Deep soil planting areas are to be de-compacted before planting with no services to be installed within these zones. **Table 2 describes for all large format industrial and light industrial lots:* • Minimum tree canopy target (% of site area) = 25% • Minimum deep soil (% of site area) = 15% • Minimum tree planting rates: For every 400sqm of site area or part thereof, at least two medium trees of one large tree is to be planted in the deep soil area.
2.4.2 Protection of Trees and Vegetation	**O1.** Conserve and manage existing vegetation and contribute to the increase of habitat and tree canopy within the Aerotropolis.

2.3.5. Conflicts in the planning framework

The Aerotropolis DCP Phase 2 has conflicting objectives between wildlife risk to airport operations and the landscape led approach that promotes ecological restoration with tree canopy of 45% in open space. Restoration of riparian zones implies restoration to the vegetation community that would have existed prior to clearing for agriculture. The appropriate ecological community for riparian restoration is Cumberland Red Gum Riverflat Forest. This community contains species that are identified as higher risk (from wildlife/aircraft perspective) in the DCP Appendix B, and would also have a density significantly higher than the limit of trees in groups of 5 being more than 100m apart.

The Western Parkland City SEPP, Aerotropolis Precinct Plan 2023 and the Aerotropolis DCP Phase 2 do not provide a hierarchy of importance between these objectives. Therefore the Master Plan has proceeded on the basis that these objectives are to be balanced, with wildlife risk mitigated through design. Where the risk is not eliminated, the Wildlife Risk Management Plan will be followed to monitor wildlife use of the site. Where significant risk is identified, additional mitigation measures may be required.

3. Habitat for Wildlife

3.1. Wildlife Hazards within 3km of the airport

The IPG Badgerys Creek site is within the 3km wildlife buffer of the airport. Technical Paper 5: Wildlife strike risk for the Western Sydney International Airport (Avisure 2023) identified 26 off-airport hazards within 3km of the proposed first runway. Within this area, 21 of the hazards (81%) were water bodies, mostly ponds. The remainder included a showground, agriculture and a waste recovery facility. The high and very high risk contributors included Duncan Creek, Ponds on Elizabeth Drive 2 and Kemps Creek Waste Recovery Park. Other high and very high hazards were the Wolstonholm Avenue Pond, Western Sydney Parklands and the Lake Gillawarna Ibis Colony which are outside the 3km radius. The ponds were all characterised as being permanent water bodies which provide habitat for waterbirds. Vegetated waterways and vegetated landscapes were not identified as a hazard.

Hazard type within 3km (Avisure, 2023)	Within 3km of runway
Ponds	17
Permanent basin	3
Duncan Creek (reservoir)	1
Billabong	1
Leppington Pastoral Company	1
Agriculture	1
Kemps Creek Resource Recovery Park	1
Luddenham Showground	1

3.2. Current available habitat

The subject land is within the Sydney Basin region under the Interim Biogeographic Regionalisation for Australia (IBRA) classification, within the Cumberland IBRA subregion. Under the NSW Mitchell landscapes classification, the subject land is underlain by Cumberland Plain and Hawkesbury-Nepean Channels and Floodplains. The immediate surroundings of the subject land are characterised by large rural landholdings used predominately for agricultural and light manufacturing purposes.

The majority of the landscape consists of pastures or cleared land (Eco Logical Australia 2024). The large open expanses of native and exotic grassland within the area provides potential foraging or nesting habitat for an array of native and non-native birds including raptors, lapwings, crows, galahs/cockatoos and parrots. Species such as Masked Lapwing (*Vanellus miles*), Little Corella (*Cacatua sanguinea*), Galah (*Eolophus roseicapilla*), Australian Magpie (*Gymnorhina tibicen*) and Australian White Ibis (*Threskiornis molucca*) commonly utilise grassland to forage and breed. Open grassland areas also provide habitat for larger mammals such as kangaroos, wallabies, and smaller rodents such as rabbits, mice, rats. This in turn attracts predators such as raptors and owls.

The best quality habitat within the study area is located along the riparian corridors. The study area is bound by two significant riparian corridors, with South Creek to the east and Badgerys Creek to the north-west. These creeks intersect with the subject land in small sections, with their associated vegetated riparian zones (VRZs) extending into the study area. Low-moderate condition native

vegetation in these areas were mapped as PCT 4025: *Cumberland Red Gum Riverflat Forest*. The watercourses and creeks within the development site, can provide foraging habitat for species including Ibis, ducks, wading birds and microbats. Species like the Australian Wood-duck (*Chenonetta jubata*), White-faced Heron (*Egretta novaehollandiae*), and Dusky Moorhen (*Gallinula tenebrosa*) are attracted to these habitats as they are known to feed on a range of food from fish to aquatic vegetation.

The several farm dams present on site are primarily utilised for irrigation purposes of the existing or previous agricultural land use. These dams (total area of 1.37 ha) had limited riparian or fringing vegetation and represent poor aquatic habitat values. The surrounding areas of the dams are dominated by exotic groundcover, representing poor habitat for native fauna species. Although poor condition, these areas still provide a source of freshwater and habitat for water birds. Farm dams provide resources for fauna to drink, forage, rest and nest/shelter within the banks of the damns. This is especially important for fauna in a landscape which is becoming increasingly urbanised. Waterlogged soil creates ideal conditions for birds such as the Australian White Ibis, Lapwings and Magpies to access worms and other invertebrates, as the water drives them close to the surface. The dams across the development site provide foraging habitat for Ibis, ducks and microbats.

Areas of native vegetation exist in clusters of varying conditions across the study area. Previous assessments identified the following three Plant Community Types (PCT) within the study area:

- PCT 3320: Cumberland Shale Plains Woodland (low condition) – small patch of isolated paddock trees in the south east of the subject land.
- PCT 4023: Coastal Valleys Swamp Oak Riparian Forest (moderate condition) – small patch in the southern area of the subject land.
- PCT 4025: Cumberland Red Gum Riverflat Forest (low and moderate condition) – associated with the riparian corridors around Badgerys Creek in the northwest, and South Creek in the east.

Patches of native vegetation within the development site provides potential foraging and roosting habitat for a variety of species including, megabats (foraging only), microbats, and a wide variety of birds including raptors, crows and parrots. Native canopy trees within the identified vegetation communities on site include *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus moluccana* (Grey Box)- *Angophora subvelutina* (Broad-leaved Apple) and *Casuarina glauca* (Swamp Oak). The native flowering canopy species within the site provide foraging and perching habitat for numerous native and non-native bird species, microbats and mega bats including the Grey-headed Flying Fox. The insects that use trees also can attract a large array of bird species (Avisure 2020).

The mid-story and understory layers within the patches of native vegetation were sparse or absent, and the understory was either grazed or dominated by exotic pastures. Although the overall condition was poor in these layers, it may provide habitat for smaller bush birds such as Fairy-wrens and Scrub wrens.

Six hollow bearing trees where previously identified within the study area (Eco Logical Australia 2024). These hollows ranged in size from small sized hollows (≤ 20 cm diameter) to medium-large sized hollow (≥ 20 cm diameter). In addition to the hollow bearing trees, 11 stags were identified within the study area which provide great roosting and nesting habit for bird and bat species.

3.3. Proposed habitat

The Master Plan proposes several areas that could provide habitat for birds and bats. Figure 3 shows the location of these areas in the Master Plan. Table 6 shows the tree canopy targets for each area.

Table 6 Canopy cover targets as pe r the Landscape Plan

Site area	Area (ha)	Canopy coverage area (ha)	Canopy cover of each area (%)
Enterprise and light industry	98.1	14.71	15
Business and enterprise	5.3	1.32	25
Local centre	3	0.9	30
Road corridors	31.5	15.75	50
Riparian corridor (VMP zone)	23.06	11.53	50
Riparian corridor (outer VRZ	9.53	5	52
Riparian corridor (stormwater basins)	9.4	0	0
Other	2.1	0	0
Total site canopy cover		49.21	29.49

3.3.1. On lot landscaping (enterprise, light industry, business and local centre)

The Landscape Plan provides for tree canopy cover ranging from 15% to 30%. The species list for on-lot landscaping is drawn from the DCP Appendix B, but does not include any species that have additional requirements for an ecologist report to be prepared.

3.3.2. Buildings

Buildings are expected to be large format to accommodate transport, logistics, storage type uses. Buildings would be approved via Complying Development Certificates, with Waste Management Plans required to be prepared and implemented. Waste Management Plans will ensure all waste is to be stored in covered facilities that would not be accessible to wildlife (see Wildlife Management Plan table 12).

3.3.3. Street trees (road corridors)

The Landscape Plan proposes planting of trees that will eventually provide a tree canopy of 50% using species from Appendix B of the DCP, noting that no trees with additional restrictions are proposed in the species list.

3.3.4. Stormwater infrastructure

Three types of stormwater basins are proposed and have been designed to be consistent with the draft Stormwater Infrastructure Design Guidelines (Sydney Water, v2022-1.0). The guidelines were prepared with multiple objectives relating to sustainability of assets, health and wellbeing, connecting with country, waterway health, social amenity and the wildlife strike objective to '*minimise wildlife strike hazard from Western Sydney Airport*'. The guidelines (p12) acknowledge:

> '*The Stormwater infrastructure are potential risks to airport operation, and significant thought and consultation has been undertaken to provide design guidance and guidelines to minimise*

any increase to wildlife risks. These measures include design elements to minimise attraction of problematic species, careful plant palette selection and management protocol.'

The three types of ponds proposed in sequential order of receiving stormwater are:

- **Sediment basins**
- **Wetlands**
- **Storage ponds**

Sediment basins are to capture stormwater from storm events and drain quickly afterwards. The basins are relatively small and would not contain permanent water or habitat.

The Master Plan provides for wetlands that play a role in treating water quality as well as providing an opportunity for evaporative loss which helps meet flow-based targets. The wetlands will have nominally a 30 hour water residence time with slow flowing water passing through a macrophyte zone that has a depth of 300mm. The edge treatment is for buffer planting of 1 m then stepped vertical sandstone logs so that there is no opportunity for birds to wade into the waterbody. The draft Sydney Water guidelines acknowledge the to reduce the risk of bird strike at the airport and therefore incorporate measures such as the avoidance of open water / deep water zones within the macrophyte zones; avoid placement of bird prey habitat features (e.g., logs or rocky features) and avoiding wader bird habitat such as clay pans. There will be 19 wetlands totalling approximately 4.15 ha.

The constructed wetlands discharge into water storage ponds which allow for further decay of contaminants and UV light to sterilize pathogens. The storage ponds are expected to have permanent water with hydraulic retention times of 3 days. In accordance with the Sydney Water guidelines, wildlife management measures include an edge with macrophyte treatment of 2.4 m, stepped sandstone logs are used to avoid gentle grades into the waterbody and maximum water depth is 1.5m. For wildlife management, the ponds are to avoid bird prey habitat features (e.g., logs and rocky features). There will be 13 storage ponds totalling approximately 4.28 ha, which gives an average pond size of 0.33 ha. Whilst ponds have been designed to reduce their attractiveness to wildlife, their attractiveness to wildlife is not eliminated.

3.3.5. Riparian corridors

Existing riparian corridors are proposed to be revegetated to Cumberland Red Gum Riverflat Forest in accordance with a Vegetation Management Plan. This vegetation community is the community that would most likely have extended along all riparian zones on the site. Tozer (2003) indicates this community would typically have a total vegetation cover (tree, small tree, shrub, forbs) of 105%, with the tree canopy averaging 23% but also being found with canopy greater than 30%.

Rehabilitating to Cumberland Red Gum Riverflat Forest is consistent with the Waterway Health and Riparian Corridor Objectives of the DCP and the draft Stormwater Infrastructure Design Guidelines (Sydney Water v 2022-1.0) which state '*By rehabilitating these waterways, the health and structure of the receiving waters are protected by mitigating erosion impacts, flows can be slowed to a more natural state and the ecological environment protected while offering cooling to the surrounding area'*. Revegetation will be for the Vegetated Riparian Zone which varies depending on the stream order.

Much of the riparian zones onsite are currently clear of native vegetation and require significant revegetation. To achieve the DCP objectives for riparian corridors, the corridors are proposed to be planted with species on the DCP Species list that are associated with Cumberland Red Gum Riverflat Forest, including the planting of eucalypts and other species that may attract wildlife due to flowering and fruits. Trees would be plated at densities of 1 tree per 50m^2 and shrubs at 1 per 10m^2 in order to achieve the eventual canopy target of 50% - noting that the landscape plan target includes mid story vegetation in achieving this target.

It is acknowledged that both the use of species and density of trees requires the submission of an ecologist report (i.e. this report) to consider building, site, and water body design outcomes and/or landscape maintenance measures that will mitigate bird and flying fox attraction and roosting areas. The use of species with special notation in the DCP list can be used where 'supported by ecologist report, confirming landscape design minimises wildlife attraction'. This issue is addressed in later chapters.

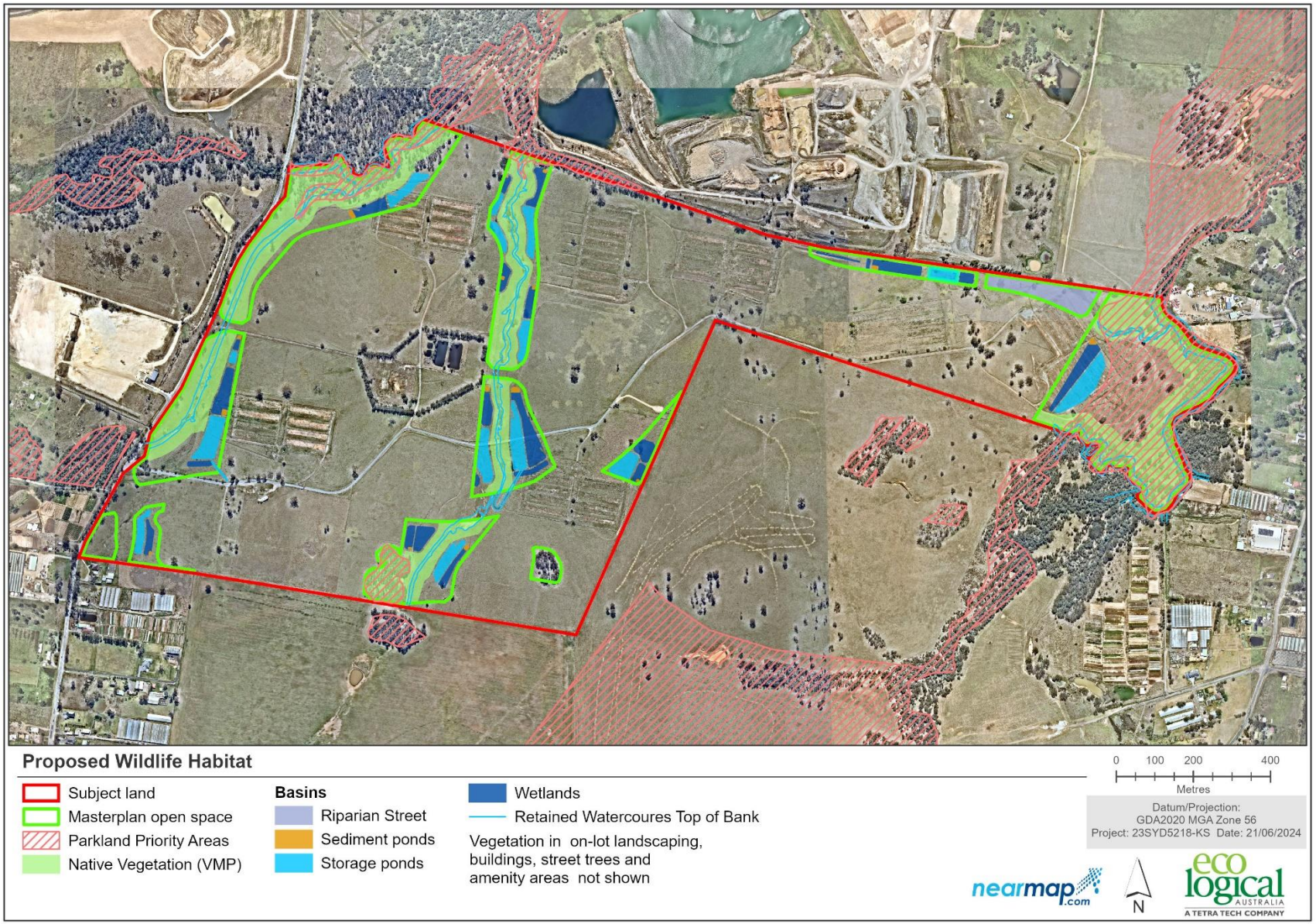


Figure 3 Proposed habitat elements

4. Wildlife

This chapter identifies bird and bat species that are found in western Sydney and ranks them according to their risk to airport operations. Terrestrial fauna such as kangaroos have not been assessed as airport fencing would prevent the movement of such fauna onto the airport land.

The methodology for this assessment is provided in Appendix A.

4.1. Likelihood of occurrence

The desktop assessment and literature review identified 288 bird species and 23 bat species (2 megabat, 21 microbats) that occur within a 15 km radius of the study site. Considering the presence of existing records, habitat requirements and known information about the study area and surrounding landscape, 160 species (148 birds, 2 megabats, 10 microbats) were determined as being present, or having a moderately high or high likelihood to occur within the study area. Of the identified 160 species, 40 species are listed under the Commonwealth *Environment Protection & Biodiversity Conservation Act* 1999 (EPBC Act), NSW *Biodiversity Conservation Act 2016* (BC Act) or both (15 listed under the BC act, 34 listed under the EPBC Act, 9 listed under both). All other species were considered unlikely to occur within the study area, based on nearby records and level or disturbance within and near the study area. The results of the likelihood of occurrence analysis including the rationale for each species are provided in Appendix B.

4.1.1. Birds

The desktop and literature review identified 288 bird species, of these, 148 species were determined as being present or having the potential to occur within the study area.

Past surveys from BirdData within the study area (near Badgers Creek, along Badgerys Creek Rd, and South Creek), confirmed the presence of 72 common bird species at risk of strikes including parrots (Galahs, Corellas, Cockatoos, Rosellas, Lorikeets), ducks and other water birds (Dusky Moorhen, Egrets, Herons, Masked Lapwing, Straw-necked Ibis), Raptors (Eagles, Kites, Kestrels, Falcons, Hobby's, Sparrowhawks), Corvids (Magpie, Currawong, Ravens, White-winged Chough), Pigeons (Crested Pigeon, Spotted Dove), Swallows (Welcome Swallow) and invasive species (Starlings and Common Myna). Other species that are confirmed onsite include small woodlands birds (Fairy-wrens, Weebills, Robins Finches, Honeyeaters). The study area also contains some suitable foraging habitat and breeding hollows for owl species. Owl and Nightjar species that could utilise the study area include: Australian Owlet-nightjar, Tawny Frogmouth, Southern Boobook and Eastern Barn Owl. Peak times of potential strikes involving this species would occur at dusk and post dusk when owls are departing their hollows to forage.

4.1.2. Megabats

The desktop and literature review identified two Megabat species (Grey-headed Flying-fox, *Pteropus poliocephalus* and Little Red Flying-fox, *Pteropus scapulatus*) that may occur within the study area. These species were not identified within the development site during previous surveys by ELA (ELA 2024), and no camps were identified to occur within the study area. However, the vegetation within the development site has the potential to provide seasonal foraging habitat for both of these species.

Foraging habitat within the development site for this species is limited as the majority of the subject area is pasture.

Flying Fox species often intermix and share camp sites with one another. The closest Flying Fox camp is located at Ropes Creek, approximately 15 km to the northeast of the development site and is estimated to occupy approximately 2,500 – 9,999 as of February 2022 (DAWE, 2023). It is known that Flying-foxes commute daily to foraging areas, usually within 15 km of the day roost site (Tidemann 1998). Flying-foxes are capable of nightly flights of up to 50 km from their roost to different feeding areas as food resources change (Eby unpubl., cited in Eby 1991). The peak times of potential strikes to these species would occur at dusk, post dusk or dawn when flying foxes are departing their roosts to forage or returning to their roosts.

4.1.3. Microbats

The desktop review identified 21 microbat species that have the potential to occur within the 15 km radius of the study site. Of these species, 10 were determined to have a moderate likelihood of occurring within the site. The other 11 species were determined unlikely to occur due to the lack of suitable habitat (caves, cliffs, taller moister rainforest habitats). Species that may occur on site include:

- Free-tailed bats: White-striped Freetail-bat (*Austronomus australis*), Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*), Eastern Free-tailed Bat (Ozimops ridei) and South-eastern Free-tailed Bat (*Ozimops planiceps*)
- Wattled Bats: Gould's Wattled Bat (*Chalinolobus gouldii*) and Chocolate Wattled Bat (*Chalinolobus morio*)
- Long-eared Bats: Lesser Long-eared Bat (*Nyctophilus geoffroyi*) and Gould's Long-eared Bat (*Nyctophilus gouldi*)
- Other Bats: Eastern Broad-nosed Bat (*Scotorepens orion*) and Little Forest Bat (*Vespadelus vulturnus*)

These species occupy a variety of habitats including native forest vegetation, wetlands, and more open habitats. These species may roost in hollows and under bark of old trees such as Eucalypts, ceilings or basements of buildings and disused birds' nests. Roosting habitats including 6 hollow-bearing trees and 11 stags have been previously recorded on site (ELA 2024).

4.2. Common Strike species

During the 2008 to 2017 period the most commonly struck species of, identified, flying animals at Sydney Airport were flying foxes (98), fruit bats (84), Australian (Richards) pipit (70), Nankeen kestrel (47) and bats (other) (46) (Figure 4). In the same period, most struck species of, identified, flying animals at Bankstown Airport were magpies (19), duck (6), pigeon (5), bat (4), and flying fox (4) (Figure 5). Many of the strikes involving animals reported as 'bats' or 'fruit bats' might have involved flying foxes.

The five most common species/groups reported to be involved in a strike Australia-wide between 2008 and 2017 are Galahs, Plovers, Bats, Magpies and Flying Foxes. Kites, Magpie-larks, Nankeen Kestrel and Swallows were also among the highest-ranking strike species Australia wide. Similar species were

recorded by Avisure in their Preliminary Western Sydney Airport Bird and Bat Strike Risk Assessment in 2016, including Masked Lapwing, Galah, Australian Magpie and Duck species.

4.3. Bird and Bat Hazard Rankings

Species from the likelihood of occurrence analysis that ranked as moderate, high, or present were considered for the hazard assessment. A total of 160 species were placed into criterion to determine their consequence score if struck, according to their body mass, flocking density and flight behaviour. This consequence score, along with a species probability score (likelihood of being involved in a strike based on historical strike data) determined the overall hazard rank for each species. Probability scores were assigned according to the percentage of reported known strikes for each species/guild using online ATSB databases. A total of 101 species were assigned scores based on ATSB strike data for Sydney and Bankstown Airports. The remaining species were assigned using Australia wide ATSB data (50 species), or if not present in either dataset species were given a low probability (since there were no records of strikes) (9 species). Consequence and probability scores for individual species are provided in Consequence and Probability Scores by Species.

The overall hazard rank is intended to be used as a general guide to identify species that have the potential to pose the most risk on site for wildlife strikes. Hazard Rankings for individual species in order from Extreme to Negligible can be found in Overall Hazard Assessment Rankings by Species . Higher ranking species have greater probabilities of being struck and may cause greater damage when struck. For ease of interpretation, species are discussed in terms of their guilds/functional groups, outlined in Appendix E.

The main species or groups of species of most concern when planning mitigation measures for this development due to high hazard rankings include:

- Megabats (Grey-headed Flying-fox, Little Red Flying-fox)
- Waterbirds (Ibis, Masked Lapwing, Cormorants, Egret)
- Pigeons/Doves (Rock Dove, Peaceful Dove, Bar-shouldered Dove)
- Large parrots (Corellas, Galahs, Cockatoos)
- Gulls (Silver Gull)
- Ducks (Chestnut Teal, Grey Teal, Pacific Black Duck, Australian Wood Duck)
- Raptors (Wedge-tailed Eagle, Little Eagle, Nankeen Kestrel)
- Australian Magpie
- Common Starling
- Owls (Eastern Barn Owl)

There are 13 species that rank as High, Very High or Extreme, which have been previously recorded within or directly adjacent to the study area (Bird life Australia Surveys, BLA Data). These include Straw-necked Ibis, Long-billed Corella, Galah, Chestnut Teal, Pacific Black Duck, Australian Wood Duck, Masked Lapwing, Wedge-tailed Eagle, Little Eagle, Cattle Egret, Sulphur-crested Cockatoo, Australian Magpie and Common Starling. Other species of note that have been recorded on site include Nankeen Kestrel, which is one of the top strike species in surrounding airports (but has a medium consequence score).

The Flying-foxes (Grey-headed Flying-fox and Little Red Flying-fox) have been identified as the highest risk species (Extreme) in this assessment due to their relatively large size, flocking behaviour and being the most recorded species for strike at the nearest airports, Sydney Airport and Bankstown Airport (ATSB, 2018). The Draft Western Sydney Aerotropolis Wildlife Management Assessment Report also identifies flying foxes as a common species with seven known active flying fox colonies in Western Sydney. However, it is important to note that no megabats or bat camps have been recorded on the site by ELA . Potential foraging habitat is present, however.

The other highest-ranking species include Australian White Ibis, Straw-necked Ibis and Rock Dove (Appendix E). These species have a high strike consequence due to their large sizes and proclivity to form large flocks (Appendix D). They also have adapted well to urban environments and can be found in urbanised areas in high numbers. Ibis are likely to occur around farm dams, the riparian corridors, and the extensive open grasslands on site. Straw-necked Ibis have previously been recorded as present on site. Rock Doves are also a common species which are likely to utilise the open grasslands and pasturelands. They also congregate near urbanised areas. Other high priority species, listed as having a 'very high' hazard ranking include Black Swan, Long-billed Corella, Galah, and Silver Gull.

Species that have highest probability of being struck within the development site include: Megabats (Grey-headed Flying-fox, Little Red Flying-fox), Ducks (e.g. Pacific Black Duck, Australian Wood Duck, Australian Shoveler, Chestnut Teal) Waterbirds (e.g. Masked-Lapwing, Ibis, Egrets and Cormorants) Pigeons (e.g. Wonga Pigeon, Peaceful Dove, Bar-shouldered Dove, Brown Cuckoo Dove, Common Bronzewing) and Eagles (e.g. Wedge-tailed and little Eagle). The Sulphur-Crested Cockatoo, Australian Magpie, Eastern Barn Owl, and Common Starling was also amongst the birds that have a high likelihood of being struck (Appendix D). These species also tend to have higher consequence scores. (Appendix D).

Some of the most commonly reported strike species Australia-wide or within the Sydney region were assigned lower hazard rankings than the above-mentioned species due to their lower consequence scores. These high strike species, including the Australian (Richards) Pipit, Magpie-lark, Nankeen Kestrel, Kites, Welcome Swallow and Fairy Martin should also be considered for management.

The majority of species categorised during this assessment had a low or negligible hazard rating (Table 7). Species of least concern are small Bush birds (Fairy-wrens, Finches, Thornbills, Pardalotes, Scrub wrens and Robins) and Honeyeaters which have few or no reports of strikes in the Sydney Region or Australia Wide. These species also tend to have lower consequence scores due to their smaller sizes (Appendix D). Other species of least concern include small owls (Australian Owlet-nightjar), smaller Parrots (Rosellas, Swift Parrot, Red-rumped Parrot), smaller Raptors (Falcons, Goshawks, Sparrowhawks, Hobbys), Swifts, Swallows and Martins, and some ground dwelling species in the duck category (Moorhens) (Table 7).

The ten microbat species identified in this assessment have been assigned a low or negligible hazard ranking. Microbats generally have smaller body sizes and don't form tight flocks so the consequences of being struck have been deemed lower. However, it is recommended to keep these species in mind when implementing mitigation measures since they potentially have high probabilities of being struck in the Sydney Region. Microbats were allocated as having a medium probability of being struck,

however it is possible that some microbat species could have been reported within the 'other bat' taxa alongside megabats within the ATSB data. This may mean their actual strike numbers could be higher.

Table 7 Hazard rankings of the common guilds/functional groups.

Hazard Rank	No. species in category	Guilds/Functional Groups in order from most to least species in each group.
Extreme	5	Megabats (2), Waterbirds (2), Pigeons (1)
Very High	4	Parrots (2), Ducks (1), Gulls (1)
High	22	Ducks (8), Waterbirds (5), Pigeons (3), Raptors (2), Bush birds (1) Corvids (1), Owls (1), Parrots (1)
Medium	35	Parrots (7), Waterbirds (6), Corvids (6), Raptors (5), Ducks (4), Pigeons (4), Owls (2), Bush birds (1)
Low	28	Parrots (8), Raptors (6), Honeyeaters (4), Bush birds (2), Corvids (2), Swifts, Swallows, Martins (2), Ducks (1), Kingfishers (1), Waders (1), Microbats (1)
Negligible	66	Bush birds (44), Microbats (9), Honeyeaters (8), Kingfishers (2), Corvids (1), Owls (1), Swifts, Swallows, Martins (1)
Total	160	

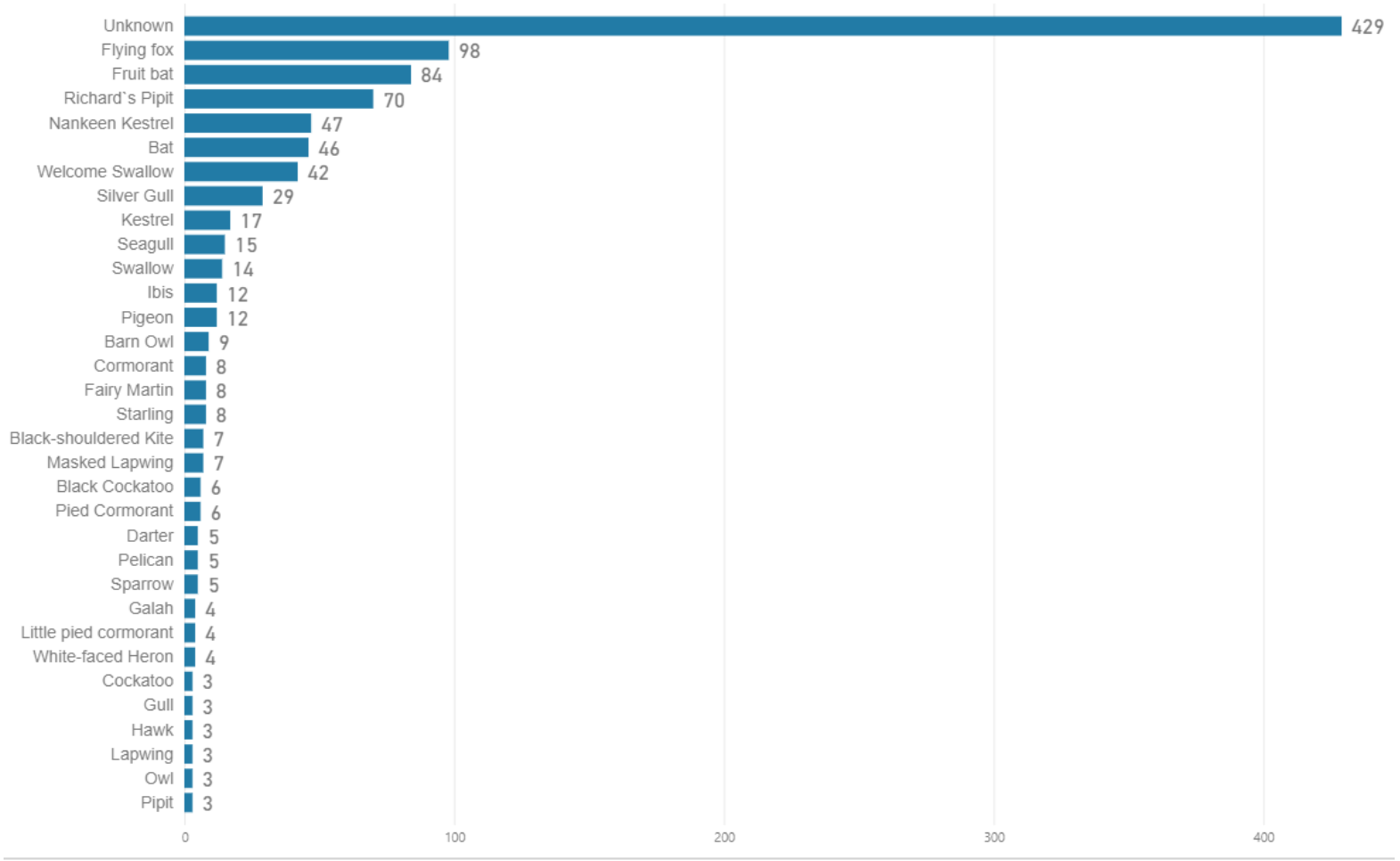


Figure 4 Bird strike by Species Recorded at Sydney Airport 2008 – 2017 (ATSB, 2018)

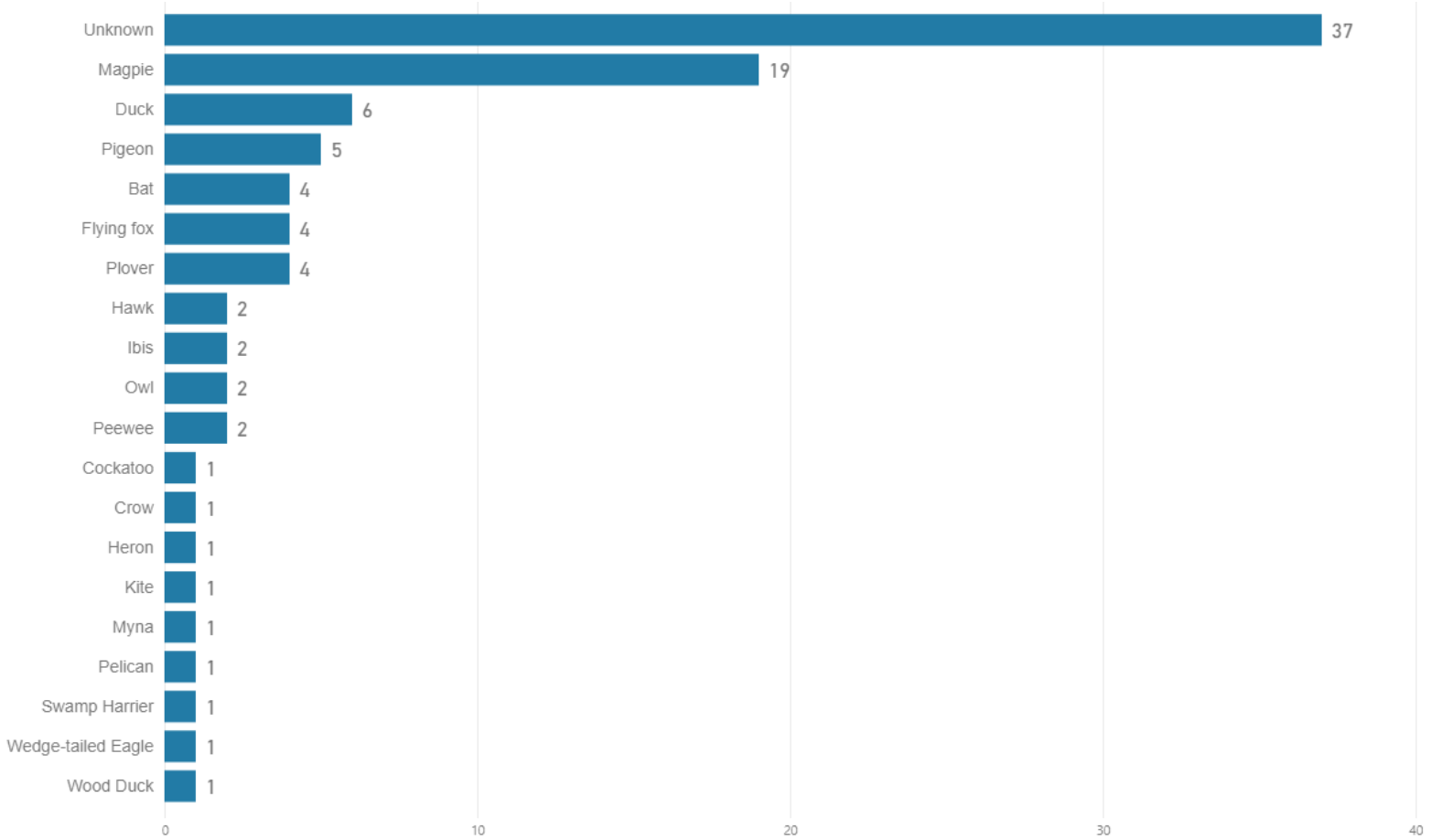


Figure 5 Bird strike by Species Recorded at Bankstown Airport 2008 – 2017 (ATSB, 2018)

5. Risk, Mitigation and Monitoring

5.1. Risk

The habitat elements created under the Master Plan have been classified according to the Aerotropolis Aviation Wildlife Safeguarding Framework (AAWSF) which is based on Guideline C of the NASF, *Managing the Risk of Wildlife Strikes in the Vicinity of Airports.* The categories of land use proposed in the IPG Master Plan include water bodies which are classified as high risk; road, landscaping and riparian corridors which are considered moderate risk; and warehouses which are considered low risk under the AAWSF. See Table 8 below.

5.2. Mitigation

Based on the risk categorisation above, the AWSF recommends which landuses are incompatible, conditional, or require mitigated or no action depending on their proximity to the airport.

The table below shows the Wildlife Attraction Risk identified for certain habitat elements as provided by the AAWSF and then describes the mitigation measures proposed for IPG Badgerys Creek Master Plan.

5.3. Monitoring

Monitoring is a critical element in determining the success of mitigation measures and identifying the need to adapt management to achieve the objective of minimising wildlife risk.

The monitoring described below is to be conducted by an ecologist experienced with long term monitoring project involving birds and bats. Reporting of wildlife is to be provided to the Western Sydney Airport within 28 days of monitoring completion.

Table 8 Recommended monitoring

Landscape Element	Standard Instrument definition	Wildlife attraction risk (AAWSF)	Actions for proposed development (AAWSF)	Proposed mitigation	Monitoring
Road corridors / street trees	Road	Moderate	Mitigate	Species to be planted will only include those in the DCP species list that do not have additional considerations for wildlife risk.	Twice annual diurnal bird survey.
Landscaping on-lot	Recreation area	Moderate	Mitigate	Planting aiming to achieve canopy target of around 15 % for the Enterprise and Light Industry; 25% in the Business and Enterprise area and 30% in the Local Centre. Species to be planted will only include those in the DCP species list that do not have additional considerations for wildlife risk	Twice annual diurnal bird survey.
Warehouse (non-food) and Offices	Warehouse and distribution centres	Very Low	Monitor	Waste storage and collection to be in accordance with a Waste Management Plan that ensures all waste is inaccessible to wildlife. Ensure that entrances to roof cavities and the like are blocked off to prevent uptake as habitat for roosting (bats and birds). Install signage at food outlets and construction sites to discourage feeding of wildlife.	Twice annual diurnal bird survey. Monitoring to establish usage of habitat, focusing on waste storage areas and any evidence or roosting in buildings.
Riparian corridors (VMP area)	Waterway (eg creeks, rivers) Conservation area - dryland	Moderate	Mitigate	As described in 3.3.5, planting of riparian corridors is proposed at a higher density and using species that exceed the performance measures in the DCP. Mitigation will principally be re-active following results of monitoring. Mitigation measures could include removal of the habitat element that	Diurnal bird survey: • once prior to the commencement of riparian restoration. • Twice annually after commencement of riparian restoration.

Landscape Element	Standard Instrument definition	Wildlife attraction risk (AAWSF)	Actions for proposed development (AAWSF)	Proposed mitigation	Monitoring
				is attractive to wildlife, or measures to disturb the breeding or foraging activity of the wildlife if the amount of wildlife activity is deemed a sufficient risk to airport operations. Moraceae species (including *Ficus* sp.) are not planted at all as these are known to be highly attractive to flying fox. Riparian corridors will be revegetated in stages, allowing time to monitor the attractiveness of the riparian corridors to wildlife and the risk to airport operations. This would be assessed and addressed within an adaptive management framework.	Each monitoring event should be morning and afternoon for minimum three consecutive days. Survey locations to be at least two per riparian corridor (i.e., minimum 6 locations in the Master Plan area). Monitoring is to record species, number, habitat and behaviour (e.g., foraging, drinking, nesting, resting, flying). Twice annual bat survey. Results are to be provided to Western Sydney Airport within 18 days of undertaking survey.
Stormwater management facility (wetlands) approximately 3.47 ha)	Wetland	High	Conditional	Designed in accordance with draft Stormwater Infrastructure Design Guidelines (Sydney Water v 2022-1.0), including: • Avoid placement of bird prey habitat features in banks and bunds • Avoidance of migratory wading bird habitat via the use of sandstone block • Typical water depth of 300 mm or greater to avoid wader habitat • Planting of a buffer strip above sandstone log	Diurnal bird survey: • once prior to the commencement of pond construction. • Twice annually after construction of wetlands. Each monitoring event should be morning and afternoon for minimum three consecutive days. Survey locations to be one per wetland. Record species, number, habitat and behaviour (e.g., foraging, drinking, nesting, resting, flying)

Landscape Element	Standard Instrument definition	Wildlife attraction risk (AAWSF)	Actions for proposed development (AAWSF)	Proposed mitigation	Monitoring
				If the wetlands are found to be regularly utilized by high risk species, adaptive management will be undertaken, including consideration of structures to make wetlands less habitable to those species. If, after all other adaptive management strategies have been exhausted and colonial bird roosting or nesting is detected, measures to restrict breeding success will be undertaken.	
Water retention basins (pond) approximately 5.65 ha	Water storage facility	High	Conditional	Expected to have permanent water storage. Designed in accordance with draft Stormwater infrastructure design Guidelines (v 2022-1.0) Sydney Water, including: • Avoid placement of bird prey habitat features in banks and bunds • Avoidance of migratory wading bird habitat via the use of sandstone block If ponds are found to be regularly utilized by high risk species, adaptive management will be undertaken, including consideration of structures to make wetlands less habitable to those species. If, after all other adaptive management strategies have been exhausted and colonial bird roosting or nesting is detected,	Diurnal bird survey: • once prior to the commencement of wetland construction. • Twice annually after construction of wetlands. Each monitoring event should be morning and afternoon for minimum three consecutive days. Survey locations to be one per storage pond. Record species, number, habitat and behaviour (e.g., foraging, drinking, nesting, resting, flying)

Landscape Element	Standard Instrument definition	Wildlife attraction risk (AAWSF)	Actions for proposed development (AAWSF)	Proposed mitigation	Monitoring
				measures to restrict breeding success will be undertaken.	

6. Consistency with Planning Framework

The following table describes the consistency of the Master Plan with the Parklands-Western Sydney City SEPP and the Aerotropolis DCP Phase 2 controls.

Table 9 Consistency with s. 4.19 Wildlife Hazards of the SEPP (Precincts – Western Parkland City) 2021

Clause	Response
(1) The objective of this section is to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport.	
(2) Development consent must not be granted to relevant development on land in the 13 km wildlife buffer zone unless the consent authority—	
(a) has consulted the relevant Commonwealth body, and	The Commonwealth will be consulted during assessment phase of the Master Plan
(b) has considered a written assessment of the wildlife that is likely to be present on the land and the risk of the wildlife to the operation of the Airport provided by the applicant, which includes— *(i) species, size, quantity, flock behaviour and the particular times of day or year when the wildlife is likely to be present, and* *(ii) whether any of the wildlife is a threatened species, and* *(iii) a description of how the assessment was carried out, and*	This report identifies the risk of certain habitat elements in section 5.1. This report describes the bird and bat species likely to utilise the site in Chapter 4 and the appendices. Appendix B identifies species that are threatened. There were a total of 36 species listed under Commonwealth EPBC Act or NSW Biodiversity Conservation Act. The methodology for identify species with greatest risk to operation of the airport is described in Appendix A.
(c) is satisfied that the development will mitigate the risk of wildlife to the operation of the Airport, including, for example, measures relating to— *(i) waste management, landscaping, grass, fencing, stormwater or water areas, or* *(ii) the dispersal of wildlife from the land by the removal of food or the use of spikes, wire or nets*	Revegetation of the riparian corridors and provision of water storage facilities and wetlands will provide habitat for species that pose a risk to airport operations. Mitigation measures are described in 5.1. These habitat features are a consequence of meeting requirements set out in the DCP and agencies responsible for regulating stormwater management. The Master Plan aims to balance competing objectives and provide mitigation measures where possible to reduce the risk of wildlife affecting airport operations.
(3) Despite subsection (2), development for the following purposes is prohibited on land in the 3km wildlife buffer zone– *(a) livestock processing industries* *(b) turf farming* *(c) waste or resource management facilities that consist of outdoor processing, storage or handling of organic or putrescible waste.*	The Master Plan does not provide for these land uses.

Table 10 Consistency with Aerotropolis DCP Phase 2 (November 2022)

Clause	Response
1. Refer to Appendix B for a list of suitable landscape species.	The species list has been used for all plantings in the Master Plan Landscape Plan.
2. In areas within the 3 km wildlife buffer but outside of the Parkland Priority Areas, a report prepared by a suitability qualified and experienced ecologist is to be submitted with any application when the landscaping plan: a. Incorporates alternative landscape species not listed within Appendix B; b. Incorporates landscape species denoted within the landscape species list; c. Will result in more than 5 trees being planted in 1 group (group refers to touching mature canopies); and/or d. Provides a spacing between a group of 5 or more trees that is less than 100 m.	The species list in Appendix B will be used for all street trees. No wildlife attracting species are proposed to be used for street trees. However, for the riparian corridors the VMP proposes to plant species that may attract wildlife. Over time, mature trees may form groups where canopy touches. An ecologist report (i.e. this report) has been prepared for submission with the Master Plan.
3. The ecologist report is to consider building, site, and water body design outcomes and/or landscape maintenance measures that will mitigate bird and flying fox attraction and roosting areas	The context for planting of the riparian corridors in this site requires reference to the Parkland Priority Areas described in the DCP Appendix B. The Parkland Priority Areas identify riparian zones throughout the Aerotropolis where planting of wildlife attracting species is not restricted by the above clause in the DCP, presumably in acknowledgement that that riparian zones should be rehabilitated to their naturally occurring plant community types. Eucalypts, angophoras and other flowering natives are permissible in these areas. The Aerotropolis contains approximately 2814 ha of Priority Parkland Areas. See Figure 1. 13 ha of the Parkland Priority Areas occurs within the IPG site, however only in the north east corner and north west corner of the site. It does not cover the full length of the western riparian corridor and doesn't cover any of the central riparian corridor. The Master Plan proposes revegetation of approximately 24.85 ha in accordance with a Vegetation Management Plan. Outside of these areas there will be some open space plantings, street trees and on-lot landscaping. Approximately 9.22 ha of the VMP area contains existing vegetation. If the Master Plan rehabilitates an additional 15.63 ha, it would represent an increase of less than 1% of the Priority Parkland Area. Whilst it is acknowledged that this vegetation may attract wildlife, it is unlikely that this magnitude of habitat would fundamentally change the presence or frequency of bird and bats in the Aerotropolis. Mitigation measures are proposed to reduce this risk, however the risk is not eliminated. This inconsistency has been proposed in order to partially meet other requirements of the Precinct Plan including:

Clause	Response
	2.1 Celebrating culture by reflecting the cultural landscape and continuous connection of Aboriginal people and country through preservation and rehabilitation of the natural environment; 4.5.3 Public domain and canopy cover; 2.3 Waterway Health and Riparian Corridors; 2.4.2 Conserve and manage existing vegetation and contribute to the increase of habitat and tree canopy within the Aerotropolis). The above planting and rehabilitation of the riparian corridor has the potential to attract wildlife due to the use of species such as Eucalypts which flower; and the density of trees which can provide roosting habitat for birds and bats. It is noted however, that the Technical Paper 5 for the Western Sydney Airport draft EIS (Avisure 2023), does not identify the existing vegetated riparian corridors (one of which is on the boundary of the airport) and extensive vegetated landscapes which contain these same species as a risk. Design outcomes for waterbodies, street trees and on-lot landscaping are described in 3.3 and 5.1 of this report.

7. Conclusion

Clause 4.19 of the SEPP provides controls to regulate development on land surrounding the Airport where wildlife may present a risk to the operation of the Airport.

An assessment of the likelihood and risk of bird and bat species found in western Sydney identified that Megabats (Grey-headed flying fox), Pigeons (Rock dove) and Ibis (Australian White Ibis and Straw-necked Ibis) pose the highest risk. Parrots (Galahs, Corellas, Cockatoos), Ducks (including Black Swan), Gulls (Silver Gull) and other waterbirds (including Lapwings) also pose a high risk (Appendix E).

The Master Plan provides habitat for waterbirds due to the need to provide stormwater ponds and wetlands. The wetlands and ponds have incorporated design elements to make them less attractive to wildlife as per the Sydney Water guidelines, including edge/depth design for stormwater storage facilities. These design elements will reduce the attractiveness of habitat, but are unlikely to eliminate it.

The Master Plan also provides habitat for woodland birds via the restoration of Cumberland Red Gum Riverflat Forest in the riparian zones. This is provided due to the need to meet other objectives relating to naturalisation of waterways, for cultural reasons and meeting tree canopy targets associated with minimising the urban heat island effect. Street trees and on-lot landscaping has incorporated the use of tree species that do not attract wildlife.

The design and mitigation measures will reduce habitat attractiveness, however they are unlikely to eliminate high risk species utilising the site. Monitoring will therefore be necessary to determine if and how high risk species are using the site. Adaptive management will then be required if the species are deemed to present a significant risk to airport operations.

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Appendix A Methodology for wildlife risk rating

A1 Desktop and literature review

A desktop assessment was undertaken by ELA which involved a review of biodiversity databases to inform the potential bird and bat species that may occur within and in the proximity of the site. The following sources was consulted during the assessment:

- BioNet (Wildlife Atlas) search for all species that have been previously recorded within or around the study area (15 km radius) – accessed 9th November 2023 (DPE 2023)
- EPBC Act Protected Matters Search Tool (PMST) for Matters of National Environmental Significance using a radius of 15 km around the Study Area – accessed 9th November 2023 (DCCEEW 2023)
- Birddata search for species observed within the site via previously conducted surveys (BirdLife Australia 2023) – accessed 9th November 2023
- Atlas of Living Australia (ALA)
- Commonwealth Species Profile and Threats Database (SPRAT) (DCCEEW 2023)
- NSW Threatened Species Profiles (DPE 2023)
- Handbook of Australian, New Zealand and Antarctic Birds (HANZAB)

In addition to the database searches, the following documents were reviewed to inform the desktop study and understand the existing wildlife populations in the locality:

- Eco Logical Australia 2024. 475 Badgerys Creek Road Master Plan Request – Biodiversity Assessment Report. Prepared for Ingham Property Group Pty Ltd.
- Eco Logical Australia 2024. 475 Badgerys Creek Road, Bradfield NSW – Riparian Assessment. Prepared for Ingham Property Group Pty Ltd.
- Bird Risk Assessment Model for Airports and Aerodromes (Paton, 2010)
- Western Sydney Aerotropolis Draft Wildlife Management Assessment Report (Avisure, 2020)
- Western Sydney Airport Preliminary Bird and Bat Strike Risk Assessment (Avisure, 2016)
- Australian aviation wildlife strike statistics 2008 – 2017 (ATSB, 2019)
- ATSB National Aviation Occurrence Database – last accessed 7 Aug 2023

A2 Likelihood of occurrence

Based on the results of the desktop review, the likelihood of occurrence was determined for bird and bat species found within and in the surrounds of the study area. Likelihood of occurrence is a determination of the potential for species to be present and make significant use of the study area. Species were ranked as having either no, low, medium, or high likelihood of occurrence, or as being present, by accessing information contained in public biological datasets (e.g. past records and species distribution models), considering species habitat requirements (including surrounding habitat connectivity), and information from previous reports (ELA 2024; ELA 2024). Species ranked as medium, high or present were investigated in further detail for their Hazard Rank (see below). The determinations of a species likelihood provided are not absolute; rather, they represent a species' potential to occur in the study area.

A3 Bird and Bat hazard assessment

This wildlife risk assessment utilises the 'Bird Risk Assessment Model for Airports and Aerodromes' (Paton, 2010) recommended by the AAWHG to assess the relative risk of wildlife strikes posed by species identified as being present or having a medium – high likelihood of occurring from the likelihood of occurrence analysis. This risk assessment is based on information available at the time of the assessment and previous knowledge of bird and bat strike issues at other airports. These results may be refined with further information.

The intention of Paton's risk assessment model is to identify the more hazardous species, and aid in hazard reduction programs. The Paton method assesses the probability and consequences of a strike event in relation to a species body mass, flocking characteristics, flight behaviour, abundance on or near an airport and data on past wildlife strikes at an airport. Both quantitative and qualitative data of abundances and strikes can be used to rank the probability of a species being involved in a strike. This flexibility enables airports with limited data to generate a risk ranking by species. The methodology used in this report for determining the consequence and probability scores are outlined in the following sections.

Paton's method is intended to be specifically for birds, but for this assessment both birds and bats were assessed using this method. A dedicated risk assessment for bats is currently under development, and the AAWHG currently recommends following other methods such as Paton's method in the interim (AAWHG 2014). The same logic when assigning scores can be applied for bats (e.g. large megabats that flock together would have similar consequences to large flocking birds). Microbats can be considered in a similar way to swifts, swallows and martins, which are of a similar size and also feed on the wing over bodies of water and in the air.

The outcome of a bird and bat risk assessment is a probability x consequence matrix as shown in (Table 11). The species found to exhibit the highest probability of being involved in a strike and potentially result in the greatest damage (consequence) to aircraft are then listed as an 'extreme' or 'very high' risk species in the upper left-hand boxes of the matrix.

Table 11 Probability x consequence matrix for assessing the severity of bird hazards at airports and for assigning an overall Hazard Rank

Consequence of a strike	Probability/Likelihood of a strike			
	Very High	High	Medium	Low
Extreme	extreme	extreme	very high	high
Very high	very high	high	high	medium
High	high	high	medium	medium
Medium	medium	medium	low	low
Low	low	low	negligible	negligible
Very low	negligible	negligible	negligible	negligible

A4 Consequence Score

Damage caused to an aircraft by a wildlife strike will depend on the body mass of the species (which determines the force of the impact), flock density (the number of individuals that may be struck in one instance), and the flight behaviour of a species. Species that fly slowly, erratically or have meandering flight paths take longer to clear airspace used by aircrafts, which may lead to longer delays, and are more likely to be struck than birds which fly rapidly and directly throughout their habitats.

Paton's (2010) model uses a simple scoring system to place species into one of:

- Six categories of body mass
- Three categories of flocking behaviour (flocking density).
- Three categories of flight behaviour – the additional category of 'Nocturnal flight activity' has been added to the standard criteria.

Table 12 Criterion for assigning species a consequence score, which estimates the level of damage to occur if involved in a wildlife strike

a) Six body mass criteria for indicative species that may be involved in a wildlife strike and their respective body mass scores.

Body Mass	Examples	Body Mass Score
< 20 g	Welcome Swallow	1
21-50 g	House Sparrow, Skylark	2
51-200g	Common Starling, Magpie-Lark, Nankeen Kestrel	4
201-1000g	Domestic Pigeon, Galah, Silver Gull, Australian Magpie, Masked Lapwing, small ducks	8
1-5 kg	White Ibis, Straw-necked Ibis, large duck	16
>5kg	Australian Pelican, Cape Barren Goose	32

b) Three flocking density criteria for indicative species that may be involved in a wildlife strike and their respective flock scores.

Flock Density	Examples	Flock Score
Usually solitary or widely spaced	Nankeen Kestrel, Skylark,	1
Often in loose flocks	Australian Magpie, Little Raven, Magpie-Lark, Welcome Swallow, Silver Gull	2
Often in tight flock	House Sparrow, Galah, Little Corella, lorikeets, ducks, ibis,	4

c) Three flight behaviour criteria for indicative species that may be involved in a wildlife strike and their respective flight scores.

Flight Behaviour	Examples	Flight Score
Rapid direct	Little Raven, Australian Magpie, ducks, ibis	1
Slow, meandering, erratic, hovering, manoeuvrable	Nankeen Kestrel, Galah, Common Starling, Swallows, Magpie-Lark, Silver Gull, Australian Pelican, Masked Lapwing	2
Nocturnal flight activity	Bats, Owls.	2

The scores for each criterion are then multiplied to calculate a consequence score, which provides a consequence category for each species (Table 14 Criterion for assigning a species a probability score, which estimates the likelihood of a species being involved in a wildlife strike). Information used to place birds into each category were collected from Appendix 1: Bird Species Scores in Paton's 2010 Assessment model and the Handbook of Australian, New Zealand and Antarctic Birds (HANZAB).

Table 13 Consequence score categories and descriptions.

Consequence Category	Consequence Score	Description of Consequence
Extreme	64-128	Aircraft subject to catastrophic damage and cannot maintain controlled flight. Substantial/serious incidents, accidents and damage caused by wildlife strike such as fatal or serious injuries, substantial aircraft damage or structural failures (engine failure, cracked or broken windshields), destruction or damage to property, emergency evacuations, emergency descents, forced landings, diversions/returns.
Very high	32	Aircraft subject to significant damage and ability to operate safely is compromised. Serious incidents and damage caused by wildlife strike such as serious injuries, precautionary descents, precautionary landings.
High	16	Aircraft subject to damage and ability to operate safely is compromised. Incidents and damage caused by wildlife strike such as dents or puncture holes to the aircraft skin, damage to wind shields or surrounding structures, damage to main rotor blades, tail rotor blades or landing gear.
Medium	8	Aircraft subject to damage however can maintain safe operations.

Consequence Category	Consequence Score	Description of Consequence
Low	4	Aircraft subject to minor damage however can maintain safe operations. Minor incidents and damage caused by wildlife strike. Minor incidents and damage caused by wildlife strike.
Very low	1-2	Aircraft misses the species, or strikes the species but is undamaged and can maintain safe operations. Minor incidents and damage caused by wildlife strike.

A5 Probability Score

Paton's model outlines two main methods to estimate the probability of a species being involved in a strike. One is to use the abundances of species at an airport (the more abundant species are more likely to be involved in a strike), and the other is by using the numbers of historical strikes. Since there are few data or estimates of bird abundances for airports, this assessment utilises wildlife strike data.

The AAWSF indicates that WSA is to provide a species risk assessment to proponents undertaking wildlife management assessments. However, due the airport not yet being constructed this assessment has not been completed and species data has not been captured. Therefore, existing data from the ATSB database for Sydney Airport and Bankstown Airport has been utilised to understand common strike species for this report. This data has been used as they are the closest airports to WSA. Data from the ATSB database for strike species Australia wide was also collected to supplement data collected from Sydney Airport and Bankstown Airport.

Strike data was compiled from the ATSB web-based interactive tool, which displays the number of reported birds strikes by species and location from 2008-2017 (ATSB, 2019). Data from Sydney and Bankstown airport were combined to analyse which species are most commonly struck in the area. The majority of bird strike data recorded by the ATSB involved a bird of an unknown/unidentified species. This is because pilots often don't have an opportunity to see a bird before striking it, or the bird is unidentifiable due to the impact. For the purpose of this assessment, these unknown species were removed from the dataset. Species which were listed multiple times under different common names were consolidated (e.g. Seagull and Silver Gull).

To streamline the assessment, species have been combined into 15 guilds or 'functional groups', since the data from the ATSB website often used general terms like "Duck", "Pigeon", "Owl", "Parrot" and "Eagle". A description of the guilds used in this assessment can be found in Appendix E. Data for individual species were used where possible, but for instances like "Duck" all duck species in our list were assigned the higher probability score or the "Duck" score to take a conservative approach.

The percentage of all known bird strikes for each species/guild for both airports were calculated, and each species was placed into the bellow criteria (Table 14). Not all species could be assigned a probability score from the combined dataset of Sydney and Bankstown airports since there were no records for particular species/guilds at these locations. Instead, these species were assigned a score with supplementary data for Australia wide historical strikes. Supplementary data was used since common strike species/guilds were identified during the likelihood of occurrence that weren't reported in the surrounding airports strike data, however should be considered since they are commonly reported strike

species Australia wide. Where no records for a species or group of species were found in any data set, species were assigned the lowest probability score (as they are not reported being struck).

Table 14 Criterion for assigning a species a probability score, which estimates the likelihood of a species being involved in a wildlife strike

Relative Frequency (% all strikes at airport	Apparent Frequency	Probability Category
> 5%	Often	Very High
1-5%	Some	High
0.1-1%	Occasional	Medium
< 0.1%	Rare/None	Low

A6 Limitations

It is important to take note of the limitations of the ATSB data collected. ATSB data is collected through mandatory occurrence reporting requirements of the *Transport Safety Investigation Act 2003* and associated Regulations from the aviation industry. Only confirmed bird strikes are included, and suspected or near misses with birds are not reported. Data quality and consistency are dependent on what is reported. It is unclear on which individuals are involved in the identification of species, it could be from an onsite ecologist, or someone untrained in bird identification. The data also is not current (from 2008 – 2017), and therefore wildlife strike numbers may not reflect current day numbers accurately. In addition to this, strike data may not provide the best estimate of the likelihood of a strike and is a reactive approach in that species are only identified after one or more strikes. The probability scores gained in this assessment can only provide a general estimation/guide on the probabilities of each species being struck. Caution should be taken in its interpretation.

Appendix B Likelihood of Occurrence Assessment

Table 15 Likelihood Assessment, Terms

Likelihood of occurrence	BC Act	EPBC Act
Present: Known resident of the study area based on site observations, recent database records (i.e. within last ten years) or expert advice. **High:** Recent records of the species in the local vicinity (i.e. within the last 10 years); and/or, the study area contains high quality or critical/ preferred habitat. **Moderate:** Previous records of the species in the local vicinity; and/or, the study area contains moderate quality or seasonal habitat. **Low:** Limited previous records of the species in the local vicinity; and/or, the study area contains habitat the species may use opportunistically or en-route to areas of preferred habitat. **None:** No suitable habitat and/or outside species range.	**EX**: Extinct **CE:** Critically endangered **E**: Endangered **V**: Vulnerable	**EX**: Extinct **CE**: Critically endangered **EN**: Endangered **VU**: Vulnerable **CD**: Conservation dependent

Table 16 Likelihood Assessment, Birds

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Acanthagenys rufogularis	Spiny-cheeked Honeyeater	-	-	1	BioNet	Found in dry woodlands, mallee and acacia scrub, especially with a porcupine grass understorey. Also found in coastal scrubs, woodlands along rivers and, occasionally, mangroves. May be found in orchards.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area, other than the wooded creek lines.
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	-	-	11	BLA Data	On the ground in open habitats, such as woodlands, forests, shrublands and grasslands with some trees. It is also common in agricultural lands, along watercourses, beside roads and in parks and gardens. It is found in most climatic zones, but only sparse in tropics, arid zone and east of the Great Dividing Range.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Acanthiza lineata	Striated Thornbill	-	-	2	BLA Data	Open forests and woodlands, mainly those dominated by eucalypts, with a well-developed understorey. Sometimes seen in parks and gardens, preferring areas that are more than ten years old. Also common in agricultural areas, particularly in areas with remnant patches or tree corridors near forests or woodlands.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Acanthiza nana	Yellow Thornbill	-	-	19	BLA Data	Open forests, woodlands and shrublands which are dominated by Casuarinas, Acacias or paperbarks rather than eucalypts.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Acanthiza pusilla	Brown Thornbill	-	-	1	BLA Data	Dense shrubby habitats including wet and dry forests, woodlands, shrublands, heathlands and rainforests, as well as along watercourses, mainly in the temperate and sub-tropical zones.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Acanthiza reguloides	Buff-rumped Thornbill	-	-	65	BioNet	Open forests and woodlands with an open or sparse understory. It is often found in the foothills of ranges but its range can extend from the coast to high sub-alpine areas.	Moderate	Suitable habitat present within the study area including remnant patches of -native

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
								vegetation, especially along the riparian corridors.
Acanthorhynchus tenuirostris	Eastern Spinebill	-	-	1	BLA Data	Heath, forest and woodland.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Accipiter cirrocephalus	Collared Sparrowhawk	-	-	1	BLA Data	The Collared Sparrowhawk is found in woodlands and forests of tropical and temperate Australia.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Accipiter fasciatus	Brown Goshawk	-	Ma	1	BLA Data	Timbered habitats. Eucalypt forests and woodlands, as well as farmland and urban areas.	Present	Previously recorded on site. Suitable habitat present within the study area including remnant patches of native vegetation, especially along the riparian corridors.
Accipiter novaehollandiae	Grey Goshawk	-	-	34	BioNet	Most forest types, especially tall, closed forests, including rainforests.	Moderate	Records in the surrounding areas. Preferred habitat not present within the study area.
Acridotheres tristis	Common Myna	-	-	23	BLA Data	Open woodland, cultivation and around habitation.	Present	Previously recorded on site. Suitable habitat present within the study area, and it is a common species in urban environments.
Acrocephalus australis	Australian Reed-Warbler	-	Ma	83	BioNet	Prefers dense vegetation alongside water, especially thick reed beds, as well as tall crops, bamboo thickets and lantana.	Low	Limited suitable habitat available on site, prefers thick reed beds and well vegetated watercourses. Few recent records.
Actitis hypoleucos	Common Sandpiper	-	Ma, Mi	Modelled	PMST	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland. Coastal wetlands and some inland wetlands,	Low	Suitable habitat (coastal areas) not present within the

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.		development site, no local records.
Aegotheles cristatus	Australian Owlet-nightjar	-	-	36	BioNet	Any tree-studded area where there are suitable hollows, although open areas are also visited. During the day it roosts in hollow branches and tree trunks. The birds form permanent bonds, and pairs occupy the same territory throughout the year.	Moderate	Suitable habitat present on site such as large hollow bearing trees.
Aerodramus terraereginae	Australian Swiftlet	-	-	3	BioNet	The Australian swiftlet feeds in flight, preying on insects and drifting spiders. It forages in flocks over rainforest edges, savanna, pastures, beaches, and gorges. It generally feeds within 30 kilometres of the breeding colony, leaving the nest for periods of about 30 minutes to hunt.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Ailuroedus crassirostris	Green Catbird	-	-	1	BioNet	Temperate and sub-tropical rainforest and paperbarks, and sometimes adjacent eucalypt forest.	Low	One recent record near Cecil Park. Limited suitable habitat present within the study area.
Alauda arvensis	Eurasian Skylark	-	-	4	BioNet	Cultivated grasslands and crops, wastelands and coastal dunes.	High	Recorded on site, suitable foraging habitat present on site including grassland and wetland habitat.
Alectura lathami	Australian Brush-turkey	-	-	9	BioNet	Humid forests along the eastern seaboard and inland to the wetter ranges, though it is most often seen in rainforest and neighbouring eucalypt forest areas.	Low	Preferred habitat not within the study area.
Alisterus scapularis	Australian King-Parrot	-	-	219	BioNet	Rainforests or wet sclerophyll forests.	Moderate	Records in the proximity of the study area. Preferred habitat not on site.
Anas castanea	Chestnut Teal	-	-	4	BLA Data	Wetlands and estuaries in coastal regions and is one of the few ducks able to tolerate high salinity waters, although it still needs fresh water for drinking. It will also use open freshwater lakes, reservoirs and sewage ponds during dry seasons.	Present	Recorded on site, suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.

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Anas gracilis	Grey Teal	-	-	61	BioNet	Common in all sheltered watered areas. These include fresh, brackish and salt water, and the birds can be found on the smallest area of water in the driest of areas. The most favoured habitat type is timbered pools and river systems of the inland areas, where these birds can be found in quite large numbers.	High	Recorded on site, suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Anas platyrhynchos	Mallard	-	-	19	BioNet	Habitats include wetlands, grasslands and crops, as well as sheltered estuaries and marine habitats. It prefers still, shallow water with abundant plant life and is most often found on artificial lakes, ponds and wetlands in urban and farm areas.	Moderate	Suitable wetland habitat within the study area.
Anas rhynchotis	Australasian Shoveler	-	-	9	BioNet	The Australasian Shoveler is found in all kinds of wetlands, preferring large undisturbed heavily vegetated freshwater swamps. It is also found on open waters and occasionally along the coast.	Moderate	Some suitable habitat within the study area, but few recent records close in the surrounding areas.
Anas superciliosa	Pacific Black Duck	-	-	5	BLA Data	Freshwater, intertidal habitats.	Present	Recorded on site, suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Anhinga novaehollandiae	Australasian Darter	-	-	36	BioNet	Wetlands and sheltered coastal waters, mainly in the Tropics and Subtropics. It prefers smooth, open waters, for feeding, with tree trunks, branches, stumps or posts fringing the water, for resting and drying its wings.	Moderate	Limited suitable habitat in the study area, prefers larger open bodies of water for foraging.
Anser anser	Greylag Goose	-	-	1	BioNet	Salt marshes, estuaries, freshwater marshes, steppes, flooded fields, bogs and pasture near lakes, rivers and streams.	Low	Few records in the study area, some suitable habitat.
Anthochaera carunculata	Red Wattlebird	-	-	306	BioNet	Forests, woodlands and gardens.	High	Suitable habitat in the study area within the patches of remnant native vegetation.

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Anthochaera chrysoptera	Little Wattlebird	-	-	138	BioNet	Prefers the drier and often scrubby, habitats, such as banksia heaths, forests, woodlands and urban parks and gardens.	High	Suitable habitat in the study area within the remnants of native vegetation.
Anthochaera phrygia	Regent Honeyeater	CE	CE	16	BioNet	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of *Casuarina cunninghamiana* (River Oak).	Moderate	Suitable foraging habitat detected within the development site.
Anthus novaeseelandiae	Australian Pipit	-	Ma	47	BioNet	Open country, in a range of habitat types from saltmarshes to dry shrublands and open woodland clearings.	High	Recent records in surrounding areas. Suitable foraging habitat present on site including the remnant woodland vegetation.
Aphelocephala leucopsis	Southern Whiteface	-	VU	2	BioNet	The southern whiteface is endemic to Australia and typically inhabits arid open woodlands with a shrubby or grassy understory, as well as grass plains throughout much of the continents south. Not present in Tasmania or in coastal areas of the mainland, this species prefers Acacia woodlands, particularly those dominated by mulga and drought-resistant chenopod shrub species, including saltbush and bluebush. They are considered sedentary; however, atlas records indicate that individuals may move into wetter areas outside of their normal range during drought years.	low	Limited suitable habitat present on site.
Apus pacificus	Fork-tailed Swift	-	Ma, Mi	6	BioNet	Primarily an aerial species which forages in flight and may occasionally land. Listed migratory marine species. The Fork-tailed Swift is almost exclusively aerial, flying from less then 1 m to at least 300 m above ground and probably much higher.	low	Few records in the surrounding areas. Preferred habitat (marine) not present within the development site.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Aquila audax	Wedge-tailed Eagle	-	-	2	BLA Data	From sea level to alpine regions in the mountains, but prefers wooded and forested land and open country, generally avoiding rainforest and coastal heaths. Wedge-tailed Eagles build their nest in a prominent location with a good view of the surrounding countryside. It may be built in either a live or dead tree, but usually the tallest one in the territory.	Present	Recorded within the study area. Suitable foraging habitat in the study area.
Ardea intermedia	Intermediate Egret	-	Ma	30	BioNet	Like most egret species, associates with all types of water bodies including wet fields and usually flocks with other egrets.	Moderate	Some suitable habitat in the study area around the farm dams and watercourses.
Ardea pacifica	White-necked Heron	-	-	44	BioNet	Sometimes seen in tidal areas, most are found in shallow fresh waters, including farm dams, flooded pastures, claypans, and even roadside ditches.	Moderate	Some suitable habitat in the study area around the farm dams and watercourses.
Ardenna pacifica	Wedge-tailed Shearwater	-	Ma, Mi	1	BioNet	Pelagicc bird found in coastal areas. They breed in colonies on small tropical islands.	No	Few records in the surrounding areas. Coastal/marine species.
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	3	BLA Data	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris. Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range.	Present	Recorded on site, suitable habitat present on site.
Artamus personatus	Masked Woodswallow	-	-	4	BioNet	Mainly inhabits open forests and woodlands usually dominated by eucalypts or acacias. They are also found in lightly timbered pastoral country, orchards and vineyards and sometimes along watercourses.	Low	Some suitable habitat within the study area, few recent records near the study area.

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Artamus superciliosus	White-browed Woodswallow	-	-	10	BioNet	Eucalypt, sheoak and Acacia woodland, including mallee, and adjacent open areas including grassland with scattered trees or shrubs. In agricultural landscapes it prefers healthy woodland patches with low disturbance and little grazing	Low	Some suitable habitat present on site. Few recent records in the surrounding areas.
Aviceda subcristata	Pacific Baza	-	-	27	BioNet	Tropical and subtropical woodlands and forest and sometimes grasslands, farmlands and urban areas. They prefer well-watered areas.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Aythya australis	Hardhead	-	-	73	BioNet	Prefers open freshwater swamps and wetlands and occasionally in sheltered estuaries. They are rarely seen on land and tend to roost on low branches and stumps near the water. They prefer deep, fresh open water and densely vegetated wetlands for breeding.	Moderate	Some suitable habitat present on site including the farm dams, South Creek and Badgerys Creek. Prefers larger, deeper bodies of water.
Barnardius zonarius	Australian Ringneck	-	-	6	BioNet	Australian Ringnecks are found in pairs or small flocks over lightly timbered areas, open woodlands and tree-lined watercourses.	Moderate	Suitable habitat, but few records in the surrounding areas.
Biziura lobata	Musk Duck	-	Ma	2	BioNet	Deep freshwater lagoons, with dense reed beds. They range from north-west Western Australia, through the south and east to southern Queensland, and can be found several hundred kilometres inland in some areas.	Low	Some suitable habitat present on site including the farm dams, South Creek and Badgerys Creek. Prefers larger, deeper bodies of water. Few records in the surrounding areas.
Botaurus poiciloptilus	Australasian Bittern	E	EN	3	BioNet	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly Typha sp. (bullrushes) and Eleocharis sp. (spikerushes).	Low	No local records, limited suitable habitat present within the study area, prefers watercourses with denser vegetation.
Bubulcus ibis	Cattle Egret	-	Ma	7	BLA Data	Occurs in grasslands, woodlands and terrestrial wetlands, often occurring in association with farm animals, particularly cattle. It roosts in trees and ground vegetation near lakes and swamps.	Present	Recorded on site, suitable habitat present on site.

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Burhinus grallarius	Bush Stone-curlew	E	-	4	BioNet	The Bush Stone-curlew is a ground-dwelling bird found throughout grasslands, heathlands, and the bush and are sometimes found in cemeteries and golf courses.	Low	Few records in the surrounding areas. Some suitable habitat available.
Cacatua galerita	Sulphur-crested Cockatoo	-	-	3	BLA Data	A variety of timbered habitats and are common around human settlements. The birds stay in the same area all year round.	Present	Recorded on site, suitable foraging habitat present on site including patches of remnant vegetation and grasslands.
Cacatua sanguinea	Little Corella	-	-	2	BLA Data	Often form large flocks, especially along watercourses and where seeding grasses are found.	Present	Recorded on site, suitable foraging habitat present on site including patches of remnant vegetation and grasslands.
Cacatua tenuirostris	Long-billed Corella	-	-	1	BLA Data	Grassy woodlands and grasslands, including pasture and crops, as well as parks in urban areas.	Present	Recorded on site, suitable foraging habitat present on site including patches of remnant vegetation and grasslands.
Cacomantis flabelliformis	Fan-tailed Cuckoo	-	Ma	3	BLA Data	Temperate forests, subtropical or tropical mangrove forests, subtropical or tropical moist montane forests, paddocks, orchards and gardens.	Present	Recorded on site. Suitable habitat present on site, including paddocks, scattered trees and wooded areas.
Cacomantis variolosus	Brush Cuckoo	-	-	14	BioNet	Wooded habitats, including rainforest, wet sclerophyll forests, paperbarks, along waterways and in more open forests and woodlands. Sometimes found in gardens.	Low	Limited suitable habitat, few records near the study area.
Calidris acuminata	Sharp-tailed Sandpiper	-	Ma, Mi	2	BioNet	Widespread in most regions of Victoria, especially in coastal areas. Inhabits shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation.	low	Suitable habitat (natural waterbodies and coastal areas) not present within the development site.
Calidris ferruginea	Curlew Sandpiper	E	CE, Ma, Mi	Modelled	PMST	Non breeding migratory species that occurs primarily on intertidal mudflats of estuaries, lagoons, mangroves, and less often on beaches, rocky shores and around lakes, dams. Can also	Low	The farm dams within the development site do not provide suitable habitat for this species, no local records.

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						occur on suitable inland habitats in the Kerang area, Mildura, and western districts.		
Calidris melanotos	Pectoral Sandpiper	-	Ma, Mi	Modelled	PMST	Non breeding migratory species that prefers shallow fresh to saline wetlands with open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. Also occurs in swamps, saltmarshes, lakes and inundated grasslands.	Low	Suitable habitat (coastal/saline areas) not present within the development site, no local records.
Caligavis chrysops	Yellow-faced Honeyeater	-	-	2	BLA Data	Found in open forests and woodlands, often near water and wetlands. It uses ridges, sand dunes, valleys and rivers when migrating. It is often found in urban areas, including in remnant bushland, as well as parks and gardens.	Present	Recorded within the study area. Some suitable habitat in the study area.
Callocephalon fimbriatum	Gang-gang Cockatoo	V	EN	13	BioNet	Gang-gang Cockatoos primarily occur within the temperate eucalypt forests and woodlands of mainland south-east Australia. The species is an altitudinal migrant. During summer months, Gang-gang Cockatoos primarily inhabit mature, wet sclerophyll forests, typically dominated by eucalypts. During winter months, Gang-gang Cockatoos tend to range beyond montane forests to inhabit woodland assemblages at lower, drier altitudes	Moderate	May forage within the riparian corridor, some local records within 15km.
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	VU	26	BioNet	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa) are important foods.	low	Very limited feed trees present within the development areas and no records of this species within 15kms.
Carduelis carduelis	European Goldfinch	-	-	19	BioNet	Found in settled areas, farmlands and weedy areas such as roadsides, railway lands and industrial wasteland. They are often seen in gardens and parks. Particularly associated with patches of Scotch Thistle.	Moderate	Suitable habitat present within the study area. Few records in the surrounding areas.
Casmerodius modesta	Eastern Great Egret	-	-	33	BioNet	Prefers shallow water, particularly when flowing, but may be seen on any watered area, including damp grasslands. Great Egrets can be	High	Recent records in the surrounding areas. Suitable habitat in the study area,

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						seen alone or in small flocks, often with other egret species, and roost at night in groups.		including damp grasslands, creeklines and farm dams.
Centropus phasianinus	Pheasant Coucal	-	-	8	BioNet	Dense understorey vegetation, particularly grasses, rushes, bracken and sedges, in open forests and woodlands, and around wetlands.	Low	Few records in the surrounding areas. Limited suitable habitat present on site.
Ceyx azureus	Azure Kingfisher	-	EN	2	BLA Data	Never far from water, preferring freshwater rivers and creeks as well as billabongs, lakes, swamps and dams, usually in shady overhanging vegetation. It is sometimes seen in parks on rivers, as well as duck or goldfish ponds in urban areas.	Present	Recorded on site, suitable foraging habitat present on site including vegetation around South Creek and Badgerys Creek.
Chalcites basalis	Horsfield's Bronze-Cuckoo	-	Ma	21	BioNet	Many wooded habitats (such as open and dry woodland and forest) with a range of understoreys from grasses to shrubs or heath. Sometimes found near clearings and in recently logged or burnt forests. Found in farmland with some trees, orchards, vineyards and urban parks and gardens.	Moderate	Some suitable habitat present on site, few recent records in the surrounding areas. Host species present (Superb Fairy-wren).
Chalcites lucidus	Shining Bronze-Cuckoo	-	Ma	48	BioNet	A range of wooded habitats from lightly wooded to rainforest, usually in the tree canopy. It is mostly found in eucalypt areas.	Moderate	Some suitable habitat, few records near the study area. Host species present in the study area (such as Thronbills).
Chalcites osculans	Black-eared Cuckoo	-	Ma	1	BioNet	Occurs in open woodland and shrubland and is often found in vegetation along creekbeds. Occurs with their principal hosts, the Speckled Warbler and Redthroat.	Low	Some suitable habitat present on site, but not recorded in the surrounding areas. Host species not recorded in the surrounding areas (Speckled Warbler, Redthroat).
Chalcophaps indica	Emerald Dove	-	-	2	BioNet	Common species in tropical forests and similar dense wet woodlands, farms and mangroves.	Low	Few records in the surrounding areas. Preferred habitat not present on site.
Charadrius bicinctus	Double-banded Plover	-	Ma, Mi	3	BioNet	Beaches, grassed edges of open wetlands and intertidal mudflats.	Low	Preferred habitat (coastal) not present within the study area.
Charadrius leschenaultii	Greater Sand Plover, Large Sand Plover	V	VU, Ma, Mi	Modelled	PMST	Sheltered sandy, shelly or muddy beaches, large intertidal mudflats, sandbanks, salt-marshes, estuaries, coral reefs, rocky islands, tidal lagoons	No	Preferred habitat (coastal) not present within the study area.

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						and dunes near the coast, although it may sometimes feed on coastal grasslands.		
Chenonetta jubata	Australian Wood Duck	-	-	5	BLA Data	Found in grasslands, open woodlands, wetlands, flooded pastures and along the coast in inlets and bays. It is also common on farmland with dams, as well as around rice fields, sewage ponds and in urban parks.	Present	Recorded on site, suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Cheramoeca leucosterna	White-backed Swallow	-	-	1	BioNet	White-backed swallows prefer open country, above open grassland and low shrubs. During the breeding season, they have a strong preference for habitats around creek beds.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Chlidonias hybrida	Whiskered Tern	-	Ma	1	BioNet	The Whiskered Tern prefers shallow terrestrial freshwater wetlands, freshwater swamps, brackish and saline lakes, floodwaters, sewage farms, irrigated croplands and large dams.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Chroicocephalus novaehollandiae	Silver Gull	-	Ma	18	BioNet	The Silver Gull is found at virtually any watered habitat and is rarely seen far from land. Birds flock in high numbers around fishing boats as these leave or return to the coast, but seldom venture far out to sea.	High	Suitable habitat present around the wetland habitats.
Chthonicola sagittata	Speckled Warbler	V	-	29	BioNet	The Speckled Warbler lives in a wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Typical habitat would include scattered native tussock grasses, a sparse shrub layer, some eucalypt regrowth and an open canopy. Large, relatively undisturbed remnants are required for the species to persist in an area.	Low	Limited suitable habitat present on site. Few records in the surrounding areas.
Cincloramphus cruralis	Brown Songlark	-	-	3	BioNet	Open country, including pastures, short crops, and grassy scrub.	Low	No recent records near the study area. Some suitable habitat present (grasslands)
Cincloramphus mathewsi	Rufous Songlark	-	-	1	BioNet	The Rufous Songlark favours open grassland, grassy open woodland, farmed land and mulga.	Low	Few records in the surrounding areas. Limited suitable habitat within the study area.

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Cincloramphus timoriensis	Tawny Grassbird	-	-	3	BioNet	Within Australia the tawny grassbird is mainly found on "coastal lowlands in rank grasslands, sedges reeds and rushes" and bordering wetlands.	Low	Few records in the surrounding areas. Limited suitable habitat within the study area.
Cinclosoma punctatum	Spotted Quail-thrush	-	CE	5	BioNet	Dry open sclerophyll forests and woodlands mainly with an open or sparse understorey and sparse to no ground cover. They avoid moist or wet habitats such as coastal lowland rainforests, preferring forest dominated by ironbarks, mallee eucalypts, or Spotted Gum forests with an open understorey on dry rocky ridges.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Circus approximans	Swamp Harrier	-	Ma	11	BioNet	Terrestrial wetlands and open country of tropical and temperate Australia and New Zealand. It is mainly seen in fresh or salt wetlands, often in deep swamps with emergent reeds and over open water.	Low	Limited suitable habitat within the study area, few recent records near the study area.
Circus assimilis	Spotted Harrier	V	-	3	BioNet	Open grasslands, open woodland including acacia and mallee, inland riparian woodland, grassland and shrubland. It can be most commonly found in native grassland however it is also seen in agricultural land and inland wetlands for the purpose of foraging.	Low	Limited suitable habitat within the study area, few recent records near the study area.
Cisticola exilis	Golden-headed Cisticola	-	-	85	BioNet	Sub-coastal areas, wetlands, swamp margins, wet grasslands, rivers, and irrigated farmland. It prefers tangled vegetation close to the ground, but breeding males may be seen singing from tall weeds or other shrubs.	Low	Limited suitable habitat within the study area, few recent records near the study area.
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	VU	3	BioNet	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great	Moderate	Few records in the surrounding areas. Limited suitable habitat present on site.

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						Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species.		
Colluricincla harmonica	Grey Shrike-thrush	-	-	5	BLA Data	Found in forests and woodlands. It is a common and familiar bird, although some decrease in numbers has been noted around human habitation, particularly in the west of its range.	Present	Recorded within the study area. Suitable habitat in the study area.
Columba leucomela	White-headed Pigeon	-	-	4	BioNet	It can commonly be found in tropical regions, subtropical rainforest, scrub, watercourses and street trees.	Low	Limited suitable habitat within the study area, few recent records near the study area.
Columba livia	Rock Dove	-	-	411	BioNet	Prefers open agricultural areas.	High	Suitable habitat in the study area. Common species with many records in the surrounding areas.
Coracina novaehollandiae	Black-faced Cuckoo-shrike	-	Ma	13	BLA Data	Widespread and common. Outside the breeding season, large family groups and flocks of up to a hundred birds form. The Black-faced Cuckoo-shrike is found in almost any wooded habitat, with the exception of rainforests. It is also familiar in many suburbs, where birds are often seen perched on overhead wires or television aerials.	Present	Recorded within the study area. Suitable habitat in the study area.
Coracina papuensis	White-bellied Cuckoo-shrike	-	Ma	6	BioNet	Savanna, woodlands, Eucalyptus forests, riparian forest, rainforest, littoral forest, river redgum bushland, mangroves, open grasslands, coconut plantations, farmlands, and suburban gardens.	Low	Limited suitable habitat present on site, few recent records near the study area.
Corcorax melanorhamphos	White-winged Chough	-	-	1	BLA Data	Found in open forests and woodlands. They tend to prefer the wetter areas, with lots of leaf-litter, for feeding, and available mud for nest building.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation and grasslands.

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Cormobates leucophaea	White-throated Treecreeper	-	-	137	BioNet	Prefers forests, including rainforests, woodlands and timbered river areas. Rarely seen on the ground, it lives in permanent territories.	Moderate	Some records in the areas surrounding the site. Some suitable habitat present including wooded riparian areas.
Corvus coronoides	Australian Raven	-	-	17	BLA Data	Found in all habitat types including: Wetland, Coastal, Heathland, Forest, Woodland, Rainforest. Not found in the more arid areas of Western Australia and wet tropics of Queensland.	Present	Recorded within the study area. Suitable habitat in the study area.
Corvus mellori	Little Raven	-	-	2	BLA Data	Scrub, agricultural areas, grazing pasture, woodlands to treeless plains, coasts, and suburbs.	Present	Recorded within the study area. Suitable habitat in the study area.
Coturnix pectoralis	Stubble Quail	-	Ma	1	BLA Data	Lives in the grasslands and shrublands of temperate regions, usually in well-watered areas, but will move into arid areas after floods or rain. It prefers tall, dense vegetation, especially grasslands, but will use lower vegetation.	Present	Recorded within the study area, but limited habitat within the study area.
Cracticus nigrogularis	Pied Butcherbird	-	-	62	BioNet	Drier forests and woodlands and often approaches parks and houses.	High	Suitable habitat present pm site. Records in the surrounding areas.
Cracticus torquatus	Grey Butcherbird	-	-	12	BLA Data	Found in a range of wooded habitats, including suburban areas. In inland areas, the birds tend to favour the denser forests.	Present	Recorded within the study area. Suitable habitat in the study area.
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	-	Mi	Modelled	PMST	Inhabits forests, occurring in coniferous, deciduous and mixed forest.	No	Suitable habitat not present within the development site, no local records.
Cygnus atratus	Black Swan	-	-	149	BioNet	Common in the wetlands of southwestern and eastern Australia and adjacent coastal islands.	Moderate	Some suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Dacelo novaeguineae	Laughing Kookaburra	-	-	8	BLA Data	Forests, open woodlands, or on the edges of plains.	Present	Recorded within the study area. Suitable habitat in the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Daphoenositta chrysoptera	Varied Sittella	V	-	100	BioNet	Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Moderate	Some suitable habitat present within the study area.
Dendrocygna arcuata	Wandering Whistling-Duck	-	Ma	1	BioNet	Prefers deep vegetated lagoons and swamps, flooded grasslands, sewerage farms, grain stubbles, pastures, irrigated lands and ricefields. It prefers deeper waters where aquatic plants and insects are plentiful.	Low	Few records in the surrounding areas. Preferred habitat not present within the study area. Prefers deep well vegetated bodies of water.
Dicaeum hirundinaceum	Mistletoebird	-	-	182	BioNet	Found wherever mistletoe grows and is important in the dispersal of this plant species.	Low	Limited suitable habitat present on site, lack of mistletoe on site.
Dromaius novaehollandiae	Emu	-	-	16	BioNet	Emus live in various habitats across Australia both inland and near the coast. They are most common in areas of savannah woodland and sclerophyll forest, and least common in heavily populated districts and arid areas.	Low	Few recent records close to the study area.
Edolisoma tenuirostris	Cicadabird	-	-	10	BioNet	Cicadabirds mainly inhabit rainforests, paperbark woodlands and mangrove areas. Those in the eastern and southern range are also occasionally found in open eucalypt forests adjacent to these habitats.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Egretta garzetta	Little Egret	-	Ma	13	BioNet	Shores of lakes, rivers, canals, ponds, lagoons, marshes and flooded land, prefers open locations to dense cover. On the coast it inhabits mangrove areas, swamps, mudflats, sandy beaches and reefs.	Moderate	Few records in the surrounding areas. Limited suitable habitat present within the study area other than the creeks.
Egretta novaehollandiae	White-faced Heron	-	-	2	BLA Data	Found anywhere where there is water, from tidal mudflats and coastal reefs to moist grasslands and gardens.	Present	Recorded on site. Suitable habitat in the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Elanus axillaris	Black-shouldered Kite	-	-	2	BLA Data	Treed grasslands and on farms, along roads, and in vacant waste lands of urban and coastal areas.	Present	Recorded on site. Suitable habitat in the study area.
Elseyornis melanops	Black-fronted Dotterel	-	-	42	BioNet	Found in the shallow margins of wetlands, lakes, rivers, sewage farms, storm drains and marshes. It is normally always near freshwater and is not often seen on the coast.	Low	While there are freshwater habitats on site, it is not optimal for this species.
Entomyzon cyanotis	Blue-faced Honeyeater	-	-	4	BioNet	Open forests, woodlands, mangroves and coastal heathlands close to water in tropical, sub-tropical and wetter temperate zones.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Eolophus roseicapilla	Galah	-	-	5	BLA Data	Found in large flocks in a variety of timbered habitats, usually near water.	Present	Recorded on site, suitable foraging habitat present on site.
Eopsaltria australis	Eastern Yellow Robin	-	-	2	BLA Data	Wide range of habitats, from dry woodlands to rainforests. They are also common in parks and gardens.	Present	Recorded on site, suitable foraging habitat present on site.
Ephippiorhynchus asiaticus	Black-necked Stork	E	-	3	BioNet	Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	Low	Few records in the surrounding areas. Preferred habitat not on site. Some suitable secondary foraging habitat present
Erythrogonys cinctus	Red-kneed Dotterel	-	-	4	BioNet	Red-kneed Dotterels are found in wetlands, lagoons and swamplands, preferring fresh water and areas prone to flooding.	Low	No recent records near the study area. Suitable habitat not present within the study area.
Erythrotriorchis radiatus	Red Goshawk	CE	EN	Modelled	PMST	Inhabiting tropical and warm-temperate woodlands and forests, the Red Goshawk prefers areas with a mosaic of vegetation types, often near wetlands. They often occur at the boundary between two vegetation types, and often favour forests or woodlands dominated by eucalypts or paperbarks. They avoid very dense or very open habitats.	Low	Mostly associated with Coastal habitat. In addition limited feed trees present within the development areas.
Eudynamys orientalis	Eastern Koel	-	-	125	BioNet	Common Koels are found in tall forests and are common in suburban areas.	Low	Preferred habitat not present on site, no records adjacent to the study area. Might be in

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
								Urban areas around the study area.
Eurostopodus mystacalis	White-throated Nightjar	-	Ma	10	BioNet	Variety of habitats but is most commonly found in dry low-elevation forests. They prefer to nest and roost in dry sclerophyll woodlands with sparse and discontinuous understory.	Low	No recent records near the study area. Limited suitable habitat within the study area.
Eurystomus orientalis	Dollarbird	-	Ma	47	BioNet	Inhabits open wooded areas, normally with mature, hollow-bearing trees suitable for nesting.	Low	Some suitable habitat present including open wooded areas with hollows present. Few recent records in the surrounding areas.
Falco berigora	Brown Falcon	-	-	45	BioNet	Found in all but the densest forests and is locally common throughout its range. The preferred habitat is open grassland and agricultural areas, with scattered trees or structures such as telegraph poles which it uses for perching.	Moderate	Records in the surrounding areas. Suitable habitat present within the study area.
Falco cenchroides	Nankeen Kestrel	-	Ma	4	BLA Data	Preferred habitats are lightly wooded areas and open agricultural regions and tend to be absent from dense forests. The Nankeen Kestrel's success as a bird of prey can be largely contributed to its tolerance for a wide variety of habitats and its ability to feed on a variety of foods and nest in a range of sites.	Present	Recorded within the study area. Suitable habitat in the study area.
Falco hypoleucos	Grey Falcon	V	VU	Modelled	PMST	Primarily occurs inland in arid areas but can occur elsewhere in Australia. Prefers lightly timbered woodland and Acaica scrub.	No	The development site is not within arid or semi-arid areas where this species is usually confined, no local records
Falco longipennis	Australian Hobby	-	-	1	BLA Data	Woodlands, forests, and open country in tropics. Most common in lightly timbered woodlands.	Present	Recorded within the study area. Suitable habitat in the study area.
Falco peregrinus	Peregrine Falcon	-	-	1	BLA Data	Found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water, and may even be found nesting on high city buildings.	Present	Recorded within the study area. Some suitable habitat in the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Falco subniger	Black Falcon	V	-	2	BioNet	The Black Falcon is found along tree-lined watercourses and in isolated woodlands, mainly in arid and semi-arid areas. It roosts in trees at night and often on power poles by day.	Low	Few records in the surrounding areas. Limited suitable habitat present.
Falcunculus frontatus	Crested Shrike-tit	-	-	7	BioNet	The Crested Shrike-tit is found in eucalypt forests and woodlands, forested gullies and along rivers in drier areas. It can also be found in rainforests. It is sometimes seen in parks and gardens, on farms with scattered trees, and on pine plantations.	Moderate	Few records in the surrounding areas. Suitable habitat present within the study area.
Fulica atra	Eurasian Coot	-	-	146	BioNet	Common in suitably vegetated lagoons and swamps. Birds are less common in the north and in the drier regions.	High	Suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Gallinago hardwickii	Latham's Snipe	-	Ma, Mi	25	BioNet	Non-breeding migratory species that occurs in freshwater wetlands with low dense vegetation on or near the coast. Prefered wetland vegetation includes sedges, grasses, lignum, reeds and rushes. Also occurs in saltmarsh and creek edges on migration, drainage ditches along roadsides and railways, crops and pasture.	Moderate	Few records in the surrounding areas. Some Suitable habitat on site.
Gallinula tenebrosa	Dusky Moorhen	-	-	1	BLA Data	Wetland habitats, with a preference for freshwater marshes and swamps, and are rarely found far from these areas except when foraging in nearby vegetation.	Present	Recorded within the study area. Suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Gallus gallus	Red Junglefowl	-	-	10	BioNet	Red junglefowl prefer disturbed habitats and edges, both natural and human-created.	Low	No recent records near the study area.
Geopelia cuneata	Diamond Dove	-	-	4	BioNet	Diamond Doves gather in small parties or flocks in dry open savanna in mulga areas often among spinifex or grasses. They are also often in open riparian woodland (beside waterways).	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area, other than within the riparian corridor.
Geopelia humeralis	Bar-shouldered Dove	-	-	125	BioNet	Woodland with a grassy understorey and in nearby open areas, usually near water. They are	Moderate	Suitable habitat present. Few records in the immediate surrounds of the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						also often found in mangroves and are frequently seen in urban areas.		
Geopelia striata	Peaceful Dove	-	-	65	BioNet	Open dry woodland with a grassy understorey and the edges of rainforest. In drier areas, they are often in woodland beside rivers, pandanus and vine thickets. They feed on the ground and roost in trees.	Moderate	Some suitable habitat present.
Gerygone fusca	Western Gerygone	-	-	3	BioNet	Widespread in drier open forests and woodlands where it can be seen among coastal and inland eucalypts, mulga and other acacia scrubs.	Low	Limited suitable habitat on site, few recent records in the surrounding areas.
Gerygone mouki	Brown Gerygone	-	-	77	BioNet	Coastal and mountain rainforest, wet gullies and mangroves.	Low	Limited suitable habitat on site, few recent records in the surrounding areas.
Gerygone olivacea	White-throated Gerygone	-	-	3	BLA Data	Temperate forests and subtropical or tropical moist lowland forests.	Present	Recorded on site. Suitable habitat present within the study area.
Glossopsitta concinna	Musk Lorikeet	-	-	53	BioNet	Found in tall, open, dry forest and woodlands, dominated by eucalypts and are usually found in the canopy. They are also seen in suburban areas, parks and street trees. They roost or loaf in tall trees away from their feeding sites.	High	Suitable habitat present within the study area. Recent records near the study area.
Glossopsitta pusilla	Little Lorikeet	V	-	24	BioNet	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Moderate	Some suitable habitat, no recent records near the study area.
Grallina cyanoleuca	Magpie-lark	-	Ma	24	BLA Data	In almost any habitat except rainforests and the driest deserts and are familiar urban birds.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.

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Grantiella picta	Painted Honeyeater	V	VU	Modelled	PMST	Prefers forest/woodland, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands with mistletoe a high number of mature trees. Also occurs in acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens.	Low	Limited suitable habitat present within the study area, species requires mistletoe and a high number of mature trees.
Gymnorhina tibicen	Australian Magpie	-	-	21	BLA Data	Found wherever there is a combination of trees and adjacent open areas, including parks and playing fields. They are absent only from the densest forests and arid deserts. Heathland, Woodland, Coastal, Island, Urban, Grassland.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Ma	47	BioNet	Occurs on beaches and estuaries, inland wetlands, lakes, reservoirs, saltmarsh, major inland streams and adjacent terrstrial habitats.	Low	Preferred habitat not present within the study area, prefers coastal areas.
Haliastur sphenurus	Whistling Kite	-	Ma	2	BLA Data	Woodlands, open country and particularly wetlands. It is also common around farmland, vineyards and anywhere where carrion (dead animals) can be found. Prefers tall trees for nesting.	Present	Recorded on site. Suitable foraging habitat present within the study area.
Heteroscenes pallidus	Pallid Cuckoo	-	Ma	2	BLA Data	It is found in Australia, Christmas Island, Indonesia, New Zealand, and Papua New Guinea. Its natural habitats are subtropical or tropical dry forests and subtropical or tropical mangrove forests.	Present	Recorded on site. Suitable foraging habitat present within the study area.
Hieraaetus morphnoides	Little Eagle	V	-	1	BLA Data	Widespread species. Occurs primarily in wooded farmland and dry woodlands.	Present	Recorded on site. Suitable foraging habitat present within the study area.
Himantopus himantopus	Black-winged Stilt	-	Ma	14	BioNet	Marshes, shallow lakes and ponds.	Low	Limited suitable habitat present within the study area, few records in the surrounding areas.
Hirundapus caudacutus	White-throated Needletail	-	VU, Ma, Mi	8	BioNet	Primarily an aerial species which forages in flight and may occassionally land. Occurs most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	Low	Marginal foraging habitat present within the development site. Few records in the surrounding areas.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Hirundo neoxena	Welcome Swallow	-	Ma	19	BLA Data	Welcome Swallows visit a wide variety of habitats with the exception of the more heavily forested regions and drier inland areas. Woodland, Wetland, Urban, Grassland, Coastal, Desert.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Hirundo rustica	Barn Swallow	-	Ma, Mi	1	BioNet	Open country in coastal lowlands, often near water, towns and cities. Birds are often sighted perched on overhead wires and also in or over freshwater wetlands, paperbark Melaleuca woodland, mesophyll shrub thickets and tussock grassland.	Low	Few records in the surrounding areas. Limited suitable habitat within the study area.
Hypotaenidia philippensis	Buff-banded Rail	-	Ma	6	BioNet	Seen singly or in pairs in dense reeds and vegetation bordering many types of wetlands or crops. It makes widespread use of artificial wetlands like sewage ponds and drainage channels.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Ixobrychus dubius	Australian Little Bittern	-	-	2	BioNet	Diverse freshwater habitats, mainly where tall rushes, reeds, Typha (cumbungi), shrub thickets or other dense cover is inundated by at least 30cm of water. It can be found in vast swamps, but unlike the Australasian Bittern, it often inhabits small patches of dense wetland vegetation such as Typha along drains or in small urban lakes.	Low	No records near the study area. Limited suitable habitat within the study area.
Ixobrychus flavicollis	Black Bittern	V	-	3	BioNet	Roost and nest in trees, and are found in tree-lined wetlands and in mangroves.	Low	No records near the study area. Limited suitable habitat within the study area.
Lalage sueurii	White-winged Triller	-	-	27	BioNet	Open woodlands and forest, tree-lined waterways in semi-arid regions and the nearby scrub. This is mainly lightly timbered country with an open shrub layer and grassy ground-cover.	Moderate	Some suitable habitat within the study area, limited recent records near the study area.
Lathamus discolor	Swift Parrot	E	CE, Ma	69	BioNet	Non-breeding winter migrant. Prefers dry forest and woodland, particularly box-ironbark forest in central and NE Victoria, and eucalptus sp. within greater Melbourne . Feeds on nectar and	Moderate	Suitable foraging habitat on site. Development site not within important mapped areas but important mapped

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						lerps of winter flowering eucalyptus including Grey Box (Eucalyptus microcarpa), Red Ironbark (Eucalyptus tricarpa), Mugga Ironbark (Eucalyptus sideroxylon) (far north-east Victoria), Yellow Gum (Eucalyptus leucoxylon) and White Box (Eucalyptus albens).		areas to the north and south of the development site. May pass through upon migration to preferred habitat.
Leucosarcia melanoleuca	Wonga Pigeon	-	-	380	BioNet	Dense coastal forests, rainforests and scrubs. It is often seen in clearings near forests.	Low	Preferred habitat not within the study area. Recent records around the study area.
Lewinia pectoralis	Lewin's Rail	-	-	1	BioNet	Lewin's rail is a highly secretive bird. This species prefers permanent, fresh-to-saline wetlands surrounded by dense vegetation. That means it can be found in artificial wetlands surrounded by dense vegetation.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area, prefers wetlands with denser vegetation.
Lichenostomus melanops	Yellow-tufted Honeyeater	-	CE	30	BioNet	Found in open dry forests and woodlands dominated by eucalypts, and often near water. They sometimes visit gardens. The endangered Helmeted Honeyeater (subspecies L. m. cassidix) is confined to narrow patches of tall forest along streams or in swamps.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Lichmera indistincta	Brown Honeyeater	-	-	2	BioNet	The Brown Honeyeater is found in a wide range of wooded habitats, usually near water. It is often found in mangroves and woodlands or dense forests along waterways. It can also be found in mallee, spinifex woodlands, low dense shrublands, heaths and saltmarshes, as well as in monsoon forests or rainforests in the Top End. It is common in parks, gardens and street trees in urban areas as well as on farms and in remnant vegetation along roadsides.	Low	Few records in the surrounding areas. Some suitable habitat present within the study area.
Limosa limosa	Black-tailed Godwit	V	Ma, Mi	1	BioNet	Coastal species found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats.	No	No recent records near the study area. Primarily a coastal species.
Lonchura castaneothorax	Chestnut-breasted Mannikin	-	-	13	BioNet	The Chestnut-breasted Mannikin is found in reed beds, long grasses, swamps and mangroves.	Low	Few records in the surrounding area. Preferred habitat not present within the study area.

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Lonchura punctulata	Nutmeg Mannikin	-	-	14	BioNet	Lives in reeds, grasses and especially in the crops around farms. It is also often around disturbed areas and vacant blocks.	Low	Some suitable habitat present on site, few recent records.
Lophoictinia isura	Square-tailed Kite	V	-	14	BioNet	Widespread across Victoria. Occurs in primarily in open forest and woodland but will also forage in adjacent open areas such as roadside clearings, farmland and logged areas. Occasionally occurs in mallee, heathland, low shrublands and grasslands.	Moderate	Some foraging habitat present on site.
Lopholaimus antarcticus	Topknot Pigeon	-	-	17	BioNet	The Topknot Pigeon is found in rainforests and nearby wet forests and woodlands, especially along moist sheltered gullies. It can also be found in drier forests and will fly across open areas to feed in rainforests or disturbed areas such as remnant forest patches, cleared farmlands, exotic trees and shrubs, particularly Camphor Laurel and privet. It is very rarely seen in suburban areas, but will forage on the outskirts of urban areas if Camphor Laurel and other fruits are available.	Low	Few records in the surrounding areas. Limited suitable habitat present on site.
Macropygia phasianella	Brown Cuckoo-Dove	-	-	28	BioNet	This is a pigeon of rainforests and wet sclerophyll forest, particularly at the forest edges, along creeks and rivers. Often found in regrowth along roads, in clearings and in weedy areas like lantana.	Moderate	Some suitable habitat, few records near the study area.
Malacorhynchus membranaceus	Pink-eared Duck	-	-	5	BioNet	Areas near water. It prefers shallow, temporary waters, however, open wetlands support large flocks. It is a highly dispersive and nomadic species.	Moderate	Some suitable habitat, few records near the study area.
Malurus cyaneus	Superb Fairy-wren	-	-	18	BLA Data	Open eucalypt woodland forests of south-eastern Australia. It inhabits dense understorey, and is usually seen in pairs or small groups. Also adapted to urban parks and gardens, and exotic weeds such as lantana.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Malurus lamberti	Variegated Fairy-wren	-	-	69	BioNet	Found in forest, woodland and shrub land habitats.	Moderate	Limited mid-storey cover for small bird habitat. Some

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
								suitable habitat present on site.
Manorina melanocephala	Noisy Miner	-	-	21	BLA Data	Found in woodlands and open forests. They have also become well adapted to suburban situations and are a common sight in parks and gardens.	Present	Recorded within the study area. Suitable habitat present on site.
Manorina melanophrys	Bell Miner	-	-	496	BioNet	Found manly in open eucalypt forests and woodlands with a dense shrubby understorey.	Moderate	Limited mid-storey cover for small bird habitat. Some suitable habitat present on site.
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	EN	5	BioNet	Prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses.	Moderate	Limited mid-storey cover for small bird habitat. Some suitable habitat present on site.
Meliphaga lewinii	Lewin's Honeyeater	-	-	134	BioNet	Prefers the wetter parts of eastern Australia, from northern Queensland to central Victoria. Found in both rainforest and wet sclerophyll forest, and often wanders into more open woodland. It is a common bird, and its call is often heard in these areas.	Moderate	Limited mid-storey cover for small bird habitat. Some suitable habitat present on site.
Melithreptus brevirostris	Brown-headed Honeyeater	-	-	4	BLA Data	Prefers open eucalypt forests and woodlands in all but the most arid zones and from the coast to subalpine areas. It is sometimes seen in parks and gardens.	Present	Recorded within the study area. Some suitable habitat in the study area.
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	1	BioNet	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora), Blakely's Red Gum (E. blakelyi) and Forest Red Gum (E. tereticornis). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees	Low	Limited suitable habitat present on site. Few records in the surrounding areas.

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Melithreptus lunatus	White-naped Honeyeater	-	-	53	BioNet	Found in open forests and woodlands, mainly in the temperate zone, and rarely in drier areas. Found in urban gardens, commonly visiting nectar feeders in areas near forests.	Low	Limited suitable habitat present on site, no recent records near the study area.
Melopsittacus undulatus	Budgerigar	-	-	130	BioNet	Budgerigars are nomadic and large flocks of birds can be seen in most open habitat types, but seldom far from water.	Moderate	Suitable habitat in study area, such as within the riparian corridors. Few records near the study area.
Menura novaehollandiae	Superb Lyrebird	-	-	19	BioNet	Moist forests. It is a ground-dwelling species in moist forests, but roosts in trees at night.	Low	Limited suitable habitat present on site. Few records in the surrounding areas.
Merops ornatus	Rainbow Bee-eater	-	Ma	18	BioNet	Widespread within Australia, although southern populations migrate north from February and return in September. Often occurs in open forest, woodlands and shrublands near water. May also occur in wooded farmland, quarries and orchards.	Low	Limited suitable habitat present on site. Few records in the surrounding areas.
Microcarbo melanoleucos	Little Pied Cormorant	-	-	134	BioNet	Fresh or salt water. It is often seen in large flocks on open waterways and on the coast. On inland streams and dams, however, it is often solitary. The Little Pied Cormorant mixes readily with the similar sized Little Black Cormorant.	High	Suitable foraging habitat present on site including the farm dams, South Creek and Badgerys Creek.
Microeca fascinans	Jacky Winter	-	-	102	BioNet	Jacky Winters prefer open woodland with an open shrub layer and a lot of bare ground. They are often seen in farmland and parks	High	Suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Milvus migrans	Black Kite	-	-	8	BioNet	Broad range of habitats. Most are found in open areas where there is close access to water bodies such as rivers, ponds, or lakes.	Moderate	Some suitable habitat present. Few recent records.
Mirafra javanica	Horsfield's Bushlark	-	VU	2	BioNet	The Horsfield's Bushlark occurs in tropical and temperate grasslands, open woodlands, cereal crops and sparse sugar cane fields. The Horsfield's Bushlark occurs from the Eyre Peninsula, South Australia, through Victoria, New South Wales, Queensland, Northern	Low	Some suitable foraging habitat present on site including the remnant open woodland vegetation and grasslands, but few records in the surrounding areas.

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						Territory and Western Australia to Shark Bay. This species is vagrant to Tasmania. It also occurs from Nigeria to Arabia, India and the Malay Archipelago.		
Monarcha melanopsis	Black-faced Monarch	-	Ma, Mi	9	BioNet	Inhabits rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, parks and gardens.	Low	Suitable habitat is not present within the development site, no local records.
Motacilla flava	Yellow Wagtail	-	Ma, Mi	Modelled	PMST	Non breeding migratory species. Occurs in grassland habitat subject to inundation.	Low	Suitable habitat is not present within the development site, no local records.
Myiagra cyanoleuca	Satin Flycatcher	-	Ma, Mi	12	BioNet	Prefers tall wetter Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	Low	Suitable habitat is not present within the development site, no local records.
Myiagra inquieta	Restless Flycatcher	-	-	117	BioNet	Found in open forests and woodlands and is frequently seen in farmland.	Moderate	Some suitable habitat present within the study area. Not recorded in the immediate surrounds of the study area.
Myiagra rubecula	Leaden Flycatcher	-	-	32	BioNet	Found in tall and medium open forests, mainly in coastal areas, preferring drier habitats than the Satin Flycatcher.	Low	Limited suitable habitat present on site, prefers taller forests near the coast.
Myzomela sanguinolenta	Scarlet Honeyeater	-	-	115	BioNet	Open forests and woodlands with a sparse understorey, especially around wetlands, and sometimes in rainforests. It can be seen in urban areas in flowering plants of streets, parks and gardens.	Moderate	Some suitable habitat present.
Neochmia modesta	Plum-headed Finch	-	-	1	BioNet	Dry savannah and subtropical/tropical (lowland) dry shrubland in Australia.	Low	Limited suitable habitat on site. No recent records.
Neochmia temporalis	Red-browed Finch	-	-	4	BLA Data	Grassy areas interspersed with dense understorey vegetation, often along creek lines.	Present	Recorded on site. Limited mid-storey cover for small bird habitat, but some suitable habitat present on site.
Neophema chrysostoma	Blue-winged Parrot	V	VU, Ma	Modelled	PMST	Occurs in range of habitats from coastal, sub-coastal, and inland areas, through to semi-arid zones. Throughout their range they favour grasslands and grassy woodlands, and are found	Moderate	Some suitable habitat present (grasslands and grassy woodlands).

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						near wetlands both by the coast and in semi-arid zones. Can also be found in altered environments like airfields, golf courses, and paddocks		
Neophema pulchella	Turquoise Parrot	V	-	3	BioNet	The Turquoise Parrot favours open, grassy woodland with dead trees near permanent water. It also inhabits coastal heaths and pastures with exotic grasses and weeds, along roadsides and in orchards.	Low	Few records in the surrounding areas. Some suitable habitat present within the study area.
Neosericornis citreogularis	Yellow-throated Scrubwren	-	-	1	BioNet	Rainforest gullies, generally with streams nearby.	Low	Few records in the surrounding areas. Preferred habitat (wet forests) not present within the study area.
Nesoptilotis leucotis	White-eared Honeyeater	-	-	22	BioNet	Forests, woodlands, heathlands, mallee and dry inland scrublands. A eucalyptus canopy, rough bark and a shrub layer are the most important requirements for white-eared honeyeaters.	Low	Some suitable habitat present within the study area, few recent records.
Ninox connivens	Barking Owl	V	-	7	BioNet	Open woodlands and the edges of forests, often adjacent to farmland. They are less likely to use the interior of forested habitat.	Low	Few records near the study area, some suitable habitat present on site.
Ninox novaeseelandiae	Southern Boobook	-	Ma	103	BioNet	A variety of habitats from dense forest to open desert, including woodlands, rural, heath and urban habitats.	Moderate	Limited suitable habitat present. Some tree hollows present.
Ninox strenua	Powerful Owl	V	-	36	BioNet	Prefers tall open continuous sclerophyll forest and woodlands with a dense understory but will also occur in more fragmented landscapes particularly if suitable adjacent habitat is present. Requires large, hollow-bearing eucalypts for breeding.	No	No suitable habitat present.
Numenius madagascariensis	Eastern Curlew, Far Eastern Curlew	-	CE, Ma, Mi	Modelled	PMST	Non-breeding migrant. Occurs in sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Also occurs in saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves	Low	Preferred habitat (coastal areas) not present within the development site, no local records.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Nycticorax caledonicus	Nankeen Night Heron	-	Ma	13	BioNet	Grasslands, meadows, forests, lagoons, beaches, reefs, marshes, shores, wetlands, and swamps. It is most commonly found near rivers and streams but also reside in urban wetlands, dry fields, gardens, ponds, airports, and parks.. The species prefer habitats with emergent vegetation when near permanent water. Roosts during the daytime in dense cover of trees, bushes, and reeds.	Low	Some suitable habitat within the study area, but few recent records in study area.
Nymphicus hollandicus	Cockatiel	-	-	25	BioNet	The Cockatiel is seen in pairs or small flocks, in most types of open country, usually near water. It is common throughout its range, especially in the north and the more arid inland areas.	Moderate	Some suitable habitat present (grasslands near water sources).
Ocyphaps lophotes	Crested Pigeon	-	-	7	BLA Data	The Crested Pigeon is found in lightly wooded grasslands in both rural and urban areas. It is usually found in the vicinity of water, as it has to drink every day, and is absent from the denser forests. Woodland, Urban, Grassland.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Origma solitaria	Rockwarbler	-	-	13	BioNet	Found on Hawkesbury and other Sydney sandstone formations and nearby limestone formations. It is usually found around rocky outcrops, in steep rocky gullies and usually near water, including along sea-cliffs in coastal areas.	Low	No suitable habitat present.
Oriolus sagittatus	Olive-backed Oriole	-	-	10	BLA Data	Forests, woodlands and rainforests, as well as well-treed urban areas, particularly parks and golf courses.	Present	Few recent records around the study area. Limited suitable habitat present on site.
Oxyura australis	Blue-billed Duck	V	-	2	BioNet	Prefers deep permanent well vegetated freshwater swamps, large dams, lakes and open waters.	Low	Some habitat on site along the watercourses and farm dams, but prefers larger, deeper bodies of water.
Pachycephala pectoralis	Golden Whistler	-	-	8	BLA Data	Found in almost any wooded habitat, from rainforest to mallee, but prefers the denser areas. Occasionally it visits parks and orchards.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.
Pachycephala rufiventris	Rufous Whistler	-	-	4	BLA Data	Forests, woodlands and shrublands, with a shrubby understorey. Is also found in gardens	Present	Recorded on site, suitable foraging habitat present on

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						and farmland with some trees, and in remnant bushland patches.		site within the remnant patches of native vegetation.
Pandion haliaetus	Osprey	-	Ma, Mi	Modelled	PMST	Marine bird. The species is a rare vagrant in Victoria. It inhabits rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.	Low	No suitable habitat on site, prefers coastal areas.
Pardalotus punctatus	Spotted Pardalote	-	-	9	BLA Data	The Spotted Pardalote is mostly found in eucalypt forests and woodlands but occurs in parks and gardens with well-established eucalypt canopy.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.
Pardalotus striatus	Striated Pardalote	-	-	9	BLA Data	Found in almost any habitat with trees or shrubs, but favour eucalypt forests and woodlands.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.
Passer domesticus	House Sparrow	-	-	293	BioNet	Occurs in and around human habitation, as well as cultivated areas and some wooded country.	High	Suitable habitat present in the remnant patches of native vegetation and grasslands.
Passer montanus	Eurasian Tree Sparrow	-	-	3	BioNet	Inhabits farms, lightly wooded areas (especially with hedgerows and bushes), villages, parks with ornamental plantings, and reedbeds along lakeshores. They nest in crevices in old buildings, light fixtures, fence posts.	Low	Some suitable habitat present, few recent records near the study area.
Pavo cristatus	Indian Peafowl	-	-	13	BioNet	It is found in moist and dry-deciduous forests, but can adapt to live in cultivated regions and around human habitations and is usually found where water is available.	Low	No recent records near the study area.
Pelecanus conspicillatus	Australian Pelican	-	Ma	101	BioNet	Pelicans are widespread on freshwater, estuarine and marine wetlands and waterways including lakes, swamps, rivers, coastal islands and shores.	Low	Limited suitable habitat present on site, prefers larger bodies of water. Might fly overhead.
Petrochelidon ariel	Fairy Martin	-	-	708	BioNet	Open country near water, and is usually seen near its nest sites, on cliffs, culverts or bridges.	High	Suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Petrochelidon nigricans	Tree Martin	-	Ma	26	BioNet	Found in the air above a range of habitats ranging from open grassed areas to forests,	High	Suitable foraging habitat present on site including the

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						especially near wetlands, but they are also found in urban areas.		remnant open woodland vegetation, wetlands and grasslands.
Petroica boodang	Scarlet Robin	V	-	7	BioNet	Open forests and woodlands. During winter, it will visit more open habitats such as grasslands and will be seen in farmland and urban parks and gardens at this time.	Low	Limited suitable habitat present on site. Few recent records.
Petroica goodenovii	Red-capped Robin	-	-	1	BioNet	Arid areas. Dry Acacia, Callitris, or mixed scrubland or woodland, dominated by such species as mulga (Acacia aneura), Georgina gidgee (Acacia georginae), raspberry jam (Acacia acuminata), black cypress-pine (Callitris endlicheri), white cypress-pine (C. columellaris), and slender cypress-pine (C. preissii) with understory shrubs, such as Cassinia, hop-bush (Dodonaea), emu bush (Eremophila), and spinifex (Triodia).	Low	No records near the study area.
Petroica phoenicea	Flame Robin	V	Ma	13	BioNet	Prefers clearings or areas with open understoreys. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense.	Moderate	Some suitable habitat present in the remnant patches of native vegetation.
Petroica rosea	Rose Robin	-	-	94	BioNet	Prefers wet forest and rainforest habitats during spring and summer, moving into drier, more open habitats during autumn and winter.	Moderate	Some suitable habitat present in the remnant patches of native vegetation.
Phalacrocorax carbo	Great Cormorant	-	-	36	BioNet	In spite of its preference for extensive areas of permanent freshwater, the Great Cormorant is not confined to these and is often observed on coastal inlets and estuaries.	Low	Requires larger bodies of water than what is present within the study area.
Phalacrocorax sulcirostris	Little Black Cormorant	-	-	81	BioNet	Found in freshwater wetlands, but will sometimes be found on sheltered coastal waters, and can use relatively small, deep water bodies. It is strongly aquatic, seldom being seen on dry land, but is often seen resting on rocks, jetties and other perches in water.	Moderate	Suitable habitat in study area around the farm dams and creeklines.

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Phalacrocorax varius	Pied Cormorant	-	-	35	BioNet	The Pied Cormorant is found in marine habitats (almost exclusively so in Western Australia), including estuaries, harbours and bays. It is also found in mangroves and on large inland wetlands in eastern Australia.	Moderate	Some suitable habitat present around the farm damns and creeklines.
Phaps chalcoptera	Common Bronzewing	-	-	164	BioNet	Common Bronzewings are found in almost every habitat type, with the exception of the most barren areas and densest rainforests. Common Bronzewings are normally seen alone, in pairs or in small flocks, and are rarely found far from water.	High	Suitable habitat present.
Phaps elegans	Brush Bronzewing	-	-	3	BioNet	The Brush Bronzewing inhabits areas with a dense shrub layer, and so can occur in the grassy heathlands near the coast and behind sand dunes, or further inland in wet or dry forests or woodlands including dense mallee.	Low	Few recent records, some suitable habitat.
Phasianus colchicus	Common Pheasant	-	-	2	BioNet	The birds are found in woodland, farmland, scrub, and wetlands. In its natural habitat the common pheasant lives in grassland near water with small copses of trees. Extensively cleared farmland is marginal habitat that cannot maintain self-sustaining populations for long.	Low	Few records in the surrounding areas. Suitable habitat not present within the study area.
Philemon citreogularis	Little Friarbird	-	-	2	BioNet	The Little Friarbird is found near water, mainly in open forests and woodlands dominated by eucalypts. Also found in wetlands, monsoon forests, mangroves and coastal heathlands. Only extend into arid zone along waterways. Mostly tropical, but also common in semi-arid zone. It will also be seen in gardens and orchards.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Philemon corniculatus	Noisy Friarbird	-	-	4	BLA Data	Dry forests and eucalypt woodlands, as well as coastal scrub, heathlands and around wetlands and wet forests, and is found in most climate zones, extending into arid areas along rivers.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.
Phylidonyris niger	White-cheeked Honeyeater	-	-	4	BioNet	Found in moist heathlands, as well as around wetlands and in forests or woodlands with a	Low	Few recent records, limited suitable habitat present on site.

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						heath understorey. Found in both temperate and subtropical zones.		
Phylidonyris novaehollandiae	New Holland Honeyeater	-	-	54	BioNet	Common in heath, forests, woodland and gardens, mainly where grevilleas and banksias are found. It is inquisitive and approaches humans. It also mixes with other types of honeyeaters.	Low	Limited suitable habitat present on site. Few recent records near the study area.
Phylidonyris pyrrhopterus	Crescent Honeyeater	-	-	1	BioNet	The Crescent Honeyeater is found in a variety of habitats, from coastal heaths, wet sclerophyll forests to mountain forests. It is often found in damp gullies or in thick tea-tree scrub and is rarely recorded in semi-arid areas. Will be seen in urban parks and gardens, especially during autumn and winter in coastal areas, and is sometimes found in pine plantations.	Low	Few records in the surrounding areas. Limited suitable habitat present within the study area.
Platalea flavipes	Yellow-billed Spoonbill	-	-	39	BioNet	Shallows of freshwater wetlands, dams, lagoons and swamps, and sometimes in dry pastures, but rarely uses saltwater wetlands. It can use much smaller areas of water than the Royal Spoonbill.	Low	Limited suitable habitat present. Few recent records.
Platalea regia	Royal Spoonbill	-	-	34	BioNet	The Royal Spoonbill is found in shallow freshwater and saltwater wetlands, intertidal mud flats and wet grasslands. Both permanent and temporary inland waters are used when available in the arid zone. Will also use artificial wetlands such as sewage lagoons, saltfields, dams and reservoirs.	Low	Limited suitable habitat present on site, no recent records near the study area.
Platycercus elegans	Crimson Rosella	-	-	1	BLA Data	The Crimson Rosella is commonly associated with tall eucalypt and wetter forests.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.
Platycercus eximius	Eastern Rosella	-	-	7	BLA Data	Found in open woodlands, grasslands, farmlands and remnant bushland. Often found in urban habitats such as parks, gardens and golf courses.	Present	Recorded on site, suitable foraging habitat present on site within the remnant patches of native vegetation.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Plegadis falcinellus	Glossy Ibis	-	Ma, Mi	3	BioNet	Glossy ibises feed in very shallow water and nest in freshwater or brackish wetlands with tall dense stands of emergent vegetation such as reeds, papyrus or rushes) and low trees or bushes. They show a preference for marshes at the margins of lakes and rivers but can also be found at lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, paddies and irrigated farmland.	Low	Some suitable habitat, no recent records near the study area.
Pluvialis squatarola	Grey Plover	-	Ma, Mi	7	BioNet	The Grey Plover is almost entirely coastal, being found mainly on marine shores, inlets, estuaries and lagoons with large tidal mudflats or sandflats for feeding, sandy beaches for roosting, and also on rocky coasts.	No	Coastal species. Few records in the surrounding areas.
Podargus strigoides	Tawny Frogmouth	-	-	821	BioNet	Forests and woodlands, scrub and heathland vegetation, savannahs, and urban areas. Rarely seen in heavy rainforests and treeless deserts. Seen in large numbers in areas populated with many river gums and casuarinas, and can be found along river courses if these areas are timbered.	Moderate	Some suitable habitat present in the remnant patches of native vegetation.
Podiceps cristatus	Great Crested Grebe	-	-	6	BioNet	Vegetated areas of freshwater lakes. Favours large deep open bodies of freshwater. Most commonly found inhabiting rivers, lagoons, lakes, swamps, reservoirs, saltfields, estuaries and bays.	Low	Limited suitable habitat present on site, prefers larger bodies of water. Few recent records around the study area.
Poliocephalus poliocephalus	Hoary-headed Grebe	-	-	13	BioNet	Found in freshwater ponds or small waterways.	Moderate	Suitable foraging habitat present on site including the farm dams and creeklines.
Poodytes gramineus	Little Grassbird	-	-	16	BioNet	Dense wetland vegetation, sedges, reeds and rank grass. It also uses shrubs such as lignum, saltmarsh and low mangroves.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Porphyrio porphyrio	Purple Swamphen	-	Ma	296	BioNet	Found around freshwater swamps, streams and marshes.	High	Suitable habitat present around the farm dams and creeklines.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Porzana fluminea	Australian Spotted Crake	-	-	1	BioNet	The Australian Spotted Crake is found in the well-vegetated edges of wetlands, whether permanent or temporary, fresh or saltwater. It is usually found among dense growths of plants such as saltbush, reeds, rushes, mangroves, thick grass, or dense shrubs such as Bottle-brush (Callistemon) or Tea-tree (Melaleuca).	Low	Limited suitable habitat present within the study area, prefers denser watercourses. Few records in the surrounding areas.
Porzana pusilla	Baillon's Crake	-	Ma	4	BioNet	Wetland and swamp areas with dense vegetation.	Low	Few recent records, some suitable habitat around the wetland areas with denser vegetation.
Porzana tabuensis	Spotless Crake	-	Ma	2	BioNet	Spotless crakes are freshwater wetland birds. Their preferred habitat is wetland and swamp areas that contain dense vegetation in which to build their nests from.	Low	Few recent records, some suitable habitat around the wetland areas with denser vegetation.
Psephotus haematonotus	Red-rumped Parrot	-	-	13	BLA Data	Found in open grasslands or lightly timbered plains, as well as along watercourses and in mallee farmlands with access to water.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Psophodes olivaceus	Eastern Whipbird	-	-	272	BioNet	Wet habitats, including rainforest, eucalypt forest and dense scrub near watercourses, in dense vegetation near the ground.	Low	Limited suitable habitat present on site, study area absent of dense understory/shrub layer.
Pterodroma cervicalis	White-necked Petrel	-	Ma	Modelled	PMST	Pelagic bird. Open seas of the south-west Pacific. Subtropical or tropical seasonally wet or flooded lowland grassland (for breeding) and open seas (for foraging).	Low	Limited suitable habitat on site, prefers coastal areas.
Ptilonorhynchus violaceus	Satin Bowerbird	-	-	206	BioNet	Wetter forests and woodlands, and nearby open areas. Common in rainforest and tall wet sclerophyll forest.	Low	Preferred habitat not found within the study area.
Ptilotula fusca	Fuscous Honeyeater	-	-	29	BioNet	Open dry eucalypt forests and woodlands with shrubby or open grassy understorey. Sometimes found on farms with remnant forest patches and sometimes seen in gardens.	Low	Some suitable habitat present, few recent records.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Ptilotula penicillata	White-plumed Honeyeater	-	-	5	BLA Data	Found in open forests and woodlands, often near water and wetlands. It is scarce or absent in arid regions unless water artificially supplied (e.g. water troughs for stock). Its overall distribution is linked to River Red Gums.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Pycnonotus jocosus	Red-whiskered Bulbul	-	-	1	BLA Data	Bulbuls are common in urban areas, where they inhabit parks, gardens and along creeks.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Pycnoptilus floccosus	Pilotbird	-	VU	Modelled	PMST	Pilotbirds are endemic to south-east Australia. Upland Pilotbirds occur above 600m in the Brindabella Ranges in the Australian Capital Territory, and in the Snowy Mountains in New South Wales and north-east Victoria (Higgins & Peter 2002; Loyn et al. 2021). Lowland Pilotbirds occur in forests from the Blue Mountains west of Newcastle, around the wetter forests of eastern Australia, to Dandenong near Melbourne (Higgins & Peter 2002; Loyn et al. 2021).	No	Preferred habitat (wet sclerophyll forests) not present within the development site, dense undergrowth not present within development site, no local records.
Rhipidura albiscapa	Grey Fantail	-	-	7	BLA Data	Most treed habitats and urban parks.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Rhipidura leucophrys	Willie Wagtail	-	-	19	BLA Data	A wide variety of habitats, but avoids densely forested areas such as rainforest. It prefers semi-open woodland or grassland with scattered trees, often near wetlands or bodies of water.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Rhipidura rufifrons	Rufous Fantail	-	Ma, Mi	23	BioNet	Found in south and central Victoria in wet sclerophyll forests, subtropical and temperate rainforests. It sometimes inhabits drier sclerophyll forests and woodlands.	Low	Preferred habitat not present within the development site, few local records.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Rostratula australis	Australian Painted Snipe	E	EN, Ma	1	BioNet	Occurs in shallow fresh or brackish wetlands with permanent or semi-permanent water, cover of adjacent grasses and muddy egdes. Also occurs in waterlogged grassland, sewage ponds and dams.	Low	Farm dams represent marginal foraging habitat for this species. Few records in the surrounding areas.
Scythrops novaehollandiae	Channel-billed Cuckoo	-	Ma	68	BioNet	Found in tall open forests, usually where host species occur. The Channel-billed Cuckoo lays its eggs in the nests of the Australian Magpie, Gymnorhina tibicen, the Pied Currawong, Strepera graculina and members of the crow family (Corvidae).	Low	Limited suitable habitat present on site.
Sericornis frontalis	White-browed Scrubwren	-	-	305	BioNet	The White-browed Scrubwren lives in rainforest, open forest, woodland and heaths. It is usually seen in pairs, low down in the thick vegetation.	Moderate	Suitable habitat within the study area.
Sericornis magnirostra	Large-billed Scrubwren	-	-	2	BioNet	The Large-billed Scrubwren lives in tropical, sub-tropical and temperate rainforests and wet sclerophyll forests, from the coastal lowlands to the slopes, ridges and tablelands of the Great Dividing Range.	Low	Few records in the surrounding areas. Suitable habitat not present within the study area.
Smicrornis brevirostris	Weebill	-	-	16	BLA Data	The Weebill inhabits almost any wooded area, with the exception of the wettest forests, but favours open eucalypt forests. It spends most of its time in the canopy, in pairs or small groups. The birds stay in the same area throughout the year.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation and grasslands.
Sphecotheres vieilloti	Australasian Figbird	-	-	28	BioNet	Rainforests and wet sclerophyll forests, but is often found in urban parks and gardens, particularly those with figs and other fruit-producing trees	Low	Limited suitable habitat present on site.
Spilopelia chinensis	Spotted Turtle-Dove	-	-	766	BioNet	A range of habitats including woodland, scrub, farmland and habitation. Found in streets, parks, gardens, agricultural areas, and tropical scrubs in diverse locations throughout eastern Australia and around the cities and major towns across southern Australia.	High	Suitable habitat present in the grasslands.

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Stagonopleura guttata	Diamond Firetail	V	VU	4	BioNet	Found throughout south-eastern mainland Australia. Inhabits grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	Moderate	Some suitable habitat present, but few records in the surrounding areas.
Sterna striata	White-fronted Tern	-	Ma	Modelled	PMST	Occurs in coastal seas and exposed rocky coasts, often with islands or stacks; sometimes roosts on sandy beaches of sheltered coasts.	Low	No suitable habitat on site, prefers coastal areas.
Stictonetta naevosa	Freckled Duck	V	-	2	BioNet	Prefers permanent fresh water swamps and creeks with heavy growth of cumbungi (bullrushes), lignum or tea-tree. During drier times, the Freckled Duck moves from ephemeral (not permanent) breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewerage ponds. They generally rest in dense cover.	Low	Few recent records, some suitable habitat around the farm dams and Lake Duncan.
Stizoptera bichenovii	Double-barred Finch	-	-	4	BLA Data	Found in dry savannah, tropical (lowland) dry grassland and shrubland habitats.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Strepera graculina	Pied Currawong	-	-	1	BLA Data	Wet and dry sclerophyll forests, rural and semi-urban environments throughout eastern Australia.	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation, wetlands and grasslands.
Strepera versicolor	Grey Currawong	-	-	28	BioNet	The Grey Currawong inhabits a wide range of habitats from the coast to the semi-desert, including forests, woodlands, mallee, coastal and other heaths. Also found in remnant vegetation on roadsides and farms, in orchards, and in suburban areas.	High	Suitable habitat present within the study area. Recent records in the surrounding areas.
Streptopelia chinensis	Spotted Dove	-	-	15	BLA Data	The Spotted Dove is common around human habitation and can easily be seen in parks, gardens and agricultural areas.	Present	Recorded on site, suitable foraging habitat present on site including the remnant

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
								open woodland vegetation, wetlands and grasslands.
Struthidea cinerea	Apostlebird	-	-	4	BioNet	The Apostlebird is found in open dry forests and woodlands near water. It may also be found in farmlands with trees, as well as along roadsides, in orchards and on golf courses	Moderate	Suitable habitat within the study area. Few records in the surrounding areas.
Sturnus vulgaris	Common Starling	-	-	8	BLA Data	Once a common bird of European deciduous woodlands (now in more rural and urban areas).	Present	Recorded on site, suitable foraging habitat present on site including the remnant open woodland vegetation and grasslands.
Symposiachrus trivirgatus	Spectacled Monarch	-	Ma, Mi	Modelled	PMST	Listed marine migratory species. The Spectacled Monarch is found in coastal north-eastern and eastern Australia, including coastal islands, from Cape York, Queensland to Port Stephens, New South Wales. It is much less common in the south. It is also found in Papua New Guinea, the Moluccas and Timor. The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	Low	Preferred habitat (coastal areas, rainforests/gullies/mangroves) not present within the development site, no local records.
Synoicus chinensis	King Quail	-	-	4	BioNet	Tropical and temperate shrublands and grasslands, towards coastal areas. Prefers dense ground vegetation such as grass, shrubs, ferns, herbs at damp or swampy sites.	Low	Limited suitable habitat present within the study area, prefers denser ground vegetation. Few recent records.
Synoicus ypsilophora	Brown Quail	-	-	67	BioNet	Agricultural areas, wet grasslands, shrublands, spinifex savannah, and freshwater wetlands.	Low	Some suitable habitat present, few recent records.
Tachybaptus novaehollandiae	Australasian Grebe	-	-	186	BioNet	Freshwater ponds or small waterways.	High	Recorded on site, suitable foraging habitat present on site including the farm dams and creeklines.
Taeniopygia guttata	Zebra Finch	-	-	12	BioNet	Zebra Finches are most commonly found in the drier areas of Australia, living year round in social flocks of up to 100 or more birds. They can	Low	Few recent records, some suitable habitat present within the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						be found in a variety of habitats, mainly dry wooded grasslands, bordering watercourses.		
Threskiornis moluccus	Australian White Ibis	-	Ma	487	BioNet	Observed in all but the driest habitats. Preferred habitats include swamps, lagoons, floodplains and grasslands, but it has also become a successful inhabitant of urban parks, gardens and tidal mudflats.	High	Some suitable habitat present around the grasslands, dams and creeklines.
Threskiornis spinicollis	Straw-necked Ibis	-	Ma	6	BLA Data	The Straw-necked Ibis prefers wet and dry grasslands, pastures, croplands and swamp or lagoon margins. It is rarely found on coastal shores, mudflats or mangroves and is generally less adaptable than the Australian White Ibis.	Present	Recorded on site, suitable foraging habitat present on site including the farm dams and creeklines.
Todiramphus macleayii	Forest Kingfisher	-	Ma	1	BioNet	Commonly found in open sclerophyll forest with a patchy or sparse understorey. They favour watercourse vegetation and the margins of swamps and billabongs. They may also be found in mangroves, cane fields, farmlands and beaches, however they require forest and woodland for breeding.	Low	Few recent records, some suitable habitat within the riparian corridor.
Todiramphus pyrrhopygius	Red-backed Kingfisher	-	-	1	BioNet	Inhabits dry forests, mulga and mallee country, to spinifex and almost treeless country, often far from water. During breeding season, the red-backed kingfisher will move to river courses to make use of the earthy banks to dig nesting burrows.	Low	Limited suitable habitat present on site, no records in proximity to the study area.
Todiramphus sanctus	Sacred Kingfisher	-	Ma	152	BioNet	Inhabits woodlands, mangroves and paperbark forests, tall open eucalypt forest and melaleuca forest.	Moderate	Some suitable habitat present in the remnant patches of native vegetation.
Trichoglossus chlorolepidotus	Scaly-breasted Lorikeet	-	-	31	BioNet	Lives in lowland eucalypt forests and woodlands but also occurs in heathlands and well-treed urban areas, including parks and gardens.	Low	Limited suitable habitat present on site. Few recent records.
Trichoglossus moluccanus	Rainbow Lorikeet	-	-	1	BLA Data	The Rainbow Lorikeet is found in a wide range of treed habitats including rainforest and woodlands, as well as in well-treed urban areas.	Present	Recorded on site, suitable foraging habitat present on site, including the native remnant patches of vegetation and scattered paddock trees.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Tringa nebularia	Common Greenshank	-	Ma, Mi	3	BioNet	Prefers sheltered coastal habitats with large mudflats and saltmarsh, mangroves or seagrass. Can occur inland, in estuaries and mudflats, mangrove swamps and lagoons, billabongs, swamps, sewage farms and flooded crops.	low	Suitable habitat (coastal areas and wetlands) not present within the development site, no local records.
Turdus merula	Eurasian Blackbird	-	-	1	BLA Data	The Common Blackbird is most often found in urban areas and surrounding localities but has successfully moved into bushland habitats. It is often seen in orchards, vineyards and gardens, as well as along roadsides and in parks.	Present	Recorded on site, suitable foraging habitat present on site, including the native remnant patches of vegetation and scattered paddock trees.
Turnix varius	Painted Button-quail	-	EN	25	BioNet	Temperate and eastern tropical forests and woodlands form the habitats of this species. They appear to prefer closed canopies with some understory and deap leaf litter on the ground.	Low	No suitable habitat present. Study area lacks quality understory vegetation.
Turnix velox	Little Button-quail	-	-	2	BioNet	Little buttonquail are found over most of arid and semi arid Australia, excluding Tasmania, Western Australia. (Kinberlys), Northern territory (Arnhem land) and Northern Queensland (Cape York peninsula), due to its preferred habitat of grasslands and woodlands of tropical and temperate regions.	Low	Few records in the surrounding areas. Limited suitable habitat within the study area.
Tyto javanica	Eastern Barn Owl	-	-	113	BioNet	Open, often arid (dry) country, such as farms, heath and lightly-wooded forest.	Moderate	Some suitable habitat present in the remnant patches of native vegetation. 6 Hollow bearing trees present.
Tyto novaehollandiae	Masked Owl	V	-	16	BioNet	Timbered areas, often with a shrub understorey. They roost and nest in large tree hollows near foraging areas.	Low	No recent records near the study area. Poor quality habitat present within the study area.
Tyto tenebricosa	Sooty Owl	V	-	3	BioNet	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	Low	No recent records near the study area. Poor quality habitat present within the study area.
Vanellus miles	Masked Lapwing	-	-	6	BLA Data	Inhabits marshes, mudflats, beaches and grasslands. It is often seen in urban areas.	Present	Recorded within the study area. Suitable habitat present

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						Where this bird is used to human presence, it may tolerate close proximity; otherwise it is very wary of people, and seldom allows close approach.		around the dams and creeklines.
Vanellus tricolor	Banded Lapwing	-	-	6	BioNet	Banded Lapwings prefer open, short grasslands such as heavily grazed paddocks, agricultural lands and saline herblands in dry and semi-arid regions.	Low	Some suitable habitat present around the dams and creeklines, few recent records near the study area.
Zanda funereus	Yellow-tailed Black-Cockatoo	-	-	1	BLA Data	Native temperate forests, while also being ubiquitous in pine plantations, and occasionally in urban areas, as long as there is a plentiful food supply.	Present	Recorded on site. May utilise the study area for foraging as they pass through the landscape.
Zoothera lunulata	Bassian Thrush	-	EN	3	BioNet	Damp, densely forested areas and gullies are favoured, usually with a thick canopy overhead and leaf-litter below.	Low	Limited suitable habitat available on site. Few recent records.
Zosterops lateralis	Silvereye	-	Ma	6	BLA Data	Silvereyes may occur in almost any wooded habitat, especially commercial orchards and urban parks and gardens. Urban, Woodland, Forest.	Present	Recorded within the study area. Suitable habitat present on site.

Table 17 Likelihood Assessment, Bats

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Austronomus australis	White-striped Freetail-bat	-	-	159	BioNet	Woodland and urban areas. Roosts in hollows in old trees and under loose bark, in dead stumps and the ceilings of buildings. Up to several hundred bats live together in a colony.	High	Recorded in the surrounding areas. Suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings).
Chalinolobus dwyeri	Large-eared Pied Bat	V	VU	16	BioNet	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features.	No	Suitable breeding habitat (caves/sandstone escarpments) are not present within the development site. Not recorded in the surrounding areas.
Chalinolobus gouldii	Gould's Wattled Bat	-	-	349	BioNet	Roost in hollows in old trees, occasionally in ceilings or basements of buildings. They roost together in colonies of around 30 bats, sometimes smaller and other times larger.	Moderate	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts). Records in areas surrounding the site.
Chalinolobus morio	Chocolate Wattled Bat	-	-	178	BioNet	Roost mainly in hollows in old trees, as well as disused birds' nests. They roost in caves in the Nullarbor area of South Australia. They roost together in colonies of 20 to a few hundred bats.	Moderate	Some records in the surrounding areas of the study site. Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts).
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	26	BioNet	Prefers moist habitats, with trees taller than 20 m.	Low	Limited suitable habitat present on site. Prefers moister habitats with taller trees.
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	141	BioNet	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost maily in tree hollows but will also roost under bark or in man-made structures.	Moderate	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings).
Miniopterus australis	Little Bent-winged Bat	V	-	14	BioNet	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca	Low	Limited suitable habitat present, prefers more well

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
						swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas.		timbered areas. Limited recent records near the study area.
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	131	BioNet	Primarily a cave-dwelling species, but can also be found in rainforests, sclerophyll forests, woodlands, monsoon forests, open grasslands, mangroves, and paperbark forests	Low	Limited suitable habitat present on site. Primarily a cave-dwelling species.
Myotis macropus	Southern Myotis	V	-	121	BioNet	Found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage.	Low	Limited suitable habitat present on site. Primarily a coastal species that roosts in caves.
Nyctophilus geoffroyi	Lesser Long-eared Bat	-	-	192	BioNet	Roosts in hollows and fissures in old trees, under bark, in old fairy marten nests, and in occasionally in caves. They often roost in ceilings, hollow walls, unused roller doors and canvas awnings in suburban and inner-city areas. They prefer hollows of big old eucalypts for nursery colonies.	Moderate	Some recent records near study area. Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings).
Nyctophilus gouldi	Gould's Long-eared Bat	-	-	39	BioNet	Sclerophyll forests and woodland, including forest remnants. Roosts under loose bark or in tree hollows, sometimes buildings, in colonies of up to 25 individuals. The abandoned nests of birds are also utilised as roosts.	Moderate	Some recent records around study area. Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings).
Ozimops planiceps	South-eastern Free-tailed Bat	-	-	19	BioNet	Found across a number of vegetation types including mallee, shrubland, open forest and woodland, with a preference for wetter environments. It has adapted well to fragmentation and is able to dwell around cities and towns. Roosts in tree hollows and man-made cavities such as sheds and barns. Does not utalise Caves. Populations can contain up to 100 individuals.	Moderate	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts), limited recent records near the study area.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Ozimops ridei	Eastern Free-tailed Bat	-	-	153	BioNet	Roosts in sheltered places during the day such as inside Eucalyptus tree hollows or in buildings. Often forages near habitat edges.	Moderate	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts).
Pteropus poliocephalus	Grey-headed Flying-fox	V	VU	685	BioNet	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roost near water in stands of native vegetation such as mangrove, rainforest, Melaleuca, Casuarina or introduced trees.	High	Some suitable foraging habitat present such as native feed trees in the remnant patches of vegetation. Known Flying-fox camp 10-15km away.
Pteropus scapulatus	Little Red Flying-fox	-	-	11	BioNet	Little Red Flying-foxes roost on the branches of trees. They roost in groups, called camps, of up to many thousands of bats. They often share camps with other flying fox species. The primary source of food for this species is obtained from Eucalyptus and Corymbia blossoms.	Moderate	Recent records in the surrounding urban areas to the north of the site. Suitable feed trees present on site.
Rhinolophus megaphyllus	Eastern Horseshoe-bat	-	-	20	BioNet	Caves and similar sites that provide adequate warmth and high humidity are preferred and may be inhabited by groups numbering up to two thousand, however, the colony size is more often between five and fifty bats.	No	No suitable habitat present on site (Caves)
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	11	BioNet	This species occupies most wooded habitats, including both wet and dry sclerophyll forest, mallee and Acacia shrubland, desert, and open woodland. They are a hollow-roosting species, so tend to be found in proximity of adequate old-growth trees. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	Low	Few records in the surrounding areas. Some suitable habitat within the study area.
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	69	BioNet	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Low	Limited suitable habitat on site. Prefers moist tall forests.

Scientific name	Common name	BC Act Status	EPBC Act Status	Records	Source	Habitat	Likelihood of occurrence	Rationale
Scotorepens orion	Eastern Broad-nosed Bat	-	-	91	BioNet	Roosts in the hollows in old trees but also occasionally buildings. They have been recorded from tree hollows some 7 metres above the ground.	Moderate	Some records in the surrounding areas of the study site. Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts).
Vespadelus darlingtoni	Large Forest Bat	-	-	21	BioNet	Found in dry and wet eucalypt forest, rainforest, and at sub-alpine to alpine habitats. Observed in small reserves of woodland of rural areas and present at the urbanised landscape. Roost in hollows with up to sixty others.	Low	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings), limited recent records near the study area.
Vespadelus pumilus	Eastern Forest Bat	-	-	10	BioNet	Roosts in hollows of old eucalypts; some individuals roost under loose bark.	Low	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings), limited recent records near the study area.
Vespadelus regulus	Southern Forest Bat	-	-	36	BioNet	Southern Forest Bats roost in hollows in old trees and under the bark of trees. They roost together in small groups and often share their roosts with Lesser Long-eared Bats.	Low	Some suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings).
Vespadelus vulturnus	Little Forest Bat	-	-	299	BioNet	Little Forest Bats roost in hollows in old trees, buildings, and timber stacks. Up to 50 bats roost together in a colony. Some bats have been seen sharing a nest with possums.	Moderate	Suitable foraging and roosting habitat within the study area (hollows, mature eucalypts, buildings). Recent records near the study area.

Appendix C Consequence and Probability Scores by Species

Table 18 Consequence scores, terms and key

Mass	Mass Score	Flock Spacing	Flock Score	Flight Behaviour	Flight Score	Consequence Category	Consequence Score (Mass Score x Flock Score x Flight Score)
< 20g	1	Usually solitary or widely spaced	1	Rapid direct	1	Extreme	64-128
21-50g	2	Loose flocks	2	Slow, meandering, erratic, hovering, manoeuvrable	2	Very High	32
51-200g	4	Tight flocks	4	Nocturnal flight activity	2	High	16
201-1000g	8					Medium	8
1-5kg	16					Low	4
> 5kg	32					Very Low	1-2

Table 19 Probability scores, terms and key

Probability Category	Relative frequency (% of all known strikes at airport) *	Apparent frequency of strikes
Very High	>5%	often
High	1-5%	some
Medium	0.1-1%	occasional
Low	<0.1%	rare/none

* Relative frequency was calculated with combined ATSB data for known bird strikes at Sydney and Bankstown Airports, or from Australia wide data where information on specific species/guilds were absent. Species that used Australia wide data are noted in a separate column bellow.

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Megabats	*Pteropus poliocephalus*	Grey-headed Flying-fox	1-5kg	16	4	2	128	Extreme	Very High	
Megabats	*Pteropus scapulatus*	Little Red Flying-fox	201-1000g	8	4	2	64	Extreme	Very High	
Pigeons	*Columba livia*	Rock Dove	201-1000g	8	4	2	64	Extreme	High	
Waterbirds	*Threskiornis moluccus*	Australian White Ibis	1-5kg	16	4	1	64	Extreme	High	
Waterbirds	*Threskiornis spinicollis*	Straw-necked Ibis	1-5kg	16	4	1	64	Extreme	High	
Ducks	*Cygnus atratus*	Black Swan	> 5kg	32	4	1	128	Extreme	Medium	
Parrots	*Cacatua tenuirostris*	Long-billed Corella	201-1000g	8	4	2	64	Extreme	Medium	
Parrots	*Eolophus roseicapilla*	Galah	201-1000g	8	4	2	64	Extreme	Medium	
Gulls	*Chroicocephalus novaehollandiae*	Silver Gull	201-1000g	8	2	2	32	Very high	Very High	
Ducks	*Anas castanea*	Chestnut Teal	201-1000g	8	4	1	32	Very high	High	
Ducks	*Anas gracilis*	Grey Teal	201-1000g	8	4	1	32	Very high	High	
Ducks	*Anas superciliosa*	Pacific Black Duck	201-1000g	8	4	1	32	Very high	High	
Ducks	*Chenonetta jubata*	Australian Wood Duck	201-1000g	8	4	1	32	Very high	High	
Ducks	*Malacorhynchus membranaceus*	Pink-eared Duck	201-1000g	8	4	1	32	Very high	High	
Waterbirds	*Vanellus miles*	Masked Lapwing	201-1000g	8	2	2	32	Very high	High	
Waterbirds	*Phalacrocorax varius*	Pied Cormorant	1-5kg	16	2	1	32	Very high	High	
Raptors	*Aquila audax*	Wedge-tailed Eagle	1-5kg	16	1	2	32	Very high	Medium	
Raptors	*Hieraaetus morphnoides*	Little Eagle	1-5kg	16	1	2	32	Very high	Medium	
Waterbirds	*Bubulcus ibis*	Cattle Egret	201-1000g	8	2	2	32	Very high	Medium	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Parrots	*Cacatua galerita*	Sulphur-crested Cockatoo	201-1000g	8	2	2	32	Very high	Medium	
Corvids	*Corcorax melanorhamphos*	White-winged Chough	201-1000g	8	4	1	32	Very high	Low	
Ducks	*Anas platyrhynchos*	Mallard	1-5kg	16	1	1	16	High	High	
Ducks	*Anas rhynchotis*	Australasian Shoveler	201-1000g	8	2	1	16	High	High	
Ducks	*Aythya australis*	Hardhead	201-1000g	8	2	1	16	High	High	
Corvids	*Gymnorhina tibicen*	Australian Magpie	201-1000g	8	2	1	16	High	High	
Pigeons	*Geopelia humeralis*	Bar-shouldered Dove	201-1000g	8	2	1	16	High	High	
Pigeons	*Geopelia striata*	Peaceful Dove	201-1000g	8	2	1	16	High	High	
Pigeons	*Macropygia phasianella*	Brown Cuckoo-Dove	201-1000g	8	2	1	16	High	High	
Waterbirds	*Microcarbo melanoleucos*	Little Pied Cormorant	1-5kg	16	1	1	16	High	High	
Waterbirds	*Phalacrocorax sulcirostris*	Little Black Cormorant	1-5kg	16	1	1	16	High	High	
Bush birds	*Sturnus vulgaris*	Common Starling	51-200g	4	4	1	16	High	High	
Owls	*Tyto javanica*	Eastern Barn Owl	201-1000g	8	1	2	16	High	High	
Raptors	*Elanus axillaris*	Black-shouldered Kite	201-1000g	8	1	2	16	High	Medium	
Raptors	*Haliastur sphenurus*	Whistling Kite	201-1000g	8	1	2	16	High	Medium	
Raptors	*Lophoictinia isura*	Square-tailed Kite	201-1000g	8	1	2	16	High	Medium	
Raptors	*Milvus migrans*	Black Kite	201-1000g	8	1	2	16	High	Medium	
Waterbirds	*Anhinga novaehollandiae*	Australasian Darter	1-5kg	16	1	1	16	High	Medium	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Waterbirds	*Ardea intermedia*	Intermediate Egret	201-1000g	8	1	2	16	High	Medium	Y
Waterbirds	*Ardea pacifica*	White-necked Heron	201-1000g	8	1	2	16	High	Medium	
Waterbirds	*Casmerodius modesta*	Eastern Great Egret	201-1000g	8	1	2	16	High	Medium	Y
Waterbirds	*Egretta garzetta*	Little Egret	201-1000g	8	1	2	16	High	Medium	Y
Waterbirds	*Egretta novaehollandiae*	White-faced Heron	201-1000g	8	1	2	16	High	Medium	
Parrots	*Cacatua sanguinea*	Little Corella	201-1000g	8	2	1	16	High	Medium	
Parrots	*Callocephalon fimbriatum*	Gang-gang Cockatoo	201-1000g	8	2	1	16	High	Medium	
Parrots	*Zanda funereus*	Yellow-tailed Black-Cockatoo	201-1000g	8	2	1	16	High	Medium	
Corvids	*Corvus coronoides*	Australian Raven	201-1000g	8	2	1	16	High	Medium	
Corvids	*Corvus mellori*	Little Raven	201-1000g	8	2	1	16	High	Medium	
Bush birds	*Grallina cyanoleuca*	Magpie-lark	51-200g	4	2	2	16	High	Medium	
Owls	*Podargus strigoides*	Tawny Frogmouth	201-1000g	8	1	2	16	High	Medium	
Parrots	*Alisterus scapularis*	Australian King-Parrot	201-1000g	8	2	1	16	High	Medium	Y
Parrots	*Glossopsitta concinna*	Musk Lorikeet	51-200g	4	4	1	16	High	Medium	Y
Parrots	*Glossopsitta pusilla*	Little Lorikeet	51-200g	4	4	1	16	High	Medium	Y
Parrots	*Trichoglossus moluccanus*	Rainbow Lorikeet	51-200g	4	4	1	16	High	Medium	Y
Owls	*Ninox novaeseelandiae*	Southern Boobook	201-1000g	8	1	2	16	High	Medium	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Corvids	*Strepera graculina*	Pied Currawong	201-1000g	8	2	1	16	High	Low	Y
Corvids	*Strepera versicolor*	Grey Currawong	201-1000g	8	2	1	16	High	Low	Y
Corvids	*Struthidea cinerea*	Apostlebird	51-200g	4	4	1	16	High	Low	
Ducks	*Fulica atra*	Eurasian Coot	201-1000g	8	2	1	16	High	Low	
Ducks	*Porphyrio porphyrio*	Purple Swamphen	1-5kg	16	1	1	16	High	Low	Y
Raptors	*Falco cenchroides*	Nankeen Kestrel	51-200g	4	1	2	8	Medium	Very High	
Pigeons	*Ocyphaps lophotes*	Crested Pigeon	201-1000g	8	1	1	8	Medium	High	
Pigeons	*Phaps chalcoptera*	Common Bronzewing	201-1000g	8	1	1	8	Medium	High	
Pigeons	*Spilopelia chinensis*	Spotted Turtle-Dove	51-200g	4	2	1	8	Medium	High	
Pigeons	*Streptopelia chinensis*	Spotted Dove	51-200g	4	2	1	8	Medium	High	
Ducks	*Poliocephalus poliocephalus*	Hoary-headed Grebe	201-1000g	8	1	1	8	Medium	High	
Ducks	*Tachybaptus novaehollandiae*	Australasian Grebe	201-1000g	8	1	1	8	Medium	High	
Raptors	*Accipiter cirrocephalus*	Collared Sparrowhawk	201-1000g	8	1	1	8	Medium	Medium	
Raptors	*Accipiter fasciatus*	Brown Goshawk	201-1000g	8	1	1	8	Medium	Medium	Y
Raptors	*Accipiter novaehollandiae*	Grey Goshawk	201-1000g	8	1	1	8	Medium	Medium	Y
Kingfishers	*Dacelo novaeguineae*	Laughing Kookaburra	201-1000g	8	1	1	8	Medium	Medium	Y
Raptors	*Falco berigora*	Brown Falcon	201-1000g	8	1	1	8	Medium	Medium	
Raptors	*Falco longipennis*	Australian Hobby	201-1000g	8	1	1	8	Medium	Medium	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Raptors	*Falco peregrinus*	Peregrine Falcon	201-1000g	8	1	1	8	Medium	Medium	
Bush birds	*Passer domesticus*	House Sparrow	21-50g	2	4	1	8	Medium	Medium	
Parrots	*Lathamus discolor*	Swift Parrot	51-200g	4	2	1	8	Medium	Medium	Y
Parrots	*Melopsittacus undulatus*	Budgerigar	21-50g	2	4	1	8	Medium	Medium	Y
Parrots	*Psephotus haematonotus*	Red-rumped Parrot	51-200g	4	2	1	8	Medium	Medium	Y
Parrots	*Barnardius zonarius*	Australian Ringneck	51-200g	4	2	1	8	Medium	Medium	Y
Parrots	*Neophema chrysostoma*	Blue-winged Parrot	51-200g	4	2	1	8	Medium	Medium	Y
Bush birds	*Acridotheres tristis*	Common Myna	51-200g	4	2	1	8	Medium	Medium	
Microbats	*Austronomus australis*	White-striped Freetail-bat	21-50g	2	2	2	8	Medium	Medium	
Corvids	*Cracticus nigrogularis*	Pied Butcherbird	201-1000g	8	1	1	8	Medium	Low	Y
Corvids	*Cracticus torquatus*	Grey Butcherbird	201-1000g	8	1	1	8	Medium	Low	Y
Parrots	*Nymphicus hollandicus*	Cockatiel	51-200g	4	2	1	8	Medium	Low	Y
Honeyeaters	*Anthochaera carunculata*	Red Wattlebird	51-200g	4	2	1	8	Medium	Low	Y
Honeyeaters	*Anthochaera chrysoptera*	Little Wattlebird	51-200g	4	2	1	8	Medium	Low	Y
Honeyeaters	*Manorina melanocephala*	Noisy Miner	51-200g	4	2	1	8	Medium	Low	Y
Honeyeaters	*Philemon corniculatus*	Noisy Friarbird	51-200g	4	2	1	8	Medium	Low	Y
Parrots	*Platycercus elegans*	Crimson Rosella	51-200g	4	2	1	8	Medium	Low	Y
Parrots	*Platycercus eximius*	Eastern Rosella	51-200g	4	2	1	8	Medium	Low	Y
Ducks	*Gallinula tenebrosa*	Dusky Moorhen	201-1000g	8	1	1	8	Medium	Low	Y
Waders	*Gallinago hardwickii*	Latham's Snipe	51-200g	4	2	1	8	Medium	Low	Y
Swifts, Swallows, Martins	*Hirundo neoxena*	Welcome Swallow	< 20g	1	2	2	4	Low	Very High	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Swifts, Swallows, Martins	*Petrochelidon ariel*	Fairy Martin	< 20g	1	2	2	4	Low	High	
Owls	*Aegotheles cristatus*	Australian Owlet-nightjar	21-50g	2	1	2	4	Low	Medium	
Bush birds	*Alauda arvensis*	Eurasian Skylark	21-50g	2	1	2	4	Low	Medium	
Bush birds	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	51-200g	4	1	1	4	Low	Medium	
Bush birds	*Heteroscenes pallidus*	Pallid Cuckoo	51-200g	4	1	1	4	Low	Medium	
Bush birds	*Neochmia temporalis*	Red-browed Finch	< 20g	1	4	1	4	Low	Medium	
Bush birds	*Stagonopleura guttata*	Diamond Firetail	< 20g	1	4	1	4	Low	Medium	
Bush birds	*Stizoptera bichenovii*	Double-barred Finch	< 20g	1	4	1	4	Low	Medium	
Bush birds	*Carduelis carduelis*	European Goldfinch	< 20g	1	2	2	4	Low	Medium	
Swifts, Swallows, Martins	*Petrochelidon nigricans*	Tree Martin	< 20g	1	2	2	4	Low	Medium	Y
Microbats	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Ozimops planiceps*	South-eastern Free-tailed Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Ozimops ridei*	Eastern Free-tailed Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Chalinolobus gouldii*	Gould's Wattled Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Chalinolobus morio*	Chocolate Wattled Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Nyctophilus gouldi*	Gould's Long-eared Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Scotorepens orion*	Eastern Broad-nosed Bat	< 20g	1	2	2	4	Low	Medium	
Microbats	*Vespadelus vulturnus*	Little Forest Bat	< 20g	1	2	2	4	Low	Medium	
Bush birds	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	21-50g	2	2	1	4	Low	Low	
Corvids	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	51-200g	4	1	1	4	Low	Low	Y
Bush birds	*Lalage sueurii*	White-winged Triller	21-50g	2	2	1	4	Low	Low	

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Bush birds	*Falcunculus frontatus*	Crested Shrike-tit	21-50g	2	2	1	4	Low	Low	
Honeyeaters	*Anthochaera phrygia*	Regent Honeyeater	21-50g	2	2	1	4	Low	Low	Y
Honeyeaters	*Manorina melanophrys*	Bell Miner	21-50g	2	2	1	4	Low	Low	Y
Honeyeaters	*Meliphaga lewinii*	Lewin's Honeyeater	21-50g	2	2	1	4	Low	Low	Y
Honeyeaters	*Melithreptus brevirostris*	Brown-headed Honeyeater	21-50g	2	2	1	4	Low	Low	Y
Bush birds	*Myiagra inquieta*	Restless Flycatcher	21-50g	2	1	2	4	Low	Low	Y
Bush birds	*Daphoenositta chrysoptera*	Varied Sittella	< 20g	1	4	1	4	Low	Low	
Bush birds	*Oriolus sagittatus*	Olive-backed Oriole	51-200g	4	1	1	4	Low	Low	
Bush birds	*Colluricincla harmonica*	Grey Shrike-thrush	51-200g	4	1	1	4	Low	Low	
Bush birds	*Coturnix pectoralis*	Stubble Quail	51-200g	4	1	1	4	Low	Low	
Bush birds	*Pycnonotus jocosus*	Red-whiskered Bulbul	21-50g	2	2	1	4	Low	Low	
Bush birds	*Turdus merula*	Eurasian Blackbird	51-200g	4	1	1	4	Low	Low	Y
Bush birds	*Anthus novaeseelandiae*	Australian Pipit	21-50g	2	1	1	2	Very low	Very High	
Bush birds	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	21-50g	2	1	1	2	Very low	Medium	
Bush birds	*Chalcites lucidus*	Shining Bronze-Cuckoo	21-50g	2	1	1	2	Very low	Medium	
Bush birds	*Rhipidura leucophrys*	Willie Wagtail	< 20g	1	1	1	1	Very low	Medium	
Bush birds	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Acanthiza lineata*	Striated Thornbill	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Acanthiza nana*	Yellow Thornbill	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Acanthiza pusilla*	Brown Thornbill	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Acanthiza reguloides*	Buff-rumped Thornbill	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Gerygone olivacea*	White-throated Gerygone	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Sericornis frontalis*	White-browed Scrubwren	< 20g	1	2	1	2	Very low	Low	
Bush birds	*Smicrornis brevirostris*	Weebill	< 20g	1	2	1	2	Very low	Low	
Kingfishers	*Ceyx azureus*	Azure Kingfisher	21-50g	2	1	1	2	Very Low	Low	Y

Functional Groups	Species	Common Name	Mass	Mass Score	Flock Score	Flight Score	Consequence Score	Consequence Category	Probability Category	Probability allocated with Australia Wide Data
Kingfishers	*Todiramphus sanctus*	Sacred Kingfisher	21-50g	2	1	1	2	Very low	Low	Y
Bush birds	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	21-50g	2	1	1	2	Very low	Low	
Bush birds	*Cormobates leucophaea*	White-throated Treecreeper	21-50g	2	1	1	2	Very low	Low	
Bush birds	*Malurus cyaneus*	Superb Fairy-wren	< 20g	1	2	1	2	Very low	Low	Y
Bush birds	*Malurus lamberti*	Variegated Fairy-wren	< 20g	1	2	1	2	Very low	Low	Y
Honeyeaters	*Acanthorhynchus tenuirostris*	Eastern Spinebill	< 20g	1	2	1	2	Very low	Low	Y
Honeyeaters	*Caligavis chrysops*	Yellow-faced Honeyeater	< 20g	1	2	1	2	Very low	Low	Y
Honeyeaters	*Myzomela sanguinolenta*	Scarlet Honeyeater	< 20g	1	2	1	2	Very low	Low	Y
Honeyeaters	*Ptilotula penicillata*	White-plumed Honeyeater	< 20g	1	2	1	2	Very low	Low	Y
Bush birds	*Pachycephala pectoralis*	Golden Whistler	21-50g	2	1	1	2	Very low	Low	
Bush birds	*Pachycephala rufiventris*	Rufous Whistler	21-50g	2	1	1	2	Very low	Low	
Bush birds	*Pardalotus punctatus*	Spotted Pardalote	< 20g	1	1	1	1	Very low	Low	
Bush birds	*Pardalotus striatus*	Striated Pardalote	< 20g	1	1	1	1	Very low	Low	
Bush birds	*Eopsaltria australis*	Eastern Yellow Robin	21-50g	2	1	1	2	Very low	Low	Y
Bush birds	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	21-50g	2	1	1	2	Very low	Low	Y
Bush birds	*Microeca fascinans*	Jacky Winter	< 20g	1	1	1	1	Very low	Low	Y
Bush birds	*Petroica phoenicea*	Flame Robin	< 20g	1	1	1	1	Very low	Low	Y
Bush birds	*Petroica rosea*	Rose Robin	< 20g	1	1	1	1	Very low	Low	Y
Bush birds	*Rhipidura albiscapa*	Grey Fantail	< 20g	1	1	2	2	Very low	Low	
Bush birds	*Zosterops lateralis*	Silvereye	< 20g	1	2	1	2	Very low	Low	

Appendix D Overall Hazard Assessment Rankings by Species

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Megabats	*Pteropus poliocephalus*	Grey-headed Flying-fox	Extreme	Very High	Extreme	High
Megabats	*Pteropus* scapulatus	Little Red Flying-fox	Extreme	Very High	Extreme	Moderate
Pigeons	*Columba livia*	Rock Dove	Extreme	High	Extreme	High
Waterbirds	*Threskiornis moluccus*	Australian White Ibis	Extreme	High	Extreme	High
Waterbirds	*Threskiornis spinicollis*	Straw-necked Ibis	Extreme	High	Extreme	Present
Ducks	*Cygnus atratus*	Black Swan	Extreme	Medium	Very High	Moderate
Parrots	*Cacatua tenuirostris*	Long-billed Corella	Extreme	Medium	Very High	Present
Parrots	*Eolophus roseicapilla*	Galah	Extreme	Medium	Very High	Present
Gulls	*Chroicocephalus novaehollandiae*	Silver Gull	Very high	Very High	Very High	High
Ducks	*Anas castanea*	Chestnut Teal	Very high	High	High	Present
Ducks	*Anas gracilis*	Grey Teal	Very high	High	High	High
Ducks	*Anas superciliosa*	Pacific Black Duck	Very high	High	High	Present
Ducks	*Chenonetta jubata*	Australian Wood Duck	Very high	High	High	Present
Ducks	*Malacorhynchus membranaceus*	Pink-eared Duck	Very high	High	High	Moderate
Waterbirds	*Vanellus miles*	Masked Lapwing	Very high	High	High	Present
Waterbirds	*Phalacrocorax varius*	Pied Cormorant	Very high	High	High	Moderate
Raptors	*Aquila audax*	Wedge-tailed Eagle	Very high	Medium	High	Present
Raptors	*Hieraaetus morphnoides*	Little Eagle	Very high	Medium	High	Present

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Waterbirds	*Bubulcus ibis*	Cattle Egret	Very high	Medium	High	Present
Parrots	*Cacatua galerita*	Sulphur-crested Cockatoo	Very high	Medium	High	Present
Ducks	*Anas platyrhynchos*	Mallard	High	High	High	Moderate
Ducks	*Anas rhynchotis*	Australasian Shoveler	High	High	High	Moderate
Ducks	*Aythya australis*	Hardhead	High	High	High	Moderate
Corvids	*Gymnorhina tibicen*	Australian Magpie	High	High	High	Present
Pigeons	*Geopelia humeralis*	Bar-shouldered Dove	High	High	High	Moderate
Pigeons	*Geopelia striata*	Peaceful Dove	High	High	High	Moderate
Pigeons	*Macropygia phasianella*	Brown Cuckoo-Dove	High	High	High	Moderate
Waterbirds	*Microcarbo melanoleucos*	Little Pied Cormorant	High	High	High	High
Waterbirds	*Phalacrocorax sulcirostris*	Little Black Cormorant	High	High	High	Moderate
Bush birds	*Sturnus vulgaris*	Common Starling	High	High	High	Present
Owls	*Tyto javanica*	Eastern Barn Owl	High	High	High	Moderate
Corvids	*Corcorax melanorhamphos*	White-winged Chough	Very high	Low	Medium	Present
Raptors	*Elanus axillaris*	Black-shouldered Kite	High	Medium	Medium	Present
Raptors	*Haliastur sphenurus*	Whistling Kite	High	Medium	Medium	Present
Raptors	*Lophoictinia isura*	Square-tailed Kite	High	Medium	Medium	Moderate
Raptors	*Milvus migrans*	Black Kite	High	Medium	Medium	Moderate
Waterbirds	*Anhinga novaehollandiae*	Australasian Darter	High	Medium	Medium	Moderate
Waterbirds	*Ardea intermedia*	Intermediate Egret	High	Medium	Medium	Moderate

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Waterbirds	*Ardea pacifica*	White-necked Heron	High	Medium	Medium	Moderate
Waterbirds	*Casmerodius modesta*	Eastern Great Egret	High	Medium	Medium	High
Waterbirds	*Egretta garzetta*	Little Egret	High	Medium	Medium	Moderate
Waterbirds	*Egretta novaehollandiae*	White-faced Heron	High	Medium	Medium	Present
Parrots	*Cacatua sanguinea*	Little Corella	High	Medium	Medium	Present
Parrots	*Callocephalon fimbriatum*	Gang-gang Cockatoo	High	Medium	Medium	Moderate
Parrots	*Zanda funereus*	Yellow-tailed Black-Cockatoo	High	Medium	Medium	Present
Corvids	*Corvus coronoides*	Australian Raven	High	Medium	Medium	Present
Corvids	*Corvus mellori*	Little Raven	High	Medium	Medium	Present
Bush birds	*Grallina cyanoleuca*	Magpie-lark	High	Medium	Medium	Present
Owls	*Podargus strigoides*	Tawny Frogmouth	High	Medium	Medium	Moderate
Parrots	*Alisterus scapularis*	Australian King-Parrot	High	Medium	Medium	Moderate
Parrots	*Glossopsitta concinna*	Musk Lorikeet	High	Medium	Medium	High
Parrots	*Glossopsitta pusilla*	Little Lorikeet	High	Medium	Medium	Moderate
Parrots	*Trichoglossus moluccanus*	Rainbow Lorikeet	High	Medium	Medium	Present
Owls	*Ninox novaeseelandiae*	Southern Boobook	High	Medium	Medium	Moderate
Corvids	*Strepera graculina*	Pied Currawong	High	Low	Medium	Present
Corvids	*Strepera versicolor*	Grey Currawong	High	Low	Medium	High
Corvids	*Struthidea cinerea*	Apostlebird	High	Low	Medium	Moderate
Ducks	*Fulica atra*	Eurasian Coot	High	Low	Medium	High

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Ducks	*Porphyrio porphyrio*	Purple Swamphen	High	Low	Medium	High
Raptors	*Falco cenchroides*	Nankeen Kestrel	Medium	Very High	Medium	Present
Pigeons	*Ocyphaps lophotes*	Crested Pigeon	Medium	High	Medium	Present
Pigeons	*Phaps chalcoptera*	Common Bronzewing	Medium	High	Medium	High
Pigeons	*Spilopelia chinensis*	Spotted Turtle-Dove	Medium	High	Medium	High
Pigeons	*Streptopelia chinensis*	Spotted Dove	Medium	High	Medium	Present
Ducks	*Poliocephalus poliocephalus*	Hoary-headed Grebe	Medium	High	Medium	Moderate
Ducks	*Tachybaptus novaehollandiae*	Australasian Grebe	Medium	High	Medium	High
Raptors	*Accipiter cirrocephalus*	Collared Sparrowhawk	Medium	Medium	Low	Present
Raptors	*Accipiter fasciatus*	Brown Goshawk	Medium	Medium	Low	Present
Raptors	*Accipiter novaehollandiae*	Grey Goshawk	Medium	Medium	Low	Moderate
Kingfishers	*Dacelo novaeguineae*	Laughing Kookaburra	Medium	Medium	Low	Present
Raptors	*Falco berigora*	Brown Falcon	Medium	Medium	Low	Moderate
Raptors	*Falco longipennis*	Australian Hobby	Medium	Medium	Low	Present
Raptors	*Falco peregrinus*	Peregrine Falcon	Medium	Medium	Low	Present
Bush birds	*Passer domesticus*	House Sparrow	Medium	Medium	Low	High
Parrots	*Lathamus discolor*	Swift Parrot	Medium	Medium	Low	Moderate
Parrots	*Melopsittacus undulatus*	Budgerigar	Medium	Medium	Low	Moderate
Parrots	*Psephotus haematonotus*	Red-rumped Parrot	Medium	Medium	Low	Present
Parrots	*Barnardius zonarius*	Australian Ringneck	Medium	Medium	Low	Moderate

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Parrots	*Neophema chrysostoma*	Blue-winged Parrot	Medium	Medium	Low	Moderate
Bush birds	*Acridotheres tristis*	Common Myna	Medium	Medium	Low	Present
Microbats	*Austronomus australis*	White-striped Freetail-bat	Medium	Medium	Low	High
Corvids	*Cracticus nigrogularis*	Pied Butcherbird	Medium	Low	Low	High
Corvids	*Cracticus torquatus*	Grey Butcherbird	Medium	Low	Low	Present
Parrots	*Nymphicus hollandicus*	Cockatiel	Medium	Low	Low	Moderate
Honeyeaters	*Anthochaera carunculata*	Red Wattlebird	Medium	Low	Low	High
Honeyeaters	*Anthochaera chrysoptera*	Little Wattlebird	Medium	Low	Low	High
Honeyeaters	*Manorina melanocephala*	Noisy Miner	Medium	Low	Low	Present
Honeyeaters	*Philemon corniculatus*	Noisy Friarbird	Medium	Low	Low	Present
Parrots	*Platycercus elegans*	Crimson Rosella	Medium	Low	Low	Present
Parrots	*Platycercus eximius*	Eastern Rosella	Medium	Low	Low	Present
Ducks	*Gallinula tenebrosa*	Dusky Moorhen	Medium	Low	Low	Present
Waders	*Gallinago hardwickii*	Latham's Snipe	Medium	Low	Low	Moderate
Swifts, Swallows, Martins	*Hirundo neoxena*	Welcome Swallow	Low	Very High	Low	Present
Swifts, Swallows, Martins	*Petrochelidon ariel*	Fairy Martin	Low	High	Low	High
Owls	*Aegotheles cristatus*	Australian Owlet-nightjar	Low	Medium	Negligible	Moderate
Bush birds	*Alauda arvensis*	Eurasian Skylark	Low	Medium	Negligible	High
Bush birds	*Cacomantis flabelliformis*	Fan-tailed Cuckoo	Low	Medium	Negligible	Present
Bush birds	*Heteroscenes pallidus*	Pallid Cuckoo	Low	Medium	Negligible	Present

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Bush birds	*Neochmia temporalis*	Red-browed Finch	Low	Medium	Negligible	Present
Bush birds	*Stagonopleura guttata*	Diamond Firetail	Low	Medium	Negligible	Moderate
Bush birds	*Stizoptera bichenovii*	Double-barred Finch	Low	Medium	Negligible	Present
Bush birds	*Carduelis carduelis*	European Goldfinch	Low	Medium	Negligible	Moderate
Swifts, Swallows, Martins	*Petrochelidon nigricans*	Tree Martin	Low	Medium	Negligible	High
Microbats	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	Low	Medium	Negligible	Moderate
Microbats	*Ozimops planiceps*	South-eastern Free-tailed Bat	Low	Medium	Negligible	Moderate
Microbats	*Ozimops ridei*	Eastern Free-tailed Bat	Low	Medium	Negligible	Moderate
Microbats	*Chalinolobus gouldii*	Gould's Wattled Bat	Low	Medium	Negligible	Moderate
Microbats	*Chalinolobus morio*	Chocolate Wattled Bat	Low	Medium	Negligible	Moderate
Microbats	*Nyctophilus geoffroyi*	Lesser Long-eared Bat	Low	Medium	Negligible	Moderate
Microbats	*Nyctophilus gouldi*	Gould's Long-eared Bat	Low	Medium	Negligible	Moderate
Microbats	*Scotorepens orion*	Eastern Broad-nosed Bat	Low	Medium	Negligible	Moderate
Microbats	*Vespadelus vulturnus*	Little Forest Bat	Low	Medium	Negligible	Moderate
Bush birds	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	Low	Low	Negligible	Present
Corvids	*Coracina novaehollandiae*	Black-faced Cuckoo-shrike	Low	Low	Negligible	Present
Bush birds	*Lalage sueurii*	White-winged Triller	Low	Low	Negligible	Moderate
Bush birds	*Falcunculus frontatus*	Crested Shrike-tit	Low	Low	Negligible	Moderate
Honeyeaters	*Anthochaera phrygia*	Regent Honeyeater	Low	Low	Negligible	Moderate
Honeyeaters	*Manorina melanophrys*	Bell Miner	Low	Low	Negligible	Moderate

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Honeyeaters	*Meliphaga lewinii*	Lewin's Honeyeater	Low	Low	Negligible	Moderate
Honeyeaters	*Melithreptus brevirostris*	Brown-headed Honeyeater	Low	Low	Negligible	Present
Bush birds	*Myiagra inquieta*	Restless Flycatcher	Low	Low	Negligible	Moderate
Bush birds	*Daphoenositta chrysoptera*	Varied Sittella	Low	Low	Negligible	Moderate
Bush birds	*Oriolus sagittatus*	Olive-backed Oriole	Low	Low	Negligible	Present
Bush birds	*Colluricincla harmonica*	Grey Shrike-thrush	Low	Low	Negligible	Present
Bush birds	*Coturnix pectoralis*	Stubble Quail	Low	Low	Negligible	Present
Bush birds	*Pycnonotus jocosus*	Red-whiskered Bulbul	Low	Low	Negligible	Present
Bush birds	*Turdus merula*	Eurasian Blackbird	Low	Low	Negligible	Present
Bush birds	*Anthus novaeseelandiae*	Australian Pipit	Very low	Very High	Negligible	High
Bush birds	*Chalcites basalis*	Horsfield's Bronze-Cuckoo	Very low	Medium	Negligible	Moderate
Bush birds	*Chalcites lucidus*	Shining Bronze-Cuckoo	Very low	Medium	Negligible	Moderate
Bush birds	*Rhipidura leucophrys*	Willie Wagtail	Very low	Medium	Negligible	Present
Bush birds	*Acanthiza chrysorrhoa*	Yellow-rumped Thornbill	Very low	Low	Negligible	Present
Bush birds	*Acanthiza lineata*	Striated Thornbill	Very low	Low	Negligible	Present
Bush birds	*Acanthiza nana*	Yellow Thornbill	Very low	Low	Negligible	Present
Bush birds	*Acanthiza pusilla*	Brown Thornbill	Very low	Low	Negligible	Present
Bush birds	*Acanthiza reguloides*	Buff-rumped Thornbill	Very low	Low	Negligible	Moderate
Bush birds	*Gerygone olivacea*	White-throated Gerygone	Very low	Low	Negligible	Present
Bush birds	*Sericornis frontalis*	White-browed Scrubwren	Very low	Low	Negligible	Moderate

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Bush birds	*Smicrornis brevirostris*	Weebill	Very low	Low	Negligible	Present
Kingfishers	*Ceyx azureus*	Azure Kingfisher	Very Low	Low	Negligible	Present
Kingfishers	*Todiramphus sanctus*	Sacred Kingfisher	Very low	Low	Negligible	Moderate
Bush birds	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	Very low	Low	Negligible	Moderate
Bush birds	*Cormobates leucophaea*	White-throated Treecreeper	Very low	Low	Negligible	Moderate
Bush birds	*Malurus cyaneus*	Superb Fairy-wren	Very low	Low	Negligible	Present
Bush birds	*Malurus lamberti*	Variegated Fairy-wren	Very low	Low	Negligible	Moderate
Honeyeaters	*Acanthorhynchus tenuirostris*	Eastern Spinebill	Very low	Low	Negligible	Present
Honeyeaters	*Caligavis chrysops*	Yellow-faced Honeyeater	Very low	Low	Negligible	Present
Honeyeaters	*Myzomela sanguinolenta*	Scarlet Honeyeater	Very low	Low	Negligible	Moderate
Honeyeaters	*Ptilotula penicillata*	White-plumed Honeyeater	Very low	Low	Negligible	Present
Bush birds	*Pachycephala pectoralis*	Golden Whistler	Very low	Low	Negligible	Present
Bush birds	*Pachycephala rufiventris*	Rufous Whistler	Very low	Low	Negligible	Present
Bush birds	*Pardalotus punctatus*	Spotted Pardalote	Very low	Low	Negligible	Present
Bush birds	*Pardalotus striatus*	Striated Pardalote	Very low	Low	Negligible	Present
Bush birds	*Eopsaltria australis*	Eastern Yellow Robin	Very low	Low	Negligible	Present
Bush birds	*Melanodryas cucullata cucullata*	Hooded Robin (south-eastern form)	Very low	Low	Negligible	Moderate
Bush birds	*Microeca fascinans*	Jacky Winter	Very low	Low	Negligible	High
Bush birds	*Petroica phoenicea*	Flame Robin	Very low	Low	Negligible	Moderate
Bush birds	*Petroica rosea*	Rose Robin	Very low	Low	Negligible	Moderate

Functional Group	Species	Common Name	Consequence score	Probability score	Hazard Rank	Likelihood of occurrence
Bush birds	*Rhipidura albiscapa*	Grey Fantail	Very low	Low	Negligible	Present
Bush birds	*Zosterops lateralis*	Silvereye	Very low	Low	Negligible	Present

Appendix E Guilds/Functional Groups used to categorize species during the Wildlife Assessment

Guild/Functional Group	Examples
Bush birds	Fairy-wrens, Thornbills, Gerygones, Scrubwrens, Weebills, Treecreepers, Pipits, Whistlers, Robins, Starlings, Silvereyes, Pardalotes, Finches, Sparrows, Woodswallows, Cuckoos, Quails.
Corvids	Magpies, Ravens, Currawongs, Butcherbirds, Cuckoo-shrikes, White-winged Choughs.
Ducks	Pacific Black Duck, Australian Wood Duck, Shovelers, Swans, Grebes, Coots, Moorhens, Swamphens.
Gulls	Silver Gull, Kelp Gull
Honeyeaters	Wattlebirds, Spinebills, Noisy Miner, Noisy Friar bird, other Honeyeaters.
Kingfishers	Kookaburra, Sacred Kingfisher, other Kingfishers
Megabats	Grey-headed Flying-fox
Microbats	Free-tailed Bats, Long-eared Bats, Wattled Bats, Little Forest Bat
Owls	Eastern Barn Owl, Southern Boobook, Tawny Frogmouth, other nightjars
Parrots	Cockatoos, Corellas, Galah, Cockatiel, Budgerigar, Lorikeets, Rosellas, other Parrots such as Swift Parrot.
Pigeons	Rock Dove, Peaceful Dove, Bar-shouldered Dove, Wonga Pigeon, Crested Pigeon, Spotted Turtle-Dove, Common Bronzewing.
Raptors	Wedge-tailed Eagle, other Eagles, Goshawks, Kites, Falcons, Kestrels, Hobbies.
Swifts, Swallows, Martins	Welcome Swallow, Fairy Martin, Tree Martin, Fork-tailed Swift.
Waders	Snipe, Stilts, Dotterel
Waterbirds	Ibis, Herons, Egrets, Bitterns, Snipe, Darters, Lapwings, Pelicans, Cormorants, Spoonbills.