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CONCEPT MASTER PAN AND STAGE 1 DETAILED BUILT FORM APPROVAL FOR ST ALOYSIUS COLLEGE: RELEVANCE OF THE FRAMEWORK FOR BIODIVERSITY ASSESSMENT

Dear Peter,

The purpose of this letter is to consider the need for formal biodiversity assessments to support the proposed Concept Master Plan and Stage 1 Detailed Built Form approval for St Aloysius College (hereafter referred to as the 'project'). This assessment considers the entire land area covered by the Main School Campus, the Senior School Campus and the Junior School Campus of St Aloysius College (Lot 10 DP 880841, Lot 101 DP 1108496 and Lot 1 DP 830667, respectively), hereafter referred to collectively as the 'subject site' (see **Figure 1**).

Our assessment is set out below, with figures provided in **Appendix A**, flora species lists provided in **Appendix B** and threatened species records summarised in **Appendix C**. Based on our assessment of biodiversity at St Aloysius College, we recommend that a waiver for the preparation of a Biodiversity Development Assessment Report (BDAR) be sought from the Department of Planning and Environment.

1. Background

1.1 Development Approval Pathway

The project is classified as Stage Significant Development under Clause 15 of Schedule 1 of *State Environmental Planning Policy (State and Regional Development) 2011*, as the Capital Investment Value (CIV) exceeds $20 million for the purpose of alterations or additions to an existing school.

1.2 Assessment Requirements for State Significant Development

Section 7.9 of the NSW *Biodiversity Conservation Act 2016* (BC Act), requires all

development applications for State Significant Development to be accompanied by a Biodiversity Development Assessment Report (BDAR) unless the Planning Agency Head and the Environment Agency Head determine that the proposed development is not likely to have any significant impact on biodiversity values.

The main steps in the biodiversity assessment process for State Significant Development are as follows:

1. The Planning Agency Head and the Environment Agency Head determines if the Biodiversity Offsets Scheme applies to the State Significant Development and specifies the environmental assessment requirements;

2. The proponent engages an accredited person to assess the development site using the Biodiversity Assessment Method (BAM) and a BDAR is prepared;

3. The approval authority considers any serious and irreversible impacts and determines whether there are additional and appropriate measures to minimise impacts;

4. The approval authority sets an offset obligation as part of the Conditions of Approval; and

5. The proponent meets their offset obligation and begins their development.

The Biodiversity Assessment Method (BAM) sets out clear and repeatable methods to conduct an assessment of direct and indirect impacts. The BAM is supported by the BAM Tool, which is a web-based tool that quantifies direct impacts using 'biodiversity credits'. Two types of credits are generated by the BAM Tool, ecosystem credits and species credits. Ecosystem credits are calculated based on a number of variables including landscape features, native vegetation and ecosystem credit species (species that are reliably predicted by habitat surrogates). Species credits are calculated based on the number of individuals (flora) or the area of habitat (fauna) of species credit species (species that are not reliably predicted by habitat surrogates).

The BAM includes a requirement to prepare a BDAR for the development site. The BDAR must be prepared by an accredited assessor. A proponent is required to submit the biodiversity development assessment report as part of an Environmental Impact Statement for a State Significant Development.

1.3 Waiver of Requirement to Prepare a Biodiversity Development Assessment Report

Section 7.9 of the BC Act indicates that there are some circumstances in which the Planning Agency Head and the Environment Agency Head will determine that a proposed development is not likely to have a significant impact on biodiversity values and as such, a BDAR is not required to be prepared. Biodiversity values are defined under the BC Act and the *Biodiversity Conservation Regulation 2017* (BC Regulation), and include:

- Vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state;
- Habitat suitability—being the degree to which the habitat needs of threatened species are present at a particular site;
- Threatened species abundance—being the occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site;
- Vegetation abundance—being the occurrence and abundance of vegetation at a particular site;
- Habitat connectivity—being the degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range;
- Threatened species movement—being the degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle;
- Flight path integrity—being the degree to which the flight paths of protected animals over a particular site are free from interference;
- Water sustainability—being the degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.

For a waiver to be applied for future development at the subject site, it needs to be demonstrated that the above listed biodiversity values will not be significantly impacted.

1.4 Native Vegetation Definition

For the purpose of the BC Act, native vegetation has the same definition as per the *Local Land Services Act 2013*. The definition of native vegetation is as follows:

> *60B Meaning of "native vegetation"*
>
> *(1) For the purposes of this Part, native vegetation means any of the following types of plants native to New South Wales:*
>
> *(a) trees (including any sapling or shrub or any scrub),*
>
> *(b) understorey plants,*
>
> *(c) groundcover (being any type of herbaceous vegetation),*
>
> *(d) plants occurring in a wetland.*

(2) A plant is native to New South Wales if it was established in New South Wales before European settlement. The regulations may authorise conclusive presumptions to be made of the species of plants native to New South Wales by adopting any relevant classification in an official database of plants that is publicly accessible.

(3) For the purposes of this Part, native vegetation extends to a plant that is dead or that is not native to New South Wales if:

(a) the plant is situated on land that is shown on the native vegetation regulatory map as category 2-vulnerable regulated land, and

(b) it would be native vegetation for the purposes of this Part if it were native to New South Wales.

(4) For the purposes of this Part, native vegetation does not extend to marine vegetation (being mangroves, seagrasses or any other species of plant that at any time in its life cycle must inhabit water other than fresh water). A declaration under section 14.7 of the Biodiversity Conservation Act 2016 that specified vegetation is or is not marine vegetation also has effect for the purposes of this Part.

1.5 The Project

The State Significant Development application for the project seeks consent for the Concept Master Plan and Stage 1 Detailed Built Form approval of the St Aloysius' College based on:

1. Concept approval is sought for the building envelopes for alterations and additions and new development across the Junior, Main and Senior Campuses.

2. Detailed built approval is sought for Main and Senior Campuses. For these two campuses the delivery will be conducted as two (2) bodies of work as summarised below:

    - Wyalla Senior Campus: Single storey addition to the heritage building fronting Robertson Lane, as well as internal refurbishment and upgrades of teaching and learning spaces.

    - Upper Pitt Street Main Campus: Demolition and rebuild of the existing four (4) storey North-East Wing fronting Upper Pitt Street, construction of new infill building in the existing quadrangle, and associated refurbishment of north-wing, south-wing, Great Hall, and Chapel.

The impacts to biodiversity as a result of the project is summarised below for each campus.

1.5.1 Main School Campus

The development is anticipated to result in the clearance of the existing planted garden bed. On the ground level the garden bed is to be replaced with garden beds and hanging garden troughs to be planted with ferns and tree ferns. This is to be supplemented by a substantial roof level planting arrangement featuring raised beds, trough planters and ornamental tree plantings.

1.5.2 Senior School Campus

The project at the Senior School Campus involves the construction of a new courtyard, a one storey extension to an existing structure and internal refurbishments of an existing structure. The construction of the courtyard will result in the clearance of the existing exotic dominated garden beds.

1.5.3 Junior School Campus

Within the Junior School Campus, all existing trees along Bligh Street, Humphrey Street and Burton Street are anticipated to be retained. There is potential for the loss of trees along Crescent Place, however, any loss of trees is to be mitigated with the replanting of replacement individuals. The existing vegetation is to be supplemented with the addition of native screen plantings and native ornamental tree plantings.

2. Methods

2.1 Site Inspection

Dr Rohan Mellick and Michael Davis of Cumberland Ecology visited the subject site on Monday, 9 July 2018. The subject site was inspected by traversing the external landscape around St Aloysius College and select internal elements with records of flora species and potential fauna habitat noted. Vegetation within the subject site was assessed in relation to Plant Community Types (PCTs) known to occur within the locality. Three random meander surveys, in which flora species encountered were recorded, were undertaken within the subject site. This included meander RMS1 within the Junior School Campus, meander RMS2 within the Senior School campus and meander RMS3 within the Main Campus. During site inspection, notes and photographs were taken documenting vegetation and habitat features throughout the subject site.

2.2 Database Analysis

Database searches were conducted to identify threatened species, populations, that occur within the locality (5 km) using the NSW Office of Environment and Heritage (OEH) BioNet Atlas database (OEH 2018a). The BioNet Atlas search facility was used to generate records of threatened flora and fauna species and populations listed under the BC Act within the search area. The number, age, and location of such records were considered to provide an indication of the species that could have the potential to occur on or around the subject site.

2.3 GIS Mapping

A desktop analysis was completed to identify whether any vegetation communities were present on or nearby the subject site. To do this, the subject site was plotted against the broad scale mapping compiled by the OEH for the Sydney Metropolitan area (OEH 2016). A vegetation map of the subject site was then produced based upon observations of vegetation during the site inspection.

The results from the OEH BioNet Atlas search were downloaded and plotted onto an aerial image (Nearmap; dated 18-1-2018) corresponding to the subject site. This subsequently displayed any threatened species within the locality to determine the potential for the species to be present within the subject site.

3. Key Findings

The subject site is a predominantly an artificial landscape with planted garden beds and isolated trees situated throughout the campuses.

3.1 Native Vegetation Desktop Study

As shown in **Figure 2**, the subject site was predominantly cleared prior to 1943. Current aerial photography and recent vegetation mapping indicates that the subject site has been maintained as cleared.

The desktop assessment revealed that a number of native vegetation communities exist within the locality; however none have been mapped as occurring within the subject site. The closest mapped occurrence of native vegetation comprises a small patch of Coastal Sandstone Foreshores Forest, located approximately 1km to the west of the subject site within Sawmillers Reserve. This community is the most abundant community within the locality occupying a total area of approximately 276 ha. Other notable communities within the locality include Coastal Enriched Sandstone Moist Forest (occupying 31.96 ha) and Coastal Enriched Sandstone Dry Forest (occupying 19.46 ha); however neither of these communities occurs within 1 km of the subject site.

3.2 Vegetation of the Subject Site

The majority of the vegetation within the subject site has been planted and cultivated within recent decades. The only vegetation that appears to have persisted since 1943 (see **Figure 2**) includes a large *Cinnamomum camphora* (Camphor Laurel) individual located within the Senior School Campus and a single *Angophora costata* (Smooth-barked Apple) individual occurring outside of the subject site, overhanging the north-western boundary of the Senior School Campus. Generally, the composition, structure and function of vegetation within the subject site and the surrounding landscape have been altered significantly from a near natural state and do not resemble any naturally occurring Plant Community Types.

i. Main School Campus

The Main School Campus contains a single garden bed with an area of 0.01 ha (see **Photograph 1**). This garden bed consists predominantly of exotic planted species and scattered exotic weeds. The exotic canopy is comprised of a single *Metrosideros excelsa* (New Zealand Christmas Bush) and a single *Cupressus leylandii* (Leyland Cypress), whilst a *Liquidambar styraciflua* (Sweetgum) overhangs the garden bed from the adjacent property.

The shrub layer is dominated by exotic garden plants including *Camellia* sp. (Camellia), *Clivia miniata* (Bush Lily), *Coprosma repens* (Mirror Bush), *Coleonema pulchellum* (Confetti Bush) and *Murraya paniculata* (Mock Orange). The ground layer is currently dominated by exotic species including *Clivia miniata*, *Juniperus* sp. (Juniper), *Cyperus involucratus* (Umbrella Plant), *Dietes grandiflora* (Fortnight Lily), *Rhaphiolepis indica* (Indian Hawthorn) and *Plumbago auriculata* (Plumbago).

Four planted native species were present within the shrub layer including *Callistemon citrinus* (Crimson Bottlebrush), *Callistemon rigidus* (Stiff Bottlebrush), *Dicksonia antarctica* (Soft Treefern) and *Pittosporum undulatum* (Sweet Pittosporum). The ground layer contains scattered native species including *Adiantum aethiopicum* (Common Maidenhair), *Dianella caerulea* var. *producta* (Blue Flax-Lily), *Dampiera purpurea* (Purple Dampiera) and *Hardenbergia violacea* (False Sarsaparilla).

Photograph 1 Garden bed within the Main School Campus

ii. Senior School Campus

The Senior School Campus features a number of garden beds planted with exotic species and others planted with native species (see **Photograph 2** and **Photograph 3**). The Senior School Campus features a number of exotic trees including a large *Cinnamomum camphora* (Camphor Laurel), a row of *Ulmus parvifolia* (Chinese Elm) and garden beds with *Acer palmatum*

(Japanese Maple). Other exotic beds within the Senior School Campus are dominated by small trees and shrubs such as *Cupressus leylandii* (Leyland Cypress), *Murraya paniculata* (Mock Orange), *Bambusa* sp. (Bamboo), *Camellia* sp. (Camellia), *Cordyline australis* (Cabbage Tree) and *Gardenia jasminoides* (Gardenia).

A single large *Lophostemon confertus* (Brush Box) exists within the Senior School Campus. This species is native to NSW but is not endemic to the Sydney region. The native plantings throughout the Senior School Campus include small trees and shrubs such as *Cupaniopsis anacardioides* (Tuckeroo), *Acmena smithii* (Lilly Pilly), *Syzygium australe* (Brush Cherry), *Banksia ericifolia* (Heath-leaved Banksia), *Banksia integrifolia* (Coast Banksia), *Banksia spinulosa* (Hairpin Banksia), *Grevillea* cultivars, *Callistemon citrinus* (Crimson Bottlebrush), *Waterhousea floribunda* (Weeping Lilly Pilly), *Elaeocarpus reticulatus* (Blueberry Ash) and *Correa alba* (White Correa). The native plantings include ground cover species such as *Actinotus helianthi* (Flannel Flower) and *Dianella caerulea* var. *producta* (Blue Flax-lily). The Senior School Campus also features an open lawn area consisting of the commonly cultivated grass *Stenotaphrum secundatum* (Buffalo Grass) scattered with exotic weeds such as *Soliva sessilis* (Bindyi), *Sonchus asper* (Prickly Sowthistle), *Lysimachia arvensis* (Scarlet Pimpernel) and *Hypochaeris radicata (*Catsear).

Photograph 2 **Garden bed within the Senior School Campus featuring a combination of native and exotic species**

Photograph 3 Native dominated planting within the Senior School Campus

iii. Junior School Campus

The Junior School Campus contains rows of medium sized trees in prominent rows along the boundary of the lot. The native trees throughout these plantings include *Brachychiton acerifolius* (Illawarra Fame Tree), *Banksia integrifolia* (Coast Banksia), *Eucalyptus microcorys* (Tallow Wood), *Eucalyptus robusta* (Swamp Mahogany), *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Lophostemon confertus* (Brush Box) and *Tristaniopsis laurina* (Water Gum). The exotic trees throughout the Junior School Campus include the Queensland native *Corymbia citriodora* (Lemon-scented Gum) and *Platanus x Acerifolia* (London Plane Tree) (see **Photograph 4**).

Native shrubs planted throughout the garden beds and as isolated individuals include *Melaleuca linariifolia* (Flax-leaved Paperbark), *Banksia ericifolia* (Heath-leaved Banksia), *Banksia spinulosa* (Hairpin Banksia), *Callistemon citrinus* (Crimson Bottlebrush) and *Acmena smithii* (Lilly Pilly). Exotic planted shrubs include *Citrus* sp., *Hibiscus* sp., *Juniperus* sp., *Photinia serratifolia* (Chinese Photinia) and *Rhaphiolepis indica* (Indian Hawthorn). The Junior School Campus features a small area of lawn consisting of the commonly cultivated grass *Stenotaphrum secundatum* (Buffalo Grass) scattered with exotic weeds such as *Soliva sessilis* (Bindyi), *Sonchus asper* (Prickly Sowthistle), *Lysimachia arvensis* (Scarlet Pimpernel) and *Hypochaeris radicata (*Catsear). **Photograph 5** displays a mixed exotic and native planting typical of the Junior School campus.

The stand of trees along Crescent Place to potentially be impacted is comprised of exotic species such as *Platanus x Acerifolia* (London Plane Tree) and *Jacaranda mimosifolia* (Jacaranda). There are additionally two native trees adjacent to these species including a single *Lophostemon confertus* (Brush Box) and a single *Brachychiton acerifolius* (Illawarra Flame Tree).

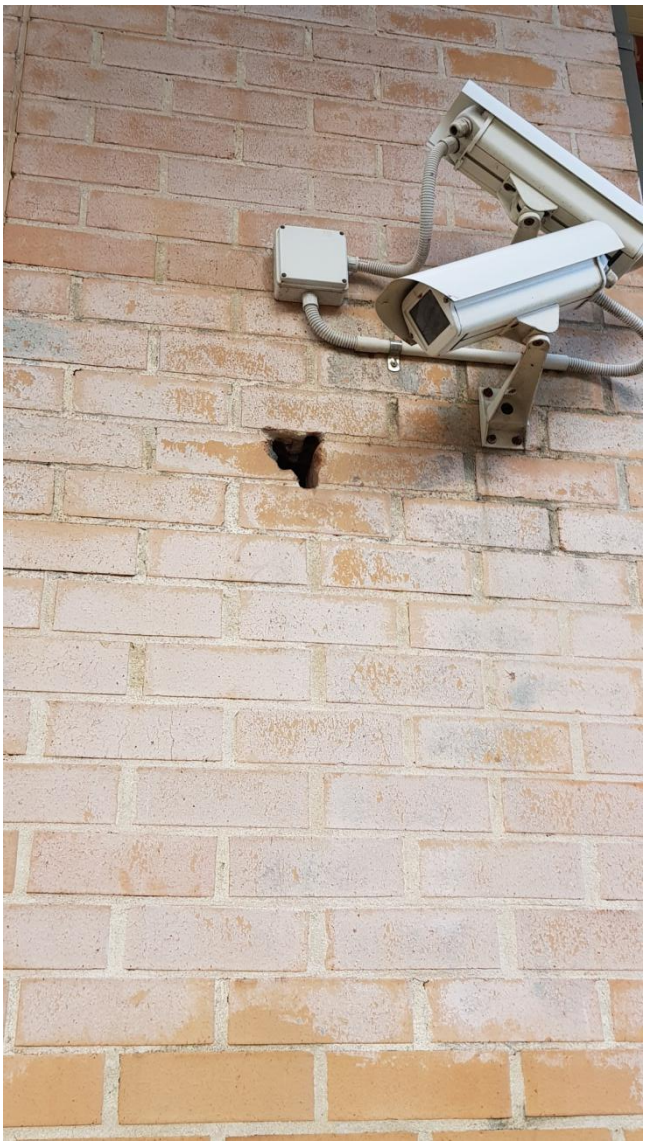
Photograph 4 **Row of *Platanus x Acerifolia* (London Plane Trees) within the Junior School Campus with the potential to be impacted by the project**

Photograph 5 **Mixed exotic and native planting within the Junior School Campus**

3.3 Fauna Habitat Features of the Subject Site

The primary habitat for native fauna within the subject site is the native and exotic plantings throughout all three campuses. This vegetation may form part of the foraging range of a number of non-threatened highly mobile or aerial groups of species including birds such as birds, microchiropteran bats and arboreal mammals. This vegetation may form part of the foraging range of a number of threatened highly mobile or aerial species including birds such as the Powerful Owl (*Ninox strenua)*, the Grey-headed Flying Fox (*Pteropus poliocephalus*) and threatened microchiropteran bats. Nectivorous, and frugivorous species such as the Grey-headed Flying Fox may utilise the native and exotic vegetation within the subject site to feed on blooms and fruit whilst insectivorous species such as microchiropteran bats may forage for insects throughout the canopy layer. The Powerful Owl may utilise the extremely limited foraging values within the subject site to hunt for prey such as Ring-tailed Possums (*Pseudocheirus peregrinus*) which have the potential to occur.

The subject site would not be expected to contain roosting habitat for threatened bird species with the potential to occur such as the Powerful Owl as no tree hollows were observed. Whilst Grey-headed Flying Foxes are likely to occur, the subject site does not contain a roosting camp. The subject site may provide roosting habitat for microchiropteran bats known to utilise urban habitats such as but are not limited to Bentwing-bats (*Miniopterus australis* and *Miniopterus schreibersii oceanensis*). These species may roost in the small crevices observed in some of the buildings and the drainage infrastructure throughout the subject site (as shown in **Photograph 6**). This habitat is quite limited as only a small number of suitable features were observed.



Photograph 6 **Crevice in the side of a building within the Junior School Campus comprising potential Microchiropteran bat roosting/refuge habitat**

3.4 Threatened Ecological Communities

As the vegetation within the subject site is of a planted origin situated throughout garden beds and rows of trees, it has been assessed as not conforming to any Threatened Ecological Communities known from the locality. The single remnant *Angophora costata* that overhangs the subject site is a characteristic species of a number of vegetation communities within the locality, including some TECs. However due to the extensive clearing within and surrounding the subject site, it cannot be determined which vegetation communities it is likely to have occurred within.

3.5 Threatened Flora

No existing records of threatened flora species are present on the subject site, however threatened species are known to occur within the locality (see **Appendix C**). Due to the lack of nearby records and the highly developed nature of the subject site, it is considered unlikely that any threatened flora species would occur within the subject site. Additionally, the site inspection did not reveal any threatened flora species within the subject site.

3.6 Threatened Fauna

A limited number of threatened fauna species are known to occur within the locality of the subject site (see **Appendix C**). No existing BioNet Atlas records of threatened fauna species are present on the subject site, however a number of records occur adjacent to the subject site and within the locality. The only threatened fauna that would be expected to occur within the subject site and immediate surround are highly mobile, aerial species. The Grey-headed Flying-fox (*Pteropus poliocephalus*) and Powerful Owl and are amongst the most notable threatened fauna that occur in North Sydney and there are records within 500 metres of the subject site.

There are many records of Grey Headed Flying Fox near within the locality as there has been a substantial colony of the species roosting in the Royal Botanic Gardens for many years. The Grey Headed Flying Fox is known to forage within 20km of a camp site and may fly over the subject site in search of foraging resources such as nectar and pollen (OEH 2018b). The Grey Headed Flying Fox may occasionally and opportunistically utilise the foraging resources within the subject site. The Powerful Owl may occasionally and opportunistically hunt for arboreal mammal prey species such as the Common Ringtail Possum (*Pseudocheirus peregrinus*) within the subject site as part of a larger foraging range (OEH 2018d); however the subject site would not be expected to support an abundance of prey species.

Some microchiropteran bats are also known to forage in urban areas. These include but are not limited to Bentwing-bats (*Miniopterus australis* and *Miniopterus schreibersii oceanensis*). These two species of bats are insectivorous cave roosting bats that often frequent buildings and infrastructure, sheltering in roofs, pipes and culverts, etc. (OEH 2017, 2018c). It is conceivable that these species could occupy nooks and crannies in the buildings of the subject site and may occasionally and opportunistically forage within the vegetation present.

Of the threatened fauna species, only the microchiropteran bats (particularly Bentwing-bats) have any chance of roosting within the subject site. These bats could infiltrate small cracks, crevices and other openings in the buildings to roost (as shown in **Photograph 6**). However, given the observed condition and maintenance of the buildings, colonies are unlikely to occur

4. Biodiversity Values Assessment

The BC Act and the BC Regulation list a suite of biodiversity values that are relevant to assessments that must take place under the BC Act. To demonstrate that the project at St Aloysius College will not impact upon biodiversity, **Table 1** systematically comments upon the relevance of each value.

Table 1 Assessment of biodiversity values within the subject site

Biodiversity Value	Assessment within Subject Site
BC Act - Part 1 Section 1.5 (2)	
(a) vegetation integrity—being the degree to which the composition, structure and function of vegetation at a particular site and the surrounding landscape has been altered from a near natural state,	No native remnant vegetation occurs on the subject site. The existing vegetation is comprised entirely of planted exotic and native species within garden beds and in rows. A single *Angophora costata* individual occurring outside of the subject site overhangs the north-western boundary of the Senior School Campus. The composition, structure and function of vegetation within the subject site and the surrounding landscape are considered to have been altered significantly from a near natural state and do not resemble any naturally occurring PCTs known from the locality. The project is anticipated to have a limited impact on native vegetation within the subject site with the majority of native plantings to be retained including a majority of the large to medium sized native tree plantings within the Junior School Campus. The stand of trees along Crescent Place to be potentially be impacted is predominantly comprised of the exotic species *Platanus x Acerifolia* (London Plane Tree) and *Jacaranda mimosifolia* (Jacaranda). There are two trees native to NSW adjacent to the exotic trees including a single *Lophostemon confertus* (Brush Box) and a single *Brachychiton acerifolius* (Illawarra Flame Tree), however these species are not locally endemic. The impacts relating to the potential removal of trees along Crescent Place is anticipated to be temporary as replacement trees are to be planted if trees are to be removed.
(b) habitat suitability—being the degree to which the habitat needs of threatened species are present at a particular site,	As discussed above, St Aloysius College has little potential to provide habitat for threatened species other than highly mobile, aerial species. Threatened species with the highest likelihood to utilise the subject site include the Grey Headed Flying Fox and the Powerful Owl. Additionally, microchiropteran bats may roost within small crevices throughout the buildings. These highly mobile species may occasionally and opportunistically utilise the limited foraging resources of the subject site as part of a larger foraging range.
(c) biodiversity values, or biodiversity-related	See below.

Table 1 Assessment of biodiversity values within the subject site

Biodiversity Value	Assessment within Subject Site
values, prescribed by the regulations.	
BC Regulation - Part 1 Clause 1.4	
(a) threatened species abundance—being the occurrence and abundance of threatened species or threatened ecological communities, or their habitat, at a particular site,	No threatened species were observed during the site inspection and as described above, only highly mobile, aerial species would be expected to utilise the subject site occasionally and opportunistically.
(b) vegetation abundance—being the occurrence and abundance of vegetation at a particular site,	As described above, no native remnant vegetation occurs on the subject site. A potentially remnant *Angophora costata* overhangs the north-eastern corner of the Senior School Campus, however the trunk does not originate from within the subject site and will not be impacted by the project. The subject site contains both exotic and native dominated plantings. The project is expected to result in the clearing of plantings containing scattered native species. The vast majority of planted native trees, shrubs and groundcover are to be retained. Any trees to be potentially removed on Crescent Lane are to be replaced post works.
(c) habitat connectivity—being the degree to which a particular site connects different areas of habitat of threatened species to facilitate the movement of those species across their range,	St Aloysius College may contribute to the habitat connectivity throughout the largely cleared and artificial landscape that dominates the suburb of Kirribilli. Trees within the subject site and its immediate surroundings may function as stepping stone habitat for highly mobile fauna, providing a degree of habitat connectivity between the small parks and reserves of the locality such as Kirribilli Point, Bradfied Park and Milson Park. The subject site would only be expected to provide habitat connectivity to highly mobile, aerial species due to the significant barriers to movement of terrestrial or sessile fauna as a result of the highly modified and developed landscape.
(d) threatened species movement—being the degree to which a particular site contributes to the movement of threatened species to maintain their lifecycle,	As above, the subject site does not contribute to the movement of threatened species other than highly mobile, aerial species. Impacts within the subject site would not be expected to have any impact on the lifecycle of such species,
(e) flight path integrity—being the degree to which the flight paths of protected animals over a particular site are free from interference,	St Aloysius College will be changed externally with an infill development and extensions to existing structures. The infill development and the additions are not anticipated to exceed the height of existing structures

Table 1 Assessment of biodiversity values within the subject site

Biodiversity Value	Assessment within Subject Site
	throughout the subject site. Subsequently the project is not expected to impact upon free-flying animals (threatened or otherwise) by interfering with flight paths.
(f) water sustainability—being the degree to which water quality, water bodies and hydrological processes sustain threatened species and threatened ecological communities at a particular site.	The waters of the harbour around the Kirribilli do sustain some threatened marine species. However, no developments are proposed that would impact upon the marine environment.

5. Conclusion

Little scope occurs for redevelopment of St Aloysius College to have significant impacts upon defined biodiversity values generally – especially for the proposed internal redevelopments. Similar conclusions can be drawn for redevelopments that occur outside, as at most, such redevelopment could impact mixed native and exotic planted vegetation. This vegetation may only comprise potential, marginal habitat within the broad habitat ranges of highly mobile threatened species such as the Grey-headed Flying Fox, microchiropteran bats and the Powerful Owl.

When assessing impacts likely from the project for internal and external redevelopments of the three campuses of St Aloysius College there is limited justification for considering impacts to threatened species with the detail required under the BAM. The project may result in marginal reduction in the foraging habitat of highly mobile, aerial threatened species. Further investigations may be required for future development proposals involving greater impacts to vegetation and potential bat roosting habitat as there is a possibility (albeit very low) that assessments under the BAM could be triggered. When assessing impacts likely from the project in its current form for internal and external redevelopments of St Aloysius College, there is very little likelihood of significant impacts to threatened species.

On the basis of our investigations, we believe that the preparation of a BDAR is not necessary due to the low likelihood of impacts to biodiversity. Therefore, we recommend that a waiver for the preparation of a BDAR be sought from the Department of Planning and Environment for the proposed Concept Master Plan and Stage 1 Detailed Built Form approval for St Aloysius College, constituting State Significant Development. Future development applications requiring major intrusive destruction of the existing buildings or significantly greater impacts to vegetation may warrant surveys for roosting bats in the building cavities or further vegetation assessment.

If any further information is required, or if you have any questions, please do not hesitate to call me on (02) 9868 1933.

Yours sincerely,

Dr David Robertson
Director
David.robertson@cumberlandecology.com.au

References

OEH. 2016. The Native Vegetation of the Sydney Metropolitan Area - VIS_ID 4489. Office of Environment and Heritage, Sydney.
OEH. 2017. Eastern Bentwing-bat - profile. Office of Environment and Heritage, Hurstville.
OEH. 2018a. BioNet Atlas. Office of Environment and Heritage.
OEH. 2018b. Grey-headed Flying-fox - profile. NSW Office of Environment and Heritage., Hurstville.
OEH. 2018c. Little Bentwing-bat - Profile. NSW Office of the Environment and Heritage, Hurtsville.
OEH. 2018d. Powerful Owl - profile. Office of Environment and Heritage, Hurstville.

Appendix A

Figures

Legend

Subject Site

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:
Image © Nearmap
(18/01/2018)

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I:\...\18097\Figures\Letter 2\20180718\Figure 1. Location_subject site

Figure 1. Location of the subject site

0 50 100 150 200 m

Legend

Subject Site

Coordinate System: MGA Zone 56 (GDA 94)

Image Source:
Sixmaps (2018)

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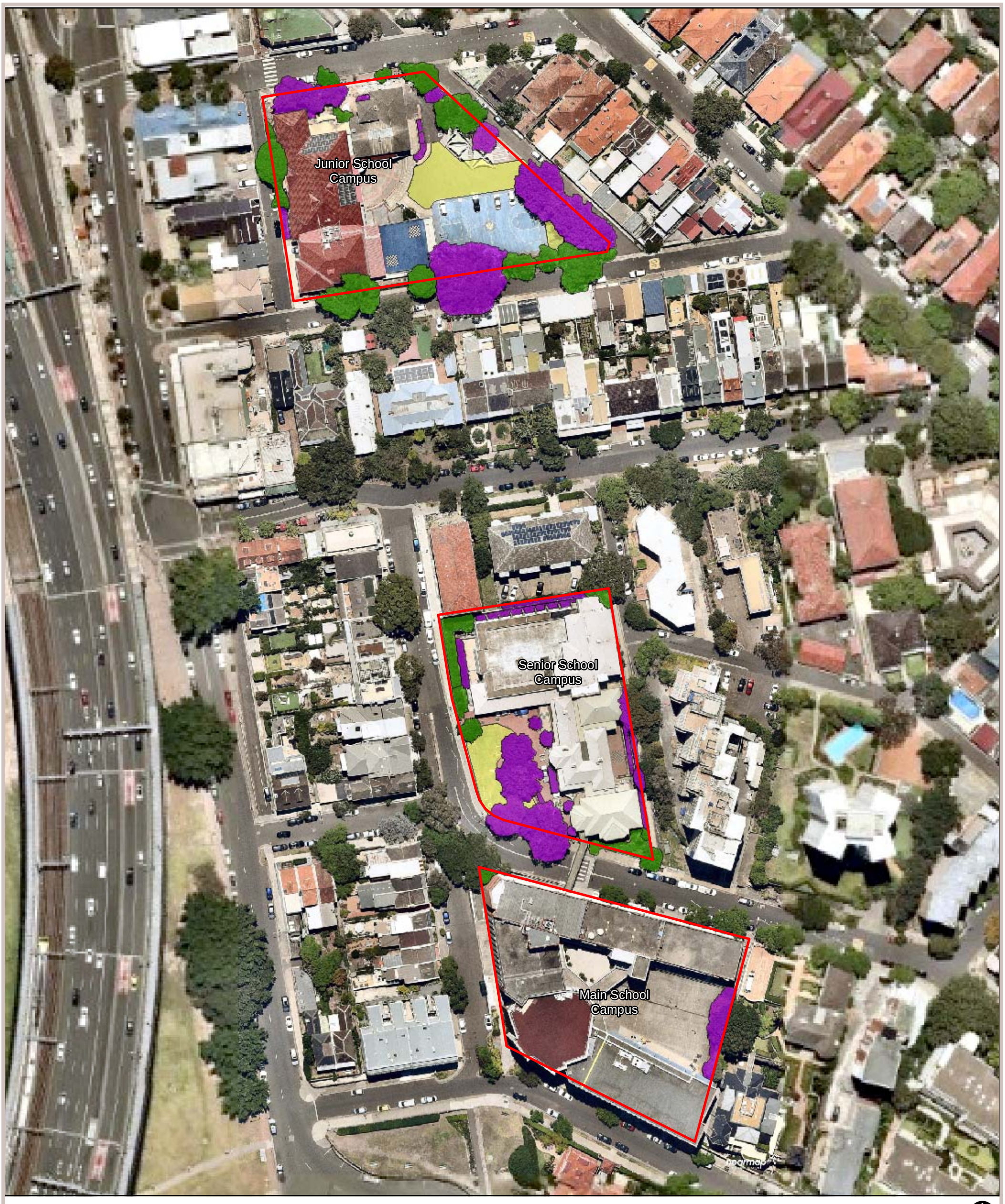
I:\...\18097\Figures\Letter 2\Figure 2. Subject site_1943

Figure 2. Historic aerial photograph of the subject site (1943 imagery)

0 10 20 30 40 m



Legend

Subject Site

Vegetation Community

Native Dominated Planting

Exotic Dominated Planting

Exotic Dominated Grassland

Coordinate System: MGA Zone 56 (GDA 94)

Image Source: Nearmap © Image (18/01/2018)

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0 10 20 30 40 m

I:\...\18097\Figures\Letter 2\20180718\Figure 2. Vegetation_subject site

Figure 3. Vegetation of the subject site

Appendix B

Flora Species List

Table 1 Flora species recorded within the subject site

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Exotic	High Threat Weed	BAM Growth Form Group	RMS1	RMS2	RMS3
Adiantaceae	*Adiantum aethiopicum*	Common Maidenhair	-	-			Fern (EG)			X
Amaryllidaceae	*Clivia miniata*		-	-	*			X	X	X
Apiaceae	*Actinotus helianthi*	Flannel Flower	-	-			Forb (FG)		X	
Apiaceae	*Daucus carota*	Wild Carrot	-	-	*			X		
Apiaceae	*Platysace* spp.		-	-			Shrub (SG)	X		
Apocynaceae	*Plumeria rubra*	Frangipani	-	-	*			X		
Araceae	*Alocasia brisbanensis*	Cunjevoi	-	-			Forb (FG)	X		
Araliaceae	*Hedera helix*	English Ivy	-	-	*	YES		X	X	
Arecaceae	*Syagrus romanzoffiana*	Cocos Palm	-	-	*			X		
Asparagaceae	*Asparagus aethiopicus*	Asparagus Fern	-	-	*	YES		X		
Asteliaceae	*Cordyline australis*	Cabbage Tree	-	-	*				X	
Asteraceae	*Hypochaeris radicata*	Catsear	-	-	*				X	
Asteraceae	*Lactuca saligna*	Willow-leaved Lettuce	-	-	*			X		
Asteraceae	*Soliva sessilis*	Bindyi	-	-	*				X	
Asteraceae	*Sonchus asper*	Prickly Sowthistle	-	-	*				X	
Bignoniaceae	*Jacaranda mimosifolia*	Jacaranda	-	-	*			X		
Bromeliaceae	*Bromelia* spp.		-	-	*			X		
Buxaceae	*Buxus microphylla*		-	-	*			X		
Convallariaceae	*Ophiopogon japonicus*	Dwarf lilyturf	-	-	*				X	
Cupressaceae	*Cupressus leylandii*		-	-	*				X	X

Table 1 Flora species recorded within the subject site

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Exotic	High Threat Weed	BAM Growth Form Group	RMS1	RMS2	RMS3
Cupressaceae	*Juniperus* spp.	Juniper	-	-	*			X		X
Cyperaceae	*Cyperus involucratus*	Umbrella Plant	-	-	*					X
Dicksoniaceae	*Dicksonia antarctica*	Soft Treefern	-	-			Other (OG)			X
Doryanthaceae	*Doryanthes excelsa*	Gymea Lily	-	-			Other (OG)	X	X	
Elaeocarpaceae	*Elaeocarpus reticulatus*	Blueberry Ash	-	-			Shrub (SG)	X	X	
Euphorbiaceae	*Triadica sebifera*	Chinese Tallowood	-	-	*	YES		X		
Fabaceae (Faboideae)	*Hardenbergia violacea*	False Sarsaparilla	-	-			Other (OG)	X		X
Fabaceae (Faboideae)	*Pisum sativum* var. *arvense*	Field Pea	-	-	*			X		
Fabaceae (Mimosoideae)	*Acacia floribunda*	White Sally	-	-			Shrub (SG)	X		
Goodeniaceae	*Dampiera purpurea*	Purple Dampiera	-	-			Forb (FG)			X
Iridaceae	*Dietes grandiflora*		-	-	*					X
Lamiaceae	*Westringia fruticosa*	Coastal Rosemary	-	-			Shrub (SG)	X		
Lauraceae	*Cinnamomum camphora*	Camphor Laurel	-	-	*	YES			X	
Lomandraceae	*Lomandra longifolia*	Spiny-headed Mat-rush	-	-			Grass & grasslike (GG)	X		
Malaceae	*Eriobotrya japonica*	Loquat	-	-	*				X	
Malaceae	*Photinia serratifolia*	Chinese Photinia	-	-	*			X		

Table 1 Flora species recorded within the subject site

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Exotic	High Threat Weed	BAM Growth Form Group	RMS1	RMS2	RMS3
Malaceae	*Rhaphiolepis indica*	Indian Hawthorn	-	-	*			X		X
Malvaceae	*Brachychiton acerifolius*	Illawarra Fame Tree	-	-			Tree (TG)	X		
Malvaceae	*Hibiscus* spp.		-	-	*			X		
Melastomataceae	*Melastoma* spp.		-	-				X		
Moraceae	*Ficus benjamina*	Weeping Fig	-	-	*			X		
Moraceae	*Morus alba*	White Mulberry	-	-	*			X		
Myrsinaceae	*Lysimachia arvensis*	Scarlet Pimpernel	-	-	*				X	
Myrtaceae	*Acmena smithii*	Lilly Pilly	-	-			Tree (TG)	X	X	
Myrtaceae	*Callistemon citrinus*	Crimson Bottlebrush	-	-			Shrub (SG)	X	X	
Myrtaceae	*Callistemon rigidus*	Stiff Bottlebrush	-	-			Shrub (SG)			X
Myrtaceae	*Callistemon viminalis*	Weeping Bottlebrush	-	-			Tree (TG)			X
Myrtaceae	*Corymbia citriodora*	Lemon-scented Gum	-	-	*			X		
Myrtaceae	*Eucalyptus microcorys*	Tallow wood	-	-			Tree (TG)	X		
Myrtaceae	*Eucalyptus robusta*	Swamp Mahogany	-	-			Tree (TG)	X		
Myrtaceae	*Lophostemon confertus*	Brush Box	-	-			Tree (TG)	X	X	
Myrtaceae	*Melaleuca linariifolia*	Flax-leaved Paperbark	-	-			Shrub (SG)	X		
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved Paperbark	-	-			Tree (TG)	X		
Myrtaceae	*Metrosideros excelsa*	New Zealand Christmas Bush	-	-	*					X
Myrtaceae	*Syzygium australe*	Brush Cherry	-	-			Shrub (SG)		X	
Myrtaceae	*Tristaniopsis laurina*	Kanooka	-	-			Tree (TG)	X		

Table 1 Flora species recorded within the subject site

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Exotic	High Threat Weed	BAM Growth Form Group	RMS1	RMS2	RMS3
Myrtaceae	*Waterhousea floribunda*	Weeping Lilly Pilly	-	-			Tree (TG)		X	
Ochnaceae	*Ochna serrulata*	Mickey Mouse Plant	-	-	*	YES		X		
Oleaceae	*Olea europaea* subsp. *cuspidata*	African Olive	-	-	*			X		
Phormiaceae	*Dianella caerulea* var. *producta*	Blue Flax-Lily	-	-			Forb (FG)		X	X
Pittosporaceae	*Pittosporum undulatum*	Sweet Pittosporum	-	-			Shrub (SG)			X
Plumbaginaceae	*Plumbago auriculata*	Cape leadwort	-	-	*					X
Poaceae	*Bambusa* spp.	Bamboo	-	-	*				X	
Poaceae	*Cenchrus* spp.		-	-	*		Grass & grasslike (GG)		X	
Poaceae	*Phyllostachys aurea*	Fishpole Bamboo	-	-	*				X	
Poaceae	*Poa annua*	Winter Grass	-	-	*				X	
Poaceae	*Stenotaphrum secundatum*	Buffalo Grass	-	-	*	YES			X	
Proteaceae	*Banksia ericifolia*	Heath-leaved Banksia	-	-			Shrub (SG)		X	
Proteaceae	*Banksia integrifolia*	Coast Banksia	-	-			Tree (TG)	X	X	
Proteaceae	*Banksia spinulosa*	Hairpin Banksia	-	-			Shrub (SG)	X	X	
Proteaceae	*Grevillea* spp.		-	-			Shrub (SG)	X	X	
Rubiaceae	*Coprosma repens*	Taupata	-	-	*					X
Rubiaceae	Gardenia *jasminoides*	Gardenia	-	-	*				X	
Rutaceae	*Citrus* spp.		-	-	*			X		
Rutaceae	*Coleonema pulchellum*		-	-	*			X		X

Table 1 Flora species recorded within the subject site

Family	Scientific Name	Common Name	BC Act Status	EPBC Act Status	Exotic	High Threat Weed	BAM Growth Form Group	RMS1	RMS2	RMS3
Rutaceae	*Correa alba* var. *alba*	White Correa	-	-			Shrub (SG)	X	X	
Rutaceae	*Crowea* spp.		-	-			Shrub (SG)	X		
Rutaceae	*Murraya paniculata*	Mock Orange	-	-	*				X	X
Sapindaceae	*Acer palmatum*	Japanese Maple	-	-	*				X	
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo	-	-			Tree (TG)		X	
Strelitziaceae	*Strelitzia nicolai*		-	-	*			X		
Theaceae	*Camellia sasanqua*	Sasanqua Camellia	-	-	*				X	X
Theaceae	*Camellia* spp.		-	-	*				X	X
Ulmaceae	*Celtis sinensis*	Japanese Hackberry	-	-	*					X
Ulmaceae	*Ulmus parvifolia*	Chinese Elm	-	-	*				X	
Violaceae	*Viola* spp.		-	-	*		Forb (FG)		X	

Appendix C

Threatened Species Likelihood of Occurrence

Table 2 Threatened flora likelihood of occurrence

Family	Scientific	Common Name	BC Act Status	EPBC Act Status	Locality Records	Likelihood of Occurrence	Likelihood of impacts from DAs within the subject site
Casuarinaceae	*Allocasuarina portuensis*	Nielsen Park She-oak	E	E	34	Nil	Nil
Ericaceae	*Epacris purpurascens* var. *purpurascens*		V	-	5	Nil	Nil
Fabaceae (Mimosoideae)	*Acacia terminalis* subsp. *terminalis*	Sunshine Wattle	E	E	53	Nil	Nil
Myrtaceae	*Callistemon linearifolius*	Netted Bottle Brush	V	-	1	Nil	Nil
Myrtaceae	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V	V	5	Nil	Nil
Myrtaceae	*Syzygium paniculatum*	Magenta Lilly Pilly	E	V	24	Nil	Nil
Doryanthaceae	*Doryanthes palmeri*	Giant Spear Lily	V	-	1	Nil	Nil

Key: V = Vulnerable, E = Endangered, CE = Critically Endangered

Table 3 Threatened fauna likelihood of occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Records	Within buildings	Around the exterior and throughout vegetation	Likelihood of impacts from the project within the subject site
Amphibia							
Pseudophryne australis	Red-crowned Toadlet	V	-	48	Nil	Nil	Nil
Aves							
Actitis hypoleucos	Common Sandpiper	-	M	2	Nil	Nil	Nil

Table 3 Threatened fauna likelihood of occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Records	Within buildings	Around the exterior and throughout vegetation	Likelihood of impacts from the project within the subject site
Anseranas semipalmata	Magpie Goose	V	-	1	Nil	Nil	Nil
Apus pacificus	Fork-tailed Swift	-	M	6	Nil	Nil	Nil
Ardea ibis	Cattle Egret	-	M	2	Nil	Nil	Nil
Ardenna pacificus	Wedge-tailed Shearwater	-	M	2	Nil	Nil	Nil
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	1	Nil	Nil	Nil
Botaurus poiciloptilus	Australasian Bittern	E	E	1	Nil	Nil	Nil
Burhinus grallarius	Bush Stone-curlew	E	-	2	Nil	Nil	Nil
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	2	Nil	Nil	Nil
Diomedea exulans	Wandering Albatross	E	M	1	Nil	Nil	Nil
Egretta sacra	Eastern Reef Egret	-	M	1	Nil	Nil	Nil
Glossopsitta pusilla	Little Lorikeet	V	-	2	Nil	Nil	Nil
Haematopus fuliginosus	Sooty Oystercatcher	V	-	2	Nil	Nil	Nil
Haematopus longirostris	Pied Oystercatcher	E	-	1	Nil	Nil	Nil
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	M	30	Nil	Nil	Nil
Hieraaetus morphnoides	Little Eagle	V	-	1	Nil	Nil	Nil
Hirundapus caudacutus	White-throated Needletail	-	M	9	Nil	Nil	Nil

Table 3 Threatened fauna likelihood of occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Records	Within buildings	Around the exterior and throughout vegetation	Likelihood of impacts from the project within the subject site
Hydroprogne caspia	Caspian Tern	-	M	1	Nil	Nil	Nil
Ixobrychus flavicollis	Black Bittern	V	-	2	Nil	Nil	Nil
Lathamus discolor	Swift Parrot	E	CE	3	Nil	Nil	Nil
Limosa lapponica	Bar-tailed Godwit		M	1	Nil	Nil	Nil
Lophoictinia isura	Square-tailed Kite	V	-	1	Nil	Nil	Nil
Ninox connivens	Barking Owl	V	-	2	Nil	Nil	Nil
Ninox strenua	Powerful Owl	V	-	200	Nil	May occasionally and opportunistically hunt for prey within the subject site as part of a large habitat range	Low likelihood of impact as the removal of native trees is anticipated to result in a marginal reduction of potential foraging habitat.
Onychoprion fuscata	Sooty Tern	V	-	1	Nil	Nil	Nil
Phaethon lepturus	White-tailed Tropicbird	-	M	1	Nil	Nil	Nil
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	1	Nil	Nil	Nil
Ptilinopus superbus	Superb Fruit-Dove	V	-	5	Nil	Nil	Nil
Sterna hirundo	Common Tern	-	M	5	Nil	Nil	Nil
Sternula albifrons	Little Tern	E	M	1	Nil	Nil	Nil
Tyto tenebricosa	Sooty Owl	V	-	1	Nil	Nil	Nil
Insecta							
Petalura gigantea	Giant Dragonfly	E	-	1	Nil	Nil	Nil

Table 3 Threatened fauna likelihood of occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Records	Within buildings	Around the exterior and throughout vegetation	Likelihood of impacts from the project within the subject site
Mammalia							
Arctocephalus forsteri	New Zealand Fur-seal	V	-	2	Nil	Nil	Nil
Arctocephalus pusillus doriferus	Australian Fur-seal	V	-	7	Nil	Nil	Nil
Miniopterus australis	Little Bentwing-bat	V	-	1	Limited chance to occur in crevices within the buildings	May occasionally and opportunistically forage within the subject site as part of a large habitat range	Low likelihood of impact if major works to the buildings are to occur. The removal of native trees is anticipated to result in a marginal reduction of potential foraging habitat.
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-	63	Limited chance to occur in crevices within the buildings	May occasionally and opportunistically forage within the subject site as part of a large habitat range	Low likelihood of impact if major works to the buildings are to occur. The removal of native trees is anticipated to result in a marginal reduction of potential foraging habitat.
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	10	Nil	Nil	Nil
Myotis macropus	Southern Myotis	V	-	473	Limited chance to occur in crevices within the buildings	May occasionally and opportunistically forage within the subject site as part of a large habitat range	Low likelihood of impact if major works to the buildings are to occur. The removal of native trees is anticipated to result in a marginal reduction of potential foraging habitat.

Table 3 Threatened fauna likelihood of occurrence

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Locality Records	Within buildings	Around the exterior and throughout vegetation	Likelihood of impacts from the project within the subject site
Petaurus norfolcensis	Squirrel Glider	V	-	1	Nil	Nil	Nil
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	282	Nil	The species would be expected to be frequently seen overflying site associated with the camp located at the botanical gardens. May occasionally and opportunistically forage within the subject site as part of a large habitat range	Low likelihood of impact as the removal of native trees is anticipated to result in a marginal reduction of potential foraging habitat.

Key: V = Vulnerable, E = Endangered, CE = Critically Endangered, M = Migratory