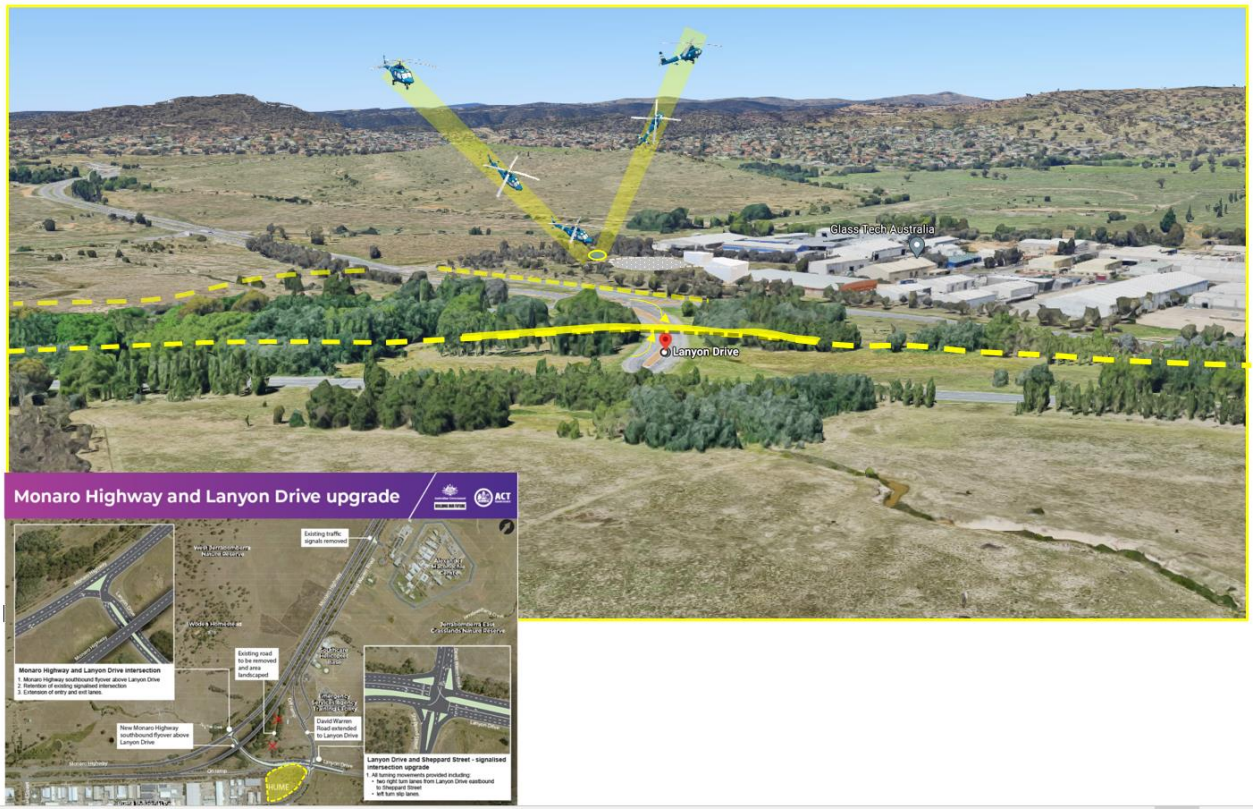

BIRD STRIKE ASSESSMENT

TRG Bushfire Response and Training Centre Block 45
Section 3 Hume ACT.

Abstract

For general aviation, 1445 wildlife incidents were reported between 2004 and 2013 with an average strike rate of 0.3 strikes per 10 000 movements (ATSB 2014). The most struck species ….. Black Kite, galah, bat , plover , kites , flying-fox4 , swallow , Nankeen Kestrel, and duck.

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Document Status			**Approved for issue**	
Version	**Author**	**Reviewer**	**Signed**	**Date**
A	RHT	CG		

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1.0 Introduction

1.1 Overview

This report is an assessment of bird strike of the proposed TRG Bushfire Response and Training Centre which includes a helicopter landing / departure area.

The Environment, Planning and Sustainable Development Directorate (EPSDD) provided a Scoping Document (EIS Scoping Document 202000027 @ March 24, 2021) for the EIS that specifically outlines the specialist study requirements for the EIS.

1.2 Purpose of this report and background

The purpose of the report is to assist with the development assessment of potential hazards and risk impacts of the proposed development and in particular address the potential for bird strike[1] and if necessary mitigation, as part of an Environmental Impact Statement (EIS) in support of a Development Application (DA) on block 43 section 3 Hume ACT.

Table 1 below outlines the specific requirements and where in the report these aspects are addressed in this report.

Table 1: Scoping Document requirements – Hazard and Risk

Scoping Document Requirement	Requirement Detail	Section where requirement is addressed.
8.1.12 Hazard and Risk	Bird strike mitigation	This report

1.2 Project Objective

The objective of this assessment is to determine the potential for bird strike from the proposed development and in particular the impact on aircraft operations[2] (helicopter) use to provide airborne services associated with emergency services / bush fire response.

[1] For general aviation, 1445 wildlife incidents were reported between 2004 and 2013 with an average strike rate of 0.3 strikes per 10 000 movements (ATSB 2014). The most struck species ….. Black Kite, galah, bat, plover , kites , flying-fox4 , swallow , Nankeen Kestrel, and duck.

[2] The flying of helicopters in an out of the site for the foreseeable future will primarily be to fly machines in and out for maintenance, refurbishment and deploy personnel / assets. This is expected to be at a maximum of 30-35 flights per month or an average 2 in-and-out flights per day on average.

Source: www.flickr.com/photos/fireflyphotography/sets/72157612944812758/

Figure 1 Helicopter Struck a flock of birds and made an emergency landing – Forrest City USA

1.3 Scope of this report

To address the scoping document requirements detailed in Table 1 and the project objective, the following scope of work was performed:

- Define the area to be assessed.
- The area of the Risk Assessment should include the take-off routes and landing approaches when significant wildlife hazards are present in these zones.
- Ranking the Probability of a Strike.
- The next step of a Risk Assessment is to rate the probability that species will be involved in a strike.
- Proposed strike mitigation measures.

In defining the scope for the assessment, the following aspects were considered:

• In principle, the habitats off-site should be more attractive to wildlife/birds than the Helicopter hard stand area site itself. However extreme cases such as a land fill or garbage dump might attract so much wildlife that it may pose an increased hazard. • Off-site land uses and activities that can affect wildlife and might need careful consideration might include the following:

Off - Airport Habitats

• Nature conservation and recreational areas/known bird habitat areas; • Local agricultural practices; • Land fill and solid waste management; • Storm water and wastewater treatment plans; • Water bodies including reservoirs, lakes, rivers and the sea; • Wetlands including marshes; and • Gravel pits and quarries.

1.4 Documents Consulted.

- Scoping Document Under Division 8.2.2 of the *Planning and Development ACT 2007*, for an Emergency Services, Maintenance and Training Facility, Application number 202000027.
- Wildlife Hazard Management Associated with Airports. Airport Practice Note 9, 2016 Aust Airports Assoc.
- Canberra Nature Parks Reserve Location Map.
- Canberra Ornithologists Group reports.

2.0 Project Background

2.1 Project Description

The site is identified as Block 45 Section 3 Hume and is located at the southwestern corner of Sheppard Street and Lanyon Drive (Figure 1) and Figure 2 regional map.

Block 45 Section 3 Hume is zoned NUZ1 Broadacre and is subject to the Main Avenues and Approach Routes overlay in the ACT Territory Plan.

The proposed development and use of the site, as described below, are permissible uses in this zone under the Zone Development Table; Emergency Services Facility and Educational Establishment, as well as ancillary use, uses definitions in the Territory Plan.

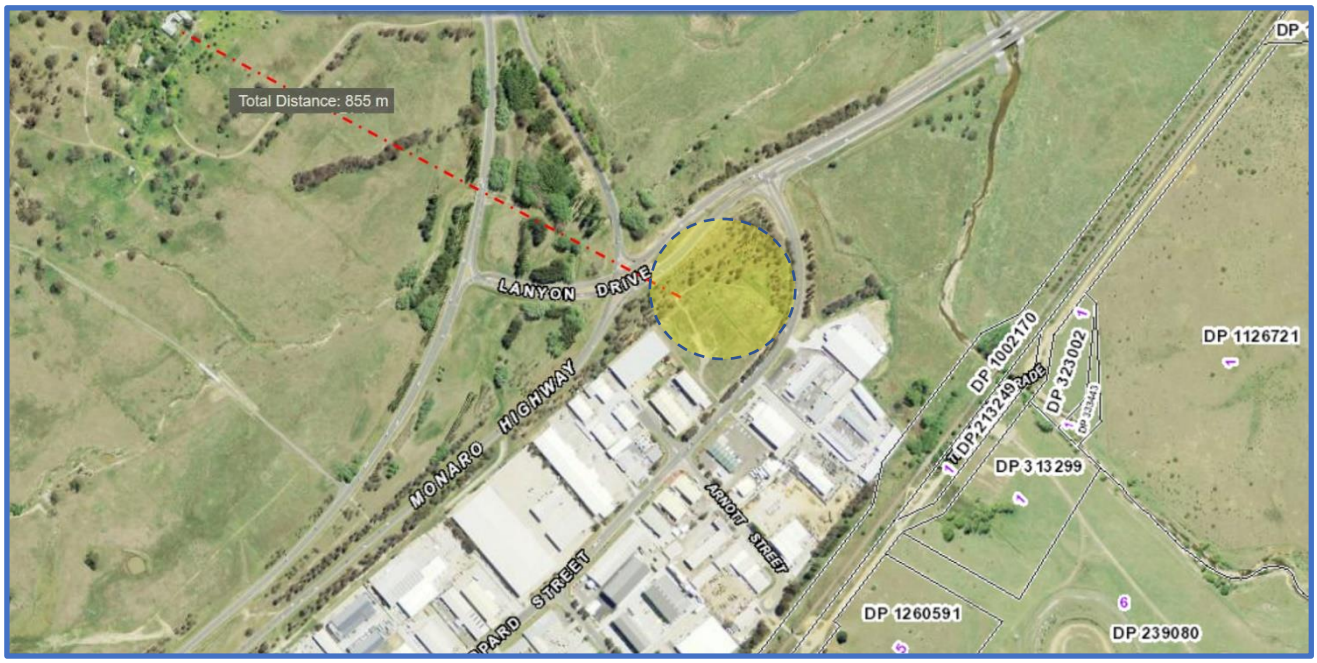


Figure 2 Development site showing nearest ACT residence - Block 45 Section 3 Hume (Source Six maps).

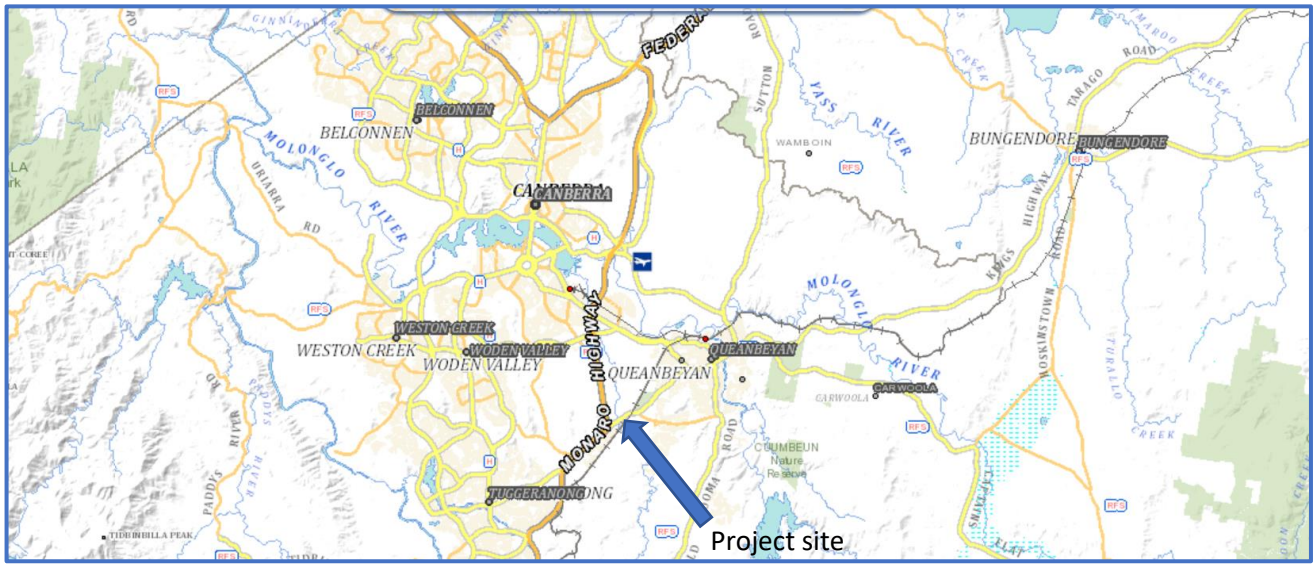


Figure 3 Project Site Regional Map (Source Six maps).

The greenfield site is characterised into two broad categories, being the cleared central parts of the site, and the outer eastern and northern portions of the site which retain a relatively intact native tree canopy as shown below, in Figure 4.

Figure 4 Block 45 Section 3 Hume (Source Six maps)>

Biodiversity Values of the Site:

A preliminary assessment of the biodiversity values of the site was completed in October 2018 by PATH-Co and updated report in Nov 2020.

PATH -Co describes the vegetation within the southern (and central) parts of the site 'Area 1' on Figure 3 is in a highly modified condition, being cleared of any native trees, and dominated by introduced grasses and numerous weed varieties, with a few (<10) small introduced/ornamental shrubs/saplings (such as apples/plums) observed to be scattered lightly through this area.

The northern portion of the site 'Area 2' supports a relatively intact native tree canopy, comprising two distinct, but contiguous patches with different species composition. The eastern parts of Area 2 support a tree species composition including predominantly Blakely's Red Gum (E. blakelyi), with some occasional Red Box (E. polyanthemos) and Yellow Box (E. melliodora) individuals.

The north, north-western parts of Area 2 supports a tree species composition including predominantly Brittle Gum (E. mannifera) with some occasional Argyle Apple (E. cinerea) and very occasional Yellow Box (E. melliodora) individuals.

Given the observed typical age and size class (approx. 12-16 m height and on average 400 – 500 mm trunk diameters (dbh) for large specimens), across both parts of Area 2 none of these trees are considered likely to be remnant trees (i.e., occurring pre-development of Canberra).

Both (all) parts of Area 2 were observed by PATH -Co to have a moderately modified understorey. The central and eastern parts of Area 2, and extending north to the intersection of Lanyon Drive and Sheppard Street, supported a relatively dense shrubby understorey, consisting primarily of Cootamundra Wattle (Acacia baileyana) and Wedge-leaf Wattle (Acacia pravissima) with some minor regrowth specimens of the eucalypt species mentioned above. Some (occasional) introduced exotic shrub varieties including Briar Rose (Rosa rubiginosa) and Hawthorn (Cratageus spp.) were also observed to be present.

A review of the ACTmapi Significant Species N/Abase also does not identify any listed threatened communities occurring in or near this area.

The nearest residence is a rural residence located about 900m to the north west of the site (Figure 2).

The site is partially surrounded by industrial development to the east and south.

The process behind the selection of this site and its suitability for the intended purpose and uses involved finding a site with the following key characteristics:

- Land with the correct zoning and locality to support the operation.
- Direct road access with a strong preference to be located close to a main/arterial road to facilitate good access for support and ground operations.
- Areas to support operational and pilot training (open land capable to support helicopter flight training is paramount)
- Adequate land area, coordination and operations office, hanger space and storage for equipment and land-based assets/resources, landing facilities and the like,
- Central location in relation to the ACT geographically to permit low response time targets,
- Location away from sensitive (primarily residential) receivers to minimise impacts from flight operations (although this is considered a relatively low impact use).

Block 45 Section 3 Hume was found to meet all of the above site requirements, being located close to Lanyon Drive and subsequently Monaro Highway, provides sufficient land area with manageable ecological constraints to achieve the site building construction and operational requirements. The site is also considered ideal in that it is located within the outer margins of the Hume Industrial Precinct, with (main) roads on all but one boundary, and therefore the operations are considered unlikely to affect any sensitive nearby users and provide approach-routes that can generally steer clear from build-up sites.

Its central location will also see an opportunity to have a response time of generally less than 10 minutes to the entire urban area of Canberra which is vital for the emergency service roles in particular that are proposed to be operated from the site.

Block 45 Section 3 Hume, subject to the application for a direct sale, is unleased land. It is identified in ACT mapi as being under the custodianship of TCCS for the purpose of City Presentation.

Intended use for Block 45 involves an application to purchase and development land for the purposes of developing infrastructure (Figure 5) to support emergency services for bush fire response activities, training, forestry and related services, including a helicopter landing site and with ancillary uses supporting these functions.

Based on a preliminary concept plan for the site (Figure 3), the proposed development would involve the following features (including preliminary estimates of the development footprint for each element): - approx. 3030 m^2 of buildings for offices, training and associated uses, - approx. 3600m^2 hardstand, for vehicle parking and manoeuvring, - 3,000m^2 storage yard for Forestrack, - 2,000m^2 (or thereabouts) Emergency Services Training Area, - 7,600m^2 identified for future possible development (longer term planning to ensure site remains viable in a changing city, regional and global context).

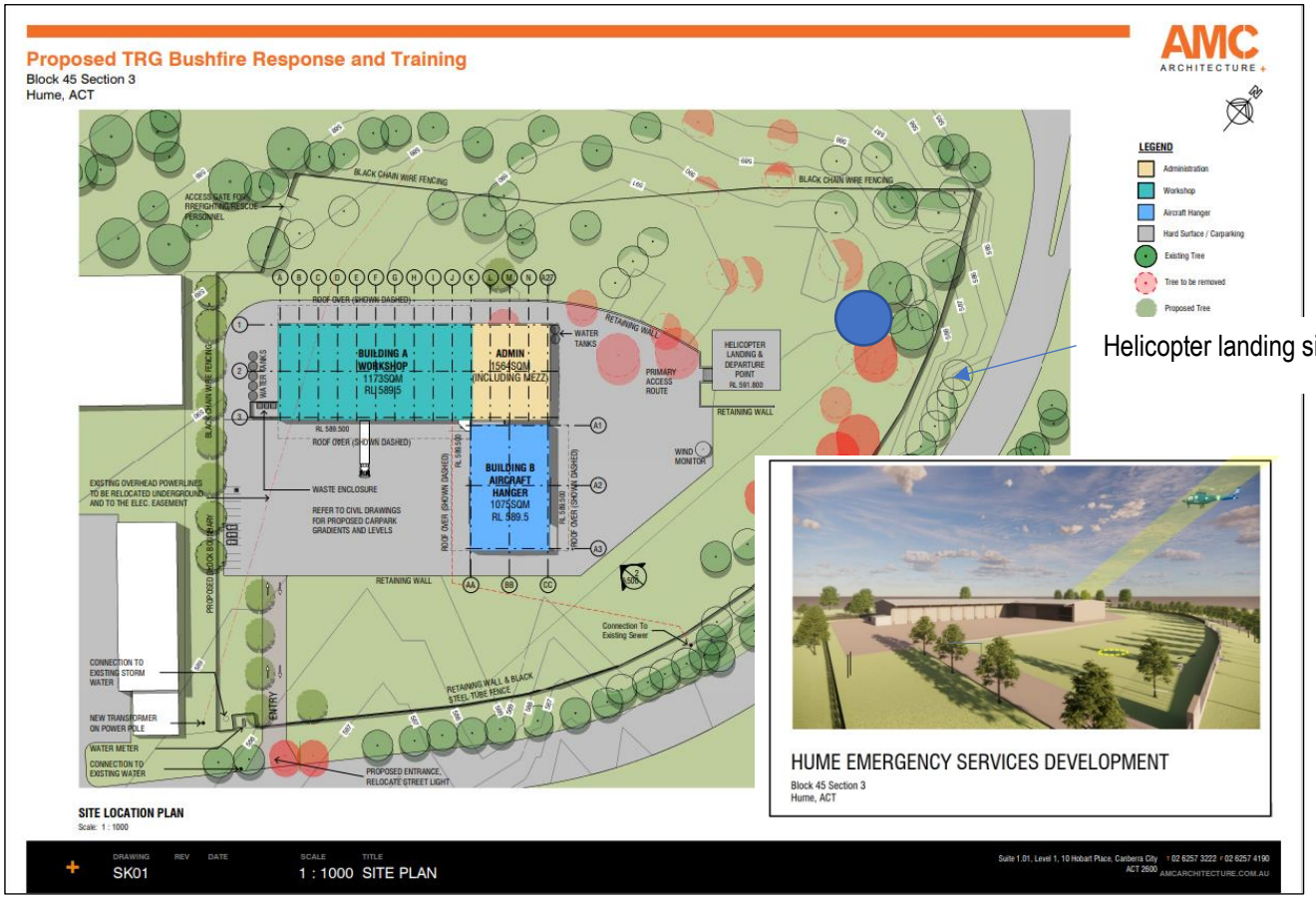
Some of the trees located in the north-eastern portion of the site will require removal to facilitate safe take-off and landing of the helicopter, however it is expected that many of the existing trees could be retained as detailed in the landscape Plan (refer to DA Plans).

The proposed helicopter landing / departure point shown in figure 3 is located approx. 30m from the north and east site boundaries, allowing for a managed safety zone in accordance with guidelines for the establishment of helicopter hard stand area.

The flying of helicopters in an out of the site for the foreseeable future will primarily be to fly machines in and out for maintenance and refurbishment associated with bush fire response/surveillance. This is expected to be at a maximum of 30-35 flights per month or an average 2 in-and-out flights per day on average.

Normal operating hours of the facility would be 7am – 5.30 pm Mon – Friday.

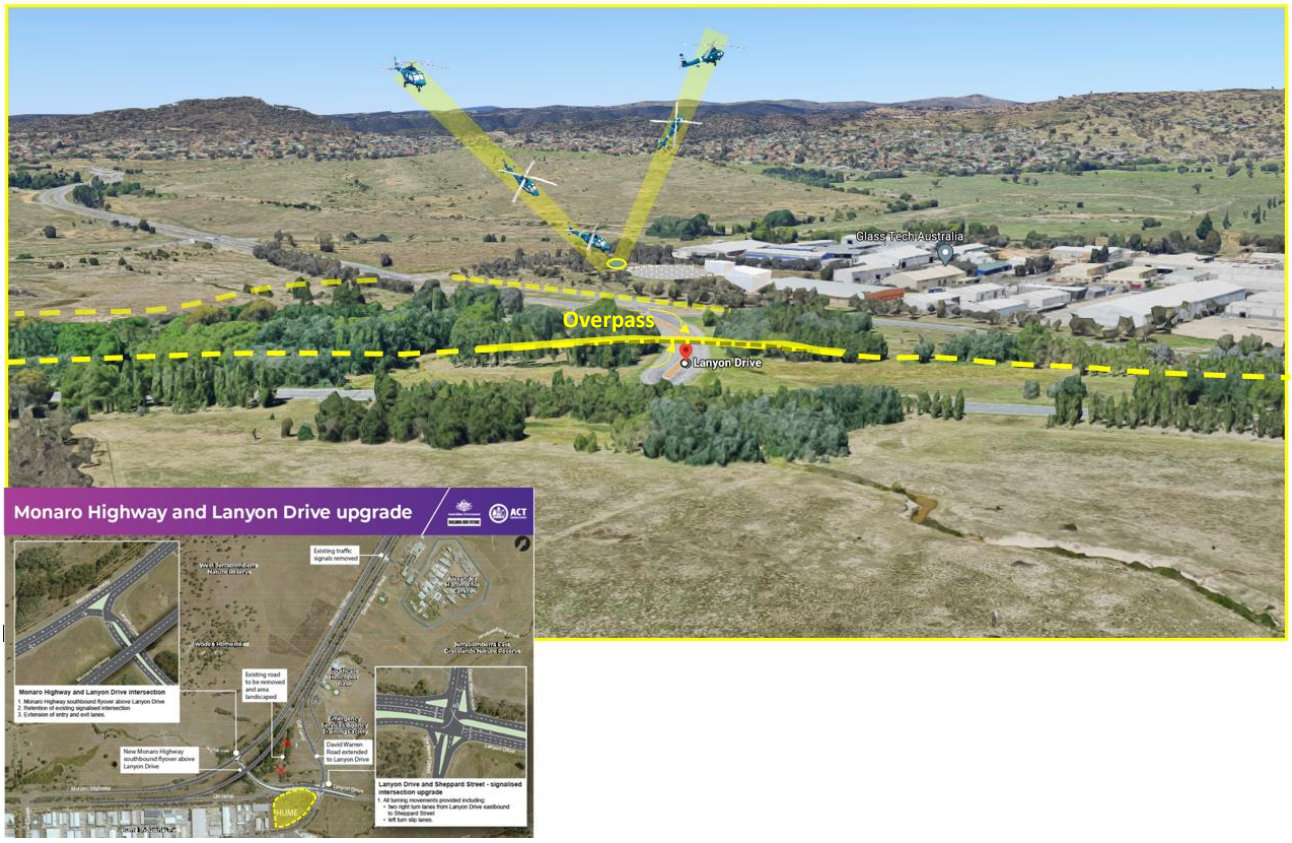
Figure 5 Proposed site plan



The proposed helicopter hard stand area is not visually distinctive or unique, it is located in the north east section of the block and is hidden from view from Lanyon Drive and Shepard street due to its elevation and surrounding trees/vegetation.

The following photomontages illustrate the preferred flight paths

Figure 6a Photomontage below illustrates the preferred flight paths to and from the Helicopter hard stand area in relation to Lanyon Drive Upgrade.


Glass Tech Australia
Overpass
Lanyon Drive
Monaro Highway and Lanyon Drive upgrade
ACT
Monaro Highway and Lanyon Drive intersection
Lanyon Drive and Sheppard Street - signalised intersection upgrade

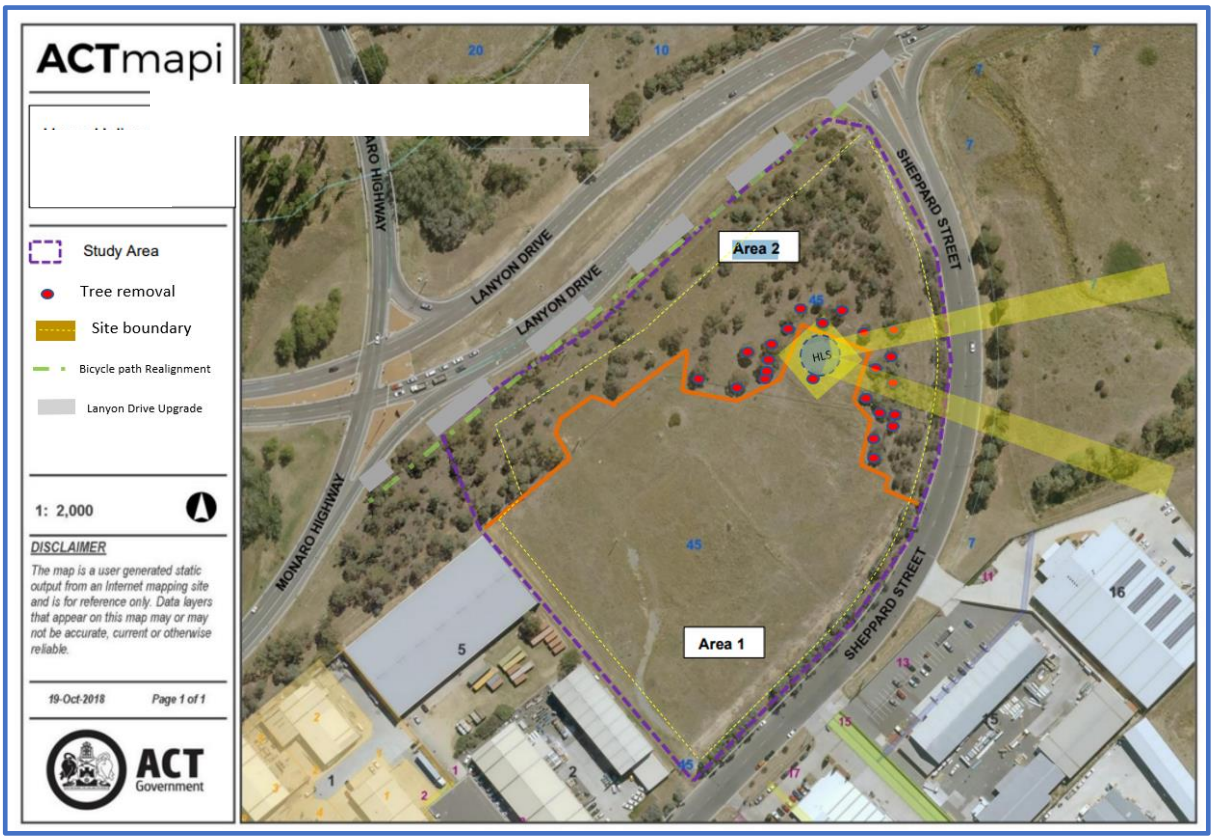

ACTmapi
Study Area
Tree removal
Site boundary
Bicycle path Realignment
Lanyon Drive Upgrade
1: 2,000
DISCLAIMER
The map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current or otherwise reliable.
19-Oct-2018
Page 1 of 1
ACT Government
MONARO HIGHWAY
LANYON DRIVE
LANYON DRIVE
SHEPPARD STREET
SHEPPARD STREET
Area 2
Area 1
HLS

Figure 6b illustrating preferred helicopter flight paths / proposed tree removal.

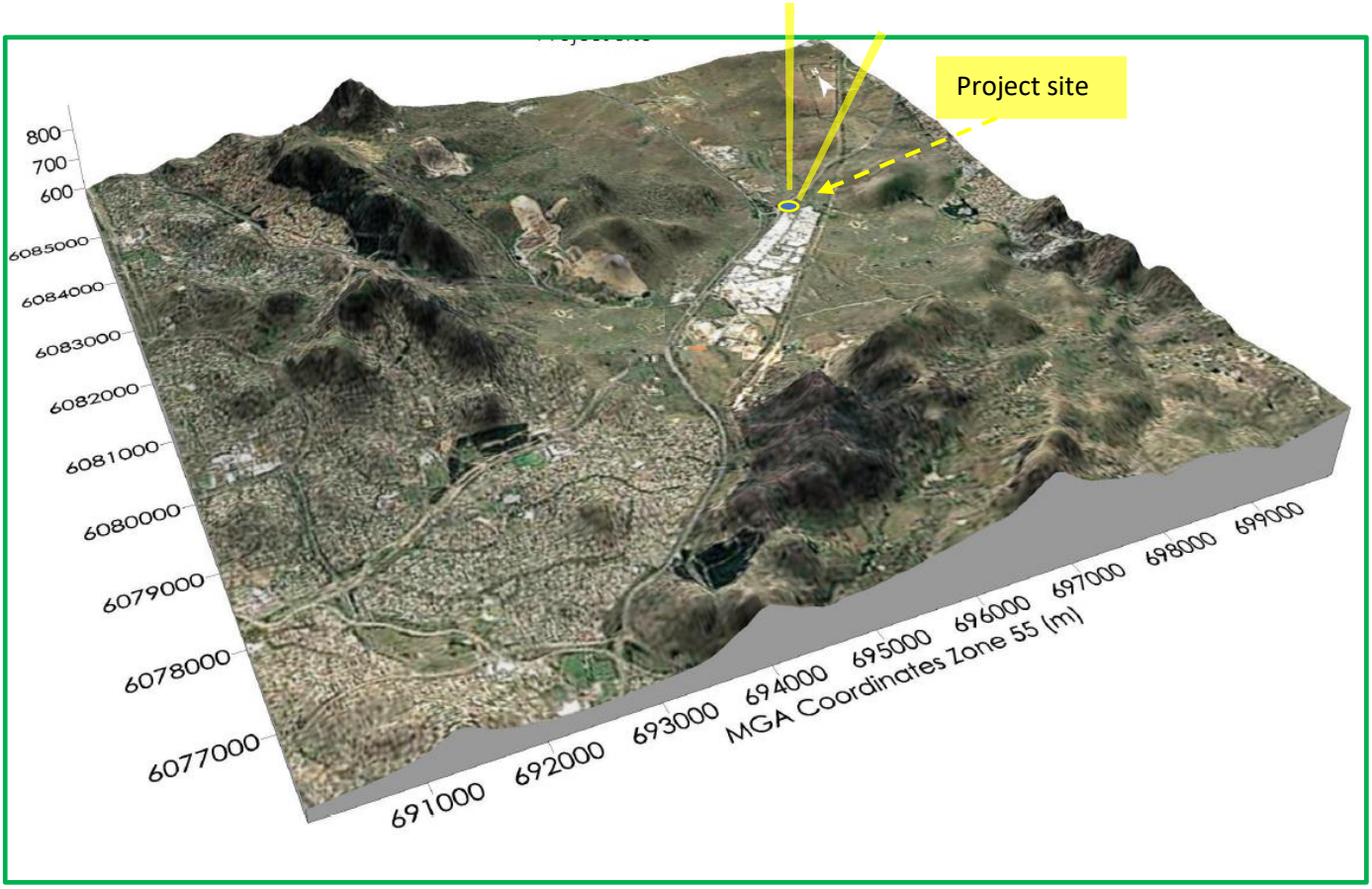


Figure 6c Long distance viewpoints to the project site illustrating helicopter flight paths.

3.0 Legislative Context

3.1 The National Airport Safeguarding Framework

In May 2012, the Department of Infrastructure and Transport (DIT) released the National Airport Safeguarding Framework (NASF). The NASF aims to develop informed land use planning regimes to safeguard airports and their adjacent communities. Guideline C of NASF, Managing the Risk of Wildlife Strikes in the Vicinity of Airports (Guideline C) aims to provide guidelines to land users and planning 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.

While the proposed development/ associated Helicopter hard stand area is not classified as an airport/heliport, this issue is important because wildlife strikes can cause potential for aircraft damage fatalities, injuries and operational delays. It is recognised that these potential impacts can be reduced by managing land use around airports to minimise the potential for wildlife to be in conflict with aircraft operations. Most wildlife strikes occur on and in the vicinity of airports, where aircraft fly at lower elevations. The risk of a strike at an airport relates to wildlife activity both within the boundary of an airport and in surrounding areas and wildlife attracted to land uses around airports can migrate onto the airport or across flight paths, increasing the risk of strikes. Airports actively reduce wildlife populations and manage the risk of strikes on airport land. Such on-airport activities are underpinned by current aviation safety regulations (NASF, 2012). Whilst these safety regulations do not apply directly to the proposed helicopter landing site, the risk of a bird strike relates mostly to wildlife activity in areas surrounding the site. In this regard the International Civil Aviation Organisation (ICAO) has developed specific advice on land uses with potential to become high risk wildlife attractants which include: − food garbage disposal; − sewage treatment and disposal; − artificial and natural lakes; − abattoirs and freezing works; − fish processing plants; − bird sanctuaries; and − outdoor theatres.

Attachment 1 to Guideline C aligns with ICAO benchmarks to provide guidance for land uses at certain distances from airports (i.e., 3 km, 8 km and 13 km) that present a risk of attracting wildlife. Whilst **the proposed development is not considered to be a bird attractant listed in the guideline C**, the guideline will be used, inter alia, to assess land uses in the vicinity of the proposed development, in order to assess the risk of aircraft bird strike of the proposed operation base/ helicopter activity in view of surrounding land use and the associated bird attractant attributes.

4.0 Bird Strike Risk Assessment

4.10 Assessment guide

This section considers the potential for the risk of bird strike to helicopter operations at the proposed site.

The following points are made about the proposed operation base.

- The proposed operation base is not considered to be a bird attractant activity.
- The proposed Helicopter landing site is not subject to CASA requirements.
- A review of the ACT mapi Significant Species N/Abase also does not identify any listed threatened communities occurring in or near this area.
- No hollow bearing trees have been identified on the site.

Guideline C Activities

The Australian Airports Association Managing Bird Strike Risk Species Information Sheets, Airport Practice Note 6 identifies the common wildlife species around Australian Aerodromes and how best to manage these. It describes the main attractants for different species often involved in bird strike around airports which generally include: - water; - food, such as human waste food, worms and invertebrates; - loafing areas/shelter; - grass; - lighting; and - transit routes for bird and bat species. Other typical attractants to birds are those uses identified in the Table from Guideline C Attachment 1 (Table 2) and are sites or uses that offer habitat, food, shelter or roosting sites for birds.

This land use also does not specifically relate to any of the uses identified in Guideline C.

4.2 Hazard Identification and Risks

4.2.2 Aircraft Movement and Type

Generally, the more aircraft movements at an aerodrome the greater the chances of wildlife strike.

Different aircraft have different susceptibility to wildlife strikes. Large turbo fan aircraft tend to fly fast, have a large frontal surface area, have a great sucking power through their engines, rendering them more likely to strike wildlife than propeller driven aircraft. In Australia, Regular Passenger

Transport aircraft are 16 times more likely to report a strike than general aviation aircraft[3]. On the other hand, light aircraft are not subject to the same rigorous design standards imposed on commercial jet aircraft. It is therefore important to identify current and projected trends for aircraft movements, as provided in Table 2 below.

Table 2 - Guideline C/ Table 2 – Proposed development aircraft movement information

Aircraft Classification		Strike Susceptibility Level	Approximate Annual Movements	Forecast Annual Movements (increase, decrease, steady)	Other Considerations
1	**Turbofan and Turbojet**	High	[N/A]	[N/A]	[N/A]
2	**Helicopter**	Moderate	400	See other	Movements dependent upon bush fire events.
3	**Piston**	Low	[N/A]	[N/A]	[N/A]
4	**Other**		[N/A]	[N/A]	[N/A]

4.2.2 Hazards

Bird Habitat Areas

Based on the land use not being recognised within Guideline C, the risk of the facility attracting birds is considered very low and no actions are required to mitigate bird attraction due the nature of the development itself. However, given the proposed activity of helicopter movements to and from the site, Guideline C shown in the following table will be used to determine any of the listed existing development activities near the proposed site in order to assess the risk from bird strike from attractant activities. Identified activities are noted in red.

[3] ATSB 2008. An analysis of Australian birdstrike occurrences 2002 to 2006.

Land Use	Wildlife Attraction Risk	Actions for Existing Developments			Actions for Proposed Developments/ Changes to Existing Developments		
		3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)	3 km radius (Area A)	8 km radius (Area B)	13 km radius (Area C)
Agriculture							
Turf farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Piggery	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fruit tree farm	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Fish processing /packing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Cattle /dairy farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Poultry farm	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Forestry	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Plant nursery	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Conservation							
Wildlife sanctuary / conservation area - wetland	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Wildlife sanctuary / conservation area - dryland	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Recreation							
Showground	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Racetrack / horse riding school	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Golf course	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sports facility (tennis, bowls, etc)	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Park / Playground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Picnic / camping ground	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Commercial							
Food processing plant	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Warehouse (food storage)	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Fast food / drive-in / outdoor restaurant	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Shopping centre	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action
Office building	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Hotel / motel	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Car park	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Cinemas	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Warehouse (non-food storage)	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Petrol station	Very Low	Monitor	No Action	No Action	Monitor	No Action	No Action
Utilities							
Food / organic waste facility	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - landfill	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Putrescible waste facility - transfer station	High	Mitigate	Mitigate	Monitor	Incompatible	Mitigate	Monitor
Non-putrescible waste facility - landfill	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Non-putrescible waste facility - transfer station	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Sewage / wastewater treatment facility	Moderate	Mitigate	Monitor	Monitor	Mitigate	Mitigate	Monitor
Potable water treatment facility	Low	Monitor	Monitor	No Action	Monitor	Monitor	No Action

Table 3 - Guideline C Table 3 Land use activities of existing developments in the region of the site

Within 8 km radius of the site, 5 existing land use developments have been identified which are considered to be bird attractant activities that require mitigation measures.

Offsite Habitat types that can be attractive to wildlife are:

- Mugga Way Landfill
- Jerrabomberra West Nature Reserve
- Jerrabomberra Wet Lands
- Fruit Tree plantation
- Sewerage Treatment Plant
- Farm Dams
- Creek

In addition to these habitats, a creek line and unmanaged grassland are located relatively near the proposed development site.

On site Habitat types that can be attractive to wildlife are:

Activities at the proposed site that can be attractive to birds includes:

- Tree lined areas near the Helicopter hard stand area – verge areas and adjacent northern boundary
- Grass areas
- Waste bin area

Natural Phenomena

Natural phenomena that attract birds.

- Bird migration – N/A
- Bird /Bat Transects – N/A

Of these habitat type/activities, the conservation area approx. 1.2 km from the site - Jerrabomberra West Nature Reserve shown in figure 8 is considered a risk to proposed helicopter activities worthy of further investigation discussed below together with the Mugga Way Landfill Site.

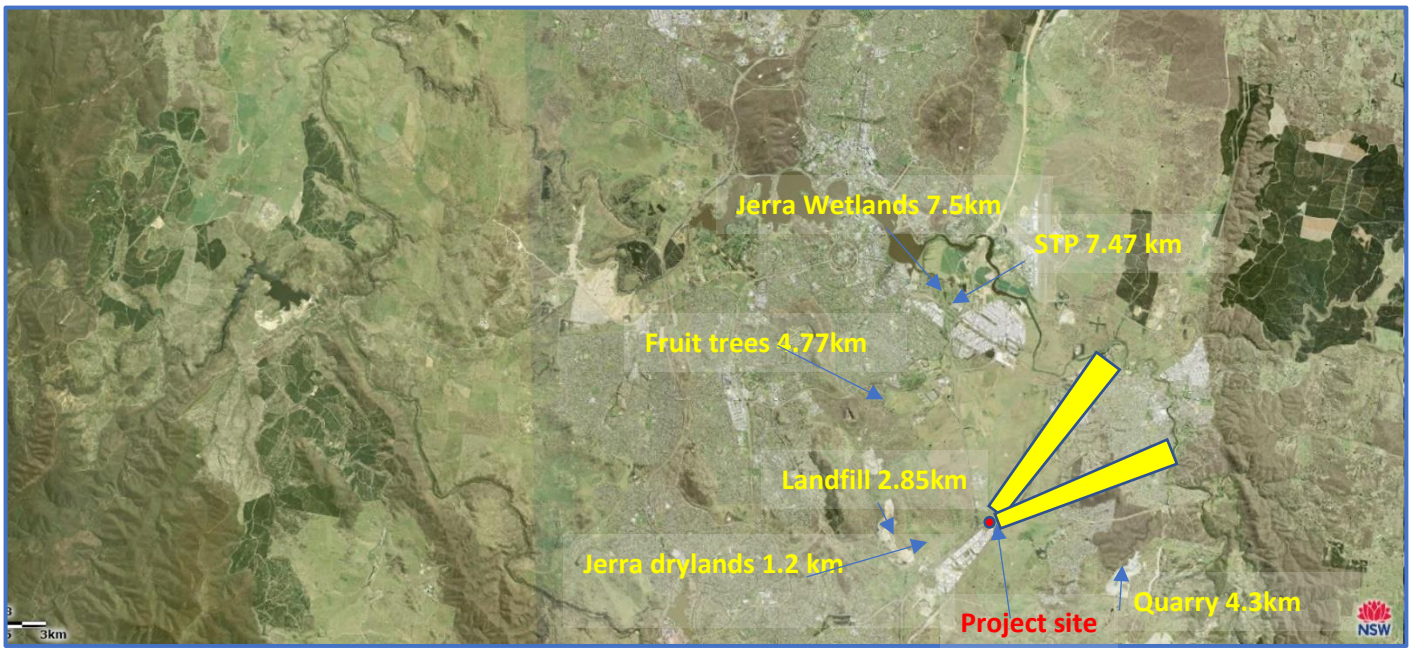


Figure 7 Bird attractant activities in the region of the site and proposed flight paths (Source: Sixmaps)

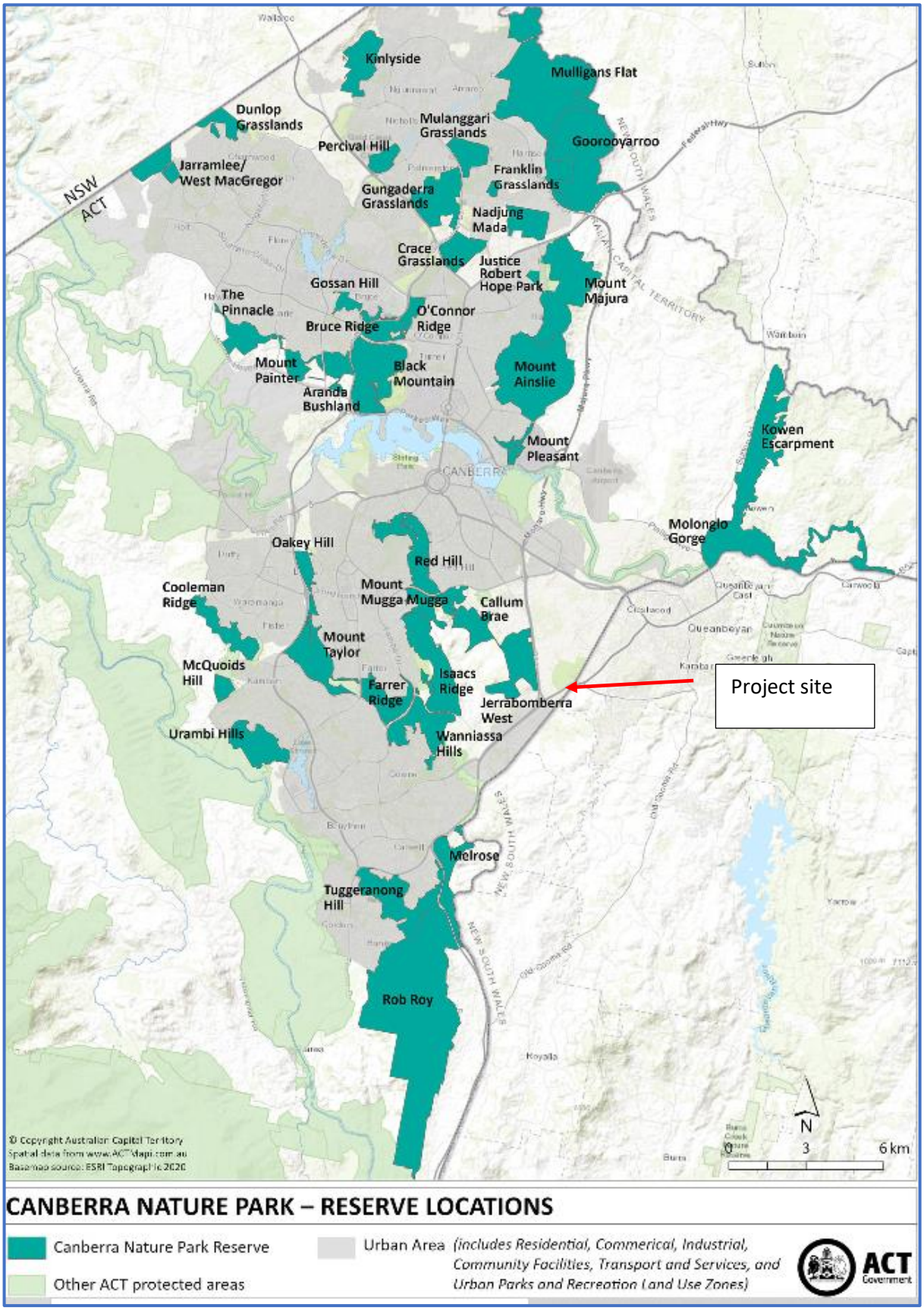


Figure 8 Canberra Nature Park

4.2.3 Review of bird attractant Risk areas in close proximity to the proposed development site

Jerrabomberra West Nature Reserve

Figure 9 Jerrabomberra West Nature Reserve

Jerrabomberra West and Jerrabomberra East (99 hectares) together form one of the largest areas of Natural Temperate Grassland in the ACT. The reserve provides an example of the 'treeless plains' and woodland transition area that were typical of the Canberra region before European settlement. The grasslands are a surprisingly diverse ecosystem, providing a haven for both common and endangered plant and animal species. The reserve is part of a large grassland–woodland complex of over 1000 hectares. The wider complex forms part of one of the largest, best connected and most diverse areas of box–gum grassy woodland remaining in Australia. One of the earliest rural properties on the Limestone Plains (now Canberra) is the heritage listed Woden Homestead, which is just outside the boundary of the Jerrabomberra West Nature Reserve. The nature reserve previously formed part of the Woden Homestead property.

In recent times the Canberra Ornithologists Group visited grassland and woodland shown the following map.

The following report noted 49 species in the area as noted in the field report below.

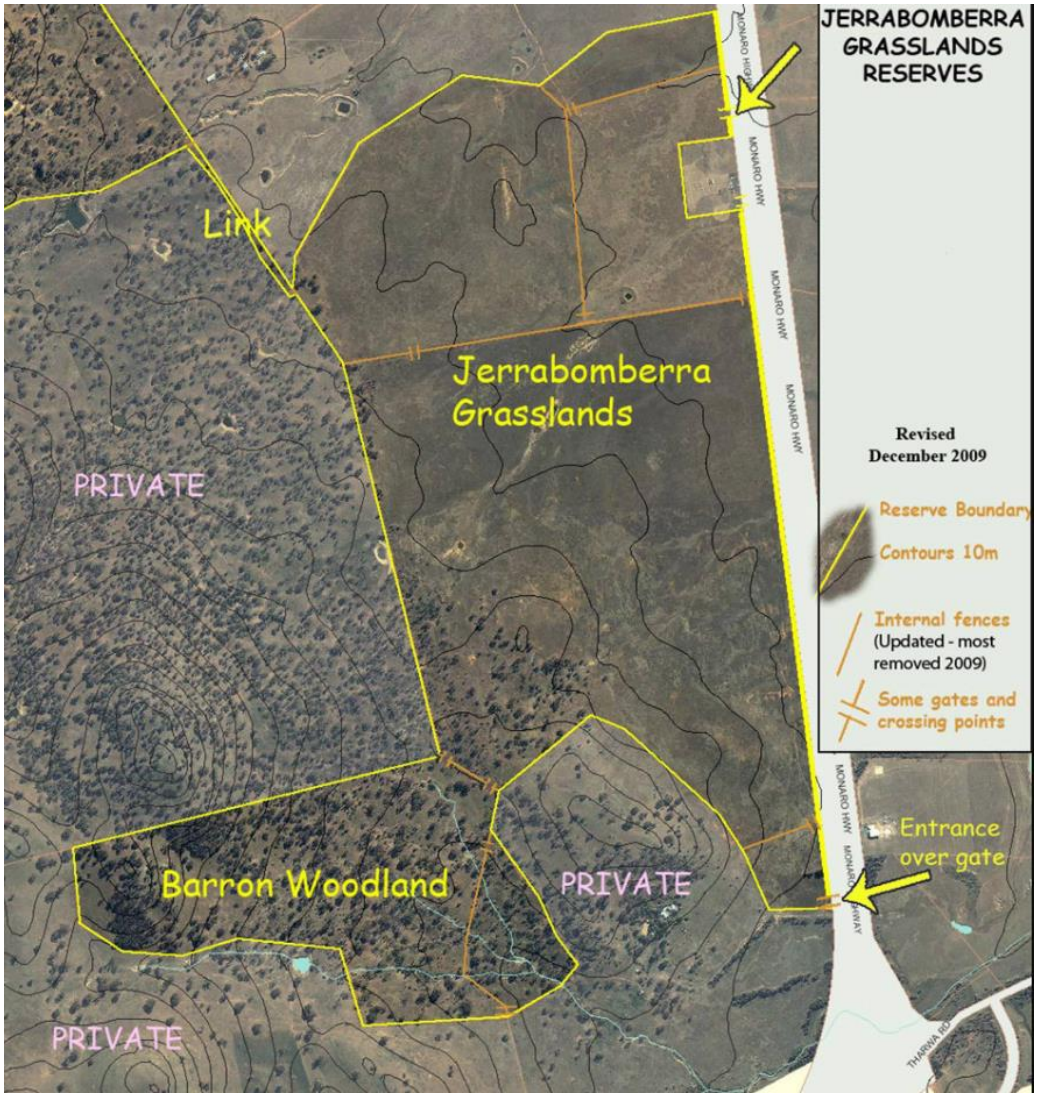


Figure 10 Map showing Jerrabomberra Grassland. (Source: Canberra Ornithologists Group Website).

Jerrabomberra Grasslands West (or horse paddocks)

Sun 03 December 2017 07:30am

Ryu Callaway

Meet at the southern entrance to the reserve, on the western side of the Monaro Hwy about 400m north of the Lanyon Dr intersection at 7:30am. If coming down Monaro from the north, I believe there is a small crossing across the median, but it may be safer to turn around in Hume or there is a roundabout some way down Lanyon Dr. Parking is very limited – the entrance is immediately adjacent to a driveway of a private property, so when parking do not block the driveway or the designated bicycle lane, and please, please carpool if possible. Hopefully the grass verge will be mown which would make parking easier. We will traverse through the grassland to the excellent woodland at the back, which is often host to a good range of summer migrants such as ***Rufous Songlark****, bronze-cuckoos, woodswallows,* ***Tree Martins****, and gerygones, as well as some scarcer species like* ***Diamond Firetail*** *and* ***Southern Whiteface****.*

It is a decent trek through the grasslands, so bring sun protection and plenty of water, and appropriate dress for snakes.

Post event report

Ten members and guests decided to risk the weather and explore this little-visited grassland and woodland. A very friendly farm dog greeted us briefly before undertaking some determined surveillance of the numerous rabbit warrens on the adjoining private property.

Despite rain threatening at one stage we remained dry and managed to see 49 species. A ***Peregrine Falcon*** *as we walked up from the gate was a good start. The highlights for the morning were a pair of* ***Varied Sittellas*** *feeding several young in a nest, a* ***Western Gerygone*** *in a nest very low in a bush, a number of* ***Southern Whiteface***, ***Nankeen Kestrels*** *observed entering a hollow and carrying food (two different locations), a* ***Rufous Whistler*** *on a nest, many parrots at nest hollows, two* ***Wedge-tailed Eagle*** *nests (not sure if either was in use), and the sighting by one member of the group of a* ***Red-capped Robin****. Well worth a return visit!*

Apart form the bird species observed in the area by the Canberra Ornithologists Group - Masked Lapwings (Plover) have been observed in the immediate area of the development site and Australian Magpie.

Masked Lapwings present a significant strike risk to aircraft because:

- They can form large flocks prior to their breeding season, increasing the chance of multiple-strike incidents;
- They establish breeding sites and aggressively defend them against people, other animals, and even aircraft; and
- Their preference for short grass, for breeding and foraging, makes many airports particularly attractive.

Risk assessments often rank this species as moderate to very high risk due to their presence on airfields, particularly in critical aircraft movement areas such as flight strips, and their highly territorial behaviour.

Preferred Habitat: With a preference for short grass and barren areas, they are often observed on sports fields, airports, median strips, golf courses, farmlands and urban parks.

Despite their relatively small size, Australian Magpies present a significant strike risk to aircraft because:

They can establish feeding territories on airports if left undisturbed;

They aggressively defend breeding territories on airfields;

They can congregate in foraging flocks on airports where the grass is short and food items are abundant; and new individuals to the airport, particularly juveniles, have poor avoidance of aircraft due to their inexperience and naivety.

Preferred Habitat - Open areas with tall trees. In urban areas they are commonly observed on airports, sports fields, golf courses, and in orchards, parks and gardens.

Mugga Way Landfill

Waste management facilities (landfills and waste transfer stations) provide food for a variety of opportunistic wildlife, Australian White Ibis, Australian Pelicans, Torresian Crows, Silver Gulls and Black Kites. This artificial food source can increase localised wildlife populations to unmanageable levels and can present a significant risk where the facility is in close proximity to the airport. In addition, where airports are situated between waste management facilities and bird roosts, birds transiting through aircraft flight paths can present a serious strike risk.

4.3 Risk Ranking

The total number of aircraft movements can influence the probability of strikes, with the number of strikes directly correlated with the number of aircraft movements assuming all other variables remain constant (type of aircraft, weather and mitigation measures). Strike probability is also influenced by the location of the landing site and subsequent arrival and departure flight paths.

Overall, the proposed helicopter landing site itself does not provide a significant attractive habitat if managed (landscape management plan implementation) to achieve an acceptable risk level.

The result of the risk assessment for is presented in risk matrix (Table 4) below.

Table 4 Nearby land use potential risk to proposed helicopter operations from bird attractant activities.

Name	Location from the proposed development site	Land Use Description /NASF	NASF Wildlife Attractant Risk	Potential risk to proposed helicopter landing site	Justification of potential risk rating
Farm dams/water course	Various	Not described	Not applicable	High	Various species – movement of birds between various water bodies could result in birds infringing flight paths.
Mugga Way Landfill	2 km W	Putrescible waste facility	High	High	Further assessment required to determine bird use of location and likelihood to transit operational flight paths.
Jerrabomberra Wetland	5km NE	Wetland	High	Low to moderate	Has the potential to roost or nesting location for wetland species. However, some distance from the site. Further assessment required to determine bird use of location and likelihood to transit operational flight paths
Grassland	.3km E	Dryland	Moderate	Moderate	May provide forage for host to a good range of summer migrants such as Rufous Songlark, bronze-cuckoos, woodswallows, Tree Martins, and gerygones, as well as some

					scarcer species like Diamond Firetail and Southern Whiteface, Masked Lapwings (Plover). Further assessment required to determine bird use of location and likelihood to transit operational flight paths
Boral Quarry	1km NE	Not described	Not applicable	Low	Ponds may attract water birds. Further assessment required to determine bird use of location and likelihood to transit operational flight paths
Proposed site	Verge/landscape areas	Not described	Not applicable	Low	Unlikely to support large flocking species; however, corellas, cockatoos and Galahas may use the site from time to time. Further assessment required to determine bird use of landscape areas in and surrounding the proposed site.

From the activities in close proximity to the proposed site, it is concluded that while the proposed activity itself would present a low risk of bird attraction/impact on aircraft, the activity of flying helicopters to and from the site could be involved in the occurrence of a wildlife event, incident or accident event. Therefore, the following section will consider mitigation measures to address the risks involved.

5.0 Strike Mitigation Measures

Mitigation strategies recommended aim to maintain the bird strike risk at an acceptable level and have been derived from standards, guidelines and assessment details outlined in this assessment.

The proponent has the opportunity to design the proposed helicopter landing area in a way that limits its attraction to birds. Key considerations will be to ensure that the design does not create bird attractive features, that bird/bat populations are monitored to assess strike risk, and that a plan to implement actions where hazards are identified is developed.

The recommended strategies covering design elements and facility operation are as follows:

- Engage a wildlife strike specialist to develop a Wildlife Hazard Management Plan that documents the following:
  - Pilot notification
  - Hazard assessment
  - Monitoring action
  - Liaison with land use planning
  - Wildlife strike/near miss reporting
  - Waste management
  - Landscape Management Plan
- Design options and exclusion devices to exclude roosting, nesting and perching opportunities for birds on lighting, buildings and fences. For example:
  - Hard stand landing area
  - Drainage system to minimise the availability of standing water
  - Waste receptacle designed and located to reduce the accessibility of putrescible waste to scavenging species.
  - Bird exclusion devices installed on buildings / lights / fences.
- Proposed grassland areas to be managed in a manner to reduce the attractiveness of birds and the maintenance protocol document.

Reassess the bird/bat strike risk on a regular basis to determine up to date risks that can inform management actions, resource allocation and monitoring programmes.

6.0 Conclusion

With the land use not being recognised within Guideline C, the risk of the proposed development attracting birds/bats is considered very low and no statutory actions are required to mitigate bird attraction. However, given that the proposed development site is surrounded by a number of bird attractant features, this assessment has made a number of recommendations. These recommendations are based a risk assessment of the proposed land use and areas near the development site.

This assessment outlines a suite of mitigation measures to be implemented covering design elements and ongoing operations of the proposed facility to manage the potential wildlife attack on helicopter operations.

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