Ecological Overview
Proposed Masterplan Concept

Pitt Street Waterfront Precinct
Chatham, NSW

Prepared For

Chase Taree Development Pty Ltd

September 2009

Orogen Pty Ltd
Suite 4 11 Manning Street
Tuncurry NSW 2428
tel 02 6555 3577
fax 02 6555 3599
email mnc@orogen.com.au
abn 44 108 784 658
www.orogen.com.au

Delivering customised solutions, on time.

Ecological Overview

Proposed Masterplan Concept

Pitt Street Waterfront Precinct

Chatham, NSW

Prepared For:

Chase Taree Developments P/L

14 September 2009

409078_REO_001

Environmental Planning, Assessment and Management

Orogen Pty Ltd
Suite 4 11 Manning Street
Tuncurry NSW 2428
tel 02 6555 3577
fax 02 6555 3599
email mnc@orogen.com.au

orogen

Report Title:	***Ecological Overview***
Project:	Pitt Street Waterfront Precinct. Chatham, NSW.
Client:	*Chase Taree Developments P/L*
Report No.:	*409078_REO_001*
Draft/Final:	Final

Orogen Pty Ltd and the authors responsible for the preparation and compilation of this report declare that we do not have, nor expect to have a beneficial interest in the subject site of this project and will not benefit from any of the recommendations outlined in this report.

The preparation of this report has been in accordance with the project brief provided by Chase Taree Developments P/L and has relied upon the information, data and results provided or collected from the sources and under the conditions outlined in the report.

All maps and plans contained within this report are prepared for the exclusive use of Chase Taree Developments P/L to accompany this report for the land described herein and are not to be used for any other purpose or by any other person or entity. No reliance should be placed on the information contained in this report for any purposes apart from those stated therein.

Orogen Pty Ltd accepts no responsibility for any loss, damage suffered or inconveniences arising from, any person or entity using the plans or information in this study for purposes other than those stated above.

Reviewed By:	*Tony Fish*
Position:	*Project Director*
Signed:	*A signed copy can be provided upon request*
Date:	14 September 2009

Prepared By:	*Eden Wyatt*
Position:	*Project Manager*
Signed:	*A signed copy can be provided upon request*
Date:	14 September 2009

Document Distribution 409078_REO_001				
Version No.	**Copies**	**Format**	**Issued To**	**Date**
1	1	PDF	Clare Swan/Anthony Elias	14 September 2009

Study Team

Member Name		
Tony Fish	*Project Director*	*Orogen Pty Ltd*
Eden Wyatt	*Project Manager/Field Ecologist*	*Orogen Pty Ltd*
Theresa Telfer	*Administration Management*	*Orogen Pty Ltd*
Chloe Telfer	*Figure Preparation*	*Orogen Pty Ltd*
William Steggall	*Field Ecologist*	*Orogen Pty Ltd*

Table of Contents

Introduction

1.1 Background

Orogen Pty Ltd has been commissioned by Chase Taree Developments P/L to prepare an Ecological Overview report to support a masterplan for the proposed Pitt Street Waterfront Precinct at Chatham (see Appendix A). Chatham is situated in the Greater Taree City Local Government Area (LGA), on the NSW Mid North Coast.

The masterplan concept for the precinct includes residential, commercial, tourist, public open spaces and a marina (Appendix A). The proposal falls under Part 3A of the *Environmental Planning & Assessment (EP&A) Act 1979*.

Baseline ecological studies have been undertaken previously within the subject site by Ecotone Ecological Consultants as part of the rezoning stage for the Precinct (Ecotone, 2007, Ecotone 2008). Orogen has reviewed the Ecotone report in the context of the masterplan. Orogen have also undertaken a brief site reconnaissance to gain an appreciation of the habitats within the subject site and to ground truth the results of the Ecotone report.

This overview report outlines the ecological features of the subject site and provides a general assessment of the likely ecological impacts of the masterplan, with particular regard to threatened species, endangered populations, and endangered ecological communities and their habitats. Detailed surveys and impact assessment would be undertaken at the DA stage for the masterplan, and this requirement would form a component of the Statement of Commitments (SOC) prepared for the development under the Part 3A process.

Methods

2.1 Desktop

2.1.1 Literature Review and Database Searches

A desktop review was undertaken to determine fauna and flora species and vegetation communities of conservation significance previously recorded in the locality (approximately 10 km radius) of the subject site. The desktop study involved the following a review of:

- Ecological Constraints Assessment. The Pitt Street Waterfront Precinct at Chatham (Taree) (Ecotone, 2007);
- Mangrove and Bank Stability Assessment. Pitt Street Precinct, Taree (Ecotone, 2008);
- Fig trees on the Manning Rezoning and Masterplanning. Rezoning Report (SKM 2009);
- Taree and Environs Koala Habitat Study (Evans T., & Fitzpatrick, T., 1996);
- *Greater Taree City Council Draft Comprehensive Koala Plan of Management Part 1: The CKPoM* (Callaghan, J., Curran, T., Thompson, J., and Floyd, R., 2002);
- Key habitats and corridors in North East NSW, NSW NPWS, (2009);
- The records of threatened species and endangered populations held on the Department of Environment, Climate Change and Water (DECCW), Atlas of NSW Wildlife database (2009);
- NSW Fisheries records and published information; and
- Department of Environment Water Heritage and the Arts (DEWHA) Protected Matters Search Tool for Matters of National Environmental Significance listed under the *Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act)*.

2.2 Field Surveys

The following methods were employed during a flora and fauna field reconnaissance undertaken in the subject site by Orogen staff on 2 September 2009.

2.2.1 Vegetation Community Surveys

A rapid botanical assessment was undertaken within the subject site using the Random Meander technique (Cropper, 1993) to ground truth vegetation communities identified by Ecotone, inventory the dominant floristics and to search for Threatened flora species and Endangered Ecological Communities (EEC) (listed by the *TSC Act* or *EPBC* Act) known or potentially occurring in the locality.

2.2.2 Habitat Assessment

A habitat assessment was conducted for all habitat types occurring within the subject site. The habitats were assessed for habitat features for Threatened species such as hollow-bearing trees, nest sites, rocky outcrops, water courses, wetland habitats, leaf litter and caves/drains or other structures suitable for roosting or denning purposes. The habitat assessment was then used to determine the Subject Species, or populations for the Section 5A Assessment.

2.2.3 Fauna Transect Searches

A fauna transect search was undertaken throughout all habitats during the field investigations. During the traverse, specific attention was given to searching for raptor nests, feeding signs of Glossy Black Cockatoo, Koala scats and scratches, Owl pellets and whitewash, worn glider runs in trees and den/nest/roost sites for Threatened owls and arboreal mammals.

2.2.4 Koala Assessment

SEPP 44 – Koala Habitat Protection

The objective of State Environmental Planning Policy No. 44 - Koala Habitat Protection (SEPP 44) is to encourage the conservation and management of habitat areas for Koalas to ensure their current distribution is maintained. An assessment of the site was therefore was undertaken in accordance with SEPP 44.

A SEPP 44 assessment involves:

- Determination of whether the subject site occurs within the Local Government Areas (LGA's) listed on Schedule 1 of SEPP 44;
- Determination of *potential Koala habitat* within the site;
- Determination of *core Koala Habitat*; and
- Consideration of the need for a Koala Plan of Management.

SEPP 44 definitions

Potential Koala Habitat

Potential Koala habitat is defined under SEPP 44 as "areas of native vegetation where the trees of the types listed in Schedule 2 constitute at least 15 % of the total number of trees in the upper or lower strata of the tree component".

Core Koala Habitat

Core Koala Habitat is defined by SEPP 44 as "an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is, females with young) and recent sightings of and historic records of a population".

2.3 Survey Limitations

Detailed surveys would be undertaken at the DA stage for the masterplan, and the survey requirement would form a component of the SOC prepared for the development under the Part 3A process. Consequently, a detailed assessment of the vegetation communities and habitats within the subject site was not undertaken by Orogen for this stage of the approval process.

Information obtained from the Ecotone reports and the site reconnaissance by Orogen was considered sufficient to evaluate and determine the likely ecological impacts, and significance of these, as a result of the masterplan. In addition, the results of the Ecotone reports and field reconnaissance by Orogen, and also a precautionary approach was applied in determining the species potentially utilising the habitats within the subject site.

2.3.1 Weather

Prevailing weather conditions during the field reconnaissance were noted.

Results

3.1 Desktop

3.1.1 Ecotone Reports

Ecotone identified that the subject site is in a highly disturbed state from previous and existing land use. In general, the subject site was reported to contain limited habitat for terrestrial flora and fauna and this habitat is relatively isolated. The vegetation within the subject site was, however, considered to provide some potential resources for a number of threatened fauna species, particularly mobile species such as birds and bats.

No threatened fauna species were detected within the subject site by Ecotone, however, one specimen of the Threatened flora species, *Eucalyptus nicholii,* was found within the subject site. This one tree was considered as mostly likely to be a planted specimen as this species does not naturally occur in the area.

Ecotone identified that the subject site contains four endangered ecological communities (EEC) listed by the *Threatened Species Conservation Act 1995 (TSC Act)*. These were: 1) *Littoral Rainforest*, 2) *Subtropical Coastal Floodplain Forest;* 3) *Swamp Oak Floodplain Forest;* and 4) *Swamp Sclerophyll Forest on Coastal Floodplains.*

These communities were reported to be highly degraded and represent very poor examples of such community types. The EEC's are generally associated around the riparian areas of a creek that drains through the subject site.

Ecotone identified the occurrence of Mangroves which are protected by the *Fisheries Management Act 1994 (FM Act),* however no critical habitats or endangered population listed by the FM Act were considered to occur within the subject site or adjoining waters. The mangroves and marine habitat were considered to provide important areas for aquatic organisms.

3.1.2 Database Searches

Review of the Atlas of NSW Wildlife database identified a total of three (3) Threatened plant species and 24 Threatened fauna species listed by the *TSC Act* as occurring within the locality (DECCW, 2009). A total of six of these species, comprising two (2) flora species and four (4) fauna species, are also listed as threatened by the *EPBC Act.*

The atlas search identified that one (1) Endangered Population listed by the *TSC Act* has been recorded in the locality. This is: *Eucalyptus seeana* in the Greater Taree LGA.

All the Threatened species and populations recorded within the locality are listed in **Tables B.1 - B.2** in **Appendix B**, which also provides an assessment of likely occurrence within the subject site (based on the habitats present), and subsequently identifies the Subject Species.

No records of threatened species, critical habitats or endangered populations listed by the FM Act were identified within the locality by the desktop searches.

3.2 Vegetation Communities

The vegetation communities observed within the subject site during the site reconnaissance by Orogen were found to be in a highly degraded state as a result of historic and existing land use including clearing, weed invasion and cattle grazing. A plan showing the location of these vegetation communities is included in **Appendix A**. The majority of the subject site comprises grazed pasture grassland, while the remaining forested communities are predominantly associated with a permanent drainage line that runs along the north of the subject site. This drainage line flows into a tidal creek that connects to the Manning River. Three (3) of the communities found within the subject site were considered to be analogous to *TSC Act* listed EEC's, however, given their highly modified state, they did not reflect true representations of these EEC's. A brief description of the vegetation communities found on the subject site is provided below.

Vegetation Community 1 - *Spotted Gum Open Woodland*

This community accounts for two (2) small patches of remnant natural vegetation above the river bank at the south eastern and south western ends of the subject site. The canopy species vary between the two patches, however, the dominant species is Spotted Gum (*Corymbia maculata*) with Ironbark (*Eucalyptus siderophloia*), Bloodwood (*Corymbia intermedia*) and White Mahogany (*Eucalyptus acmeniodes*) as canopy associates. The mid and lower stratums comprise both native and exotic shrubs, climbers and grasses. The mid and lower stratum of the far eastern community was dominated by Lantana (*Lantana camara*).

Vegetation Community 2 - *Mangrove Riparian Forest*

This community occurs as a narrow band along the bank of the Manning River and tidal areas of the drainage line. The community grades into **Community 5** further up the drainage line. The dominant species in this community is Grey Mangrove (*Avicennia marina*). Species found fringing this community include scattered specimens of Swamp Oak, Small-leaved Tuckeroo (*Cupaniopsis parvifolia*), Two-leaved Tuckeroo (*Rhysotoechia bifoliolata* subsp. *bifoliolata*), Shatterwood (*Backhousia sciadophora*), and Wild Quince (*Alectryon subscinereus*). The partially intact shrub and ground layers are dominated by Cockspur thorn (*Maclura cochinchinensis*), Common Reed (*Phragmites australis*), Lesser Joyweed (*Alternanthera denticulata*) and Wandering Jew (*Commelina cyanea*). Trampling by cattle has significantly altered this community and as such there is ground compaction, erosion and little seedling recruitment.

Vegetation Community 3 – *Swamp Oak Forest*

One section of the Mangrove Riparian Forest is adjoined by a small stand of Swamp Oak. As opposed to scattered individual trees fringing the mangroves at other locations, this small stand forms a community that is analogous to the TSC listed Swamp Oak Floodplain Forest EEC.

Vegetation Community 4 - *Freshwater Reedland*

This community occurs as a single patch in the central section of the drainage line and is dominated by two (2) native Reed species, these being *Typha orientalis* and *Phragmites australis*. These species form a mosaic with smaller patches of Saw Sedge (*Ghania clarkei*), Tall Sedge (*Carex appressa*) and Spiny Mat Rush (*Lomandra longifolia*). The community is fringed by scattered small trees and shrubs, namely Coral tree (*Erythrina sykesii*), Flax-leaved Paperbark (*Melaleuca linarifolia*), and Camphor Laurel (*Cinnamomum camphora*).

This community is considered to comprise at least one type of EEC listed by the TSC Act. There is an ambiguity in determining if this community comprises *Freshwater Wetland on Coastal Floodplain* or if it is a tree-lees form of *Swamp Sclerophyll Forest on Coastal Floodplain.*

For the purposes for this report, this community is considered to be more closely aligned to the *Freshwater Wetland on Coastal Floodplain EEC as* it is dominated by reeds and sedges, and lacks a tree canopy.

Vegetation Community 5 - *Lowland Rainforest*

This community represents a highly degraded and simplified form of Lowland Rainforest. The canopy comprises mixed rainforest trees and shrubs including Sweet Pittosporum (*Pittosporum undulatum*), Red Ash (*Alphitonia excelsa*), Hard Quandong (*Eleocarpus obovatus*) Brown Myrtle (*Choricarpia leptopetala*), Brush Kurrajong (*Commersonia fraseri*), Rough-leaved Elm (*Aphananthe philippinensis*) and Whalebone Tree (*Streblus brunonianus*). Weed species present include Large-leaf Privet (*Ligustrum lucidum*), Camphor Laurel and Lantana. This community is considered to be analogous with the *TSC Act* listed *Lowland Rainforest on Floodplain EEC*, however, due to its degraded state and low species diversity, it is not considered to have any regional significance.

Vegetation Community 6 - *Weed Infestations*

This vegetation type is scattered throughout the subject site with the largest patch occurring near the northern boundary, along the western section of the drainage line. It is dominated by a mixture of exotic weeds including Large-leaf Privet, Small-leaf Privet (*Ligustrum sinense*), Camphor Laurel, Lantana, Wild Tobacco (*Solanum mauritianum*), Willow (Salix sp.), Crofton Weed (*Ageratina adenophora*) and Papyrus (*Cyperus papyrus*) and has a structure of either dense thickets, closed forest or sedgeland with scattered trees.

Vegetation Community 7 - *Pasture Grassland*

This community accounts for the largest overall area within the subject site. It consists of open grazing land or areas of managed land around existing commercial and industrial areas. The community generally occurs on the low-lying flood-prone parts of the site, and includes many marshy areas, some of which are low-lying natural depressions or ephemeral drainage lines. Trees are almost entirely absent from the community with the exception of occasional paddock trees. It is made up almost entirely of exotic pasture grasses and pasture weeds. Species recorded in this community include Kikuyu (*Pennisetum clandestinum*), Rhodes Grass (*Chloris gayana*), Couch (*Cynodon dactylon*), Fireweed (*Senecio madagascariensis*) and Purple Top (*Verbena bonariensis*).

3.2.1 Threatened Flora Species and EEC's

The subject site was not found to support any threatened species or EEC's listed by the *EPBC Act.*

One Threatened flora species listed by the TSC Act was detected within the subject site, namely *Eucalyptus nicholii.* Only one tree of this species was found growing behind the Cemex concrete depot in close proximity to the Manning River. This species is not native to the area and has most likely been planted as it is often used in landscaping. This one tree does not form a viable population/community and is not considered to have conservation significance on the local or regional scale.

The subject site is considered to contain potential habitat for two red gums of conservation significance, namely *Eucalyptus seeana* which comprise an Endangered Population in Taree and *Eucalyptus glaucina,* which is listed as *Vulnerable* by the *TSC Act* and *EPBC Act*. Orogen found only two (2) red gums within the subject site during the reconnaissance, and have identified these trees as *Eucalyptus tereticornis*.

Field surveys undertaken by Orogen identified some discrepancies in the EEC mapping and classification provided in assessment prepared by Ecotone. It is noted, however, that classifying highly modified communities can sometimes be difficult given that key defining features are often missing.

Orogen considers that three (3) TSC Act listed EEC's occur in the subject site, namely Freshwater Wetland on Coastal Floodplain, Swamp Oak Floodplain Forest, and Lowland Rainforest on Floodplain (**Appendix A**).

Ecotone has mapped areas as *Littoral Rainforest*; however this rainforest type only grows in close proximity to the coast. Orogen considers that the area around the drainage line mapped as Littoral Rainforest by Ecotone should therefore be mapped as the *Lowland Rainforest on Floodplain EEC*. Orogen also considers that areas mapped by Ecotone as Littoral rainforest along the bank of the Manning comprise scattered trees and these do not constitute a rainforest community.

Orogen considers that the *Subtropical Coastal Floodplain Forest EEC* mapped along part of the drainage by Ecotone is more closely aligned to *Lowland Rainforest on Floodplain EEC*. The vegetation in this area was found to lack a canopy of mixed Eucalypts which is a key feature of Subtropical Coastal Floodplain Forest.

In addition, as discussed, areas mapped by Ecotone as *Swamp Sclerophyll Forest EEC* are considered to be more closely aligned with the *Freshwater Wetland on Coastal Floodplain EEC.*

3.3 Fauna Habitat Assessment

The native vegetation occurring within the subject site was found be in a highly degraded state and isolated from other bushland remnants in the locality. This vegetation, however, represents a potential habitat resource for both Protected and Threatened fauna species. The habitat features identified within and adjoining the subject site are discussed below.

The trees within the subject site would offer foraging resources for a variety of nectivorous and insectivorous species such as birds, microchiropteran bats, rodents and scansorial mammals. The vegetation within the subject site also contributes to potential hunting habitat for the Threatened owls and raptors such as the Square-tailed Kite (*Lophoictinia isura*). The subject site was, however, found to not support any suitable feed trees (*Allocasuarina* spp.) and therefore lacks potential foraging resources for the Glossy Black-Cockatoo.

The subject site contains very limited fallen timber and suitable native ground cover vegetation. The subject site therefore lacks substantial shelter and foraging resources for smaller terrestrial fauna such as rodents and reptiles.

Ecotone formally recorded a total of nine (9) hollow-bearing trees. The hollows observed by Orogen were found to offer a variety of cavity size classes, however, the majority were mostly less than 5 cm diameter. The subject site therefore contains potential roosting, nesting or denning habitat for a variety of fauna groups including small birds, microchiropteran bats, arboreal mammals, scansorial mammals, and larger size birds such as Owls.

The subject site contains some artificial structures such as derelict warehouses and a larger sized culvert which may provide roosting opportunities for micro-bats that utilise such structures (eg *Myotis macropus*).

The subject site contains some tree species which represent suitable feed trees for the Koalas. The habitat value of the site's vegetation for the Koala is discussed further in Section 3.3.2.

Waterways

The subject site is adjoined by the Manning River to the south and was found to support a permanent drainage line which flows into a tidal creek.

The habitats provided by the River and drainage line represent suitable aquatic habitat for a variety of waterbirds, and the freshwater areas provide potential habitat for some amphibian species. The estuarine and freshwater habitats within the subject site, however, represent a very small area of habitat for Threatened wetland or wader species such as the Black-necked Stork (*Ephippiorhynchus asiaticus*). In addition, the freshwater habitats within the subject site are highly degraded and considered unlikely to provide potential breeding habitat for most threatened amphibians. One species, the Green and Golden Bell Frog (Litoria aurea) has been recorded in the locality, and marginal habitat for the species occurs in some parts of the drainage line. This habitat is, however, isolated from areas in the locality where this species has been recorded previously.

Mangrove vegetation lines the tidal creek and mangroves also occur along some areas of the subject site that front the Manning River. In addition, a narrow linear area of sea grass (Zostera spp) was observed at some locations along the river frontage of the subject site.

The mangroves and seagrass, and also the water body of the river represents potential habitat for a variety of marine species, including fish and macro-invertebrates. The mangroves and seagrass, however, represent a very small area of potential habitat in the context of the Manning River system. No Threatened species listed by the *FM Act* have been recorded in the locality, and it is highly unlikely that any would occur within these areas of the subject site.

3.3.1 Fauna Traverse Searches

No evidence of habitat utilisation by Threatened species was observed within the subject site by Orogen. Some scratches were noted on the trunks of some trees within the subject site and these scratches may have been attributed to possums and goannas.

3.3.2 Koala Assessment

The study area is located within the Greater Taree City LGA, which is listed on Schedule 1 of SEPP 44.

The field reconnaissance identified that the subject site and environs site supports several tree species that are known to be locally utilised by the Koala including: *E. tereticornis, E. acmenoides*, *E. siderophloia*, *C. intermedia* and *C. maculata.*

Only one (1) of these tree species, *Eucalyptus tereticornis,* is listed as a Koala feed tree on Schedule 2 of SEPP 44. Only two *Eucalyptus tereticornis* were found within the entire subject site and therefore the subject site contains does not contain '*potential Koala habitat*' pursuant to SEPP 44.

Field investigations and desktop assessment undertaken by Ecotone, and also by Orogen, indicate that the subject site is unlikely to be utilised regularly, if at all by the Koala. The subject site contains a relatively small number of suitable feed trees, and these are most likely isolated from any other areas of Koala habitat in the locality. It is therefore concluded that the subject site is highly unlikely to contain *core Koala habitat* pursuant to SEPP 44

Koala scat searches

There were no Koala scats identified beneath any of the trees searched during the specific searches.

3.3.3 Weather Conditions

Prevailing weather conditions during the field reconnaissance were noted as warm, sunny and dry. The weather conditions did not impede the field investigations.

3.3.4 Corridors

Review of the NPWS Key habitats and corridors in North East NSW, (NPWS, 2009) indicates that the subject site is not located within or does not adjoin any corridors modelled by NPWS. Review of aerial photography and ground-truthing confirmed that the vegetation within the subject site is unlikely to form part of a significant fauna movement corridor.

The 'riparian corridor' along the foreshore of the river provides limited habitat in terms of connectivity. Currently, this area would most likely be suited for flying species such as birds and bats or possibly more robust arboreal mammals such as Brushtail Possums (*Trichosurus vulpecula).*

The Masterplan shows that some of the riparian corridor would be removed (*eg.* the waterfront developments), and this corridor may be broken as a result. Notwithstanding, this clearing would not create a barrier to the species considered likely to utilise these habitats at present (*ie.* flying species).

Section 5A Assessment Process

4.1 Background

This section of the report provides a background to the Section 5A Assessment including a definition of terms used in the assessment process and the determination of Subject Species. The potential for significant impact as a result of the proposed clearing upon the Subject Species is provided in **Appendix C.**

The *Threatened Species Conservation Amendment Act* (*2002*) amended the *EP & A Act*, by the identification of 7 factors that must be considered when assessing the impacts of a particular proposal. The objective of the Section 5A Assessment is to determine if a proposal is likely to have a *significant effect* on Threatened species, populations or ecological communities, or their habitats.

4.2 Definitions

4.2.1 Local Population

The *TSC Act* defines a "local population" as "a population that occurs within the subject site , unless the existence of contiguous or proximal occupied habitat and the movement of individuals or exchange of genetic material across the boundary of the subject site can be demonstrated" (NPWS, 1996).

The local population of a species in the area of the proposal would be limited to the habitats in the local area, rather than the population residing within the subject site. Although some individuals may reside within the subject site, populations are generally linked to more extensive tracts of vegetation. For the purposes of this assessment the local population is considered as the population which resides within the subject site and habitats in the local area.

4.2.2 Viability of the Local Population

The Section 5A Assessment requires that a determination be made as to whether the viability of a local population will be compromised by the proposal in question. A viable local population is defined by the NPWS (1996) as "*a population that has the capacity to live, develop and reproduce under normal conditions*". In respect of the proposed clearing, to determine that the local population would be detrimentally affected, it would be necessary to prove that partial removal of the habitat within the subject site would affect the movement of Subject Species to the extent that local populations may become extinct.

4.2.3 Regional Population

The term region is defined by the *TSC Act* as "a bioregion defined in a national system of bioregionalisation that is determined by the Director-General to be appropriate for those purposes". The subject site is situated within the New South Wales North Coast biogeographic region, which extends from the QLD/NSW Border south to about Port Stephens, and west to the Great Dividing Range (Thackway & Cresswell, 1995).

4.3 Subject Species

All the Threatened species recorded within the locality are listed in **Tables B.1 - B.2** in **Appendix B**, which also provides an assessment of likely occurrence within the subject site, and based on this, the determination of Subject Species. In addition, although not recorded in the locality, a number of other Threatened species were considered as Subject Species given the habitats available at the subject site, their known distribution and the habitat requirements of these species (refer **Tables B.1 - B.2** in **Appendix B**).

A total of 20 fauna species were considered as Subject Species for the subject site and the assessment for significant impact (Section 5A) is provided in **Appendix C**. The extent of clearing assessed in the Section 5A is discussed in **Section 6.1.**

4.3.1 Endangered Ecological Communities

As discussed within a previous section of the report, three (3) Endangered Ecological Communities listed under the *TSC Act* were recorded within the subject site during the reconnaissance, namely: *Lowland Rainforest on floodplain in the NSW North Coast bioregion, Swamp Oak Floodplain Forest of the NSW North Coast, Sydney Basin and South East Corner bioregions and Freshwater Wetlands on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions.*

4.4 Section 5A Conclusion

It is concluded from the Section 5A Assessment provided in **Appendix C** that the proposal is unlikely to have a significant effect on *'Threatened species, populations or ecological communities or their habitats within the locality'*.

Commonwealth Environmental Protection and Biodiversity Conservation Act 1999

5.1 Commonwealth EPBC ACT Assessment Process

The *Commonwealth Environmental Protection and Biodiversity Conservation Act 1999* (*EPBC Act*) requires that assessment be made to determine if an activity is likely to impact upon seven (7) identified matters of National Environmental Significance (NES). Activities considered likely to cause a significant impact to matters of NES require Commonwealth approval under the provisions of the *EPBC Act.*

5.1.1 Assessment

The relevance of each matter of NES when considering the proposed development is discussed in **Table 5.1.** This assessment was undertaken with reference to an Environment Protection and Biodiversity Conservation Act Online Database search (7 September 2009), with a buffer area of 10 km.

Table 5.1 - Consideration of EPBC Act Matters of NES

Consideration	Assessment
World Heritage Areas	The proposal will not impact upon any World Heritage Area.
National Heritage Places	There are no National Heritage places that will be affected by the proposal.
Ramsar Wetlands of International Significance	The proposal will not impact upon any Ramsar Wetland.
Listed Threatened Species and Ecological Communities	The subject site was not found to contain any EPBC listed ecological communities or threatened flora species. The habitat resources requiring removal are highly unlikely to represent a significant area of habitat for EPBC listed fauna species in a local or regional context. The proposal will not cause isolation of habitats in the locality. The proposal is therefore considered unlikely to cause a significant impact to any Threatened species listed under the *EPBC Act.*
Listed Migratory Species	The subject site does not contain an important area of habitat for migratory species and is therefore unlikely to cause a significant impact to any listed migratory species, including those on JAMBA/CAMBA.
Commonwealth Marine areas	The proposal will not cause direct impacts to any commonwealth marine areas and is highly unlikely to cause significant indirect impacts to any commonwealth marine areas.
Nuclear actions	The proposal does not constitute a nuclear action.

5.1.2 Other Matters Protected by the EPBC Act

In addition to the Matters of National Environmental Significance, consideration must be given to other matters protected by the *EPBC Act* when assessing proposals. These matters are summarised in **Table 5.2** and this assessment was undertaken with reference to an Environment Protection and Biodiversity Conservation Act Online Database search, with a buffer area of 10 km.

Table 5.2 - Consideration of Other Matters under the EPBC Act

Consideration	Assessment
Commonwealth Lands	The proposal will not impact upon any Commonwealth Lands.
Commonwealth Heritage Places	The proposal will not impact upon any Commonwealth Heritage Places.
Places listed on the Register of the National Estate (RNE)	The proposal will not affect any places listed on the RNE.
Listed Marine Species	The adjoining section of the Manning River comprises a very small area of habitat for oceanic marine species and is unlikely to be utilised by the majority of oceanic marine species protected by the *EPBC Act*. The proposal is unlikely to cause significant direct or indirect impacts to any marine habitats in the locality. The habitat proposed to be removed is unlikely to represent an area of important habitat for listed 'terrestrial marine' species such as the Swift Parrot (*Lathamus discolour*), White-throated Needletail (*Hirunapus caudactus*), and Rainbow Bee-eater (*Merops ornatus*) etc. The proposal is therefore unlikely to cause a significant impact to listed marine species.
Whales and Other Cetaceans	The adjoining section of the Manning River comprises a very small area of habitat for cetaceans, and this section is highly unlikely to be utilised by such species. The proposal is highly unlikely to cause significant direct or indirect impacts to any marine habitats. The proposed development is therefore unlikely to cause a significant impact to whales and other cetaceans listed under the *EPBC Act.*
Critical Habitats	No critical habitats listed under the *EPBC Act* have been identified within the locality.
Commonwealth Reserves.	No Commonwealth Reserves occur within the locality.

5.1.3 Key Threatening Processes

There are currently 17 Key Threatening Processes (KTP's) listed under the *EPBC Act*, however, only two (2) of these listed KTP's are relevant to the proposed activity, namely '*loss of climatic habitat caused by anthropogenic emissions of greenhouse gases'* and '*Land Clearance'*.

The construction activity will contribute to atmospheric greenhouse gases. This will, to some degree, be offset by the retention and restoration of vegetation communities on the site and also by planting trees for landscaping. Consideration should also be given to purchasing carbon credits and using ecologically sustainable design principles in the precinct.

The small amount of native vegetation proposed to be removed for the proposal is considered negligible to the area of native vegetation occurring in the locality.

5.1.4 Potential for Significant Effect on Matters of NES

It is submitted that the proposal will not result in the potential for a significant effect on Threatened Species and Threatened Ecological Communities listed under the *EPBC Act.*

There are no Wetlands of International Significance, Migratory Species, EPBC listed Threatened species or any other matters protected by the *EPBC Act* that will be significantly affected by the proposed development. It is therefore considered that the proposed development would not require Commonwealth approval under the provisions of the *EPBC Act.*

Discussion of Potential Impacts

6.1 Habitat Removal

The majority of the vegetation that would be removed or modified for the development comprises pasture grassland and weed thickets. The proposal will therefore result in the removal of a relatively small amount of native vegetation. The proposal will result in the removal of approximately 0.18 hectares of Lowland Forest and 0.30 hectares of Swamp Forest as shown in **Appendix A.**

The native vegetation requiring removal comprises:

- highly modified bushland fragments;
- scattered trees; and
- mangroves and seagrass from the tidal zone of the Manning River;

The proposal will also require modification of the river bed/tidal zone of the Manning River. The exact extent of mangrove and seagrass removal will be determined during the Aquatic Assessment as part of the SOC.

While a number of Threatened fauna may potentially occur within the subject site, the habitat proposed to be removed or modified represents a very limited habitat resource for fauna in terms of aerial extent and quality. The habitats within the subject site are relatively isolated and would most likely only form linkages for more mobile, flying species such as birds and bats. Some arboreal fauna may also traverse through the site, however, existing connectivity would be very marginal for such species and any linkages most likely terminate within the site itself.

The proposal will result with the removal of up to 9 hollow bearing trees, however the hollow resources provided by these trees is considered negligible to the available hollow resources in the locality. In addition, the loss of these hollows could be offset with the erection of nest boxes in retained habitats.

The Threatened flora species (*Eucalyptus nicholii*) detected within the subject site is not native to the North Coast Bioregion. The one tree found to occur within the subject site does not form a viable population/community and is not considered to have conservation significance.

It is highly unlikely that any Threatened fauna species are dependent on the vegetation requiring removal and the clearing will not cause isolation of habitats in the locality. The impact of removing pasture improved grassland, weed infestations and small fragmented patches of woodland is considered negligible in the context of more suitable habitat occurring in the locality. In addition, there is scope to rehabilitate any retained areas to compensate for any loss of native vegetation on the site.

Given the limited native vegetation within the subject site, the proposed development is likely to result with increasing the amount of native vegetation in the area.

Detailed surveys to confirm occurrence of flora and fauna of conservation significance within the subject site would, however, need to be undertaken as part of the SOC. It is, however, unlikely that the results would significantly alter the outcomes of this overview assessment. Additional mitigation measures can be specifically formulated following the results of the surveys, should they be required

Similarly, the small amount of mangrove and seagrass vegetation likely to be removed for the development is not considered significant in the context to the extent of mangroves and seagrasses associated with the Manning River. The proposal would also not create a barrier to movement for fish.

No Threatened species, habitats or endangered populations listed by the FM Act have been recorded in the locality, and it is highly unlikely that any would occur within the areas proposed for disturbance. Therefore, based on the lack of records, and the relatively small area of disturbance to fisheries habitat, the development is considered highly unlikely to cause a significant impact (direct or indirect) upon any Threatened species, Endangered Population or Endangered Communities listed by the *FM Act*.

Detailed surveys and impact assessment on marine/aquatic habitat would, however, need to be taken as part of the SOC and would include a quantitative study to state how much seagrass and mangrove habitat would be removed. The assessment would need to address the *Fish Habitat Protection Plan No. 1* and *Fish Habitat Protection Plan No. 2: Seagrasses* developed by NSW Fisheries.

6.1.1 Endangered Ecological Communities

The proposal will result with modification to the composition of the EEC's with the subject site through clearing and/or utilisation for bio-filtration, and/or revegetation techniques.

The EEC's within the subject site are, however, currently highly degraded and occur as small isolated patches within a highly modified landscape. Any clearing or modification of these communities as a result of the proposal is unlikely to result in placing each community type at risk of extinction in the local area.

Although these communities are highly degraded, the Statement of Commitments would need to include measures to improve the condition of the EEC's where retained. In particular, the bio-filtration would need to be designed in a manner that improves the quality of the communities proposed to be utilised for this purpose.

6.1.2 Weeds

The paddocks within the subject site are dominated by exotic species as a result of pasture improvement for grazing. Existing bushland remnants such as the vegetated drainage lines and riparian areas are also infested with weeds sourced from the paddocks. Other weed species in these areas have most likely established from seeds spread by the wind and birds (*eg.* Privet, Coral Tree). Any clearing for the proposal is therefore unlikely to exacerbate the spread or colonisation of weed species present in the subject site.

Notwithstanding, a weed management strategy would be incorporated into a rehabilitation plan for the remnant areas and this document would be prepared as part of the SOC.

6.1.3 Erosion and Sedimentation

The potential for erosion and sedimentation during construction, and also runoff generated by the completed road is considered minimal. Appropriate controls implemented during the construction phase would reduce the potential for erosion of exposed surfaces and sedimentation of receiving waters.

6.1.4 Cumulative Effect

The proposed clearing will contribute towards the cumulative effect of habitat loss occurring in the locality. In the context of the existing development occurring throughout the locality, and due to the relatively small area of potential habitat for Threatened species and Protected species that will be removed as a result of the proposal, the cumulative impact could not be regarded as considerable or significant.

6.2 Mitigation Measures and Statement of Commitments

While the proposal is not considered likely to cause a significant impact upon any Threatened species, Population or Endangered Ecological Community, a number of mitigation measures are recommended in order to reduce the potential for impacts associated with the proposal. In addition, the proposed development provides an opportunity to improve the ecological value of the habitats proposed to be retained within the subject site. These measures would form a component of the Statement of Commitments for the project and are briefly listed below. Details of each measure would be prepared at a later stage of the approval process.

6.2.1 Statement of Commitments Summary

1. Detailed terrestrial and aquatic (including marine) surveys and impact assessment at DA stage. The assessment would need to address the *Fish Habitat Protection Plan No. 1* and *Fish Habitat Protection Plan No. 2: Seagrasses* developed by NSW Fisheries.

2. General mitigation concepts to conserve flora and fauna would need to be developed and would include, but not be limited to:

    a. Rehabilitation of any retained habitats within the subject site in accordance with a rehabilitation plan. Plan to include/outline

        i. Planting locations, densities, and schedules

        ii. Species for planting (must be locally indigenous flora species suited to each vegetation community to be rehabilitated).

        iii. Regular weed management and target areas

        iv. Monitoring and frequency

    b. Compensation of any hollow bearing trees with nest boxes (minimum 2:1 ratio). Next boxes erected in retained areas;

    c. Habitat resource recovery and relocation (*eg.* keep relocate felled timber into retained habitats where appropriate);

    d. Pre-clearing surveys of fauna habitats (eg searches for raptor nests, identify hollow trees for removal);

    e. Ecological clearing supervision for removal of any hollows

    f. Design clearing techniques to minimise risk to injury of potential inhabitants. For example:

        i. clear hollows outside breeding periods;

        ii. Shake hollow tree before felling, allowing inhabiting fauna to emerge

        iii. inspect (by ecologist/fauna carer) all hollows upon felling

    g. Erect suitable nesting platforms for the Osprey; and

    h. Installation of other artificial habitat structures, including fish habitat.

3. More specific mitigation may need to be developed following outcomes of detailed surveys at DA stage to conserve flora and fauna. This may include redesign of development if critical items are identified;

4. Design the bio-filtration system to be sympathetic to the EEC's proposed to be utilised. The design must aim to improve the condition of the community;

5. Measures to minimise disturbance to retained habitats;

6. Appropriate erosion and sedimentation controls to protect the Manning River during and post construction;

7. Appropriate controls to exclude general public from entering rehabilitation areas, and/or encourage persons to keep to formed tracks within walkways; and

8. Construction of interpretive signage in retained areas or along walkways.

Conclusion

7.1 Conclusion

The potential impacts associated with development in accordance with the master plan prepared for the proposed Pitt Street Waterfront Precinct at Chatham have been identified. Establishing the precinct will require removal or modification of pasture-improved grassland, modified fragments of woodland, and small linear stands of mangroves and seagrass. The proposal will also require modification of the river bed/tidal zone of the Manning River.

The assessment provided in this report also concludes that a breeding population of any Threatened terrestrial fauna species (*TSC Act* and *EPBC Act*) are unlikely to be dependent upon the habitats proposed to be removed or modified, and the proposed clearing will not cause isolation of habitats in the locality.

No Threatened species, habitats or endangered populations listed by the *FM Act* have been recorded in the locality, and it is highly unlikely that any would occur within the areas proposed for disturbance. Based on the lack of records, and the relatively small area of disturbance to fisheries habitat, the development is considered highly unlikely to cause a significant impact (direct or indirect) upon any Threatened species, Endangered Population or Endangered Communities listed by the *FM Act*.

The Section 5A Assessment (**Appendix C**) concluded that the proposal is unlikely to have a significant effect on *'Threatened species, populations or ecological communities or their habitats within the locality'*. Similarly, the proposal is highly unlikely to a cause significant impact to any matters of NES protected by the *EPBC Act.*

The proposal is therefore unlikely to result in a significant adverse environmental impact. As such, neither an Environmental Impact Statement nor a Species Impact Statement is required and the proposal would not require approval by the Commonwealth.

The proposed development provides an opportunity to improve the ecological value of the habitats proposed to be retained within the subject site. Any restoration works would be undertaken as a component of the Statement of Commitments for the project (**Section 6**) and details of each measure would be prepared at a later stage of the approval process. Detailed terrestrial and aquatic (including marine) surveys and impact assessment would need to be undertaken at the DA stage, and this requirement will also form a component of the Statement of Commitments for the project.

References

Callaghan, J., Curran, T., Thompson, J., and Floyd, R., (2002). *Greater Taree City Council Draft Comprehensive Koala Plan of Management Part 1: The CKPoM*. Australian Koala Foundation with Greater Taree City Council and the CKPoM Steering Committee.

Cropper, S.C. (1993) *Management of Endangered Plants*, CSIRO Publications, Melbourne.

DECC, (2008). Recovery Plan for the Koala (*Phascolarctos cinereus*). Prepared by DECC, Sydney, NSW.

DECCW, (2009). *Atlas of NSW Wildlife*, Department of Environment, Climate Change and Water. Accessed online at http://wildlifeatlas.nationalparks.nsw.gov.au/wildlifeatlas/watlas.jsp.

Department of Environment and Conservation (NSW), (2006). NSW Recovery Plan for the Large Forest Owls: Powerful Owl *Ninox strenua*), Sooty Owl (*Tyto tenebricosa*) Masked Owl (*Tyto novaehollandiae*) DEC, Sydney.

Department of Environment and Conservation, (2005). Draft Recovery Plan for the Green and Golden Bell Frog (*Litoria aurea*). DEC NSW, Hurstville, NSW.

Department of the Environment, Water, Heritage and the Arts, (2009). EPBC Act online data base search. Available at Department of the Environment and Heritage website: http://www.environment.gov.au/erin/ert/epbc/index.html

Ecotone, (2007). Ecological Constraints Assessment. The Pitt Street Waterfront Precinct at Chatham (Taree). Unpublished report prepared by Ecotone Ecological Consultants Pty Ltd for SKM Pty Ltd and Greater Taree Council

Ecotone, (2008). Mangrove and Bank Stability Assessment. Pitt Street Precinct, Taree. Unpublished report prepared by Ecotone Ecological Consultants Pty Ltd for SKM Pty Ltd and Greater Taree Council

Evans T., & Fitzpatrick, T. (1996) *Taree and Environs Koala Habitat Study*. Report for Greater Taree City Council.

Harden, G. (ed), (1992-2002), vol 1 (edn 2, 2000), vol 2 (edn 2, 2002), vol 3 (1992), vol 4 (1993) *Flora of New South Wales.* University of NSW Press, Sydney.

NSW Government, (2009). BioNet. Online database. Available online at http://www.bionet.nsw.gov.au/Area.cfm.

NSW National Parks and Wildlife Service, (2000). *Threatened Species of the Lower North Coast of New South Wales*. National Parks and Wildlife Service, Coffs Harbour.

NSW NPWS, (1996). *Threatened Species Conservation Act – Information Circular No. 2*, National Parks and Wildlife Service, Hurstville.

NSW NPWS, (2009). Key habitats and corridors in North East NSW. Accessed online at: http://maps.nationalparks.nsw.gov.au/keyhabs/default.htm.

PlantNet, (2009). *The Plant Information Network System of Botanic Gardens Trust, Sydney, Australia.* Accessed online at http://plantnet.rbgsyd.nsw.gov.au/search/simple.htm.

SKM, (2009). Fig trees on the Manning Rezoning and Masterplanning. Rezoning Report. Unpublished report prepared by Sinclair Knight Merz Pty Ltd for Greater Taree Council.

Thackway, R. and Cresswell, I., (1995). *An Interim Biogeographic Regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program Version 4*, Australian Nature Conservation Agency, Canberra.

Walker, J. and Hopkins, M.S., (1990). *Vegetation*. Pp 58-86 in *Australian Soil and Land Survey, Field Handbook* by R.C. McDonald, R.F. Isbell, J.G. Speight, J, Walker and M.S. Hopkins Inkata Press, Melbourne.

Appendix A

FIGURES

VEGETATION COMMUNITIES

ABN 35 869 825 189
www.sutersarchitects.com.au

Issue	Description	Date	Chk	Ver
A	PRELIMINARY	09.09.09	KD	MM
B	PRELIMINARY	10.09.09	KD	MM

Legend

- 01. PLANTED TREES
- 02. WEED INFESTATIONS
- 03. FRESHWATER REEDLAND
- 04. SPOTTED GUM OPEN WOODLAND
- 05. SWAMP OAK FOREST
- 06. LOW LAND RAINFOREST
- 07. MANGROVE RIPARIAN WOODLAND

FIGTREES ON THE MANNING MASTERPLAN

PITT STREET
TAREE NSW

GREATER TAREE CITY COUNCIL
+ SINCLAIR KNIGHT MERZ

Drawing
VEGETATION COMMUNITIES

Scale	Date	Drawn
NTS	09.09.2009	KD
Project Number	**Drawing Number**	**Issue**
7986	SK01	A

suters

CLEARING IMPACTS

ABN 35 869 825 189
www.sutersarchitects.com.au

Issue	Description	Date	Chk	Ver
A	PRELIMINARY	10.09.09	KD	MM

Legend

- 01. PLANTED TREES
- 02. WEED INFESTATIONS
- 03. FRESHWATER REEDLAND
- 04. SPOTTED GUM OPEN WOODLAND
- 05. SWAMP OAK FOREST
- 06. LOW LAND RAINFOREST
- 07. MANGROVE RIPARIAN WOODLAND
- 08. AREAS AFFECTED BY CLEARING

FIGTREES ON THE MANNING MASTERPLAN

PITT STREET
TAREE NSW

GREATER TAREE CITY COUNCIL
+ SINCLAIR KNIGHT MERZ

Drawing
CLEARING IMPACTS

Scale	Date	Drawn
NTS	10.09.2009	KD
Project Number	**Drawing Number**	**Issue**
7986	SK02	A

suters

Appendix B

SUBJECT SPECIES TABLES

orogen

Table B.1 - Threatened Flora Species and Populations Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
Slaty Red Gum	*Eucalyptus glaucina*	TSC Act: Vulnerable EPBC Act: Vulnerable ROTAP: 3VCa	Moderate Subject site contains potential habitat for this Red Gum species, however, the species was not detected within the subject site.	No
Trailing Woodruff	*Asperula asthenes*	TSC Act: Vulnerable EPBC Act: Vulnerable ROTAP: 3VC-	Low potential for occurrence. The subject site is not considered to represent potential habitat for *Asperula asthenes* and the species was not detected within the subject site.	No
Pale Yellow Doubletail	*Diuris flavescens*	TSC Act: Critically Endangered EPBC Act: Not Listed ROTAP: 2K	Highly unlikely to occur. Restricted to Wingham.	No
Narrow-leaved Red Gum	*Eucalyptus Seeana*	TSC Act: Endangered Population in the Greater Taree LGA EPBC Act: Not Listed ROTAP: Not Listed	Moderate Subject site contains potential habitat for this Red Gum species, however, the species was not detected within the subject site.	No

* Locality defined as 10 km radius around the subject site

orogen

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
Green and Golden Bell Frog	*Litoria aurea*	TSC Act: Endangered EPBC Act: Endangered	Very low chance of occurrence in freshwater drainage area as this habitat is highly degraded, water quality is likely to be poor, and is isolated from known habitat in the locality. Presence of the species could be ruled out with targeted survey as part of the SOC. Restoration of wetland also likely to improve potential habitat for the species.	Yes
Speckled Warbler	*Pyrrholaemus saggitatus*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. Subject site vegetation represents a small amount of potential habitat for the species.	Yes
Square-tailed Kite	*Lophoictinia isura*	TSC Act: Vulnerable EPBC Act: Not Listed	Low – moderate potential for occurrence. Site contains suitable habitat for prey species, however, this represents a very small amount of habitat for the species.	Yes
Eastern Osprey	*Pandion cristatus*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate to high potential for occurrence. This species could use a selection of trees within the subject site for nesting, however, no such nests have been observed within the site. Adjoining section of Manning River represents a small area of	Yes

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
			potential foraging habitat for the Osprey.	
Magpie Goose	*Anseranus semipalmata*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The wetland areas within the subject site represent a very small area of potential habitat for this species.	Yes
Australasian Bittern	*Botaurus poiciloptilus*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The wetland areas and riparian vegetation within the subject site represent a very small area of potential habitat for this species.	Yes
Glossy Black Cockatoo	*Calyptorhynchus lathami*	TSC Act: Vulnerable EPBC Act: Not Listed	Very low potential for occurrence. The subject site lacks suitable foraging resources for this species. This species is unlikely to utilise any hollow resources within the subject site for breeding.	No
Black-necked Stork	*Irediparra gallinacea*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The wetland areas within the subject site do not represent optimal habitat for this species which prefers more open areas. The wetland habitats within the subject site also represent a very small area of potential habitat for this species.	Yes
Comb-crested Jacana	*Irediparra gallinacea*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The wetland areas within the subject site do not represent optimal	No

orogen

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
			habitat for this species which prefers areas with dense floating vegetation.	
White Tern	*Gygas alba*	TSC Act: Vulnerable EPBC Act: Not Listed	Unlikely to occur. The subject site lacks habitat for this species.	No
Little Lorikeet	*Glossopsitta pusilla*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate to high potential for occurrence. Although not recorded in the locality, the subject site contains suitable foraging and also potential nesting resources for this highly mobile species.	Yes
Swift Parrot	*Lathamus discolour*	TSC Act: Endangered EPBC Act: Endangered	Low potential for occurrence. Although not recorded in the locality, the subject site contains suitable foraging resources for this highly mobile and nomadic species.	Yes
Powerful Owl	*Ninox strenua*	TSC Act: Vulnerable EPBC Act: Not Listed	Low - moderate potential for occurrence. The Subject site contains marginal habitat for prey species. The subject site contains some hollow bearing trees within larger sized cavities for nesting by this species. Being located in such a modified and exposed environment, these trees are unlikely to be utilised by this species.	Yes

orogen

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
Masked Owl	*Tyto novaehollandiae*	TSC Act: Vulnerable EPBC Act: Not Listed	Low - moderate potential for occurrence. The Subject site contains marginal habitat for prey species. The subject site contains some hollow bearing trees within larger sized cavities for nesting by this species. Being located in such a modified and exposed environment, these trees are unlikely to be utilised by this species.	Yes
Sooty Owl	*Tyto tenebricosa*	TSC Act: Vulnerable EPBC Act: Not Listed	Unlikely to occur. The vegetation within the subject site does not represent suitable habitat for this species.	No
Spotted-tailed Quoll	*Dasyurus maculatus*	TSC Act: Endangered EPBC Act: Endangered (SE mainland population)	Very low potential for occurrence. The subject site contains potential habitat resources for this species. The subject site is, however, relatively isolated from other areas of habitat for this species.	Yes
Brush-tailed Phascogale	*Phascogale tapoatafa*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The subject site contains potential foraging and denning resources for this species. The subject site is, however, relatively isolated from other areas of habitat for this species.	Yes
Common Planigale	*Planigale maculata*	TSC Act: Vulnerable	Unlikely to occur	No

orogen

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
		EPBC Act: Not Listed	Very limited records in the LGA and the subject site would be isolated from other areas of habitat for this species.	
Yellow-bellied Glider	*Petaurus australis*	TSC Act: Vulnerable EPBC Act: Not Listed	Unlikely to occur. The vegetation within the subject site does not represent suitable habitat for this species.	No
Squirrel Glider	*Petaurus norfolcensis*	TSC Act: Vulnerable EPBC Act: Not Listed	Low potential for occurrence. The subject site contains potential foraging and denning resources for this species. The subject site is, however, relatively isolated from other areas of habitat for this species.	Yes
Koala	*Phascolarctos cinereus*	TSC Act: Vulnerable EPBC Act: Not Listed	Very low potential for occurrence. The subject site contains very limited feed trees for the Koala and is isolated from other areas of habitat for this species.	Yes
Long-nosed Potoroo	*Potorous tridactylus tridactylus*	TSC Act: Vulnerable EPBC Act: Vulnerable	Unlikely to occur. The vegetation within the subject site is not considered to represent suitable habitat for this species and is isolated from other areas of habitat for this species.	No
Grey-headed Flying-fox	*Pteropus poliocephalus*	TSC Act: Vulnerable	Highly likely to occur.	Yes

orogen

Table B.2 - Threatened Fauna Species Recorded in the Locality*

Common Name	Scientific Name	Legal Status	Potential For Occurrence/Potential Habitats Within the Subject Site	Determination of Subject Species
		EPBC Act: Vulnerable	The subject site contains suitable foraging resources for this species. The subject site is, however, unlikely to be utilised as a camp site.	
Eastern Freetail-bat	*Mormopterus norfolkensis*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate potential for occurrence. The subject site contains potential foraging and roosting resources for this species.	Yes
Little Bentwing-bat	*Miniopterus australis*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate potential for occurrence. The subject site contains potential foraging and roosting resources for this species.	Yes
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate potential for occurrence. The subject site contains potential foraging and roosting resources for this species.	Yes
Southern Myotis	*Myotis macropus*	TSC Act: Vulnerable EPBC Act: Not Listed	Moderate potential for occurrence. The subject site contains potential foraging habitat and roosting resources for this species.	Yes

* Locality defined as 10 km radius around the subject site

Appendix C

SECTION 5A ASSESSMENT

orogen

Table C.1 - Section 5A Assessment Table

Part	Section 5A Criteria	Assessment
a)	*In the case of a Threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction*	The vegetation proposed to be cleared comprises small bushland fragments, scattered trees and mangroves, weed thickets and pasture grassland. The proposal will also require modification of the river bed/tidal zone of the Manning River. The degraded bush fragments do not represent a significant amount of potential foraging or breeding habitat for threatened fauna. The drainage line and marine habitats proposed to be removed or modified also do not represent a significant area of habitat in the context of wetland and estuarine habitat occurring in the locality. While the proposal will result in the removal or modification of a small area of potential habitat for the Subject Species, it is highly unlikely that any of the Subject Species are dependent on the habitat proposed to be removed or modified. The habitat proposed to be removed or modified represents a very small area of habitat relative to the Subject Species home ranges. The potential habitat resources to be removed from the subject site are also considered negligible to the area of suitable habitat remaining in the locality. In addition, it is likely that the development will result in a net gain of native vegetation in the subject site. The proposal is therefore unlikely to have an adverse effect on the life cycle of any Subject Species such that a viable local population is likely to be placed at risk of extinction.
b)	*In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction;*	The proposed development will not have an adverse impact upon the life cycle of any species that constitutes an Endangered Population.
c)	*In the case of a critically endangered or endangered ecological community, whether the action proposed:*	
	i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or	Several floodplain EEC's have been identified within the subject site. These communities are highly degraded and the removal or modification of these communities is unlikely to result in placing each community type at risk of extinction in the local area.

Table C.1 - Section 5A Assessment Table

Part	Section 5A Criteria	Assessment
	ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction;	The proposal will result with modification to the composition of the EEC's with the subject site through clearing and/or utilisation for bio-filtration, and/or revegetation techniques. The EEC's within the subject site are, however, currently highly degraded and occur as small isolated patches within a highly modified landscape. Any modification of these communities as a result of the proposal is unlikely to result in placing each community type at risk of extinction in the local area.
d)	*In relation to the habitat of a threatened species, population or ecological community:*	
	i) The extent to which habitat is likely to be removed or modified as a result of the action proposed, and	Refer part (a)
	ii) Whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and	The habitats within the subject site are currently located within a fragmented landscape and the vegetation within the subject site is unlikely to form part of a significant fauna movement corridor. The vegetation along the foreshore of the river provides limited habitat in terms of connectivity. Currently, this area would most likely be suited for flying species such as birds and bats or possibly more robust arboreal mammals. The Masterplan shows that some of the riparian corridor would be removed (*eg.* the waterfront developments), and this corridor may be broken as a result. Notwithstanding, this clearing would not create a barrier to the species considered likely to utilise these habitats at present (*ie.* flying species).
	iii) The importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.	The vegetation proposed to be removed is highly modified and is located within a fragmented and a relatively isolated environment. This habitat therefore represents very poor quality habitat for all of the Subject Species. In addition, the vegetation proposed to be removed comprises a very small area of habitat for any Subject Species relative to their home ranges and also to the area of habitat within the wider locality. Therefore, as discussed in Part a), and sub sections i), ii), and iii) of Part d), the potential habitat proposed to be removed could not be considered an important area of habitat for any Subject Species, or considered important to the long term survival of any population occurring in the locality.

orogen

Table C.1 - Section 5A Assessment Table

Part	Section 5A Criteria	Assessment
e)	***Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly);***	The proposal will not have an adverse effect on critical habitat listed under the *TSC Act or FM Act.*
f)	***Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan;***	An approved recovery plan has been prepared for the three Large Forest Owls - Powerful Owl, Sooty Owl and Masked Owl, and also for the Koala. A draft recovery plan has been prepared for the Green and Golden Bell Frog. There are no threat abatement plans applicable to the proposal for the Subject Species. LARGE FOREST OWLS The proposal is considered to be consistent with Recovery Objective 4 of the recovery plan prepared for the Large Forest owls as the potential impacts to these species have been assessed and addressed through the environmental assessment process for the proposal. The proposal is also considered to be consistent with Recovery Objective 5 as the area of habitat to be removed is not considered a significant area (in terms of size, quality and importance) of habitat for the Powerful Owl or Masked Owl and no known nesting habitat will be removed. The remaining objectives of the recovery plan prepared for the three Large Forest Owls are not considered to be relevant to the proposal and more specifically relate to the responsibilities of government agencies. KOALA The proposal is considered to be consistent with Objective 1 of the recovery plan for the Koala as the local population would be conserved in existing or potential habitat occurring in the locality. The remaining objectives of the recovery plan prepared for the Koala are considered to not be relevant to the proposal and more specifically relate to government agencies. GREEN AND GOLDEN BELL FROG The subject site has not yet been found to contain any known populations of the Green and Golden Bell Frog and therefore the recovery plan objectives of the draft plan prepared for the species are not relevant to this proposal at this stage. Targeted surveys to confirm or discount the presence of this species would be undertaken as part of the SOC. Measures to conserve and/or improve the habitat value for the species within the subject site would be developed and implemented should this species be found to occur.

orogen

Table C.1 - Section 5A Assessment Table

Part	Section 5A Criteria	Assessment
g)	*Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process;*	
	Anthropogenic climate change	The use of machinery during construction and clearing of some vegetation will make a contribution to anthropogenic climate change through release of stored carbon from vegetation and greenhouse gas emissions associated with use of fossil fuels. The retention and restoration of habitats on the site, planting of trees for landscaping and various other sustainability measures would make the impact of the proposal on anthropogenic climate change negligible.
	Clearing of native vegetation	As per Parts (a) and (d).
	Removal of dead wood and dead trees	The proposal will result in the removal of some fallen timber that occurs within the subject site. It is unlikely that the removal of a small amount of timber from the subject site will result with a significant impact to any of the Subject Species. In addition, any timber may be resited into the retained habitats.
	Invasion and/or establishment of Native Plant Communities by Lantana camara, Chrysanthemoides monilifera, exotic perennial grasses, and exotic vines and scramblers*	Given the modified nature of the habitats in the subject site , the clearing associated with the proposal will not significantly increase opportunities for any KTP listed weed species becoming established within or adjoining the clearing areas.
	Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands	The proposal will result with modification to the flow regime within the drainage line and also floodplain within the subject site as result of removing mangroves and foreshore habitat, re-contouring the land, construction of culverts, bridges, and roads, and use for bio-filtration (in the drainage line). Natural flow regimes within the subject site have, however, been significantly modified from historic use both within the subject site and also from land use and development within the catchment. The proposal will therefore not significantly alter the natural flow regime within the subject site or receiving waters. The proposed development, will, in fact, be more likely to result with improving flow regimes within the drainage line to more natural conditions.

orogen

Table C.1 - Section 5A Assessment Table

Part	Section 5A Criteria	Assessment
	Loss of hollow-bearing trees	Less than 9 hollow-bearing trees are proposed to be removed. The removal of these hollows is, however, considered negligible to the context of hollow resources available in the locality, including hollow trees occurring in higher quality forested habitats and conservation areas. Mitigation measures such as hollow retention (where possible), pre-clearing surveys, clearing supervision, and nest box installation , would be implemented as part of the SOC to further reduce the impact of removing hollow bearing trees.
	The remaining KTP's listed by Schedule 3 the *TSC Act* are not considered relevant to the proposal.	