St Leonards Plaza

Flora and Fauna Assessment

Prepared for
Lane Cove Council

27 August 2012

DOCUMENT TRACKING

ITEM	DETAIL
Project Name	St Leonards Plaza – Flora and Fauna Assessment
Project Number	12SYDECO-0069
File location	G:\Synergy\Projects\12SYDECO\12SYDECO-0069 St Leonards Plaza Flora & Fauna Assessment\Report\Draft Reports
Project Manager	Tammy Paartalu
Prepared by	Belinda Failes
Approved by	Jennie Powell
Status	FINAL:
Version Number	1
Last saved on	27 August 2012
Cover photo	Top Left: Eastern side of rail corridor (subject site). Top Right: Western side of rail corridor (subject site). Bottom Left: Fauna habitat within rail corridor. Bottom Right: Urban area within subject site. Photos taken by ELA ecologist Belinda Failes 22 August 2012.

This report should be cited as 'Eco Logical Australia August 2012. *St Leonards Plaza – Flora and Fauna Assessment*. Prepared for Lane Cover Council.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Lane Cove Council.

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Abbreviations

ABBREVIATION	DESCRIPTION
DPI	Department of Planning and Infrastructure
ELA	Eco Logical Australia Pty Ltd
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
LGA	Local Government Area
NES	Matters of National Environmental Significance under the EPBC Act
SEWPAC	Commonwealth Department of the Sustainability, Environment, Water, Population, and Communities
SMCMA	Sydney Metropolitan Catchment Management Authority
TSC Act	NSW *Threatened Species Conservation Act 1995*
WoNS	Weeds of National Significance

Executive Summary

Eco Logical Australia Pty Ltd has undertaken a flora and fauna assessment, on behalf of Lane Cove Council, for the proposed St Leonards plaza and bus/rail interchange. The proposal will provide open space for local residents and improve the safety of the current rail/bus interchange.

The plaza will create a new elevated platform over a section of the rail corridor on the south side of St Leonards Station. Under the proposal the vegetation within the rail corridor and adjoining street trees (up to 0.03 ha) will be permanently removed.

The vegetation within the subject site is considered by Lane Cove Council to contribute towards an important wildlife corridor for local fauna, in particular urban birds. It may also provide potential foraging for one threatened species, *Pteropus poliocephalus* (Grey-headed Flying-fox).

However, an assessment of the ecological values of the vegetation earmarked for removal identified that limited habitat resources were provided within the vegetation. The vegetation is also located at the edge of Pacific Highway which forms a barrier for most fauna species with the exception to some highly urbanised species (birds and bats). Therefore, under the proposal it is unlikely that the proposal will significantly impact on any threatened flora and fauna species. Although some minor disturbance may occur to local fauna species these are not considered significant and may be mitigated through the recommendations provided.

1 Introduction

1.1 BACKGROUND

Eco Logical Australia Pty Ltd (ELA) was commissioned by Lane Cove Council to prepare a flora and fauna assessment for the proposed St Leonards Plaza and the bus/rail interchange. The proposal has been declared a State Significant Development under Part 4.1 of the *Environmental Planning & Assessment Act* (EP&A). This flora and fauna assessment will assist in determining the potential ecological impacts associated with the proposed development.

1.2 OBJECTIVES

The key objectives of this report are to:

- Map and verify the vegetation community within the site
- Undertake targeted searches for threatened flora species listed under *Threatened Species Conservation Act 1995* (TSC) or *Environmental Protection Biodiversity and Conservation Act 1999* (EPBC);
- Identify potential habitat features such as hollow-bearing trees, potential nesting or roosting sites and winter-flowering species;
- Assess the value of the rail corridor in terms of the function it serves as a fauna movement corridor within the LGA; and
- Assess the potential for threatened species listed under the TSC or EPBC Acts to occur at or utilise the site based on the presence of suitable habitat.

1.3 PROPOSAL DESCRIPTION

The Lane Cove Council (together with North Sydney and Willoughby Councils) and with the NSW Government *Department of Planning and Infrastructure* (DPI)) has taken the opportunity to provide valuable open space for local residents following the submission of two Development Applications (DAs) on either side of the rail corridor. Under this new proposal the open space would span over the rail corridor and join the two new developments. The proposal will also;

- Provide new public space incorporating sustainable development design;
- Upgrade the bus interchange to provide safer commuter access including new escalators to the rail platforms and new set-down area for bus commuters;
- Reduce traffic flow by dissolving Canberra Ave and Lithgow St; and
- Facilitate commercial initiatives within the area

1.4 SITE DESCRIPTION

St Leonards is located at the junction of three local government areas (LGA), North Sydney, Willoughby and Lane Cove Councils, with Lane Cove the driving force behind the proposed development (**Figure 1**). The proposed plaza is bounded by Pacific Highway in the north and aligns with Marshall Ave in the

south. The outer boundaries to the east and west are formed by Lithgow St and Canberra Ave respectively (**Figure 2**). A majority of the local area surrounding the proposed plaza consists of low density housing with new plans to increase to high density housing.

The rail corridor consists of a narrow strand of trees on the upper slope of a fill batter either side of the rail line. The terrain drops away steeply and vegetation on the banks and lower edges is limited to exotic ground cover species. The soil profile is significantly disturbed and no remnant vegetation is present within the subject site.

Vegetation over much of St Leonards is considered highly fragmented from urban development. Mature street trees line the surrounding urban streets and form a network which extends over a large area and link significant bushland areas such as Battern Reserve to adjacent habitats.

Key Terms

Subject site: the area of direct impact, incorporating the plaza and bus/rail construction footprint and as indicated in red boundary (**Figure 2**)

Study area: the area beyond the construction which may be subject to indirect impacts (**Figure 1**).

Locality: 10 kilometre radius around the subject site.

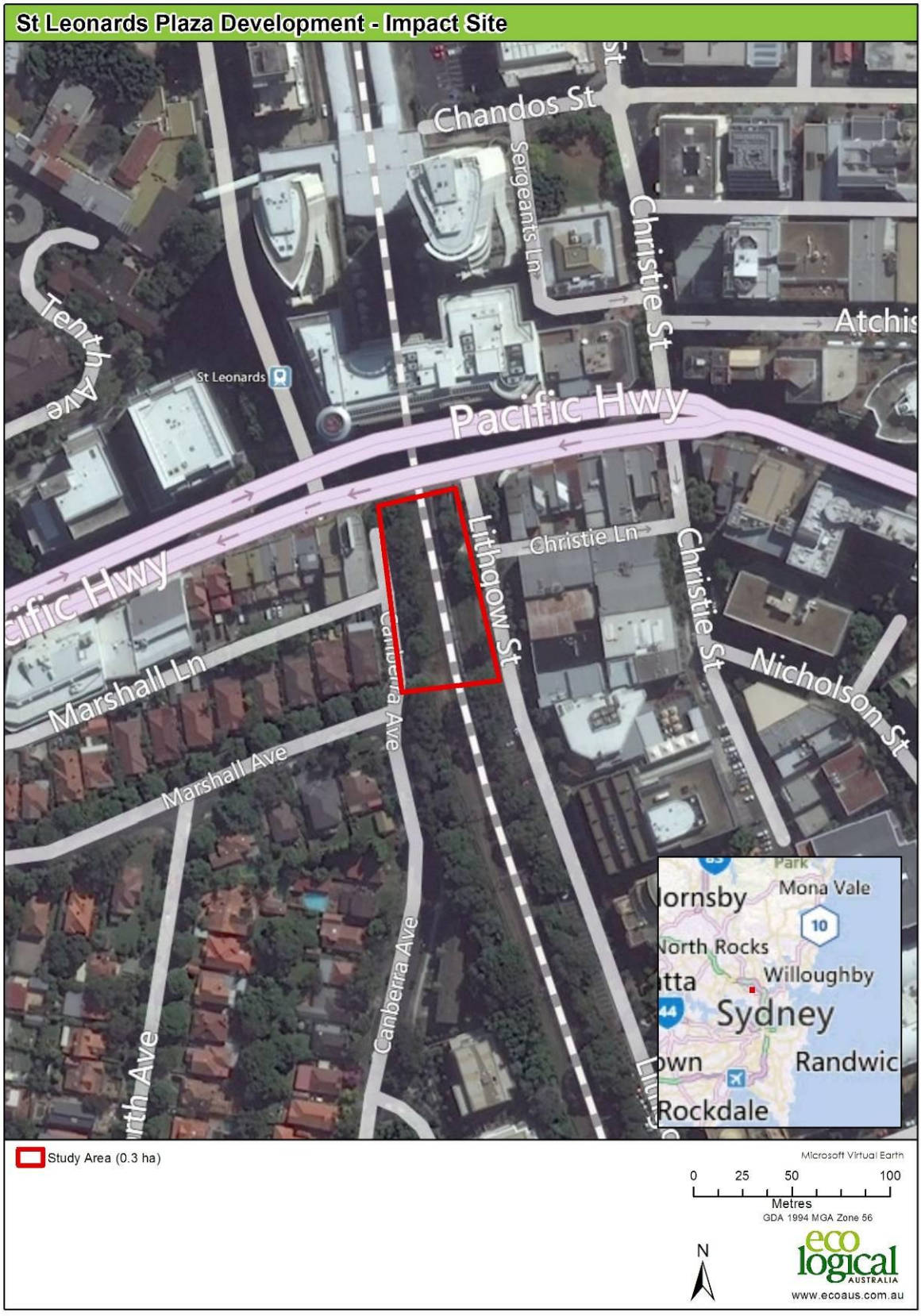

Figure 1 Study area

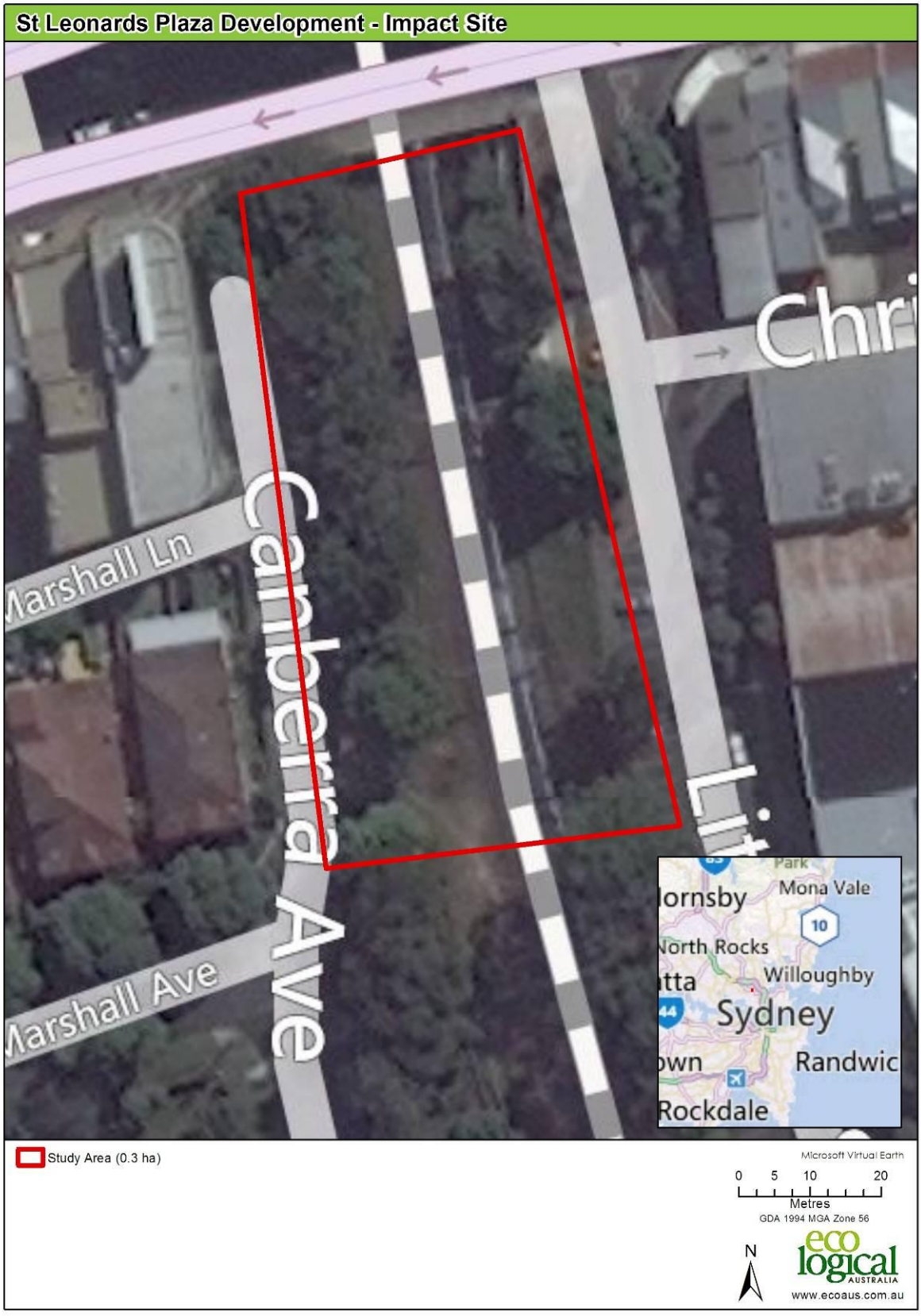

Figure 2 Subject site (red boundary)

2 Legislative Context

2.1 COMMONWEALTH LEGISLATION

2.1.1 Environment Protection Biodiversity Conservation Act 1999

The EPBC Act is Commonwealth legislation that deals with Matters of National Environmental Significance (NES). Where a development or activity has the potential to have a significant impact on a matter of NES, a referral is made to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC). The Department determines whether the activity can proceed with no further assessment by the Commonwealth, or whether it will be a controlled action for which an Environmental Impact Assessment must be supplied. The Act also allows for Strategic Assessments which assess a policy, plan or program rather than individual developments.

Environmental approvals under the EPBC Act may be required for an 'action' that is likely to have a significant impact on Matters of National Environmental Significance (known as 'Matters of NES') being:

- World Heritage Areas;
- National Heritage Places;
- Ramsar wetlands of international importance;
- Nationally listed threatened species and ecological communities;
- Listed migratory species;
- Commonwealth marine areas;
- Nuclear actions; and
- Great Barrier Reef Marine Park.

Of potential relevance to the site are Matters of NES which include nationally listed threatened species and ecological communities and listed migratory species.

Where there is the potential for a proposal to have a significant impact on any Matter of NES a Referral under the EPBC Act is submitted to Department of Sustainability, Environment, Water, Population and Communities (DSEWPAC) for approval.

2.2 STATE LEGISLATION

2.2.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the principal planning legislation for NSW, providing a framework for the overall environmental planning and assessment of development proposals. Various legislative instruments, such as the NSW *Threatened Species Conservation Act 1995* (TSC Act), are integrated with EP&A Act and have been reviewed separately.

In determining a development application, the consent authority is required to take into consideration the matters listed under Section 79C of the EP&A Act that are relevant to the application. Key considerations include:

- Any environmental planning instrument, including drafts;
- The likely impacts of a development;
- The suitability of the study area to be developed;
- Any submissions made in accordance with the EP&A Act or regulations; and
- The public interest.

2.2.2 Threatened Species Conservation Act 1995

The *Threatened Species Conservation Act 1995* (TSC Act) aims to protect and encourage the recovery of threatened species, populations and communities listed under the Act. The TSC Act is integrated with the EP&A Act and requires consideration of whether a development (Part 4 of the EP&A Act) or an activity (Part 5 of the EP&A Act) is likely to significantly affect threatened species, populations and ecological communities or their habitat.

The potential impact of development of the site on any threatened species, populations or communities would need to be assessed at the development application stage using assessments of significance under Section 5A of the EP&A Act (also known as a seven-part test). If the impacts on the area are found to be 'significant', a Species Impact Statement (SIS) and concurrence from the Director General of the Department of Environment, Climate Change and Water (DECCW) is required.

This report assesses potential impact on threatened species, communities and populations and their habitat.

2.2.3 Noxious Weeds Act 1993

The main objectives of this Act are to reduce and monitor the impact of weeds within the NSW state to protect the state from negative impacts on the economy, community and environment from weeds. The Minister for Regional Infrastructure and Services together with the Minister for Primary Industries are responsible for the declaration of noxious weeds, the assignment of an appropriate noxious class and identification of controls and management for all noxious weeds. The Act is also responsible for the prevention of new weeds establishing, restrict the spread of existing significant weeds and reduce the extent of these weeds. Finally, the Act provides for the effective monitoring and reporting of weed management in NSW.

3 Methodology

3.1 LITERATURE REVIEW

A literature review and database search was carried out on available resources, including:

- Office of Environment and Heritage (OEH) Atlas of NSW Wildlife (10 km radius) (Accessed August 2012);
- Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) online search Protected Matters Search Tool (Accessed August 2012);
- Sydney Metropolitan Catchment Management Authority (SMCMA) vegetation mapping; and
- Wildlife Habitat Corridor Study for Lane Cove Council (1995).

An assessment of the likelihood of occurrence of all threatened species, populations and migratory species which have been recorded within the study area or are likely to occur is available in **Appendix A**.

3.2 FLORA AND FAUNA SURVEY

A brief field survey was conducted on 22 August 2012 by Belinda Failes (ELA ecologist) together with Kerry Heatley (Lane Cove Council Assistant Manager Open Space – Bushland) and Brian O'Dowd (Manager – Urban Design). The survey included a traverse around the compounds of the rail corridor and adjoining study area.

Field survey included a floristic census of dominant species within the subject site recorded to the genus and species level where applicable. Opportunistic observations of foraging fauna were also recorded during the field survey.

3.3 FAUNA HABITAT

All potential habitat attributes and the connectivity of the vegetation were recorded during the field survey. Habitat features include specific foraging or nesting resources required by fauna groups, with emphasis on locally occurring threatened species. The habitat assessment provides a detailed description of fauna resources and the subject site's ability to specifically support threatened species and determine species diversity and abundance. This habitat assessment also has an important role in predicting threatened species likelihood to occur in an area. Habitat features that were surveyed included:

- foraging resources (i.e. sap feed trees, flowering trees and shrubs);
- connectivity with other vegetation;
- presence of hollow bearing trees, dead standing timbers (i.e. stags) and/or coarse bark:
- accumulation of leaf litter and large woody debris;
- presence of standing or flowing water bodies;
- rocks and rocky outcrops; and
- disturbance history.

3.4 LIMITATIONS

Site inspection did not include a traverse within the rail corridor for safety reasons. As such the survey effort was conducted from behind chain-mesh fencing. Therefore, a comprehensive flora and fauna assessment was not undertaken. It is possible that threatened flora species or fauna habitat features were not identified during the site inspection. Additionally, according to the *Vertebrate Fauna Survey* conducted for the NSW Comprehensive Regional Assessment (NPWS, 1998) a comprehensive flora and fauna assessment should include a number of different survey methods over varying climatic and seasonal conditions are required to produce an extensive census of fauna species utilising the subject site.

The methodologies employed during the site inspection were conducted according to the scope of the proposal, time restraints and the disturbed nature of the study area. As such, the techniques used in this investigation are considered adequate to gather the necessary data to assess the impacts of the proposal on the fauna species and evaluate the habitats found in the study area. Nevertheless, the species list should be used only as a guide to the fauna present and acknowledgement of the limitations is required.

4 Results

4.1 LITERATURE RESULTS

Database results identified a total of 33 flora species and 62 fauna species including; 3 fish, 4 frogs, 6 reptiles, 33 birds, 16 mammals listed under the TSC and/or EPBC Acts which have been either previously recorded or have potential to occur within a 10 km radius of the subject site (**Appendix A**). The site may provide limited foraging habitat for one threatened species, the *Pteropus poliocephalus* (Grey-headed Flying-fox).

4.2 VEGETATION DESCRIPTION

Only one vegetation community within the study area has been mapped by SMCMA as 'urban exotic/native' (**Figure 3**). This community typically refers to a combination of native planting or widely dispersed native plants and exotic species. Vegetation within the subject site has yet to be classified.

The subject site is dominated by a planted canopy of *Casuarina cunninghamiana* (Forest Oak) *Eucalyptus microcorys* (Tallowwood), *Lophostemon confertus* (Brushbox) and *E. paniculata* (Grey Ironbark). A mid canopy of native species is also present within the north-western corner of the subject site, species include *Melaleuca linariifolia* (Snow in Summer) and *C. cunninghamiana* suckers. The shrub layer is sparse and represented by exotic species; *Phoenix canariensis* (Canary Island Date Palm), *Ochna serrulata* (Mickey Mouse Plant) and *Ligustrum lucidum* (Large Leaved Privet). The ground layer is dominated by *Ehrharta erecta* (Panic Veltdgrass) and interspersed with exotic herbs such as *Parietaria judaica* (Pellitory) and *Plantago lanceolata* (Lamb's Tongues). Only one native species was recorded within the ground layer, *Lomandra longifolia* (Spiny-headed Mat-rush), this species appears to have been planted. The flora species on site have been listed as native and exotic in **Appendix B**

A number of the native species recorded are not considered indigenous to the natural vegetation communities of St Leonards, i.e. dry woodland communities on Hawkesbury sandstone and the more fertile forests on Wianamatta shales. .

Figure 3 Vegetation within the study area

4.3 SIGNIFICANT FLORA AND FAUNA

A total of 36 flora species including 20 exotic species were recorded during the site inspection. Four weeds species are also classed as noxious under the *Noxious Weeds Act 1993* within the Lane Cove Council LGA (DIP 2012) including one species, *Asparagus aethiopicus* (Asparagus Fern) also listed as a Weed of National Significance (WoNS). (**Table 1**).

Table 1: Summary of noxious weeds and Weeds of National Significance of Lane Cove LGA recorded within the subject site

SCIENTIFIC NAME	COMMON NAME	CLASS	WoNS
Asparagus aethiopicus	Asparagus Fern	4	Yes
Ochna serrulata	Mickey Mouse Plant	4	No
Parietaria judaica	Pellitory	4	No
Ligustrum lucidum	Broad Leaved Privet	4	No
Class 4	The growth of the plant must be managed in a manner that reduces its numbers spread and incidence and continuously inhibits its reproduction and the plant must not be sold propagated or knowingly distributed		

Only one fauna guild (birds) was identified during the brief site survey. A total of five common urban bird species were identified within the study area, although only three were observed foraging within the subject site (**Appendix C**). Two of the bird species were exotic and were present in high densities within the established outdoor food-court on the northern side of Pacific Highway.

A nest was also observed (E0332882, N6255957) within a *Casuarina cunninghamiana* (Forest Oak) approximately one metre from the pedestrian bridge on the western side of the subject site. There was no evidence of recent activity at the time of the inspection and the origin of the nest was also unknown.

4.4 HABITAT VALUES

Limited fauna habitat was available within the subject site. Prolonged disturbance during rail corridor expansion and urban development have contributed to the fragmentation and isolation of habitats and spread of exotic species. The following fauna habitat features were identified within the subject site:

- Native canopy trees;
- Winter-flowering trees;
- Prolific flowering and fruiting trees, including exotic species
- Accumulation of leaf litter; and
- Concrete and metal basking objects.

Habitat features may provide suitable foraging and roosting opportunities for urban bird species and reptiles or potential wildlife corridor for dispersing highly mobile species in particular the *Pteropus poliocephalus* (Grey-headed Flying Fox) listed as vulnerable under the TSC and EPBC Acts.

No hollows or other significant habitat features were recorded during the field survey. Overall the subject site provides limited some resources for highly urbanised arboreal and reptile species. Suitable foraging resources were also observed within the adjacent vegetation to be retained under the proposal.

4.5 CORRIDORS AND CONNECTIVITY

The Pacific Highway forms a barrier for most fauna species with the exception of highly mobile species (i.e. bats and birds). The narrow band of trees within the rail corridor extends from Pacific Highway in the north to River Road in the south and continues on the southern side of River Road (**Figure 1**). Several side streets near the rail corridor also form a network of canopy street trees. Overall, the habitat is highly fragmented and disturbed, with little remnant vegetation remaining. However, the 'corridors' are important for facilitating the movement of highly mobile and urbanised arboreal species between foraging resources and may provide stepping stone linkages to more extensive bushland areas such as Battern Reserve.

5 Impact Assessment

5.1 DIRECT IMPACTS

The direct impacts of the proposed plaza and bus/rail interchange will include:

- Removal of 0.03 ha of unclassified vegetation including over 20 native trees;
- Removal of two roads (Canberra Ave and Lithgow Rd);
- Construction of the elevated plaza platform and associated infrastructure;
- Change in the current landscape from vegetated to open space;
- Disturbance to the soil profile and capping of remaining soil under the platform;
- Excavation and earthworks relating to the construction of proposed development; and
- Loss of potential fauna habitat.

5.1.1 Vegetation clearance

Approximately 0.03 ha of unclassified vegetation including over 20 mature native trees and exotic and shrub and mix ground cover will be permanently removed under the proposal. Vegetation within the subject site has potential to provide foraging, roosting and nesting opportunities for some urbanised native fauna species. It is unlikely that the proposal will significantly impact native or threatened fauna species given the small nature and the available resources retained in the adjacent study area.

5.1.2 Habitat loss

The proposed plaza development will result in the loss of foraging substrate for birds, bats and reptiles. Of particular concern is the loss of several wintering flowering species such as *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Banksia integrifolia* (Coastal Banksia). Given the highly urbanised landscape there are often issues with limited food supplies during winter. Therefore, any loss of winter flowering species may impact on local resident species which depend on the availability of these species. Flowering species such as the Broad-leaved Paperbark and Coastal Banksia may provide limited foraging habitat for *Pteropus poliocephalus* (Grey-headed Flying-fox) however this species is highly mobile and able to access foraging habitat across the entire Sydney region. The loss of 20 native and exotic trees is unlikely to significantly impact on threatened and local fauna.

5.1.3 Habitat fragmentation and corridor disturbance

The removal of 0.03 ha mixed native and exotic vegetation may have small scale impacts on the connectivity of between the north and south of Pacific Highway. The loss of vegetation may deter highly mobile species which utilise the vegetation within the subject site as a stepping-stone to the north side of Pacific Highway (i.e. birds). However, considering the adjacent vegetation within the north side of the highway is retained only as urban landscaped gardens, the fauna species which commute across the highway are either likely to find an alternate route or continue to utilise the passage way despite the changes. As such the proposal will not result in significant fragmentation or disturbance to the corridor for fauna species.

5.2 INDIRECT IMPACTS

5.2.1 Exotic flora and fauna species

Under the proposal the vegetation within the subject site will be altered from a native canopy with exotic ground cover to an open landscaped design. There is potential that this may impact on the native and exotic fauna species by;

- Increasing the pressure between fauna species for roosting and nesting resources in adjacent habitats;
- Reducing the foraging available resources for fauna species; and
- Providing favourable environment for exotic fauna species and leading to increase in exotic species (birds and rodents) which may outcompete native species.

Additionally, there is potential that the proposed open landscape with increased hard surfaces may increase nutrient flow into adjacent areas from surface water runoff and cause increase in weed infestation along the retained vegetation within the rail corridor and adjacent vegetation. This in term may further reduce biodiversity value of the vegetation along the rail corridor.

5.2.2 Shading of vegetation

The construction of a raised plaza platform may alter the availability of light for the vegetation retained within the study area. This may be more obvious during winter when the sun is lower in the northern sky. A reduction in sunlight may limit the ability of some plants to grow and reproduce and in severe cases cause dieback.

5.2.3 Changes in lighting and noise

It assumed that the plaza will include addition of new lighting and introduction of noise within the proposed plaza site. This may impact on foraging of nocturnal species or roosting of diurnal species. However, these impacts have not been fully assessed under this flora and fauna assessment.

6 Mitigation Measures

Mitigation measures have been provided to minimise potential impacts on adjoining vegetation communities and fauna species. These include:

- Installation of temporary fencing around vegetation to be retained;
- Preparation of a Sedimentation and Erosion Control Plan;
- Removal of noxious weeds prior to construction;
- Implementation of hygiene controls to prevent spread of weeds and pathogens during construction;
- Inspection of potential nests by an ecologist prior to disturbance of native vegetation;
- Retention of fallen logs and rocks were possible to provide habitat resources for ground-dwelling species;
- Installation of nest-boxes for hollow-dependent species;
- Utilisation of native plants particularly prolific flowering shrubs within the plaza;
- Planting of native canopy, shrub and ground cover species within the rail corridor including winter-flowering canopy trees;
- On-going weed control within the rail corridor
- Monitoring of exotic bird populations and consideration of appropriate controls

7 Conclusion

The Lane Cove Council in collaboration with the adjoining councils have proposed a new plaza and bus/rail interchange to meet the demands of residents for open space and a safe transition between public transport. The proposal will result in a loss of 0.03 ha of native canopy species and mixed ground and shrub layer. The proposal may also impact on the native fauna which utilise the subject site as a foraging, roosting or corridor. However, the proposal is not considered a significant impact as;

- Limited habitat is available within the subject site;
- A small amount of mixed native/exotic vegetation (0.03 ha) is to be removed;
- Vegetation within the subject site does not support significant resources for threatened species; and
- It is unlikely to result in the fragmentation or connectivity with other habitats.

Recommendations have been provided to mitigate potential impacts of the proposal. These are considered the minimal standards to alleviate potential impacts on fauna and flora species within the study area.

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Appendix A: Likelihood of Occurrence Tables

Summary of initial assessment to determine the likelihood of occurrence of threatened species, populations and ecological communities in the impact assessment area.

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. This assessment applies to the impact assessment area only, not to the entire subject site. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- "known" = the species was or has been observed on the site
- "likely" = a medium to high probability that a species uses the site
- "potential" = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- "unlikely" = a very low to low probability that a species uses the site
- "no" = habitat on site and in the vicinity is unsuitable for the species.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
FLORA					
Acacia bynoeana	Bynoe's Wattle	E	V	*Acacia bynoeana* is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains, and has recently been found in the Colymea and Parma Creek areas west of Nowra. It is found in heath and dry sclerophyll forest, typically on a sand or sandy clay substrate, often with ironstone gravels (DEC 2005).	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Acacia terminalis subsp. terminalis	Sunshine Wattle	E	E	*Acacia terminalis* subsp. *terminalis* has a very limited distribution, mainly in near-coastal areas from the northern shores of Sydney Harbour south to Botany Bay, with most records from the Port Jackson area and the eastern suburbs of Sydney. It occurs in coastal scrub and dry sclerophyll woodland on sandy soils (DEC 2005).	**Unlikely – not suitable habitat**
Allocasuarina portuensis	Nielsen Park She-oak	E	E	*Allocasuarina portuensis* was originally recorded at Nielson Park in the Woollahra local government area. None of the original individuals are left within the area it was discovered and the species presently only persists from propagation material. This species once grew in tall closed woodlands on shallow sandy siliceous, coarsely textured soils.	**Unlikely – not suitable habitat**
Amperea xiphoclada var. *pedicellata*			Extinct	*Amperea xiphoclada* var. *pedicellata* was previously widespread in heath, woodland and forest on low-fertility sandy soils and is now extinct (SEWPAC 2012)	**Unlikely – not suitable habitat**
Asterolasia elegans	Asterolasia elegans	E	E	*Asterolasia elegans* is restricted to a few localities on the NSW Central Coast north of Sydney, in the Baulkham Hills, Hawkesbury and Hornsby LGAs. It is found in sheltered forests on mid- to lower slopes and valleys, in or adjacent to gullies (DEC 2005).	**Unlikely – not suitable habitat**
Caladenia tessellata	Thick Lip Spider Orchid	E	V	*Caladenia tessellata* occurs in grassy sclerophyll woodland, often growing in well-structured clay loams or sandy soils south from Swansea, usually in sheltered moist places and in areas of increased sunlight (DEC 2005). It flowers from September to November (DEC 2005).	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Callistemon linearifolius	Netted Bottlebrush	V		*Callistemon linearifolius* has been recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW, growing in dry sclerophyll forest (DEC 2005). For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River (DEC 2005).	**Unlikely – not suitable habitat**
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	*Cryptostylis hunteriana* is known from a range of vegetation communities including swamp-heath and woodland (DEC 2005). The larger populations typically occur in woodland dominated by Scribbly Gum (Eucalyptus sclerophylla), Silvertop Ash (E. sieberi), Red Bloodwood (Corymbia gummifera) and Black Sheoak (Allocasuarina littoralis); where it appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (C. subulata) and the Tartan Tongue Orchid (C. erecta) (DEC 2005). Bell (2001) has identified Coastal Plains Scribbly Gum Woodland and Coastal Plains Smoothed-barked Apple Woodland as potential habitat on the Central Coast. Flowers between November and February, although may not flower regularly (DEC 2005; Bell 2001).	**Unlikely – not suitable habitat**
Darwinia biflora	Darwinia biflora	V	V	*Darwinia biflora* is an erect or spreading shrub to 80cm high associated with habitats where weathered shale capped ridges intergrade with Hawkesbury Sandstone, where soils have a high clay content (NPWS 1997).	**Unlikely – not suitable habitat**
Deyeuxia appressa	Deyeuxia appressa	E	E	Almost nothing is known of the habitat and ecology of this highly restricted NSW endemic known only from two records in the Sydney area; first collected in 1930 at Herne Bay, Saltpan Creek, off the Georges River, south of Bankstown; then collected in 1941 from Killara, near Hornsby (DEC 2005).	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Epacris purpurascens var. *purpurascens*	Epacris purpurascens var. purpurascens	V		*Epacris purpurascens* var. *purpurascens* has been recorded between Gosford in the north to Avon Dam in the south, in a range of habitats, but most have a strong shale soil influence (DEC 2005).	**Unlikely – not suitable habitat**
Eucalyptus camfieldii	Camfield's Stringybark	V	V	*Eucalyptus camfieldii* is associated with shallow sandy soils bordering coastal heath with other stunted or mallee eucalypts, often in areas with restricted drainage and in areas with laterite influenced soils, thought to be associated with proximity to shale (DEC 2005).	**Unlikely – not suitable habitat**
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	*Eucalyptus nicholii* naturally occurs in the New England Tablelands of NSW, where it occurs from Nundle to north of Tenterfield. Grows in dry grassy woodland, on shallow and infertile soils, mainly on granite (DEC 2005). This species is widely planted as an urban street tree and in gardens but is quite rare in the wild (DEC 2005). Plantings undertaken for horticultural and aesthetic purposes are not considered threatened species under the TSC Act.	**Unlikely – not suitable habitat**
Eucalyptus pulverulenta	Silver-leafed Gum	V	V	*Eucalyptus pulverulenta* is found in two disjunct areas, the Lithgow to Bathurst area and on the Monaro (Bredbo and Bombala areas). It grows as an understorey plant in shallow soils in open forest (DEC 2005).	**Unlikely – not suitable habitat**
Genoplesium baueri	Bauer's Midge Orchid	V		Known from coastal areas from northern Sydney south to the Nowra district. Previous records from the Hunter Valley and Nelson Bay are now thought to be erroneous. Grows in shrubby woodland in open forest on shallow sandy soils.	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Grevillea caleyi	Caley's Grevillea	E	E	*Grevillea caleyi* is restricted to an 8 km square area around Terrey Hills, approximately 20 km north of Sydney. It occurs in three major areas of suitable habitat, namely Belrose, Ingleside and Terrey Hills / Duffys Forest within the Ku-ring-gai, Pittwater and Warringah LGAs. It occurs on ridgetops between elevations of 170 to 240 m asl, on laterite soils in open or low open forests, generally dominated by Eucalyptus sieberi, Corymbia gummifera and E. haemastoma (DEC 2005).	**Unlikely – not suitable habitat**
Haloragodendron lucasii	Haloragodendron lucasii	E	E	Known locations of this species are confined to a very narrow distribution on the north shore of Sydney. Haloragodendron lucasii is associated with low woodland on sheltered slopes near creeks on moist loamy sand on bench below small sandstone cliff lines, with continuous seepage (Benson and McDougall 1997).	**Unlikely – not suitable habitat**
Lasiopetalum joyceae	Lasiopetalum joyceae	V	V	*Lasiopetalum joyceae* grows in ridgetop woodland, heath, woodland or open scrub, often with a clay influence (NPWS 1997).	**Unlikely – not suitable habitat**
Leptospermum deanei	Leptospermum deanei	V	V	*Leptospermum deanei* has been recorded in Hornsby, Warringah, Ku-ring-gai and Ryde LGAs, in woodland on lower hill slopes or near creeks, at sites with sandy alluvial soil or sand over sandstone (DEC 2005). It has also been recorded in riparian scrub dominated by Tristaniopsis laurina and Baeckea myrtifolia; woodland dominated by Eucalyptus haemastoma; and open forest dominated by Angophora costata, Leptospermum trinervium and Banksia ericifolia (DEC 2005).	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Melaleuca biconvexa	Biconvex Paperbark	V	V	*Melaleuca biconvexa* occurs in coastal districts and adjacent tablelands from Jervis Bay north to the Port Macquarie district. It grows in damp places often near streams (PlantNet 2011).	**Unlikely – not suitable habitat**
Melaleuca deanei	Deane's Paperbark	V	V	Found in heath on sandstone (DEC 2005), and also associated with woodland on broad ridge tops and slopes on sandy loam and lateritic soils (Benson and McDougall 1998).	**Unlikely – not suitable habitat**
Pelargonium sp. (G.W. Carr 10345)		E	E	In NSW, Pelargonium sp. (G.W. Carr 10345) is known from the Southern Tablelands (PlantNet 2011). Otherwise, only known from the shores of Lake Omeo near Benambra in Victoria where it grows in cracking clay soil that is probably occasionally flooded (Walsh & Entwisle 1999).	**Unlikely – not suitable habitat**
Persoonia hirsuta	Hairy Geebung	E	E	*Persoonia hirsuta* occurs from Singleton in the north, south to Bargo and the Blue Mountains to the west (DEC 2005). It grows in dry sclerophyll eucalypt woodland and forest on sandstone.	**Unlikely – not suitable habitat**
Pimelea curviflora var. *curviflora*	Pimelea curviflora var. curviflora	V	V	*Pimelea curviflora* var. *curviflora* is confined to the coastal area of Sydney between northern Sydney in the south and Maroota in the north-west. It grows on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands (DEC 2005). Associated with the Duffys Forest Community, shale lenses on ridges in Hawkesbury sandstone geology (Pittwater Council 2000).	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Pimelea spicata	Spiked Rice-flower	E	E	In western Sydney, *Pimelea spicata* occurs on an undulating topography of well structured clay soils, derived from Wianamatta shale (DEC 2004). It is associated with Cumberland Plains Woodland (CPW), in open woodland and grassland often in moist depressions or near creek lines (Ibid.). Has been located in disturbed areas that would have previously supported CPW (Ibid.).	**Unlikely – not suitable habitat**
Prostanthera junonis	Somersby Mintbush	E	E	Likely to be restricted to the Somersby Plateau, found on the Somersby and Sydney Town soil landscapes (NPWS 2000a). Occurs predominantly in the low woodland component of the Hawkesbury Sandstone Complex dominated by Eucalyptus haemastoma with Banksia ericifolia or B. serrata in the understorey (ibid.). Has been found in the ecotone between low woodland and open forest or the open scrub\heath components (ibid.). Not found in sedgelands or Allocasuarina distyla open heath (ibid.).	**Unlikely – not suitable habitat**
Prostanthera marifolia	Seaforth Mintbush	CE	X	*Prostanthera marifolia* is currently only known from the northern Sydney suburb of Seaforth and has a very highly restricted distribution. It occurs in localised patches in or in close proximity to the Duffys Forest EEC. It grows on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses (DEC 2005).	**Unlikely – not suitable habitat**
Sarcochilus hartmannii	Hartman's Sarcochilus	V	V	Known from just a few populations north of the Richmond River in far northern NSW. Plants grow as a lithophyte on rock surfaces, usually in exposed sites in woodland or open forest. Previous records from further south now refer to a different species, S. aequalis.	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Streblus pendulinus	Siah's Backbone		E	On the Australian mainland, Siah's Backbone is found in warmer rainforests, chiefly along watercourses. The altitudinal range is from near sea level to 800 m above sea level. The species grows in well developed rainforest, gallery forest and drier, more seasonal rainforest (SEWPAC 2012).	**Unlikely – not suitable habitat**
Syzygium paniculatum	Magenta Lilly Pilly	V	V	This species occupies a narrow coastal area between Bulahdelah and Conjola State Forests in NSW. On the Central Coast, it occurs on Quaternary gravels, sands, silts and clays, in riparian gallery rainforests and remnant littoral rainforest communities (Payne 1997). In the Ourimbah Creek valley, S. paniculatum occurs within gallery rainforest with Alphitonia excelsa, Acmena smithii, Cryptocarya glaucescens, Toona ciliata, Syzygium oleosum with emergent Eucalyptus saligna. At Wyrrabalong NP, S. paniculatum occurs in littoral rainforest as a co-dominant with Ficus fraseri, Syzygium oleosum, Acmena smithii, Cassine australe, and Endiandra sieberi. Payne (1991) reports that the species appears absent from Terrigal formation shales, on which the gully rainforests occur. S. paniculatum is summer flowering (November-February), with the fruits maturing in May (DEC 2005).	**Unlikely – not suitable habitat**
Tetratheca glandulosa	Tetratheca glandulosa	V	V	Associated with ridgetop woodland habits on yellow earths also in sandy or rocky heath and scrub (NPWS 1997). Often associated with sandstone / shale interface where soils have a stronger clay influence (NPWS 1997). Flowers July to November.	**Unlikely – not suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Tetratheca juncea	Black-eyed Susan	V	V	Occurs on predominantly low nutrient soils with a dense grassy understorey of grasses although it has been recorded in heathland and moist forest (DEC 2005). It is associated with dry open forest or woodland habitats dominated by Corymbia gummifera, Eucalyptus capitellata, E. haemastoma and Angophora costata (Payne 1993). Themeda australis is generally the dominant ground cover (Payne 1993). T. juncea also displays a preference for southern aspect slopes, although is slopes with different aspects (DEC 2005). Flowers July to December.	**Unlikely – not suitable habitat**
Thesium australe	Austral Toadflax	V	V	Widespread throughout the eastern third of NSW but most common on the North Western Slopes, Northern Tablelands and North Coast. Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (Themeda australis) (DEC 2005). The preferred soil type is a fertile loam derived from basalt although it occasionally occurs on metasediments and granite.	**Unlikely – not suitable habitat**

Fauna Species

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
VERTEBRATE FISH					
Epinephelus daemelii	Black Rockcod		V	The black cod's entire range includes warm temperate and subtropical waters of the south-western Pacific, including south-eastern Australia and the North Island, Kermadec Islands and Poor Knights Islands of New Zealand.	**No**
Macquarie australasica	Macquarie Perch	E (under FM Act)	E	Habitat for the Macquarie perch is bottom or mid-water in slow-flowing rivers with deep holes, typically in the upper reaches of forested catchments with intact riparian vegetation. Macquarie perch also do well in some upper catchment lakes. In some parts of its range, the species is reduced to taking refuge in small pools which persist in midland–upland areas through the drier summer periods.	**No**
Prototroctes maraena	Australian Grayling	-	V	Historically, this species occurred in coastal streams from the Grose River southwards through NSW, VIC and TAS. On mainland Australia, this species has been recorded from rivers flowing east and south of the main dividing ranges. This species spends only part of its lifecycle in freshwater, mainly inhabiting clear, gravel-bottomed streams with alternating pools and riffles, and granite outcrops but has also been found in muddy-bottomed, heavily silted habitat. Grayling migrate between freshwater streams and the ocean and as such it is generally accepted to be a diadromous (migratory between fresh and salt waters) species.	**No**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
AMPHIBIANS					
Heleioporus australiacus	Giant Burrowing Frog	V	V	Forages in woodlands, wet heath, dry and wet sclerophyll forest (Ehmann 1997). Associated with semi-permanent to ephemeral sand or rock based streams (Ehmann 1997), where the soil is soft and sandy so that burrows can be constructed (Environment Australia 2000).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Litoria aurea	Green and Golden Bell Frog	E1	V	This species has been observed utilising a variety of natural and man-made waterbodies (Pyke & White 1996; Pyke and White 1996) such as coastal swamps, marshes, dune swales, lagoons, lakes, other estuary wetlands, riverine floodplain wetlands and billabongs, stormwater detention basins, farm dams, bunded areas, drains, ditches and any other structure capable of storing water. Fast flowing streams are not utilised for breeding purposes by this species (Mahony 1999). Preferable habitat for this species includes attributes such as shallow, still or slow flowing, permanent and/or widely fluctuating water bodies that are unpolluted and without heavy shading (DEC 2005a). Large permanent swamps and ponds exhibiting well-established fringing vegetation (especially bulrushes–Typha sp. and spikerushes–Eleocharis sp.) adjacent to open grassland areas for foraging are preferable (Ehmann 1997; Robinson 2004). Ponds that are typically inhabited tend to be free from predatory fish such as Mosquito Fish (Gambusia holbrooki) (DEC 2005a). Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (Typha spp.) or spikerushes (Eleocharis spp.).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Mixophyes balbus	Stuttering Frog	E	V	A variety of forest habitats from rainforest through wet and moist sclerophyll forest to riparian habitat in dry sclerophyll forest (DECC 2007) that are generally characterised by deep leaf litter or thick cover from understorey vegetation (Ehmann 1997). Breeding habitats are streams and occasionally springs. Not known from streams disturbed by humans (Ehmann 1997) or still water environments (NSW Scientific Committee 2002).	**Unlikely- no suitable habitat**
Pseudophryne australis	Red-crowned Toadlet	V	—	Red-crowned Toadlets are found in steep escarpment areas and plateaus, as well as low undulating ranges with benched outcroppings on Triassic sandstones of the Sydney Basin (DECC 2007). Within these geological formations, this species mainly occupies the upper parts of ridges, usually being restricted to within about 100 metres of the ridgetop. However they may also occur on plateaus or more level rock platforms along the ridgetop (DECC 2007). Associated with open forest to coastal heath (Ehmann 1997). Utilises small ephemeral drainage lines which feed water from the top of the ridge to the perennial creeks below for breeding, and are not usually found in the vicinity of permanent water (Ehmann 1997). Breeding sites are often characterised by clay-derived soils and generally found below the first sandstone escarpment in the talus slope (NPWS 1997).	**Unlikely- no suitable habitat**
REPTILES					

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Hoplocephalus bungaroides	Broad-headed Snake	E	V	Typical sites consist of exposed sandstone outcrops and benching where the vegetation is predominantly woodland, open woodland and/or heath on Triassic sandstone of the Sydney Basin (DECC 2007). They utilise rock crevices and exfoliating sheets of weathered sandstone during the cooler months and tree hollows during summer (Webb & Shine 1998). Some of the canopy tree species found to regularly co-occur at known sites include Corymbia eximia, C. gummifera, Eucalyptus sieberi, E. punctata and E.piperita (DECC 2007).	**Unlikely- no suitable habitat**
Caretta caretta	Loggerhead Turtle	E	E & M	Loggerhead Turtles are ocean-dwellers, foraging in deeper water for fish, jellyfish and bottom-dwelling animals. The female comes ashore to lay her eggs in a hole dug on the beach in tropical regions during the warmer months. Loggerhead Turtles are found in tropical and temperate waters off the Australian coast. In NSW they are seen as far south as Jervis Bay and have been recorded nesting on the NSW north coast and feeding around Sydney. (DECC 2009)	**No**
Chelonia mydas	Green Turtle	V	V & M	Ocean-dwelling species spending most of its life at sea.	**No**
Dermochelys coriacea	Leatherback Turtle	E	E & M	Occurs in inshore and offshore marine waters.	**No**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Eretmochelys imbricata	Hawksbill Turtle	-	V & M	Hawksbill Turtles are found in tropical, subtropical and temperate waters in all the oceans of the world. Nesting is mainly confined to tropical beaches (Marquez 1990). In Australia, there are two genetically separate subpopulations; one in the northern Great Barrier Reef, Torres Strait and Arnhem Land; and the other on the North West Shelf of Western Australia. Hawksbill Turtles spend their first five to ten years drifting on ocean currents (Carr 1987; Limpus et al. 1994). During this pelagic phase, they are often found in association with rafts of Sargassum (a floating marine plant that is also carried by currents) (Carr 1987). Once Hawksbill Turtles reach a certain length, they settle and forage in tropical tidal and sub-tidal coral and rocky reef habitat. Hawksbill Turtles have been seen in temperate regions as far south as northern NSW (Limpus 1992; Robins 2002; Whiting 2000).	**No**
Natator depressus	Flatback Turtle		V	The flatback turtle is endemic to Australia and all known breeding sites of this species occur only in Australia. Flatback turtles have a preference for shallow, soft-bottomed sea bed habitats away from reefs (SEWPAC 2012).	**No**
AVES					

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Anthochaera phrygia	Regent Honeyeater	CE	E1, Mi	"Regent Honeyeaters mostly occur in dry box-ironbark eucalypt woodland and dry sclerophyll forest associations, wherein they prefer the most fertile sites available, e.g. along creek flats, or in broad river valleys and foothills. In NSW, riparian forests containing Casuarina cunninghamiana (River Oak), and with Amyema cambagei (Needle-leaf Mistletoe), are also important for feeding and breeding. At times of food shortage (e.g. when flowering fails in preferred habitats), Honeyeaters also use other woodland types and wet lowland coastal forest dominated by Eucalyptus robusta (Swamp Mahogany) or E. maculata (Spotted Gum. Regent Honeyeaters sometimes occur in coastal forest, especially in stands dominated by Swamp Mahogany and Spotted Gum, but also in those with Southern Mahogany E. botryoides, and in those on sandstone ranges with banksias Banksia in the understorey . They have been recorded in open forest including forest edges, wooded farmland and urban areas with mature eucalypts (Garnett 1993). The Regent Honeyeater primarily feeds on nectar from box and ironbark eucalypts and occasionally from banksias and mistletoes (NPWS 1995). As such it is reliant on locally abundant nectar sources with different flowering times to provide reliable supply of nectar (Environment Australia 2000).	Unlikely
Botaurus poiciloptilus	Australasian Bittern	V	-	Terrestrial wetlands with tall dense vegetation, occasionally estuarine habitats (Marchant & Higgins 1993). Reedbeds, swamps, streams, estuaries (Simpson & Day 1999).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Burhinus grallarius	Bush Stone-curlew	E1	—	Associated with dry open woodland with grassy areas, dune scrubs, in savanna areas, the fringes of mangroves, golf courses and open forest / farmland (Pittwater Council 2000; Marchant & Higgins 1993). Forages in areas with fallen timber, leaf litter, little undergrowth and where the grass is short and patchy (Environment Australia 2000; Marchant & Higgins 1993). Is thought to require large tracts of habitat to support breeding, in which there is a preference for relatively undisturbed in lightly disturbed.	**Unlikely- no suitable habitat**
Calidris ferruginea	Curlew Sandpiper	—	Mi	Intertidal mudflats of estuaries, lagoons, mangrove channels; around lakes,, dams, floodwaters, flooded saltbush surrounds of inland lakes (Morcombe, 2004).	**Unlikely- no suitable habitat**
Charadrius mongolus	Lesser Sand Plover	V	Ma	Favours coastal areas including beaches, mudflats and mangroves where they forage (DECC 2007). They may be seen roosting during high tide on sandy beaches or rocky shores (DECC 2007).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Diomedea exulans	Wandering Albatross	E	V, Mig, Mar	"The Wandering Albatross is marine, pelagic and aerial. It occurs where water surface temperatures range from -2° to 24°C. In the Australasian region, it occurs inshore, offshore and in pelagic. The Wandering Albatross feeds mainly in pelagic, offshore and inshore waters on squid and fish, but also crustaceans and carrion (Marchant & Higgins 1993). It regularly feeds in sheltered harbours and straits, and sometimes gathers at outfalls of unmodified sewage. Foraging behaviours such as flying long distances to search for food, following boats, feeding aggressively on offal and diving for baits makes the species susceptible to being drowned in longline fishing gear (DEH 2006).	**No**
Dasyornis brachypterus	Eastern Bristlebird	E	E	Habitat is characterised by dense, low vegetation including heath and open woodland with a heathy understorey; in northern NSW occurs in open forest with tussocky grass understorey; all of these vegetation types are fire prone.	**Unlikely- no suitable habitat**
Diomedea exulans antipodensis	Antipodean Albatross	-	V, Mi, Ma	The species ranges across the southern Pacific Ocean, east to the coast of Chile and west to eastern Australia.	**No**
Diomedea exulans gibsoni	Gibson's Albatross		V	Gibson's Albatross is marine, pelagic and aerial (SEWPAC 2012).	**No**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Erythrotriorchis radiatus	Red Goshawk	CE	V	"Associated with forests and woodlands with a mosaic of vegetation types, an abundance of birds and permanent water. In NSW, this species is thought to favour mixed subtropical rainforest, Melaleuca Swamp Forest, and open eucalypt forest along rivers, often in rugged terrain (Marchant & Higgins 1993; DECC 2007). The Red Goshawk nests in large trees, frequently the tallest and most massive in a tall stand, and nest trees are invariably within one km of permanent water.	**Unlikely- no suitable habitat**
Fregetta grallaria	White-bellied Storm Petrel	-	V	On small offshore islets and rocks in the Lord Howe Island group.	**No**
Glossopsitta pusilla	Little Lorikeet	V	—	In New South Wales Little Lorikeets are distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri. Little Lorikeets mostly occur in dry, open eucalypt forests and woodlands. They have been recorded from both old-growth and logged forests in the eastern part of their range, and in remnant woodland patches and roadside vegetation on the western slopes. They feed primarily on nectar and pollen in the tree canopy, particularly on profusely-flowering eucalypts, but also on a variety of other species including melaleucas and mistletoes. On the western slopes and tablelands White Box Eucalyptus albens and Yellow Box E. melliodora are particularly important food sources for pollen and nectar respectively.	**Unlikely- no suitable habitat**
Haematopus longirostris	Pied Oystercatcher	E1	—	Roosts and forages on sandy beaches, sand banks, mudflats and estuaries (Marchant & Higgins 1993, Simpson & Day 1999).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Hieraaetus morphnoides	Little Eagle	V	—	The Little Eagle is widespread in mainland Australia, central and eastern New Guinea. The Little Eagle is seen over woodland and forested The population of Little Eagle in NSW is considered to be a single population (DECCW 2010). This species was recently listed as vulnerable due to a moderate reduction in population size based on geographic distribution and habitat quality (NSWSC 2010).lands and open country, extending into the arid zone. It tends to avoid rainforest and heavy forest.	**Unlikely- no suitable habitat**
Ixobrychus flavicollis	Black Bittern	V	—	Occurs in both terrestrial and estuarine wetlands generally in areas of permanent water and dense vegetation (DECC 2007). In areas with permanent water it may occur in flooded grassland, forest, woodland, rainforest and mangroves (DECC 2007)	**Unlikely- no suitable habitat**
Lathamus discolor	Swift Parrot	E	E1, Ma	Breeds in Tasmania between September and January. Feeds mostly on nectar, mainly from eucalypts, but also eats psyllid insects and lerps, seeds and fruit. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts. Favoured feed trees include winter flowering species such as Swamp Mahogany (Eucalyptus robusta), Spotted Gum (Corymbia maculata), Red Bloodwood (C. gummifera), Mugga Ironbark (E. sideroxylon), White Box (E. albens) and Forest Red Gum (E. tereticornis) (DECC 2007). Box-ironbark habitat in drainage lines, and coastal forest in NSW is thought to provide critical food resources during periods of drought or low food abundance elsewhere.	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Macronectes giganteus	Southern Giant-Petrel	E1	-	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW. Over summer, the species nests in small colonies amongst open vegetation on Antarctic and subantarctic islands, including Macquarie and Heard Islands and in Australian Antarctic territory.	**No**
Macronectes halli	Northern Giant-Petrel	V	V	The Northern Giant Petrel breeds in the sub-Antarctic, and visits areas off the Australian mainland mainly during the winter months (May-October). Immature and some adult birds are commonly seen during this period in offshore and inshore waters from around Fremantle (WA) to around Sydney (NSW) (Pizzey & Knight 1999).	**No**
Neophema chrysogaster	Orange-bellied Parrot	E4A	CE	Breeds only in coastal south-west Tasmania and spends the winter in coastal Victoria and South Australia. It nests in hollows in eucalypt trees which grow adjacent to its feeding plains. In early October the birds arrive in the south west and depart after the breeding season usually in March and April.	**Unlikely- no suitable habitat**
Nettapus coromandelianus	Cotton Pygmy-goose	E1	-	This species is a rare vagrant to southern Australia. Hunter River is this species southern boundary in NSW (OEH 2012). Relies on aquatic environments including freshwater lakes, lagoons, swamps and dams (OEH 2012). Habitats contain aquatic vegetation including waterlilies, hydrilla, ceratophyllum and other deep-water species. It also requires dead hollow-bearing trees for roosting and breeding (OEH 2012).	**Unlikely- no suitable habitat**
Pterodroma neglecta neglecta	Kermadec Petrel	V	V	Marine forager.	**No**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Ptilinopus superbus	Superb Fruit-Dove	V	—	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms (DECC 2007). It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees (ibid.). Part of the population is migratory or nomadic (ibid.). At least some of the population, particularly young birds, moves south through Sydney, especially in autumn (ibid.). Breeding takes place from September to January (ibid.). Will feed in adjacent mangroves or eucalypt forests (Blakers et al. 1984).	**Unlikely- no suitable habitat**
Rostratula australis (a.k.a. R. benghalensis)	Painted Snipe (Australian subspecies)	E	V	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber (DECC 2007). Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (ibid.). Breeding is often in response to local conditions; generally occurs from September to December (DECC 2007). Roosts during the day in dense vegetation (NSW Scientific Committee 2004). Forages nocturnally on mud-flats and in shallow water (DECC 2007). Feeds on worms, molluscs, insects and some plant-matter (ibid.).	**Unlikely- no suitable habitat**
Sterna fuscata	Sooty Tern	V	—	Forages offshore, usually only observed onshore in breeding season or when storms force them to shelter (DECC 2007)	**Unlikely- no suitable habitat**
Sternula nereis nereis	Fairy Tern		V	The Fairy Tern (Australian) nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation. The subspecies has been found in embayments of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline (SEWPAC 2012).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Thalassarche bulleri	Buller's Albatross	-	V, M, Bonn	Marine forager	**No**
Thalassarche cauta cauta	Shy Albatross	V	V, M, Bonn	Marine forager	**No**
Thalassarche cauta salvini	Salvin's Albatross	-	V, M, Bonn	Marine forager	**No**
Thalassarche cauta steadi	White-capped Albatross	-	V, M, Bonn	Marine forager	**No**
Thalassarche melanophris impavida	Campbell Albatross	V	V, M, Bonn	Marine forager	**No**
NOCTURNAL BIRDS					
Ninox connivens	Barking Owl	V	—	Associated with a variety of habitats such as savanna woodland, open eucalypt forests, wetland and riverine forest. The habitat is typically dominated by Eucalypts (often Redgum species), however often dominated by Melaleuca species in the tropics (DECC 2007). It usually roosts in dense foliage in large trees such as River She-oak (Allocasuarina cunninghamiana), other Casuarina and Allocasuarina, eucalypts, Angophora, Acacia and rainforest species from streamside gallery forests (NPWS 2003). It usually nests near watercourses or wetlands (NPWS 2003) in large tree hollows with entrances averaging 2-29 metres above ground, depending on the forest or woodland structure and the canopy height (Debus 1997).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Ninox strenua	Powerful Owl	V		Powerful Owls are associated with a wide range of wet and dry forest types with a high density of prey, such as arboreal mammals, large birds and flying foxes (Environment Australia 2000, Debus & Chafer 1994). Large trees with hollows at least 0.5m deep are required for shelter and breeding (Environment Australia 2000).	**Unlikely- no suitable habitat**
Pandion haliaetus	Osprey	V	—	Associated with waterbodies including coastal waters, inlets, lakes, estuaries, beaches, offshore islands and sometimes along inland rivers (Schodde and Tidemann 1986; Clancy 1991; Olsen 1995). Osprey may nest on the ground, on sea cliffs or in trees (Olsen 1995). Osprey generally prefer emergent trees, often dead or partly dead with a broken off crown (Olsen 1995).	**Unlikely- no suitable habitat**
MAMMALS					
Cercartetus nanus	Eastern Pygmy-possum	V	—	The Eastern Pygmy Possum occurs in wet and dry eucalypt forest, subalpine woodland, coastal banksia woodland and wet heath (Menkhorst & Knight 2004). Pygmy-Possums feed mostly on the pollen and nectar from banksias, eucalypts and understorey plants and will also eat insects, seeds and fruit (Turner & Ward 1995). The presence of Banksia sp. and Leptospermum sp. are an important habitat feature (DECC 2007). Small tree hollows are favoured as day nesting sites, but nests have also been found under bark, in old birds nests and in the branch forks of tea-trees (Turner & Ward 1995).	**Unlikely- no suitable habitat**
Arctocephalus forsteri	New Zealand Fur-seal	V		Marine	**No**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Arctocephalus pusillus doriferus	Australian Fur-seal	V		Marine	**No**
Eubalaena australis	Southern Right Whale	V		Marine	**No**
Megaptera novaeangliae	Humpback Whale	V	-	Marine	**No**
Dasyurus maculatus	Spotted-tailed Quoll	V		The Spotted-tailed Quoll inhabits a range of forest communities including wet and dry sclerophyll forests, coastal heathlands and rainforests (Mansergh 1984; DECC 2007j), more frequently recorded near the ecotones of closed and open forest and in NSW within 200km of the coast. Preferred habitat is mature wet forest, especially in areas with rainfall 600 mm/year (Mansergh 1984). Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This species requires habitat features such as maternal den sites, an abundance of food (birds and small mammals) and large areas of relatively intact vegetation to forage in (DECC 2007). Maternal den sites are logs with cryptic entrances; rock outcrops; windrows; burrows (Environment Australia 2000).	**Unlikely- no suitable habitat**
Petaurus australis	Yellow-bellied Glider	V	—	This species is restricted to tall mature forests, preferring productive tall open sclerophyll forests with a mosaic of tree species including some that flower in winter (Environment Australia 2000, Braithwaite 1984, Davey 1984, Kavanagh 1984; DECC 2007). Large hollows within mature trees are required for shelter, nesting and breeding (Henry and Craig 1984; DECC 2007).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Pseudomys novaehollandiae	New Holland Mouse	-	V	A small burrowing native rodent with a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Inhabits open heathlands, open woodlands with a heathland understorey and vegetated sand dunes. A social animal, living predominantly in burrows shared with other individuals. The home range of the New Holland Mouse ranges from 0.44 ha to 1.4 ha and the species peaks in abundance during early to mid stages of vegetation succession typically induced by fire (DSEWPC 2010)	**Unlikely- no suitable habitat**
Potorous tridactylus	Long-nosed Potoroo	V	-	Associated with dry coastal heath and dry and wet sclerophyll forests (Strahan 1998) with dense cover for shelter and adjacent more open areas for foraging (Menkhorst & Knight 2004).	**Unlikely- no suitable habitat**
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE Mainland Population)	-	V		**Unlikely- no suitable habitat**
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	Rocky areas in a variety of habitats, typically north facing sites with numerous ledges, caves and crevices (Strahan 1995).	**Unlikely- no suitable habitat**
Phascolarctos cinereus	Koala	V-E2	-	Associated with both wet and dry Eucalypt forest and woodland that contains a canopy cover of approximately 10 to 70% (Reed et al. 1990), with acceptable Eucalypt food trees. Some preferred Eucalyptus species are: Eucalyptus tereticornis, E. punctata, E. cypellocarpa, E. viminalis	**Unlikely- no suitable habitat**
Isoodon obesulus	Southern Brown Bandicoot	E	E	This species is associated with heath, coastal scrub, heathy forests (Menkhorst & Knight 2004), shrubland and woodland on well drained soils. This species is thought to display a preference for newly regenerating heathland and other areas prone to fire (Menkhorst & Seebeck 1990).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
BATS					
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	The Large-eared Pied Bat has been recorded in a variety of habitats, including dry sclerophyll forests, woodland, sub-alpine woodland, edges of rainforests and wet sclerophyll forests (Churchill 1998; DECC 2007). This species roosts in caves, rock overhangs and disused mine shafts and as such is usually associated with rock outcrops and cliff faces (Churchill 1998; DECC 2007).	**Unlikely- no suitable habitat**
Pteropus poliocephalus	Grey-headed Flying-Fox	V	V	Inhabits a wide range of habitats including rainforest, mangroves, paperbark forests, wet and dry sclerophyll forests and cultivated areas (Churchill 1998, Eby 1998). Camps are often located in gullies, typically close to water, in vegetation with a dense canopy (Churchill 1998).	**Potential – limited foraging habitat**
Miniopterus australis	Little Bent-wing Bat	V	—	Prefers well-timbered areas including rainforest, wet and dry sclerophyll forests, Melaleuca swamps and coastal forests (Churchill 1998). This species shelter in a range of structures including culverts, drains, mines and caves (Environment Australia 2000). Relatively large areas of dense vegetation of either wet sclerophyll forest, rainforest or dense coastal banksia scrub are usually found adjacent to caves in which this species is found (DECC 2007). Breeding occurs in caves, usually in association with M. schreibersii (Environment Australia 2000, DECC 2007).	**Unlikely- no suitable habitat**

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Associations	Likelihood of Occurrence
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	V	—	Associated with a range of habitats such as rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland (Churchill 1998). It forages above and below the tree canopy on small insects (AMBS 1995, Dwyer 1995, Dwyer 1981). Will utilise caves, old mines, and stormwater channels, under bridges and occasionally buildings for shelter (Environment Australia 2000, Dwyer 1995).	**Unlikely- no suitable habitat**

Appendix B: Site Flora Species List

(recorded on the subject site) N: Australian Native E: Exotic

SCIENTIFIC NAME	COMMON NAME	NATIVE/EXOTIC	STATUS
Ageratina adenophora	Crofton Weed	E	
Asparagus aethiopicus	Asparagus Fern	E	WoNS/NW
Banksia integrifolia	Coastal Banksia	N	
Bidens pilosa	Cobblers Pegs	E	
Callistemon sp.		N	
Casuarina cunninghamiana	Forest Oak	N	
Chloris gayana	Rhodes Grass	E	
Cinnamomum camphora	Camphor laurel	E	
Cirsium vulgare	Spear Thistle	E	
Conyza sp.		E	
Coprosma repens	NZ Mirror Bush	E	
Ehrharta erecta	Panic Veldt Grass	E	
Eucalyptus botryoides	Bangalay	N	
Eucalyptus microcorys	Tallowwood	N	
Eucalyptus paniculata	Grey Ironbark	N	
Eucalyptus sp.		N	
Foeniculum vulgare	Fennel	E	
Glochidion ferdinandi	Cheese Tree	N	
Grevillea robusta	Silky Oak	N	
Harpephyllum caffrum	Kaffir Plum	E	
Hypochaeris radicata	Catsear	E	
Kunzea sp.		N	
Lomandra longifolia	Spiny-headed Mat-rush	N	
Ligustrum lucidum	Large Leaved Privet	E	NW
Lophostemon confertus	Brush Box	N	
Melaleuca linariifolia	Flax-leaved Paperbark	N	
Melaleuca quinquenervia	Broad-leaved Paperbark	N	
Melaleuca styphelioides	Prickly-leaved Tea Tree	N	
Ochna serrulata	Mickey Mouse Plant	E	NW
Parietaria judaica	Pellitory,	E	
Phoenix canariensis	Canary Island Date Palm	E	
Plantago lanceolata	Lamb's Tongues	E	
Solanum nigrum	Black-berry Nightshade	E	
Sonchus oleraceus	Common Sowthistle	E	
Tristaniopsis laurina	Water Gum	N	
Vicia sp.	Vetch	E	

Appendix C: Fauna Species List

SCIENTIFIC NAME	COMMON NAME	WITHIN SUBJECT SITE	ADJACENT TO SUBJECT SITE
*Acridotheres tristis**	Common Myna		O
*Columba livia**	Rock Dove		O
Corvus coronoides	Australian Raven	O	
Manorina melanocephala	Noisy Miner	O	
Trichoglossus haematodus	Rainbow Lorikeet	O	O

O = Observed

* Denotes exotic species

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