



**FLORA AND FAUNA SURVEYS  
AND  
BIODIVERSITY IMPACT ASSESSMENT  
FOR  
PROPOSED STATE SIGNIFICANT DEVELOPMENT  
APPLICATION FOR STAGES 1 & 1A OF THE CONCEPT  
APPLICATION AREA (CA AREA)  
AT  
SHORTLAND STREET AND STURT STREET,  
TELOPEA, NSW**

***PREPARED FOR:***

**FRASERS PROPERTY TELOPEA DEVELOPER PTY LTD  
C/O NATURALLY TREES  
PO BOX 5085 ELANORA HEIGHTS  
NSW 2101**

**REVISION B - 30<sup>th</sup> JUNE 2021**

# ACS Environmental Pty Ltd

## **Flora and Fauna Surveys, Biodiversity and Ecological Impact Assessment and Bushland Plans of Management Services**

Australian Company Number (ACN) 154 491 120

Australian Business Number (ABN) 24 154 491 120

3/28 Tullimbar Road, Cronulla NSW. 2230

Tel: 9527 5262. Mob: 0403 081 902.

Email: [acs@actinotus.com](mailto:acs@actinotus.com); Web: [www.actinotus.com](http://www.actinotus.com)

### **Director**

Peter Stricker BSc. (Hons) (Syd) <sup>□</sup> # \* ^



<sup>□</sup> Member Ecological Consultants Association NSW Inc

<sup>#</sup> Accredited Biodiversity Assessment Assessor (Biodiversity Conservation Act 2016) - (Accreditation Number BAAS 18125)

<sup>\*</sup> ACS Environmental is an accredited Animal Research Establishment certified by the NSW Dept of Primary industries

<sup>^</sup> Scientific Biodiversity Conservation Act Licence BSL100855 (DPIE 2021)

The principal of 'ACS Environmental P/L has worked in the area of floristic and faunal impact assessment services for a period of greater than 20 years. He also has over 30 years of experience in scientific research (ecological) and teaching in biological science.

<b>CONTENTS</b>	<b>page No.</b>
<b>EXECUTIVE SUMMARY</b>	ix
<b>1 INTRODUCTION</b>	<b>1</b>
1.1 Introduction and purpose of report	1
1.2 Background	2
1.3 Site description	2
1.4 Proposed development	3
1.5 History of Concept Application Area	5
1.6 Arboricultural assessment of Concept Application Area	5
1.7 Statutory and legislative requirements	18
1.8 Documents provided	19
1.9 Scope of the study	19
<b>2 EXISTING ENVIRONMENT</b>	<b>20</b>
2.1 Topography, geology and soils	20
2.2 Existing vegetation	20
2.3 Current and surrounding land-use	21
<b>3 FLORA AND FAUNA SURVEY AND ASSESSMENT</b>	<b>23</b>
3.1 Methods	23
3.1.1 Literature review	23
3.1.2 Site survey	23
3.1.3 Flora survey	23
3.1.4 Fauna survey	23
3.1.5 Limitations of study	23
3.2 Results - Flora	24
3.2.1 Landscape features	24
3.2.2 Discrete areas of vegetation composition	24
3.2.3 Indigenous and exotic plant species	58
3.2.4 Plant community	59
3.2.5 Conservation status of plant community	60
3.2.6 Impacts to vegetation resulting from proposed development and mitigation measures	61
3.2.7 Species of conservation significance	63
3.3 Results - Fauna and potential habitat assessment	66
3.3.1 Location and weather conditions of Concept Application Area	66
3.3.2 Habitats present	66
3.3.3 Wildlife corridor potential	67

<b>CONTENTS</b>	<b>page No.</b>
3.3.4 Fauna recorded	68
3.3.5 Fauna species of conservation significance	70
3.3.5.1 Threatened species	70
3.3.5.2 Threatened species with potential to occur at the Concept Application Area	72
<b>4 POTENTIAL IMPACTS AND COMPLIANCE WITH DEVELOPMENT IN PARRAMATTA COUNCIL LGA</b>	<b>76</b>
4.1 Introduction	76
4.2 Proposed impacts to floristic biodiversity	77
4.2.1 Potential impacts of development	77
4.2.2 Recommended mitigation measures	77
4.3 Compliance with Threatened Species Legislation	77
4.3.1 Threatened species	77
4.3.2 Threatened ecological community	77
4.4 Compliance with Effluent and Stormwater Disposal	77
4.5 Conclusions	78
<b>5 ADDRESSING THE PROPOSED DEVELOPMENT IN RELATION TO THE BAM (BIODIVERSITY ASSESSMENT METHOD) AS REQUIRED BY THE BC ACT (2016)</b>	<b>79</b>
5.1 Offset Scheme Thresholds	79
5.1.1 Natural Area Thresholds	79
5.1.2 Biodiversity Values Map	79
5.1.3 Threatened species, populations and/or ecological communities	80
<b>6 REFERENCES AND LITERATURE REVIEWED</b>	<b>82</b>
<b>FIGURES</b>	<b>page No.</b>
1 Schematic representation of the Telopea Estate Site Plan (2020) of the Telopea Urban Release Area (Source LAHC)	6
2. The Concept proposal as indicated in the image is further detailed in the Urban Design Report prepared by Bates Smart (2020) and Hassell (2020)	6
3. Schematic representation of the Stage 1A extent of works including the part demolition and upgrade of Sturt and Shortland Streets, including new kerb-realignment, new footpaths, landscaping, new parking bays, bus zones, line marking and crossing	7



## FIGURES

page No.

4.	Schematic representation of the Envelope Control Plan of the proposed Core and East Precincts of the Stage 1 Telopea Urban Release Plan (Bates Smart 2020)	9
5.	Schematic representation of the Master Plan of Stage 1 - 1A of the Stage 1 Telopea Urban Release Plan (Hassall Ltd 2020)	10
6.	Current aerial image of Concept Application Area of Stage 1 Telopea Urban Release Plan (red outline) (from SIXmaps 2020)	11
7.	Aerial image taken in 1943 indicating the boundaries of the current CA A of Stage 1 Telopea Urban Release Plan (red outline) (from SIXmaps 2020)	12
8A.	Schematic representation of 4 sheets indicating the locations of various species of trees at Telopea Stage 1 (for updated detail refer to Scales 2021)	13
8B.	Schematic representation indicating the location of various trees in the north-western section Telopea Stage 1 (for updated detail refer to Scales 2021)	14
8C.	Schematic representation indicating the location of various trees in the north-eastern section Telopea Stage 1 (for updated detail refer to Scales 2021)	15
8D.	Schematic representation indicating the location of various trees in the south-western section Telopea Stage 1 (for updated detail refer to Scales 2021)	16
8E.	Schematic representation indicating the location of various trees in the south-eastern section Telopea Stage 1 (for updated detail refer to Scales 2021)	17
9.	Aerial view of surrounding land use of subject land indicating long established residential development with bushland retained along drainage lines and corridors	21
10A.	Group 1, 6 & 7 trees along Shortland Street, Telopea (from Scales 2019)	28
10B.	Group 2, 3, 4, 5 & 8 trees along Shortland, Wade and Sturt Streets, Telopea (from Scales 2019)	29
10C.	Group 9, 10, 11 & 12 trees along Sturt Street and Polding Place, Telopea (from Scales 2019)	30

**FIGURES**

page No.

11	Large, well established individuals of Spotted Gum occur along Shortland Street	31
12	Individuals of Black Tea -tree occur at rear of Community Centre car park along Shortland Street	34
13	Individuals of Sydney Blue Gum occur in this group, particularly along the western end of Shortland street and at the corner of Wade Street. Magpie nest evident at central top of image	36
14	Individuals of Broad-leaved Paperbark occurring along Sturt Street	41
15	Weeping Bottlebrush occur on railway side of Sturt Street	43
16	Individuals of Sydney Blue Gum and Spotted Gum occur in this group within the residential complex at the western end of the study area. Raven nest evident at top of image	46
17	Large mature individual of non-locally occurring Lemon-scented Gum	49
18	Individuals of Spotted Gum in foreground and Blackbutt at rear on LHS	50
19	Individuals of Spotted Gum and Brush Box are common in this group of canopy species	52
20	Individual of Thin-leaved Stringybark containing hollow about 6m up the trunk	54
21	Individuals of River Oak and Weeping Bottlebrush that characterise this group of trees	55
22	Section of trees representative of this group, including Weeping Bottlebrush and showing several individuals of dead Red Ironbark remaining within the copse	57
23	OEH (2016) mapping of ecological communities occurring at the subject site indicates that no natural ecological community occurs within the CA A (yellow shaded areas indicate Urban Natives and Exotics OEH 2016).	59
24	DPIE (2020) mapping of ecological communities occurring at the CA A indicates that no natural ecological community occurs within the area (no shaded areas)	60

## FIGURES

page No.

25	Recorded sightings of 5 of the most recorded threatened flora species within a 5km radius of the CA A within the last 20 years (DPIE Bionet Atlas 2020)	65
26	Opportunistic avian species such as the Australian White Ibis and the feral Rock Pigeon foraging at the Concept Application Area	69
27	Recorded sightings of the 5 most commonly recorded threatened fauna within a 5km radius of the CA A within the last 20 years (DPIE Bionet Atlas 2020)	72
28	Indicating that no threatened fauna species has been recorded closer to the CA A than about 450m	73
29	Biodiversity Values Mapping of CA A at Shortland and Sturt Streets, Telopea (blue solid circle on map), showing biodiversity values mapped for the CA A and surrounds (biodiversity values along drainage creeks etc. are indicated in purple shading) (DPIE 2020).	80

## TABLES

1	Groups of trees delineated as to their relative species composition and location within the Concept Application Area (see figures 11A - 11C for locations of the discrete groups of trees)	26
2	Some common ground cover species, varying in frequency of occurrence, that occur in maintained lawns among the residential buildings in association with the canopy tree distributions. Kikuyu is the principal lawn grass comprising the lawns	27
3	Indicative native species representative of STIF vegetation, an ecological community type that most likely occurred at the locality before settlement and clearing for agriculture and residential development	33
4	Indicates the discrete groups of trees and particular tree species which are considered to have the greatest potential for nesting and sheltering for avifauna and microchiropterans	61
5	Fifteen (15) species of threatened flora that have been recorded within a 10km area centred around the CA A within the last 20 years (DPIE 2020)	64

## **TABLES**

- |   |  |    |
|---|--|----|
| 6 | Indicates the fauna recorded or expected to occur within the CA A at Telopea   | 68 |
| 7 | Thirty three (33) species of threatened fauna recorded within 5km radius of the Concept Application Area within the previous 20 years (DPIE Bionet Atlas 2020) | 71 |

## EXECUTIVE SUMMARY

This revised report has been prepared by ACS Environmental Pty Ltd for Naturally Trees (Scales 2021) on behalf of *Fraser's Property Telopea Developer Pty Ltd* (Fraser's) and accompanies a State Significant Development Application (SSDA) submitted to the NSW Department of Planning, Industry and Environment (DPIE). The SSDA seeks Concept Approval, in accordance with Division 4.4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), for the staged redevelopment of the '**Telopea Concept Application Area**', as well as a detailed proposal for the first stage of development, known as '**Stage 1A**'.

The purpose of the flora and fauna surveys and ecological impact assessment is to document existing and expected biota and to ensure all necessary safeguards are described and complied with in relation to the Stage 1A works and to the proposal as required by Parramatta LEP 2011 and Parramatta DCP 2011.

The land is currently utilised predominantly as a public housing estate with managed lawn grass areas dominated by a suite of exotic grass and herbaceous weed species. Various species of a total of mostly non-locally occurring native canopy species are documented for the Concept Application Area (Scales 2021).

The proposal is to redevelop the area for market affordable and social housing together with new retail and community facilities and open space as outlined in the Telopea Master Plan (prepared by Land and Housing Corporation and The City of Parramatta 2017).

The location has been mapped as not containing any natural ecological plant community (Figures 23 & 24).

Aerial mapping and ground-truthing indicates that the proposed development will occur in existing cleared and developed areas of the Concept Application Area (CA Area), where exotic grassland and landscaped trees comprise the derived vegetated landscape occurring at the study site (Figures 11 - 22).

The surveyed land proposed for construction has been historically cleared in structure, floristics and functionality well before 1943 (Figure 7), replacing former ecological forested communities, possibly including Blue Gum High Forest and Sydney Turpentine Ironbark Forest.

Bionet Atlas of NSW Wildlife data records for an area of 5km radius around the Concept Application Area indicate that 15 flora species of conservation significance have been recorded within the last 20 years.

Habitat at the highly floristically and structurally modified Concept Application Area is not suitable for the occurrence of any of these species. Comprehensive targeted searches for particularly these, but other, conspicuous, mostly large life-form species in the exotic-occurring assemblages of the Concept Application Area did not locate these, or any other threatened flora species, in the Concept Application Area.

The DPIE Bionet Atlas of NSW Wildlife database 2020 recorded thirty three (33) species of terrestrial and avifauna listed as threatened under the BC Act within a 5 km radius of the Concept Application Area. The proposal to develop the currently cleared and managed areas of the Concept Application Area is not considered to compromise any of these species life cycles in relation to foraging, roosting and breeding opportunities.

In regard to threatened species legislation, the proposed development is considered to comply with the desired criteria in relation to The Parramatta Council LEP (2011) and to the Parramatta Council DCP (2011) legislative instruments.

It is considered that the development would be highly unlikely to have an adverse effect on the life cycle of any individual threatened flora or fauna species or their respective habitat. It is considered that for potential impacts to any threatened ecological communities or threatened flora or fauna, concurrence from the Director General of the Department of Planning, Industry and the Environment is not required, nor is a Species Impact Statement necessary for the proposed development.

Environmental criteria in relation to requirement for biodiversity offsets is assessed as follows:

- There are no areas of natural bushland area proposed for development and so none will be impacted and the proposal does not trigger any biodiversity offsets;
- An area marked out by a 20 x 20m quadrat was measured for attributes of biodiversity in relation to quantification of an index for Vegetation Integrity (VI) of potential Sydney Turpentine Ironbark Forest (STIF). The Index Value was calculated as VI =3.3, a value less than the Index of 15 recognised as being the threshold value for the requirement of an offset amount for the removal of 0.06ha of potential CEEC (BAM 2017).
- The Concept Application Area is not marked on the Biodiversity Values Map as containing any significant biodiversity value (Figure 30) and as such, the proposed development does not impact on any areas of natural bushland and so does not trigger biodiversity offsets; and
- It is assessed and considered that no threatened species (of both flora and fauna) would be significantly impacted by the proposed development of the Concept Application Area.

- It is considered that the areas historically cleared of vegetation do not conform to the definition of a natural ecological community as it has been extensively cleared, developed and managed and supports a high cover of exotic grass and exotic herbaceous weed species, as well as an assemblage of mostly non-locally occurring canopy species. As such, the development based on threatened species occurrence is considered not to trigger the biodiversity offsets scheme.

As such, it is considered that biodiversity offsets, nor a Species Impact Statement, in relation to the proposed development are not required.

## GLOSSARY AND ACRONYMS

BAM - Biodiversity Assessment Method (2017) - supports the BC Act (2016).

BC Act - *Biodiversity Conservation Act (2016)* - legislation enacted in August 2017

BGHF - Blue Gum High Forest

CA Area - Concept Application Area

CEEC - Critically Endangered Ecological Community

DAWE - Commonwealth Department of Agriculture, Water and Environment

DPIE - Department of Planning, Industry and Environment

E (threatened species status) - Endangered species

EEC - Endangered Ecological Community as listed by the BC Act and EPBC Act

EPBC Act - Environmental Protection & Biodiversity Conservation Act (1999). Enacted to protect and manage nationally and internationally (migratory) flora, fauna and ecological communities, defined in the Act as matters of national environmental significance (NES)

Habitat - areas occupied, either territorially, periodically or occasionally, by a species, population or ecological community

LAHC - Land and Housing Corporation

Migratory species - listed under the EPBC Act and relating to international agreements to which Australia is a signatory. Includes the Japan-Australia Migratory Bird Agreement (JAMBA), China-Australia Migratory Bird Agreement (CAMBA) Republic of Korea Migratory Bird Agreement (ROKAMBA)

OEH - State Office of Environment and Heritage

PCT - Plant Community Type identified as such using the Bionet Vegetation Classification system (OEH 2018)

STIF - Sydney Turpentine Ironbark Forest

Threatened species, populations or ecological communities - Entities listed by the BC Act and EPBC Act as 'Vulnerable to decreasing population growth in time', Endangered as population growth decreasing rapidly leading to eventual extinction' or 'Critically Endangered, a more extreme rate of population decrease than the former'.

TPZ - Tree Protection Zone



V (threatened species status) - Vulnerable

# 1 INTRODUCTION

## 1.1 INTRODUCTION AND PURPOSE OF REPORT

This report has been prepared by ACS Environmental Pty Ltd for Naturally Trees on behalf of *Frasers Property Telopea Developer Pty Ltd* (Frasers) and accompanies a State Significant Development Application (SSDA) submitted to the NSW Department of Planning, Industry and Environment (DPIE). The SSDA seeks Concept Approval, in accordance with Division 4.4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), for the staged redevelopment of the **Telopea 'Concept Application Area'** (CA), as well as a detailed proposal for the first stage of development, known as '**Stage 1A**'.

The purpose of this report is to provide *Frasers Property Telopea Developer Pty Ltd* (Frasers) with detailed flora and fauna surveys on a Revised Concept Application Area (Revision B as of June 2021) and to prepare a biodiversity impact assessment to accompany the SSDA.

The report investigates the impact of the proposed development on the biodiversity values of the existing natural or derived biota occurring on the land and provides the following guidelines for appropriate conservation of existing biodiversity and recommended mitigation measures in relation to the proposed impacts:

- describe the ecological value of the existing populations of landscaped street trees and trees planted to provide amenity amongst building structures;
- to evaluate the potential for the current populations of trees to represent threatened ecological communities and/or to provide habitat for threatened species of flora and/or fauna, and to assess the requirement to provide biodiversity offsets for potential impacts in relation to the BC Act (2016). This evaluation will provide guidance on appropriate management and protective measures in support of the planning submission of the Concept Application proposal and for the Stage 1 works;
- to ensure all necessary safeguards are described and complied with in relation to the Stage 1 and 1A works and to the proposal as required by Parramatta LEP 2011 and Parramatta DCP 2011; and
- to prepare a comprehensive report addressing current legislation, qualifying potential impacts and describing mitigation measures in relation to the above assessments.

## 1.2 BACKGROUND

The Telopea Concept Application Area forms part of the **Telopea Precinct Master Plan** (2017), which was prepared by NSW Land and Housing Corporation (LAHC) and Parramatta City Council to facilitate the rezoning of the precinct in December 2018 (see Figure 1). The Master Plan seeks to revitalise the Telopea Precinct through the redevelopment of LAHC's social housing assets, as well as sites under private ownership, to deliver an integrated community with upgraded public domain and community facilities – and to capitalise on access to the new Parramatta Light Rail network.

The Telopea Concept Application Area (CA Area) includes the land identified in Figure 2 and is predominantly owned by LAHC. The proposed redevelopment of the Concept Application Area is part of the NSW Government *Communities Plus* program, which seeks to deliver new communities where social housing blends with private and affordable housing with good access to transport, employment, improved community facilities and open space. The program seeks to leverage the expertise and capacity of the private and non-government sectors.

In December 2019, the NSW Government announced that the Affinity consortium, comprising Frasers and Hume Community Housing, were awarded the contract to redevelop the Telopea CA Area. The SSDA represents the first step in the delivery of the planned redevelopment of the Telopea CA Area and the Stage 1A works will provide market housing development on the site, as well as a rail crossing and new arrival plaza for the Parramatta Light Rail.

## 1.3 SITE DESCRIPTION

The Telopea CA Area is located in the Parramatta Local Government Area (LGA). It is approximately 4km north-east of the Parramatta Central Business District (CBD), 6km south-west of Macquarie Park Strategic Centre, and 17km from Sydney CBD.

The Telopea CA Area comprises 99 individual allotments (refer to Figure 1). It currently accommodates 486 social housing dwellings, across a mix of single dwelling, townhouse, and 3-9 storey residential flat buildings as well as the Dundas Community Centre, Dundas Branch Library, Community Health Centre, Hope Connect church, and Telopea Christian Centre.

The immediate surrounds comprise predominantly residential properties within an established landscape setting. The broader Precinct contains the Telopea Public School, a

neighbourhood centre known as the Waratah Shops, and two large Council parks known as Sturt Park and Acacia Park.

## **1.4 PROPOSED DEVELOPMENT**

The SSDA seeks Concept Approval for the staged redevelopment of the Concept Application Area, as well as a detailed proposal for the first stage of development. The Concept Proposal sets out the maximum building envelopes and GFA that can be accommodated across the CA Area, and identifies the land uses and public infrastructure upgrades to be provided. The Concept proposal will establish the planning and development framework from which any future development application will be assessed against.

The Telopea Concept Proposal comprises:

- A mixed-use development with maximum GFA of 394,898m<sup>2</sup> including:
  - Approximately 4700 dwellings, including a mix of social, affordable and market dwellings
  - Inclusion of a new retail precinct with a new supermarket, food and beverage, and speciality retail
  - Proposed childcare facility
  - Proposed combined library and community centre
  - Proposed combined Church, Residential Aged Care Facility and Independent living unit
- Delivery of new public open space, including:
  - A new light rail plaza
  - Hill top park
  - Eyles pedestrian link
  - Open space associated with the proposed library
- Retention of existing significant trees
- Road and intersection upgrades
- Cycle way upgrades
- Upgrade of utility services

The Telopea CA Area is divided into four precincts known as Core, North, South and East incorporating a total of 29 lots. The Concept Proposal is further detailed in the Urban Design Report prepared by Bates Smart and Hassell.

The first stage of works to be delivered (known as 'Stage 1A') is located within the Core precinct adjacent to the Parramatta Light Rail station and will include:

- Site establishment works, including demolition of all existing buildings and structures, tree removal, site preparation, excavation, and services augmentation
- Construction of a new arrival plaza for the Parramatta Light Rail, incorporating a Community Pavilion
- Construction of the Sturt Street extension, Light Rail crossing including Adderton Road intersection works and cycleway connection
- Part demolition and upgrade of Sturt and Shortland streets including new kerb-realignment, new footpaths and landscaping, new parking bays, bus zones, line marking and crossing
- Construction of a new public park surrounding the existing significant trees
- Construction of residential flat buildings, up to 10-storeys in height, including studio, one, two and three bedroom apartments
- Construction of two basement levels, with access / egress via Sturt Street and Winter Street, including waste and loading facilities
- Associated open space and landscaping works, including retention of existing significant trees, ground and rooftop communal open space, and a publicly accessible through site link.

The Stage 1A proposal is further detailed in the Urban Design Report prepared by Plus Architecture and Landscape Report prepared by Hassell.

An image of the Concept proposal is provided in Figures 1, 2 & 3

Figure 4 is a schematic representation of the proposed Masterplan indicating the proposed Envelope Control Plan for the Core and East Precincts (Bates Smart 2020).

Figure 5 is a schematic representation of the Masterplan Stage 1 - 1A (Hassel Ltd 2020).

Figure 6 is an aerial image of the Concept Application Area showing the boundaries of the proposed Stage 1 development area.

## **1.5 HISTORY OF CONCEPT APPLICATION AREA**

Historically the land has been cleared since before 1943 for farming including crop farming and grazing.

Figure 7 is an aerial of the Concept Application Area as it appeared in 1943, indicating the cleared rural landscape that was developed at that time, overlain by the proposed boundaries of the Stage 1 development area.

## **1.6 ARBORICULTURAL ASSESSMENT OF CONCEPT APPLICATION AREA**

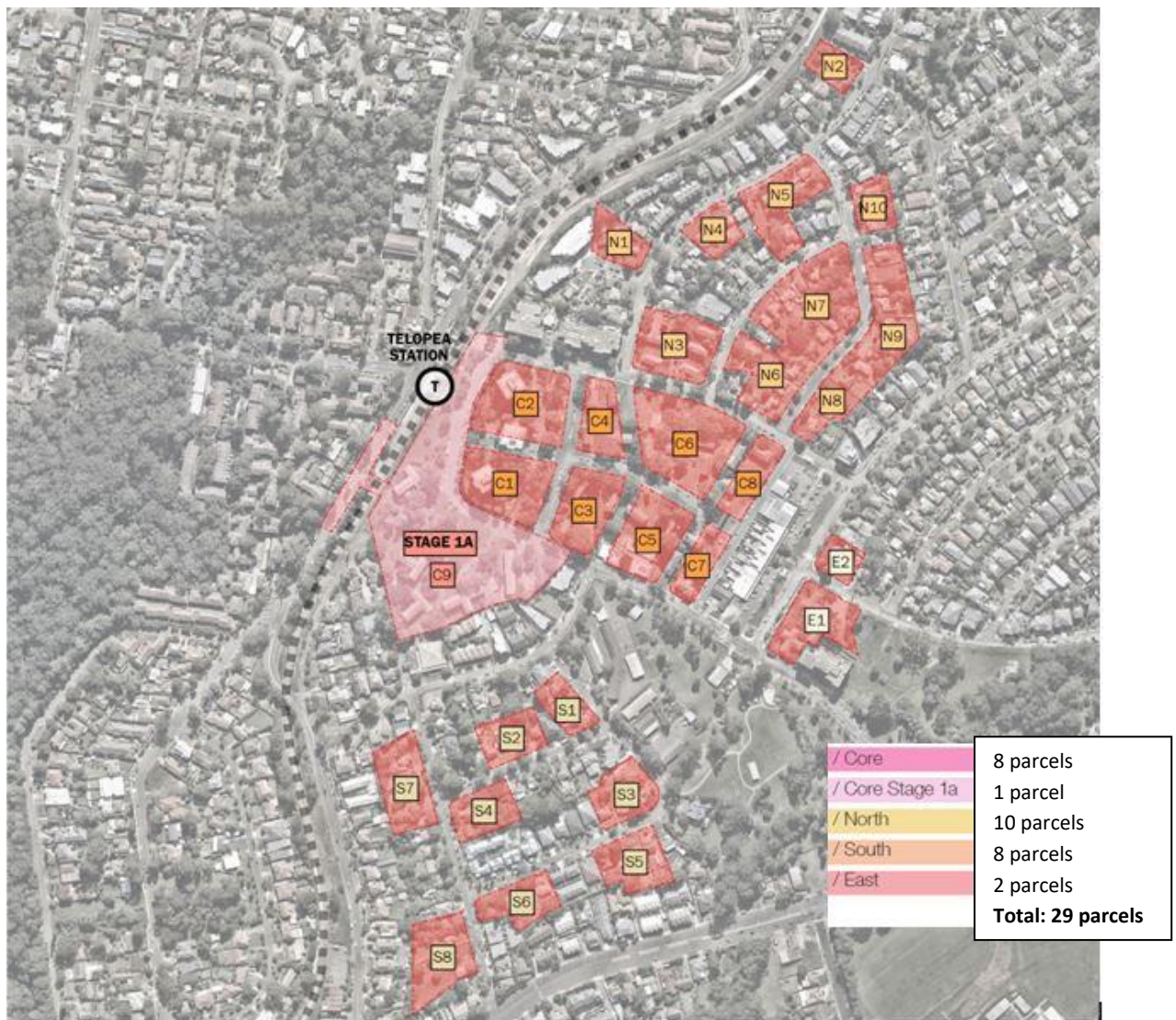
Scales (2021) has completed a revised Arboricultural Impact Assessment and Method Statement for the Concept Application Area and documented a total of 392 individual trees that occur within the CA Area. As such, the tree numbers and species referred to in this report are as for those documented in the revised report by Naturally Trees Arboricultural Consulting by Scales (2021).

Figures 8A, 8B, 8C, 8D and 8E indicate the locations of the individuals of the various tree species that have been documented for the CA Area by Scales (2021). Figure 8A is a composite diagram indicating the relationship between the 4 individual sheets that comprise the tree distribution across the CA Area (Scales 2021).









**Figure 2** - The Concept proposal as indicated in the image is further detailed in the Urban Design Report prepared by Bates Smart (2020) and Hassell (2020).



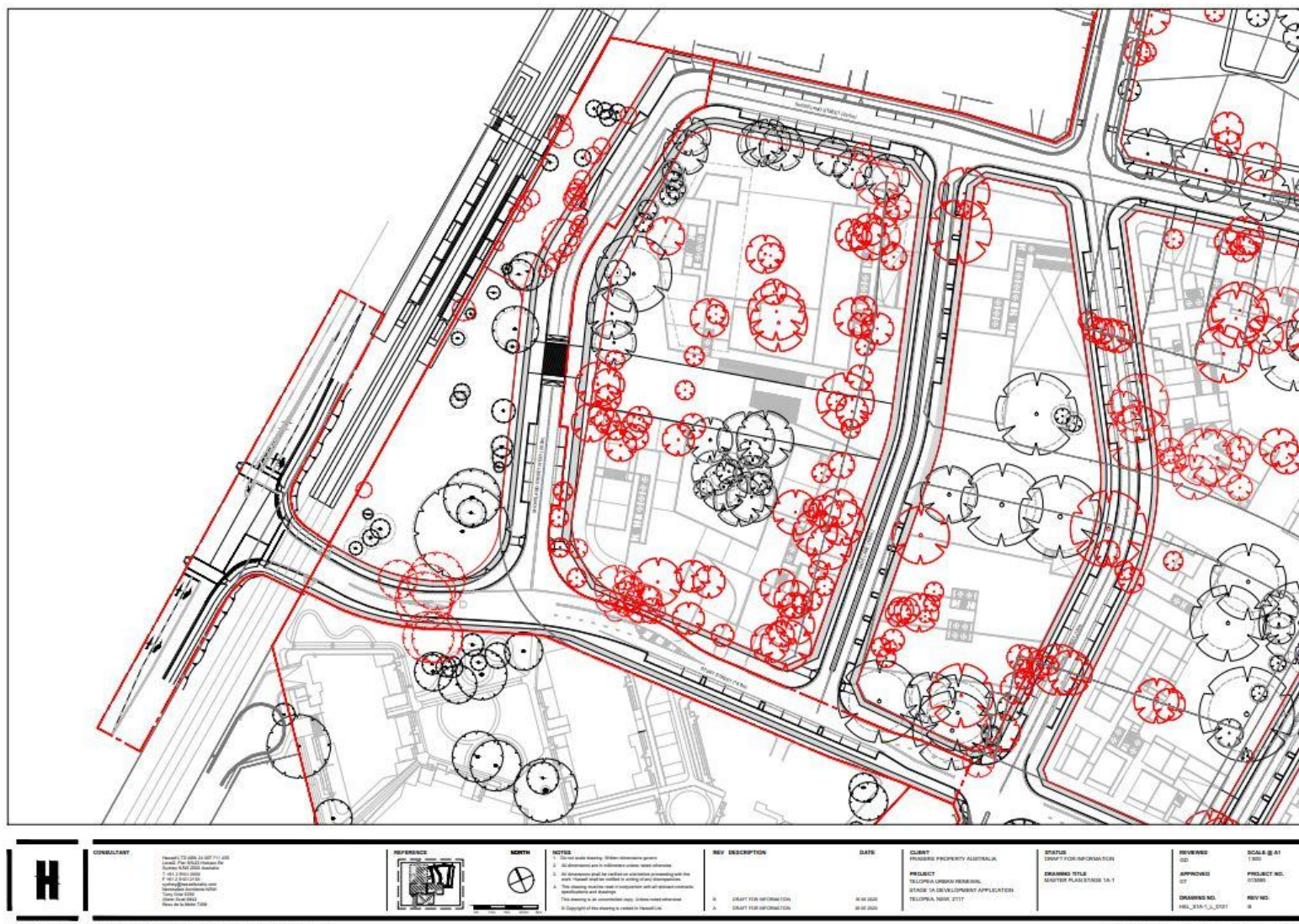


**Figure 3** - Schematic representation of the Stage 1A extent of works including the part demolition and upgrade of Sturt and Shortland Streets, including new kerb-realignment, new footpaths, landscaping, new parking bays, bus zones, line marking and crossing



**Figure 4 - Schematic representation of the Envelope Control Plan of the proposed Core and East Precincts of the Stage 1 Telopea Urban Release Plan (Bates Smart 2020)**





**Figure 5 - Schematic representation of the Master Plan of Stage 1 - 1A of the Stage 1 Telopea Urban Release Plan (Hassall Ltd 2020)**





**Figure 6** - Current aerial image of the Concept Application Area of Stage 1 Telopea Urban Release Plan (red outline) (from SIXmaps 2020)





**Figure 7** - Aerial image taken in 1943 indicating the boundaries of the Concept Application Area of Stage 1 Telopea Urban Release Plan (red outline) (from SIXmaps 2020)



**Figure 8A** - Schematic representation of 4 updated sheets indicating the locations of various species of trees at Revised Telopea Stage 1 (for detail refer to Scales 2021)





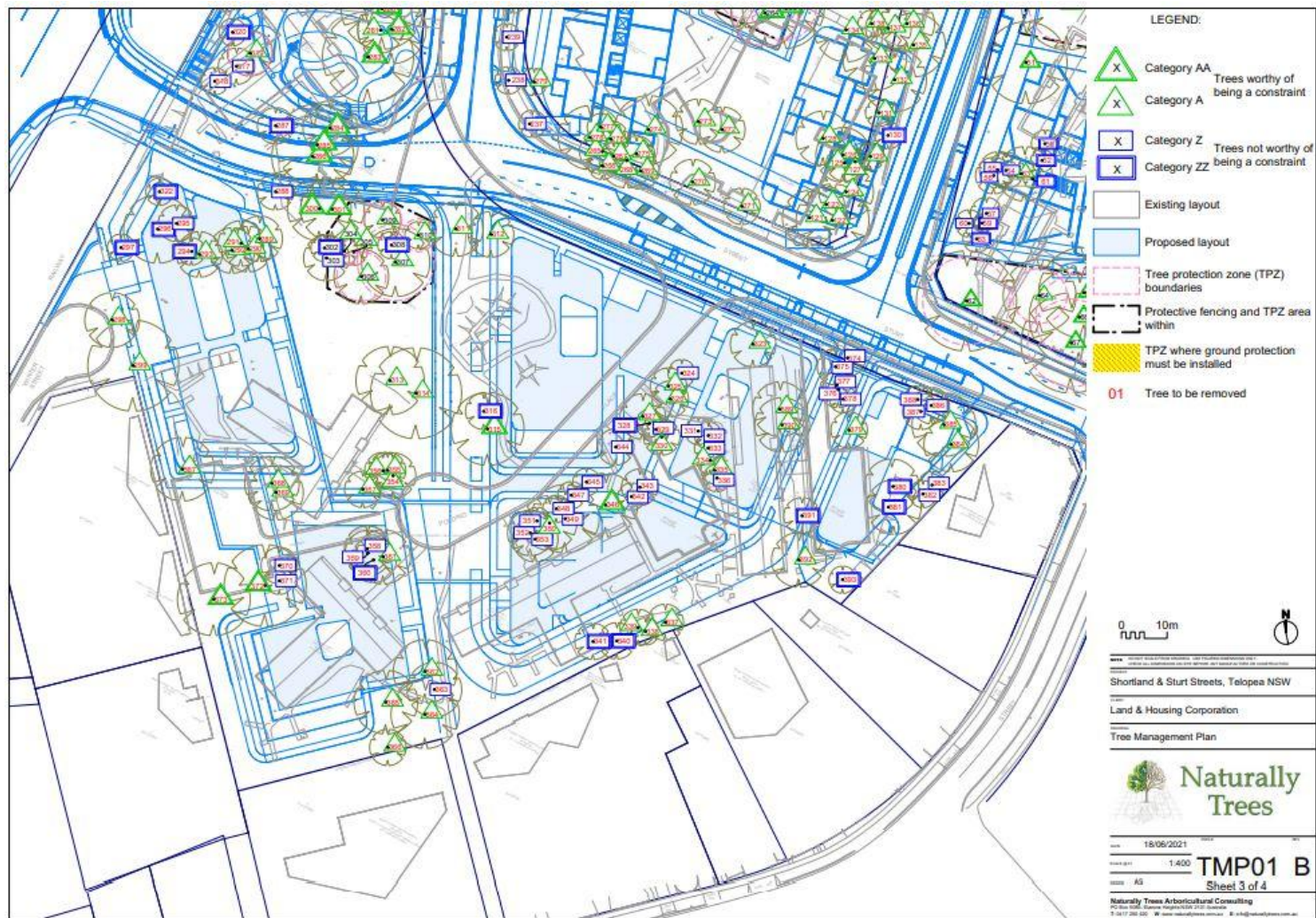
**Figure 8B** - Schematic representation indicating location of various trees in the north-western section of Revised Telopea Stage 1 (for updated detail refer to Scales 2021)





**Figure 8C** - Schematic representation indicating the location of various trees in the north-eastern section of Revised Telopea Stage 1 (updated detail refer to Scales 2021)





**Figure 8D** - Schematic representation indicating the location of various trees in the south-western section of Revised Telopea Stage 1 (updated detail refer to Scales 2021)





**Figure 8E** - Schematic representation indicating the location of various trees in the south-eastern section of Revised Telopea Stage 1 (updated detail refer to Scales 2021)

## 1.7 STATUTORY AND LEGISLATIVE REQUIREMENTS

Planning controls provided by State and Commonwealth Legislation include the following:

- ◆ Environmental Planning and Assessment Act (EP & A Act) (1979),
- ◆ Commonwealth Environment Protection and Biodiversity Conservation Act (EPBC Act) (1999),
- ◆ Biodiversity Conservation Act (BC Act) (2016). The BC Act (2016) includes Preliminary Determinations of the NSW Scientific Committee (to July 2020) as well as Provisional Listings of Endangered Species on an emergency basis (to July 2020),

The objectives of this Act are:

- to provide for the conservation of threatened species, populations and ecological communities of animals and plants. The Act sets out a number of specific objects relating to the conservation of biological diversity and the promotion of ecologically sustainable development.

- ◆ Biosecurity Weeds Act 2015 (NSW)

The objectives of this Act are:

- to reduce the negative impact of weeds on the economy, community and environment of this State by establishing control mechanisms to:
  - prevent the establishment in this State of significant new weeds, and
  - restrict the spread in this State of existing significant weeds, and
  - reduce the area in this State of existing significant weeds,
- to provide for the monitoring of and reporting on the effectiveness of the management of weeds in this State

Local Council planning controls include the:

- ◆ Parramatta Local Environment Plan (2011) and Parramatta Development Control Plan (2011)

This flora and fauna assessment report includes an account of:

- ◆ Threatened flora and fauna species, populations, endangered ecological communities and their habitats, as listed under the Biodiversity Conservation Act (BC Act), 2016;
- ◆ Nationally significant flora species, as listed under the Environment Protection and Biodiversity Conservation Act (EPBC Act), 1999;
- ◆ Rare or threatened Australian plants (RoTAP) as listed in Briggs and Leigh (1996); and
- ◆ Any regionally or locally significant species in the Parramatta Council LGA.

## 1.8 DOCUMENTS PROVIDED

- ◆ Bates Smart Pty Ltd (2020) Telopea Masterplan: Core and East Precincts - Envelope Control Plan (Drawing No. DA01.MP.130E)
- ◆ Craig and Rhodes (2020) Survey Plan (Dwg Nos. 190 - 19G [Sheets 1-36])
- ◆ Eco logical (2017) Telopea Master Plan. Flora and Fauna Assessment prepared for Land and Housing Commission.
- ◆ Hassall Ltd (2020) Master Plan Stage 1 -1A (Drawing No. HSL\_S1-1A\_L\_0101)
- ◆ Plus Architecture (2020) Floor Plans (Dwg Nos. PLA-AR-DA098 - PLA-AR-DA101)
- ◆ Scales (2021) Revision B - Arboricultural Impact Assessment and Method Statement for Telopea Stage 1 and 1A - Shortland Street and Sturt Street, Telopea for proposed Revision B of Telopea Urban Release Area

## 1.9 SCOPE OF THE STUDY

The survey work was undertaken to provide Naturally Trees (Scales 2021) on behalf of Frasers Property Pty Ltd with current and detailed information on the following:

- ◆ Identification of the flora and fauna that occur at the Concept Application Area including documentation of species lists and mapping of identifiable plant communities;
- ◆ Identification of Threatened (Endangered and Vulnerable) species, populations, communities and habitats as listed in Schedules 1 & 2 of the Biodiversity Conservation Act 2016 (BC Act) including Preliminary Determinations of the NSW Scientific Committee, and the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), ROTAP species (Briggs & Leigh 1996) and regionally and locally significant species that could potentially be impacted upon by the proposed development;
- ◆ Identify listed migratory species (as listed in international treaties referred to in the EPBC Act);
- ◆ Identification of fauna species, including species of amphibians, reptiles, birds or mammals, not directly recorded during surveys but that could potentially occur in the Concept Application Area as indicated by the presence of associated habitat;
- ◆ Preparation of a report describing vegetation communities on the Concept Application Area indicating their current condition and level of degradation;
- ◆ Recording of the area and extent of Biosecurity (and other significant High Threat Exotic) weed species in the CA Area;
- ◆ Assessment of potential impacts of the proposal on existing flora and fauna within the CA Area;
- ◆ Preparation of a report outlining findings and recommendations.

## 2 EXISTING ENVIRONMENT

### 2.1 TOPOGRAPHY, GEOLOGY AND SOILS

Much of the Concept Application Area has a gently sloping topography with shallow gradients sloping to the south and south-east east, though there are parts of the CA Area that have moderately steep to steep gradients .

The local substrate geology of the CA Area at Telopea appears to occur on sediments of the Ashfield Shale Series of the Wianamatta Group of Shales (Herbert 1983). The Ashfield Shale is comprised of fine-grained black to dark grey shale and laminite (Herbert 1983).

The predominant soil landscape series of the landscape appears to be the erosional Glenorie Soil Landscape Series (Chapman & Murphy 1989). This soil landscape is characterised by undulating to rolling hills on Wianamatta Group shales, with narrow ridges, hillcrests and valleys (Hazelton *et al* 1990).

Soils include shallow to moderately deep red podzolic soils on crests, moderately deep red and brown podzolic soils on upper slopes and deep yellow podzolics on lower slopes and in areas of poor drainage (Chapman & Murphy 1989).

### 2.2 EXISTING VEGETATION

The Concept Application Area (CA Area) is comprised of a managed urban landscape with planted street trees and groups of trees within housing complexes, small trees and shrubs in garden areas and extensive maintained exotic grassy lawns including mostly exotic herbaceous ground cover species within maintained curtilage areas.

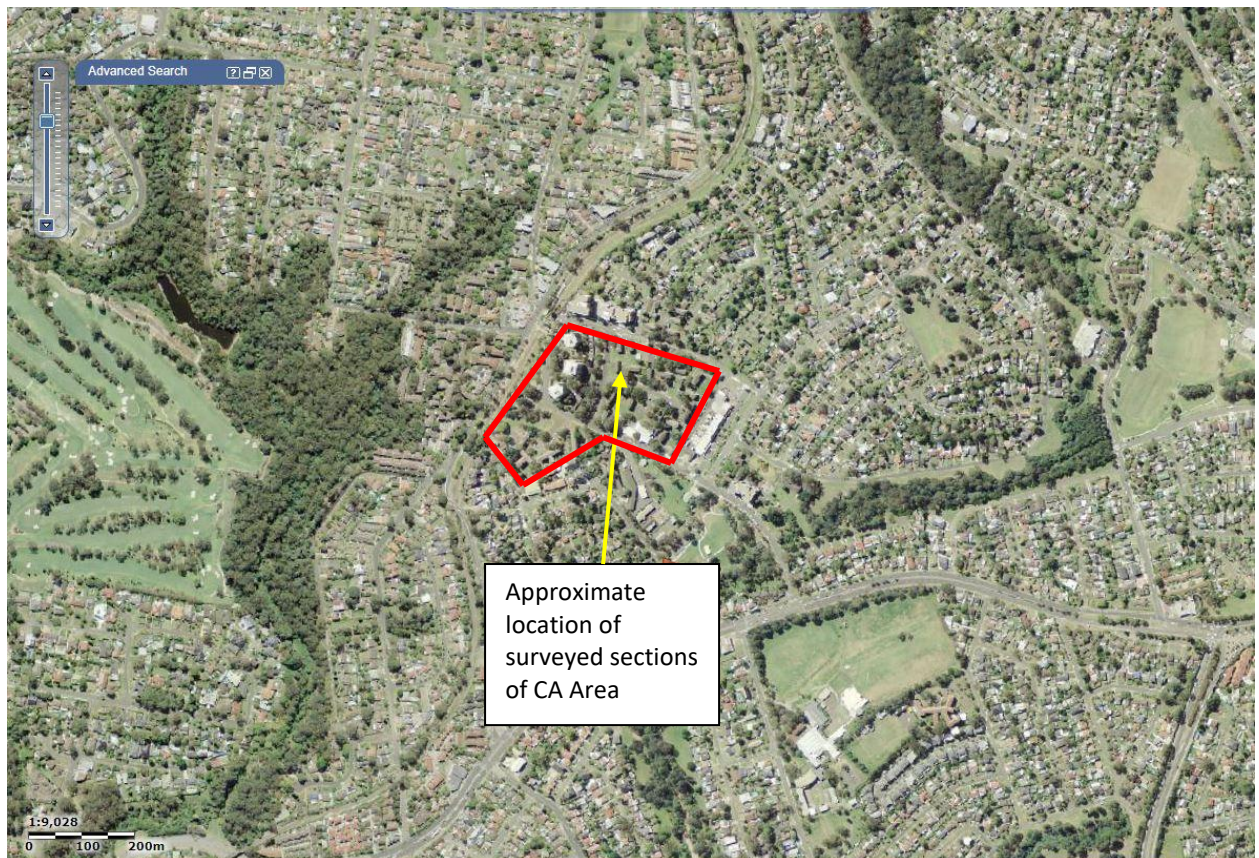
Scales (2021) documents a total of 392 individuals of various tree species, including a few that represent former natural species assemblages, some which include non-locally occurring native species, and some which include exotic ornamental species.

Figure 7 indicates that most of the natural vegetation, which may have included Sydney Turpentine Ironbark Forest and possibly Blue Gum High Forest (Benson & Howell 1990), had been almost totally cleared for farming land use before 1943.



## 2.3 CURRENT AND SURROUNDING LAND USE

The aerial view of the Concept Application Area at Telopea indicates that much of the locality is established residential development with bushland retained mainly along creek and drainage line corridors, comprising mainly alluvial vegetation assemblages. About 11% of native vegetation occurs within a 1500m buffer around the CVA Area, mostly along established creek-lines. Figure 9 indicates the surrounding landscape of the CA Area.



**Figure 9** - Aerial view of surrounding land use of Concept Application Area (outlined in red font) indicating long established residential development with bushland retained along drainage lines and corridors

## 3 FLORA AND FAUNA SURVEY AND ASSESSMENT

### 3.1 METHODS

#### 3.1.1 Literature review

Existing information on 'Threatened Flora of the Locality', defined as an area of 5km radius around the CA Area, was accessed from the DPIE Atlas of NSW Wildlife (online BioNet), Commonwealth DAWE Environmental Reporting Tool (July 2020) and RoTAP (Briggs and Leigh 1996) databases. Other literature detailing regionally and locally threatened and significant flora and fauna, as well as plant communities of the study area, included NSW Scientific Committee Final Determinations (1996-2020), Besnson & Howell (1999), Benson and Howell (1994), OEH (2016) '*Final Edition of 'Native Vegetation of the Cumberland Plain'*' and DPIE Mapping (2020).

#### 3.1.2 Site survey

The Concept Application Area was surveyed on 11<sup>th</sup> March 2020.

#### 3.1.3 Flora survey

Currently existing information on 'Threatened Flora of the Locality', defined as a 10km x 10km area centred around the site, was accessed from the DPIE Atlas of NSW Wildlife (March 2020), the Department of Agriculture, Water and Environment (DAWE) Environmental Reporting Tool (March 2020), and RoTAP (Briggs & Leigh, 1996) databases.

Other literature detailing regionally and locally threatened and significant flora, as well as endangered populations and plant communities of the study area, including NSW Scientific Committee Final Determinations (1996 - 2021) were accessed and reviewed.

Comprehensive surveys were undertaken on foot (Diversity Search method of Cropper 1993, and Threatened Biodiversity Surveys and Assessment - Guidelines for Developments and Activities - DEC 2004) to identify the existence of extant flora populations present at the Concept Application Area.

As the Concept Application Area proposed for development was a largely cleared, highly structurally and floristically modified, derived vegetation, a quadrat-based (20 x 50m) methodology was only able to be undertaken in one location within the CA Area.

The survey included a complete floristic inventory of indigenous and exotic species and an assessment of the presence, or likelihood of occurrence, of any threatened, rare, regionally or locally significant species or plant community occurring at the CA Area.

The extent of noxious and other weed incursions on the Concept Application Area was also assessed.

The Concept Application Area was delineated into various sections based on the populations of tree species that comprised relatively discrete compositions in different areas within the CA Area.

As the whole area of the CA Area had been landscaped sometime well after 1943, groups of similar tree species or associates occurred in the same areas and were not located randomly across the entirety of the Concept Application Area.

#### **3.1.4 Fauna Survey**

The survey effort complies with that recommended by the Draft Guidelines for Threatened Species Assessment under Part 3A (DEC and DPI, 2004) for the study area size, habitat types available on the site and seasonal factors.

A dedicated ground search was undertaken as was a census of extant birds. The survey involved different search strategies and protocols and all extant fauna or evidence of fauna was recorded. Threatened fauna species not recorded in the surveys but with the potential to be present as indicated by habitat are considered in the final assessment.

#### **Strategies employed for the field investigation of the Study Area:**

Assessment of the value of habitat suitable for native fauna species and specific habitat structures/resources considered important in life cycles. These structures or resources include:

- Mature trees with hollows for breeding, roosting and/or nesting;
- Particular foraging resources such as certain tree or shrub species;
- Dispersal, migratory or foraging corridors for fauna;
- Leaf litter and ground search for reptiles, frogs and threatened invertebrates;
- Identification of scats and other indirect evidence to suggest fauna utilisation such as tracks, scratch marks or diggings;

#### **3.1.5 Limitations of the study**

Limitations of the study may arise where certain cryptic species of plants may occur as soil-stored seed or as subterranean vegetative structures. Some species are identifiable above-ground only after particular environmental circumstances related to factors such as periodic fire frequency, intensity or seasonality, soil moisture regime, grazing pressure, biological life-cycle patterns as in the case of small geophytic taxa such as species of orchids etc.



Diurnal surveys at one time of the year cannot be expected to detect the presence of all species occurring, or likely to occur, in the CA Area. This is because some species may (a) occur seasonally, (b) utilise different areas periodically (as a component of a more extensive home range), or (c) become dormant during specific periods of the year. Rather, the survey provides the opportunity to sample the area, search specifically for species likely to be encountered within the available time frame, and assess the suitability of habitat for particular species.

The criteria used to assess the likelihood of threatened species occurring in the CA Area included the specificity of habitat features such as tree canopy cover, relative soil moisture regime, relative soil nutrient regimes, extent of historical disturbance and degradation of vegetation and known occurrences of threatened species in the immediate locality.

If all or most of these collective criteria deemed optimal for the occurrence of a particular threatened species occur in relation to the habitat of the CA Area, then the likelihood of its potential occurrence in the habitat of the CA Area could be assessed as being relatively high. If only some of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the CA Area, then its potential occurrence in the area of study may be deemed moderate at best. If few of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the CA Area, then the likelihood of its occurrence would be assessed as being low to very unlikely.

These criteria are qualified in respect of threatened flora species in Appendix 2 of this report and in relation to threatened species of fauna in Appendix 3 of this report.

## **3.2 RESULTS - FLORA**

### **3.2.1 Landscape features**

The Concept Application Area occurs within the Cumberland/Pittwater IBRA subregion of the Sydney Basin IBRA Region.

### **3.2.2 Discrete areas of vegetation composition**

Over the entire surveyed CA Area, a total of 15 discrete areas with distinct vegetation representation and relative location within the surveyed areas could be identified. These are listed and described in Table 1 and the discrete areas mapped in Figures 10A, 10B and 10C.

Fairly common to the extensive grassy lawn areas occurring throughout the current development are exotic grass and herbaceous species, these are listed in Table 2.

AREA ON MAP (FIGURE 10)	LOCATION IN SURVEYED AREA (FIGURE 10)	DOMINANT TREE SPECIES (from Scales 2021)
<b>1</b>	Along eastern section of Shortland Street to Wade Street	Mainly Lemon-scented Gum, Spotted Gum to 26m tall, Liquidambar, some Grey Gum, Tallow-wood, River Oak and Red Ironbark
<b>1A</b>	At rear of Community Centre off Shortland Street	Mainly Black Teatree ( <i>Melaleuca bracteata</i> ) to 9m tall
<b>2</b>	Along western section of Shortland Street and extending south along Wade Street	Sydney Blue Gum to 26m tall, Brush Box to 10m tall, some River Oak to 12m tall.
<b>2A</b>	Along north-western section of Sturt Street	Brush Box to 12m tall, River Oak to 14m tall
<b>3</b>	Along western length of Sturt Street	Broad-leaved Paperbark to 14m tall, also Blue Gum to 28m tall, River Oak to 14m tall, Swamp Mahogany to 9m tall
<b>4</b>	On railway side of Sturt Street.	Mainly Weeping Bottlebrush to 6m tall, Broad-leaved Paperbark to 7m tall, Swamp Mahogany to 10m tall
<b>5</b>	Initial group of mature trees in complex surrounded by Shortland, Sturt and Wade Streets	Blue Gum to 26m tall an Broad-leaved Paperbark to 12m tall
<b>5A</b>	Second group of mature trees in complex surrounded by Shortland, Sturt and Wade Streets	Sydney Blue Gum to 28m tall, Spotted Gum to 28m tall, Coast Mahogany to 20m tall
<b>6</b>	Southern side of Eyles Street	Tallow-wood to 26m tall
<b>7</b>	Northern Side of Eyles Street	Varied group from Lemon-scented Gum to 30m tall, Weeping Bottlebrush to 7m tall, also exotic species Jacaranda, Norfolk Island Pine, Liquidambar, <i>Ficus benjamina</i> and Chinese Tallow Wood

AREA ON MAP (FIGURE 10)	LOCATION IN SURVEYED AREA (FIGURE 10)	DOMINANT TREE SPECIES (from Scales 2021)
<b>8</b>	Group of trees to west of SW corner of Sturt Street	Spotted Gum to 28m tall, Blackbutt to 30m tall
<b>9</b>	Group of trees to the south of Group 8 at SW corner of Sturt Street	Spotted Gum to 26m tall, Brush Box to 14m tall, 1 individual of Wallangarra White Gum to 20m and 1 individual of Narrow-leaved Black Peppermint to 18m
<b>10</b>	Group of trees to south of Group 9 at western end of Polding Place	Hills Fig to 16m tall, Thin-leaved Stringybark to 20m tall, Weeping Bottlebrush to 7m tall
<b>11</b>	Group of trees southern side of Polding Place	Spotted Gum, Weeping Bottlebrush to 7m tall, River Oak to 10m tall
<b>12</b>	Group of trees opposite Wade Street and south-east of Polding Place	Weeping Bottlebrush to 6m, Liquidambar to 14m tall and Red Ironbark to 16m tall

**Table 1** - Groups of trees delineated as to their relative species composition and location within the Concept Application Area (see Figures 10A - 10C for locations of the discrete groups of trees)

Native Ground cover species	Scientific name	Common name
	<i>Glycine tabacina</i>	Love Creeper
	<i>Dichondra repens</i>	Kidney Weed
	<i>Bothriochloa macra</i>	Red Leg Grass
Exotic Grass Ground cover species		
	<i>Cenchrus clandestinus</i>	Kikuyu***
	<i>Eragrostis curvula</i>	African Love Grass
	<i>Cynodon dactylon</i>	Common Couch
	<i>Sporobolus africanus</i>	Parramatta Grass
	<i>Paspalum dilatatum</i>	Paspalum
Exotic Herbaceous Ground cover species		
	<i>Modiola caroliniana</i>	Small-flowered Mallow
	<i>Hypochaeris radicata</i>	Cats ear
	<i>Trifolium repens</i>	Clover
	<i>Taraxacum officinale</i>	Daisy
	<i>Alternanthera pungens</i>	Khaki Weed
	<i>Conyza bonariensis</i>	Flaxleaf Fleabane
	<i>Capsella bursa-pastoris</i>	Shepherds Purse
	<i>Sonchus oleraceous</i>	Sowthistle
	<i>Bidens pilosa</i>	Cobblers Pegs
	<i>Plantago lanceolata</i>	Plantain
	<i>Aruajia sericifera</i>	Moth Plant

**Table 2** - Some common ground cover species, varying in frequency of occurrence, that occur in maintained lawns amongst the residential buildings in association with canopy tree distributions. Kikuyu\*\*\* is the principal lawn grass comprising the lawns



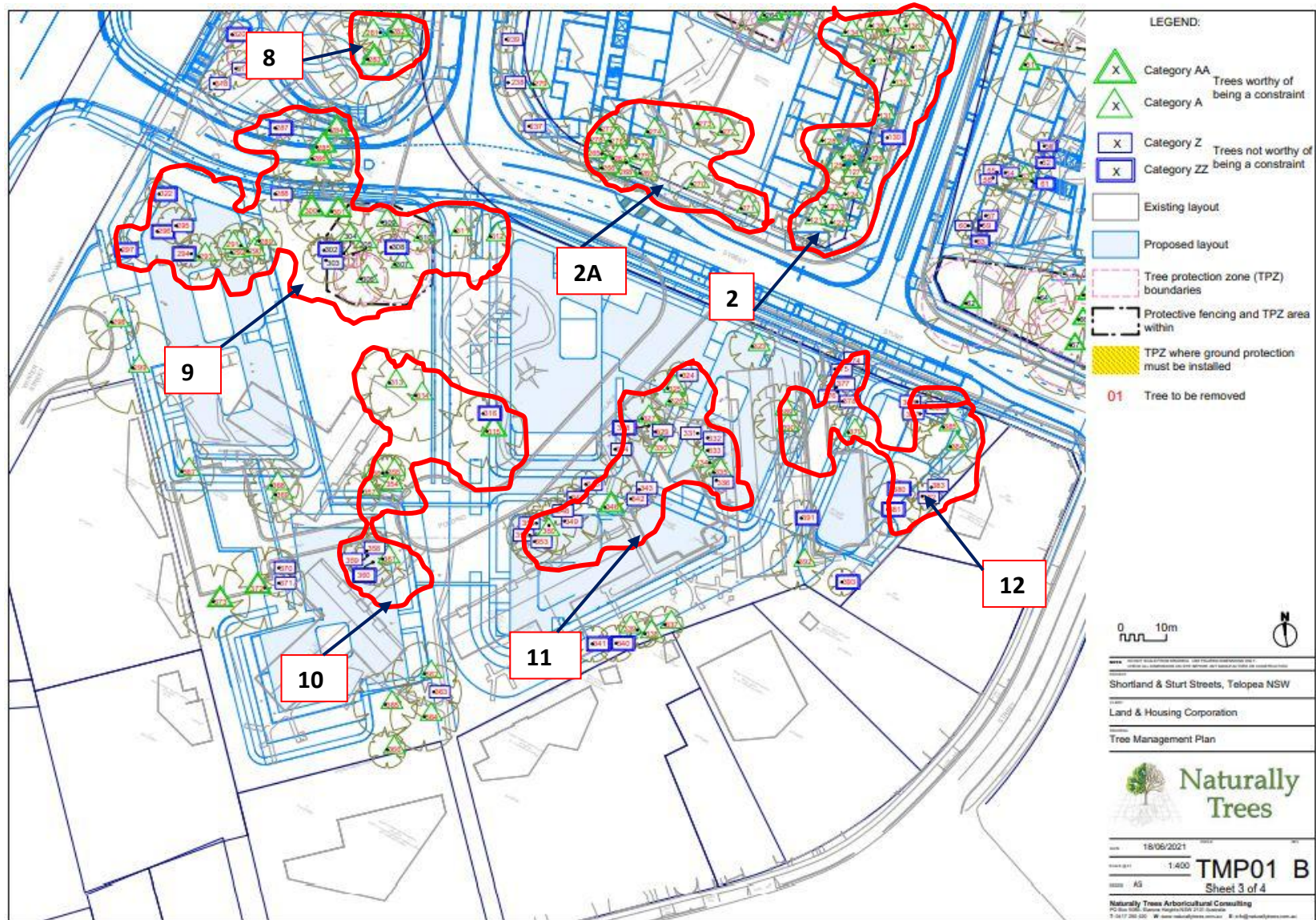
**Figure 10A** - Group 1, 1A, 6 & 7 trees along Shortland Street, Telopea (polygons overlain on revised map from updated report by Scales 2021)





**Figure 10B** - Group 2, 2A, 3, 4, 5, 5A & 8 trees along Shortland, Wade and Sturt Streets, Telopea (polygons overlain on map from revised report by Scales 2021)





**Figure 10C** - Group 2, 2A, 3, 8, 9, 10, 11 & 12 trees along Sturt Street and Polding Place, Telopea (polygons overlain on map from revised report by Scales 2021)



**Descriptions and assessment of the various groups of trees occurring across the study area are as follows:**

### **Group 1**

#### **Location**

Along eastern end of Shortland Street (Figure 10A)

#### **Composition**

Mainly comprises canopy species such as Lemon-scented Gum, Tallow-wood, Queen Palm, Jacaranda, Liquidambar and Spotted Gum which would not naturally occur at this location, most of which are non-locally occurring native species. Figure 11 indicates a typical view of this Group.



**Figure 11** - Large, well established individuals of Spotted Gum occur along Shortland Street



### **Impacts of proposed development**

Most of these trees will be removed for the redevelopment.

Some 5 trees will be retained comprising mostly mature tall individuals of Lemon-scented Gum and an individual of Tallow-wood (Scales 2021).

### **Status and ecological value**

Some larger individual trees may provide potential nesting and/or foraging resources for common species of local avifauna and arboreal mammals. No nests or hollows observed in any individual trees. Trees all occurring in managed exotic lawn grass with about 5-10% bare ground and 2% leaf litter.

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only mostly non-locally occurring planted canopy trees such as described above (Figure 11).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 11), nor a natural litter component in the ground stratum (Figure 11).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 11).

As such, it is considered that there is no requirement for providing an offset value for the loss of these mostly non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 lists representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

Stratum	Species name	Common name
Trees	<i>Eucalyptus resinifera</i>	Red Mahogany
	<i>Eucalyptus paniculata</i>	Grey Ironbark
	<i>Allocasuarina torulosa</i>	Forest Oak
	<i>Angophora costata</i>	Sydney Red Gum
	<i>Elaeocarpus reticulatus</i>	Blueberry Ash
	<i>Eucalyptus saligna</i>	Blue Gum
	<i>Eucalyptus pilularis</i>	Blackbutt
	<i>Syncarpia glomulifera</i>	Turpentine
	<i>Pittosporum undulatum</i>	Sweet Pittosporum
Small trees	<i>Notelaea longifolia</i>	Mock Olive
	<i>Glochidion ferdinandi</i>	Cheese Tree
	<i>Clerodendrum tomentosum</i>	Hairy Clerodendrum
	<i>Pittosporum revolutum</i>	Rough Fruit Pittosporum
	<i>Myrsine variabilis</i>	Muttonwood
Shrubs	<i>Maytenus silvestris</i>	Narrow-leaved Orangebark
	<i>Platylobium formosum</i>	Handsome Flat-pea
	<i>Polyscias sambucifolius</i>	Elderberry Panax
	<i>Breynia oblongifolia</i>	Coffee Bush
Sub-shrubs	<i>Leucopogon juniperinus</i>	Prickly Beard Heath
	<i>Daviesia ulicifolia</i>	Gorse Bitter-bush
Ground covers	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush
	<i>Oplismenus aemulus</i>	Basket Grass
	<i>Viola hederacea</i>	Native Violet
	<i>Dianella caerulea</i>	Blue Flax Lily
	<i>Pratia purpurascens</i>	Whiteroot
	<i>Pseuderanthemum variabile</i>	Pastel Flower
Twiners	<i>Eustrephus latifolius</i>	Wombat Berry
	<i>Pandorea pandorandum</i>	Wonga Wonga Vine
	<i>Morinda jasminoides</i>	Sweet Morinda
	<i>Tylophora barbata</i>	Bearded Tylophora
	<i>Glycine clandestina</i>	Love Creeper

**Table 3** - Indicative native species representative of STIF vegetation, an ecological community type that most likely occurred at the locality of the CA Area before settlement and clearing for agriculture and residential development

## Group 1A

### Location

At rear of car-park at Telopea Community Centre (Figure 10A)

### Composition

Mainly comprises canopy species such as Black Tea-tree which does not naturally occur at this location (Figure 12).



**Figure 12** - Individuals of Black Tea -tree occur at rear of Community Centre car park along Shortland Street

### Impacts of proposed development

All of these trees will be removed for the redevelopment.

### Status and ecological value

Trees may provide nesting and/or foraging resources for locally occurring avifauna and arboreal mammals. No nests or hollows observed in any individual trees. Trees occurring in managed exotic lawn grass.

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 12).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 12), nor a natural litter component in the ground stratum (Figure 12).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 12).

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

## **Group 2**

### **Location**

Occurs along western end of Shortland Street and along Wade Street (Figures 10B & 10C)

### **Composition**

Comprises individuals of Sydney Blue Gum, a canopy species which may have occurred at this location in assemblages of Blue Gum High Forest and/or Sydney Turpentine Ironbark Forest. Other species that occur including River Oak and Brush Box are non-locally occurring native species.

### **Impacts of proposed development**

Most of these trees, totalling about 46 individuals, will be removed for the redevelopment. Proposed for removal are a total of 26 individuals of Sydney Blue Gum (Figures 8C & 8D from Scales 2021).

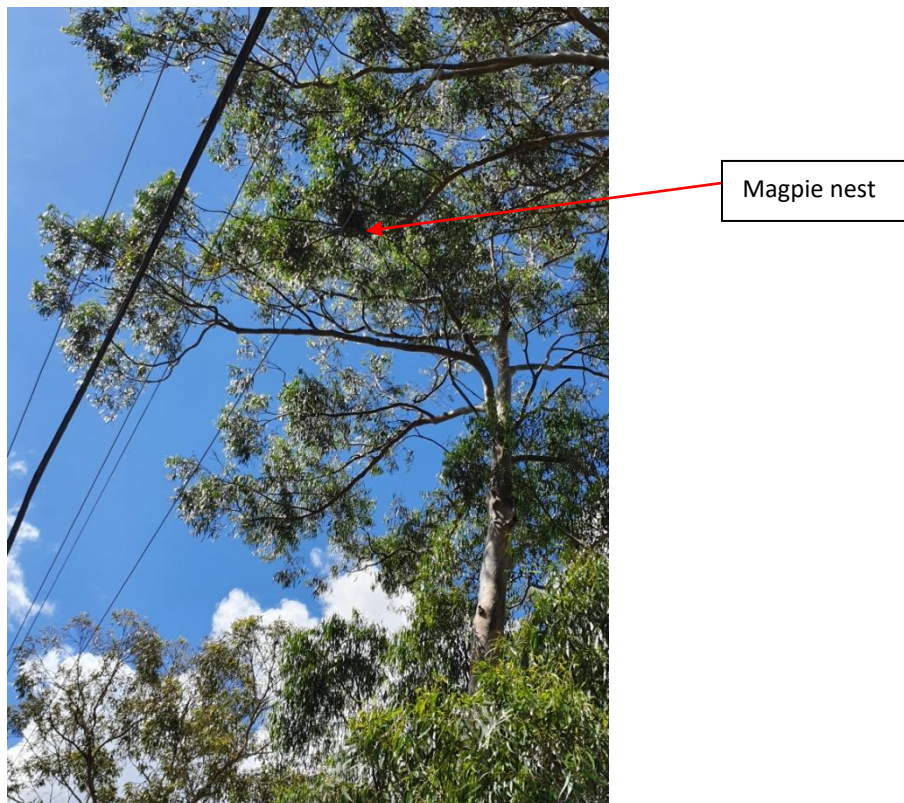
Some 3 trees will be retained comprising two mature tall individuals of Sydney Blue Gum and an individual of Coast Mahogany (Scales 2021).



### **Status and ecological value**

Trees provide nesting and/or foraging resources for locally occurring avifauna and arboreal mammals. A large stick nest possibly made by the Australian Magpie was observed in a tall individual of Blue Gum (Figure 13). No hollows observed in any individual trees. Trees occur in managed exotic lawn grass and within residential complexes as well as along streetscapes. Grassy council verge contains up to 30% of herbaceous exotic species. Gardens include shrub species such as Sweet Pittosporum, African Olive and Viburnum species.

Any individuals of Sydney Blue Gum (Scales 2021) would be recommended to be retained.



**Figure 13** - Individuals of Sydney Blue Gum occur in this group, particularly along the western end of Shortland Street and at the corner of Wade Street. Magpie nest evident at central top of image

### **Vegetation Integrity Index**

A clump of Sydney Blue Gums occurring in the north-eastern section of this group of trees (Group 2; Figure 10B) occupies an area of 20 x 20m. Numerical coding given for these individuals are specified as 152 - 161 (Figures 8C & 10B) (from Scales 2021).

Even though this copse of trees had been planted in a landscape plan, it was conferred to a likely PCT that may have occurred in the locality before clearing. As such, this area was

quantitated by BAM analysis to acquire a measure of Vegetation Integrity (BAM 2017) as follows:

**Site context:**

- **IBRA region** - Sydney Basin
- **IBRA subregion** - Cumberland/Pittwater
- **Landscape** - Pennant Hills Ridges
- **Landscape features** - Connectivity of canopies

**Vegetation:**

- **Formation** - Wet Sclerophyll Forests (Grassy sub-formation)
- **Class** - Northern Hinterland Wet Sclerophyll Forests
- **Likely PCT before clearing** - Sydney Turpentine Ironbark Forest (STIF) PCT No. 1281
- **Extent native vegetation cleared within a 1500m buffer area centred around the subject site** - 90%
- **Associated TEC** - Sydney Turpentine Ironbark Forest (STIF) PCT No. 1281 in the Sydney Basin Bioregion
- **BC Act & EPBC Act listings** - Critically Endangered Ecological Community

**Vegetation Zones:**

- **Patch size (non-intact)** - > 13ha
- **Area of patch PCT 1281 to be impacted** - 0.06ha
- **Floristic composition condition score** - 0.04
- **Structure condition score** - 39.6
- **Function condition score** - 2.2
- **VEGETATION INTEGRITY INDEX (VI)** - 3.3
- **FUTURE VEGETATION INTEGRITY INDEX** - 0

**Habitat suitability - Confirmed suitability for habitat for threatened flora or fauna: NONE**

**(no surveys required)**

**Credits: Ecosystem credits (STIF) - NONE**

ACS Environmental - Flora and fauna surveys and biodiversity impact assessment - proposed Concept Application Area in Stage 1A and Stage 1 of the Telopea Urban Release Area

**Price: NONE**

**Conclusion:**

As the Vegetation Integrity Index (VI) is <15 for this derived TEC, the index is too low to acquire a biodiversity offset cost for this small patch of planted individuals of Sydney Blue Gum (BAM 2017), which mostly occur as a monoculture in association with canopy species which do not occur locally (such as River Oak and Brush-box, Scales 2021).

In regard to the other component trees described within this group (Group 2 in Figures 8C, 8D & 10B), this group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are many non-locally occurring planted canopy trees such as described.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

**Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

## Group 2A

### **Location**

Occurs along north-western end of Sturt Street (Figures 8D, 10B & 10C)

### **Composition**

Mainly comprises many individuals of Brush Box and River Oak, both non-locally occurring native species.

### **Impacts of proposed development**

All of these trees, totalling 14 individuals including Brush Box and Broad-leaved Paperbark, will be removed for the redevelopment (Figure 8D in Scales 2021).

### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals. No hollows observed in any individual trees. Trees occurring in managed exotic lawn grass and within residential complexes as well as along streetscapes.

This group of mixed tree species does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area



before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

### **Group 3**

#### **Location**

Occurs along western section of Sturt Street (Figure 10B)

#### **Composition**

Mainly comprises many individuals of Broad-leaved Paperbark, Swamp Mahogany, Weeping Bottlebrush and River Oak, all non-locally occurring native species, the exotic species Chinese Tallow-wood, Murraya and Prunus, as well as some individuals of Sydney Blue Gum (Figure 8C from Scales 2021).

#### **Impacts of proposed development**

All of these trees, totalling 74 individuals including the mix of canopy species described above, will be removed for the redevelopment (Figure 8C in Scales 2021 and 10B from Scales 2021).

#### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals. Rainbow Lorikeets observed actively foraging on Broad-leaved Paperbark flowers. No hollows observed in any individual trees. Trees occurring in managed exotic lawn grass within residential complexes as well as along streetscapes (Figure 14).



**Figure 14** - Individuals of Broad-leaved Paperbark occurring along Sturt Street

This group of non-locally occurring trees does not represent any known or natural Plant Community Type (PCT) that would have occurred in the locality before clearing, nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 14).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 14), nor a natural litter component in the ground stratum (Figure 14).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 14).

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

## **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

### **Group 4**

#### **Location**

Occurs along railway line boundaries of Sturt Street (Figures 8C & 10B)

#### **Composition**

Mainly comprises small individuals of Weeping Bottlebrush, with some River Oak, Swamp Mahogany and Brush Box, all non-locally occurring native species (Figure 15).

#### **Impacts of proposed development**

All of these trees, totalling 40 individuals from Tree Nos. 192 - 232 in Scales (2021) including the mix of canopy species described above, will be removed for the redevelopment (Figure 8C in Scales 2021 and 10B from Scales 2021).

#### **Status and ecological value**

Trees may provide nesting and/or foraging resources, particularly in flowering seasons, for avifauna and arboreal mammals.

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 15).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 15), nor a natural litter component in the ground stratum (Figure 15).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 15).

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.



**Figure 15** - Weeping Bottlebrush occur on the railway side of Sturt Street



## Group 5

### **Location**

Occurs within residential complex bounded by Shortland, Wade and Sturt Streets (Figure 10B)

### **Composition**

Comprises a small group of 5 tall, mature individuals including two individuals of Blue Gum and individuals of Kaffir Plum, Broad-leaved Paperbark and River Oak (Figure 8C) (Scales 2021)

### **Impacts of proposed development**

All of these trees, totalling 5 individuals from Tree Nos. 168 - 172 in Scales (2021) including the mix of canopy species described above, will be removed for the redevelopment (Figure 8C & 10B in Scales 2021).

### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals.

This group of mixed trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area

before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

## **Group 5A**

### **Location**

Occurs within residential complex bounded by Shortland, Wade and Sturt Streets (Figures 8C & 10B from Scales 2021)

### **Composition**

Comprises a group of 13 tall, mature individuals of Spotted Gum, Sydney Blue Gum and Coast Mahogany to 28m tall, potentially locally occurring native species.

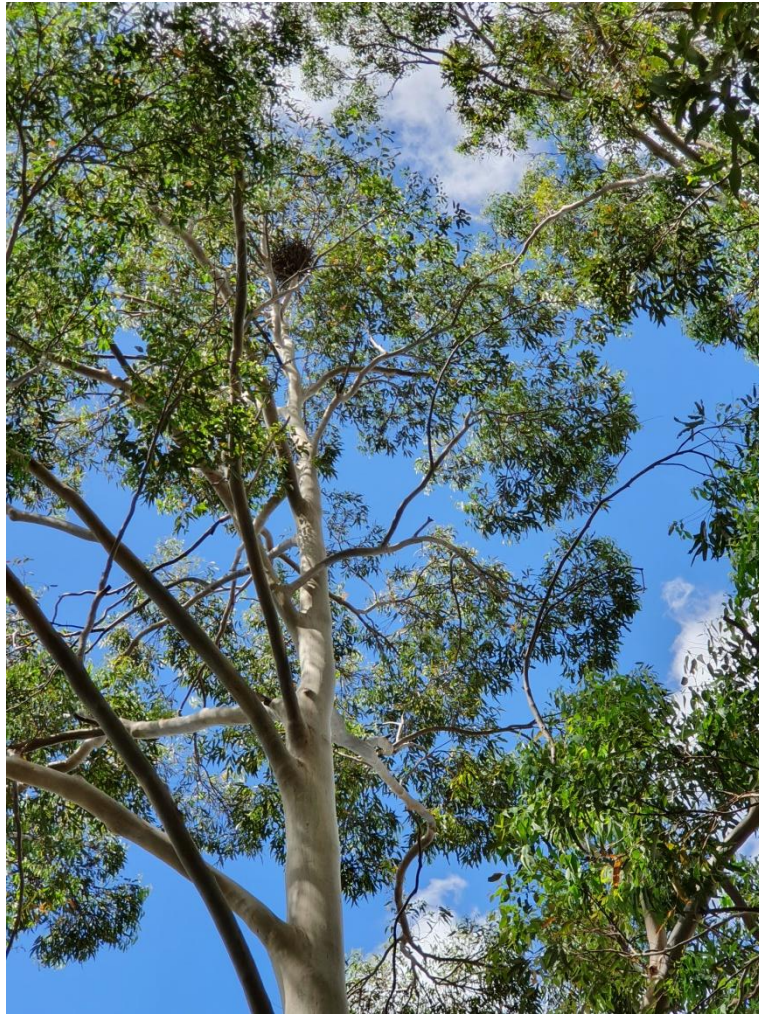
### **Impacts of proposed development**

Most of these trees, totalling 13 individuals from Tree Nos. 251 - 264 in Scales (2021) will be retained within the proposed redevelopment though protective fencing must be provided for the TPZ of these individuals (Figures 8C and 10B in Scales 2021).

Two individuals of Coast Mahogany, a non-locally occurring native species would be removed as a result of the proposal.

### **Status and ecological value**

Trees provide nesting and/or foraging resources for avifauna and arboreal mammals. A large Australian Raven stick nest was observed in an individual of Blue Gum (Tree No. 263 in Scales 2021) (Figure 16) and similarly, a large stick nest occupied by an Australian Magpie was observed in a tall individual of Spotted Gum (Tree No. 258 in Scales 2021)



**Figure 16** - Large, tall individuals of Sydney Blue Gum and Spotted Gum occur in this group that will be retained within the residential complex at the western end of the study area. Raven nest evident at top of image.

### **Group 6**

#### **Location**

Occurs along the southern side of Eyles Street (Figures 8B & 10A)

#### **Composition**

Comprises a group of 6 tall, mature individuals including 4 individuals of Tallow Wood to 26m tall, an individual of Silky Oak and one of Liquidambar, all non-locally occurring native species.

#### **Impacts of proposed development**

Three of the individuals of Tallow-wood (Tree Nos. 48 - 50 in Scales (2021)) will be retained within the proposed redevelopment.

Three of the other non-locally occurring native species would be removed as a result of the proposal.

### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals.

This group of mixed trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.



## Group 7

### **Location**

Occurs along the northern side of Eyles Street (Figures 8B & 10A)

### **Composition**

Comprises a varied group of 20 small tree to large canopy species (numbered from 4 - 24 in Scales 2021) varying from a tall mature individual of Lemon-scented Gum to 30m tall (Figure 17), a non-locally occurring native species, to several exotic ornamental trees (Scales 2021) and groups of Weeping Bottlebrush to 7m tall, also a non-locally occurring species. Kikuyu managed lawnscapes with 5% bare ground and 15% herbaceous weeds.

### **Impacts of proposed development**

The large individual of Lemon-scented Gum (Tree No. 4 in Scales 2021) will be retained within the proposed redevelopment.

The other 23 individuals of non-locally occurring native species would be removed as a result of the proposal.

### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals, and the retention of the tall, mature individual of Lemon-scented Gum is a valuable resource in this regard (Figure 17).

This group of mixed trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these

individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.



**Figure 17** - Large mature individual of non-locally occurring Lemon-scented Gum

## Group 8

### Location

Occurs to the west side of the South-west corner Sturt Street (Figures 10B & 10C from Scales 2021)

### Composition

Comprises a small copse of 4 tall mature trees including an individual of Blackbutt to 30m tall (Tree No. 283 in Scales 2021) and 3 individuals of Spotted Gum to 28m tall (Tree numbers 280 - 283 in Scales 2021) (Figure 18).

### Impacts of proposed development

All the above-mentioned individuals of mature, potential habitat trees will be removed as part of the re-development.

### Status and ecological value

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals. The individual of Blackbutt (Tree No. 283 in Scales 2021), a species that would potentially have occurred at this location before clearing, contains at least two nesting hollows, one relatively large hollow and one smaller hollow. **Removal of these trees would require that at least 2 nest boxes, one small and one medium sized, should be installed on suitable retained trees within the CA Area**



**Figure 18** - Individuals of Spotted Gum in foreground and Blackbutt at rear LHS of image.

## Group 9

### **Location**

Occurs to the west side of the South-west corner Sturt Street, immediately below the location of Group 8 (Figures 8D & 10C from Scale 2021)

### **Composition**

Comprises a copse of 28 individuals of small and large canopy trees including a few individuals of Spotted Gum to 26m tall and several individuals of Brush Box, as well as individuals of other non-locally occurring native canopy species numbered from 284 - 312 in Scales (2021) (Table 1) (Figure 19).

### **Impacts of proposed development**

The group of 9 individuals numbered from 302 to 310 in Scales (2021) of mature trees will be retained within the development. These include two individuals of Spotted Gum and 5 individuals of Brush Box (Scales 2021) (Figures 8D & 10C).

A total of 19 individuals will be removed, including individuals of Spotted Gum and Brushbox (Scales 2021) (Figure 8D).

### **Status and ecological value**

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals.

The managed grassy lawnscape comprises 85% Kikuyu, 5% bare ground and about 10% of exotic herbaceous weed species.

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 19).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 19), nor a natural litter component in the ground stratum (Figure 19).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 19).



As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.



**Figure 19** - Individuals of Spotted Gum and Brush Box are common in this group of canopy species, many of which will be retained (Group 9 in Figures 8D & 10C).

## Group 10

### Location

Occurs to the south below the location of Group 9, at the end of Polding Place (Figures 8D & 10C)

### Composition

Comprises a discontinuous copse of 12 trees including a mature individual of Thin-leaved Stringybark (*Eucalyptus eugenioides*) to 26m tall (Figure 20), Hills Fig to 16m tall and Weeping Bottlebrush to 7m tall, the latter two species of which are non-locally occurring native canopy species (Table 1) (Figure 20).

### Impacts of proposed development

The group of individuals numbered from 313 to 316 and 354 to 360 in Scales (2021) of trees will be removed as a result of the development. These include an individual of Thin-leaved Stringybark which contains a small nesting or roosting hollow (Scales 2021) (Figures 8D & 10C).

### Status and ecological value

Trees may provide nesting and/or foraging resources for avifauna and arboreal mammals.

The individual of Thin-leaved Stringybark contains a small nesting and/or roosting hollow at about 6m up the trunk (Figure 20). **This habitat feature should be replaced by the installation of two nesting boxes on suitable retained trees within the CA area to accommodate small parrots or other avifauna to compensate for the loss of this hollow.**

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 20).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 20), nor a natural litter component in the ground stratum (Figure 20).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 20).



As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 lists representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.



**Figure 20** - Individual of Thin-leaved Stringybark (Tree number 315 in Scales 2021) containing small hollow about 6m up the trunk

## Group 11

### Location

Occurs along the southern side of Polding Place (Figures 8D & 10C)

### Composition

Comprises a copse of 29 mostly small trees of Weeping Bottlebrush to 7m tall and River Oak to 10m tall, (though including an individual of Spotted Gum to 22m), all of which are non-locally occurring native canopy species (Table 1) (Figure 21).

### Impacts of proposed development

The group of individuals numbered from 324 to 353 in Scales (2021) of trees will be removed to facilitate the proposed re-development.

### Status and ecological value

Small trees of Weeping Bottlebrush may provide foraging resources for avifauna and arboreal mammals.



**Figure 21** - Individuals of River Oak and Weeping Bottlebrush that characterise this group of trees



This group of trees does not represent any known or natural Plant Community Type (PCT) that would naturally occur in this locality, nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 21).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 21), nor a natural litter component in the ground stratum (Figure 1).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 21).

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 list representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

### **Group 12**

#### **Location**

Occurs opposite the southern end of Wade Street, to the south-east of Polding Place (Figures 8D & 10C)

#### **Composition**

This group of 18 trees numbered from 374 to 393 in Scales (2021) includes an individual of Red Ironbark to 16m, individuals of Weeping Bottlebrush to 6m tall and the ornamental species Liquidambar to 14m tall, none of which are locally occurring native canopy species (Table 1) (Figure 22).

### **Impacts of proposed development**

The group of 19 individuals numbered from 374 to 393 in Scales (2021) of trees will be removed as a result of the development.

### **Status and ecological value**

Small trees of Weeping Bottlebrush may provide foraging resources for avifauna and arboreal mammals. Several individuals of Red Ironbark are dead, with stags of these individuals remaining in the landscape (Figure 22).



**Figure 22** - Section of trees representative of this group, including Weeping Bottlebrush and showing several individuals of dead Red Ironbark remaining within the copse.

This group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are only non-locally occurring planted canopy trees such as described above (Figure 22).

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover (Figure 22), nor a natural litter component in the ground stratum (Figure 22).

As such, there is no potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage (Figure 22).

As such, it is considered that there is no requirement for providing an offset value for the loss of these non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities such as Sydney Turpentine Ironbark forest (STIF) which may have occurred in the locality before clearing since well before 1943 (Figure 7).

### **Recommendations**

It is recommended that future landscaping utilises species representative of Sydney Turpentine Ironbark Forest, an ecological community that may have occurred in the area before settlement and clearing (Benson and Howell (1990). Table 3 lists representative species that are recommended for landscaping following redevelopment. Representative species that are expected to have occurred in the locality before settlement and clearing could be also be derived from lists given in the Determination of STIF as a critically endangered ecological community by the Scientific Committee of NSW in 2019.

### **3.2.3 Indigenous and exotic plant species**

Few indigenous species occur in this managed and maintained landscape. Some of these species are listed in Table 2, with few others recorded, these including Swamp Dock (*Rumex brownii*) and individuals of Sweet Pittosporum (*Pittosporum undulatum*) occurring in managed garden areas of the housing complex.

Exotic herbaceous and grass (weed) species are also listed in Table 1.

Species nomenclature follows that of Harden (1990 – 2002; 2021 online).

All the canopy trees occurring across the Concept Application Area appear to have been planted (comparing Figures 6 & 7) and only the canopy species Sydney Blue Gum (*Eucalyptus saligna*), Blackbutt (*Eucalyptus pilularis*) and Thin-leaved Stringybark (*Eucalyptus eugenioides*) are considered to have potentially occurred in former forested ecological communities before clearing which occurred well before 1943 (Figure 7).

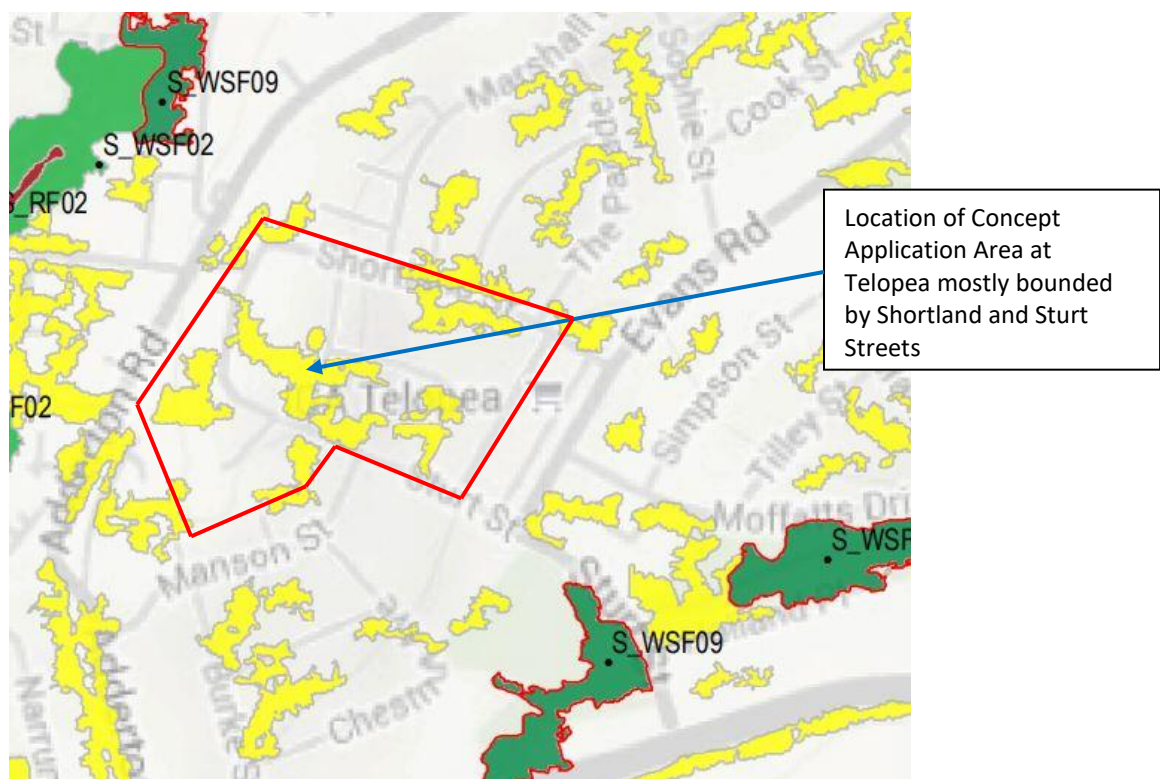


### 3.2.4 Plant community

#### Previous mapping

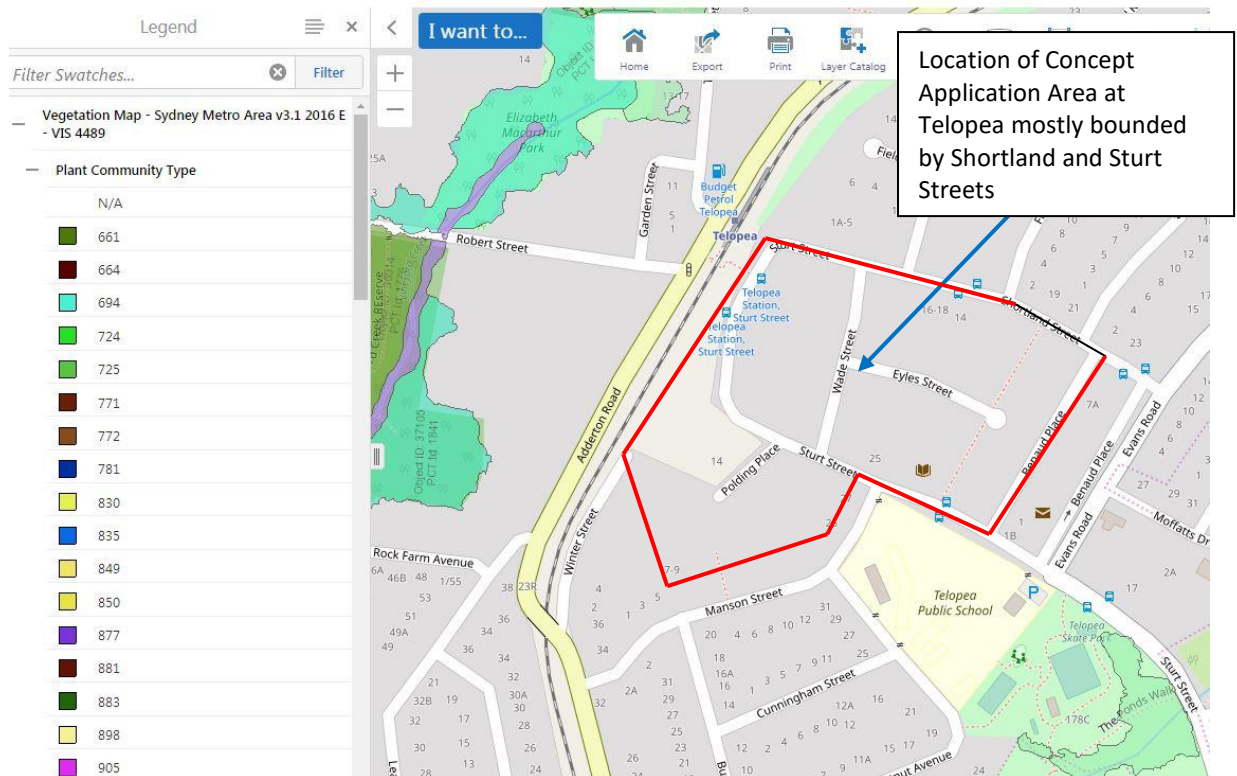
The local ecological plant community that occurs within and mostly surrounding the Concept Application Area has been mapped by OEH (2016) as Urban Natives and Exotics, a non-natural ecological community, compiling data from extent of disturbance (condition) and including some ground-truthing (Figure 23) (OEH 2016).

More recent mapping by DPIE (2021) also indicates that no distinct, recognisable, natural ecological community occurs within the Concept Application Area (Figure 24).



**Figure 23** - OEH (2016) mapping of ecological communities occurring at the Concept Application Area indicates that no natural ecological community occurs within the locality (yellow shaded areas indicate Urban Natives and Exotics OEH (2016) and green polygons with red edging indicate nearby distributions of Turpentine Ironbark Forest (S\_WSF09) (PCT 1281) (OEH 2016).





**Figure 24-** DPIE (2020) mapping of ecological communities occurring at the Concept Application Area indicates that no natural ecological community occurs within the CA Area (no shaded areas)

### 3.2.5 Conservation status of Ecological Community

#### Status of ecological community occurring at subject site

Aerial mapping and ground-truthing indicates that the proposed development will occur in areas which have no ecological conservation value in relation to registers of the BC Act (2016) and EPBC Act (1999).

However, ground-truthing identifies that the larger, more mature canopy species, such as particularly Sydney Blue Gum and Blackbutt, which may potentially have occurred in former distributions of Blue Gum High Forest or Sydney Turpentine Ironbark Forest in this locality, have a high habitat value in regard to foraging and nesting habitat as evidenced by nests and hollows observed in some of these more mature individuals.

Table 4 indicates the discrete groups of trees and particular tree species which are considered to have the greatest potential for nesting and sheltering for avifauna and microchiropterans.

GROUP (TABLE 1)	TREE SPECIES	HABITAT ATTRIBUTE (NESTING/HOLLOWS)	FIGURE
2	Sydney Blue Gum	Active nesting in large trees (Magpie)	14
5A	Sydney Blue Gum & Spotted Gum	Active nesting in large trees (Magpie & Australian Raven)	17
8	Blackbutt	Hollows suitable for breeding and sheltering	19
10	Thin-leaved Stringybark	Hollows suitable for breeding and sheltering	21

**Table 4** - Indicates the discrete groups of trees and particular tree species which are considered to have the greatest potential for nesting and sheltering for avifauna and microchiropterans

Notwithstanding that these large stick nests have been constructed by common urban avifauna such as Magpies and Ravens, it would be recommended that these individuals be retained, or at a minimum, that nesting boxes be installed on some larger trees that are proposed to be retained (Scales 2021).

The proposal does include the retention of many of these suitable habitat trees (see section 3.2.2)

### **3.2.6 Impacts to vegetation resulting from proposed development and mitigation measures (for detail see Section 3.2.2)**

#### **Trees proposed for retention**

A total of 44 individuals of trees of 12 different species (or 11%) will be retained from a total tree population of 392 documented trees (Scales 2021). These retained trees include 13 mature individuals of locally-occurring species, 26 individuals of non-locally occurring native species with heights at least 14m or more, and 5 individuals of exotic, ornamental canopy species (Scales 2021).

Mature tall trees that will be retained include 6 individuals of Sydney Blue Gum (including the individuals containing the stick nest indicated in Figure 16, 3 individuals of Spotted Gum (including tree no. 258 with stick nest) and 4 individuals of Coast Mahogany (*Eucalyptus botryoides*).

Also retained are 10 tall mature trees of Tallow Wood, 6 of Lemon-scented Gum, 5 of Brush Box, and 2 individuals of Wallangarra White Gum (among others) (Scales 2021).

The retention of at least 38 individuals of 'Important Trees' (Scales 2021) indicates that a significant extent of foraging, nesting, roosting and sheltering habitat would currently be retained over the area of the subject land.

### **Trees proposed for removal**

A total of 348 trees, of varying species, varying sizes and level of maturity, all of which have been planted since well after 1943, are proposed to be removed to facilitate the proposed Stage 1A and Stage 1 developments at the CA Area at Telopea.

### **Detailed impact appraisal by Scales (2021)**

The proposed development will require the removal of 203 'high category trees' that are considered arboriculturally to have the characteristics of a moderate to high significance and display good health and condition (Scales 2021).

To retain Tree Numbers 165 & 166 in Scales (2021), design and/or siting modification may be required to accommodate setbacks as prescribed in AS4970-2009 (Aust Standard) *Protection of trees on development sites*. Specifically, the existing ground levels would be required to remain within their TPZ to avoid severance of structural roots.

### **Recommendations for landscaping**

Plant species, including canopy trees that could be used in landscaping programs for the redevelopment, include species representative of Sydney Turpentine Ironbark Forest (STIF) or Blue Gum High Forest (BGHF)) that may have occurred in the locality on Wianamatta Shale sediments before clearing (Benson & Howell 1990; OEH 2016).

Table 3 indicates a representative list of plants species from various structural groups that could be used in a future landscaping program.

Examples of canopy species which could be used in future landscaping programs include species such as Sydney Blue Gum, Blackbutt, Grey Ironbark, Turpentine, Sydney Red Gum (*Angophora costata*), Red Mahogany (*Eucalyptus resinifera*), Broad-leaved Ironbark (*Eucalyptus fibrosa*) and Narrow-leaved Ironbark (*Eucalyptus crebra*) (Table 3) (Benson & Howell 1990; OEH 2016).

Small tree species could include species such as Sweet Pittosporum, Blueberry Ash (*Elaeocarpus reticulatus*) and Hickory Wattle (*Acacia implexa*) (Benson & Howell 1990; OEH 2016).

### 3.2.7 Flora species of conservation significance

#### **Threatened species**

The Bionet Atlas of NSW Wildlife (2020) records for an area of 5km radius around the Concept Application Area indicate that 15 species of conservation significance have been recorded within a radius of 5km of the site within the last 20 years (Table 5).

Six of these species are listed as Endangered on the BC Act with four listed as Vulnerable, with 9 species listed as Vulnerable on the Commonwealth EPBC Act.

Eco Logical (2017) lists these species with an account of their threatened status, habitat features and likelihood of occurrence.



Family	Common name	Scientific name	NSW status	Comm. status	No. of records
Campanulaceae	Tadgell's Bluebell in the local government areas of Auburn, Bankstown, Baulkham Hills, Canterbury, Hornsby, Parramatta and Strathfield	<i>Wahlenbergia multicaulis</i>	E2		1
Convolvulaceae	Narrow-leafed Wilsonia	<i>Wilsonia backhousei</i>	V		99
Dilleniaceae	Julian's Hibbertia	<i>Hibbertia spanantha</i>	E4A	CE	1
		<i>Hibbertia superans</i>	E1		43
Elaeocarpaceae		<i>Tetradlea glandulosa</i>	V		3
Ericaceae		<i>Epacris purpurascens</i> var. <i>purpurascens</i>	V		73
Fabaceae (Faboideae)		<i>Dillwynia tenuifolia</i>	V		2
Fabaceae (Mimosoideae)	Kanangra Wattle	<i>Acacia clunies-rossiae</i>	V		1
	Downy Wattle	<i>Acacia pubescens</i>	V	V	5
Myrtaceae		<i>Darwinia biflora</i>	V	V	81
	Deane's Paperbark	<i>Melaleuca deanei</i>	V	V	1
	Scrub Turpentine	<i>Rhodamnia rubescens</i>	E4A		2
	Magenta Lilly Pilly	<i>Syzygium paniculatum</i>	E1	V	6
Rhamnaceae	<i>P. prunifolia</i> in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	<i>Pomaderris prunifolia</i>	E2		3
Thymelaeaceae		<i>Pimelea curviflora</i> var. <i>curviflora</i>	V	V	1

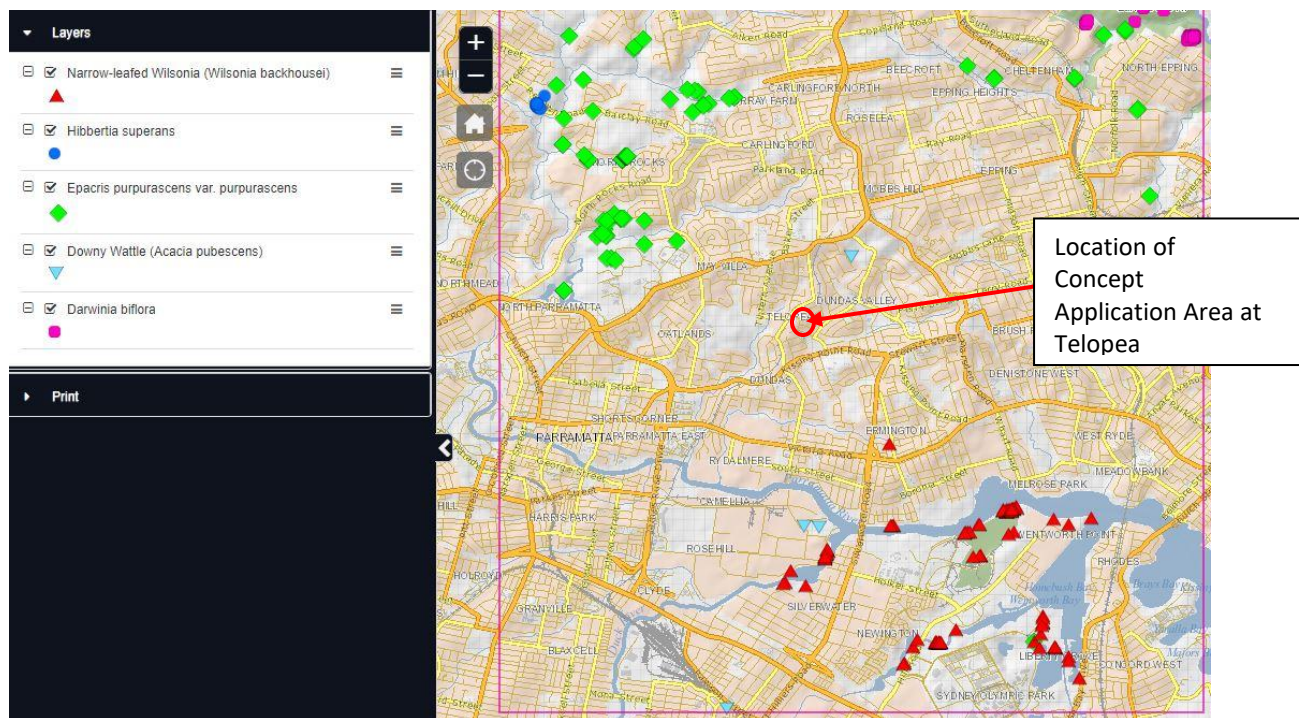
**Table 5** - Fifteen (15) species of threatened flora that have been recorded within a 10km area centered around the Concept Application Area within the last 20 years (DPIE 2020)

For these species, the cleared, managed and highly modified residential landscaped areas of the subject site, with managed lawns, is unsuitable for the occurrence of any threatened species. No natural shrub canopy occurs and only a few common naturally occurring ground cover species were recorded (Table 2).

Eco Logical (2017) state that 'no threatened flora species listed under the TSC Act (now BC Act) or EPBC Act were recorded during the site inspection and given the highly disturbed and modified nature of the study area, it is unlikely that any threatened flora would occur'.

Figure 25 indicates the recorded sightings of five of the most commonly recorded flora species of conservation significance in the locality of the subject site and shows that any threatened flora species occur mainly within Lake Parramatta reserve to the north-west or

Lane Cove National Park to the north-east. Some threatened species occur near the Parramatta River at Wentworth Point to the south-east.



**Figure 25** - Recorded sightings of 5 of the most recorded threatened flora species within a 5km radius of the Concept Application Area within the last 20 years (DPIE Bionet Atlas 2021)

None of the threatened flora species, or any other threatened flora species, occurs or was expected to occur at or in the vicinity of the Concept Application Area (Figure 25).

Lists of threatened flora species preferred habitats and assessed impacts of threatened species that have been recorded within a 10km area surrounding the Telopea Master Plan Precinct are detailed in Eco Logical (2017).

### 3.3 RESULTS - FAUNA AND POTENTIAL FAUNA HABITAT ASSESSMENT

The following fauna assessment has been prepared with particular regard to the BC Act, Section 5A of the current EP&A Act and the EPBC Act.

#### 3.3.1 Location and weather conditions at Concept Application Area

##### **Grid co-ordinates of centre of Concept Application Area;**

latitude: -33.7950420°;

longitude: 151.0427661°

##### **Weather conditions**

At Parramatta Met Station No: 066124

Mild temperatures with very light breeze, no rain.

Rainfall 0mm

9am Temp: 19.4°; Wind Speed: 2km/hr SE

A dedicated ground search was undertaken as well as a census of extant birds. The survey involved different search strategies and protocols and all extant fauna or evidence of fauna was recorded.

#### 3.3.2 Habitats present

The habitats of the Concept Application Area include:

1. Cleared, managed lawn-scape areas with extensive exotic grassland and patches of bare ground (Figures 11, 17, 18, 19, 20, 21 & 22), and
2. Large tall mature canopy trees occurring in rows or clumped within managed lawn-scapes (Figures 11 - 22).

The extensive areas of managed exotic grassland provides poor habitat but may provide some food resources for seed foraging avifauna.

Canopy trees may provide sheltering and seasonal food resources for avifauna, arboreal species and occasionally, the Grey-headed Flying Fox. A few small and medium sized hollows for species of parrots and other birds or microbats were recorded within the Concept Application Area. Some large stick nests were recorded during this survey.

The developed areas have no habitat features such as hollow logs, dense leaf litter, rock shelves and crevices etc that may provide safe foraging and potential shelter for small terrestrial fauna species such as skinks or small mammals, though existing rubbish container structures may provide shelter for some small feral mammalian species such as mice and the Black Rat.

### **3.3.3 Wildlife corridor potential**

The Concept Application Area occurs within a long established residential development, though with some bushland retained along drainage lines and corridors at Vineyard Creek to the west and The Ponds Creek to the south-east, some 500m from the surveyed areas (Figure 9).

The extensive presence of canopy trees within the Concept Application Area affords a moderate degree of connectivity for common avian species in the locality.



### 3.3.4 Fauna recorded

Table 6 indicates the fauna recorded or expected to occur within the Concept Application Area at Telopea.

Class/Family	Common name	Scientific name	Subject land
<b>AVES</b>			
Alcedinidae	Laughing Kookaburra	<i>Dacelo novaeguineae</i>	e
Cacatuidae	Galah	<i>Eolophus roseicapillus</i>	e
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>	e
Psittacidae	Crimson Rosella	<i>Platycercus elegans</i>	e
	Rainbow Lorikeet	<i>Trichoglossus haematodus</i>	x
Meliphagidae	Noisy Miner	<i>Manorina flavigula</i>	x
	Little Wattlebird	<i>Anthochaera chrysoptera</i>	x
	Red Wattlebird	<i>Anthochaera carunculata</i>	x
Corvidae	Australian Raven	<i>Corvus coronoides</i>	x
Columbidae	Rock Pigeon*	<i>Columba livia</i>	x
Hirundinidae	Welcome Swallow	<i>Hirundo neoxena</i>	x
Cracticidae	Australian Magpie	<i>Gymnorhina tibicen</i>	x
	Grey Butcherbird	<i>Cracticus torquatus</i>	x
Monarchidae	Magpie-lark	<i>Grallina cyanoleuca</i>	x
Threshkiornithidae	Australian Ibis	<i>Threshkiornis moluccus</i>	x
Sturnidae	Common Myna*	<i>Acridotheres tristis</i>	x
<b>MAMMALIA</b>			
Pseudocheiridae	Common Ringtail possum	<i>Pseudocheirus peregrinus</i>	e
Phalangeridae	Common Brushtail Possum	<i>Trichosurus vulpecula</i>	e
Pteropodidae	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	e
Muridae	House Mouse*	<i>Mus musculus</i>	e
Muridae	Black Rat*	<i>Rattus rattus</i>	e

**Legend:**

x - observed either onsite or overhead or heard in vicinity;

e - expected to occur onsite and in vicinity

\* - feral

**Table 6-** Indicates the fauna recorded or expected to occur within the Concept Application Area at Telopea.

Of the bird species observed or expected to occur, many were species that prefer a grassland habitat (Table 5). There was no dominant species among the birds with each occupying selective niches.

The Common Brushtail Possum (*Trichosurus vulpecula*) and Ring-tail Possum (*Pseudocheirus peregrinus*) are expected to occur within the extensive tree canopy areas that occur within the housing complex.

A few trees within the surveyed area contained small hollows that could accommodate small mammals such as microbats, as well as small avian species.

Reptilian habitat was rated as relatively poor within the managed lawns with little leaf litter which was rated poor for sheltering.

Habitat for amphibian species was rated as poor as no discrete drainage lines or ponds occur within the proposed development site.

Due to the rubbish container structures occurring at the site, the pest species Black Rat and House Mouse would be expected to occur occasionally at, and in the vicinity, of the Concept Application Area (Table 5). The Australian White Ibis and Rock Pigeon were observed foraging at the Concept Application Area (Figure 26).



**Figure 26** - Opportunistic avian species such as the Australian White Ibis and the feral Rock Pigeon observed foraging at the Concept Application Area

### 3.3.5 Fauna species of conservation significance

#### 3.3.5.1 Threatened species

The criteria used to assess the likelihood of threatened species occurring in the CA Area include the specificity of habitat features such as tree canopy cover, relative soil moisture regime, relative soil nutrient regimes, historical disturbance and degradation of vegetation and known occurrences of threatened species in the immediate locality.

If all or most of these collective criteria deemed optimal for the occurrence of a particular threatened species occur in relation to the habitat of the CA Area, then the likelihood of its potential occurrence in the habitat of the CA Area could be assessed as being relatively high. If only some of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the CA Area, then its potential occurrence in the area of study may be deemed moderate at best. If few of these collective criteria deemed suitable for the occurrence of a particular threatened species occur in the habitat of the CA Area, then the likelihood of its occurrence would be assessed as being low to very unlikely.

The DPIE Atlas of NSW Wildlife database 2020 (Dept Planning, Industry and Environment) listed thirty three (33) species of terrestrial and avifauna considered threatened under the BC Act within a 5 km radius of the CA Area (Table 6). Five of these species are designated as endangered by the NSW Scientific Committee with the remainder designated as vulnerable. Under the EPBC Act 1999, five species are listed as vulnerable with five, endangered (Table 7).

Family	Common name	Scientific name	NSW status	Comm. status	No. of records
<b>Amphibia</b> <b>Myobatrachidae</b>	Red-crowned Toadlet	<i>Pseudophryne australis</i>	V		4
<b>Hylidae</b>	Green and Golden Bell Frog	<i>Litoria aurea</i>	E1	V	13,034
<b>Aves</b> <b>Apodidae</b>	White-throated Needletail	<i>Hirundapus caudacutus</i>		V,C,J,K	19
<b>Ardeidae</b>	Australasian Bittern	<i>Botaurus poiciloptilus</i>	E1	E	6
	Black Bittern	<i>Ixobrychus flavicollis</i>	V		3
<b>Accipitridae</b>	Spotted Harrier	<i>Circus assimilis</i>	V		4
	White-bellied Sea-Eagle	<i>Haliaeetus leucogaster</i>	V		306
	Little Eagle	<i>Hieraaetus morphnoides</i>	V		6
<b>Cacatuidae</b>	Gang-gang Cockatoo	<i>Callocephalon fimbriatum</i>	V		5
<b>Psittacidae</b>	Little Lorikeet	<i>Glossopsitta pusilla</i>	V		4
	Swift Parrot	<i>Lathamus discolor</i>	E1	CE	9
<b>Strigidae</b>	Barking Owl	<i>Ninox connivens</i>	V		4
	Powerful Owl	<i>Ninox strenua</i>	V		171

Family	Common name	Scientific name	NSW status	Comm. status	No. of records
Tytonidae	Eastern Grass Owl	<i>Tyto longimembris</i>	V		1
Tytonidae	Masked Owl	<i>Tyto novaehollandiae</i>	V		3
Meliphagidae	Regent Honeyeater	<i>Anthochaera phrygia</i>	E4A	CE	1
	White-fronted Chat	<i>Epthianura albifrons</i>	V		210
Neosittidae	Varied Sittella	<i>Daphoenositta chrysoptera</i>	V		2
Artamidae	Dusky Woodswallow	<i>Artamus cyanopterus cyanopterus</i>	V		8
Petroicidae	Scarlet Robin	<i>Petroica boodang</i>	V		1
	Flame Robin	<i>Petroica phoenicea</i>	V		1
Mammalia Dasyuridae	Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	V	E	3
Phascolarctidae	Koala	<i>Phascolarctos cinereus</i>	V	V	1
Pteropodidae	Grey-headed Flying-fox	<i>Pteropus poliocephalus</i>	V	V	536
Emballonuridae	Yellow-bellied Sheath-tail-bat	<i>Saccolaimus flaviventris</i>	V		12
Molossidae	Eastern Coastal Free-tailed Bat	<i>Micronomus norfolkensis</i>	V		6
Vespertilionidae	Large-eared Pied Bat	<i>Chalinolobus dwyeri</i>	V	V	2
	Eastern False Pipistrelle	<i>Falsistrellus tasmaniensis</i>	V		6
	Southern Myotis	<i>Myotis macropus</i>	V		31
	Greater Broad-nosed Bat	<i>Scoteanax rueppellii</i>	V		5
Miniopteridae	Little Bent-winged Bat	<i>Miniopterus australis</i>	V		1
	Large Bent-winged Bat	<i>Miniopterus orianae oceanensis</i>	V		98
Gastropoda Camaenidae	Dural Land Snail	<i>Pommerhelix duralensis</i>	E1	E	29

**Legend to Table 7 - BC Act, EPBC Act, Migratory Bird Agreements**

<b>Key</b>	
Environmental Protection and Biodiversity Conservation Act (EPBC Act) 1999	Biodiversity Conservation Act (BC Act) 2016
CE - Critically Endangered	E1 - Endangered
E - Endangered	E4 - critically endangered
V - Vulnerable	V - Vulnerable
	C CAMBA Migratory bird agreement between Australia and China

**Table 7 - Thirty three (33) species of threatened fauna recorded within 5km radius of the Concept Application Area within the previous 20 years (DPIE Bionet Atlas 2020).**



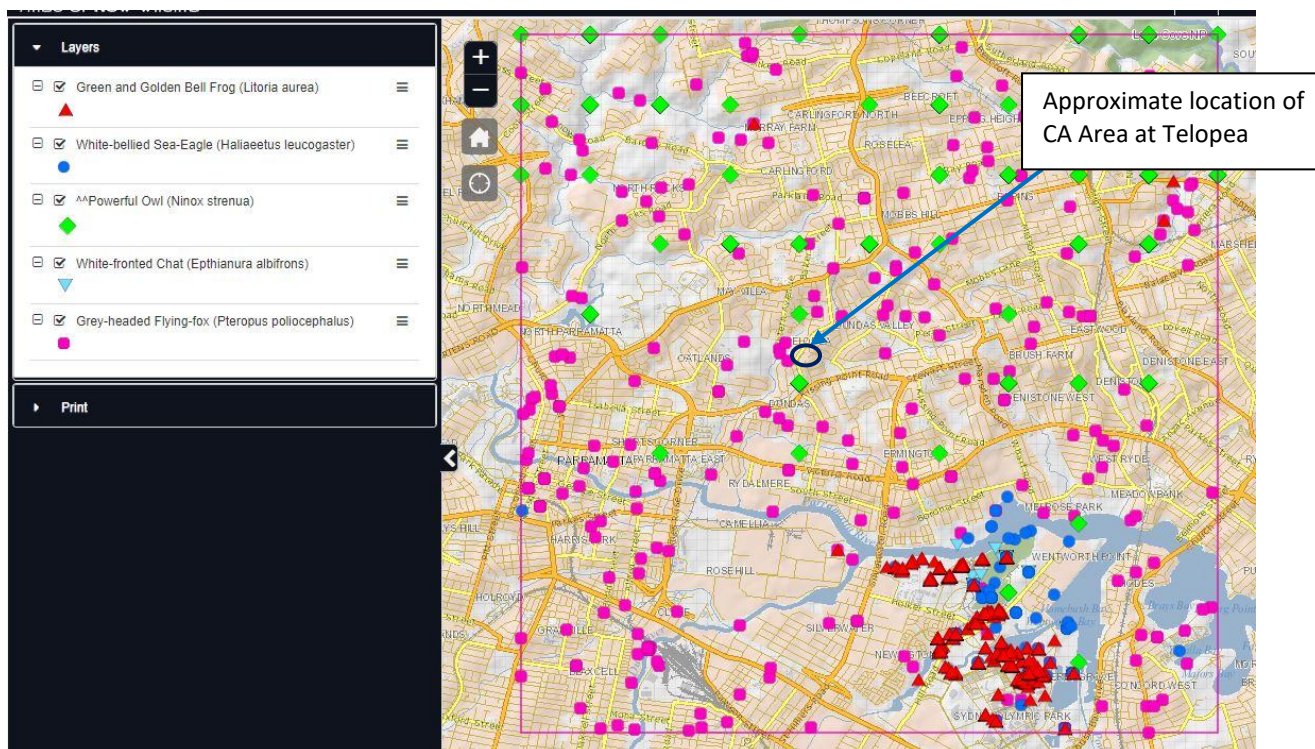
### 3.3.5.2 Threatened species with potential to occur at the Concept Application Area

All threatened species listed require specific habitat for foraging, nesting or roosting. The Concept Application Area was assessed for these habitat requirements.

Due to the highly modified (managed exotic grassland) habitat of the CA Area, with landscaped canopy tree populations and high number of residential activity throughout the housing area complex, no threatened fauna species are considered likely to regularly occur as indicated by the recorded sightings of threatened fauna species in the locality. No threatened fauna species was recorded within a 2km distance of the proposed development area.

Lists of threatened fauna species preferred habitats and assessed impacts of threatened species that have been recorded within a 10km area surrounding the Telopea Master Plan Precinct are detailed in Eco Logical (2017).

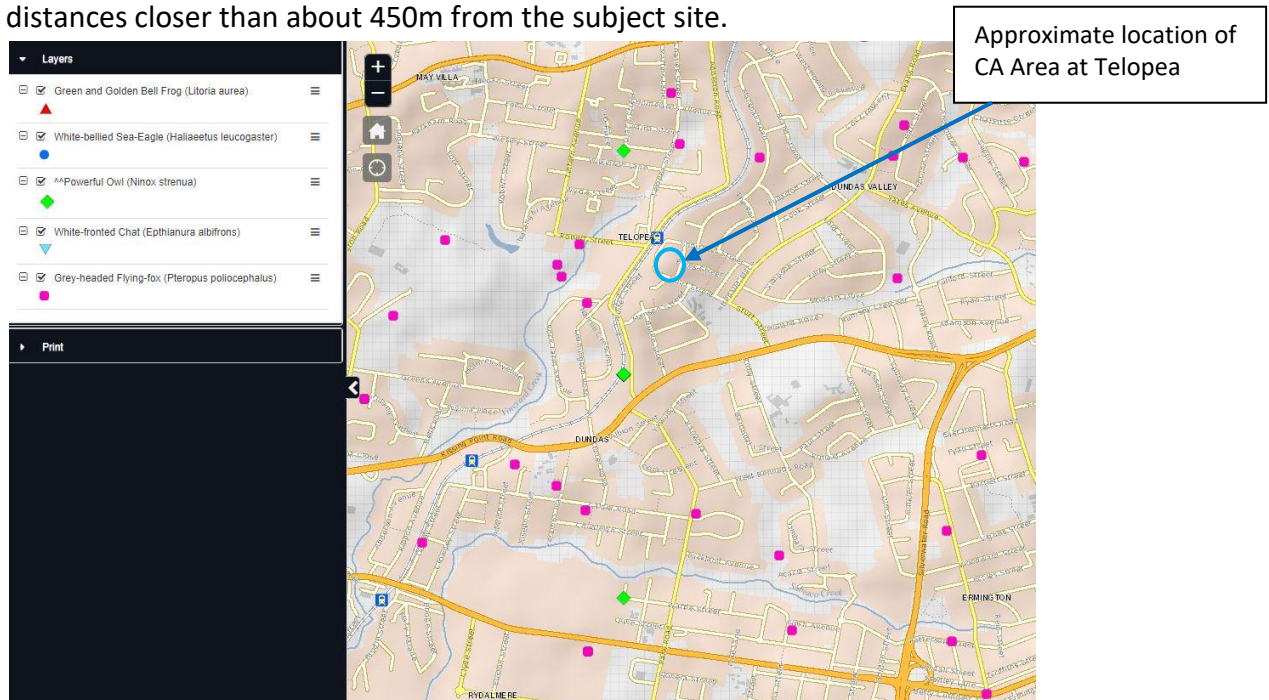
Figure 27 indicates the locations of recorded sightings of the most recorded fauna within a 5km radius of the subject site within the previous 20 years.



**Figure 27** - Recorded sightings of the 5 most commonly recorded threatened fauna within a 5km radius of the Concept Application Area within the last 20 years (DPIE Bionet Atlas 2020)

The recorded threatened fauna distributions indicate that The Powerful Owl (recorded as heard in 1km grid locations on the mapping) and the Grey-headed Flying Fox, are commonly recorded across the locality (Figure 27).

Figure 28 indicates however, that none of these threatened species has been recorded at distances closer than about 450m from the subject site.



**Figure 28** - Indicating that no threatened species has been recorded closer to the CA A than about 450m

Two threatened species recorded in the greatest numbers in the vicinity of the Concept Application Area include the following:

1. The Powerful Owl (*Ninox strenua*) has been recorded across the locality (recorded in 1km grid patterns according to call) and over much of the Sydney region where forested areas or where significant numbers of canopy trees occur (Figure 28).

The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest (DPIE 2020).

The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine (*Syncarpia glomulifera*), Black She-oak (*Allocasuarina littoralis*), Blackwood (*Acacia melanoxylon*), Rough-

barked Apple (*Angophora floribunda*), Cherry Ballart (*Exocarpus cupressiformis*) and a number of eucalypt species (DPIE 2020).

The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider. Flying foxes are important prey in some areas; birds comprise about 10-50% of the diet depending on the availability of preferred mammals. As most prey species require hollows and a shrub layer, these are important habitat components for the owl (DPIE 2020).

Pairs of Powerful Owls demonstrate high fidelity to a large territory, the size of which varies with habitat quality and thus prey densities. In good habitats a mere 400ha can support a pair; where hollow trees and prey have been depleted the owls need up to 4000 ha (DPIE 2020).

The Powerful Owl may occasionally forage within the area if prey species are in abundance (Figure 27). However during the survey, prey for this large owl did not appear sufficient in number to attract it to the CA Area.

2. Grey-headed Flying Fox (*Pteropus poliocephalus*). This species congregates in large camps and is found in a variety of habitats including rainforest, mangroves, Melaleuca swamps, wet and dry sclerophyll forests and also cultivated areas. The species feeds on the blossoms of more than 80 plant species, especially eucalyptus blossom and the fruits of a number of palm species. Flowering species of eucalypts such as Swamp Mahogany (*Eucalyptus robusta*) and Forest Red Gum (*Eucalyptus tereticornis*) and Paperbarks (*Melaleuca quinquenervia*), are particularly important. Distances of up to 30km from the camp are often travelled, with 60-70km sometimes covered per night to reach a particular food source.

The Grey-headed Flying Fox (*Pteropus poliocephalus*) was not sighted during the survey, which occurred during mid-morning when the bats would be roosting in camps, but may be attracted to flowering Eucalyptus and paperbark trees on occasion during the warmer months (Figure 27).

It is considered that, as the area that is proposed to be impacted is relatively small, with the retention of 112 trees, the potential landscaping of a greater number of trees in the redeveloped site, and the greater extent of foraging area in the region, this species will not be compromised by the proposed development for the Concept Application Area (see also Eco Logical 2017).

The report on the Flora and Fauna Master Plan for the Telopea Development by Eco Logical (2017) states that 'No threatened fauna were recorded during the site inspection.

Hollows may provide roosting habitat for microbats including the Eastern Freetail-bat (*Mormopterus norfolkensis*) and the Greater Broad-nosed Bat (*Scoteanax rueppellii*). **Several hollows were recorded within the subject site, and it is recommended that replacement habitat is provided as part of the proposal in the installation of small and medium sized nest boxes and bat boxes affixed to suitable retained trees occurring within the CA Area.**

The Grey-headed Flying-fox (*Pteropus poliocephalus*) is likely to use the subject site for foraging, including vegetation within the proposed increased residential density areas; however the Master Plan proposes to maintain some mature trees in the street verges.

The Parramatta DCP, under which any development will be assessed, states that: Stands of mature trees that contribute to the quality of the landscape will be protected where possible or replaced in the redevelopment of sites'.



## **4 POTENTIAL IMPACTS AND COMPLIANCE WITH DEVELOPMENT IN THE PARRAMATTA COUNCIL LGA**

### **4.1 INTRODUCTION**

Development must comply with Parramatta Council LEP (2011) and Parramatta Council DCP (2011). This plan applies to all land within the Parramatta Council LGA to which LEP 2011 applies.

The general aims of the Parramatta Local Environmental Plan (LEP) 2011 include the following (Eco Logical 2017):

- to encourage a range of development, including housing, employment and recreation;
- to foster environmental, economic, social and physical wellbeing so that Parramatta develops as an integrated, balanced and sustainable city;
- to identify, conserve and promote Parramatta's natural and cultural heritage as the framework for its identity, prosperity, liveability and social development;
- to minimise risk to the community in areas subject to environmental hazards, particularly flooding and bushfire, by restricting development in sensitive areas; and,
- to protect and enhance the natural environment, including areas of remnant bushland in Parramatta, by incorporating principles of ecologically sustainable development into land use controls.

The Parramatta City Council Development Control Plan (DCP) 2011 works in conjunction with the Parramatta LEP 2011 to ensure the following (Eco Logical 2017):

- that development contributes to the quality of the natural and built environments;
- encourage development that contributes to the quality of the public domain;
- ensure that development is economically, environmentally and socially sustainable;
- ensure future development has consideration for the needs of all members of the community;
- ensure development positively responds to the qualities of the site and its context; and,
- ensure development positively responds to the character of the surrounding area.

The Concept Application Area is within the Telopea Precinct, which identifies the following:

- Stands of mature trees that contribute to the quality of the landscape will be protected where possible or replaced in the redevelopment of sites.
- Once approved, the Telopea Master plan will be incorporated into the Parramatta City Council Development Control Plan (Eco Logical 2017).

## **4.2 PROPOSED IMPACTS TO FLORISTIC BIODIVERSITY**

### ***4.2.1 Potential impacts of development***

The design of the proposed development, including the retention of 44 existing trees incorporating a total of 38 mature, 'important' trees (Scales 2021), in various areas including street verges, would comply with the Parramatta DCP 2011.

### ***4.2.2 Recommended mitigation measures***

The former habitats of BGHF and STIF could be enhanced by the incorporation of landscape plantings including native species which are diagnostically positive for this ecological community. Examples of canopy trees that could be used are given in Section 3.2.5 of this report and lists of species in all structural layers for these ecological communities can be found in Table 3 and OEH (2016).

## **4.3 COMPLIANCE WITH THREATENED SPECIES LEGISLATION**

### ***4.3.1 Threatened species***

No individuals of threatened flora or fauna were recorded, or expected to occur, at the Concept Application Area (Sections 3.2.6 and 3.3.5)

### ***4.3.2 Threatened Ecological Community***

No elements of any threatened ecological community occur within the managed landscape of the Concept Application Area (Figures 11 - 22) (See Section 3.2.2).

## **4.4 COMPLIANCE WITH EFFLUENT AND STORMWATER DISPOSAL**

The Concept Application Area is serviced by sewage and storm water infrastructure.

## 4.5 CONCLUSIONS

The proposed redevelopment of the Concept Application Area, including the retention of many suitable habitat trees and the undertaking of recommended mitigation measures, is considered to comply with the desired criteria in relation to Parramatta Council LEP (2011) and DCP (2011).

## **5 ADDRESSING THE PROPOSED DEVELOPMENT IN RELATION TO THE BAM (BIODIVERSITY ASSESSMENT METHOD) AS REQUIRED BY THE BC ACT (2016)**

### **5.1 OFFSET SCHEME THRESHOLDS**

#### **5.1.1 Natural area thresholds**

There is no area of potential natural bushland occurring at the Concept Application Area that is proposed to be impacted (Figures 5, 11 - 22).

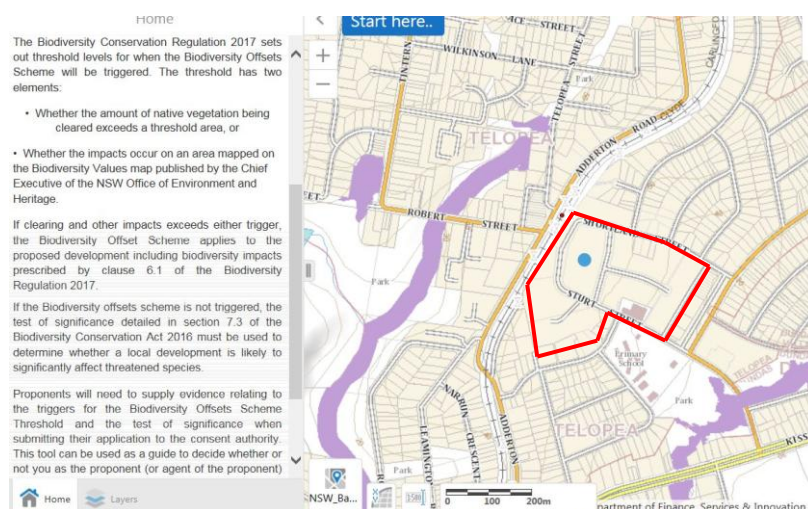
The development does not meet the offset criteria in relation to natural areas that would potentially be impacted (See Section 3.2.2).

#### **5.1.2 Biodiversity Values Map**

The Biodiversity Values Map (BV Map) identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The Biodiversity Offsets Scheme applies to all local developments, major projects or the clearing of native vegetation where the *State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017* applies. Any of these will require entry into the Biodiversity Offsets Scheme if they occur on land mapped on the Biodiversity Values Map (DPIE 2020).

The location of the subject property on the Biodiversity Values Map is indicated in Figure 29.





**Figure 29 - Biodiversity Values Mapping of Concept Application Area (outlined in red font) at Shortland and Sturt Streets, Telopea (blue solid circle on map), showing no biodiversity values mapped for the CA Area (biodiversity values occur along drainage creeks etc. and are indicated in purple shading) (DPIE 2020).**

No areas indicated within the Concept Application Area are mapped as containing significant Biodiversity Value (Figure 29).

As such, a formal Biodiversity Development Assessment Report is not valid as the Vegetation Integrity of the areas to be developed will be approaching zero, and as such, no offsets are deemed necessary for this development.

### 5.1.3 Threatened species, populations and/or ecological communities.

No threatened flora or fauna species, and no extent or elements of any natural threatened ecological community occur within the Concept Application Area, and none will be impacted either directly or indirectly.

A clump of individuals of Sydney Blue Gums occurring in the north-eastern section of a discrete group of trees identified as Group 2 (Figure 10B corresponding to Figure 8C) occupies an area of 20 x 20m. Coded numbers of these individuals are given as 152 - 161 (Figures 8C & 10B) (from Scales 2021).

Even though this copse of trees had been planted in a landscape plan, it was conferred to the most likely PCT that may have occurred in the locality before clearing as PCT No. 1281 (Sydney Turpentine Ironbark Forest). As such, this area was quantified by BAM analysis to acquire a measure of Vegetation Integrity (BAM 2017) of 3.3 (see Group 2 in Section 3.2.2).

As the Vegetation Integrity Index (VI) is <15 for this derived TEC, the index is too low to acquire a biodiversity offset cost for this small patch of planted Sydney Blue Gum individuals (BAM 2017), which mostly occur as a monoculture in association with canopy species which do not occur locally (such as River Oak and Brush-box) (Scales 2021).

In regard to the other component trees described within this group (Group 2 in Figures 8C, 8D & 10B), this derived group of trees does not represent any known or natural Plant Community Type (PCT), nor do they represent any natural formation or class of vegetation as prescribed by BAM in order to calculate any potential offsetting value. There is no natural structural integrity nor functional attributes, and floristically, there are mostly only derived, non-locally occurring, planted canopy trees such as described.

There is no regenerative function within the landscaped area, with no regenerating saplings of canopy species, nor logs providing faunal habitat on the managed exotic grassland ground cover nor a natural litter component in the ground stratum.

As such, there is little potential for this group of landscaped canopy trees to provide habitat for any threatened fauna species, nor would any threatened flora species potentially disperse into this managed curtilage.

As such, it is considered that there is no requirement for providing an offset value for the loss of these derived, non-locally occurring canopy species, save for the potential replacement of these individuals with canopy species more representative of such ecological communities as Sydney Turpentine Ironbark forest (STIF) or Blue Gum High Forest (BGHF) which may have occurred in the locality before clearing since well before 1943 (Figure 7), as listed in Table 3.

As such, it is considered that no significant impacts would occur to any threatened species or to the extent of distribution of any threatened ecological community in the locality of the Concept Application Area.

## 6 REFERENCES AND LITERATURE REVIEWED

- Bates, Smart (2020) and Hassell (2020) Urban Design Report for Telopea Masterplan Stage 1A
- Benson, D. and Howell, J. (1994) The natural vegetation of the Sydney 1: 100,000 map sheet. *Cunninghamia* **3**:677 – 787.
- Benson, D. and Howell, J. (1990) Taken for Granted: The bushland of Sydney and its suburbs
- Briggs, J.D. and Leigh, J.H.C. (1996) Rare or Threatened Australian Plants: CSIRO Division of Plant Industry/Australian National Parks and Wildlife Service. CSIRO Publishing, Melb.
- Chapman, G.A. and Murphy, C.L. (1989) *Soil landscapes of the Sydney 1;100 000 sheet*. (Soil Conservation Service of N.S.W.: Sydney).
- Churchill, S., (1998). *Australian Bats*. Reed New Holland Publishers.
- Cogger, H. G. (2000). Reptiles and Amphibians of Australia. 6th ed. Reed New Holland, Sydney.
- Commonwealth DAWE Protected Matters Environmental Search Tool (2020)
- Cropper, S (1993) *Management of Endangered Plants* CSIRO Pub. East Melbourne
- DEC (2002) *Final Edition of 'Native Vegetation of the Cumberland Plain'*. Conservation Programs and Planning Division, Central Directorate.
- DEC (2004) Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities
- DECCW (2011) Cumberland Plain Recovery Plan.
- DPIE Atlas of NSW Wildlife (2020). NPWS Geographic Information Systems Division, Hurstville NSW, 2220.
- Dwyer, P.D. (1995) Common Bentwing-bat *Miniopterus schreibersii* Pp. 494-5 in Strahan, R. (ed.) The Mammals of Australia. Reed Books, Sydney.
- Eco Logical (2017) Flora and fauna assessment for the Telopea Master Plan *prepared for the Land and Housing Corporation*

- Fairley, A. & Moore, P. (2010) *Native Plants of the Sydney District – An Identification Guide*. Kangaroo Press, Kenthurst, Sydney.
- Fairley, A. (2004) *Seldom Seen – Rare Plants of Greater Sydney*. New Holland Publ Sydney, Aust.
- Gibbons P, Lindenmayer D (2000) 'Tree Hollows and Wildlife Conservation in Australia'. (CSIRO Publishing: Canberra)
- Harden, G. J. (ed.) (1990 – 2002; 2020 online) *Flora of New South Wales*, Royal Botanic Gardens, Sydney NSW.
- Hassall (2020) *Landscape Report for Telopea Masterplan Stage 1A*
- Herbert, C. (1983) '*Geology of the 1:100 000 Sheet 9130*'. Geological Survey of NSW, Sydney.
- Lumsden, L.F. and Menkhorst, P. (1995) Yellow-bellied Sheathtail-bat. Pp 161-2 in Menkhorst, P.W. (ed.) *Mammals of Victoria*. Oxford University Press, Melbourne.
- Menkhorst, P & F Knight (2001). *A field guide to the Mammals of Australia*. Victoria: Oxford University Press.
- NSW Scientific Committee. Final Determinations (1996 – 2020) Determinations relating to listings of threatened species, ecological communities and key threatening processes in the Schedules of the *Biodiversity Conservation Act 1995*.
- OEH (2016) 'The Native Vegetation of the Sydney Metropolitan Catchment Management Authority Area'.
- OEH (2017) *Biodiversity Assessment Method* (published August 2017)
- Pizzey, G. and Knight, F. (2003). *The Field Guide to the Birds of Australia*. Angus and Robinson Pubs.
- Plus Architecture (2020) *Urban Design Report for Telopea Masterplan Stage 1A*
- Scales (2019) *Arboricultural Impact Appraisal and Method Statement for Telopea Stage 1, Shortland Street and Sturt Street prepared for Frasers Telopea Property Developer Pty Ltd for the Land and Housing Corporation*



Scales (2020) Revision 1 - Arboricultural Impact Appraisal and Method  
Statement for Telopea Stage 1 & 1A, Shortland Street and Sturt Street  
*prepared for Frasers Telopea Property Developer Pty Ltd for the Land  
and Housing Corporation*

Scales (2021) Revision 2 - Arboricultural Impact Appraisal and Method  
Statement for Telopea Stage 1 & 1A, Shortland Street and Sturt Street  
*prepared for Frasers Telopea Property Developer Pty Ltd for the Land  
and Housing Corporation*

Smith A.P & Murray (2002) Habitat requirements of the squirrel glider (*Petaurus  
norfolcensis*) and associated possums and gliders on the New South Wales  
central coast. *Wildlife Research* 30(3) 291-301

Specht, R. L., Specht, A., Whelan, M.B., Hegarty, E. E. (1995) Conservation Atlas  
of Plant Communities in Australia. Southern Cross Univ Press Lismore

Strahan, R. 1995 *Complete Book of Australian Mammals*, Second Edition.  
Sydney: ReedBooks.