Glebe Island Silos Signage

Ecological Impact Assessment

oOh!media/Urban Concepts

21 February 2025

Final

cumberland ecology
PART OF SLR

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The preparation of this report has been in accordance with the brief provided by the Client and has relied upon the data and results collected at or under the times and conditions specified in the report. All findings, conclusions or commendations contained within the report are based only on the aforementioned circumstances. The report has been prepared for use by the Client and no responsibility for its use by other parties is accepted by Cumberland Ecology.

Version	Date Issued	Amended by	Details

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Date:	21 February, 2025

Table of Contents

Table of Tables

Table of Photographs

No table of figures entries found.

Table of Graphs

No table of figures entries found.

Table of Appendices

Table of Figures

No table of figures entries found.

Glossary

Term	Definition
BC Act	NSW *Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
LGA	Local Government Area
MA	Modification Application
NSW	New South Wales
the 'subject site	The Glebe Island Silos
the 'client'	oOh!media
the 'project'	Display signage on Glebe Island Silos

1. Introduction

Cumberland Ecology (Part of SLR) has been requested by Urban Concepts on behalf of oOh!media (the 'client') to prepare a Desktop Ecological Assessment for the display of signage on the Glebe Island Silos (the 'project'). The Glebe Island Silos are located on Lots 12 & 13 DP1170710 (the 'subject site'), in Rozelle, New South Wales (NSW) in the Inner West Council Local Government Area (LGA). The Silos are situated on the western side of the Anzac Bridge, north of Victoria Road, between White Bay and Blackwattle Bay.

The subject signage has existed on the Glebe Island Silos for 32 years and has been the subject of numerous development and modification applications over that time. It is currently illuminated using top mounted 120W LED floodlights that are aimed downwards towards the two faces of the sign (Electrolight Australia 2025). The lights currently turn on at dusk (approximately 6 pm) and turn off at 11 pm daily. Under Australian Standard (AS) 4282:2019 – Control of Obtrusive Effects of Outdoor Lighting, the maximum permissible night-time luminance of the signage is 350 cd/m^2. The existing signage luminance level is currently 58 cd/m^2. It is understood that the standard has been updated, however the project still complies with the requirements of the standard and no changes are proposed or required in order to remain compliant.

It is understood that the existing signage is the subject of a legal and valid development consent (DA No. DA21/13182) that will expire on 8 September 2025. The client intends to lodge a S4.55 (2) Modification Application (MA), seeking a new three-year consent duration for the display of advertising signage The project does not propose a change in current luminance level and will remain at approximately 58 cd/m^2.

Cumberland Ecology previously prepared an ecological assessment addressing the impacts of the Silo signage lighting on nocturnal birds and bats. It is understood that an updated assessment is required to support the Modification Application. This ecological assessment will be used to inform and form part of the Statement of Environmental Effects for this project. In particular, the updated assessment is required to consider recent changes to the locality since the previous assessment as well as future developments, including but not limited to:

- The Rozelle Parklands; and
- The adjacent Bays West Stage 1 and White Bay Power Station areas.

Subsequent sections of this document provide an evaluation of the ecological impact of the signage and its associated light spill, particularly in regard to birds and bats. **Appendix B** contains a list of threatened fauna species recorded from the locality, and Tests of Significance for threatened fauna species potentially impacted by the project are included in **Appendix C**.

2. Methodology

2.1. Database Analysis

A comprehensive review of existing databases was conducted for the locality using the NSW Government BioNet Atlas (EHG 2025a) and Commonwealth Government Protected Matters Search Tool (DCCEEW 2025a). The locality is defined as the area within a 5 km radius of the centre of the subject site. The BioNet Atlas was examined for records of any threatened fauna species listed under the NSW *Biodiversity Conservation Act 2016* (BC Act) and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) within the locality. Due to the nature of the project, this assessment was limited to bats and birds, as these are deemed most likely to be potentially affected by light spill produced by the project.

2.2. Literature Review

The following documents (where relevant to ecology) were reviewed during the preparation of this assessment:

- *Biodiversity Conservation Act 2016* (BC Act), in particular Part 6 (Biodiversity Offsets Scheme) and Part 7 (Biodiversity Assessments and Approvals);
- NSW Biodiversity Vales Map
- Lighting Impact Assessment – Outdoor Signage at Glebe Island Silos, Sommerville Road, Rozelle by Electrolight Australia, dated January 2025.
- Glebe Island Silos Illuminated Signage – 10 Year Extension Consultant Advice Letter by Electrolight Australia, dated 03 December 2021;
- National Light Pollution Guidelines for Wildlife (DoEE 2020).
- State Environmental Planning Policy (Industry and Employment) 2021 – Chapter 3 and Schedule 5 Advertising and Signage, and the associated Transport Corridor Outdoor Advertising and Signage Guidelines 2017;
- The relevant provisions of the Biodiversity and Conservation Act 2016;
- State Environmental Planning Policy Biodiversity and Conservation 2021;
- National Light Pollution Guidelines for Wildlife;
- The Bays West Precinct Strategy;
- Bays West Place Based Transport Strategy;
- State Environmental Planning Policy (Precincts—Eastern Harbour City) 2021 - Appendix 8 Stage 1 Bays West Precinct, and the associated Stage 1 Bays West Design Guide 2022;
- The Bays West Stage 1 Draft Master Plan and Urban Design Framework;
- Rozelle Interchange Urban Design and Landscape Plan;
- The statutory plans and policies of the Ports Authority;

- The statutory planning and policy controls of the Inner West Council;
- AS/NZS 4282:2023 - Control of the obtrusive effects of outdoor lighting;
- Norton Rose Fulbright Legal Advice; and
- The operating parameters of the existing sign that are defined by the existing conditions of consent (DA 21/13182).
- Relevant sections of the following databases were also reviewed:
- NSW Threatened Biodiversity Database Collection (EHG 2025b);
- Commonwealth Species Profile and Threats Database (DCCEEW 2025b).

3. Results

3.1. Habitat Assessment

The subject site is completely lacking in vegetation or artificial structures that may be considered suitable habitat for native species including birds and bats. It is located in an extremely urban context, and the entire area surrounding the silos is surrounded by sealed surfaces, and major highways. The project is situated in a highly urbanised locality with very limited vegetation and high levels of existing light pollution from surrounding buildings and infrastructure such as Victoria Road and the Anzac Bridge. Accordingly, it is not expected that any species would nest or forage in the subject site, but there is some low potential for aerial species to encounter the site while foraging in the wider area or as part of migratory routes.

It is understood that the Rozelle Parklands and Bays West Precinct are currently under construction and will include plantings of vegetation and the construction of wetlands. The new development has vast open space which has provided additional shared path connections to the Anzac Bridge and view lines to the Silo signage. These areas are in relatively close proximity to the subject site and may offer some future potential foraging resources for bird and bat species, depending on the vegetation that is planted.

That ,notwithstanding, the Rozelle Parklands and Bays West Precinct also occur in a highly urbanised area with minimal habitat for native species. Accordingly, any fauna species that would have potential to occur are likely to be urban adapted and habituated to high levels of night light in the environment. As these developments are finalised, they will have their own lighting regimes, so any species utilising habitat in these areas in the future would be acclimated to the light spill associated with the adjacent subject site.

Several parks currently occur in the locality, including Bicentennial Park, Glebe Foreshore Park, and Jubilee Park, on the other side of Rozelle Bay to the subject site. These parks currently contain grassed areas and some planted canopy trees and would likely provide some habitat for native species, including birds and bats. Due to the complete absence of habitat in the subject site, it is considered unlikely that it is used by any native species, particularly given that areas of potential habitat occur relatively nearby.

3.2. Threatened Fauna

Although no fauna have been recorded within the subject site, a number of species listed as threatened under the BC Act and/or EPBC Act have been recorded within the wider locality (see **Appendix B**). These include several threatened bird species and eight threatened bat species. The species with potential to be impacted by lighting from the project are limited to nocturnal species, and therefore this assessment focusses mainly on the potential impact of the lighting on threatened nocturnal species. These are limited to the Grey-headed Flying-fox, the Sooty Owl, the Powerful Owl, the Barking Owl, and nine threatened microchiropteran bat species.

Despite several nocturnal species being recorded from the locality, the subject site does not provide any foraging, breeding or roosting habitat for these species. There is no vegetation of any kind in the subject site that could provide habitat for native species, and shoreline habitat is also absent. The interface between the marine habitats in White Bay and Johnstons Bay and Glebe Island is entirely artificial and appears to be constructed from concrete. This precludes the possibility of the shoreline being used for foraging or nesting purposes by migratory shorebirds, also considering the complete lack of any fringing vegetation. As no site inspection has been undertaken, it is uncertain if there is potential for microbats to utilize the structures present

for roosting, however, due to the lack of foraging vegetation in the vicinity of the subject site, it is unlikely that a significant number of bats would roost in the subject site, if any.

The Grey-headed Flying-fox, the nocturnal microbats and the owl species recorded from the locality are all fundamentally mobile and there is potential for them to fly through occasionally, however this is likely to only occur from time to time due to the absence of suitable habitats surrounding the subject site.

The introduction of new vegetation in the nearby Rozelle Parklands and Bays West Precinct may provide some additional foraging resources near to the subject site if suitable tree species are planted. However there is no reason to suggest that these species would transit through the subject site on their way to other more remote habitats, except occasionally.

These species are considered in more detail below.

3.2.1. Grey-headed Flying Fox

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is listed as Vulnerable under the BC Act and the EPBC Act. The species occurs in the coastal belt between Rockhampton (QLD) and Melbourne (VIC), and inhabits subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps, as well as urban gardens and cultivated fruit crops (EHG 2025b, DCCEEW 2025b). The species feeds on nectar and pollen on native trees, particularly Eucalyptus, Melaleuca and Banksia, as well as rainforest fruits. Due to the seasonality of its preferred food sources, the species is highly migratory, and relative abundance is varied throughout the year. Individuals roost in large colonial camps, usually within 20km of a regular food source, near water and dense canopy vegetation (EHG 2025b).

The BioNet Atlas holds 1757 records of the Grey-headed Flying-fox within the locality. The high number of records within the locality is likely due to the presence of two known roosting camps located in Gladesville and Centennial Park, approximately 5 km north-west and 5 km south-east of the subject site respectively. No foraging or nesting habitat is present within the subject site. However, as this species can travel up to 50km s part of a foraging range, it is expected that this species has potential to fly over the subject site on its way to foraging resources found within nearby Easton Park and Callan Park located to the west of the subject site. The introduction of new vegetation in the nearby Rozelle Parklands and Bays West Precinct may also provide some foraging resources if suitable tree species are planted. This species is not likely to roost or breed in the subject site as no camps are present within the subject site or locality.

3.2.2. Powerful Owl

The Powerful Owl (*Ninox strenua*) is listed as Vulnerable under the BC Act. In New South Wales, the species is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains. The Powerful Owl inhabits a variety of vegetation types, including woodland, open sclerophyll forest, tall open wet forest and rainforest. While the species generally requires large tracts of forest habitat, it is also known to occur in more fragmented habitats. The main prey for this species is medium-sized arboreal mammals, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider, as well as flying-foxes and occasionally other birds if mammals are less available. Nesting habitat consists of large hollows (greater than 45 cm diameter and greater than 100 cm deep) in old eucalypts (at least

150 years old), preferably amid canopy trees and sub-canopy or understorey trees or tall shrubs. As most prey species require hollows and a shrub layer, these are important habitat components for the owl (EHG 2025b).

The Bionet Atlas lists 257 records of the Powerful Owl in the locality of the project. No foraging habitat is present within the subject site. It is expected that the species may occasionally fly over the subject site on its way to foraging resources found within nearby Easton Park and Callan Park located to the west of the subject site or in the nearby Rozelle Parklands and Bays West Precinct. The species would not nest within the subject site as it does not contain any vegetation.

3.2.3. Barking Owl

The Barking Owl (*Ninox connivens*) is listed as Vulnerable under the BC Act. The species is found throughout most of continental Australia and in NSW occurs widely and sparsely. The main habitats consist of woodland and open forest, including fragmented remnants and partly cleared farmland. The species roosts in shaded portions of tree canopies and nests in hollows of large, old trees. Birds hunt throughout closed forest and more open areas and feed preferentially on small arboreal mammals. When prey densities are low, the owls may also feed on birds, bats, insects and terrestrial mammals (EHG 2025b).

The BioNet Atlas holds one record of the Barking Owl within the locality. No foraging habitat is present within the subject site. It is expected that the species may occasionally fly over the subject site on its way to foraging resources found within nearby parklands. The species would not nest within the subject site as it does not contain any vegetation.

3.2.4. Sooty Owl

The Sooty Owl (*Tyto tenebricosa*) is listed as Vulnerable under the BC Act. This species inhabits rainforest (including dry, subtropical and warm temperate rainforests) as well as moist eucalypt forests. In NSW, it occurs along the coast, coastal escarpment and eastern tablelands. It roosts in hollows of tall forest trees or heavy vegetation and nests in very large hollows. It forages on small ground or arboreal mammals such as Common Ringtail Possums or Sugar Gliders (EHG 2025b).

The BioNet Atlas holds one record of the Sooty Owl within the locality. No foraging habitat is present within the subject site. It is expected that this species has potential to fly over the subject site on its way to foraging resources found within nearby Easton Park and Callan Park located to the west of the subject site. The species would not nest within the subject site as it does not contain any vegetation.

3.2.5. Microchiropteran Bats

Several threatened microchiropteran bats have been recorded from the locality, and due to their similarities in habitat requirements, they are considered together in this section. Initially a brief overview of the habitat requirements of each species is provided, followed by an assessment of the likelihood of their occurrence and utilization of the subject site.

The Large-eared Pied Bat (*Chalinolobus dwyeri*) is listed as Endangered under the BC Act and EPBC Act. Preferred habitat for the species requires a combination of sandstone cliffs or escarpments for roosting and adjacent fertile woodland for foraging. However, roosting may also occur in previous mine shafts, caves,

overhangs and disused Fairy Martin nests. The species is widely and sparsely distributed across NSW, consisting of small populations of around 50 individuals. A large concentration of colonies is scattered around the sandstone escarpments of the Sydney basin and the north-west slopes (DCCEEW 2025b).

The Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) is listed as Vulnerable under the BC Act. The species is found along the south-east coast and ranges of Australia, usually in moist habitats with trees taller than 20m. Roosting generally occurs in eucalypt hollows but has also been recorded in buildings or under loose tree bark. The species feeds on flying insects, foraging around canopy height (EHG 2025b).

The Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*) is listed as Vulnerable under the BC Act. The species is found along the east coast of Australia, between south QLD and south NSW, and mainly occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. The species predominantly roosts in tree hollows but may also utilize bark and man-made structures. Roosting is usually solitary but communal roosting has occasionally been recorded (EHG 2025b).

The Little Bent-winged Bat (*Miniopterus australis*) is listed as Vulnerable under the BC Act. The species occurs along the east coast and ranges of Australia and inhabits moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub, usually preferring well-timbered areas. Bats roost in caves, tunnels, tree hollows, disused mines, stormwater drains, culverts, bridges and occasionally buildings. The species feeds on small insects, foraging below the canopy of dense vegetation (EHG 2025b).

The Large Bent-winged Bat (*Miniopterus orianae oceanensis*) is listed as Vulnerable under the BC Act. The species is distributed along the east and north-west coasts of Australia and inhabits rainforest, rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, melaleuca forests and open grasslands. Bats primarily roost in caves, but may also use abandoned mines, stormwater tunnels, buildings and other artificial structures. Populations are centred around maternity caves that are used for the birth and rearing of young, and extend within 300km of the cave during the non-breeding season. The species forage for moths and other flying insects above the canopy in forested areas (EHG 2025b).

The Southern Myotis (*Myotis macropus*) is listed as Vulnerable under the BC Act. The species occurs in the coastal band from the north-west of Australia along the top-end and down to western VIC. Bats usually roost in small groups close to water in caves, mine shafts, tree hollows, stormwater channels, buildings, wharves, bridges and dense foliage. The species forages for insects over streams and ponds (EHG 2025b).

The Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*) is listed as Vulnerable under the BC Act. The species is found across northern and eastern Australia and inhabits most types of woodland habitat. Individuals roost solitarily or in small groups, in tree hollows, buildings and occasionally mammal burrows, and forage for insects in most habitats (EHG 2025b).

The Greater Broad-nosed Bat (*Scoteanax rueppellii*) is listed as Vulnerable under the BC Act. The population is mostly distributed across the gullies and river systems that drain the Great Dividing Range and often extends to the coast. The species is primarily found in tall wet forest but inhabits a variety of habitats, including woodland, rainforest and moist and dry eucalypt forest. Bats roost mainly in tree hollows but may also utilize buildings, and forage for insects and other bats along creek and river corridors (EHG 2025b).

The above microchiropteran bat species have been recorded in the locality surrounding the subject site. However, these species are fundamentally mobile and would likely only encounter the project incidentally. The subject site is devoid of vegetation and it unlikely that the human-made structures are suitable habitat for nesting or roosting for these species.

3.3. Biodiversity Conservation Act 2016

A key part of the BC Act is the introduction of the Biodiversity Offsets Scheme (BOS). The BOS applies to local development (assessed under Part 4 of the EP&A Act) that is likely to significantly affect threatened species or communities or that triggers threshold levels for when assessment via the BOS is required. The threshold has three elements:

- Whether the amount of native vegetation being cleared exceeds a threshold area;
- Whether the area being cleared is mapped on the Biodiversity Values map published by the Minister for the Environment; and
- Whether the impact on threatened species or ecological communities is deemed significant.

If a proposed development triggers entry into the BOS, in accordance with Section 7.2 of the BC Act, the development is considered likely to significantly affect threatened species and the ecological assessment requires preparation of a Biodiversity Development Assessment Report (BDAR) by an accredited assessor. A BDAR is not required if a proposed development does not trigger entry into the BOS. An assessment of whether the current MA triggers these threshold levels is provided below.

The native vegetation clearing thresholds are defined in Part 7.2 of the *Biodiversity Conservation Regulation 2017*. As the current development application is limited to an extension to continue display of existing signage on the Glebe Island Silos, no native vegetation is proposed to be to be cleared. Therefore, the current MA does not trigger the BOS by this mechanism.

Under the BC Act the Biodiversity Values Map (BV Map) identifies sites which are considered to have significant environmental values which require the preparation of a Biodiversity Development Assessment Report (BDAR) to accompany any DA for impacts to these areas. As the site that is the subject of the current MA is not on the BV Map, the BOS is not triggered by this mechanism. It should be noted that all areas of outstanding biodiversity value, as mentioned in Section 7.2 of the BC Act are also shown as areas of biodiversity value on the BV Map. Therefore, the project also does not occur in an area of outstanding biodiversity value

As presented in Sections 3.1. and Section 3.2. of this document, the subject site does not comprise suitable habitat for any threatened species. Nonetheless a precautionary approach has been taken and Tests of Significance, in accordance with Section 7.2 and Section 7.3 of the BC Act have been prepared for threatened nocturnal fauna with potential to occur in the locality of the subject site. Based on the results of the Tests of Significance presented in Appendix C, a significant impact on threatened species is unlikely to occur as a result of the proposed MA and therefore the BOS threshold is not triggered by this mechanism.

Accordingly, a BDAR is not required under the Biodiversity Offsets Scheme (BOS) and this Desktop Ecological Assessment is deemed suitable ecological documentation for the purpose of assessing the ecological impacts of the current MA.

Furthermore, in relation to Modifications of planning approvals or activities, Clause 7.17 (2)(c) of the BC Act states that 'however a further biodiversity development assessment report is not required to be submitted if the authority or person determining the application for modification (or determining the environmental assessment requirements for the application) is satisfied that the modification will not increase the impact on biodiversity values'

The current MA seeks a new three-year consent duration for the display of advertising signage with no changes in current luminance level. As the current MA is limited to a continuation of existing lighting within a highly urbanised area with limited to no habitat values for native flora and fauna, the MA is not considered to result in any increases in impact on biodiversity values. Nonetheless, an impact assessment has been conducted as a precautionary measure and is detailed in the following sections.

4. Impact Assessment

This section provides an assessment of the impact of the project on nocturnal threatened species that have been recorded from the locality, followed by an assessment of compliance with the Wildlife Light Pollution Guidelines.

4.1. Threatened Fauna

Threatened fauna species with potential to be impacted by the project are limited to nocturnal species. Threatened nocturnal species that have been recorded within the locality of the subject site include owls, microchiropteran bats and the Grey-headed Flying-fox.

Tests of Significance were undertaken for all threatened species considered to have the potential to be impacted by the project (see **Appendix C**). Groups of species that share similar habitat requirements were assessed collectively and are summarised below. The assessed species are not considered to be significantly impacted by the project.

4.1.1. Grey-headed Flying-fox

The Grey-headed Flying-fox has been recorded within the locality, however, this species is unlikely to use the subject site for foraging purposes as it does not contain any vegetation. It roosts/breeds in camps which do not occur within the subject site. This species is highly mobile and would likely only encounter the subject site on occasion as part of a much broader foraging range on its way to and from foraging resources further afield.

The closest roosting camps are approximately 5 km away which, given the intensity and directionality of the lighting, are unlikely to be impacted by the light spill generated by the project.

Since the advertising signage has been operating in its current location for over 30 years, it is likely that the Grey-headed Flying-fox would have become habituated to the existing light spill. The project has implemented the National Light Pollution Guidelines for Wildlife (DoEE 2020) and ceases operating the lights at 11 pm, eliminating any light spill effects for the majority of night-time hours.

Furthermore, the lighting for the project complies with Australian Standard AS 4282-2019 *Control of the obtrusive effects of outdoor lighting*. It is understood that this standard has been updated since the last modification, however the lighting still meets the requirements of the standard. The project does not propose an increase in current intensity light levels and therefore the project will still be in compliance with the standard.

A Test of Significance has been prepared for this species and is presented in **Appendix C**. This assessment indicates that the project is unlikely to have a significant impact on the Grey-headed Flying-Fox.

4.1.2. Owls

Threatened owls recorded from the locality include the following species:

- Powerful Owl (*Ninox strenua*);
- Barking Owl (*Ninox connivens*); and
- Sooty Owl (*Tyto tenebricosa*).

Although the above owl species have all been recorded within the locality, due to the complete lack of any kind of foraging, breeding or roosting habitat in the subject site, they are very unlikely to occur. However, these species are highly mobile and have potential to fly over the subject site on occasion to access resources from other parts of the landscape as part of a broad foraging range.

Since the advertising signage has been operating in its current location for over 30 years, it is likely that local owl species would have become habituated to the existing light spill. The project has implemented the National Light Pollution Guidelines for Wildlife (DoEE 2020) and ceases operating the lights at 11 pm, eliminating any light spill effects for the majority of night-time hours.

Furthermore, the lighting for the project complies with Australian Standard AS 4282-2019 *Control of the obtrusive effects of outdoor lighting*. It is understood that this standard has been updated since the last modification, however the lighting still meets the requirements of the standard. The project does not propose an increase in current intensity light levels and therefore the project will still be in compliance with the standard.

A Test of Significance has been prepared for these owl species and is presented in **Appendix C**. This assessment indicates that the project is unlikely to have a significant impact on these species.

4.1.3. Microchiropteran Bats

Threatened microchiropteran bats recorded from the locality include the following species:

- Yellow-bellied Sheathtail-bat (*Saccolaimus flaviventris*);
- Eastern False Pipistrelle (*Falsistrellus tasmaniensis*);
- Large Bent-winged Bat (*Miniopterus orianae oceanensis*);
- Little Bent-winged Bat (*Miniopterus australis*);
- Large-eared Pied Bat (*Chalinolobus dwyeri*);
- Greater Broad-nosed Bat (*Scoteanax rueppellii*);
- Southern Myotis (*Myotis macropus*); and
- Eastern Coastal Free-tailed Bat (*Micronomus norfolkensis*).

Although the above microchiropteran bat species have all been recorded within the locality, these species are unlikely to use the subject site for foraging or roosting purposes it does not contain any vegetation or suitable man-made structures. These species are highly mobile and have potential to fly over the subject site on occasion to access resources from other parts of the landscape as part of a broad foraging range.

Since the advertising signage has been operating in its current location for over 30 years, it is likely that local microchiropteran bat species would have become habituated to the existing light spill. The project has implemented the National Light Pollution Guidelines for Wildlife (DoEE 2020) and ceases operating the lights at 11 pm, eliminating any light spill effects for the majority of night-time hours.

Furthermore, the lighting for the project complies with Australian Standard AS 4282-2019 *Control of the obtrusive effects of outdoor lighting*. It is understood that this standard has been updated since the last modification, however the lighting still meets the requirements of the standard. The project does not propose an increase in current intensity light levels and therefore the project will still be in compliance with the standard.

A Test of Significance has been prepared for these microchiropteran bat species and is presented in **Appendix C**. This assessment indicates that the project is unlikely to have a significant impact on these species.

4.2. Assessment of Compliance with Wildlife Light Pollution Guidelines

The National Light Pollution Guidelines for Wildlife (DoEE 2020) describes the best practice lighting design principles for infrastructure with external lighting in order to minimise potential impacts to wildlife. To the extent that is practicable, this project has implemented these principles as detailed below:

1. Start with natural darkness and only add light for specific purposes.

The project is located in an area with a high level of existing light pollution from surrounding buildings and infrastructure such as Victoria Road and the Anzac Bridge. The baseline light level in the locality is therefore not natural darkness. The project requires light for the specific purpose of lighting the signage which would otherwise not be visible during nighttime hours.

2. Use adaptive light controls to manage light timing, intensity and colour.

The project involves the use of LED lights which are able to be controlled remotely, implementing a light regime which includes the timing of the lights to only come on after sunset and turn off according to curfew at 11 pm, limiting the amount of exposure to local wildlife and eliminating light spill effects for the majority of nighttime hours. Additionally, the use of adaptive light controls ensure that the intensity of the light will remain at the current luminance level of 58 cd/m^2.

3. Light only the object or area intended – keep lights close to the ground, directed and shielded to avoid light spill.

Due to the nature of the project and the signage being visible from the elevated roadway, keeping lights close to the ground is not feasible and would only create additional light spill. However, the lights are shielded and are currently illuminating the signage from above and directed downwards to minimise light spill.

4. Use the lowest intensity lighting appropriate for the task.

The project proposes to retain the existing signage luminance level which is currently set at 58 cd/m^2, well below the maximum permissible nighttime luminance of the signage of 350 cd/m^2 and thereby using the lowest intensity lighting appropriate for the task.

5. Use non-reflective, dark-coloured surfaces.

Due to the nature of the project as advertising signage, the image contained within the sign changes periodically. The presence of dark-coloured surfaces would therefore vary from time to time, depending on which advertisement is currently in place.

6. Use lights with reduced or filtered blue, violet and ultra-violet wavelengths.

The types of lights currently in use for the project and the use of reduced or filtered blue, violet and ultra-violet wavelengths is unknown.

The National Light Pollution Guidelines for Wildlife does not provide recommendations relating to specific wattage or light intensity as the degree of impact of those factors on wildlife is dependent on each species. Instead, it recommended that projects requiring outdoor lighting consider the six best practice lighting design principles detailed above.

5. Conclusion

The project entails the lodgement of a Modification Application, seeking a new three-year consent duration for the display of advertising signage in the subject site. The project does not propose a change in current luminance level that will remain at approximately 58 cd/m^2.

Several threatened fauna species have been recorded from the locality, however those with potential to be impacted by the project are limited to nocturnal species which are active while the advertising signage is operating. Nocturnal threatened species with potential to occur in the subject site include the Grey-headed Flying-fox, three owl species and several microchiropteran bats.

Although these species have all been recorded within the locality, due to the complete lack of any kind of foraging, breeding or roosting habitat in the subject site, they are very unlikely to occur. However, these species are highly mobile and have potential to fly over the subject site on occasion to access resources from other parts of the landscape as part of a broad foraging range.

Since the advertising signage has been operating in its current location for over 30 years, it is likely that these threatened species would have become habituated to the existing light spill. The project has implemented the six best practice lighting principles detailed in National Light Pollution Guidelines for Wildlife (DoEE 2020) to the extent that is practicable and ceases operating the lights at 11 pm, eliminating any light spill effects for the majority of night-time hours.

Furthermore, the lighting for the project complies with Australian Standard AS 4282-2019 *Control of the obtrusive effects of outdoor lighting*. It is understood that this standard has been updated since the last modification, however the lighting still meets the requirements of the standard. The project does not propose an increase in current intensity light levels and therefore the project will still be in compliance with the standard.

Assessments have been conducted in accordance with the requirements of Section 7.2 and Section 7.3 of the BC Act and have confirmed that the project does not occur in an Area of Outstanding Biodiversity Value nor does it trigger any of the BOS thresholds. Tests of Significance in accordance with Section 7.3 of the BC Act have been completed for the Grey-headed Flying-fox, owl species and microchiropteran bats that have been recorded for the locality, and these indicate that the signage is unlikely to have a significant impact on these species. As the MA does not trigger entry into the BOS and will not result in any increases to impacts on biodiversity values compared to the current existing approvals, a BDAR is not required to accompany the MA.

6. References

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APPENDIX A :
Threatened Species Recorded from the Locality

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Table 1 Likelihood of Occurrence Assessment - Threatened Species

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Actitis hypoleucos	Common Sandpiper	-	M	1	Species occurs near coastlines utilising coastal and inland wetlands, streams, mudflats, lakes, claypans and reservoirs. Forages in shallow water and roosts on rocks or in roots or branches of vegetation.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat.
Aves	Apus pacificus	Fork-tailed Swift	-	M	6	Species has been recorded throughout NSW, but mostly east of the Great Divide. The species is almost exclusively aerial in Australia and breeds overseas. It forages from a metre above the ground, up to hundreds of metres in altitude, and mostly occur over inland plains, though sometimes over foothills, and coastal areas.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional transitory fly-throughs.
Aves	Ardenna grisea	Sooty Shearwater	-	V, M	1	In Australia, the Sooty Shearwater is known to breed on islands off New South Wales (NSW) and Tasmania. The species also occurs off the coast of south-east Queensland in small numbers and is a moderately common migrant and visitor to Victoria and South Australia. The species forages in pelagic sub-tropical, sub-Antarctic and Antarctic waters, but may occasionally forage inshore during rough weather. Birds nest in burrows or rock crevices	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional fly-throughs as part of a larger migratory and foraging range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						on coastal slopes, ridges and cliff tops, in herbfields, tussock grassland or forest.	
Aves	Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	1	In New South Wales the species is widespread from coast to inland, including the western slopes of the Great Dividing Range and farther west. The Dusky Woodswallow is found in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. The species primarily eats invertebrates, mainly insects, which are captured whilst hovering and sallying above the canopy or over water.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional fly-throughs.
Aves	Botaurus poiciloptilus	Australasian Bittern	E	E	2	Occurs in freshwater wetlands, and more rarely, estuarine wetlands. It favours wetlands with tall, dense vegetation, and forages in shallow water up to a depth of 0.3m. It nests in deep vegetative cover over shallow pools.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional fly-throughs.
Aves	Burhinus grallarius	Bush Stone-curlew	E	-	7	Lives in open forest and woodlands with a sparse, grassy ground layer, and fallen timber. It feeds on insects and small insects and vertebrates including frogs, lizards, and snakes. Nesting is undertaken in a scrape or small bare patch.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Calidris ferruginea	Curlew Sandpiper	CE	CE, M	2	Found in coastal areas with intertidal mudflats, including estuaries, inlets and lagoons, and ponds in saltworks. The species have also occasionally been recorded inland around lakes, dams and waterholes with mud or sand present. Main requirements for feeding habitats are the presence of mudflats or shallow water up to 60mm. Species may also forage in saltmarsh environments and flooded paddocks.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.
Aves	Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	2	Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she-oak species, particularly Black She-oak (Allocasuarina littoralis), Forest She-oak (A. torulosa) or Drooping She-oak (A. verticillata) occur.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project area. Any occurrence would be limited to occasional fly-throughs.
Aves	Diomedea exulans	Wandering Albatross	E	V, M	1	Marine and pelagic species that nests on islands near coastal or inland ridges, slopes, plateaux and plains, often on marshy ground.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory and foraging range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Gallinago hardwickii	Latham's Snipe	V	V, M	8	Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site.
Aves	Glossopsitta pusilla	Little Lorikeet	V	-	4	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophoras, Melaleucas and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Also utilises isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Grantiella picta	Painted Honeyeater	V	V	1	Occurs in Boree, Brigalow and Box-Gum Woodlands and Box-Ironbarks. Feeds primarily on mistletoe fruit and insects.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Haematopus longirostris	Pied Oystercatcher	E	-	4	Prefers intertidal flats of inlets and bays, open beaches and sandbanks. Nests primarily on coastal or estuarine beaches.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	34	The White-bellied Sea-Eagle is found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site, although they may forage in waters adjacent.
Aves	Hirundapus caudacutus	White-throated Needletail	V	V, M	2	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Occur over most types of habitat, particularly above wooded areas including open forest and rainforest, between trees or in clearings and below the canopy.	Unlikely. Suitable habitat is absent from the project site. Any occurrence would be limited to fly-throughs as part of a larger migratory range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Ixobrychus flavicollis	Black Bittern	V	-	1	Inhabits terrestrial and estuarine wetlands, generally in areas containing permanent water and dense vegetation. The species can occur in flooded grassland, woodland, rainforest, and mangroves. It feeds on frogs, reptiles, fish, and invertebrates such as snails, dragonflies, shrimp and crayfish. It roosts during the day on the ground amongst dense reeds or within trees. It nests in branches overhanging water.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Lathamus discolor	Swift Parrot	E	CE	3	In NSW mostly occurs on the coast and south west slopes. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Eucalyptus robusta, Corymbia maculata, C. gummifera, E. sideroxylon, and E. albens. Breeds in Tasmania in spring and summer.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Limosa lapponica	Bar-tailed Godwit	-	M	59	It is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Less frequently it occurs in salt marsh, salt lakes and brackish wetlands, sandy ocean beaches and rock platforms. It is a migratory wader, arriving in NSW for part of the year	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						(August - October) before departing overseas, with only a few individuals overwintering.	
Aves	Limosa limosa	Black-tailed Godwit	V	E, M	1	Found in coastal habitats such as mudflats, estuaries, bays and intertidal sandflats. It is also found in shallow and sparsely vegetated, near-coastal wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.
Aves	Lophoictinia isura	Square-tailed Kite	V	-	1	Found in a variety of timbered habitats including dry woodlands and open forests. It is a specialist hunter preying on passerine birds, especially honeyeaters and targets predominately nestlings and insects occuring in the tree canopy. It nests in tree forks or on large horizontal tree limbs located mostly along or near watercourses.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	1	Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (Eucalyptus sideroxylon), White Box (E. albens), Inland Grey Box (E. microcarpa), Yellow Box (E. melliodora) and Forest Red Gum (E. tereticornis). In NSW it is widespread, with records from the tablelands and western slopes	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						of the Great Dividing Range to the north-west and central-west plains and the Riverina.	
Aves	Ninox connivens	Barking Owl	V	-	1	Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting. Nests in hollows of large, old eucalypts. Hunts small arboreal mammals such as Squirrel Gliders and Ringtail Possums, but when loss of tree hollows decreases these prey populations it becomes more reliant on birds, invertebrates and terrestrial mammals. Requires very large permanent territories in most habitats due to sparse prey densities.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Ninox strenua	Powerful Owl	V	-	257	In NSW the Powerful Owl lives in forests and woodlands occurring in the coastal, escarpment, tablelands and western slopes environments. Specific habitat requirements include eucalypt forests and woodlands on productive sites on gentle terrain; a mosaic of moist and dry types, with mesic gullies and permanent streams; presence of leafy sub canopy trees or tall shrubs for roosting; presence of large old trees to provide nest hollows. Optimal habitat includes a tall shrub	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						layer and abundant hollows supporting high densities of arboreal marsupials.	
Aves	Pluvialis fulva	Pacific Golden Plover	-	M	2	Occurs in coastal habitats and occasionally around inland wetlands. Inland areas usually consist of wetlands with muddy margins and short emergent vegetation.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Ptilinopus regina	Rose-crowned Fruit-Dove	V	-	1	Occurs primarily in sub-tropical and dry rainforest, and occasionally in moist eucalypt forest and swamp forest.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Ptilinopus superbus	Superb Fruit-Dove	V	-	6	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Sternula albifrons	Little Tern	E	M	1	Occurs in sheltered coastal environments, beaches, estuaries, lakes, lagoons, river mouths and deltas. The species breeds from Tasmania to the Gulf of Carpentaria.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Tyto tenebricosa	Sooty Owl	V	-	1	Occurs in coastal rainforest, including dry, subtropical, and temperate rainforests, and moist eucalypt forests. Utilises tall trees in heavily vegetated areas for day time resting. It hunts during the night for small ground or tree dwelling mammals such as the Common Ringtail Possum or Sugar Glider. The species requires very large tree hollows for nesting.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Mammalia	Chalinolobus dwyeri	Large-eared Pied Bat	E	E	1	The species is associated with areas dominated by sandstone escarpments; sandstone cliffs and fertile woodland valley habitat occurring in close proximity to each other is important for the species. It roosts in cliff/escarpment areas and forages in fertile forest. Roosting is predominately in arch caves with dome roofs, but has been observed in disused mines shafts, overhangs, and disused Fairy Martin nests.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Mammalia	Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	-	5	Favours hollow trunks of Eucalypt trees over 20m high in wet sclerophyll forest and coastal mallee. Occasionally found in old wooden buildings.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Mammalia	Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	-	11	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Mammalia	Miniopterus australis	Little Bent-winged Bat	V	-	25	Distributed widely along Australian east coast and ranges from Cape York, Queensland to Wollongong, NSW. Inhabits moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas with dense cover for insect foraging at night. Roost in caves and tree hollows but will also utilise artificial structures such as tunnels, buildings and stormwater drains. Often roost alongside the Common Bentwing Bat, especially in winter.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Mammalia	Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	87	Widely distributed along east coast and north west coast of Australia. Roost preferentially in caves, however will utilise artificial structures such as storm water drains, culverts and bridges when natural habitat features are scarce. Discrete populations form around a maternity cave of specific temperature/humidity	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						conditions. Require forested areas for hunting insects above canopy.	
Mammalia	Myotis macropus	Southern Myotis	V	-	33	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Mammalia	Pteropus poliocephalus	Grey-headed Flying-fox	V	V	1757	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Low. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs as they access resources and return to their camps at Gladesville and Centennial Park.
Mammalia	Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	9	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Mammalia	Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	2	Found mainly in the gullies and river systems that drain the Great Dividing Range. Usually roosts in tree hollows and buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Table 2 Likelihood of Occurrence Assessment – Migratory Species

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Actitis hypoleucos	Common Sandpiper	-	M	1	Species occurs near coastlines utilising coastal and inland wetlands, streams, mudflats, lakes, claypans and reservoirs. Forages in shallow water and roosts on rocks or in roots or branches of vegetation.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat.
Aves	Apus pacificus	Fork-tailed Swift	-	M	6	Species has been recorded throughout NSW, but mostly east of the Great Divide. The species is almost exclusively aerial in Australia and breeds overseas. It forages from a metre above the ground, up to hundreds of metres in altitude, and mostly occur over inland plains, though sometimes over foothills, and coastal areas.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional transitory fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Ardenna grisea	Sooty Shearwater	-	V, M	1	In Australia, the Sooty Shearwater is known to breed on islands off New South Wales (NSW) and Tasmania. The species also occurs off the coast of south-east Queensland in small numbers and is a moderately common migrant and visitor to Victoria and South Australia. The species forages in pelagic sub-tropical, sub-Antarctic and Antarctic waters, but may occasionally forage inshore during rough weather. Birds nest in burrows or rock crevices on coastal slopes, ridges and cliff tops, in herbfields, tussock grassland or forest.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to occasional fly-throughs as part of a larger migratory and foraging range.
Aves	Ardenna pacifica	Wedge-tailed Shearwater	-	M	12	Pelagic, marine species that breeds on islands along the east and west coasts of Australia. Nests on flat areas with dense grassy and tussocky vegetation.	Low. Project area does not comprise suitable breeding or roosting habitat. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Ardenna tenuirostris	Short-tailed Shearwater	-	M	6	Breeds on islands along the eastern and southern coastlines of Australia. Migratory species which forages offshore.	Low. Project area does not comprise suitable breeding or roosting habitat. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.
Aves	Calidris ferruginea	Curlew Sandpiper	CE	CE, M	2	Found in coastal areas with intertidal mudflats, including estuaries, inlets and lagoons, and ponds in saltworks. The species have also occasionally been recorded inland around lakes, dams and waterholes with mud or sand present. Main requirements for feeding habitats are the presence of mudflats or shallow water up to 60mm. Species may also forage in saltmarsh environments and flooded paddocks.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Cuculus optatus	Oriental Cuckoo	-	M	1	Non-breeding visitor to Australia who is a brood parasite. Usually inhabits forested areas and can be found at all levels of the canopy and at a range of elevations.	Low. Project area does not comprise suitable breeding or roosting habitat. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.
Aves	Diomedea exulans	Wandering Albatross	E	V, M	1	Marine and pelagic species that nests on islands near coastal or inland ridges, slopes, plateaux and plains, often on marshy ground.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory and foraging range.
Aves	Gallinago hardwickii	Latham's Snipe	V	V, M	8	Seen in small groups or singly in freshwater wetlands on or near the coast, generally among dense cover. They are found in any vegetation around wetlands, in sedges, grasses, lignum, reeds and rushes and also in saltmarsh and creek edges on migration. They also use crops and pasture.	Unlikely. Suitable breeding, foraging or roosting habitats are absent from the project site.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Hirundapus caudacutus	White-throated Needletail	V	V, M	2	Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Occur over most types of habitat, particularly above wooded areas including open forest and rainforest, between trees or in clearings and below the canopy.	Unlikely. Suitable habitat is absent from the project site. Any occurrence would be limited to fly-throughs as part of a larger migratory range.
Aves	Hydroprogne caspia	Caspian Tern	-	M	4	Prefers sheltered coastal embayments but is known to occur in near-coastal or inland terrestrial wetlands. Builds nests in open areas or areas with low vegetation.	Low. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.
Aves	Limosa lapponica	Bar-tailed Godwit	-	M	59	It is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays. Less frequently it occurs in salt marsh, salt lakes and brackish wetlands, sandy ocean beaches and rock platforms. It is a migratory wader, arriving in NSW for part of the year (August - October) before	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
						departing overseas, with only a few individuals overwintering.	
Aves	Limosa limosa	Black-tailed Godwit	V	E, M	1	Found in coastal habitats such as mudflats, estuaries, bays and intertidal sandflats. It is also found in shallow and sparsely vegetated, near-coastal wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains.	Unlikely. Project area does not comprise suitable breeding, foraging or roosting habitat. Any occurrence would be limited to fly-throughs as part of a larger migratory range.
Aves	Pluvialis fulva	Pacific Golden Plover	-	M	2	Occurs in coastal habitats and occasionally around inland wetlands. Inland areas usually consist of wetlands with muddy margins and short emergent vegetation.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.
Aves	Pluvialis squatarola	Grey Plover	-	M	2	Found in coastal areas where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons.	Low. Suitable habitat is absent from the project site. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Stercorarius pomarinus	Pomarine Jaeger	-	M	1	Migratory visitor to Australia that breeds in the Arctic. Outside the breeding season they spend their time out at sea, with large numbers in the Caribbean. Nests on the ground, typically on a slight rise or hummock in the tundra.	Low. Project area and surrounds do not comprise suitable breeding or nesting habitat. Any occurrence would be limited to fly-throughs as part of a wider foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.
Aves	Sterna hirundo	Common Tern	-	M	7	Marine, pelagic and coastal habitats. The species is a non-breeding migrant to Australia, where it is widespread and common on the eastern coast south to eastern Victoria, and common on parts of the northern coast, mainly east of Darwin.	Unlikely. Project area does not comprise suitable breeding or roosting habitat. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.
Aves	Sternula albifrons	Little Tern	E	M	1	Occurs in sheltered coastal environments, beaches, estuaries, lakes, lagoons, river mouths and deltas. The species breeds from Tasmania to the Gulf of Carpentaria.	Unlikely. Suitable breeding, foraging or roosting habitat is absent from the project site. Any occurrence would be limited to occasional fly-throughs.

Class	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Count	Habitat Requirements	Likelihood of Occurrence
Aves	Thalasseus bergii	Crested Tern	-	M	37	Nesting habitat typically comprises low-lying sandy, rocky, or coral islands, sometimes amongst stunted shrubs, often without any shelter at all. When not breeding, the greater crested tern will roost or rest on open shores, less often on boats, pilings, harbour buildings and raised salt mounds in lagoons. It is rarely seen on tidal creeks or inland waters.	Low. Any occurrence would be limited to fly-throughs as part of a wider migratory and foraging range. As the signage has been in place for over 30 years, species is likely to be habituated to any light spill resulting from the project.

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APPENDIX B :
Tests of Significance

B.1. Introduction

This appendix contains the formal Tests of Significance required under Section 7.3 of the BC Act that have been prepared in accordance with the Threatened Species Test of Significance Guidelines (EHG 2018). The Test of Significance is used for determining whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

Tests of Significance have been provided for threatened nocturnal species that have been recorded from the locality (owls, microbats and the Grey-headed Flying-fox). Each Test of Significance is a series of factors (shown as italicised text below) for which a response has been supplied beneath in plain text. Due to the similarities in their habitat requirements, one composite Test of Significance has been prepared for owls, and one for all the threatened microbats.

B.2. Owls

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Although not recorded within the subject site, three threatened owl species have been recorded within the locality. As no habitat resources are present in the subject site they are not likely to use the area, however, these species are highly mobile and may potentially encounter the subject site on occasion as they transit through the locality. These species would not use the subject site for foraging or roosting purposes as it does not contain any vegetation.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

c. In relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The subject site does not contain any vegetation and therefore none is proposed to be removed. Suitable habitat in nearby parklands will remain. As such no habitat for the birds will be removed, modified, fragmented or isolated as a result of the project.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No area of outstanding biodiversity value is located in or near the subject site. Therefore, the project is not likely to have an adverse effect on an area of outstanding biodiversity value (directly or indirectly).

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

No key threatening processes will result as a consequence of the project.

Conclusion

Three threatened owl species have been recorded within the locality however, the project does not contain either foraging or roosting/breeding habitat for these species due to the lack of vegetation. The project has implemented the six best practice lighting principles detailed in the National Light Pollution Guidelines for Wildlife (DoEE 2020) to the extent that is practicable. The project is therefore not expected to create either direct or indirect impacts which will risk the survival or result in the fragmentation of these species' populations. Accordingly, no significant impact is predicted to occur to these owl species as a result of the project.

B.3. Microchiropteran Bats

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction

Although not recorded within the subject site, eight threatened microchiropteran bat species have been recorded within the locality. However, these species are unlikely to use the subject site for foraging or roosting purposes as it does not contain any vegetation or suitable man-made structures. These species are highly mobile and would likely only encounter the subject site on occasion as they transit through as part of a much broader foraging range..

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

c. In relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The subject site does not contain any vegetation and therefore none are proposed to be removed. Suitable microchiropteran bat habitat in nearby Easton Park and Callan Park located to the west of the subject site will remain. As such no habitat for microchiropteran bats will be removed, modified, fragmented or isolated as a result of the project.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No area of outstanding biodiversity value is located in or near the subject site. Therefore, the project is not likely to have an adverse effect on an area of outstanding biodiversity value (directly or indirectly).

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

No key threatening processes will result as a consequence of the project.

Conclusion

A number of threatened microchiropteran bat species have been recorded within the locality, however, the project does not contain either foraging or roosting/breeding habitat for microchiropteran bat species due to the lack of vegetation or suitable man-made structures. The project has implemented the six best practice lighting principles detailed in the National Light Pollution Guidelines for Wildlife (DoEE 2020) to the extent that is practicable. The project is therefore not expected to create either direct and indirect impacts which will risk the survival or result in the fragmentation of these species population. Accordingly, no significant impact is predicted to occur to microchiropteran bat species as a result of the project.

B.4. Grey-headed Flying Fox

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Although not recorded within the subject site, the Grey-headed Flying-fox has been recorded within the locality. However, this species is highly mobile and would likely only encounter the subject site on occasion as it transits through as part of a much broader foraging range. This species would not use the subject site for foraging purposes it does not contain any vegetation. It roosts/breeds in camps which do not occur within the

subject site. The closest roosting camps are approximately 5 km away which, given the intensity and directionality of the lighting, are unlikely to be impacted by the light spill generated by the project.

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

c. in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

The subject site does not contain any vegetation and therefore none are proposed to be removed. Suitable Grey-headed Flying-fox foraging habitat in nearby Easton Park and Callan Park located to the west of the subject site will remain. Additionally, the closest roosting camps are approximately 5 km away which, given the intensity and directionality of the lighting, are unlikely to be impacted by the light spill generated by the project. As such no habitat for the Grey-headed Flying-fox will be removed, modified, fragmented or isolated as a result of the project.

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

No area of outstanding biodiversity value is located in or near the subject site. Therefore, the project is not likely to have an adverse effect on an area of outstanding biodiversity value (directly or indirectly).

e. whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

No key threatening processes will result as a consequence of the project.

Conclusion

The Grey-headed Flying-fox has been recorded within the locality, however, the project does not contain either foraging or roosting/breeding habitat for the Grey-headed Flying-fox due to the lack of vegetation or roosting camps. The project has implemented the six best practice lighting principles detailed in the National Light

Pollution Guidelines for Wildlife (DoEE 2020) to the extent that is practicable. The project is therefore not expected to create either direct and indirect impacts which will risk the survival or result in the fragmentation of this species population. Accordingly, no significant impact is predicted to occur to the Grey-headed Flying-fox as a result of the project.