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Flora and Fauna Assessment

Macquarie Village

110-114 Herring Road, Macquarie Park.

Total Earth Care Pty Ltd

December 2010

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Macquarie Village

110-114 Herring Road, Macquarie Park.

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Prepared by:	L Laurie (Project Officer)		
Prepared for:	Stamford Property Services		
Authorised by:	Robert Blackall		
TEC Job No.	C2160-AJ+C		

37 Irrawong Road
North Narrabeen NSW 2101
Telephone 02 9913 1432
Facsimile 02 9913 1434
www.totalearthcare.com.au
ABN 14 043 484 770

bushregen@totalearthcare.com.au
envirorehab@totalearthcare.com.au
admin@totalearthcare.com.au
consulting@totalearthcare.com.au
archaeology@totalearthcare.com.au

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EXECUTIVE SUMMARY

Total Earth Care has undertaken a Flora and Fauna Assessment and Report at the subject site at 110-114 Herring Road, Macquarie Park, New South Wales on behalf of Allen Jack + Cottier for Stamford Property Services Pty Ltd. The Flora and Fauna Survey and Assessment Report has been prepared as part of an Environmental Assessment to assess the potential environmental impacts of the proposal. These requirements, including those required in relation to the flora and fauna that occur or may utilise the site are set out in the Director-General's Requirements for Application numbers MP 10_0112 and MP 10_0113.

This Flora and Fauna Assessment and Report has been undertaken with reference to the Department of Environment, Climate Change and Water's "Draft Guidelines for Threatened Species Assessment under part 3A of the Environmental Planning Act 1979" (2005).

There is potential that the proposed development will have some minor direct and indirect impacts on flora and fauna, and their habitats, which occur on the subject site and within the study area. This flora and fauna assessment has considered the flora and fauna species, vegetation communities and habitat components and concluded that the subject site does not currently support threatened flora and fauna species that are indigenous to the area, and has not identified significant habitat for any species targeted in the survey and assessment. A small area of the plant communities occurring on the subject site has been recorded as the Endangered Ecological Community Sydney Turpentine-Ironbark Forest, but it is considered to be of limited conservation value due to its current condition. An assessment of significance for the STIF community has concluded that the potential impact will not be significant and further assessment such as a Species Impact Statement is not required.

1 INTRODUCTION

Stamford Property Services is currently proposing the redevelopment of the Stamford Grand North Ryde Hotel (SGNR) located at the corner of Herring & Epping Roads Macquarie Park (subject site). The 2.2 hectare (ha) site proposed for redevelopment will be known as the Macquarie Village, 110-114 Herring Road, Macquarie Park (Figures 1 and 2). The site currently contains a number of buildings comprising the hotel complex together with a tennis court near the northern corner of the property, grade car parking on the south-western side of the complex and basement car parking facilities. The complex contains a large internal courtyard area incorporating a pool, ornamental ponds and garden areas (Earthscape Horticultural Services 2010).

The project will be assessed under Part 3A of the EP&A Act, and is for a Concept Plan and Stage 1 Project Application. The Concept Plan is for the creation of 7 building envelopes to be constructed in two stages, accommodating approximately 620 one, two and three bedroom residential apartments, commercial (Strata Office, Childcare, café) and recreation facilities (Gymnasium and resident's function room), with at grade and basement parking. The Part 3A Project Application is seeking consent for the Concept Plan, and a Stage 1 Project Application for four buildings containing 311 apartments.

2 AIMS AND OBJECTIVES

The aims of the flora and fauna assessment for the current proposal are to:

- survey and describe the existing flora and fauna within the subject site;
- determine the presence or likely occurrence of threatened species, populations and ecological communities (or their habitats), as listed under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *NSW Threatened Species Conservation Act 1995* (TSC Act); and
- determine areas that are of conservation significance and should be either excluded or constrain development as part of the current or future proposals.

3 METHODS

3.1 Desktop Research

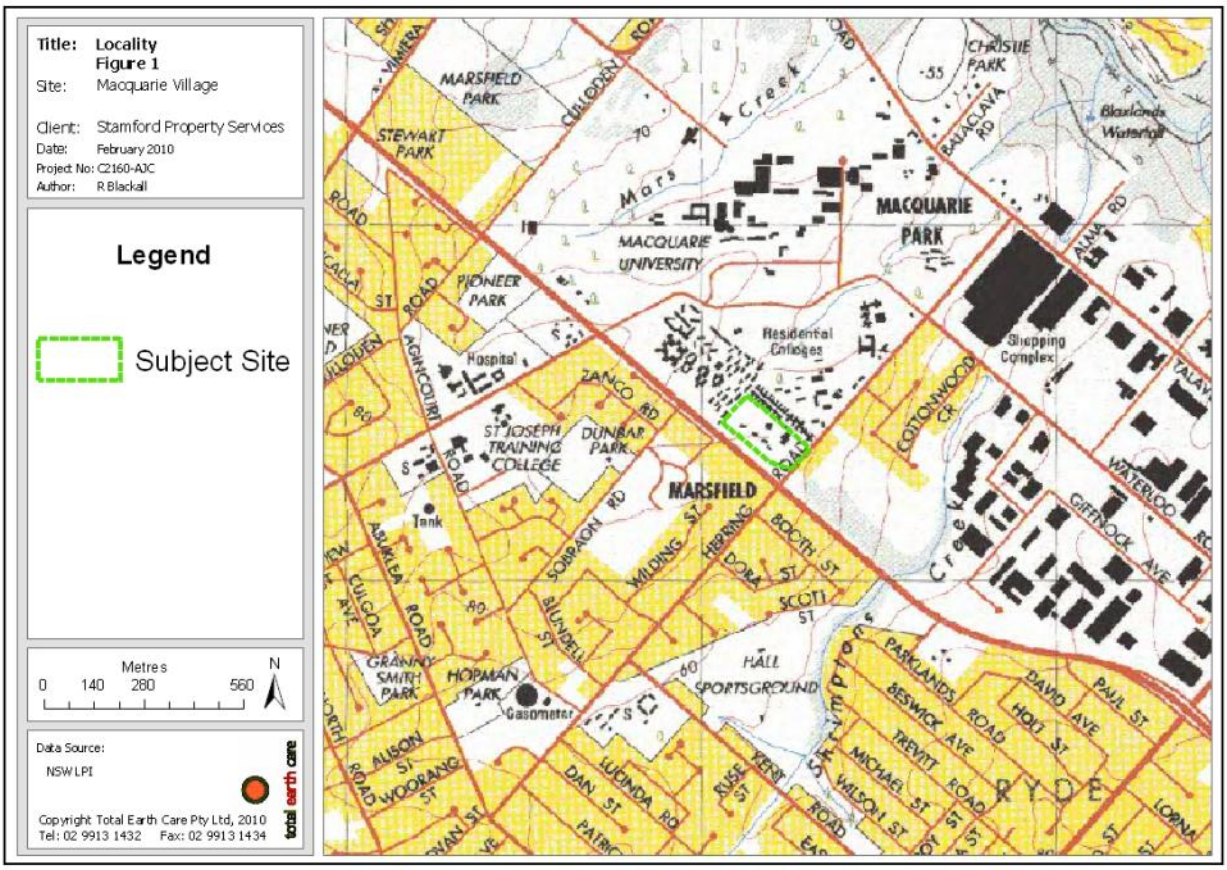
Prior to field surveys, records of all threatened species, populations and endangered ecological communities (EECs) previously recorded within a 5km radius of the subject site were obtained from the Department of Environment, Climate Change and Water (DECCW) Wildlife Atlas database. An EPBC Act Protected Matters Report was generated using the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) Protected Matters Search Tool for a 5km radius of the subject site. The report identifies matters of national environmental significance in the study area including threatened biodiversity and other matters protected by the EPBC Act.

Threatened species, threatened populations, threatened communities, or their habitats, were targeted during the field survey. Recent existing reports of the biodiversity of the study area and locality were also reviewed prior to field surveys and these are briefly summarised in following sections of this report.

3.2 Flora

General botanical surveys were conducted on the subject site on 26thth November 2010 involving:

- the identification of native and exotic plant species according to *Field Guide to the Native Plants of Sydney* (Robinson 2003) and the *Flora of NSW* (Harden 1992, 1993, 2000, 2002), with reference to recent taxonomic changes;


Title: Locality
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Site: Macquarie Village
Client: Stamford Property Services
Date: February 2010
Project No: C2160-AJC
Author: R Blackall
Legend
Subject Site
Metres
0 140 280 560
N
Data Source:
NSW LPI
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Tel: 02 9913 1432 Fax: 02 9913 1434
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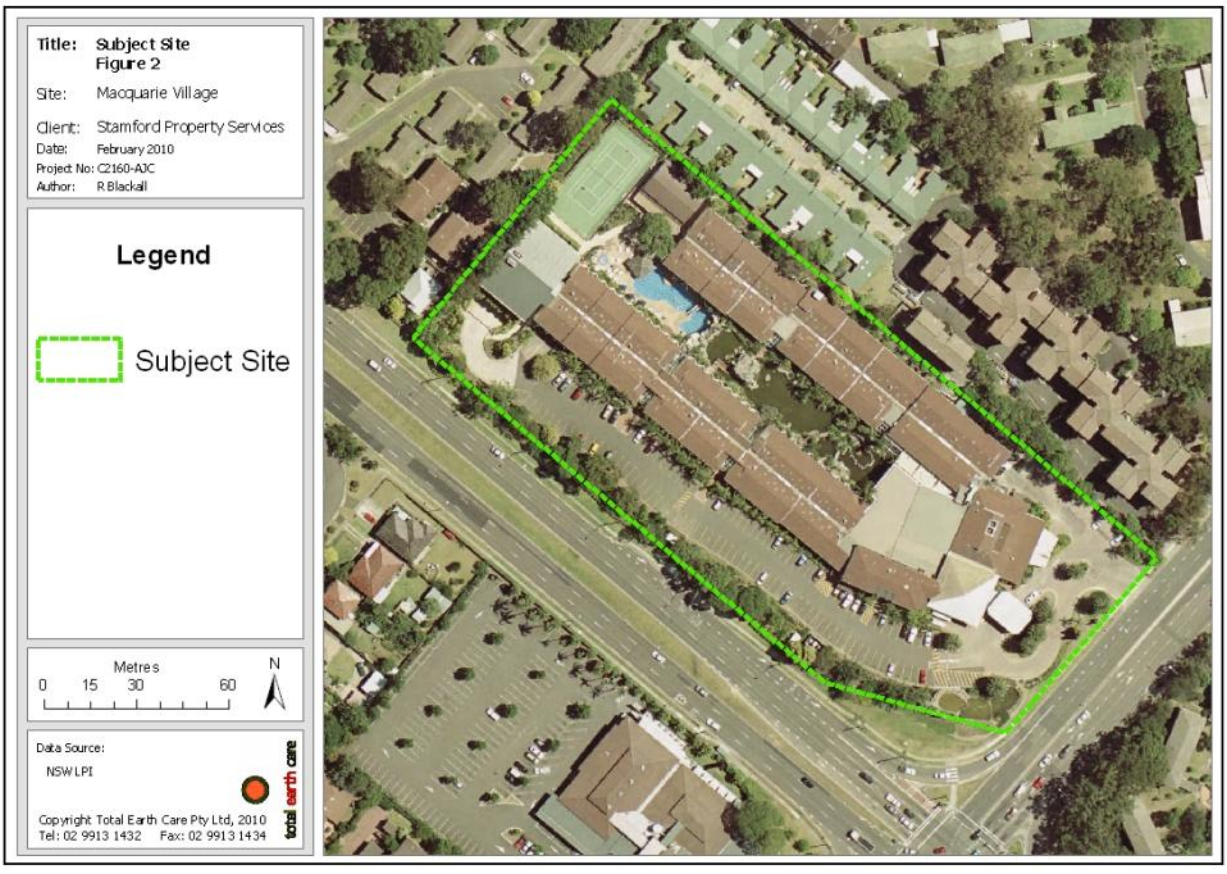
MARSHFIELD PARK
STEWART PARK
PIONEER PARK
MACQUARIE UNIVERSITY
MACQUARIE PARK
CHRISTIE PARK
Residential Colleges
Shopping Complex
Hospital
ST JOSEPH TRAINING COLLEGE
DUNBAR PARK
MARSHFIELD
HALL SPORTSGROUND
HOPMAN PARK
GRANNY SMITH PARK
Gasometer
Tank


Title: Subject Site
Figure 2
Site: Macquarie Village
Client: Stamford Property Services
Date: February 2010
Project No: C2160-AJC
Author: R Blackall
Legend
Subject Site
Metres
0 15 30 60
N
Data Source:
NSW LPI
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- the identification and mapping of plant communities (where present) according to the structural definitions of Specht & Specht (1999), and to previous broad-scale mapping of the Cumberland Plain by DECC (2009), NPWS (2003); and of the Sydney 1:100,000 map sheet by Benson & Howell (1994);
- targeted searches for plant species of conservation significance according to the "random meander" method (Cropper 1993).

The conservation significance of plant species and plant communities was determined according to:

- TSC Act for significance within NSW; and
- EPBC Act for significance within Australia.

All flora species were recorded and an inventory of species was compiled (Appendix A).

3.3 Fauna

General diurnal fauna surveys, were conducted on the subject site during the afternoon of 26th November 2010. Weather conditions were warm, with a light wind and no rain. The diurnal surveys involved observations of animal activity, habitat identification and searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, scratches and diggings). Surveys for avifauna and amphibians involved visual detection and aural recognition of bird and frog calls. Due to the limited fauna habitats available no nocturnal survey was undertaken.

The conservation significance of fauna species and populations was determined according to:

- TSC Act for significance within NSW; and
- EPBC Act for significance within Australia.

3.4 Limitations

Field surveys were conducted over 1 day during late spring 2010. In addition to the survey undertaken, the full spectrum of flora and fauna species and ecological processes likely to occur on the site were considered by identifying potential habitats for such species and assessing the potential for these species to occur on the site based on previous records, the type and condition of habitats present, the land use of the site and its landscape context.

4 RESULTS

4.1 Previous Studies and Reports

4.1.1 Urban Bushland in the Ryde LGA

Ryde City Council has undertaken surveys to map the extent and classify the remnant native vegetation of the local government area (Oculus, 2001). The survey involved reference to existing vegetation mapping schemes of the Sydney region and interpretation of aerial images. Some ground truthing was carried out and limited to a few sites focusing on predicted or known areas supporting Endangered Ecological Communities (EECs). The survey identified six native plant communities, three of which are identified as having national and state conservation significance. The report lists the largest and/or most significant bushland reserves in the local government area.

The report suggests that the EEC Sydney Turpentine-Ironbark Forest (STIF) was probably the most common native plant community in the Ryde LGA prior to European settlement. The report identifies a small and degraded remnant of STIF on land that occurs adjacent to the proposed development site alongside Ivanhoe Road. This remnant was mapped as extending through to the nearby Morling College Site. The report notes that larger remnants of STIF occur nearby, including Wallumatta Nature Reserve 3km to the south-east, Stewart Park 1km to the north-west and Macquarie University remnants 1km to the north.

4.1.2 Ryde Flora and Fauna Study 2006

The *Ryde Flora and Fauna Study 2006* (Biosphere Environmental Consultants, 2006) was commissioned by Ryde City Council to identify base-line biodiversity in four key reserves of the LGA. The survey focused on vertebrate and invertebrate fauna and native and exotic plant species assessing both species richness and relative abundance with surveys carried out in autumn and spring.

Although none of the reserves were free of urban impacts the report identified that several bushland reserves in the LGA retained representative native flora and fauna. Several rare and two threatened plant species were located during the survey effort by Biosphere as were threatened ecological communities. One threatened owl and one threatened microchiropteran bat species were detected during their surveys and the report suggests that both species were foraging preferentially along the Lane Cove River corridor (Biosphere Environmental Consultants, 2006).

In assessment of the fauna survey results, the 2008 Ryde Flora and Fauna Study suggests that terrestrial mammals, large reptiles and frogs have been significantly affected by development in the Ryde LGA. Predation by foxes, dogs and cats and clearing of native vegetation are identified as resulting in the widespread loss of terrestrial mammals and larger reptiles. The significant decline of frog species in the LGA is attributed to substantial loss of foraging and breeding habitat, impacts on water quality and predation by introduced fish species (Biosphere Environmental Consultants, 2006).

The report states that forest and woodland birds are still well represented in the LGA due to the habitat provided by tree canopy including that of surveyed reserves. However due to an absence of mid-storey vegetation cover, the smaller passerines (perching songbirds) had declined markedly (Biosphere Environmental Consultants, 2006).

The major impacts that are affecting the biodiversity of the LGA are summarised in the 2008 Ryde Flora and Fauna Study and these include but are not limited to:

- weed invasion;
- contamination of creeks and ground water;
- changes in flow patterns of creeks through storm water control;
- increased erosion of creek banks;
- loss of ephemeral freshwater habitat;
- penetration of bushland by walking tracks, roads and easements;
- feral animals, such as foxes, cats, dogs, rats and mice;
- high density of native, predatory birds;
- night-light pollution from street lights and house lights;
- noise and movement disturbance; and
- edge effects

4.1.3 Ryde Flora and Fauna Study 2008

In 2008 Ryde City Council commissioned Bioshere Environmental Consultants to produce *The Ryde Flora and Fauna Study 2008* (Biosphere Environmental Consultants, 2008). This study focused more on the flora and fauna species found in the smaller reserves not surveyed in the 2006 study. The study echoed the previous report's findings (Biosphere Environmental Consultants, 2006) and found poorer species diversity in these smaller reserves with increased impacts such as weeds, predatory birds and edge effects. There were little additional management recommendations.

4.1.4 Native Vegetation of the Cumberland Plain 2003

At a regional scale *The native vegetation of the cumberland plain, Western Sydney: systematic classification and field identification of communities* (Tozer, 2003), provides a survey of vegetation communities occurring on the Cumberland Plain and adjacent plateaus characterised by Wianamatta Shale soils. This study recognises that most of the native vegetation communities of the Cumberland Plain and neighbouring Wianamatta Shales are listed as endangered under the *Threatened Species Conservation Act 1995* (Tozer, 2003). As such, part of the rationale for the survey was to address the need for quantitative data to assist in the identification of native plant communities and provide an assessment of the conservation value of vegetation remnants.

The aim of the survey was to revise the existing plant community classification to take account of; recently described communities and other communities warranting recognition; provide quantitative data for characteristic species in each community (frequency of occurrence and relative abundance); identify species showing high fidelity to each community as a basis for diagnosing community type in the field; estimate the present cover of native vegetation; and derive a spatial model as a basis for predicting the vegetation type and conservation value of all remaining remnants (Tozer, 2003). In classifying communities interpreted in light of previous publications and EECs listed under the TSC Act, Tozer (2003) recognises and describes more than one unit for some community types, including Sydney Turpentine-Ironbark Forest which incorporates both Turpentine-Ironbark Forest and Turpentine-Ironbark Margin Forest.

The survey incorporated systematic, stratified field sampling to record floristic structure and composition, a classification procedure based on hierarchical, agglomerative clustering analysis; spatial modelling of community distributions using geological, climatic and topographic variables; and the interpretation of patterns in canopy composition and remnant condition in aerial photographs. The resulting *Native Vegetation of the Cumberland Plain, Western Sydney − 1:25 000 Map Series* (NPWS, 2002) incorporates Ryde LGA in Map 10 of the series. For the subject site there is no classified extant native over-storey vegetation. Areas mapped as having native over-storey vegetation near to the subject site occur approximately 1km to the north, west and south. Much of this vegetation is mapped as Turpentine Ironbark Forest and Turpentine Ironbark Margin Forest.

4.1.5 Sydney Metropolitan Catchment Management Authority (DECC 2009)

The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area, a vegetation community mapping project conducted by Department of Environment & Climate Change (DECC 2009) has mapped Sydney Turpentine Ironbark Forest as occurring adjacent to the subject site. The mapping carried out by DECC (2009) has been carried out at a finer scale than Tozer (2003), with generally greater levels of visitation for sites in the locality than Tozer (2003) although neither the subject site nor any adjacent sites were visited as part of the DECC (2009) mapping. This remnant of STIF has been mapped by DECC (2009) to the south-east of the subject site, on Housing NSW land between Ivanhoe Road and Herring Road. The draft DECCW vegetation community mapping within the locality is provided in Figure 5. During the current survey, this site to the south-east of the subject site was visited and the dominant tree species observed in the part of the remnant closest to the subject site, adjacent to Herring Road, was *Eucalyptus pilularis* Blackbutt with uncommon specimens of *Syncarpia glomulifera* Turpentine. There were no observed individuals of *Angphora costata* Sydney Red Gum, *Eucalyptus saligna* Sydney Blue Gum or *Angophora floribunda* in this part of the area mapped as STIF by DECC (2009), while there were specimens of these species occurring on the subject site. This was seen as supporting evidence that the specimens on the subject site of *Angophora costata*, *Angophora floribunda* and *Eucalyptus saligna* were planted.

4.1.6 Tree Assessment Report – Earthscape Horticultural Services (EHS 2010)

Consulting Arborists Earthscape was commissioned by Allen Jack + Cottier on behalf of Stamford Property Services Pty Ltd to assess the health and condition of trees growing on or immediately adjacent to the subject site (EHS 2010). This report identified any native trees of environmental significance. The survey found 17 specimens of three species of locally occurring species, as outlined below (Table 1). The majority of all 243 trees specimens surveyed are located outside their natural distribution and were not considered indigenous to the site.

Table 1 Locally occurring tree species within development footprint as mapped by EHS (2010)

Locally Occurring Native Tree Species	Common Name	Number of Specimens
Eucalyptus saligna	Sydney Blue Gum	3
Syncarpia glomulifera	Turpentine	1
Angophora costata	Sydney Red Gum	12
Eucalyptus pilularis	Blackbutt	1
Acacia parramattensis	Black Wattle	3
Angophora floribunda	Rough-barked Apple	1

4.2 Landscape

The subject site is located at Macquarie Park, and incorporates an approximately 2.2 ha parcel of land at the northern intersection of Epping and Herring Roads. It is bound by a retirement village to the north and north-west and multi storey apartment blocks to the north-east. Beyond these neighbouring properties, the large campus of Macquarie University occurs to the north. The subject site is found in the catchment of Shrimpton's Creek which runs some 500 metres to the south-east of the subject site in a north-easterly direction where it discharges into the Lane Cove River. A significant proportion of the subject site lacks vegetation due to the site currently being dominated by built infrastructure, including the hotel and its facilities such as swimming pools, tennis court, hard landscaping and associated parking. Most of the original soil profile has been altered and the majority of the site is developed, with the small areas of exposed soil mainly restricted to boundaries of the site, particularly the south-west frontage with Epping Road.

The Glenorie Soil Landscape is mapped by Chapman *et al* (1989) within the Flora and Fauna study area. Chapman and Murphy (1989) described the Glenorie Soil Landscape as occurring over the Ashfield and Bringelly Shales of the Wianamatta Group Shales. Surface soils are friable loams, overlying clay loams with various clay sub soils deeper through the profile. This soil type has a generally low to moderate fertility and erodibility increases from low for surface soils through to moderate for subsoils.

As noted above, the majority of the site is occupied by built infrastructure that covers the soil. In the small areas where soil is open, it appears to have been heavily disturbed and levels appear to have been altered. There is some evidence in these areas of exposed soils that foreign matter has been incorporated such as blue metal and building waste.

4.3 Flora

4.3.1 Plant Species

For the purposes of the current report, non-native flora species occurring as planted specimens in highly modified edaphic conditions of raised and isolated containerised gardens containing brought-in growing media have not been listed in detail. However any fauna habitat they may offer has been considered in full.

A total of 40 plant species were recorded within the two plant communities identified within the study area during the flora field survey, including 21 native species and 19 introduced species (Appendix A). There were 13 native species recorded in the subject site that are not indigenous to the area, and 8 locally indigenous species. No threatened plant species were found during the current survey growing on the subject site.

4.3.2 Plant Communities

Two plant communities were identified within the subject site:

- Native & Exotic Gardens
- Sydney Turpentine Ironbark Forest (STIF) Trees

Previous broad-scale mapping of the Sydney 1:100,000 map sheets by Benson and Howell (1994) have not identified any native plant communities either on, or immediately adjacent to, the subject site. Similarly, mapping of the native vegetation of the Cumberland Plain and adjacent areas by NPWS (2002) has not identified any native plant communities either on, or immediately adjacent to the subject site. The mapping project by NPWS (2002) did identify several stands of Sydney Turpentine-Ironbark Forest and Turpentine Ironbark Margin Forest approximately one kilometre to the north, south and west of the subject site. More recent mapping with a higher confidence of accuracy has been carried out by DECC (2009). This mapping has identified a remnant of STIF occurring to the south-east of the subject site bound by Ivanhoe Road, Herring Road and Epping Road.

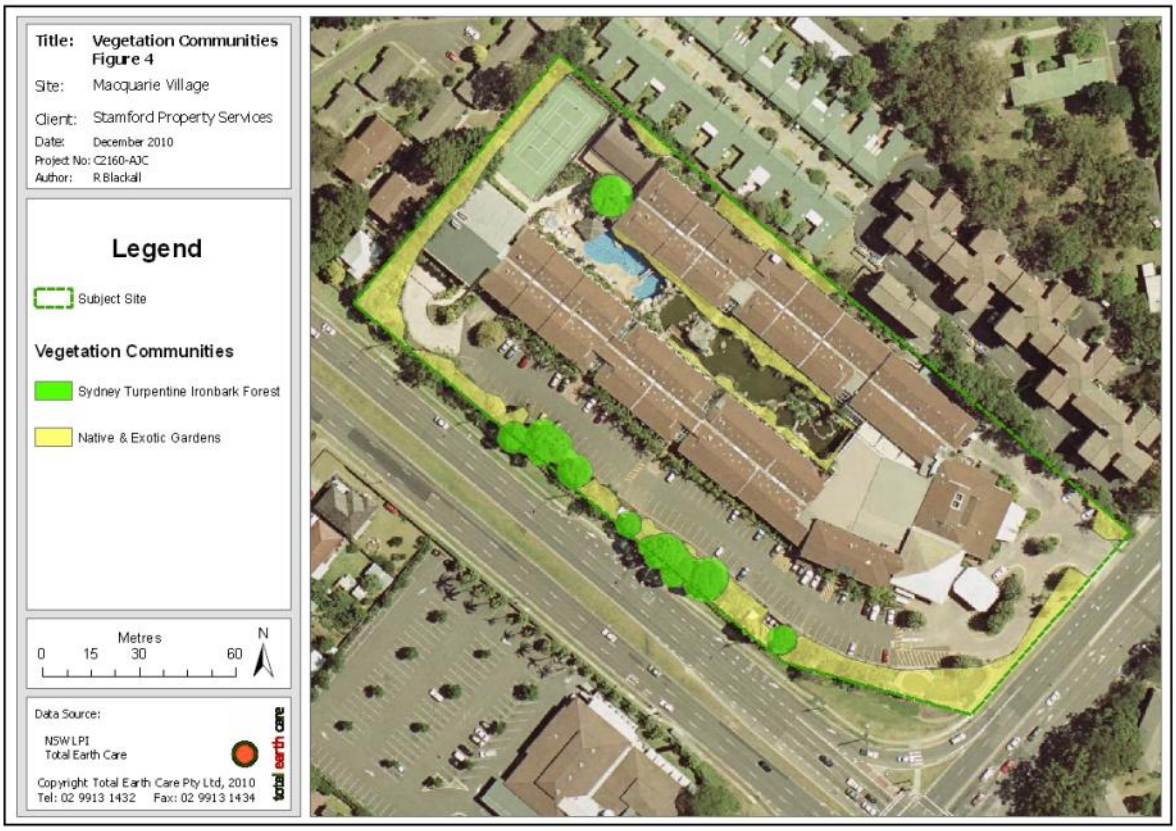
Allen Jack + Cottier (AJ+C), on behalf of Stamford Property Services, have forwarded a submission from Council that states "While the potential fauna habitat is limited, there is existing vegetation on site and on surrounding properties. An endangered ecological community has been identified on the Housing NSW site to the east and on the Macquarie University Campus to the north. This site is in the same catchment as those communities.

The distribution of plant communities identified in the current survey within the study site is shown in Figure 4 and these are described below.

Native & Exotic Gardens

The Native & Exotic Gardens plant community occurs over the majority of the subject site that is not occupied by the built infrastructure associated with the hotel accommodation, recreation facilities and car-parking. Much of the soil profile within the central extent of the Native & Exotic Gardens plant community, in the areas adjacent to the swimming pool and fish ponds, is composed of imported fill in raised garden beds. A single *Syncarpia glomulifera* Turpentine occurs in a bed that has been isolated by surrounding development. The soil profile within this isolated bed appears to be based on the original soil, although with some build-up of organic matter in the 'O' horizon. Soils in the remainder of the Native & Exotic vegetation community are largely derived from the original parent soil, with modifications of soil levels and some degree of cultivation or incorporation of foreign material. These particular areas are restricted to the boundaries of the subject site, particularly the south and western edges.

Dominant species in the Native & Exotic Gardens plant community vary over the subject site. The central distribution of this plant community, around the swimming pool and fish ponds, is dominated by the exotic species *Syagrus romanzoffiana* Cocos Palm, with plantings of exotic broad-leaved species such as *Strelitzea reginae* Bird of Paradise. As stated, a single *Syncarpia glomulifera* Turpentine occurs as an apparent remnant from the original community in an isolated bed at the northern end of this part of the Native & Exotic plant community, and a small specimen of the native *Pittosporum undulatum* Sweet Pittosporum is growing adjacent to it. Where it occurs toward the Epping Road boundary, this plant community is dominated by native trees of both local and non-indigenous species. All of these trees appear to be planted. Species found commonly from 5 – 15 metres tall include *Angophora costata* Sydney Red Gum and *Eucalyptus saligna-botryoides* complex, along with many smaller native trees and shrubs such as *Acacia parramattensis* Black Wattle*, Acacia floribunda* Gossamer Wattle*, Lophostemon confertus* Brush Box and *Corymbia citriodora* Lemon-scented Gum*.* There was no groundlayer layer in this part of the plant community. The area of the Native & Exotic plant community that occurs along the Herring Road boundary is principally non-local native and exotic trees and shrubs with a maintained exotic lawn.


Title: Vegetation Communities
Figure 4
Site: Macquarie Village
Client: Stamford Property Services
Date: December 2010
Project No: C2160-AJC
Author: R Blackall
Legend
Subject Site
Vegetation Communities
Sydney Turpentine Ironbark Forest
Native & Exotic Gardens
Metres
0 15 30 60
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Data Source:
NSW LPI
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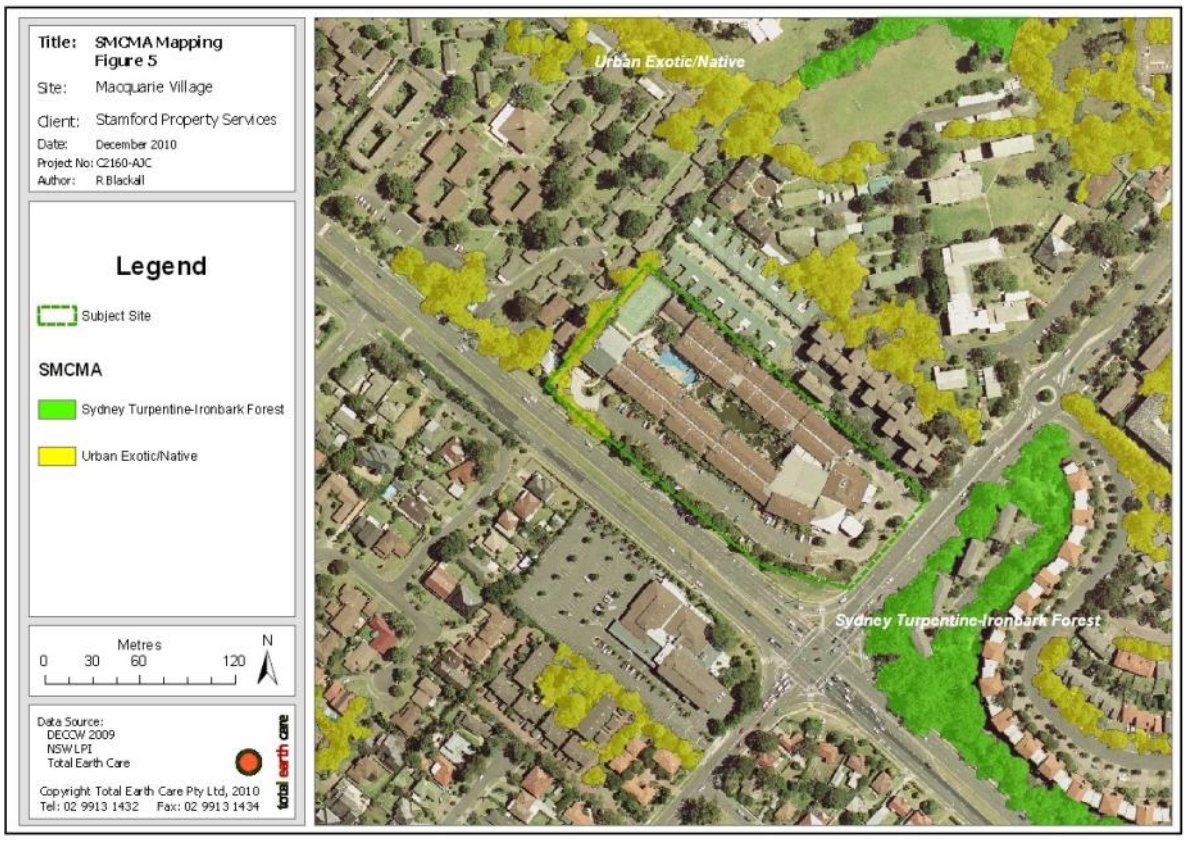
Title: SMCMA Mapping
Figure 5
Site: Macquarie Village
Client: Stamford Property Services
Date: December 2010
Project No: C2160-AJC
Author: R Blackall
Legend
Subject Site
SMCMA
Sydney Turpentine-Ironbark Forest
Urban Exotic/Native
Metres
0 30 60 120
N
Data Source:
DECCW 2009
NSW LPI
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Tel: 02 9913 1432 Fax: 02 9913 1434
total earth care
Urban Exotic/Native
Sydney Turpentine-Ironbark Forest

No noxious weeds were noted growing on site.

There was observed very little native resilience on site, with most local species appearing to be planted with the exception of the single *Syncarpia glomulifera* Turpentine, a single naturalised small *Pittosporum undulatum* Sweet Pittosporum, and a small number of *Acacia parramattensis* Black Wattle which may or may not be planted. It should be noted that *Acacia parramattensis* and *Syncarpia glomulifera* are all characteristic species for the Endangered Ecological Community (EEC) Sydney Turpentine Ironbark Forest as per the Threatened Species Conservation Act's (TSC Act) Final Determination by the NSW Scientific Committee. There was no evidence of any other seedling recruitment of any native plant species, locally indigenous or otherwise. The community was structurally simple with poorly defined layers. There were no horticultural or environmental weeds observed on site.

Sydney Turpentine Ironbark Forest (STIF) Trees

Within the extent of the Native & Exotic Gardens plant community occur several isolated individual trees that are characteristic species for the EEC STIF. Clause 3 of the Scientific Committee's Final Determination for STIF as an endangered ecological community states that *"The structure of the community was originally forest, but now may exist as woodland or as remnant trees."* In its broadest definition, this infers that single tree specimens, as long as they are characteristic species of STIF and occur in appropriate soil landscapes and locality, can be considered as representing the extent of this EEC on a site. As such, the specimens of *Angophora costata* Sydney Red Gum, *Angophora floribunda* Rough-barked Apple and *Syncarpia glomulifera* Turpentine incorporate the extent of STIF on the subject site. For the purpose of mapping the extent of STIF, the horizontal canopy extent has been shown for each of these specimens. It should be noted that two other characteristic STIF species were growing on the subject site, *Pittosporum undulatum* Sweet Pittosporum and *Acacia parramattensis* Black Wattle, but as these are not classified as characteristic 'tree' species as per the final determination, and they do not occur in an area that is otherwise considered structurally and floristically developed and resilient enough for the community to be considered in existence, they are not mapped here as being STIF.

4.3.3 Threatened Plant Species

There were no threatened plant species listed under either the TSC Act, or the EPBC Act, recorded on the subject site in the current investigation.

A search of the DECCW Wildlife Atlas identified 31 threatened plant species occurring within 10 km of the site (Table 2).

Table 2 Threatened flora species previously recorded within the locality (10km search) on the DECCW Wildlife Atlas and EPBC Act Protected Matters Search Tool.

Scientific Name	TSC Act Status[1]	EPBC Act Status[2]
Acacia bynoeana	E1	V
Acacia terminalis ssp terminalis	E1	
Caladenia tessellata	E1	V
Callistemon linearifolius	V	-
Camarophyllopsis kearneyi	E1	
Darwinia biflora	V	V
Deyeuxia appressa	E1	E

Table 2 cont' Threatened flora species previously recorded within the locality (10km search) on the DECCW Wildlife Atlas and EPBC Act Protected Matters Search Tool.

Eucalyptus camfieldii	V	V
Eucalyptus nicholii	V	V
Epacris purpurascens var. purpurascens	V	
Genoplesium baueri	V	-
Grevillea caleyi	E1	
Haloragodendron lucasii	E1	E
Hibbertia puberula	E1	
Hygrocybe anomala var. ianthinomarginata	V	
Hygrocybe aurantipes	V	
Hygrocybe austropratensis	E1	
Hygrocybe collucera	E1	
Hygrocybe griseoramosa	E1	
Hygrocybe lanecovensis	E1	
Hygrocybe reesiae	V	
Hygrocybe rubronivea	V	
Lasiopetalum joyceae	V	
Leptospermum deanei	V	V
Melaleuca deanei	V	V
Persoonia hirsuta	E1	
Pimelea curviflora var. curviflora	V	V
Prostanthera marifolia	CE	Ex
Sarcochilus hartmannii	V	
Syzygium paniculatum	E1	V
Tetratheca glandulosa	V	V

[1] E1 – endangered (Schedule 1 of the TSC Act); CE – Critically Endangered (Schedule 1A of the TSC Act) V – vulnerable (Schedule 2 of the TSC Act).
[2] E – endangered, V – vulnerable, Ex- Extinct

4.3.4 Threatened Populations

No threatened flora populations listed under the TSC Act were recorded on the subject site in the current investigation.

4.3.5 Threatened Ecological Communities

Sydney Turpentine Ironbark Forest (Threatened Species Conservation Act, 1995)

One EEC, Sydney Turpentine-Ironbark Forest (STIF) is recorded in the locality in a previous survey (DECC 2009). STIF is listed as endangered under the NSW Threatened Species Conservation Act, 1995 (TSC Act).

STIF is an Open Forest community with a sparse shrub stratum and well developed groundcover stratum but can exist as woodland or as remnant trees dependant on disturbance history (NSW Scientific Committee, 1998).

STIF occurs within the local government areas Ashfield, Auburn, Canterbury, Concord, Drummoyne, Leichhardt, Marrickville, Bankstown, Ryde, Hunters Hill, Baulkham Hills, Ku-ring-gai, Hornsby, Parramatta, Bankstown, Rockdale, Kogarah, Hurstville, and Sutherland and is restricted to the Sydney Basin Bioregion. Large areas of STIF have been cleared for agriculture and urban development with remnants small and scattered and only small areas of STIF are presently included in conservation reserves (NSW Scientific Committee, 1998). In many of the LGA's where the community is known, particularly in the inner western suburbs, only remnant trees may remain. The NSW Scientific Committee (1998) suggests that these stands may have particular ecological and genetic significance and may be important sources of propagation material for use in rehabilitation projects.

Various estimates of the remaining area of the community range from 0.5% (NSW Scientific Committee, 1998) to 4.5% (NPWS, 2004) of its original extent. Threats to the community include clearing, physical damage from recreational activities, rubbish dumping, grazing, mowing and weed invasion (NSW Scientific Committee, 1998). The DECC has identified a total of 10 strategies to help recover this EEC and these are accompanied by a total of 16 priority actions.

Previous mapping of the native vegetation of Western Sydney Map Sheet 10 - Map 10 - Auburn LGA, Concord LGA, Hunters Hill LGA, Ku-ring-gai LGA, Lane Cove LGA, North Sydney LGA, Ryde LGA, Strathfield LGA and Willoughby LGA 1:25, 000, does not depict any mapped vegetation communities on the subject site. Previous mapping by DECC (2009) similarly does not map any vegetation communities on the subject site but identifies a remnant of the Endangered Ecological Community Sydney Turpentine Ironbark Forest occurring on land on the other side of, and adjacent to, Herring Road to the south-east of the subject site.

From surrounding extant vegetation, mapping of the general locality, from structural and floristic remnants, and soil landscape on the site, it could be inferred that originally the entire site was covered with STIF.

Sydney Turpentine Ironbark Forest (Environment Protection and Biodiversity Conservation Act 1999)

The Commonwealth Environment Protection Biodiversity Conservation Act (1999) also recognises the EEC Sydney Turpentine Ironbark Forest and it is listed as critically endangered. The definition of this EEC under the EPBC Act differs somewhat to that of the NSW TSC Act. The EPBC Act encompasses a broader range of formations and includes communities that the TSC Act considers as separate to STIF.

The EPBC Act is however more narrow in scope when it defines minimum benchmarks of total area and structural intactness than does the TSC Act. The EPBC Act requires that any vegetation to be encompassed by the Act's definitions of STIF must be at least one hectare in area and to have an intact native understorey.

The vegetation on the subject site or study area does not qualify to conform to this definition as the vegetation (on the adjoining site) with an intact understory is less than 1 hectare in area.

In summary, the subject site contains a total of 8 locally indigenous species and no noxious weed species. No threatened flora species occur on the subject site. Using the broad definition as per the scientific committee of STIF being able to exist as 'remnant trees', those trees occurring on site that are characteristic tree species have been determined as the extent of this EEC occurring on the subject site. The current survey and report considers that the disturbed soil profiles, small size of

remnant area, lack of resilience, lack of significant connectivity, absence of a fully structured native plant community, very poor species diversity and absence of many basic ecological processes, makes the conservation values of the STIF occurring on site as low. Additionally, most of the characteristic tree species appear to have been planted and as such do not represent processes of natural seed recruitment from genetically integral STIF specimens. Therefore, a Referral to the Commonwealth Environment Department (SEWPAC) is not required as the action will not have a significant impact on a matter of national environmental significance.

4.4 Fauna

4.4.1 Fauna Species

Only one native species of vertebrate fauna was observed during the current survey, a pair of Australian Ravens *Corvus coronoides* that were roosting on the buildings of the hotel.

4.4.2 Fauna Habitats

Fauna habitats of the subject and study area are assessed in two main categories for the current survey. Fauna habitat features and resources at a locality scale form part of the broader landscape of the study area. Site specific fauna habitat features and resources provide the key elements required by native fauna for the maintenance of life cycles. Fauna habitats identified in the current survey and associated general fauna are summarised in Table 3.

Table 3 Fauna habitat types and resources.

Area	Habitat Feature	Habitat Resources and Fauna
Locality	Large continuous tracts of native plant communities, including Lane Cove National Park	Foraging, nesting, roosting and sheltering for birds, reptiles, amphibians, arboreal and terrestrial mammals and bat species.
	Landscape planted and street trees	Foraging, nesting, roosting and sheltering for birds, reptiles, amphibians, arboreal and terrestrial mammals and bat species.
	Drainage corridors	Foraging, nesting, roosting and sheltering for small, medium and large birds, arboreal mammals, reptiles and amphibians.
Subject Site	Broken canopy of native and/or exotic trees	Foraging, nesting, roosting and sheltering for small, medium and large birds, reptiles, arboreal mammals, megachiropteran and microchiropteran bat species.
	Sparse and disjunct midstorey and/or understorey	Foraging, nesting, roosting and sheltering for small and medium birds, reptiles, arboreal mammals and arboreal frogs.
	Highly modified groundcover	Foraging for small and medium birds, reptiles, amphibians and terrestrial mammals.
	Open mown areas	Foraging for birds
	Access roads and pathways	Foraging and flyways for microchiropteran bat species.

Currently the subject site is a highly modified landscape that lacks many of the natural habitat features and resources that are important in the maintenance of native fauna diversity and life cycles, including fully structured vegetation, tree-hollows, a diverse shrub layer for food sources and protection, leaf litter and loose surface soils, sandstone outcrops and ledges, loose rocks, an abundance of logs and rotting stumps. In addition to the altered nature of fauna habitats, current human activities within the

subject site and surrounding area, including high levels of night light, noise and vehicle or human traffic, are likely to reduce fauna habitat potential. Relative to the condition of native vegetation on the subject site, limited connectivity to bushland and the absence of many habitat features and resources as described above, the subject site has a low level of fauna habitat value.

4.4.3 Wildlife Corridors

Natural corridors provide connections within the landscape between larger areas of habitat. Corridors facilitate the movement and genetic exchange of flora and fauna, which allows the continuation of viable populations. The importance of wildlife corridors, such as drainage lines and fully or partially contiguous vegetation cover, is well documented (e.g. Recher *et al*, 1986). At a locality scale the subject site forms a broken corridor to the south via the vegetation beside Epping Road that extends to Shrimpton Creek and then east as a broken corridor towards the Lane Cove River. Surrounding remnant vegetation are offering some habitat resources and contribute to a fragmented corridor extending through the University campus and Morling College Site toward Lane Cove National Park in the north east. However the site is not considered to be part of a significant wildlife corridor for the movement and dispersal of native flora and fauna for the locality due to the limited habitat structure of the vegetation community within the study area and existing fragmentation within the locality.

4.4.4 Threatened Fauna Species

No threatened fauna species, or significant habitat for any threatened fauna species was noted on the subject site. A search of the DECCW Wildlife Atlas and EPBC Act Protected Matters Report identified 27 threatened fauna species previously recorded within 10km of the site (Table 4). Seven species have a dual listing under the TSC Act and EBPC Act.

Table 4 Threatened fauna species previously recorded within the locality (10km of the site) on the DECCW Wildlife Atlas and EPBC Act Protected Matters Search Tool.

Scientific Name	Common Name	TSC Act Status[1]	EPBC Act Status[2]
Botaurus poiciloptilus	Australasian Bittern	V	-
Callocephalon fimbriatum	Gang-gang Cockatoo	V	-
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	E
Cercartetus nanus	Eastern Pygmy-possum	V	-
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Dasyurus maculatus	Spotted-tailed Quoll	V	E
Ephippiorhynchus asiaticus	Black-necked Stork	E1	-
Falco hypoleucos	Grey Falcon	V	-
Glossopsitta pusilla	Little Lorrikeet	V	-
Ixobrychus flavicollis	Black Bittern	V	-
Lathamus discolor	Swift Parrot	E1	E
Limosa limosa	Black-tailed Godwit	V	-
Litoria aurea	Green and Golden Bell Frog	E	V

[1] CE critically endangered (Schedule 1A of the TSC Act); E1 – endangered (Schedule 1 of the TSC Act); V – vulnerable (Schedule 2 of the TSC Act).

[2] CE - critically endangered, E – endangered, V – vulnerable

Table 4 cont' Threatened fauna species previously recorded within the locality (10km of the site) on the DECCW Wildlife Atlas and EPBC Act Protected Matters Search Tool.

Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-
Mormopterus norfolkensis	Eastern Freetail-bat	V	-
Nettapus coromandelianus	Cotton Pygmy-Goose	E1	-
Ninox connivens	Barking Owl	V	-
Ninox strenua	Powerful Owl	V	-
Pandion haliaetus	Osprey	V	-
Petaurus australis	Yellow-bellied Glider	V	-
Polytelis swainsonii	Superb Parrot	V	-
Pseudophryne australis	Red-crowned Toadlet	V	-
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Ptilinopus superbus	Superb Fruit-Dove	V	-
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-
Varanus rosenbergi	Rosenberg's Goanna	V	-
Xanthomyza phrygia	Regent Honeyeater	E1	E

4.4.5 Threatened Populations

No threatened flora populations listed under the TSC Act were recorded on the subject site in the current investigation.

5 HABITAT POTENTIAL FOR THREATENED SPECIES

5.1 Flora

Table 5 summarises the habitat potential of the subject site for the threatened plant and fungi species previously recorded as occurring within 5km radius of the site on the DECC Wildlife Atlas and listed in the EPBC Act matters of national environmental significance report for the locality.

Table 5 Habitat potential for threatened flora species previously recorded within the locality.

Scientific Name	Species Habitat Preference	Likelihood of Species to Occur on Subject Site
Acacia bynoeana	Bynoe's Wattle is a semi-prostrate shrub to a metre high. The species is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Occurs in heath or dry sclerophyll forest on sandy soils. Generally prefers open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrowleafed Apple.	Nil Subject site does not support preffered soil type or vegetation associations

Scientific Name	Species Habitat Preference	Likelihood of Species to Occur on Subject Site
Acacia terminalis ssp terminalis	Very limited distribution between Botany Bay to the northern foreshore of Port Jackson. Recent collections have only been made from the Quarantine Station, Clifton Gardens, Dover Heights, Parsely Bay, Nielson Park, Cooper Park, Chifley and Watsons Bays.Coastal scrub and dry sclerophyll woodland on sandy soils .	Nil Subject site does not support preferred soil type or vegetation associations.
Caladenia tessellata	The Tessellated Spider Orchid is known from the Sydney area (old records), Wyong, Ulladulla and Braidwood in NSW. Populations in Kiama and Queanbeyan are presumed extinct. It was also recorded in the Huskisson area in the 1930s. Generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil.	Nil Distribution of this species is highly restricted
Callistemon linearifolius	This shrub is recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. There are currently only 5-6 populations in the Sydney area, of the 22 populations recorded in the past. Three of these are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve, and Spectacle Island Nature Reserve. Further north it has been recorded from Yengo National Park. Grows in dry sclerophyll forest	Nil Subject site does not support preferred soil type or vegetation associations.
Camarophyllopsis kearneyi	Known only from its type locality in Lane Cove Bushland Park in the Lane Cove local government area in the Sydney metropolitan region. Its occurrence appears to be limited to the Lane Cove Bushland Park. Surveys in potentially suitable habitats elsewhere in the Sydney Basin Bioregion have failed to find *Camarophyllopsis kearneyi.*	Nil. Distribution of this species is highly restricted. Subject site does not support suitable habitat.
Darwinia biflora	An erect to spreading shrub to 80cm high. Occurs at 129 sites in the northern and north-western suburbs of Sydney, in the Ryde, Baulkham Hills, Hornsby and Ku-ring-gai local government areas. The species occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. Associated overstorey species include *Eucalyptus haemastoma*, *Corymbia gummifera* and/or *E. squamosa*. The vegetation structure is usually woodland, open forest or scrub-heath. Fire is an important factor in the life cycle of this species. Fire kills all plants, but also produces a flush of germination from seed stored in the soil. The number of individuals at a site declines with time since fire, as the surrounding vegetation develops.	Nil - Low. Marginal preferred soil type and vegetation associations occur on the subject site but habitat is severely modified
Deyeuxia appressa	An erect perennial grass that is a highly restricted NSW endemic known only from two pre-1942 records in the Sydney area. Was first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown. Was then collected in 1941 from Killara, near Hornsby. Has not been collected since and may now be extinct in the wild due to the level of habitat loss and development that has occurred within these areas. Grows on wet ground.	Nil. Distribution of this species is highly restricted.
Epacris purpurascens var. purpurascens	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South. Found in a range of habitat types, most of which have a strong shale soil influence including sclerophyll forest, scrubs and swamps on sandstone. Lifespan is recorded to be 5-20 years, requiring 2-4 years before seed is produced in the wild. Killed by fire and reestablishes from soil-stored seed.	Nil - Low. Marginal preferred soil type and vegetation associations occur on the subject site but habitat is severely modified
Eucalyptus camfieldii	Restricted distribution in a narrow band from Raymond Terrace in the north, south to Waterfall. Localised and scattered distribution includes sites at Norah Head (Tuggerah Lakes), Peats Ridge, Mt Colah, Elvina Bay Trail (West Head), Terrey Hills, Killara, North Head, Menai, Wattamolla and a few other sites in Royal National Park. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas. Associated species frequently include stunted species of *E.oblonga* Narrow-leaved Stringybark, *E. capitellata* Brown Stringybark and *E. haemastoma* Scribbly Gum. Poor response to too frequent fires.	Nil. Subject site does not support suitable soil type and vegetation associations

Scientific Name	Species Habitat Preference	Likelihood of Species to Occur on Subject Site
Eucalyptus nicholii	This species is widely planted as an urban street tree and in gardens but is quite rare in the wild. It is confined to the New England Tablelands of NSW, where it occurs from Nundle to north of Tenterfield, largely on private property. Natural habitat for the species is dry grassy woodland, on shallow and infertile soils, mainly on granite.	Nil. Subject site does not support preferred soil type or vegetation associations.
Genoplesium baueri	A terrestrial orchid 6-15 cm high, fleshy, brittle, yellowish-green or reddish. Inflorescence sparse, 1-3 cm long, 1-6-flowered. The species has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Known to occur in the Pittwater, Cumberland, Burragorang and Sydney Cataract areas. Grows in sparse sclerophyll forest and moss gardens over sandstone. Flowers Dec. – Mar.	Nil. Subject site does not support suitable habitat.
Grevillea caleyi	Restricted to an 8km square area around Terrey Hills, approximately 20km north of Sydney. Occurs in three major areas of suitable habitat, namely Belrose, Ingleside and Terrey Hills/Duffys Forest within the Ku-ring-gai, Pittwater and Warringah Local Government Areas. All natural remnant sites occur within a habitat that is both characteristic and consistent between sites. All sites occur on the ridgetop between elevations of 170 to 240m asl, in association with laterite soils and a vegetation community of open forest, generally dominated by Eucalyptus sieberi and E. gummifera. Commonly found in the endangered Duffys Forest ecological community.	Nil. Subject site does not support suitable habitat.
Haloragodendron lucasii	An erect hairless shrub to 1.5 m tall, with fourwinged branches arising in pairs. The flowers are creamy-white and almost stalkless, with four triangular erect sepals (petal-like structures). The known locations of this species are confined to a very narrow distribution on the north shore of Sydney. The species is associated with dry sclerophyll forest. Reported to grow in moist sandy loam soils in sheltered aspects, and on gentle slopes below cliff-lines near creeks in low open woodland. Associated with high soil moisture and relatively high soil-phosphorus levels.	Nil. Distribution of this species is highly restricted. Subject site does not support suitable habitat.
Hibbertia puberula	Has not been seen for over 40 years. Early records of this species are from the Hawkesbury River area and Frenchs Forest in northern Sydney, South Coogee in eastern Sydney, the Hacking River area in southern Sydney, and the Blue Mountains. Occurs on sandy soil often associated with sandstone.	Nil. Subject site does not support preferred habitat.
Hygrocybe anomala var. ianthinomarginata	Type locality, Lane Cove Bushland Park, Lane Cove Local Government Area. Other records from Royal and Blue Mountains NPs. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat.
Hygrocybe aurantipes	Type locality, Lane cove Bushland Park, Lane Cove Local Government Area. Other records from Blue Mountains National Park (Mt Wilson) and Hazelbrook. Does not produce above ground fruiting bodies (fungus) all year round. Fruiting bodies begin appearing mid May to mid July sometimes to August. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat.

Scientific Name	Species Habitat Preference	Likelihood of Species to Occur on Subject Site
Hygrocybe austropratensis	Only know from type locality at Lane Cove Bushland Park, Lane Cove Local Government Area. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss. Does not produce above ground fruiting bodies (fungus) all year round. Fruiting bodies begin appearing mid May to mid July sometimes to August.	Nil. Subject site does not support preferred habitat.
Hygrocybe collucera	Only know from type locality at Lane Cove Bushland Park, Lane Cove Local Government Area. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat.
Hygrocybe griseoramosa	Only know from type locality at Lane Cove Bushland Park, Lane Cove Local Government Area. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat
Hygrocybe lanecovensis	Only know from type locality at Lane Cove Bushland Park, Lane Cove Local Government Area. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat
Hygrocybe reesiae	Type locality, Lane cove Bushland Park, Lane Cove Local Government Area. Also recorded from Blue Mountains National Park in the Hazelbrook area. Also found in Tasmania. Occurs in gallery warm temperate forests dominated by Lilly Pilly (Acmena smithii), Grey Myrtle (Backhousia myrtifolia), Cheese Tree (Glochidion ferdinandi) and Sweet Pittosporum (Pittosporum undulatum). Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat
Hygrocybe rubronivea	Only know from type locality at Lane Cove Bushland Park, Lane Cove Local Government Area. Occurs in gallery warm temperate forests dominated by Lilly Pilly Acmena smithii, Grey Myrtle Backhousia myrtifolia, Cheese Tree Glochidion ferdinandi and Sweet Pittosporum Pittosporum undulatum. Associated with alluvial sandy soils of the Hawesbury Soil Landscapes. Occur as individuals or in groups, terrestrial rarely on wood and only if extremely rotten; substrates include soil, humus, or moss.	Nil. Subject site does not support preferred habitat .
Lasiopetalum joyceae	Has a restricted range occurring on lateritic to shaley ridgetops on the Hornsby Plateau south of the Hawkesbury River. It is currently known from 34 sites between Berrilee and Duffys Forest. Seventeen of these are reserved. Grows in heath on sandstone	Nil. Subject site does not support preferred habitat.

Scientific Name	Species Habitat Preference	Likelihood of Species to Occur on Subject Site
Leptospermum deanei	A shrub known from Hornsby, Warringah, Ku-ringgai and Ryde LGAs the species occurs in Woodland on lower hill slopes or near creeks preferring sandy alluvial soil or sand over sandstone. Vegetation associations are Riparian Scrub - e.g. *Tristaniopsis laurina, Baechea myrtifolia*; Woodland - e.g. *Eucalyptus haemstoma*; and Open Forest - e.g. *Angophora costata*,*Leptospermum trinervium, Banksia ericifolia*. The species is probably killed by fire	Nil Subject site does not support preferred habitat.
Melaleuca deanei	Occurs in two distinct areas, in the Ku-ringgai/Berowra and Holsworthy/Wedderburn areas with more isolated occurrences at Springwood Wollemi National Park, Yalwal and on the Central Coast. The species grows in heath on sandstone. The species is known from the following reserves, Berowra Valley Regional Park, Brisbane Water National Park, Ku-ring-gai Chase National Park, Garigal National Park, Lane Cove National Park, Royal National Park and Heathcote National Park.	Nil Subject site does not support preferred habitat.
Persoonia hirsuta	The Hairy Geebung has been recorded in the Sydney coastal area (subsp. hirsuta - Gosford to Berowra to Manly to Royal National Park), the Blue Mountains area (subsp. evoluta - Springwood, Lithgow, Putty) and the Southern Highlands (subsp. evoluta - Balmoral, Buxton, Yanderra and Hill Top areas). It is probably killed by fire (as other Persoonia species are) but will regenerate from seed. The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone	Nil Subject site does not support preferred habitat.
Pimelea curviflora var. *curviflora*	Open forest and shrublands on sandy soils in coastal areas or shale/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes. Often grows amongst dense grasses and sedges.	Nil Subject site does not support preferred habitat.
Prostanthera marifolia	Occurs as localised patches in or in close proximity to the Duffys Forest Ecological Community, which is listed as an Endangered Ecological Community in Schedule 1, Part 3 of the *Threatened Species Conservation Act* 1995. The sites are located on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses, a soil type which only occurs on ridge tops and has been extensively urbanised.	Nil Subject site does not support preferred habitat.
Sarcochilus hartmannii	From the Richmond River in northern NSW to Gympie in south-east Queensland. Favours cliff faces on steep narrow ridges supporting eucalypt forest and clefts in volcanic rock from 500 to 1,000 m in altitude. Also found occasionally at the bases of fibrous trunks of trees, including cycads and grass-trees.	Nil. Subject site does not support preferred soil type of vegetation associations
Syzygium paniculatum	The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Bulahdelah to Conjola State Forest. On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Nil. Subject site supports some marginal habitat in places, but not as natural habitat
Tetratheca glandulosa	In areas of shale-sandstone transition habitat such as shale-cappings over sandstone. Occupies ridgetops, upper-slopes and mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey/sandy loam with stony lateritic fragments common. Vegetation varies from heaths and scrub to woodlands, open woodlands and open forest with distribution broadly corresponding to Sydney Sandstone Ridgetop Woodland.	Nil. Subject site does not support preferred soil type of vegetation associations

5.2 Fauna

Table 6 summarises the habitat potential of the subject site for the threatened fauna species previously recorded as occurring within 5km radius of the site on the DECCW Wildlife Atlas and listed in the EPBC Act matters of national environmental significance report for the locality.

Table 6 Habitat potential for threatened fauna species previously recorded within the locality.

Species	Preferred Habitat	Likelihood of Occurrence
Botaurus poiciloptilus	The Australasian Bittern is a large, stocky bird, reaching up to 75 cm in length. In NSW the species may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes and spikerushes. Australasian Bitterns hide during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Breeding occurs in summer from October to January. Nests are built in secluded places in densely-vegetated wetlands on a platform of reeds, and there are usually six olive-brown eggs to a clutch.	Nil-low. Subject site does not support freshwater wetlands.
Callocephalon fimbriatum	The Gang-gang Cockatoo is found in the central NSW coast and Tableland areas, including Canberra and the Hawkesbury/Nepean and Sydney Metro region. Usually frequents forested areas with old growth attributes required for nesting and roosting purposes. Also utilises less heavily timbered woodlands and urban fringe areas to forage, but appears to favour well timbered country. Preferred diet comprises the seeds of eucalypts, wattles and introduced hawthorns but the species will also consume berries, fruits, nuts and insects and their larvae.	Low-Medium. Subject site offers nesting and foraging habitat.
Calyptorhynchus lathami	The Glossy Black Cockatoo is distributed along the Australian east coast and inland districts, the species occurs from western Victoria to Rockhampton in Queensland and as far west as Cobar and Griffith in NSW. Locally nomadic; flocking habitat is limited to dryer forest types of suitable feeding habitat with the species feeding exclusively on seeds from Casuarina species. Breeding occurs in autumn and winter; one chick is raised by both parents in a nest constructed in a large tree-hollow (NPWS 1999).	Nil - Low. Subject site does not offer preferred nesting or foraging habitat
Cercartetus nanus	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pillaga, Dubbo, Parkes and Wagga Wagga on the western slopes. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest.They feed largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum (Pseudocheirus peregrinus) dreys or thickets of vegetation, (eg. grass-tree skirts). Nest-building appears to be restricted to breeding females, where tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks.	Nil. Subject site does not offer preferred nesting or foraging habitat.
Chalinolobus dwyeri	The Large-eared Pied Bat is a microchiropteran bat found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Hirundo ariel). Forage in low to mid-elevation dry open forest and woodland and well-timbered areas containing gullies close to roosting habitat. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and have a high fidelity to the same cave over many years. This species probably forages for small, flying insects below the forest canopy and likely to hibernate through the coolest months.	Nil - Low. Subject site does not offer roosting habitat. Subject site offers some foraging habitat. Species may fly over site on occasion.

Dasyurus maculatus	The Spotted-tailed Quoll is currently found along the escarpments, tablelands and coast of the eastern seaboard from the Bundaberg area in south-east Qld south through NSW to Victoria and Tasmania. Spotted-tailed Quolls are found in a variety of forest types including dry and moist eucalypt forests and rainforest. They tend to move along drainage lines and make dens in fallen hollow logs or among large rocky outcrops. They are usually nocturnal but are known to hunt and bask during the day. They are known to hunt on the ground and in trees	Nil-low. Subject site does not offer preferred habitat to the species
Ephippiorhynchus asiaticus	The Black-necked Stork is the only stork species in Australia. The species is widespread across coastal northern and eastern Australia, becoming increasingly uncommon further south into NSW, and rarely south of Sydney. Some birds may move long distances and can be recorded well outside their normal range.Inhabits permanent freshwater wetlands including margins of billabongs, swamps, shallow floodwaters, and adjacent grasslands and savannah woodlands; can also be found occasionally on inter-tidal shorelines, mangrove margins and estuaries.	Nil-low. Subject site does not support freshwater wetlands.
Falco hypoleucos	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. Recorded utilizing a range of habitat from coastal to arid areas. Roosts and nests in dead or alive trees.	Nil-low. Species is a vagrant to Sydney region. Subject site offers poor foraging habitat.
Glossopsitta pusilla	The Little Lorikeet is the smallest of the Australian Lorikeets. The species is distributed from Cairns in QLD to Adelaide in SA. In New South Wales Little Lorikeets are occur in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending west to Albury, Parkes, Dubbo and Narrabri. The species predominately forages for nectar and pollen in the tree canopy as well as melaleucas and mistletoes.	Nil-low. Subject site does not support preferred foraging habitat.
Ixobrychus flavicollis	The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds. Nests, built in spring are located on a branch overhanging water and consist of a bed of sticks and reeds on a base of larger sticks. Between three and five eggs are laid and both parents incubate and rear the young.	Nil. Subject site does not support preferred foraging habitat.
Lathamus discolour	The Swift Parrot migrates from breeding grounds in Tasmania to the Australian mainland in winter the species ranges from south-eastern South Australia across inland and coastal areas to southeast Queensland. The preferred habitat on mainland Australia is woodlands and riparian vegetation where there are winter flowering eucalypts such as the Swamp Mahogany, Eucalyptus robusta in coastal areas (NPWS 2002a). Breeding in Tasmania between September and February sometimes in small colonies the nest is an unlined tree hollow with three to five eggs laid. The species feeds mainly on nectar but also pollen and insects (NPWS 2003).	Nil-low. Subject site does not support preferred foraging habitat.

Limosa limosa	The Black-tailed Godwit is a large sandpiper that breeds in Mongolia and Eastern Siberia and migrates to Australia in August, returning to the northern hemisphere in March. The species inhabits sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats, where it forages for insects, crustaceans, molluscs, worms, larvae, spiders, fish eggs, frog eggs and tadpoles in soft mud or shallow water. Black-tailed Godwits roost on low banks of mud, sand and shell bars.	Nil Subject site does not support preferred foraging habitat.
Litoria aurea	The Green and Golden Bell Frog is distributed along the NSW and eastern Victorian coasts and some isolated locations west of the Great Dividing Range in NSW, this species inhabits wetlands such as marshes, dams and stream verges. Preferred habitat includes unshaded water bodies with adjacent grassy areas and suitable diurnal sheltering sites such as emergent vegetation and rocks and is known to inhabit highly disturbed sites within the Greater Sydney region (NPWS 1999). Frequently active by day. Adults prey on invertebrates and other amphibians. Tadpoles feed on algae or other vegetative material (NPWS 1999). Breeding usually occurs in summer when conditions are warm and wet (Cogger 1992) and water-bodies used for breeding usually have a substrate of sand, rock or clay, are still and shallow and are free of predatory fish eg. Mosquito Fish.	Nil-low. Subject site does not support preferred foraging habitat.
Miniopterus schreibersii oceanensis	The Eastern Bent-wing Bat is distributed through out eastern Australia from north Queensland to far south-eastern South Australia. In NSW recorded from the coast to the western slopes of the Great Dividing Range. Occurring in forests and woodlands the species live in colonies and roost in caves, old mines and occasionally buildings. Females form nursing colonies in spring utilising specific nursery caves with high humidity and temperature. The species forages for insects above the tree canopy (DEC 2005). Have two foraging flights a flight.	Low. Subject site offers some foraging habitat. Species may fly over site on occasion.
Mormopterus norfolkensis	The Eastern Freetail-bat occurs in dry sclerophyll forest and woodland east of the Great Dividing Range from south Queensland to southern NSW. They roost mainly in tree hollows but will are also found roosting under bark or in man-made structures. They are generally solitary and probably insectivorous (DEC 2005).	Nil - low. Subject site offers some roosting and foraging habitat.
Nettapus coromandelianus	The Cotton Pygmy-goose is a small surface-feeding duck with a goose-like bill. Although once found from north Queensland to the Hunter River in NSW, the Cotton Pygmy-goose is now only a rare visitor to NSW. Freshwater lakes, lagoons, swamps and dams, particularly those vegetated with waterlilies and other floating and submerged aquatic vegetation. The Cotton Pygmy-goose uses standing dead trees with hollows close to water for roosting and breeding.	Nil. Subject site does not support preferred habitat.
Ninox connivens	The Barking Owl occurs throughout Australia except for the central arid regions and Tasmania, sparse in southern Australia. Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses, during the day they roost along creek lines, usually in tall understorey trees with dense foliage such as Acacia and Casuarina species, or the dense clumps of canopy leaves in large eucalypts. Home range is from 30 to 200 hectares and birds are present all year.	Nil - low. Subject site supports marginal habitat for prey species. Subject site does not support or preferred roosting or nesting habitat.
Ninox strenua	The Powerful Owl is found throughout forests and woodlands of south eastern Australia from southeast Queensland to southeast South Australia. In NSW the species is less common in the southern part of its range. Occupying a large home range of more than 1000 ha, the species roosts by day in dense vegetation, commonly on drainage lines and in gullies. Require tree-hollows of more than 50cm depth for nesting, where one to two eggs are laid. Diet consists of medium sized arboreal marsupials with preferred prey including Greater Gliders, Ringtail Possums, Sugar Gliders and Flying Foxes.	Low. Subject site may support preferred prey species. Subject site does not support or preferred roosting nesting habitat.

Pandion haliaetus	Ospreys are found right around the Australian coast line, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia, and rare in inland Australia.They favour coastal areas, especially the mouths of large rivers, lagoons and lakes.They feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Nil-low. Subject site does not support preferred habitat.
Petaurus australis	The Yellow-bellied Glider is found along the eastern seaboard to the western slopes of the Great Divide, from southern Queensland to Victoria (NPWS 2002a). The species inhabits tall mature eucalypt forests and nests in large tree hollows where they build substantial, spherical nests of eucalypt leaves. Yellow-bellied Gliders feed from a range of sources, including winter-flowering eucalypts that provide nectar and pollen, and sap-trees, which are eucalypt trees into which they chew V-shaped incisions to collect sap.	Nil-Low. Subject site offers poor foraging habitat.
Polytelis swainsonii	The Superb Parrot is a distinctive large, bright grass-green parrot. The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest.May forage up to 10 km from nesting sites, primarily in grassy box woodland.	Nil. Subject site does not support preffered habitat
Pseudophryne australis	The Red-crowned Toadlet is generally confined to the Sydney Basin, occuring in open forests, mostly on Hawkesbury and Narrabeen Sandstones. Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings, sheltering under rocks and amongst dense vegetation in thick leaf litter. Breeds in damp leaf litter. Hatching occurs when the tadpoles are well developed and the site has had heavy rainfall.	Nil. Subject site does not support preferred habitat.
Pteropus poliocephalus	The Grey-headed Flying-Fox occurs along the east coast of Australia from Bundaberg in Queensland to Melbourne in Victoria and to the western slopes of the Great Diving Range in northern NSW. Habitat includes heath, swamps, forests, woodlands and rainforests. The species roosts in aggregations of up to tens of thousands of animals and migrates depending on availability of food resources, which may be seasonal. Mating commences in March and females give birth to one young in October or November, with a six-month gestation. Nectar, pollen and fruits or foraged from native trees and vines or sometimes fruit crops.	Low Subject site does not comprise a camp. Subject site offers some very limited foraging habitat.
Ptilinopus superbus	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania. 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.The nest is a structure of fine interlocked forked twigs, giving a stronger structure than its flimsy appearance would suggest, and is usually 5-30 metres up in rainforest and rainforest edge tree and shrub species.	Nil-low. Subject site offers some foraging habitat.

Saccolaimus flaviventris	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings, however 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. This species appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown.	Nil - low. Subject site offers some foraging habitat. Species may fly over site on occasion.
Varanus rosenbergi	Rosenbergi's Goanna occurs in NSW along the Central Coast regions inhabiting Sclerophyll forest, woodland and heathland. Diet consists of insects, reptiles, small mammals and birds. Associated with termites, the mounds of which this species nests in. Termite mounds are a critical habitat component. Individuals require large areas of habitat. Shelters in hollow logs, rock crevices and in burrows, which they may dig for themselves, or they may use other species' burrows, such as rabbit warrens.	Nil. Subject site does not support preferred nesting or foraging habitat
Xanthomyza phrygia	The Regent Honeyeater is formerly distributed from South Australia, Eastern Victoria, NSW and to Dalby in Queensland; distribution of this species has now become extremely patchy. In NSW the species has been recorded from coastal areas to as far west as Narrabri with important breeding areas west of Armidale. The species is semi-nomadic and occurs in temperate eucalypt woodlands with most records from box-ironbark associations and wet lowland coastal forests. One to three eggs are laid between July and November in a nest constructed in eucalypts, casuarinas or mistletoes. Diet consists of nectar (with a preference for eucalypts including Red Ironbark, White Box and Yellow Box) and soft and hard bodied arthropods.	Nil-low. Subject site does not support preferred habitat

6 LEGISLATION AND POLICY

6.1 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) provides for the conservation and protection of threatened species, populations and ecological communities of animals and plants through specific objectives relating to the conservation of biodiversity and promoting ecologically sustainable development. The Schedules of the TSC Act identify endangered or vulnerable species, populations, ecological communities, critically endangered species or ecological communities and key threatening processes affecting the listed species, populations and ecological communities. Provision is made for the preparation of recovery plans for listed threatened species, populations and ecological communities and threat abatement plans to manage key threatening processes.

The TSC Act provides for the declaration and mapping of habitats that are critical to the survival of those identified threatened species, populations and ecological communities that are classified as endangered (critical habitats). Further, the TSC Act also sets out the methods of assessment, management and regulation of actions that may damage critical or other habitat or otherwise significantly affect threatened species, populations and ecological communities.

6.2 Environmental Planning and Assessment Act 1979

As the current project is to be considered under Part 3A of the EP&A Act, the terms of reference for the environmental assessment has be set out in the DGRs. The DGRs do not require specific reference to legislative guidelines relating to threatened flora and fauna assessment. However, Ryde City Council have made a submission that states that "While the potential fauna habitat is limited, there is existing vegetation on site and on surrounding properties. An endangered ecological community has been identified on the Housing NSW site to the east and on the Macquarie University Campus to the north. This site is in the same catchment as those communities."

The local tree species occurring on site are characteristic species for the EEC STIF. Under the final determination for STIF as an EEC, it is stated that the community can occur as single trees. Because of this, all single specimens of characteristic tree species occurring on the subject site have been identified as comprising the extent of STIF for this site.

This report addresses the potential impacts of the proposal to any remnant STIF vegetation. While Part 3A and the DGRs don't require a seven part test to determine the significance of potential impacts, an assessment of significance for the ecological community (listed under the TSC Act) was carried out in accordance with The Department of Environment, Climate Change and Water's *Draft Guidelines for Threatened Species Assessment under Part 3A* (DECCW, 2005).

6.3 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) would only become relevant if it was considered that an impact on a 'matter of National Environmental Significance (NES)' were likely, thus providing a trigger for referral of the proposal to the Department of the Environment and Water, Heritage and the Arts.

Matters of national environmental significance identified in the Act are:

- world heritage properties;
- national heritage places;
- Ramsar wetlands;
- nationally threatened species and communities;
- migratory species protected under international agreements;
- the Commonwealth marine environment; and
- nuclear actions.

6.4 SEPP 44 – Koala Habitat Protection

State Environmental Planning Policy No.44 - Koala Habitat Protection (SEPP 44) aims to protect the Koala and its habitat by incorporating prescriptions for consent authorities to consider during the assessment of development applications. SEPP 44 contains prescriptions for the consideration of "potential koala habitat" and "core koala habitat" for developments within Local Government Areas listed on Schedule 1 of the Policy. Ryde LGA is listed on Schedule 1 as an area to which SEPP 44 applies.

"Potential koala habitat" is defined by SEPP 44 as "areas of native vegetation where the trees of types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component". No tree species were recorded within the study area as listed under Schedule 2 of the Policy as Koala "feed tree species". As such the subject site does not support "potential koala habitat", as defined under SEPP 44.

"Core koala habitat" is defined under SEPP 44 as areas of land that contain "a resident population of koalas, evidenced by attributes such as breeding females and recent sightings of and historical records of a population". No evidence (such as sightings, calls, scats and fur) of a resident population of the Koala were recorded during the current investigation. As such the subject site does not support and "core koala habitat", within the meaning of SEPP 44.

6.5 SEPP 19 – Bushland in Urban Areas

State Environmental Planning Policy No.19 - Bushland in Urban Areas (SEPP 19) aims to, amongst other things, "protect and preserve bushland" within the urban areas of Sydney (Department of Planning 1986). Ryde is listed under SEPP 19 as a Council area to which the Policy applies.

Clauses 6, 7 and 8 of the Policy outline requirements for development consent to be considered by a consent authority, when assessing development applications that involve disturbance to bushland "zoned or reserved for public open space". The subject site is not zoned "for public open space" pursuant to Ryde LEP 2000, and thus Clauses 6, 7 and 8 of SEPP 19 do not apply to the proposed development.

7 IMPACT ASSESSMENT

The Concept Plan for the Macquarie Village proposal includes the use of buffer planting as a green street setback around the perimeter of the site which will incorporate much of the existing trees and vegetation already existing on the southern edge of the site which has been mapped as part of the STIF community. In addition to the retention of the existing vegetation it is proposed that this area will be densely planted with turpentine ironbark forest species along the Epping Road boundary.

The impact of the current proposal, including the Concept Plan and Stage 1 Project Application is predominately limited to the area identified as the 'subject site', and no significant indirect impacts to the adjoining sites is predicted. The proposal will include the removal of nearly all native and exotic plant species where necessary to enable the construction project to occur, including excavation for the underground car park areas. Aspects of the proposal to limit the potential impacts to flora and fauna include the retention of as many trees as possible outside the construction zone, and tree protection measures for those trees retained. The Arborist report identifies trees that should be considered for retention and the corresponding tree protection measures to be employed as part of the construction project.

This flora and fauna assessment has considered the flora and fauna species, vegetation communities and habitat components and concluded that the subject site does not currently support threatened flora and fauna species that are indigenous to the area, and has not identified significant habitat for any species targeted in the survey and assessment. The original plant community on the subject site would have been representative of the EEC Sydney Turpentine-Ironbark Forest. While this community would have occurred over the study area prior to clearing, it is only now present on the subject site as individual trees, with only one of these considered to be a remnant tree, with the majority of local native tree species considered by the current report to have been planted. One single remnant tree (*Syncarpia glomulifera* Turpentine) that is characteristic STIF species will be removed as part of the proposal.

The Assessment of Significance (7-part test) has concluded that the potential impact to STIF located within the study area from the proposed development is not significant, and a Species Impact Statement is therefore not required. No other threatened flora and fauna species were recorded on site and fauna habitat is poor, and the likelihood of threatened fauna species utilising the site for key aspects of their lifecycle is considered to be very low and for these reasons, further assessment of species previously recorded within the locality has not been conducted.

Clearing of native vegetation is considered to be a Key Threatening Process under the TSC Act, and while some clearing will occur it is predominantly within the native and exotic garden areas, with most of the original vegetation of the study area previously cleared for residential development and road construction. This has resulted in fragmentation of the remaining vegetation. The proposal would result in additional vegetation removal and disturbance as described above however it is not likely to be significantly increased.

In relation to the current proposal for the subject site this report concludes that:

- the proposed removal of flora species are not considered significant habitat trees for threatened fauna species and will not impact on threatened species;
- there is unlikely to be a significant impact on the general native flora and fauna of the subject site and study area as a result of the proposal;
- there is unlikely to be a significant impact on native flora and fauna habitats as a result of the proposal;
- the 7-part Test (Assessment of Significance) under the EP&A Act has concluded that there is unlikely to be a significant impact on the STIF endangered ecological community as a

result of the proposal provided precautionary measures to protect the area are implemented during construction and design elements consider the potential for ongoing impacts during operation of the proposed facility;

8 RECOMMENDATIONS

This assessment has concluded that the current proposal is unlikely to impact on the native flora and fauna of the subject site and biodiversity of adjacent areas. Further to the assessment within this report, and to minimise or control potential impacts of the current proposal on the native flora and fauna of the subject site and study area, this report recommends the following.

- Removal of trees should be offset with the revegetation of the Epping Road setback buffer zones and removal of exotic species from the site;
- Any landscaping or revegetation works are to incorporate locally indigenous native plant species, including those that are characteristic of STIF;
- Seed should be collected from the single Turpentine tree that is to be removed, and plants propagated from the seed should be used within revegetation works. Seed should also be provided to Ryde Council for use in other bushland revegetation projects within the locality;
- Tree protection measures as recommended within the Earthscape report should be implemented for all retained trees;
- Temporary fencing is to be installed around the construction area and machinery or materials storage areas to eliminate the potential for accidental damage to the STIF remnants and all retained trees on the site during construction works;
- Installation, maintenance and decommissioning of sediment and erosion controls as required and as specified in any consent and soil and water management plan;
- Machinery parking and equipment or materials storage compounds are to be in areas of pre existing disturbance;
- Native trees or limbs of trees that are removed as part of clearing for the current proposal should be mulched and used on site in rehabilitation or landscaping works; for temporary sediment and erosion control during construction; or as habitat features in any restoration works;
- The current proposal is to be carried out in accordance with all policies, operational procedures and guidelines in place as part of a consent condition or environmental planning instrument relating to environmental management or impact minimisation for construction projects of the scope for current proposal. This would include but not be limited *to City of Ryde Development Control Plan 2006 – 8.2 Stormwater Management* (RCC, 2006) and *Managing Urban Stormwater. Soils and Construction. Volume 1, 4th Edition* (Landcom, 2004).

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Appendix A

Flora Species Inventories

Macquarie Village, Macquarie Park

General Status	
*	Exotic (not native to Australia)
N( )	Noxious weeds and 'Control Class' as listed on the NSW Noxious Weeds Act 1993 for the Campbelltown LGA
ni	Non - indigenous native species (does not naturally occur at this locality)
(?)	Uncertain identification
Conservation Status	
CE	Critically Endangered - listed under Schedule 1A of the TSC Act
E	Endangered - listed under Schedule 1 of the TSC Act
V	Vulnerable - listed under Schedule 2 of the TSC Act
Abundance	
c	Common, species occur all over the site
o	Occasional, species occur over the survey area but not in large numbers at any occurrence
uc	Uncommon, species occur only once or twice during the survey

Status	Family	Genus species	Common Name	Abundance	
				STIF Trees	Garden
	Fabaceae - Mimosoideae	Acacia floribunda	White Sally Wattle		o
	Fabaceae - Mimosoideae	Acacia parramattensis	Sydney Green Wattle		o
	Myrtaceae	Acmena smithii	Lilly Pilly		u
	Myrtaceae	Angophora floribunda	Apple	u	
	Sterculiaceae	Brachychiton acerifolius	Flame Tree		u
*	Buxaceae	Buxus	sp		o
	Myrtaceae	Callistemon viminalis	Weeping Bottlebrush		u
	Pinaceae	Cedrus deodara	Himalayan Cedar		u
	Mrytaceae	Corymbia citriodora	Lemon-scented Gum		o
	Myrtaceae	Corymbia maculata	Spotted Gum		o
	Cupressaceae	Cupressus macrocarpa	Golden Cypress		c
	Poaceae	Cynodon dactylon	Couch		c
	Myrtaceae	Eucalyptus botryoides	Bangalay		u
	Myrtaceae	Eucalyptus pilularis	Blackbutt		u
	Myrtaceae	Eucalyptus racemosa	Narrow-leaved Scribbly Gum		o
	Myrtaceae	Eucalyptus saligna	Sydney Blue Gum	o	
	Moraceae	Ficus lyrata	Fiddle-leaf Fig		u
*	Moraceae	Ficus sp			u
ni	Proteaceae	Grevillea robusta	Silky Oak		c
	Proteaceae	Hakea salicifolia	Willow-leaved Hakea		u
*	Bignoniaceae	Jacaranda mimosifolia	Jacaranda		u
*	Altingiaceae	Liquidambar styraciflua	Liquidambar		o
	Arecaceae	Livistona australis	Cabbage Fan-palm		o
	Arecaceae	Livistona chinensis	Chinese Fan Palm		c
ni	Myrtaceae	Lophostemon confertus	Brush Box		u

*	Araceae	Monstera deliciosa	Fruit Salad Plant		u
*	Rutaceae	Murraya paniculata			o
*	Poaceae	Pennisetum clandestinum	Kikuyu Grass		o
*	Arecaceae	Phoenix canariensis	Canary Island Date Palm		c
	Pittosporaceae	Pittosporum undulatum	Sweet Pittosporum		u
	Fagaceae	Quercus robor	English Oak		u
ni	Araliaceae	Schefflera actinophylla	Umbrella Tree		o
ni	Proteaceae	Stenocarpus sinuatus	Firewheel Tree		u
*	Strelitziaceae	Strelitzia reginae	Bird of Paradise		o
*	Arecaceae	Syagrus romanzoffiana	Cocos Palm		c
	Myrtaceae	Syncarpia glomulifera ssp glomulifera	Turpentine	u	
	Cupressaceae	Thuja orientalis	Chinese Arborvitae		c
*	Apocynaceae	Trachelospermum jasminoides	Star Jasmine		o
	Arecaceae	Washingtonia robusta	Cotton Palm		u
	Lamiaceae	Westringia fruticosa	Coastal Rosemary		o

Appendix B

Assessment of Significance

Macquarie Village, Macquarie Park

7-part Test – Sydney Turpentine-Ironbark Forest

(a) In the case of a threatened species, whether the action proposed 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.

The TSC Act defines a 'threatened species' as 'a species specified in Part 1 or 4 of Schedule 1 or in Schedule 2' of the Act. Sydney Turpentine-Ironbark Forest (STIF) is not a 'threatened species', as defined under the TSC Act.

(b) In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction.

The TSC Act defines an 'endangered population' as 'a population specified in Part 2 of Schedule 1' of the Act. STIF is not an 'endangered population', as defined under the TSC Act.

(c) In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:
- **(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.**

The local occurrence of Sydney Turpentine-Ironbark Forest (STIF) adjacent to the subject site has been mapped by DECC (2009). This remnant is mapped by DECC (2009) as a more or less contiguous patch of STIF amounting to approximately 44 hectares with a very high disturbance pattern. Other remnants of STIF have been identified by DECC (2009) within one kilometre to the north-west, north, north-east and south.

As the NSW Scientific Committee's Final Determination for STIF encompasses single remnant trees, the Flora and Fauna Report has considered each tree occurring on site, of a species characteristic of STIF, as being the extent of STIF on the site. Only one tree, a specimen of *Syncarpia glomulifera* Turpentine, was considered to be undoubtedly a remnant tree with all other trees on the subject site to be planted. Notwithstanding, the precautionary principle has been applied here and all trees of characteristic species have been considered as potential individual trees making up the extent of STIF on the subject site.

The single remnant specimen of *Syncarpia glomulifera* is proposed to be removed as it occurs within the development footprint. This specimen is isolated from all other STIF tree species on the subject site and is growing in a highly modified edaphic environment that including a raised and isolated garden bed.

The other characteristic tree species that occur on the subject site, considered here to be planted, occur as a narrow broken band of planted native trees for approximately 100 metres along the south-western boundary of the site. The STIF characteristic species within this planted area include 12 specimens of *Angophora costata* and one specimen of *Angophora floribunda*. These trees occur in an area outside the proposed building footprint, but may be adversely affected during the construction works due to unplanned incursions into their root zones. Additionally, the effect of significant shading by adjacent proposed buildings has been assessed as likely reducing the effect of seedling recruitment over time of existing STIF characteristic trees to the degree that the community would cease to exist in the area affected. As a result of this, for the purposes of assessing impacts, these trees have been considered that they will be impacted upon to the equivalent degree of being removed as part of this proposal. These shading effects from proposed building would also reduce the long term sustainability of planting trees in this area to offset tree removals to be reduced.

The loss of canopy trees will be offset with the revegetation of the buffer zone along the Epping Road setback, but due to the modified solar access conditions as part of the proposal (as noted above), offsetting will need to be modified to encompass revegetation and habitat recreation that produce

sustainable ecological processes over time. The significance of the trees for removal did not consider any significant value for critical habitat or fauna dispersal. A majority of these species have been planted or are located outside their natural habitat.

Overshadowing from the construction of the multistorey infrastructure will be significant along the area of the south-west boundary currently occupied by the narrow band of planted *Angophora costata* and the single *Angophora floribunda*. If these trees were able to be retained during construction works, the significant change to solar access would have a potential detrimental effect on these plants, shortening their lifespan and probably precluding effective germination of any seed.

The proposal will not have any significant impact on the STIF occurring to areas south of the Herring Road boundary. Although there will be a loss of solar access to the northern part of this remnant due to the 50 metre height of the buildings nearest to Herring road, this is considered minor as this area of STIF affected by shading from proposed buildings currently has little native understorey.

(d) In relation to a habitat of a threatened species, population or ecological community:
- **(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, 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 action, and**
- **(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

The Sydney Turpentine-Ironbark Forest community has been extensively cleared and modified since European settlement. Only 4.5% of the original distribution in NSW of 26,000 hectares remains intact (DEC, 2004). The STIF community once dominated the Ryde Council; today limited stands of remnant STIF vegetation remain and are highly fragmented, similar to the study area.

The proposal will remove the single remnant specimen of *Syncarpia glomulifera* Turpentine, and there is a likelihood of resultant terminal decline over time of the narrow strip of planted trees along the south-western boundary due to shadowing by the proposed buildings. The removal of the proposed trees will not directly cause fragmentation or isolation.

No critical habitat potential or significant tree species for sheltering or foraging of threatened species under the *TSC Act* was identified for any of the proposed trees for removal.

(e) Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly).

No area has been designated as 'critical habitat' under Part 3 of the TSC Act 1995 for STIF.

(f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan.

There is currently no specific recovery plan in place for STIF. A draft recovery plan has been written by DECC for threatened ecological communities of the Cumberland Plain but notes that Sydney Turpentine Ironbark Forest will not be specifically addressed in the recovery plan, as only a small proportion of its distribution occurs within the study area.

There are no Threat Abatement Plans currently in operation for any Key Threatening Processes threatening the STIF that specifically relate to the subject site.

(g) Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The TSC Act defines "threatening process" as 'a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, populations or ecological communities'.

Schedule 3 of the TSC Act provides a list of the 'key threatening processes' (KTP). Of the KTP's listed in Schedule 3 of the TSC Act the following are currently in operation;

- *Invasion of native plant communities by exotic perennial grasses*. Exotic landscaped grasslands are wide spread through the subject site. Including *Ehrharta erecta* Panic Veldtgrass and *Pennisetum clandestinum* Kikuyu Grass.

KTP's as listed in Schedule 3 of the TSC Act that will operate as a result of the current proposal are;

- *Clearing of native vegetation*. Removal of native species are not considered critical habitat of within STIF. Only one remnant tree will be removed. This specimen has been identified as having fair vigour. As it occurs in a small raised and isolated garden bed in an otherwise paved environment within a courtyard between multistorey buildings, the resilience of this species to regenerate is considered very low.

The main KTP's that have a potential to either commence to operate or be exacerbated on the subject site as a result of the current proposal are Infection of native plants by *Phytophthora cinnamomi* and Loss of hollow-bearing trees. However it is equally or more likely that *Phytophthora cinnamomi* would infect the subject site or study area due to dispersal in the current stormwater flows of the drainage line on the subject site boundary and the size and density of tree hollows that may be lost will possibly only currently provide sheltering and nesting habitat for a limited range of native fauna species.

The proposed development constitutes a scheduled or preliminary KTP of the removal of an isolated remnant tree in a highly modified area that has very little capacity for natural regeneration due to very poor resilience.

Conclusion

In light of the consideration made in the above seven factors (1-7), the proposed construction within the subject site does not impose "a significant effect" on the STIF endangered ecological community in the adjacent site. In summary the following assumption was made -

> **The proposal does not include the direct clearing or construction works within areas of STIF apart from the removal of a single specimen of *Syncarpia glomulifera* Turpentine. The construction footprints will not adversely reduce the dimensions of the current STIF coverage therefore; will not further fragment the community.**

Consequently a Species Impact Statement is not required for the completion of this assessment.