

# Proposed development of F01 Chau Chak Wing Museum

## Preliminary Biodiversity Assessment Report

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### Summary

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#### Objectives

The objective of this study is to provide preliminary information regarding potential impacts on biodiversity in relation to the Project.

#### Methods and Results

The study gathered a range of information regarding the flora and fauna of the site and locality using a combination of 'desktop' analysis and a site inspection. The study found that the site does not contain any native vegetation communities and that fauna habitat is extremely limited. However, one threatened species, the Grey-headed Flying-fox, forages in trees on the site. Potential habitat for a second threatened species, the Eastern Freetail-bat, also occurs. Most of the habitat for the Grey-headed Flying-fox occurs outside of the development site and will be retained, including all of the fig trees within and outside of the site. Two of three hollow-bearing trees that occur within the development site will be retained and the third is proposed for salvage and translocation. There was no evidence of microbat use of the tennis centre building.

#### Conclusions

The study found that there will be little or no impact of the Project on most native flora and fauna in the locality. Impacts on the Grey-headed Flying-fox and potential impacts on the Eastern Freetail-bat are not likely to be significant. The FBA Landscape Score is zero and application of the FBA beyond calculation of the landscape score is not recommended.

#### Recommendations

If there is a requirement to prepare an impact assessment and/or an offset strategy for this Project, then it is recommended that a more suitable assessment mechanism than the FBA/BBAM be utilised; for example, the Transport for NSW tree offset calculator, which can be used to calculate replanting requirements in the instance of tree removal.

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# 1. Objectives of assessment

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## 1.1 Project Context

The University of Sydney wishes to construct a five-storey building referred to as the F01 Chau Chak Wing Museum (the Project) on its Camperdown campus. The Project will include construction of two underground levels and three above-ground levels and will be located mainly on the existing tennis courts and grounds to the east of the Great Hall. The project is a State Significant Development and requires an Environmental Impact Statement to be prepared. The Secretary's Environmental Assessment Requirements (SEARs) have been received and include requirement 10, "Biodiversity", which reads:

*"Biodiversity impacts related to the proposed development are to be assessed and documented in accordance with the Framework for Biodiversity Assessment, unless where otherwise agreed by the OEHL, by a person accredited in accordance with s142B(1)(c) of the Threatened Species Conservation Act 1995."*

## 1.2 Objectives

The Framework for Biodiversity Assessment (FBA) describes a three-stage process for the preparation of a Biodiversity Assessment Report (BAR), including: Stage 1 – Biodiversity Assessment; Stage 2 – Impact assessment (biodiversity values); and Stage 3 – Biodiversity Offset Strategy. Appendix 7 of the FBA states that:

*"If not prepared prior to application, it is recommended that the outcomes of Stage 1 are discussed with OEHL prior to commencement of Stage 2, during the preparation of the EIS."*

Stage 1 of the BAR is described in Sections 3, 4, 5 and 6 of the FBA. Section 3 of the FBA describes the form and content of the BAR, Section 4 of the FBA describes the calculation of a landscape score, Section 5 of the FBA describes the assessment of native vegetation on the development site and Section 6 of the FBA describes the assessment of threatened species and populations. Section 5.1.1.3 of the FBA states that:

*"Areas that are not native vegetation (i.e. land not included in native vegetation extent) do not require further assessment in the FBA except where it is assessed as habitat for threatened species according to Section 6.4."*

The BioBanking Assessment Methodology and Credit Calculator Operational Manual (BAM) (upon which much of the FBA is based) indicates that the minimum size of a vegetation zone should be 0.25 ha and that:

*"If the total area of native vegetation on the development site is an area of less than 0.25 ha, then the assessor should consider whether the methodology is a suitable option for assessing the biodiversity values of the site" and*

*"If the development site contains only scattered paddock trees and the groundcover is not native (indigenous) vegetation or the groundcover is in low condition, the assessor should consider whether the biobanking methodology is a suitable option to assess the biodiversity values of the site, especially where the area is small. Assessment for biobanking is not recommended in these circumstances"*

The development site does not contain native vegetation and the groundcover is not native (indigenous) vegetation. Therefore, the objective of this study is to provide preliminary information regarding potential impacts on biodiversity in relation to the Project that can be used by the University as a basis for discussions with the Office of Environment and Heritage (OEH).

The scope of this study is therefore to provide information in relation to the following relevant matters discussed in Sections 3 and 4 of the FBA as information required for Stage 1 of a BAR:

- identification and mapping of development site;
- identification of landscape features in the area in which the development site is located, including bioregions, native vegetation extent, rivers and wetlands, etc.; and
- calculation of a landscape value score.

The study also includes a consideration of whether or not threatened species, populations and ecological communities or their habitats (as listed by the NSW *Threatened Species Conservation Act 1995* [TSC Act] and/or Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* [EPBC Act]) are likely to be affected by the Project.

## 2. Site and Project Descriptions

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### 2.1 The Site and Surrounds

The development site is located in the north-east of the University's grounds near the Parramatta Road entrance (Figure 1), including the area currently used as the Fisher Tennis Courts site (Figure 2). Parramatta Road runs in an approximate east to west alignment to the north. University Place runs in a north-south direction to the west, beyond which is the University's main Quadrangle Building. University Avenue is located to the south. Victoria Park is located beyond the University grounds to the east.

The main portion of the site consists of three tennis courts, to the north of which is a small weatherboard tennis pavilion building, and an area of lawn and garden to the east. The northern boundary between the University campus and Parramatta Road features a retaining wall above which is a linear garden bed. A row of fig trees is located between the development site and University Avenue to the south.

### 2.2 The Project

The proposal comprises the construction of the new Chau Chak Wing Museum in the north-eastern sector of the Camperdown campus. The proposed museum will comprise a new five level building (maximum of three storeys above ground) with central void and will include:

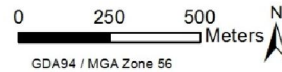
- Entry foyer and museum shop
- Gallery space
- CERC (Collections Education Research & Conservation Facility) space
- Collection storage and workshop areas
- Staff offices, facilities and boardroom
- Study rooms and schools education area
- A 130 seat Auditorium
- Café and terrace facilities
- Loading dock
- Plant rooms.

The proposed works also include associated earthworks, tree removal, landscape works and augmentation to existing infrastructure and services.



**Legend**

Chau Chak Building-Proposed Footprint



GDA94 / MGA Zone 56


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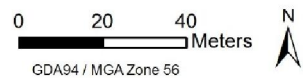


**Figure 1: Location Plan**



**Legend**

 Chau Chak Building-Proposed Footprint



Service Layer Credits: © Land and Property Information 2015



**Figure 2: Proposed development footprint**

### 3. Site analysis

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The site currently contains three tennis courts, a small building housing materials and administration for the Fisher Tennis Centre, a pathway, a lawn area, garden beds and planted trees and shrubs. The surrounding area mainly contains University buildings, the closest being the Great Hall and the Fisher Library, residences, roads and other infrastructure, sports ovals, parks and gardens.

There are no native vegetation communities located in the Project area. The vegetation that does occur comprises a lawn area and planted trees, shrubs and garden beds. The Fisher Tennis Centre building has an aged roof cavity that could potentially be a suitable roost site for microchiropteran bats. Some of the older fig trees in the area contain limb hollows that could be suitable for roosting microchiropteran bats or arboreal mammals. Most of the other trees are relatively young and of limited habitat value for native fauna, although small hollows are present in some. There are trees in the vicinity of the project area that are listed as significant trees on the state heritage register.

The Project will result in the removal of a number of trees, garden plantings, the tennis courts and the small building. According to the drawing provided by the architect (JPW-SD-L-0503), the row of fig trees to the south and the trees and garden to the north will be retained, as will a large fig tree next to the small building and a Holly Oak tree containing hollows in the north-western corner of the site. The drawing also indicates that most of the existing trees to be removed are to be salvaged and transplanted elsewhere in the University.

## 4. Methods

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### 4.1 Approach

The approach to this study involved:

- Background research;
- Mapping of the site and landscape features;
- A site inspection and collection of data and photographs;
- Consideration of the potential for threatened species known from the vicinity to occur within the study area and/or be impacted by the proposed development;
- Use of the BioBanking Credit Calculator to generate a landscape score.

### 4.2 Background Research

Features of the study area and the surrounding landscape were examined through use of satellite imagery, maps and relevant reports. Information sources included:

- Results of field surveys undertaken within the University and in the adjacent Victoria Park in 2010-2011;
- Preliminary Ecological Assessment for the University of Sydney Campus Improvement Program;
- The Native Vegetation of the Sydney Metropolitan Area. Version 2.0 (OEH 2013); and
- OEH spatial data including IBRA bioregions and subregions, NSW landscape regions (Mitchell landscapes) and rivers and wetlands.

### 4.3 Field Assessments

Two ecologists (Chantelle Doyle and Glenn Muir) surveyed the site on 9 November 2016. The survey included identification of the flora on and adjacent to the site and examination of fauna habitat features. Data on flora and site features (where present) were collected, such as vegetation structure, native vegetation cover, exotic vegetation cover, native and weed species present, number of hollow-bearing trees and length of logs. Opportunistic records of fauna utilising the site at the time of the survey were collected.

A second site inspection was carried out on 3 March 2017 by ecologist Chris Jackson. The primary aim of this inspection was to determine if microchiropteran bat species were utilising the roof cavity of the small building next to the tennis courts.

### 4.4 Biobanking Calculator

Data were entered into the BioBanking Credit Calculator in order to determine the landscape value of the development site (refer to section 4 of the BioBanking Assessment Methodology 2014 [BBAM]).

### 4.5 Threatened Species

Section 6.4 of the FBA was used to guide the identification of candidate species for further assessment. Species that require further assessment are those species whose presence cannot be predicted based on PCT and habitat criteria. In some circumstances, the particular habitat components of species assessed for ecosystem credit species, such as the breeding habitat of a cave roosting bat, are also assessed for species credits.

## 5. Results

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### 5.1 Landscape Context

The site is situated within the Interim Biogeographic Regionalisation for Australia (IBRA) “Sydney Basin” bioregion and the “Cumberland – Sydney Metro” subregion and the Mitchell Landscape “Ashfield Plains” (Figure 3). There are no rivers, streams or estuaries within the development site (Figure 3.2). The nearest waterways to the development site are Orphans Creek Canal, located on the northern side of Parramatta Road approximately 700 m to the north-west, which drains into Johnston’s Creek Canal before discharging in Rozelle Bay. Whites Creek Canal is approximately 2300 m to the west and also discharges into Rozelle Bay. The nearest “wetland” to the development site is Lake Northam, which is a large constructed pond that collects stormwater, approximately 250 m to the east in Victoria Park.

The majority of the vegetation within both the 100 ha and the 1000 ha assessment circles consists of planted street trees, gardens and parks classified by OEH (2013) as “urban/exotic”. Native vegetation mapped by OEH (2013) within the 1000 ha circle comprises a few small areas of Estuarine Mangrove Forest and Estuarine Saltmarsh that in total make up less than 1 ha in area.

### 5.2 Native vegetation

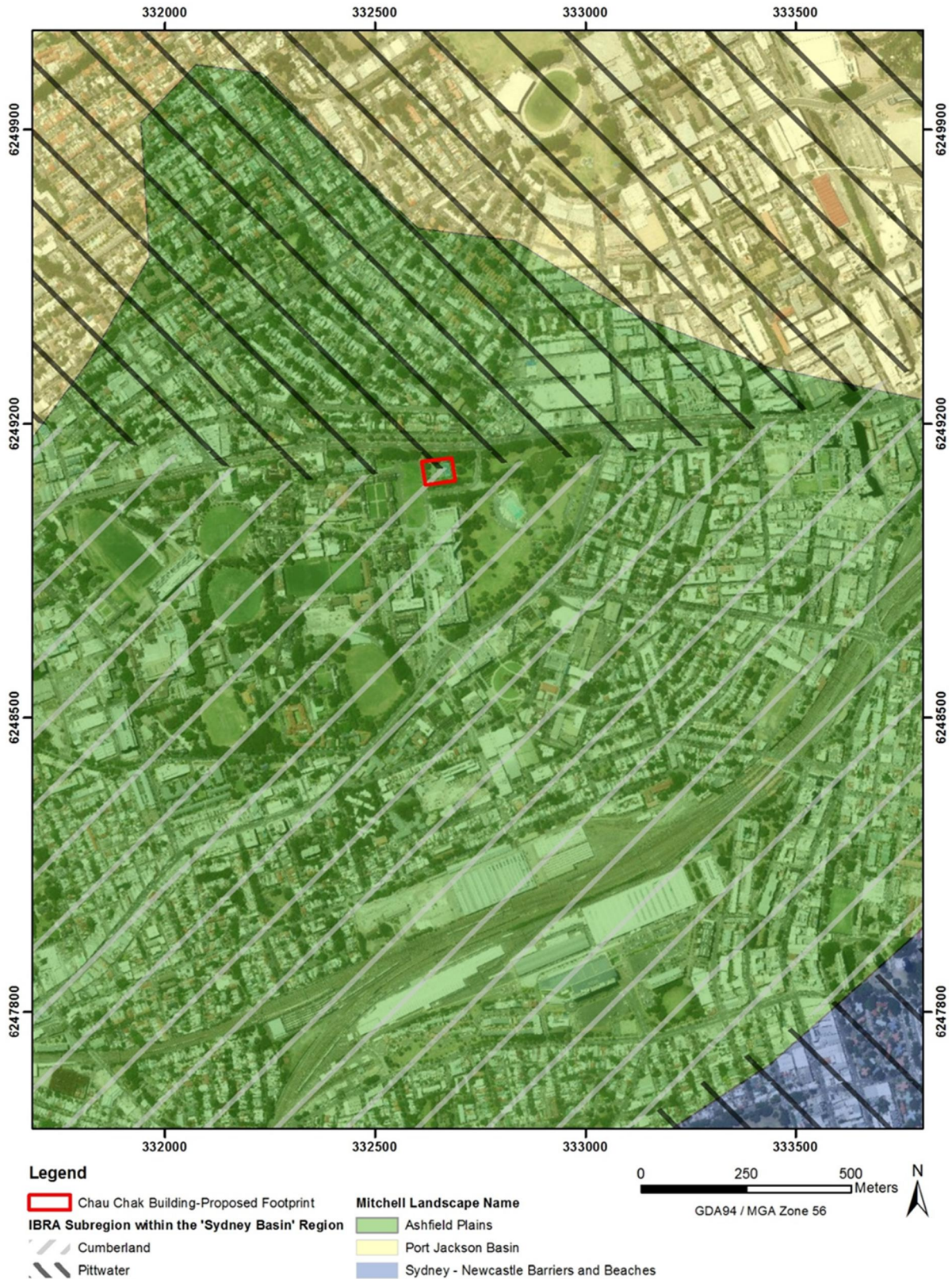
No remnant native vegetation was located within the development site. The vegetation that does occur comprises a lawn area (Kikuyu and Buffalo grass with occasional native species *Oplismenus aemulus* and *Microleana stipoides*) and planted trees, shrubs and garden beds. Nine *Tristaniopsis laurina* (Water Gum) of varying ages have been planted sporadically around the perimeter of the tennis court and western edge of the pathway. Although commonly cultivated, this species is native to the Sydney region. Other planted species included one *Lophostemon confertus* (Brush Box), a native of northern NSW; three *Brachychiton acerifolius* (Illawarra Flame Tree), native to the southern highlands; and two Scribbly Gums (probably *Eucalyptus haemastoma*), native to the Sydney region.

Planted exotics include one large old *Quercus ilex* (Holly Oak) on the western edge of the site and two smaller individuals on the northern edge; a *Murraya paniculata* (Mock Orange) hedge bordering the eastern edge of the tennis courts; one *Jacaranda mimosifolia* (Jacaranda); four mature *Pinus* sp. (probably *Pinus radiata*); one young recently planted *Pinus halepensis* (Aleppo Pine, planted in 2015); and two mature *Olea europea* subsp. *cuspidata* (African Olive) (Plate 3).

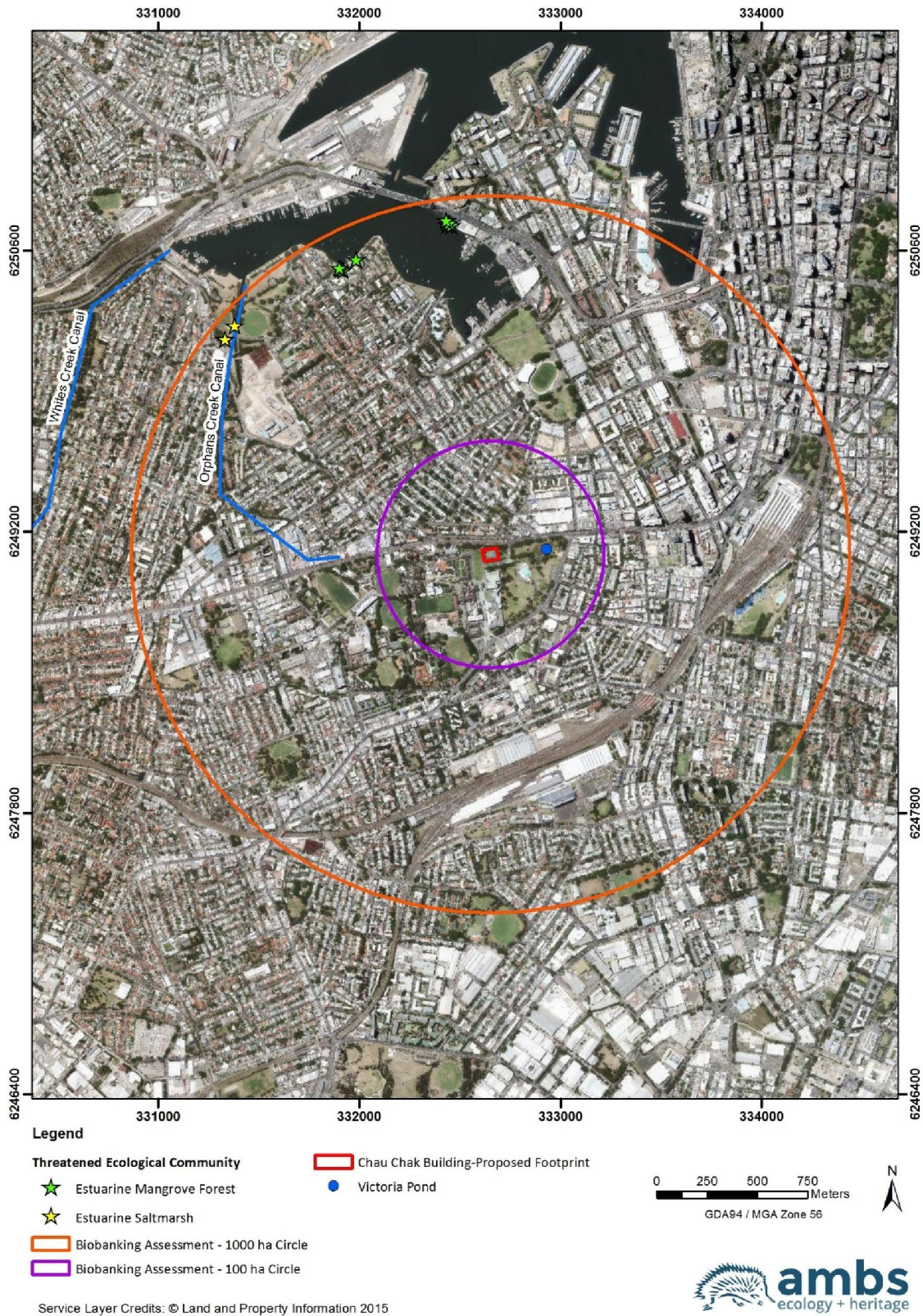
The garden beds consist of the exotic species *Agapanthus*, *Cycas* sp., *Chlorophytum* sp. (Spider plant), *Dietes*, *Hedera helix* (English Ivy), *Miscanthus sinensis* (Zebra grass), *Liriope*, *Phormium tenax* (New Zealand Flax), *Strelitzia reginae* (Bird of Paradise) with native cultivars of *Dianella tasmanica* (Variegated Flax Lily) and five *Doryanthes excelsa* (Gynea Lily). Recruited native ground layer species occur sporadically and include *Cyperus gracilis*, *Dichondra repens* (Kidney weed) and *Viola hederacea* (Native Violet).

A *Syzygium* hedge is located on the western edge of the courts, bordering the Fisher Tennis Courts building. One planted *Callistemon viminalis* (Weeping Bottlebrush) also occurs on the western edge of the courts.

A feature of the site is a mixed stand of large, mature *Ficus macrophylla* and *Ficus rubiginosa* (Morton Bay Fig and Port Jackson Fig), both native to the region, which have been planted. It is understood by AMBS that the fig trees will be retained.



**Figure 3: IBRA bioregions and NSW landscape regions of the Project site**



**Figure 4: Landscape features**

Note: areas of native vegetation are marked with a star as the total area of each is too small to be seen.



**Plate 1: Trees in the project area have been tagged by ArborPlan (left) and old African Olive on the northern edge of the project footprint with ground layer of Agapanthus (right)**

### 5.3 Other Site Features

Fauna habitat within the development site is minimal. The tennis courts provide almost no fauna habitat. Habitat that does occur consists of planted trees of varying ages, a few of which contain hollows, and gardens. Hollow-bearing trees within the development site include a large fig next to the tennis centre building (which will be retained), an old Holly Oak in the north-eastern corner of the site (which will be retained), and a smaller Holly Oak in the garden bed to the east of the site that contained a few small entrances that could potentially constitute functional hollows, and a basal hollow. The basal hollow was occupied by a Black Rat (*Rattus rattus*) at the time of the survey and the size of the openings of the other potential hollows would suggest only small fauna (e.g. frogs, lizards, microbats) would be able to utilise the features. The two African Olives contained several small entrances at the base, but none appeared to be functional hollows and no evidence of use was observed.

The *Murraya* hedge about 1 m high and the *Agapanthus* and *Liriope* dominated garden beds would likely provide habitat for introduced rats and small lizards. Apart from the hedge there is no lower mid-storey vegetation and there are no logs.

The inspection of the roof cavity of the Fisher Tennis Centre storage building found no evidence of roosting bats but did record rat scats. The presence of rats in the roof cavity, most likely Black Rat (*Rattus rattus*), suggests that microbats are unlikely to use the cavity due to risk of predation.

The only native fauna opportunistically observed during the survey were Noisy Miners, which were abundant.

The large, mature fig trees to the immediate north of the development site contained many hollows and would likely provide both food and shelter resources for a range of native and exotic animals.



**Plate 2: Fisher tennis centre building and a large fig on the northern edge of the project footprint (left); tennis courts and planted garden beds (right).**

#### **5.4 Landscape Value**

The landscape value generated by the BioBanking Credit Calculator in relation to the development site was 0.00.

#### **5.5 Threatened Species**

One candidate species for further assessment was identified; the Grey-headed Flying-fox (*Pteropus poliocephalus*). This species was assumed to be likely to use the habitat on the development site on the basis that:

- It is known to occur in the vicinity of the development site;
- It is known to forage on at least three species of tree that occur within or adjacent to the development site (Brush Box, Moreton Bay Fig and Port Jackson Fig); and
- Scats were observed within the project footprint.

Based on the occurrence of previous records within 5 km of the development site and the presence of tree hollows, there is also some potential for the ecosystem-credit microbat species Eastern Freetail-bat *Mormopterus norfolkensis* to occur. The species was not recorded roosting in the Fisher Tennis Building. It could potentially forage on the site.

## 6. Assessment

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For the purposes of addressing the requirements of item 10 of the SEARS, this study has utilised the BioBanking Credit Calculator to determine the landscape value of the site, which is zero.

Further use of the calculator in relation to this Project is not recommended. If there is a requirement to prepare an impact assessment and/or an offset strategy for this Project, then it is recommended that a more suitable assessment mechanism be utilised; for example, the Transport for NSW Offset Calculator.

One threatened species is likely to utilise the Project area; the Grey-headed Flying-fox, which forages in the fig trees in and around the site and potentially forages in some of the smaller trees when in blossom. However, most of the feed trees will be retained, including all of the large figs, the Campus contains stands of figs in other locations and the removal of a few individual trees is unlikely to be a significant impact on this species.

Other habitat features, such as tree hollows, are limited within the development site. No evidence of microbat use was found in the small building. Two trees with hollows that could potentially provide roost habitat for the Eastern Freetail-bat (also a threatened species) will be retained. Only one other tree on the site was considered to have hollows potentially useful for microbats and it is understood by AMBS that this tree is proposed for salvage and translocation.

## 7. Conclusions and Recommendations

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The development site for this Project is small, highly disturbed and contains no native plant communities. The vegetation that is present consists of planted trees and shrubs, many of which are not native to the area, two low hedges, a lawn and garden beds of mostly *Agapanthus* and *Liriope*. The surrounding area is highly urbanised and there is very little vegetation that has not been mapped by OEH as “Urban Exotic/Native”. The BioBanking Credit Calculator generated a landscape value of zero for the development site. Due to the size and nature of the site it is not recommended that the FBA/Credit Calculator be applied any further.

The development site is likely to be of limited value for most native fauna. However, the site does contain some trees that provide a foraging resource for the Grey-headed Flying-fox and there were three hollow-bearing trees located within the project footprint. Two of the hollow-bearing trees will be retained; the third, which contained a few small potential hollows and a basal hollow that was occupied by a Black Rat, is proposed for salvage and translocation. Most of the Grey-headed Flying-fox resources including all of the figs will be retained.

The Project is likely to have little or no impact on most native flora and fauna in the locality, but will have a minor impact on the Grey-headed Flying-fox and there is a small potential for impacts on the Eastern Freetail-bat. It is not likely that the impacts on either species would be significant.

If there is a requirement to prepare an impact assessment and/or an offset strategy for this Project, then it is recommended that a more suitable assessment mechanism than the BBAM be utilised; for example, the Transport for NSW tree offset calculator, which can be used to calculate replanting requirements in the instance of tree removal.

## 8. References

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