Westlink Industrial Estate
Wildlife Management Assessment Report

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Template 2.8.1

Executive Summary

Eco Logical Australia Pty Ltd was engaged by ESR Australia to prepare a Wildlife Management Assessment Report (WMAR) for the proposed development at 290-308 Aldington Road, 59-62 Abbotts Road and 63 Abbotts Road Kemps Creek, for the purposes of an industrial estate known as Westlink (formerly known as the Kemps Creek Logistics Park). This report is focused on assessing the impacts and mitigating the risk wildlife may present to the safe operation of Western Sydney Airport (WSA). The report describes the existing wildlife attraction properties of the site and the proposed development. This report outlines mitigation measures and strategies to avoid, minimise and mitigate the potential impacts of wildlife to the safe operation of WSA.

The site is part of the Western Sydney Employment Area, and specifically the Mamre Road Precinct and is zoned under the State Environmental Planning Policy (Western Sydney Employment Area) 2009. Consistent with the above, this report has been prepared to support a State Significant Development Application (SSD- 9138102) under Part 4 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The proposed development comprises of a warehouse and logistics estate. The development stages associated to this application comprises of estate earthworks, construction of structural supports, primary estate roads, external road network, stormwater infrastructure, environmental management work and the warehouse and logistics estate.

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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

1. Introduction

1.1. Overview

The proposed development is to be assessed as a State Significant Development (SSD). This Wildlife Management Assessment has been prepared to address submissions received during the exhibition process of SSD-9138102 and address Clause 21, Wildlife hazards, of *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020* (Aerotropolis SEPP).

The Wildlife Management Assessment has utilised the Aerotropolis Airport Wildlife Safeguarding Framework (AAWSF) to complete the risk assessment.

1.2. General description of the development site

The site comprises three separate allotments identified as 290-308 Aldington Road, 59-62 Abbotts Road, and 63 Abbotts Road, as shown in Figure 6 below. These addresses are legally described as Lots 13, 12 and 11 in DP253503, respectively. The land is approximately 319,800m2 in area and is irregular in shape. The site is located within the suburb of Kemps Creek, within the Penrith Local Government Area (LGA).

The entire development site is currently zoned IN1: General Industrial under *State Environmental Planning Policy (Western Sydney Employment Area) 2009*.

The development site is located within a highly modified and largely cleared agricultural landscape with patches of natural vegetated areas containing patches of grassy woodlands, planted windbreaks and sporadic trees of planted native and exotic species. Several dams of varying size are also present across the development site. A dwelling and associated farm buildings are also located on the development site. The site contains a combination of residential dwellings, farm shed and miscellaneous agricultural greenhouses and structures.

1.3. Project description

This SSDA seeks approval for the following development:

- Site preparatory works, including:
    - Demolition and clearing of all existing built form structures and vegetation;
    - Bulk earthworks including 'cut and fill' to create flat development platforms for the proposed buildings, and topsoiling, grassing and site stabilisation works;
- Subdivision of the site into 5 individual lots;
- Construction of a new industrial estate at the site comprising 7 industrial allotments and a total gross leasable area of 150,577m2, including:
    - 6 new industrial warehousing buildings with ancillary offices across 4 6 allotments, comprising:
        - 144,482m2 of warehousing floorspace; and

        - 5,895m2 of ancillary office floorspace;
    - 1 new on-site retail café building comprising 200m2 of floorspace; and
    - Fit out of Lot 1 warehouse with inclusion of Automated Manoeuvrable Robots (AMR).
- Construction of a new internal road layout and parking for 658 vehicles;
- Associated site servicing works and ancillary facilities, including OSD detention basin;
- Associated site landscaping; and
- Works-in-kind (WIK) arrangements through a Voluntary Planning Agreement (VPA) for external road upgrades including to Aldington and Abbotts Road, and a new signalised intersection at Mamre and Abbotts Road.

The proposed development is to be staged. Stage one comprises of establishing the stormwater basin along the south-western boundary, providing the majority of the internal road network. One Warehouse with offices will also be constructed during this stage and establishment the entry from intersection of Abbotts & Aldington Road. Stage two will be the construction of the industrial and office facilities for the remaining lots.

1.4. Western Sydney Airport (Nancy-Bird Walton)

The new Western Sydney Airport (Nancy-Bird Walton) is under construction and is on track 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, as planning has provided a 10km buffer between the airport and suburban areas.

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.

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 has contributed to the death 276 people and destroyed 108 aircrafts (Thorpe, 2003). Bird strike occurrences most commonly occur during take-off and landing.

Wildlife issues associated to land-based animals (primarily terrestrial mammals) are rare and have been effectively mitigate 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. However, COVID19 pandemic has impacted this trend as air traffic levels in 2020 were 40% below the air traffic levels of the previous year. 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 types of flying animal were galahs (801), plovers (602), bats (582), magpies (516) and flying foxes (464) (ATSB, 2018). Galahs were more commonly involved in birds trikes of multiple birds, with more than 38 per cent of Galah strikes involving more than one Galah (ATSB, 2017). The extent of damage to aircraft in these occurrences generally corresponds to the size and number of animals struck, the larger bird is the more likely it is to result in aircraft damage. Large animals have the ability to destroy engines, windshields and cause significant damage components and the aerodynamic surfaces of an aircraft such as leading-edge surfaces. It must be 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 specific to the location of the airport, in particular the availability of habitat for birds and bats near the airport. Additionally, species have different tendencies for being struck by aircraft, such as the ability to avoid aircraft (Avisure, 2020). The airport operations contribute to the strike risk through variables such as of number of aircraft movements, flight paths and the time of flights (ATSB, 2018). 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 high number of aircraft movements located in close proximity to desirable and diverse habitat for birds and bats have a higher risk of bird strike compared to those with fewer aircraft movements and poor potential habitat for bird and bat species. It is important to note that some manmade habitats can be have high attractant properties for specific bird and bat species than natural environments. Species such as the Australian White Ibis, Ravens/Crows, Pelicans, Gulls and Pigeons are commonly found in large number in urban environments particularly around putrescible waste facilities and locations poor waste management.

Due to the risk associate 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 3. Additionally, this report is directed by these documents for the approach to assess the wildlife risk associated with the proposal and the mitigation and management measure proposed.

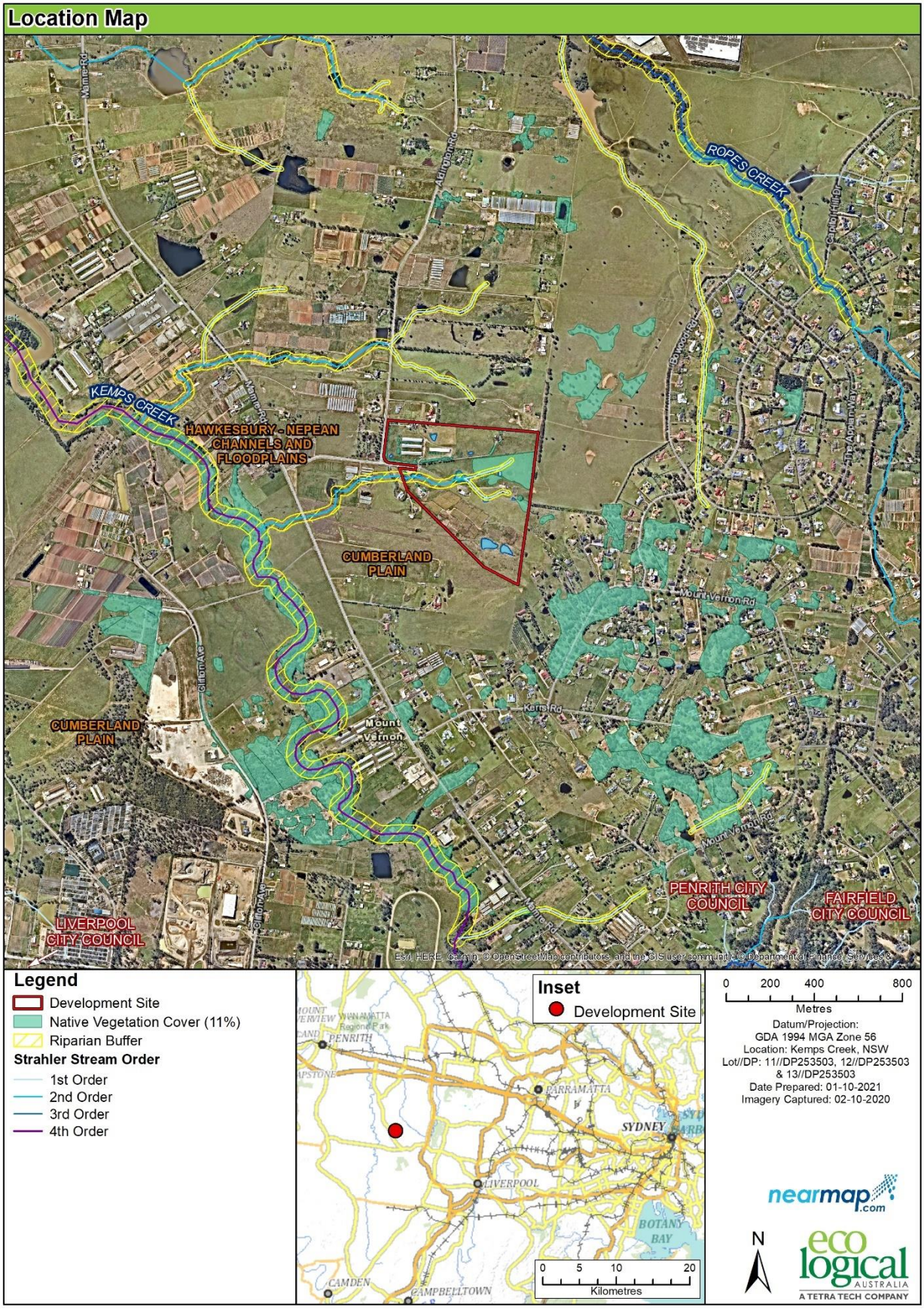


Figure 1 Location of Proposal

2. Legislative and Regulatory Context

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 1.

Table 1 ICAO Annex 14, Volume 1, Aerodrome Design and Operation – Wildlife Hazzard 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 airports 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 139-26(0)* (AC) provides further guidance for wildlife management adjacent to airports, a summary of the controls relates to this document and the MoS is provide in Table 2.

Table 2 Controls of CASA Documents Relevant to Wildlife Hazard Management

Document and Section	Control
MoS 17.01 (2)	The aerodrome operator, in consultation with local planning authority, must attempt to monitor sites within 13km of the aerodrome reference point the attracted wildlife.
MoS 17.04 (2)	Wildlife Hazard Management Plans must specify the liaison arrangements for local planning authorities within a radius of at least 13km from the aerodrome reference point.
AC 6.11	For wildlife hazards in the Aerodromes vicinity which contribute to the risk but are outside of the control of the aerodrome operator (i.e. adjacent land) it is expected that the aerodrome operator will; o Advise the relevant landowner or controlling authority of both the nature of the wildlife hazard and the resultant impact on the aerodrome and o Work with the relevant land owners or controlling authority to manage wildlife hazards.
AC 7.3.1	Operators of Certified Aerodromes are required to monitor and record on a regular basis the presence of wildlife on the aerodrome. This requirement also extends to the aerodrome vicinity where wildlife hazards outside the aerodrome are found to impact on the safe operation of the Aerodrome.
AC 9.2	Wildlife Monitoring must involve wildlife activity in the vicinity of the aerodrome
AC 9.4.1	The monitoring of wildlife in the vicinity of the aerodrome should cover any obvious concentrations of wildlife and/or sources of wildlife attraction (i.e., habitat, migratory routes, feeding and breeding area etc.)
AC 9.4.4	The outcome of the wildlife monitoring must be recorded. These records should be maintained in order to provide a detailed history of wildlife populations and behaviour over time.
AC 9.4.5	Once monitoring has identified a wildlife hazard, it should be assessed.

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 landuse planning frameworks to achieve airport safety outcome. 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 by Avisure to create the Aerotropolis Aviation Wildlife Safeguarding Framework (AAWSF) which aims to safeguard WSA against wildlife hazards. The AAWSF is provided in

Appendix A, the framework provides wildlife attraction risk associated to land use and appropriate actions for this use located within sub areas, see Figure 2. The proposal site is located in sub area B1 which is outside of the 3km wildlife buffer zone but within the 13km wildlife buffer zone.

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 6 and mitigation measures are presented in Section 7, additionally the AAWSF land use table is presented in Appendix B

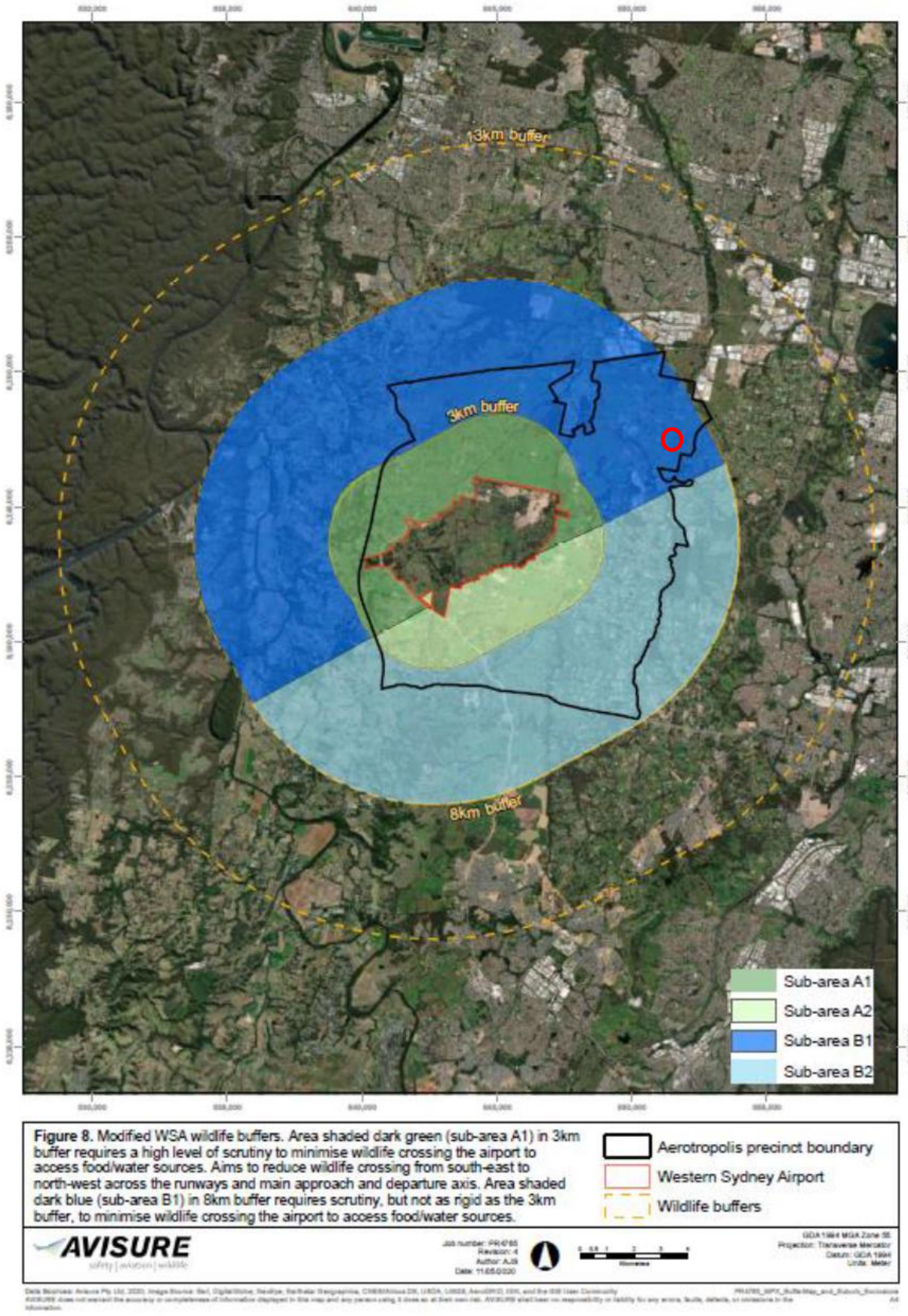


Figure 8. Modified WSA wildlife buffers. Area shaded dark green (sub-area A1) in 3km buffer requires a high level of scrutiny to minimise wildlife crossing the airport to access food/water sources. Aims to reduce wildlife crossing from south-east to north-west across the runways and main approach and departure axis. Area shaded dark blue (sub-area B1) in 8km buffer requires scrutiny, but not as rigid as the 3km buffer, to minimise wildlife crossing the airport to access food/water sources.

Figure 2 Western Sydney Airport Wildlife Buffer Sub Areas (the proposal, circled in red, is located within Sub-area B1)

3. Planning framework

3.1.1. Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of development proposals. The proposed development is State Significant Development and is to be assessed under Part 4.1 of the EP&A Act.

Ministerial Directions are issued under section 9.1 of the EP&A Act to provide provision or give effect to particular principles, aims, and objectives. Table 3 presents the Ministerial Directions that relate to the proposed development:

Table 3 Ministerial Direction Relevant to the Proposed Development

Direction	Detail
3.5 Development Near Regulated Airports and Defence Airfields	Not allow development types that are incompatible with the current and future operation of that airport.
7.8 Implementation of Western Sydney Aerotropolis Interim Land Use and Infrastructure Implementation Plan	The objective of this direction is to ensure development within the Western Sydney Aerotropolis is consistent is with the Stage 1 Western Sydney Land Use and Infrastructure Plan 2018. The direction applies to when a relevant planning authority preparing a planning proposal for land within the Western Sydney Aerotropolis and land affected by the obstacle limitation surface and ANEF contours for Western Sydney Airport.

These Ministerial Directions have been incorporated into the planning instruments and strategic plans that direct development in the area, specifically *State Environmental Planning Policy (Western Sydney Aerotropolis) 2020, Draft Aerotropolis Precinct Plan 2020,Western Sydney Aerotropolis Development Control Plan 2020 – Phase 1 and the Draft Western Sydney Aerotropolis Development Control Plan 2021 – Phase 2.*

3.1.2. State Environmental Planning Policy (Western Sydney Employment Area) 2009

The State Environmental Planning Policy (Western Sydney Employment Area) 2009 (WSEA SEPP) is intended to enhance the land to within the Western Sydney for employment purposes. The site of the proposal is zoned IN1: General Industrial under the WSEA SEPP.

3.1.3. State Environmental Planning Policy (Western Sydney Aerotropolis) 2020

Clause 21 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. The clause states that development consent must not be granted to relevant development on land within 13km Wildlife Buffer Zone, see Figure 2, 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 does not include any of the above landuses, therefore clause 21 does not apply to the proposed development.

3.1.4. Aerotropolis Precinct Plan 2020

The Precinct Plan was developed to utilise the features of the Aerotropolis as it is today: the creeks and tributaries; undulating topography and view lines; 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.

The Precinct Plan aims to safeguard future airport operations from inappropriate development while still supporting the development of places that will generate employment. The Department of Planning, Industry and Environment considered the impact of wildlife attraction when determining the appropriate location and type of new land uses within the Aerotropolis to manage the risk of collisions between wildlife and aircraft. The plan indicates that careful landscape design, species selection and mitigation measures can meet the vision for the Western Parkland City while mitigating these risks.

Table 4 below presents the specific requirements of Precinct Plan in relation to Wildlife Management and how the proposal meets the requirements

Table 4 Compliance of the Proposal with Draft Aerotropolis Precinct Plan 2020

Section	Reference	Requirement	Proposal Compliance
3.2.4 Riparian corridors and farm dams	BG1	Where appropriate, re-purpose or re-build farm dams as water in the landscape features. In doing so, address issues such as dam failure, safety, water quality, algal bloom risk, water level fluctuations and wildlife attraction.	Farm dams are to be removed within development footprint and replaced with a water sensitive urban stormwater system. This will reduce the wildlife attracting qualities of the site. This is discussed in Section 5.
3.3.5 Road Network	AM6	Landscape all streets and provide an urban tree canopy in a way which does not inadvertently cause wildlife to become a safety hazard in the operational airspace of the Airport.	Street trees are to be monitored for attracting wildlife that is considered a common strike species. If monitoring finds that common strike species are using the street trees for habitat actions will be undertaken to reduce the habitat qualities of the trees. Mitigation measures are provided in Section 6.

Section	Reference	Requirement	Proposal Compliance
3.4.2 Land use and built form	LU07	Consider wildlife attraction when determining the appropriate location and type of new land uses within the Aerotropolis to manage the risk of collisions between wildlife and aircraft. Certain high risk wildlife attracting uses have been identified within the Aerotropolis SEPP and will not be permitted. Other high risk uses will only be allowed where it can be demonstrated that adequate mitigation measures can be implemented.	The proposal does not propose any uses which are considered to high risk or very risk in relation to wildlife attracting. This is discussed in Section 5.

3.1.5. Draft Mamre Road Precinct Development Control Plan 2020

Section 2.1 of the Mamre Road Precinct DCP provides controls to safeguard the future operations of the Airport, including 24-hour operations, protections for the surrounding community and ensure compatible development on surrounding lands. Table 5 presents how the proposed project complies with the Performance Outcomes of Section 4.1 of the Mamre Road Precinct DCP.

Table 5 Compliance with the Draft Mamre Road Development Control Plan 2020

Reference	Performance Outcomes	Proposal Compliance
Section 4.1 Airport Safeguarding		
10)	Development must not attract wildlife which would create a safety hazard in the operations of the Airport	The proposal has been designed to reduce the attraction of wildlife that has the potential to cause safety hazards in the operational airspace of the airport. The removal of farm dams will help reduce the wildlife attraction of the site. The proposed landscaping will be monitored and managed to ensure that wildlife attraction is minimised.
11)	All waste bins are to be designed and installed with fixed lids	The Waste Management Plan specifies that all waste is to be contained to ensure that the waste does not fall, blow, wash or otherwise escape from the site.
12)	Any bulk waste receptacle or communal waste storage area must be contained within enclosures that cannot be accessed by birds or flying foxes.	Mitigation measures are provide in Section 7 to ensure waste storage areas are designed in a manner that does not allow access to birds or flying foxes.
13)	Any stormwater detention within the 8km wildlife buffer is to be designed to fully drain within 48 hours after a rainfall event.	The stormwater detention basin is designed to drain within 24 hours of a rainfall event.

3.1.6. Draft Western Sydney Aerotropolis Wildlife Management Assessment Report

The Draft Western Sydney Aerotropolis Wildlife Management Assessment Report was prepared by Avisure and commissioned by the Western Sydney Planning Partnership to assist in the preparation of the Draft Western Sydney Aerotropolis Precinct Plan 2020. The main goal of the report is to ensure that developments in the area do not increase the risk of wildlife impacting the safe operation of the airport.

The report was commissioned to identify the appropriate framework for the assessment of wildlife safeguarding and to present methods to manage the potential increased attraction of wildlife by future development. It is important to note that wildlife safeguard conflicts with the vision of the parkland city and utilisation of the blue and green grid, as revegetation and habitat restoration is likely to attract wildlife (Avisure, 2020).

Therefore, Wildlife safeguarding is to be addressed through on-going monitoring, assessment and mitigation activities, landscaping and revegetation must still be undertaken. This approach has been taken into consideration when preparing the wildlife management assessment.

The report also presents the Aerotropolis Aviation Wildlife Safeguarding Framework (AAWSF) which is provided in Appendix B. The AAWSF provides the basis for assessing the wildlife attracting qualities of land uses within the vicinity of WSA.

3.1.7. Aviation Safeguarding Guidelines - Western Sydney Aerotropolis and surrounding areas

The purpose of these guidelines are to assist relevant planning authorities, consultants and proponents when assessing and, preparing development applications which are impacted by aviation safeguarding controls.

Section 4 of the Guidelines provides further direction for the wildlife safeguarding in the vicinity of Western Sydney Airport. In particular the guidelines direct planning authorities and consultants to the appropriate sections of the SEPP and DCP that provide wildlife safeguarding controls. As these matters are discussed above this report is considered to have been prepared in accordance with these guidelines.

4. Assessment Methodology

4.1. Desktop review

ELA reviewed literature and data to develop an understanding of the ecology of the site and the current risk environment. ELA has worked around the area and on the site for a number of years and has utilised existing knowledge, previous assessments and data bases searches to understand the existing environment. The following documents were reviewed to inform the field study and understand the existing wildlife populations in the locality:

- Ecological constraints for 290-309 Aldington Road, Kemps Creek (ELA, 2019)
- Kemps Creek Logistics Biodiversity Development Assessment Report (ELA, 2020)
- Northern Gateway Wildlife Management Report (ELA, 2021)
- 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, 2018)
- ATSB National Aviation Occurrence Database
- NSW BioNet Atlas
- Protected Matters Search Tool

4.2. Common strike species

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.

Nearly 40% of bird strike data recorded by the ATSB throughout Australia between 2008 and 2017 involved a bird of an unknown species or the bird was not identified. This trend is evident in the strike data for Sydney Airport and Bankstown Airport, which is presented in Table 6 and Table 7.

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), Richards pipit (70), Nankeen kestrel (47) and bats (46). 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).

The ATSB data indicates that flying foxes and bat species are the most common strike species in the Sydney region. It is important to note that there may be some misidentification and naming of species in this data as a fruit bat is another name for a flying fox, and the term bat is also used.

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.

Table 6 Birdstrike by Species Recorded at Sydney Airport 2008 - 2017 (ATSB, 2018)

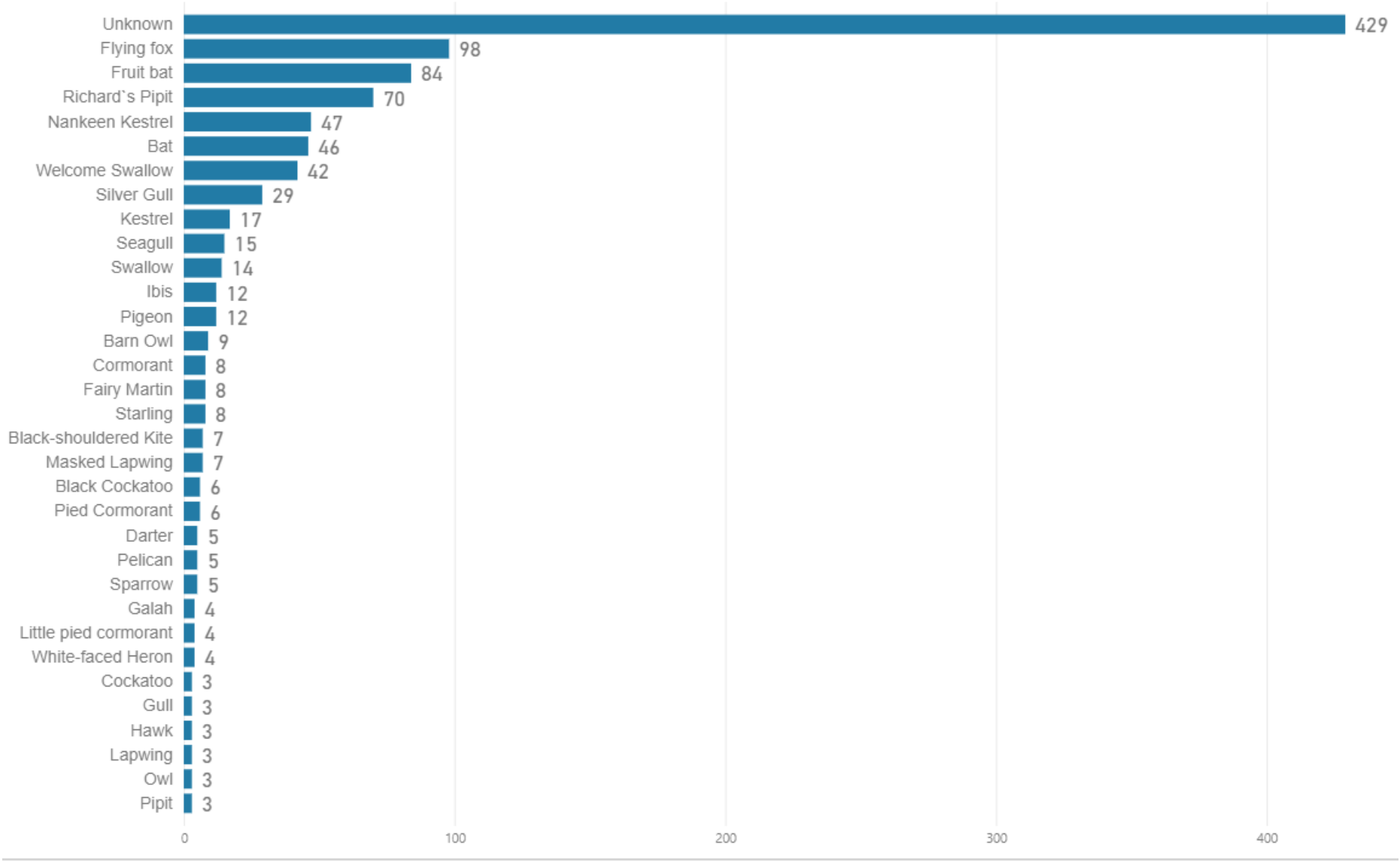
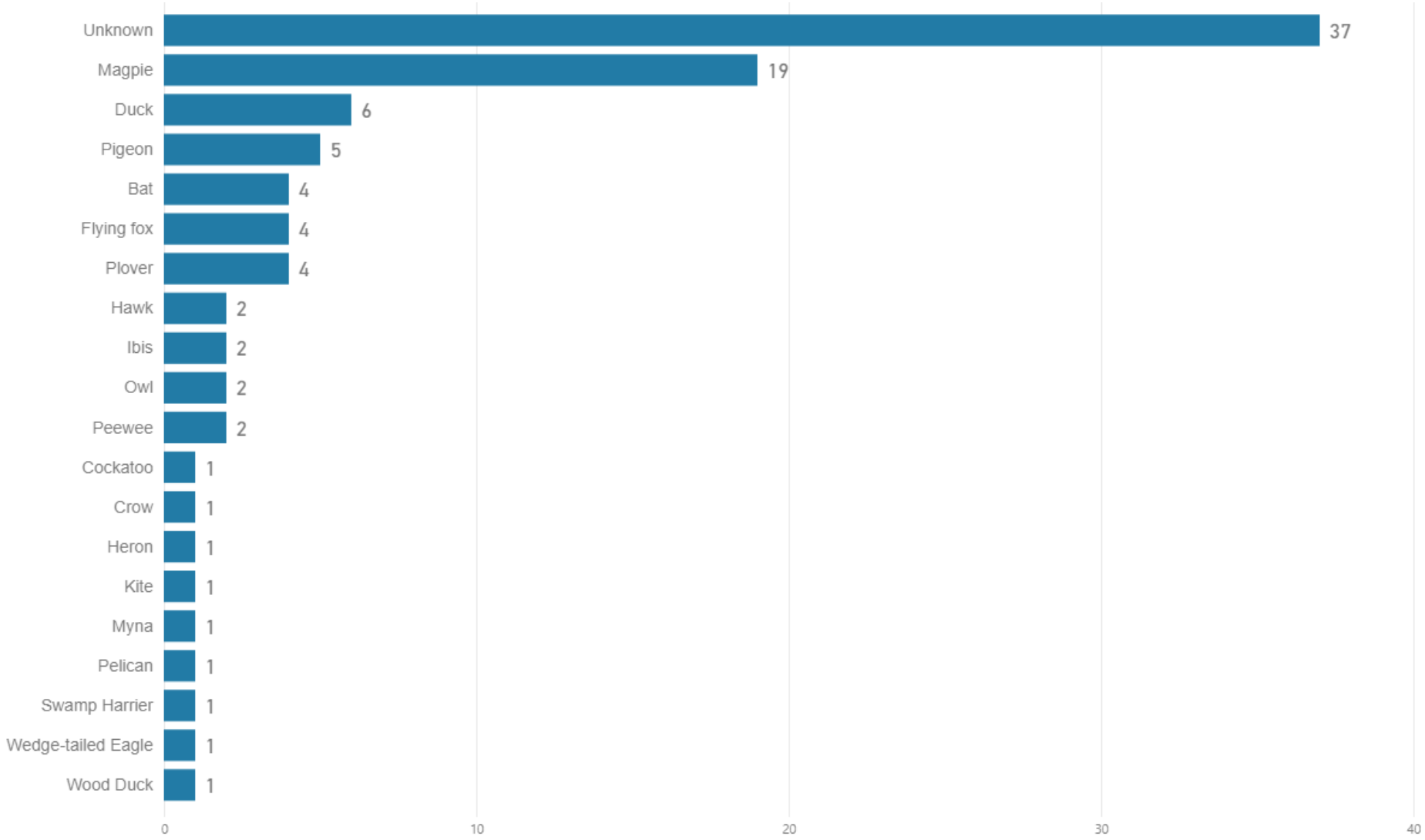


Table 7 Birdstrike by Species Recorded at Bankstown Airport 2008 - 2017 (ATSB, 2018)



The Preliminary Bird and Bat Strike Assessment, prepared by Avisure in 2015, to support the Western Sydney Airport Environmental Impact Statement found the habitat in the area to be suitable for the Australian White Ibis, and also recorded large quantities of Straw-necked Ibis. These species have not been recorded having large strike numbers at the surrounding airports identified above but should be considered due to their high strike consequence associated to their large size and proclivity to form large flocks.

4.3. Risk assessment methodology

This wildlife risk assessment utilises the wildlife hazard assessment process set out in the AAWSF and presented in Appendix B. The assessment primarily investigates wildlife attraction of the existing environment and contrast this against the potential wildlife attraction associated to the proposed development.

The risk assessment methodology rates the risk associated to the identified strike species/groups on site and the existing habitat types against the proposed habitat type and the species/group it is likely to attract and the corresponding risk of strike. The risk assessment will summarise how the overall wildlife attraction of the proposal will change and the associated effect on wildlife strike potential.

5. Wildlife Risk Assessment

5.1. Species assessment

5.1.1. Birds

Previous studies have noted that the four most common species/groups at risk of strikes around Australian Airports between 2013 and 2014 were kites, bats/flying foxes, lapwings/plovers and Galahs for Australian Airports (ATSB, 2014). Similar species were recorded by Avisure in their Preliminary Western Sydney Airport Bird and Bat Strike Risk Assessment in 2015, including Masked Lapwing, Galah, Australian Magpie and duck species.

Previous field studies in the area indicated that bird species were mainly found around the remnant native trees and the farm dams (ELA, 2021).

The agricultural land in the area combined with the presence of farm dams provides good foraging habitat for the Australian White Ibis. Straw-necked Ibis were recorded in large numbers during the Preliminary Western Sydney Airport Bird and Bat Strike Risk Assessment (Avisure, 2015). Other common species that utilise farm dams include Australian Wood Duck (*Chenonetta jubata*), Australasian Swamphen (*Porphyrio melanotus*) and Masked Lapwing (*Vanellus miles*).

The Australian White Ibis presents a significant strike risk to aircraft due to a number of reasons including:

- Their body mass size
- Flocking behaviour (is cause for multiple strike incidents)
- The urbanisation of Australian White Ibis.

The study area currently provides the preferred habitat for Australian White Ibis which includes open pasture and large waterbodies for foraging. The presence of large dams in the study area provides preferred habitat for other common strike species such as the Masked Lapwing, ducks, such as the Australian Wood Duck and other wetland birds.

Common bird species that utilise native and planted canopy trees for foraging include the Australian Raven (*Corvus coronoides*), Eastern Rosella, Magpies, Galahs and Common Mynah.

Other common strike species such as Galahs and Australian Magpies may have recorded no to low numbers due to the relatively disconnected vegetation within the study area.

5.1.2. Megabats

No roosting habitat (i.e. camps) have been recorded within the development site. According to the National Flying-fox Monitoring Program, no camps currently occur or have ever been recorded within the development site (DAWE 2021). The nearest active Grey-headed Flying-fox camp occurs approximately 5 km to the east of the development site, within Wetherill Park (DAWE 2021).

The closest known nationally important Grey-headed Flying Fox camp as identified on the National Flying-fox monitoring viewer (DAWE, 2021) is approximately 25 km north-east of the development site at Parramatta Park. This camp was last estimated to occupy 2,500-9,999 individuals in 2019. The closest camp at Ropes Creek is located approximately 10 km to the north of the development site and is estimated to occupy approximately 500-2,499 as of May 2019 (DAWE, 2021).

Although the camps at Wetherill Park and Parramatta are located outside of the 13 km wildlife buffer, it is known that Grey-headed Flying-foxes commute daily to foraging areas, usually within 15 km of the day roost site (Tidemann 1998). Grey-headed 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 and McConkey et al. 2015). At most times of the year there is a complete exodus from the camp site at dusk. The peak times of potential strikes on this species would occur at dusk and post dusk when flying foxes are departing their roosts to forage.

The development site contains 1.33 ha of potential foraging habitat for the Grey-headed Flying-fox. Additional foraging habitat was recorded within the broader locality of the development site.

5.1.3. Strike Species

Species have been combined into functional groups to streamline the risk assessment. Groups were identified based on previous studies, species ecology/behaviour and ATSB strike data, and contain species with similar strike risk profiles.

- **Megabats** - this primarily relates to the grey-headed flying fox but also incorporates other non-identified megabat species.
- **Ibis** – this includes the Australian White Ibis and the Straw-necked Ibis. Both species have been found in the area and have a similar strike risk due to their similar size and flocking nature.
- **Galahs** - no Galahs were recorded during the site visit, but Corellas were identified. Corellas have similar flocking natures to Galahs and may have been misidentified Corellas when ATSB strike data is collected. This group also includes other large cockatoos.
- **Ducks** – this includes the Australian Wood Duck, Australasian Grebe and the Eurasian Coot.

- **Crows** - this includes the Australian Raven and the Australian Magpie.
- **Raptors** – this includes Nankeen Kestrel,Black Shouldered Kite and other raptors.
- **Lapwings** – this primarily relates to the Masked Lapwing, a moderate sized bird that favours flat, open grassland habitats.
- **Wrens** – this group includes small woodland birds.
- **Parrots** – this group includes small parrots such as lorikeets and rosellas.
- **Microbats** – this includes all microbat species.

Megabats have been identified as the highest risk group of species due to their relatively large size and being the most recorded species for strike at the nearest airports, Sydney Airport and Bankstown Airport (ATSB, 2018). However, it is important to note that no megabats have been recorded on the site by ELA or on previous study of WSA site but potential foraging habitat is present.

Galahs, Ibis and Lapwing are all identified as posing a moderate risk of causing strikes. Across Australia, Galahs are the most common species to cause strike incidents. However, there are very few recordings of Galah strikes at the nearest airports, Sydney Airport and Bankstown Airport (ATSB, 2018). Species of the Galah grouping were not identified in significant numbers on the site. Ibis were relatively common across the site and have been previously recorded at the WSA site in significant numbers. Due to their size, they have the ability to cause significant damage if struck. However, ATSB strike data indicates that Ibis are rarely struck when compared with other species, approximately 1.4% of strikes between 2008 and 2017 across Australia involved an Ibis (ATSB, 2018). Birds from the Lapwing group were identified across the site and in the adjoining WSA site, primarily the Masked Lapwing. Masked Lapwings are known for aggressive behaviour when protecting their nest and young. They will often try lure danger away from their young through distractionary techniques making their flight patterns erratic, thus creating opportunities for strikes to occur, although this is most likely to only be an issue on an airport site itself in close proximity to a runway.

Mitigation measures to reduce the risk of strike on this species are presented in Section 7. Measures are focused on monitoring and reducing the wildlife attracting properties of the proposed development and include the appropriate selection of landscape plantings around the development site including reduce use of species which produce nectar, berries, fruit or seeds will attract birds and flying-foxes.

5.2. Attracting habitat

The attraction of habitat for various wildlife species is dependent on the level of food, water and shelter that is available. Habitat can be comprised of both native vegetation, horticultural varieties turfed areas as native trees, decorative trees, fruit trees, shrubs, gardens and turf can be particularly attractive to wildlife because they offer feeding, sheltering, roosting, and nesting opportunities (Avisure 2020). Additionally, some urbanised environments and specific human activities present habitat that provides feeding opportunities and is therefore attractive to specific species.

5.2.1. Trees and shrubs

Trees and shrubs provided feeding, foraging, sheltering, nesting and roosting habitat for birds and megabats. These habitats can be comprised of remnant native vegetation, rehabilitating native vegetation, and landscaped areas. Native and exotic species have attractant qualities and the following families of plant species are considered to have high attractant qualities (Avisure, 2020);

- Proteaceae
- Myrtaceae
- Moraceae
- Arecaceae

Birds such as Rainbow Lorikeet (T*richoglossus moluccanus*) and Sulphur-crested Cockatoo (*Cacatua galerita*) and megabats such as the threatened Grey-headed Flying-fox (*Pteropus poliocephalus*) are attracted to trees and shrubs that produce seed, fruit, berries and nectar and can congregate in large numbers. Even the insects that use trees can attract a large array of bird species (Avisure 2020).

5.2.2. Grassland areas

When grasses are maintained at short lengths such as lawns, sporting fields and recreational parklands, this can provide the opportunity for species such as Masked Lapwing (*Vanellus miles*), Little Corella (*Cacatua sanguinea*), Galah (*Eolophus roseicapilla*), Australian Magpie (*Gymnorhina tibicen*) and Australian White Ibis (*Threskiornis molucca*) the opportunity to forage and breed.

When grasslands are not maintained at short lengths such as native grasslands, this can provide refuge for rodents, small mammals, reptiles, insects and small foraging birds which can in time attract raptors such as Nankeen Kestrel (*Falco cenchroides*) and Black-shouldered Kite (*Elanus axillaris*) (Avisure 2009).

5.2.3. Water

Water bodies such as creeks, rivers dams and wetlands can attract a vast array of birds including Australian Wood-duck (*Chenonetta jubata*), Australian Pelican (*Pelecanus conspicillatus*), White-faced Heron (*Egretta novaehollandiae*), Dusky Moorhen (*Gallinula tenebrosa*) and Black Swan (*Cygnus atratus*) as they are known to feed on range of food from fish to aquatic vegetation. Large water bodies also provide larger raptors including White-bellied Sea-eagle (*Haliaeetus leucogaster*) and Wedge-tailed Eagle (*Aquila audax*) with a source of food, such as fish.

Constructed drains and swales are attractive to birds as they provide a source of freshwater and habitat for water birds. 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. Gently sloped drains allow easy access for birds to the water source.

5.2.4. Urban Environments

Urban environments can provide a range of habitat to specific species. As mentioned above urban drainage system provide foraging habitat, furthermore, culverts and road bridges provide nesting habitat for species such as the Fairy martin and pigeons. Stormwater detention and retention basins also attract birds if they hold water for an extended period of time.

A major attractant in urban environments of birds is the availability of food and organic waste. This attractant is generally associated to litter or insecure waste receptacles. Insecure waste receptacles are either open bins, overflowing bins or bins with inadequate lids that allow birds to open or enter the bin. It is mainly scavenging birds, such as the Australian White Ibis, Australian Crow, Silver Gulls and pigeons, that utilise this type of habitat.

5.3. Existing habitat assessment

The Biodiversity Development Assessment Report (BDAR) undertaken for the subject land included habitat assessments for fauna within the subject land. The dominant habitat features identified on site included dams/aquatic vegetation and native vegetation as described in Table 8.

Table 8: Habitat Features and Risk Ratings

Habitat feature	Category	Wildlife attraction risk (AAWSF)	Justification of potential risk rating
Dams/aquatic vegetation	Farm dam	High	The large dams across the development site provide foraging habitat for Ibis, ducks, wading birds and microbats. Dense wetland vegetation is limited.
Native vegetation	Conservation area (dryland) / Natural areas	Moderate	Native vegetation within the development site provides potential foraging and roosting habitat for a variety of species including, megabats (foraging only), and a wide variety of birds including raptors, crows and parrots.
Open grassland	Intensive Livestock Agriculture	Moderate	Open native and exotic grassland provides potential habitat for an array of native and non-native birds including raptors, lapwings, crows, galahs/cockatoos and parrots.

The farm dams within the site are currently the highest attracting habitat for wildlife as it provides resources for fauna to drink, forage, and nest/shelter within the banks of the dams. This is especially important for fauna in a landscape which is becoming increasingly urbanised.

The large open expanses of native and exotic grassland within the area also provides many bird species foraging or nesting habitat. 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 and pest species like foxes.

The native flowering canopy species within the site provide foraging habitat for native and non-native bird species and also provide habitat for microbats to forage and mega bats such as the Grey-headed Flying Fox.

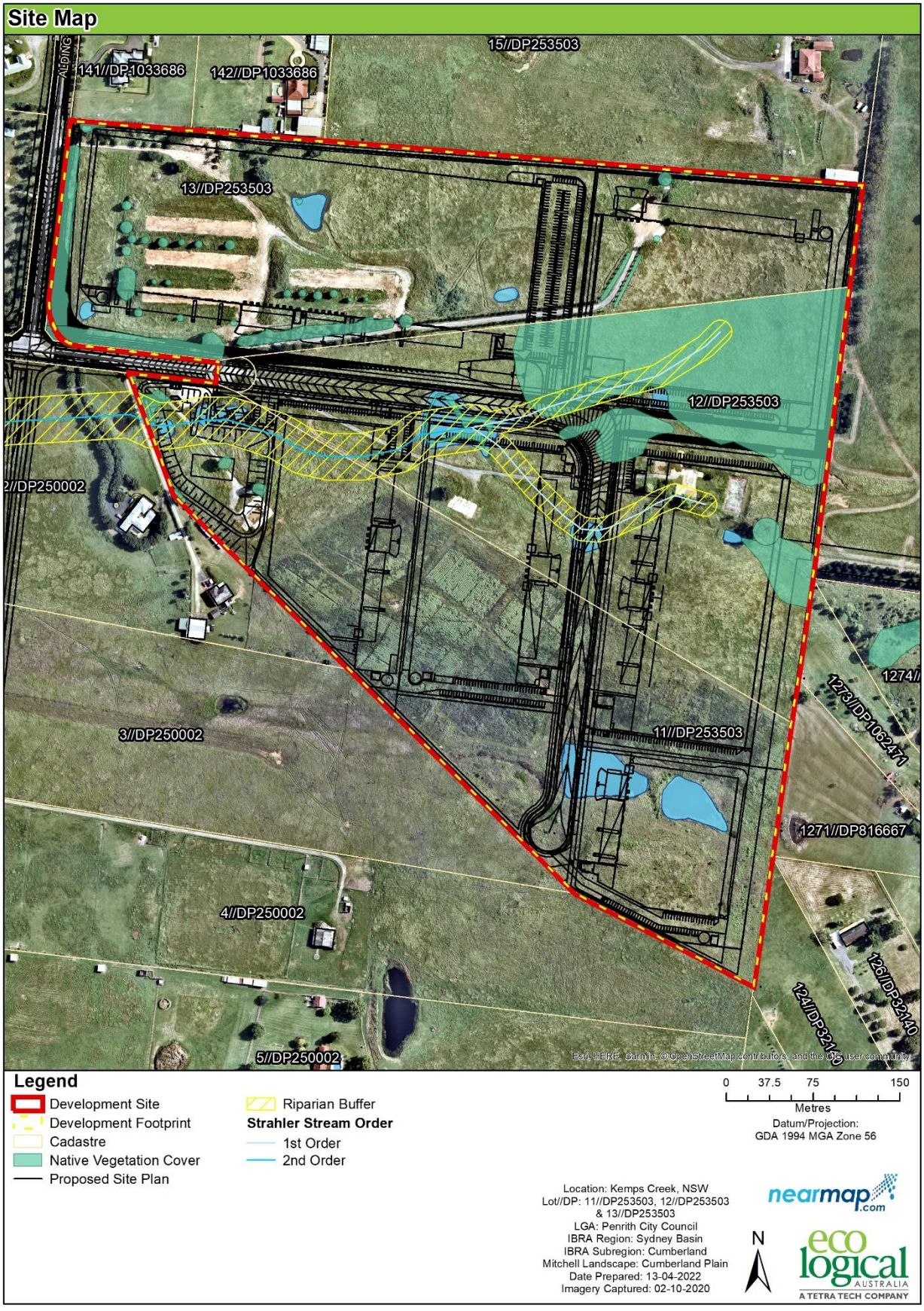


Figure 3 Existing Habitat Features

5.4. Staged construction assessment

The staged construction assessment covers the transition from the existing environment to the proposed environment. During this period bulk earth work and infrastructure construction is to be undertaken. Once the earthworks have been completed there will period of time where lots are vacant awaiting the construction of the industrial and office buildings. Exposed excavations will be grassed over until the construction of buildings begins.

The assessment of wildlife attraction risk associated to staged construction is presented in Table 9. Mitigation methods to reduce this risk are provided in Section 6.

Table 9 Stage Construction Risk Assessment

Habitat feature	Category	Wildlife attraction risk (AAWSF)	Justification of potential risk rating
Exposed and disturbed soils	Earthworks	Moderate	Earthworks and exposed soils can be attractive for bird to forage on exposed invertebrates. Additionally stockpiles and temporary construction infrastructure can provided perching opportunities.
Open grassland	Intensive Livestock Agriculture	Moderate	Open native and exotic grassland provides potential habitat for an array of native and non-native birds including raptors, lapwings, crows, galahs/cockatoos and parrots.

5.5. Proposed habitat assessment

The proposed habitat assessment is broken into five sections:

- Landscaping and street trees
- Cafe
- Water detention basins
- Urban areas

The location of the proposed habitat features is presented in Figure 4.

The proposal is required to deliver a development integrating landscaping and tree canopy elements and ensuring a high standard of architectural, urban and landscape design within the emerging Mamre Road Precinct and the greater Western Sydney Parkland City.

It is important to note that wildlife safeguard conflicts with the vision of the Western Sydney Parkland City utilising the blue and green grid. This primarily due to landscaping and revegetation activities potential to attract wildlife. Therefore, wildlife safeguarding is to be addressed through on-going monitoring, assessment and mitigation activities.

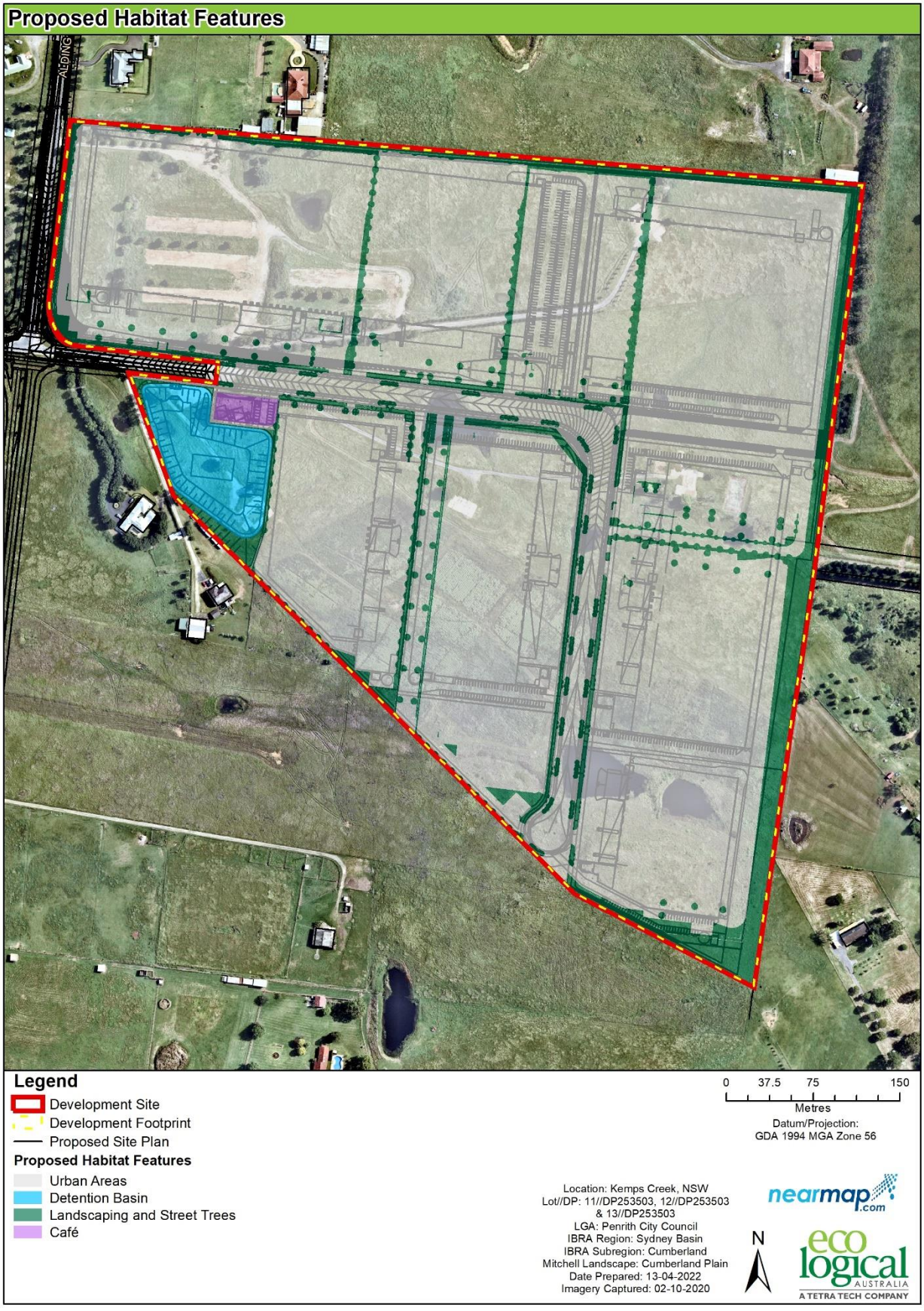


Figure 4 Proposed Habitat Features

5.5.1. Landscaping and Street Trees

Landscaping is located throughout the site to help reduce the urban heat island effect and reduce the visual impact of the development from adjoining land.

Trees, shrubs and groundcovers will be planted around the boundaries of the site. The planting areas are narrow, the eastern boundary will contain the widest landscaped are which is 15m wide in its widest points.

All other landscaping throughout the site will be individual or group plantings. Street trees are to be provided along the estate road and additional trees will be planted on the lot boundaries. Landscaped areas on the industrial lots will compromise of shrubs and groundcovers. The western boundary, facing Aldington Road, will feature a series of retaining walls with shrubs and grasses to be planted at the terrace levels.

Landscaping is proposed around the detention basin to allow people who work in the area a place to have an outside break. There will be a walkway around the basin, covered seats and picnic table and public amenity area. A café is proposed to service this area, this habitat feature is discussed below. The indicative planting schedule is provided in Appendix C. The schedule includes the following species which are listed in the *Draft Western Sydney Aerotropolis Wildlife Management Assessment Report* as attractant species:

- *Corymbia maculate* (Spotted Gum)
- *Eucalyptus moluccans* (Grey Box)
- *Eucalpytus tereticornis* (Forest Red Gum)
- *Melaleuca decora* (Feather Honeymyrtle)
- *Melaleuca styphelloides* (Prickly Paperbark)

Due to the intent to plant these specific trees a Wildlife Management Plan must be prepared prior to construction. Further details about what is required in the Wildlife Management Plan are provided in Section 6.2.

Landscaping and street trees have the potential to attract a variety of bird and bats species. The Wildlife Management Plan will monitor the attractant nature of this vegetation and if strike species are detected actions will be undertaken reduce the attractant nature of the vegetation.

5.5.2. Cafe

The proposed development will provide a café for workers in the area to utilise. The *Draft Western Sydney Aerotropolis Wildlife Management Assessment Report* identifies fast food, drive ins and outdoor restaurant as having high wildlife attractant potential. This is primarily associated to food and waste not managed appropriately, such as tables left with food on them, the cafe may attract scavenging species such as pigeons and ibis.

The Wildlife Management Plan will detail a monitoring program to determine the attractant nature of the café and actions to reduce wildlife attraction if strike species are identified as being attracted to this area.

5.5.3. Water Detention Basins

The proposed development will remove the six farm dams. This water will now be managed through a stormwater system which will utilise the principles of water sensitive urban design utilising biofiltration and biorientation. The proposed development also includes a retention basin, which is designed to drain within 24 hours of a storm and will remain dry between storms. This is in line with the requirements identified in the WSA Wildlife Management Report (Avisure, 2020).

Water detention basins have a high wildlife attraction risk, however due to the fast-draining design these areas within the proposed development are unlikely to attract large number or duck and waterbirds on a regular basis.

5.5.4. Urban Areas

The proposed masterplan includes the provision of seven super lots to support industrial and warehouse developments. The built form strategy allows for smaller mixed uses premises adjacent to Elizabeth Drive. Development scale gradually increases to large scale warehouse along the central distributor road. There will be some vegetation provide on lots, but it will primarily be carparking and buildings. The primary attracting potential is related to waste storage and disposal, a Waste Management Plan (SLR, 2021) has been prepared for the proposed development. Mitigation measures are provided in Section 6.

Urban areas are unlikely to present a significant wildlife attraction risk due to the lack of habitat features likely to attract wildlife and high levels of disturbance/human activity.

5.5.5. Risk Assessment

Table 10 identifies the wildlife attraction risk associated to each proposed habitat feature using the AAWSF. The highest land use category is used to determine the risk.

Table 10 Proposed Habitat Risk Assessment

Habitat feature	Category	Wildlife attraction risk (AAWSF)	Justification of potential risk rating
Landscape and Street Trees	Park/Playground	Moderate	Landscaped open space provides potential habitat for an array of native and non-native birds including Ibis, lapwings, crows, galahs/cockatoos and parrots.
Cafe	Food and Drink Premises	High	If food and waste is not managed appropriately food scraps and waste can attract scavenging species to the area such as pigeons and ibis.
Water	Water Retention Basins	High	Retention basins provide foraging habitat for Ibis, ducks, wading birds and microbats. Due to the fast-draining nature of the basins the habitat potential will only be temporary.
Urban Areas	Warehouses and distribution centres	Very Low	Urban areas provide a limited amount of habitat to birds such as Ibis and Pigeons. However, this is associated to the availability of waste to scavenge from. The availability of waste to scavenge from is considered low due to the requirements of the Waste Management Plan.

5.6. Projected aircraft movement

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.

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 11.

Table 11 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-2020. Initial demand is 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.

5.7. Overall risk assessment

Megabats are considered to pose the greatest potential of being involved in a bird strike incident and have potential to cause significant damage. Ibis, Galahs and Lapwings are considered to have moderate potential to be involved in a bird strike incident and cause damage. The mitigation measures provided in Section 6 are targeted towards these species.

The proposed development is assessed as reducing the overall wildlife attraction risk compared to the existing environment. This is predominately due to the removal of farm dams which were identified as being the primary wildlife attractant onsite and the highest risk existing habitat feature. Farm dams are being replace stormwater system and the installation of retention basins. The retention basin has been designed to fully draining within 24 hours of a storm. It is important to note that this faster draining than what is required by the DCP.

Additionally, the replacement of large swathes of open grassland with warehouse development will reduce the likelihood of many common strike species being attracted to the area. This includes Cockatoos, Galahs, Ibis and Magpies.

The proposed environment does include restoration of riparian corridors, opens space and retention basin that require monitoring and mitigation measures to further reduce the risk of wildlife being attracted to the area and causing bird strike. It is also important note the risk of bird strike will increase through time as the demand for flights at WSA increases and aircraft movements increase accordingly. This has been taken into account in the preparation of mitigation measures provided in Section 6.

6. Wildlife Risk Mitigation Measures

6.1. Mitigation measures incorporated into design

During the deign process mitigation measure have been incorporated to reduce the wildlife attractant properties of the proposed development. Table 12 summaries these measures and how the relate to the AAWSF land uses and requirements.

Table 12 Summary of Mitigation Measures Incorporated into the Design Process

AAWSF category	AAWSF Requirement	Mitigation Measures Incorporated Into Design
Waterways Urban Open Space Playground Landscaping Landscape - Parks and gardens, Landscape - Natural area revegetation Landscape - Streets and transport corridors	Mitigate	Planting schedules are provided Appendix C . The schedule includes species which are listed in the *Draft Western Sydney Aerotropolis Wildlife Management Assessment Report* as attractant species: • Corymbia maculate (Spotted Gum) • Eucalyptus moluccans (Grey Box) • Eucalpytus tereticornis (Forest Red Gum) • Melaleuca decora (Feather Honeymyrtle) • Melaleuca styphelloides (Prickly Paperbark) A Wildlife Management Plan is to be prepared prior to construction. The plan will specify monitoring activities to assess the attractant nature of the development and provide trigger based management actions to mitigate emerging risks.
Earthworks	Mitigate	Wildlife hazard management activities must be included in the Construction Environment Management Plan (CEMP). It Is important to deter any common strike species from becoming attracted and habituated to the site. The CEMP can include options for managing wildlife hazards associated with: • Earthworks • Soil and other material stockpiles • Temporary infrastructure • Water retention areas • Waste management Exposed excavations must be grassed, vacant lots awaiting development. If common strike species are encountered the WMP will direct the appropriate mitigation methods. Mitigation measures are only required if the airport is operational during construction or lots are awaiting development.
Warehouse	Monitor	The Waste Management Plan, produced by SLR, provides measures for the waste management during construction and operation of the proposed development. Warehouse and industrial developments must have storage areas for bins and ensuring that waste receptacles have secure lids that do not allow waste to fall, blow, wash or otherwise escape the site.

AAWSF category	AAWSF Requirement	Mitigation Measures Incorporated Into Design
Stormwater management facilities	Mitigate	Large farm dams have been proposed for removal. Water in the will now be managed through stormwater system that utilise water sensitive urban design principles including the use of rain gardens and OSD basin. OSD basin have been designed to drain within 48 hours of storm activity.

6.2. Wildlife Management Plan

In accordance with the AAWSF a Wildlife Management Plan will need to be prepared prior to construction. The Wildlife Management Plan is to include triggers for further mitigation measures based on results of monitoring.

Monitoring of habitat areas must be undertaken at regular intervals or at specific times of year where common strike species may be attracted to the site. The following table provides the minimum monitoring events per year. Monitoring must be undertaken by a qualified ecologist with a bachelor's degree in ecology or similar area of study.

Table 13 Minimum Monitoring Requirements

Area	Monitoring Tasks	Frequency	Time of year	Notes
Construction	Diurnal Bird Survey	Once every six months	N/A	Monitoring is only required if the airport is operational.
Landscaping and Street Trees	Diurnal Bird Survey Nocturnal Megabat Surveys	Once every six months	N/A Megabat survey must be undertaken in summer	Survey should focus on fruit bearing and flowering plants
Water	Diurnal Bird Survey	Once every six months	N/A -	Survey should be conducted after a rainfall event
Cafe	Diurnal Bird Survey	Once every six months		To determine whether café is presenting a wildlife attracting risk and if additional mitigation measures are required.

The Wildlife Management Plan will identify trigger points for additional mitigation measures to reduce habitat availability for common strike species. Monitoring will identify when or if a trigger point is reached. Trigger points should be linked to the presence of common strike species and provide guidance on additional mitigation measures to reduce the wildlife attractant properties of the site.

Additional mitigation measures that may be required, include:

- Netting of waterbodies
- Installation of bird deterrents, including sonic and visual deterrents
- Vegetation management including the removal of fruits, nests, perches and entire trees

- Installation of exclusionary devices such as netting or anti perching spikes.
- Egg oiling and relocation of common strike species

7. Conclusion

This Wildlife Management Assessment Report (WMAR) for the proposed development at 290-308 Aldington Road, 59-62 Abbotts Road, and 63 Abbotts Road found that the proposed development will reduce the amount of wildlife attracting habitat on the site compared to the existing land use. This is primarily associated to the urbanisation of much of the site and the removal of key attracting features such as farm dams. The proposed development will still provide some attracting habitat and it is recommended that a Wildlife Management Plan is prepared prior to construction. The Wildlife Management Plan will direct monitoring and mitigation activities to further reduce the wildlife attractant properties of the site.

The assessment determined that the highest risk strike species are Megabats, Galahs, Ibis and Lapwings. Monitoring and mitigation of the attraction of these species is to be prioritised, in particular Megabats. These species were identified through using ATSB strike data from the Sydney Regionand previous reports. WSA may identify further species once the airport is operational.

WSA is predicted to have a moderate volume of aircraft traffic for its first few years of operation. The demand for the airport is expected to steadily grow until it reaches its capacity at approximately 2063. This means that risk of bird and bat strike will increase into the future as aircraft movements increase. Therefore, monitoring and mitigation should be review periodically to ensure it is still fit for purpose considering the changing airport operations.

8. References

Avisure. (2020). *Western Sydney Aerotropolis Draft Wildlife Management Assessment Report* (Rep.). Sydney, NSW: Western Sydney Planning Partnership.

Avisure. (2016). Western Sydney Airport Preliminary Bird and Bat Strike Risk Assessment (Western Sydney Airport Environmental Impact Assessment, Rep.).

Churchill, S. 2008. Australian Bats. Second Edition. Allen and Unwin. New Reed New Holland. Sydney.

Department of Infrastructure, Transport, Regional Development and Communications, DITRDC. (2021). *Western Sydney Airport Plan* (Australia, Federal Government, Department of Infrastructure, Transport, Regional Development and Communications). Canberra, ACT: Department of Infrastructure, Transport, Regional Development and Communications.

Eby, P. 1991. Seasonal Movements of Grey-headed Flying-foxes, *Pteropus poliocephalus* (Chiroptera: Pteropodidae), from Two Maternity Camps in Northern New South Wales. *Wildlife Research*. 18:547-559.

Eco Logical Australia. 2020. Kemps Creek Logistics Biodiversity Development Assessment Report. Prepared for ESR.

Eco Logical Australia. 2019. Ecological constraints for 290-309 Aldington Road, Kemps Creek Prepared for ESR.

Eco Logical Australia 2021. Wildlife management Assessment Report Prepared for BHL Group.

International civil Aviation Organsiation 2012, *Doc 9137 Airport Services Maunal. Part 3. Wildlife Control and Reduction.*

International civil Aviation Organsiation 2013, *Annex 14 to the Convention on International Civil Aviation Aerodromes, Volume 1, Aerodrome Design and Operation.*

Jackson, C. and Groves, S. 2015. *Taxonomy of Australian Mammals*. CSIRO Publishing.

Law, B. S., Anderson, J., and Chidel, M. 1999. Bat communities in a fragmented forest landscape on the south-west slopes of New South Wales, Australia. Biological Conservation 88, 333-345.

Lloyd, A.M., Law, B.S., and Goldingay, R. 2006. Bat activity on riparian zones and upper slopes in Australian timber production forests and the effectiveness of riparian buffers. Biological Conservation 129, 207-220.

McKenzie, N. L., Start, A. N., and Bullen, R. D. 2002. *Foraging ecology and organisation of a desert bat fauna*. Australian Journal of Zoology 50, 529-548.

Mills, D. J., Norton, T. W., Parnaby, H. E., Cunningham, R. B., and Nix, H. A. 1996. *Designing surveys for microchiropteran bats in complex forest landscapes - a pilot study from south-east Australia*. Special issue: Conservation of biological diversity in temperate and boreal forest ecosystems 85, 149-161.

Pennay, M., Law, B., and Reinhold, L. 2004. *Bat calls of New South Wales: Region based guide to echolocation calls of Microchiropteran bats*. NSW Department of Environment and Conservation, Hurstville.

Pennay, M., Law. Bradley., Lunney. D.,2011. Review of the distribution and status of the bat fauna of New South Wales and the Australia Capital Territory. In Biology and Conservation of Australasian Bats. Edsited by Bradlwy Law, Peggy Eby, Daniel Lunney and Lindy Lumsden. Royal Zoological Society, NSW, Mosman, NSW. Australia.

Reardon, T.B., McKenzie, N.L., Cooper, S.J.B., Appleton, B., Carthew, S. and Adams, M. 2014. A molecular and morphological investigation of species boundaries and phylogenetic relationships in Australian free-tailed bats *Mormopterus* (Chiroptera: Molossidae). Australian Journal of Zoology 62: 109 – 136.

Reinhold, L., Law, B., Ford, G., and Pennay, M. 2001. Key to the bat calls of south-east Queensland and north-east New South Wales. 2001. Queensland, DNR.

SLR. (2020). ESR Kemps Creek Logistics Park (Rep.). Sydney, NSW: Prepared for ESR.

Thorpe, John. (2003). Fatalities and destroyed aircraft due to bird strikes, 1912–2002.

Tidemann, C.R. 1998. Grey-headed Flying-fox, *Pteropus poliocephalus*, Temminck, 1824. **In:** Strahan, R., ed. *The Mammals of Australia*. Frenchs Forest: New Holland Publishers Pty Ltd.

Van Dyck, s., and Strahan. R. 2008. Mammals of Australia. Third Edition. Reed New Holland. Sydney.

Van Dyck, s., Gynther. I., and Baker. A. 2013. Field Companion to the Mammals of Australia. New Reed New Holland. Sydney.

Appendix A Concept Master Plan

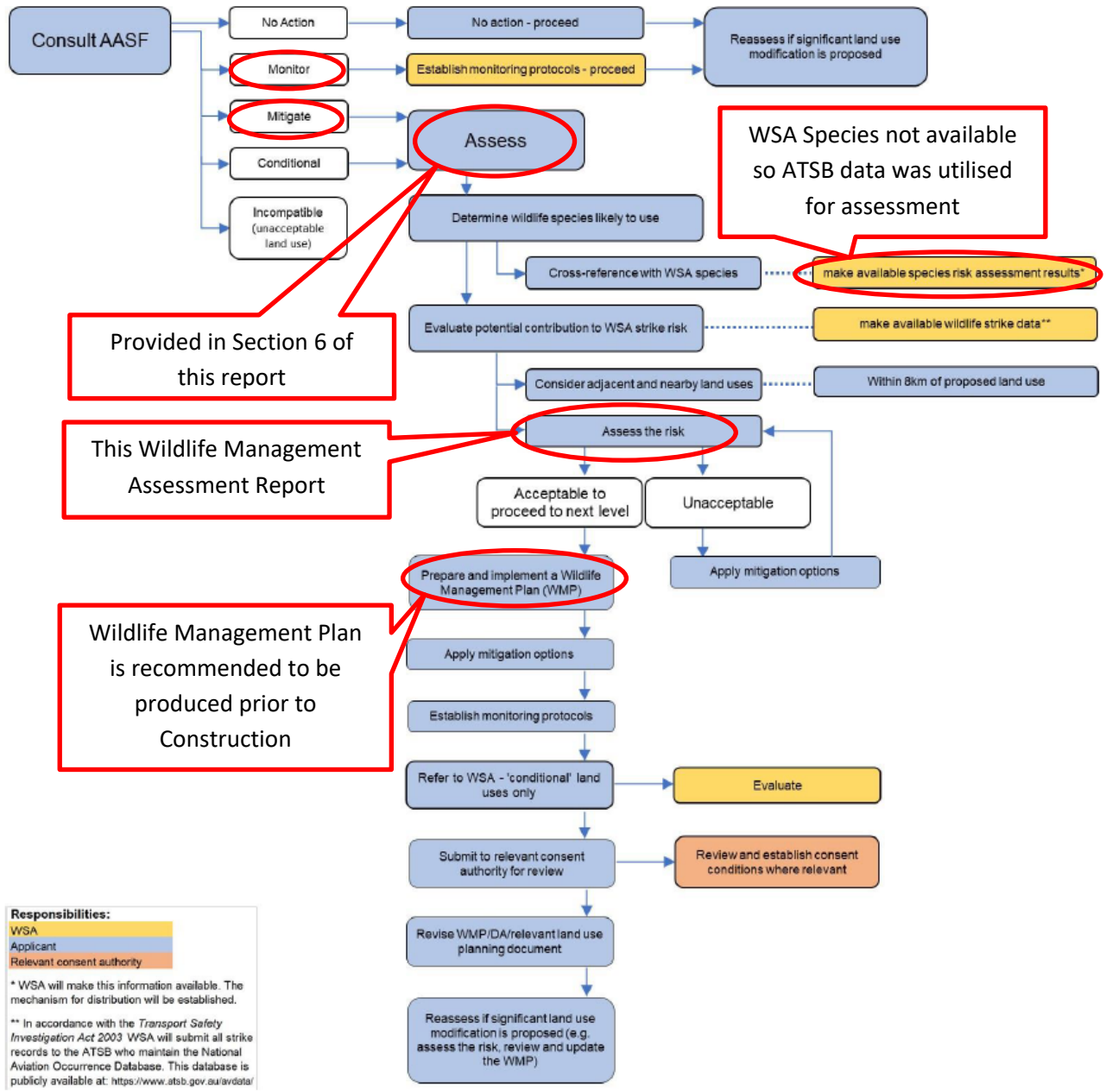
Appendix B Aerotropolis Wildlife Safeguarding Framework (AAWSF)

Red boxes are indicated relevant lands use of the proposed development, sub area of the site and required action.

Land Use [12]	Standard Instrument Definition	Wildlife Attraction Risk	Western Sydney Aerotropolis: Actions for Existing Developments					Western Sydney Aerotropolis: Actions for Proposed Developments / Changes to Existing Developments				
			3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)
			Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2		Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2	
Agriculture												
Abattoir	Livestock processing industry	Very High	Mitigate	Mitigate	Mitigate	Mitigate	Mitigate	Incompatible	Incompatible	Mitigate	Mitigate	Mitigate
Turf farm	Intensive plant agriculture	Very High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Incompatible	Incompatible	Mitigate	Monitor	Monitor
Piggery	Intensive livestock agriculture	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Orchard	Intensive plant agriculture	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Fish processing /packing plant	Livestock processing industry	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Aquaculture	Aquaculture	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Farm dam	Water storage facility	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Crops (e.g. wheat, grains, rice, legumes)	Agriculture	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Grain storage	Storage Premises (or ancillary)	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Cattle /dairy farm	Intensive livestock agriculture	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Poultry farm	Intensive livestock agriculture	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Plant nursery	Plant nursery	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Viticulture	Viticulture	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Market farms and gardens	Garden Centre	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Forestry	Forestry	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Horticulture	Horticulture	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Conservation and Natural Areas												
Wildlife sanctuary - wetland	Environmental protection works	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Conservation area - wetland	Environmental protection works	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Wildlife breeding/roosting	Environmental protection works	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Flying-fox camp	N/A – dependent on geographical context of camp	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Wetland	Wetland	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Wildlife sanctuary - dryland	Environmental protection works	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Conservation area - dryland	Environmental protection works	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Waterway (e.g. creeks, rivers)	Waterway	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Natural areas	Environmental facility or environmental protection works	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Recreation												
Showground	Recreation facility (outdoor) or (major)	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Fish cleaning facilities	N/A	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Public feeding of wildlife	N/A	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor

Land Use [12]	Standard Instrument Definition	Wildlife Attraction Risk	Western Sydney Aerotropolis: Actions for Existing Developments					Western Sydney Aerotropolis: Actions for Proposed Developments / Changes to Existing Developments				
			3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)
			Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2		Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2	
Urban open space (e.g. cycleways, green areas, pedestrian walkways)	Recreational area	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Racetrack / horse riding school	Recreation facility (outdoor)	Moderate	Mitigate	Monitor	Monitor	Monitor	Monitor	Mitigate	Mitigate	Mitigate	Monitor	Monitor
Golf course	Recreation facility (outdoor)	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Sports facility (tennis, bowls, etc)	Recreation facility (outdoor)	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Sports fields	Recreation area	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Park / Playground	Recreation area	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Picnic / camping ground	Camping ground	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Water sport facilities	Recreational facility (outdoor)	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Boat ramps	Boat ramp	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Recreational fishing areas	N/A	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Commercial												
Food processing	Agricultural produce industry or Livestock processing industry	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Fast food / drive-in / outdoor restaurant	Food and drink premises	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Earthworks	N/A - only during construction of other uses	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Warehouse (food storage)	Warehouse and distribution centre	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Shopping centre	Retail premises	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Marina	Marina	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Zoo	Animal boarding or training establishment	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Markets	Market	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Construction	N/A - only as ancillary to other purposes	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Office building	Office premises	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Hotel / motel	Hotel / motel	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Car park	Car park	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Cinemas	Entertainment facilities	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Warehouse (non-food storage)	Warehouse and distribution centre or Storage premises	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Petrol station	Service station	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Public transport facility	N/A	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Aerospace industry	N/A	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
School/university	Educational establishment	Very Low	Monitor	No Action	No Action	No Action	No Action	Monitor	No Action	No Action	No Action	No Action
Utilities												
Organic waste facility - open	Waste or resource management facility	Very High	Mitigate	Mitigate	Mitigate	Mitigate	Mitigate	Incompatible	Incompatible	Mitigate	Mitigate	Mitigate
Putrescible waste facility - landfill - open	Waste disposal facility	Very High	Mitigate	Mitigate	Mitigate	Mitigate	Mitigate	Incompatible	Incompatible	Mitigate	Mitigate	Mitigate
Putrescible waste facility - transfer station - open	Waste or resource transfer station	Very High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Incompatible	Incompatible	Mitigate	Monitor	Monitor
Sewage / wastewater treatment facility	Sewage treatment plant	High	Mitigate	Mitigate	Mitigate	Mitigate	Mitigate	Conditional	Conditional	Mitigate	Mitigate	Mitigate
Water retention basins	Water storage facility	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor

Land Use [12]	Standard Instrument Definition	Wildlife Attraction Risk	Western Sydney Aerotropolis: Actions for Existing Developments					Western Sydney Aerotropolis: Actions for Proposed Developments / Changes to Existing Developments				
			3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	3 km radius (Area A)	8 km radius (Area B)	8 km radius (Area B)	13 km radius (Area C)
			Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2		Sub-area A1	Sub-area A2	Sub-area B1	Sub-area B2	
Waste collection points (commercial)	N/A	High	Mitigate	Mitigate	Mitigate	Monitor	Monitor	Conditional	Mitigate	Mitigate	Monitor	Monitor
Organic waste facility - enclosed	Waste or resource management facility	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Putrescible waste facility - landfill - enclosed	Waste disposal facility	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Putrescible waste facility - transfer station - enclosed	Waste or resource transfer station	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Non-putrescible waste facility - landfill	Waste disposal facility	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Dams	Water storage facility	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Stormwater drains	Water storage facility	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Non-putrescible waste facility - transfer station	Waste or resource transfer station	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Potable water treatment facility	Resource recovery facility	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Stormwater management facilities	Water storage facility	Low	Monitor	Monitor	Monitor	No Action	No Action	Mitigate	Monitor	Mitigate	No Action	No Action
Landscaping and Vegetation												
Landscaping: parks and gardens	Recreation area	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Landscaping: natural area revegetation	Environmental protection works	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Landscaping: streets and transport corridors	Road	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Landscaping: roads and motorways	Road	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor
Landscaping: rooftop gardens	N/A	Moderate	Mitigate	Monitor	Mitigate	Monitor	Monitor	Mitigate	Monitor	Mitigate	Monitor	Monitor


Consult AASF
No Action
Monitor
Mitigate
Conditional
Incompatible (unacceptable land use)
No action - proceed
Establish monitoring protocols - proceed
Reassess if significant land use modification is proposed
Assess
Determine wildlife species likely to use
Cross-reference with WSA species
make available species risk assessment results*
Evaluate potential contribution to WSA strike risk
make available wildlife strike data**
Consider adjacent and nearby land uses
Within 8km of proposed land use
Assess the risk
Acceptable to proceed to next level
Unacceptable
Apply mitigation options
Prepare and implement a Wildlife Management Plan (WMP)
Apply mitigation options
Establish monitoring protocols
Refer to WSA - 'conditional' land uses only
Evaluate
Submit to relevant consent authority for review
Review and establish consent conditions where relevant
Revise WMP/DA/relevant land use planning document
Reassess if significant land use modification is proposed (e.g. assess the risk, review and update the WMP)
WSA Species not available so ATSB data was utilised for assessment
Provided in Section 6 of this report
This Wildlife Management Assessment Report
Wildlife Management Plan is recommended to be produced prior to Construction
Responsibilities:
WSA
Applicant
Relevant consent authority
* WSA will make this information available. The mechanism for distribution will be established.
** In accordance with the Transport Safety Investigation Act 2003 WSA will submit all strike records to the ATSB who maintain the National Aviation Occurrence Database. This database is publicly available at: https://www.atsb.gov.au/avdata/

Appendix C Indicative Planting Schedule

Indicative Plant Schedule

Proposed planting shall be a mixture of native and exotic species primarily chosen to be low maintenance and suitable for the local growing conditions.
Proposed trees will be a combination of both evergreen and deciduous species, with deciduous positioned to allow for solar access in the winter and shade in the summer.

Street Trees		
Corymbia maculata	Spotted Gum	20 x 8
Trees		
Eucalyptus moluccana	Grey Box	20 x 8
Eucalyptus tereticornis	Forest Red Gum	30 x .8
Lagerstroemia indica	Crepe Myrtle	8 x 4m
Magnolia 'Little Gem'		4 x 2.5m
Melaleuca decora	Feather Honeymyrtle	12 x 5m
Melaleuca styphelioides	Prickly Paperbark	10 x 4m
Shrubs		
Carissa macrocarpa 'Desert Star'	Natal Plum	2 x 1m
Callistemon 'Endevour'	Bottlebrush	2.5 x 2.5
Callistemon viminalis 'Little John'	Little John Bottlebrush	.8 x 8
Correa alba	White Correa	1 x 1m
Loropetalum 'Plum Gorgeous'		1.5 x 2m
Melaleuca 'Claret Tops'	Honey Myrtle	1 x 1m
Raphiolepis 'Oriental Pearl'	Indian Hawthrone	.8 x 1m
Westringia sp	Coastal Rosemary	1.2 x 1.2
Kalanchoe 'Silver Spoons'		1.2 x 1.2m
Grasses and Groundcovers		
Adenanthos cuneatus 'Coral Carpet'	Jug Flower	.2 x 1.5m
Carpobrotus glaucescens	Pigface	.3 x 2m
Blue Fescue	Festuca glauca	.4 x .4
Gazania tomentosa	Silver Leaf Gazania	.1 x 1
Grevillea 'Poorinda Royal Mantle'		.1 x 1m
Hardenbergia violacea	Purple Coral Pea	.2 x 3m
Hibbertia scandens		.3 x 1m
Liriope 'Evergreen Giant'		.6 x .6
Lomandra 'Tanika'	Tanika Mat-Rush	.6 x .6
Myoporum parvifolium	Creeping Boobialla	
Pennisetum Rubrum	Fountain Grass	.9 x .6
Society Garlic	Tulbaghia violacea	.3 x.3


Corymbia maculata


Eucalyptus moluccana


Melaleuca decora


Magnolia 'Little Gem'


Raphiolepis 'Oriental Pearl'


Carpobrotus glaucescens


Correa alba


Kalanchoe 'Silver Spoons'


Liriope 'Evergreen Giant'


Hardenbergia violacea


Lomandra 'Tanika'


Westringia sp

SITE IMAGE
Landscape Architects

Kemps Creek Logistics Park | Landscape SSD Report