

Jerrabomberra High School

Aviation wildlife hazard assessment

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Contents

Summary	2
1. Project background	2
2. The site and the development	3
Figure 1. Jerrabomberra High School location.....	4
Figure 2. Layout of the Jerrabomberra High School campus.....	5
3. Wildlife hazard assessment framework.....	6
Figure 3. Wildlife risk zones near Canberra Airport.....	7
4. Wildlife survey methods	8
5. Wildlife survey results and implications	9
Table 1. Summary of wildlife survey results and implications.....	11
6. Mitigation measures	13
7. References	14
Photograph 1. Part of flock of 30 Magpies feeding on recently graded soil at JHS site.	15
Photograph 3. Small group of Wood and Black Ducks in pond on eastern boundary of JHS site.	16
Photograph 4. Group of Wood Ducks on David Madew playing fields adjacent to JHS site.	16
Photograph 5. Jerrabomberra, secure bin at fast food outlet.....	17
Photograph 6. Jerrabomberra, fast food outlet bin with contents accessible to wildlife.	17
Appendix 1. Risk ratings, records and potential for hazardous species at and around JHS site ..	18

Jerrabomberra High School aviation wildlife hazard assessment

Summary

The area surrounding the new Jerrabomberra High School site contains wildlife species that may pose a hazard to aircraft on the flight path south of Canberra Airport.

The construction of the school could result in the temporary attraction of small numbers of hazardous species. The finished school site should provide habitat for fewer hazardous species than the site in its previous condition as grazing land or during the construction phase while providing minor potential attractions for other species. Mitigation measures to manage the above risks are suggested in Section 6.

1. Project background

An Environmental Impact Statement (EIS) has been prepared for the development of the new Jerrabomberra High School (JHS) in NSW (Mecone 2021). Following submissions in response to the EIS, the Department of Planning, Industry and Environment (DPIE) requested the Department of Education to address the concern raised by Canberra Airport that the Aviation Assessment needs to be updated to address 'Guideline C – Managing Wildlife Strike Risk' of the National Airports Safeguarding Framework (NASF), either through a wildlife assessment or by engaging a qualified Ornithologist to review/monitor potential bird attracting activities/plantings.

The NASF provides guidance on planning requirements for development that affects aviation operations, including building activity around airports that might penetrate operational airspace and/or affect navigational procedures for aircraft. Guideline C allows State/Territory and local government decision makers to manage the risk of collisions between wildlife and aircraft at or near airports where that risk may be increased by the presence of wildlife-attracting land uses by providing a risk ranking and mitigation advice for land uses within specified distances from airports. Schools are not specifically covered but associated features such as sports facilities and playgrounds have a wildlife attraction risk of moderate, with a requirement for this to be mitigated when new developments are proposed.

The current report is an aviation wildlife assessment with recommendations for reducing the risk of attracting wildlife potentially hazardous to aircraft during the construction and operation of the new high school at Jerrabomberra.

2. The site and the development

The site set aside for JHS is about 4.5 ha, with housing and Lake Jerrabomberra to the south, playing fields to the south-east, and woodland, grassland and pasture to the east, north and west. Jerrabomberra Creek is west of the site and there are farm dams to the east and north-east (Figure 1).

The Architectural Design Report (Appendix 3 of the EIS, Tanner Kibble Denton 2021) shows that most of the undeveloped land to the north of the site is marked for future development (Innovation Precincts) with some land further west being incorporated into a grassland reserve.

The Biodiversity Development Assessment Report (BDAR, Appendix 9 of the EIS Capital Ecology 2021) shows that the vegetation on the JHS site included the remnant ground layer of a threatened native woodland community and exotic grassland with pasture species and weeds. At the time of the current field survey (February 2022) the site had been fenced from grazing for some time, although previously grazed by cattle and sheep. Some of the vegetation had been cleared and the rest was dominated by tall dense *Phalaris* (a pasture grass) with scattered native grasses and broad-leaved weeds.

The steeply sloping land in the east and south of the site which will not be built on under the current plan may be regenerated and re-established with native grassland plant species (Landscape Design Report, Appendix 4 of the EIS, CONTEXT Landscape Architecture 2021). The rest of the site will contain buildings, paved sports/play areas, artificial grass, terracing, paths and a 'productive garden'. Landscaping will include native and deciduous exotic trees (Figure 2).



Figure 1. Jerrabomberra High School location

Shows developed suburbs, Lake Jerrabomberra south of site, playing fields to the east, chain of ponds/wetlands to the north-east, Jerrabomberra Creek and Enviro Drive to the west and pasture/grassland to the north.

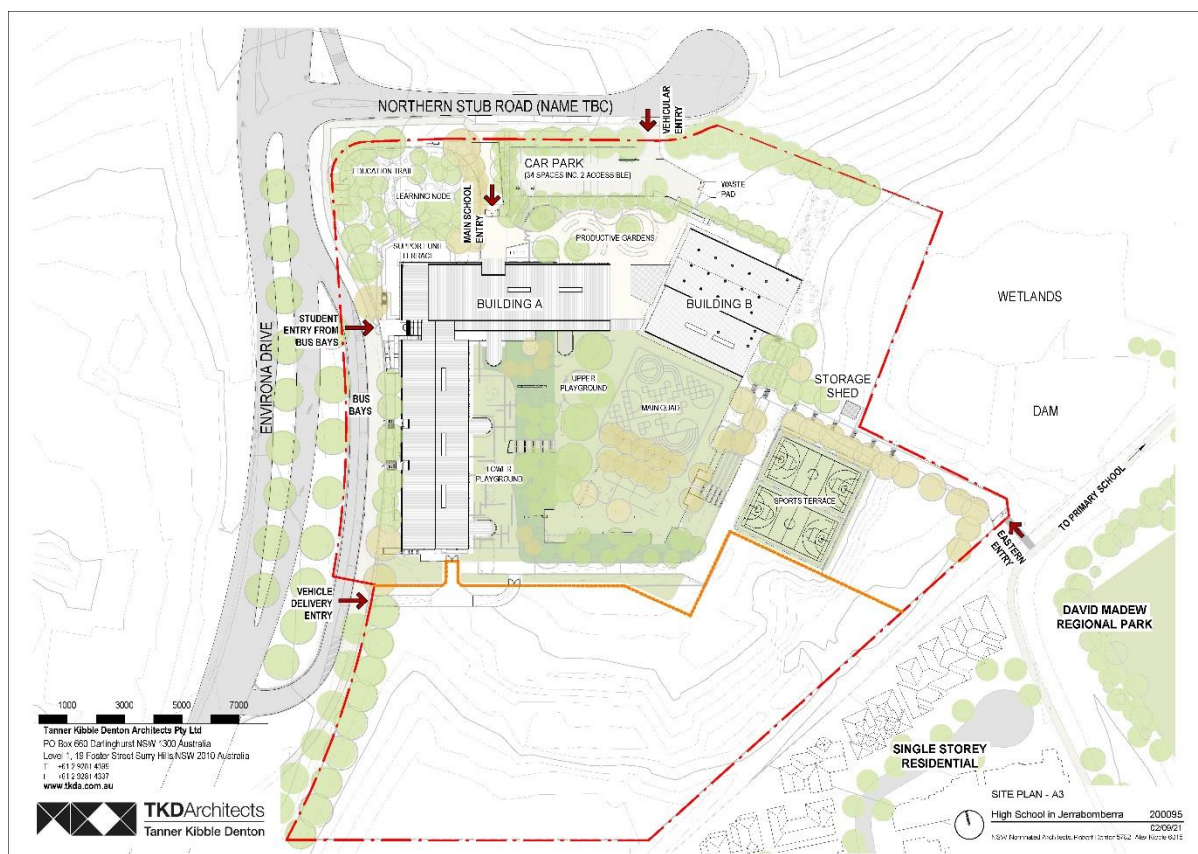


Figure 2. Layout of the Jerrabomberra High School campus
(from TKD Architects 2021)

3. Wildlife hazard assessment framework

The NASF Guideline C ranks the risks of particular land uses within radial distances of 3, 8 and 13 km of airport runways. Figure 3 shows these radial distances in relation to Canberra Airport, with the JHS site being 7.5 km south of the southern end of the main runway, within the 3-8 km annulus. Guideline C does not specifically cover schools but associated features such as sports facilities and playgrounds have a wildlife attraction risk of Moderate, with a requirement for the risk at existing sites to be monitored and to be mitigated when new developments are proposed.

Canberra Airport has a Bird and Wildlife Hazard Management Plan (Capital Airport Group 2021) containing a Risk Assessment Matrix that ranks local wildlife species according to the risk they pose to aircraft. Canberra Airport has provided these documents and access to their extensive birdstrike and bird count data to assist in this assessment. The Risk Assessment Matrix provides a risk rating for hazardous species by assessing the **probability** of a species being struck by aircraft and the potential **consequences** of the strike.

The **probability** of being struck depends on past strike records, the numbers and time that the animals frequent or cross the Airport and approaches, and their behaviour (e.g. soaring/hunting over the runway or feeding on the ground/staying close to cover).

The **consequence** of an aircraft striking a species depends mainly on the weight of the animal and whether it occurs in groups and includes:

- aircraft destroyed/ lives lost
- substantial damage/injuries
- minor damage/flight affected
- negligible damage/no effect on flight
- no damage/effect on flight).

Serious strikes causing aircraft damage that have occurred on the southern approach to Canberra Airport include Black Swans and a Great (Black) Cormorant ingested into aircraft engines, and several strikes involving Wedge-tailed Eagles. Wood Ducks and Masked Lapwings are also often struck when they move onto the airport at night. There is little habitat to attract flying-foxes to the airport itself but they have been seen moving east through the southern approach after sunset and are occasionally struck.

Nearby areas which may provide habitat for some hazardous wildlife include Lake Jerrabomberra, the David Madew playing fields, surrounding suburbs (with parks and ponds), nearby pastures, native grasslands and woodlands and the ACT Mugga Lane waste facility (which services Queanbeyan-Palerang). More distant waterbird habitats include the Molonglo River Corridor and associated wetlands to the north-west and Googong Reservoir to the south-east.

Any changes at the JHS site that may increase the numbers or movement of hazardous wildlife require mitigation during the construction and operation of the school.

Canberra Airport Bird and Wildlife Buffer Zones
 In response to guideline C in the National Airports Safeguarding Framework,
 Managing the Risk of Wild Life Strikes in the Vicinity of Airports - finalised in May 2012

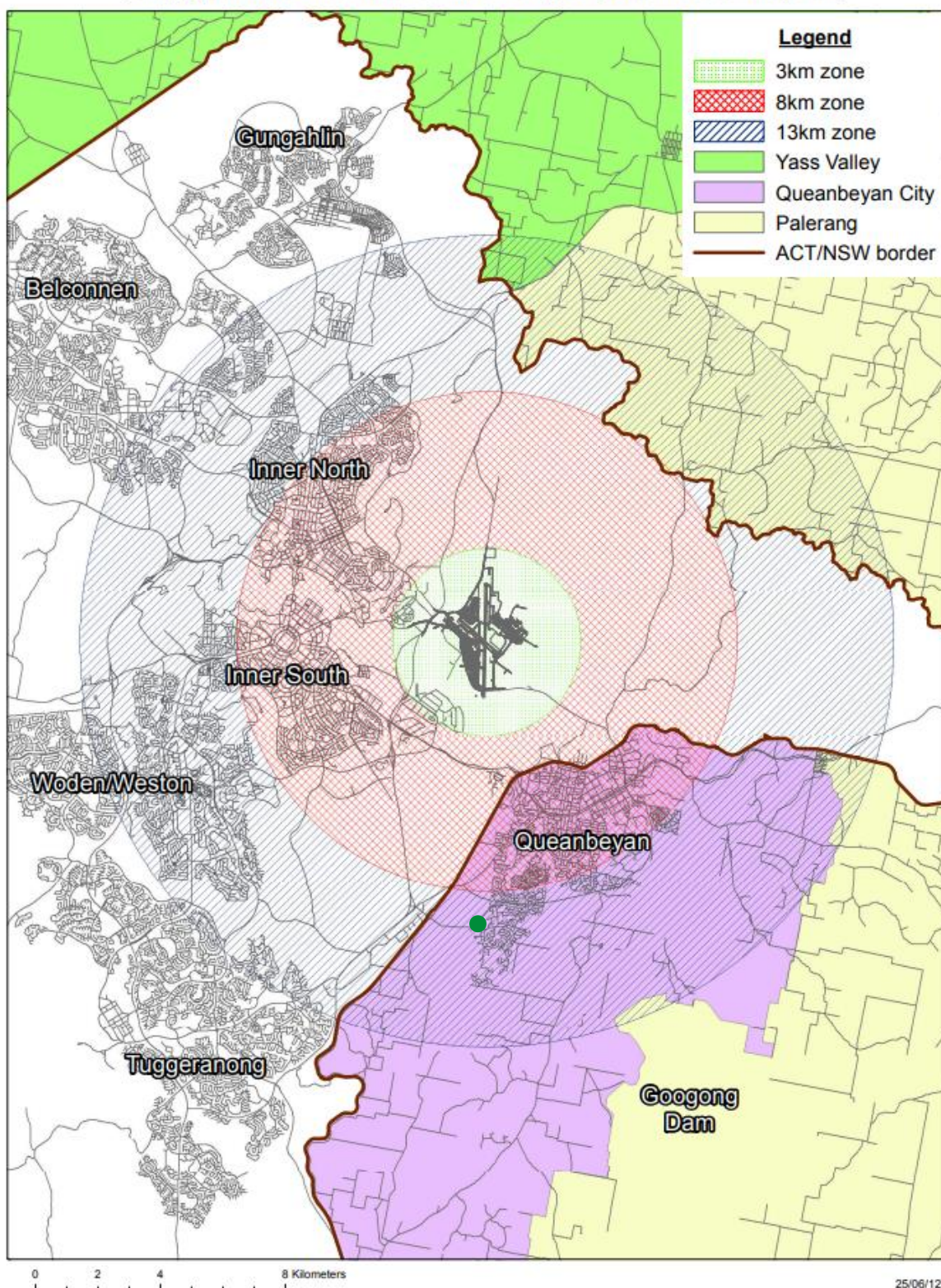


Figure 3. Wildlife risk zones near Canberra Airport.

● Jerrabomberra High School site

4. Wildlife survey methods

The desktop survey included:

- eBird online data - eBird documents the presence or absence of species, as well as bird abundance through checklist data submitted by members. Data submitted in the last 10 years for species of concern in areas south of Canberra Airport and within 10 km of the JHS site were examined.
- Atlas of Living Australia (ALA) online data - ALA is a collaborative digital project that collates Australian biodiversity data from multiple sources. Occurrences of selected species within 5-10km of the JHS site were examined.
- publications of the Canberra Ornithologists Group (COG) and their chatline archive.
- data provided by Canberra Airport including wildlife hazard assessments and their wildlife strike database.
- National Capital Authority data on the Grey-headed Flying-fox camp at Commonwealth Park (Ecosure 2019).

The above sources were consulted to assess the existing wildlife hazard to aircraft in the area south of Canberra Airport, and to show the potential for any increased hazard due to wildlife in the vicinity being attracted to the JHS site and through the southern approach to Canberra Airport during and after development.

The JHS site and the surrounding area was surveyed on foot for six hours on 8 February 2022, searching for wildlife and potential habitats. Surveys carried out by this consultant in December 2021 for another project west of Envirova Drive provided additional wildlife records.

5. Wildlife survey results and implications

All wildlife species for the JHS site and surrounding areas recorded in the desk and field survey were noted. The data for those species that have a Canberra Airport risk rating of Extreme, Very high, High or Moderate are collated in Appendix 1. A summary of the survey results is presented in Table 1.

Lake Jerrabomberra and the associated urban ponds to the north-east provide the most local habitat for hazardous bird species, with large numbers of waterbirds often recorded there. Nine Australasian Darters observed circling over and perching beside the water bodies in February 2022, and there was evidence of recent breeding by Black Swans, Dusky Moorhens and Eurasian Coots. A record of 150 White Ibis on jetties and the island in Lake Jerrabomberra from 2021 carried a note by the observer that the site could become a roost site given that other known roosts had been recently abandoned. In February 2022 bird droppings on jetties and a solar panel raft and scaring devices (models of owls and hawks) placed on some jetties suggested that perching by large birds remains a problem.

No other potentially hazardous species that were not already in the Risk Rating Matrix and are likely to be affected by the development were recorded. For example, three Australian Pelicans were recorded at Lake Jerrabomberra in 2018 and large numbers (500-1000) of Eurasian Coots have been recorded at Googong Reservoir and Fyshwick Sewage Ponds (ACT), but the movements and distribution of these species will not be affected by the JHS development as it contains no water bodies.

The JHS site would originally have supported only low numbers of hazardous species due to its small size and the mostly well-drained treeless habitat and densely vegetated drainage line. Most species originally present are likely to have their numbers reduced during construction and operation of JHS due to loss of habitat and increased human disturbance.

Some birds may at times be attracted to the construction site to feed on prey items exposed by turning of soil, to temporary ponding caused by interrupted drainage and/or to waste foodstuffs (if not secured). These include Australian (White) Ibis, Australian Magpie, Masked Lapwing, Australian Wood Duck, Little Raven and Australian Raven. Feral (and native Crested) Pigeons and Wood Ducks may feed on grassed verges after seeding. Attraction of Wood Ducks, Magpies, Galahs, Feral Pigeons, Australian Ravens, Little Ravens and Magpie-larks to the JHS and nearby construction sites was observed in February 2022 (see photographs). At the JHS site this is not expected to add significantly to aircraft hazards as birds are likely to be attracted for short periods and to be making low-level flights from local populations, and the construction site will be small compared to others nearby. An exception would be if Australian Ibis visited as they could fly higher through the flight path on their way from the Mugga Lane tip. Large birds such as these often circle on thermals to gain height before making longer movements. Mitigation measures are suggested in Section 6.

The landscape design appears to include little if any irrigated mown grass and, if implemented, this would minimise foraging habitat for a number of species of concern (Wood Ducks, Straw-necked Ibis, Australian Magpie, Masked Lapwing, Australian Raven, Magpie-lark). There are no playing fields and one small play area will use artificial grass. The use of unirrigated native grasses has been suggested for perimeter buffer plantings and to rehabilitate the unused southern and eastern slopes of the site and this should attract little wildlife of concern.

The suggested tree planting list for amenity plantings (CONTEXT Landscape Architecture 2021) includes some undesirable species such as American Black Walnut *Juglans nigra*, and Chinese Pistachio *Pistacia chinensis* and Pin-oak *Quercus palustris*. Sulphur-crested Cockatoos occur in mobile flocks and feed on the fruits of these trees, as may Little Corellas which are also common in the area. The landscape architecture report also says that 'orchards will contain endemic, native and exotic species to be used as fresh produce in the food tech classes', and it should be noted that some fruit trees may attract flying-foxes and cockatoos if not netted.

Some architectural design features can inadvertently provide increased nesting and perching sites for Feral Pigeons and could increase their numbers in a district. Features which could facilitate this are the low-pitched roofs, pierced and folded metal screens mounted out from the building or over external stairs, articulated façade which may provide extra ledges and covered walkways/spaces between buildings. Pigeons could also take advantage of discarded food from school lunches or feeding by students. In addition, minimising Feral Pigeon numbers is desirable for health and safety due to the risk of contamination with faecal material and parasites and their accumulation of dry nesting material which can pose a fire hazard or block downpipes.

Table 1. Summary of wildlife survey results and implications

(blue entries indicate potential increases in hazard, addressed in Section 6, Mitigation measures)

Species	Risk Rating (Airport)	Habitat/records in vicinity (within ca 10 km of JHS site)	Potential effect during JHS construction	Potential effect of JHS operation
Galah <i>Eolophus roseicapilla</i>	Extreme(>9 birds) Very high (<10)	Occurs at and around site, common in grassland, woodland, parks, suburbs	Fewer likely due to vegetation clearing and human disturbance	Neutral - reduced foraging areas, increase in perching sites
Australian Wood (Maned) Duck <i>Chenonetta jubata</i>	Very high	Numerous in wetlands and irrigated grasslands around site	Small numbers may be attracted to temporary ponding or to feed on seeds/shoots after seeding of verges	Numbers likely to be reduced due to lack of ponds and irrigated grassland
Straw-necked Ibis <i>Threskiornis spinicollis</i>	Very high	Occasional in small numbers around site	Fewer likely due to vegetation clearing and human disturbance	Numbers likely to be reduced due to lack of ponds and irrigated grassland
Wedge-tailed Eagle <i>Aquila audax</i>	Very high	Frequent records of 1-2 birds soaring in area	Less likely to occur due to human disturbance	Less likely to occur due to loss of foraging habitat
Little Eagle <i>Hieraaetus morphnoides</i>	Very high	Occasional records of 1-2 birds soaring in area	Less likely to occur due to human disturbance	Less likely to occur due to loss of foraging habitat
Grey-headed Flying-fox <i>Pteropus poliocephalus</i>	Very high	A few records from Queanbeyan/Jerrabomberra mainly wildlife rescues. Known large colony 12km to north-west at Commonwealth Park (ACT)	None, no habitat present	Small numbers could feed in landscaping/garden trees
Black Swan <i>Cygnus atratus</i>	High	2-6 birds occasionally recorded at Lake Jerrabomberra and local ponds	None, no habitat present	None, no habitat created or lost
Australasian Darter <i>Anhinga novaehollandiae</i>	High	Up to nine birds observed on and over Lake Jerrabomberra	None, no habitat present	None, no habitat created or lost
Eastern Grey Kangaroo <i>Macropus giganteus</i>	High	Present at JHS site, common in surrounding grassland and occasional in parkland	Numbers will be reduced by vegetation clearing	Numbers will be reduced by vegetation clearing, no effect on population near Airport
Wombat <i>Vombatus ursinus</i>	High	Present at JHS site, currently common in surrounding pasture and along Jerrabomberra Creek	Fewer likely due to vegetation clearing and human disturbance	Numbers will be reduced by vegetation clearing, no effect on population near Airport
Great Cormorant <i>Phalacrocorax carbo</i>	High	Small numbers at Lake Jerrabomberra	None, no habitat present	None, no habitat created or lost
Australian (White) Ibis <i>Threskiornis molucca</i>	High	Some at nearby wetlands, high of 150 on island/jetties at Lake Jerrabomberra 6/2021. Many at Mugga Lane tip 4km west of JHS (e.g. 300, 1/2022)	Small numbers could be attracted to turned earth/temporary ponding or workers' food waste	Occasional birds could be attracted if food waste not correctly disposed of at school site
Australian Magpie <i>Gymnorhina tibicen</i>	High	Common species in all habitats around JHS. 31 seen feeding on freshly-graded soil onsite in Feb 2022.	Groups may be attracted to feed on invertebrates in disturbed soil. Likely to be local birds only	Neutral - small numbers could nest in landscaping trees, but most onsite foraging habitat will be lost
Masked Lapwing <i>Vanellus miles</i>	High	Small numbers present around water bodies and in irrigated grassland	Small numbers could be attracted to disturbed soil and ponding at night.	Not likely to be present due to lack of habitat

Table 1. (continued)

Species	Risk Rating (Airport)	Habitat/records in vicinity (within ca 10 km of JHS site)	Potential effect during JHS construction	Potential effect of JHS operation
Little Raven <i>Corvus mellori</i>	High	Flocks occur in area, especially in winter.	Groups may be attracted to feed on invertebrates in disturbed soil.	Not likely to be present due to lack of habitat
Australian Raven <i>Corvus coronoides</i>	High	Pairs and small family groups occur in grassland, woodland and parklands	Small numbers may be attracted to feed on invertebrates in disturbed soil or to workers' food waste	Numbers not likely to increase
Little Corella <i>Cacatua sanguinea</i>	High	Flocks occur in parklands and tree plantations	No likely effect	Small numbers may use landscaping trees
Sulphur-crested Cockatoo <i>Cacatua sulphurea</i>	High	Flocks occur in woodlands, parklands and tree plantations	No likely effect	Small numbers may use landscaping trees
Pacific Black Duck <i>Anas superciliosa</i>	High	Small numbers occur in Lake Jerrabomberra and local ponds/dams	No likely effect	Disturbance may reduce use of pond on eastern boundary
European (Red) Fox <i>Vulpes vulpes</i>	High	Scats seen on JHS site, along Jerrabomberra Ck, on Environa Dr verge	Local foxes may investigate construction site at night	Fewer likely due to vegetation clearing but no effect on population near Airport
Silver Gull <i>Chroicocephalus novaehollandiae</i>	High (>9 birds) Moderate (<10)	Occasional at Lake Jerrabomberra	No likely effect	No likely effect
Yellow-tailed Black-Cockatoo <i>Calyptorhynchus funereus</i>	High	Small groups occur in forests and tree plantations	No likely effect	No likely effect unless many pine trees planted
Little Black Cormorant <i>Phalacrocorax sulcirostris</i>	High	Occasional at Lake Jerrabomberra	None, no habitat present	None, no habitat created or lost
Whistling Kite <i>Haliastur sphenurus</i>	High	Few records nearby, more around lower Jerrabomberra Ck and Lake Burley Griffin (ACT) 8-10km to NW	No likely effect	None, no habitat created or lost
Brown (European) Hare <i>Lepus capensis</i>	High	Some may be present in denser grasslands to the west	Less likely to occur due to vegetation clearing and human disturbance	Fewer likely due to vegetation clearing but no effect on population near Airport
Rock Dove (Feral Pigeon) <i>Columbia livia</i>	High (>9 birds) Moderate (<10)	Small numbers recorded at and near site	Flocks may visit for a short time after seeding of road and path verges	May increase, design of buildings could offer nesting spaces and playground feeding could occur
Magpie-lark <i>Grallina cyanoleuca</i>	Moderate	Small numbers occur throughout woodland, grassland, parkland, suburbs and playing fields	Small numbers could be attracted to feed in disturbed or flooded soil	Neutral - some could use landscaping trees but foraging habitat will be lost
White-faced Heron <i>Egretta novaehollandiae</i>	Moderate	Occasional around wetlands	Rare bird could be attracted to feed on disturbed or flooded soil	None, no habitat created or lost
Australian Kestrel <i>Falco cenchroides</i>	Moderate	Occasional in rural grasslands/pastures and woodlands	Less likely to occur due to vegetation clearing and human disturbance	Less likely to occur due to loss of foraging habitat

6. Mitigation measures

During the construction phase risks can be reduced by:

- Minimising ponding from interruptions to drainage by appropriate shaping, using silt barriers to facilitate drainage without erosion
- Ensuring that waste foodstuffs are not accessible to birds on the construction site by signage and provision of secure bins
- Using direct seeding rather than spray-grassing for planting verges of road, bus zone, drop-off area and paths.
- Reassessing building features that may allow nesting/roosting of Feral Pigeons and modifying them to prevent this. This will also improve health, safety and amenity by reducing use of the buildings by other introduced species such as Common Starling, Common Myna and House Sparrow.

During the operational phase risks can be reduced by:

- Limiting the use of trees which attract hazardous bird species and flying-foxes or replacing them with other species (final list should be checked by this consultant or another qualified person)
- Netting any animal-attracting fruiting trees in the productive garden to reduce attraction of Grey-headed Flying-foxes and Cockatoos
- Using secure bins for food waste (see photographs) that cannot be accessed by birds and animals. This also increases amenity and reduces health risks from flies and rodents
- Discouraging feeding of wildlife as part of the school's operational management plan.

7. References

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Photograph 1. Part of flock of 30 Magpies feeding on recently graded soil at JHS site.



Photograph 2. Part of flock of 25 Wood Ducks at temporary pond and earth banks at construction site on Environa/Tompsitt Drive.



Photograph 3. Small group of Wood and Black Ducks in pond on eastern boundary of JHS site.



Photograph 4. Group of Wood Ducks on David Madew playing fields adjacent to JHS site. (JHS project does not include additional playing fields)



Photograph 5. Jerrabomberra, secure bin at fast food outlet.



Photograph 6. Jerrabomberra, fast food outlet bin with contents accessible to wildlife.

Appendix 1. Risk ratings, records and potential for hazardous species at and around JHS site

Species	Risk rating (Canberra Airport)	Jerrabomberra HS site		Environs Drive		Playing fields		Lake Jerrabomberra		Jerrabomberra ponds		Suburban area		Surrounding pasture		Comments
		Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	
Galah (>9 birds)	Extreme										28	2				Development unlikely to increase risk (foraging areas removed)
Galah (<10 birds)	Very high	2					21			2						As above
Aust. Wood Duck	Very high			47		14	38	3	55	22	46			28		Development unlikely to increase risk (no ponds or irrigated grass areas added)
Straw- necked Ibis	Very high								6							Development unlikely to increase risk (no wet grassland areas added)
Wedge- tailed Eagle	Very high								2		1			1		Development will not increase risk (foraging area removed)
Little Eagle	Very high															Development will not increase risk (foraging area removed)
Grey- headed Flying-fox	Very high															Appropriate landscaping necessary to prevent increased risk.
Black Swan	High							3	6		2					Development will not increase risk (no wetlands or irrigated grasslands added)
Australasian Darter	High							9	3							Development will not increase risk (no wetlands added)
E Grey Kangaroo	High	✓		✓		✓						✓		✓		Not relevant (too far from airport, and existing habitat will be removed)
Wombat	High	✓		✓		✓						✓		✓		Not relevant (too far from airport, and existing habitat will be removed)
Great Cormorant	High								8							Development will not increase risk (no wetlands added)

Appendix 1 (continued)

Species	Risk rating Canberra Airport	Jerrabomberra HS site		Enviro Drive		Playing fields		Lake Jerrabomberra		Jerrabomberra ponds		Suburban area		Surrounding pasture		Comments
		Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	
Aust. White Ibis	High	6 (o/h)						1	150		1					Food waste control necessary during construction. Final development unlikely to increase risk (no grasslands/wetlands added). 150 on island and jetties at Lake Jerrabomberra June 2021, could become major roost.
Australian Magpie	High	31				2	9	5	20	1	9	1		3		Development unlikely to increase risk (some potential nest trees added but foraging areas removed)
Masked Lapwing	High						3	2	4	2	2					Development unlikely to increase risk (no additional short grassland)
Little Raven	High								7					7		Potential for attraction of small numbers during construction earthworks
Australian Raven	High					1	2		7		3			2		Potential for attraction of small numbers during construction earthworks or to exposed food waste.
Little Corella	High					1	4		50	72	68					Potential for trees in landscaping to support small numbers
Sulphur-crested Cockatoo	High						4	2	40	2	32					Potential for trees in landscaping to support small numbers
Pacific Black Duck	High	4					1	10	31	5	9					Development will not increase risk (no wetlands added)
European Red Fox	High	√		√										√		Not relevant (too far from airport)
Silver Gull (>9 birds)	High								30							Development will not increase risk (no habitat added)
Yellow-tailed Bk-Cockatoo	High															Development unlikely to increase risk (with appropriate landscaping)

Appendix 1 (continued)

Species	Risk rating Canberra Airport	Jerrabomberra HS site		Enviroana Drive		Playing fields		Lake Jerrabomberra		Jerrabomberra ponds		Surburban area		Surrounding pasture		Comments
		Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	Feb-22	10 yr max	
Little Black Cormorant	High								52							Development will not increase risk (no wetlands added)
Whistling Kite	High															Development unlikely to increase risk (foraging areas removed)
European Hare	High															Not relevant (too far from airport, and existing habitat will be removed)
Feral Pigeon (>9 birds)	High															Potential for increased nesting and roosting on buildings, feeding by students. Will need appropriate controls.
Feral Pigeon (<10 birds)	Moderate	2							8		1					As above
Magpie-lark	Moderate	2				5	4	2	7	7	4	1		8		Development will not increase risk (no habitat added)
White-faced Heron	Moderate								2	1						Development will not increase risk (no wetlands or irrigated grasslands added)
Silver Gull (<10 birds)	Moderate															As for >9 Gulls above
Australian Kestrel	Moderate													1		Development will not increase risk (foraging area removed)