



2 June 2008

David O'Donnell
Mallesons Stephen Jaques
Level 61, Governor Phillip Tower
1 Farrer Place
Sydney NSW 2000

Dear David

RE: CASUARINA TOWN CENTRE: REVIEW OF FLORA AND FAUNA IMPACT ASSESSMENT

Cumberland Ecology
PO Box 2404
Carrington NSW 2143
NEW Australia
Telephone (00) 65 66 1000
Mobile 0405 780 408
Facsimile (00) 65 66 1077
Web: www.cumberlandecology.com.au

As you requested, I have completed a review of the likely flora and fauna impacts associated with the creation of the Town Centre at Casuarina and my report is provided in Appendix A. In order to prepare the report I visited the site of the proposed Town Centre at Casuarina on Monday 28th of April and have walked across the site with Peter Macgregor. I have also reviewed relevant literature about the proposal and surrounding land, including the recent Application made under Part 3A of the Environmental Planning and Assessment Act 1979.

1. ECOLOGY OF THE TOWN CENTRE SITE

The Casuarina Beach development has been constructed according to a Master Plan, the ecological impacts of which were assessed by a Species Impact Statement (SIS) and approved by the Land and Environment Court with the involvement of the National Parks and Wildlife Service (NPWS) (now Department of Environment and Climate Change).

As part of the approval for the Master Plan there has been substantial work done to protect significant vegetation within the land covered by the Master Plan, which the Town Centre forms part of. This has entailed protection and rehabilitation of land within the coastal strip that forms the eastern fringe of the subject land and dedication of land to be added to Cudgen Nature Reserve to the west. There has also been significant work done to provide compensatory habitat for the Common Blossom Bat, a threatened flying fox species that forages on Banksias and other native shrubs within coastal vegetation (see following section).

The major ecological impacts from the Master Plan, including the Town Centre

site, have been anticipated by the approval and consent conditions. Provision has been made to protect the major ecological attributes within the Casuarina Beach site and to provide compensatory plantings to offset the impacts arising from the developments in the Town Centre.

The vegetation on the subject land is regenerating shrubland on coastal sand dunes that were sand mined in the 1960s and 1970s. None of the vegetation is consistent with endangered ecological communities that have been listed by the *Threatened Species Conservation Act 1995* or the *Environment Protection and Biodiversity Conservation Act 1999*.

Since the original flora and fauna assessment was prepared for the Town Centre site in 2005, there have been no additional threatened species or populations listed that would be likely to be of relevance to the Town Centre site. Two endangered ecological communities occur within the vicinity of the Town Centre land. These are Littoral Rainforest which occurs on the conserved and rehabilitated coastal strip and Coastal Swamp Sclerophyll Forest which occurs in land conserved along Cudgen Creek. Neither of these plant communities occurs within the land proposed for the Town Centre and neither will be significantly impacted by the proposed development.

Due to the disturbed nature of the vegetation, it is unlikely that it provides substantial habitat for threatened species other than foraging habitat for the Common Blossom Bat. For this reason I support the findings of the flora and fauna assessments made within the Part 3A Application. I do not believe that there will be significant detrimental impacts upon threatened flora and fauna.

2. COMMON BLOSSOM BAT

The major threatened species of concern for the entire development was the Common Blossom Bat. An SIS was prepared to assess the impacts of the Master Plan on this species. The SIS found that although the Common Blossom Bat forages across the Casuarina Beach site, it is not solely dependent upon that land and roosts within rainforest vegetation in the vicinity of Wollumbin Scout Camp on the eastern side of Cudgen Lake to the south of the Casuarina site. The SIS found that Casuarina Beach site contained stands of Coast Banksia (*Banksia integrifolia*) and other plant species that provide foraging resources for the Common Blossom Bat and that the project would entail clearance of significant areas of this resource. Consequently, proposals were developed for compensatory plantings of foraging resources for the Common Blossom Bat and the conditions of consent for the Master Plan included:

- The planting of approximately 15,000 Coast Banksias and other relevant plant species as a future foraging resource to replace the stems of Coast Banksia to be removed as a whole for the development. These contemporary plantings were located on lands to be retained and conserved to the west and north west of Casuarina Beach development area.
- The planting of Coast Banksias over the eight management lots within the Casuarina Beach project, and

- The deferral of development in two portions of the Casuarina Beach site for a period of 4 years (in the case of the Town Centre site) or some other period agreed by NPWS (now Department of Environment and Climate Change), Gunninah and the applicant

By 2003 there had been approximately 38,000 Coast Banksias planted in the vicinity of Casuarina Beach and a further 7,000 are to be planted. That foraging resource now exceeds that which was originally required to satisfy the development consent and is substantially greater than the foraging resource that was and is proposed to be removed.

The success of plantings has been reviewed by Gunninah Environmental Consultants in 2003 and the review found that some of the initial compensatory plantings have had poor success. However, there has been a high success rate within the foredune area and these plantings currently provide excellent resources for the Common Blossom Bat.

The 2003 review by Gunninah found that to facilitate development of the remainder of the Casuarina Beach Estate site and to ensure the provision of foraging resources for the Common Blossom Bat at this location, further compensatory habitat is proposed including

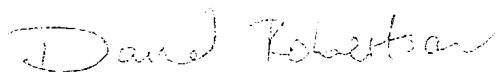
- The rehabilitation of part of Cudgen Nature Reserve to the immediate south of the Casuarina Beach Estate site by removal of Bitou Bush and Coastal Tea Tree and their replacement by Coast Banksias (for foraging) and littoral rainforest (for roosting);
- Remediation of the initial compensatory plantings by the application of fertiliser and water as necessary and by fencing or protecting plantings from browsing; and
- The provision of an additional area of compensatory plantings within the conserved lands along Cudgen Creek to the immediate west of the Northwest Precinct in an area of introduced grass and disturbance

Based upon the information provided in the review of compensatory plantings by Gunninah Environmental Consultants I have prepared an Assessment of Significance as specified under Section 5a of the *Environmental Planning and Assessment Act 1979* though such an assessment is not required for projects assessed under Part 3A of that Act. The Assessment of Significance, which is provided in Appendix C to the letter, concludes that there will be no significant impact upon the Blossom Bat from the development of the Town Centre.

In conclusion, I believe that the ecological impacts of the Town Centre have been adequately assessed and provided for. No additional threatened flora or fauna species have been listed since the 2005 flora and fauna assessment that would invalidate that assessment.

If you would like to discuss this matter further please phone me on 9868 1933.

Yours sincerely



David Robertson

Director

david.robertson@cumberlandecology.com.au

Appendix A

Casuarina Town Centre: Review of Flora
and Fauna Impact Assessment



A.1 Introduction

The purpose of this report is to review and update the flora and fauna impact assessment that was prepared as part of the Environmental Assessment for the Concept Plan for the Town Centre at Casuarina Beach. This report:

- (a) Updates the flora and fauna assessment in the Environmental Assessment with more recently listed threatened species, populations and ecological communities;
- (b) Provides further details in relation to threatened species known to occur in the site locality; and
- (c) Updates the flora and fauna study relied upon in the Environmental Assessment to reflect changes to the relevant assessment of significance of potential impacts on threatened species in a separate test undertaken for each species that may be impacted as a result of the proposal

A.2 Background

Since the commencement of site planning and the requisite environmental planning investigations over ten years ago, Casuarina Township is developing into a coastal community. There is now a substantial ocean frontage to the development and a number of residential precincts that have been developed.

The site originally encompassed 200 hectares of sand-mined land. While portions of the land have now been developed, other areas have been revegetated. Currently the developing Casuarina community consists of a contemporary residential area with public amenity facilities including beach car parking, support sport and recreation facilities and integrated bikeway and pedestrian pathways immediately behind the revegetated natural dune system and the beach.

The Casuarina Beach Town Centre, the subject of the application, is approximately 15 hectares of land that is centrally located within the Casuarina Beach development area (see photograph 1).

The Project Application is an application under Part 3A of the Environmental Planning and Assessment Act 1979. The project includes a project application for Stage 1 Works to occur on Lot 223 on DP 1048494 and Lot 3 on DP 1042119, Parish of Cudgen, County of Rouss. The proponent of the project is Kings Beach No. 2 Pty Ltd.

The Casuarina Master Plan area has been the subject of a suite of earlier flora and fauna investigations by Gunninah (1996a, 1996b). The flora and fauna of the proposed site of the Town Centre has more recently been evaluated by Cardno (2005).

As part of the application process, the Director-General has issued a set of environmental assessment requirements, Director General's Requirements (DGRs), setting out relevant plans, documents and information that must be submitted to the Department of Planning with the Application. The DGRs were amended on 21 March 2007 to include further project application

issues. Flora and fauna issues are addressed in Part A Item 7 of the amended DGRs as follows:

7. Flora and Fauna

7.1 Outline measures for the conservation of flora and fauna and their habitats within the meaning of the Threatened Species Conservation Act 1995, in particular the Common Blossom Bat habitat identified within and adjacent to the site.

7.2 Consider impacts of clearing native vegetation.

The Department of Planning has now provided comments on the draft Application and has requested further information in relation to flora and fauna. In particular the Department has requested that the Ecological Assessment completed in 2005:

- (a) be updated to consider more recently listed threatened species populations and ecological communities;
- (b) provide further details in relation to threatened species known to occur in the site locality; and
- (c) be updated to reflect changes to the relevant assessment of significance of potential impacts on threatened species in a separate test undertaken for each species that may be impacted as a result of the proposal.

A.3 Method

A.3.1 Literature Review

The following reports that were prepared for the subject site were reviewed to examine the way in which the ecological impacts of the project have been assessed on behalf of the Applicant:

- Cardno (2005) Ecological Assessment Report Casuarina Beach Town Centre. Kings Beach No 3 Pty Ltd. Cardno Pty Ltd
- Cardno MBK Engineers. (January 2006). Report on Engineering and Environmental Matters – Development Application for Town Centre Site, Kings Beach (No.2).
- NSW Department of Planning – Director Generals Office. (March 2007). Amended Director General's Environmental Assessment Requirements. Casuarina Town Centre, Coast Road, Casuarina Beach (MP 06_0258)
- NSW Department of Planning – Director Generals Office. (March 2008). MP 06_0258 Comments on Revised Draft EA
- Victor G Ferros – Town Planning Consultants. (March 2008). Environmental Assessment to Department of Planning in Relation to Concept Plan for Town Centre Casuarina Beach Including a Project Application for Stage 1 Works on Land Described as Lot 223 on DP 1048494 and Lot 3 on DP 1042119, Parish of Cudgen.

County of Rous and Situated on the Coast Road, Casuarina Beach Township
Kingscliff South.

A.3.2 Database Review

The Atlas of NSW Wildlife (DEC (NSW) 2008) and the EPBC Protected Matters search tool (DEWHA, 2008) were used to provide a list of threatened fauna and flora in the locality of the study area. The lists are presented in Appendix B with an indication of the likelihood of the species occurring within the study area.

A.3.3 Aerial Photograph Interpretation

Aerial photographs at 1:25,000 scale were utilised to identify the extent of vegetation with respect to the site and surrounding areas.

A.3.4 Field Inspection

A field inspection was conducted of the subject land and surrounds on Monday 28th of May 2008. During the field inspection notes were made about the nature and extent of vegetation and fauna habitats that occurred on the subject site and within surrounding land. An inspection was also made of the land within the coastal reserve and within the nature reserve to the west of the subject land.

A.4 Findings

A.4.1 Existing Vegetation

The site proposed for the Town Centre has been partially cleared and has also been subjected to sand mining in the 1960s and 1970s. As a result, the existing vegetation that occurs is semi-natural. The extent of clearing is shown in Photograph 1.

The original natural vegetation has been heavily altered and weeds such as Bitou Bush have become established on the site proposed for the Town Centre (see Photographs 2 and 3).

As described in the Cardno report (Cardno 2005) the dominant vegetation on the Town Centre site is coastal scrubland dominated by Coastal Banksia (*Banksia integrifolia* subsp. *integrifolia*), Coast Tea Tree (*Leptospermum laevigatum*), Wattles (*Acacia* spp) and Coastal Oak (*Casuarina equisetifolia* ssp. *incana*). Introduced shrubs, particularly Lantana (*Lantana camara*) and Bitou Bush (*Chrysanthemoides monilifera* subsp. *rotunda*) are abundant in places.

No endangered ecological communities occur on the subject site, though regenerating Littoral Rainforest occurs to the east of the subject land and Coastal Swamp Sclerophyll Forest occurs to the west in association with Cudgen Creek.

The clearing and weed invasion of the subject site limit its utility for threatened flora and fauna.

A.4.2 Likelihood of Threatened Flora and Fauna

Since the original flora and fauna assessment was prepared for the Town Centre site in 2005, there have been no additional threatened species or populations listed that would be likely to be

of relevance to the Town Centre site. An analysis of threatened species records obtained from within 10 km radius of the subject site has been provided in Appendix B.

Two endangered ecological communities occur within the vicinity of the Town Centre land. These are Littoral Rainforest which occurs on the conserved and rehabilitated coastal strip and Coastal Swamp Sclerophyll Forest which occurs in land conserved along Cudgen Creek. Neither of these plant communities occurs within the land proposed for the Town Centre and neither will be significantly impacted by the proposed development.

A.4.3 Common Blossom Bat

The major threatened species of concern for the entire development was the Common Blossom Bat. A SIS was prepared to assess the impacts of the Master Plan on this species. The SIS found that although the Common Blossom Bat forages across the Casuarina Beach site, it is not solely dependent upon that land and roosts within rainforest vegetation in the vicinity of Wollumbin Scout Camp on the eastern side of Cudgen Lake to the south of the Casuarina site. The SIS found that Casuarina Beach site contained stands of Coast Banksia (*Banksia integrifolia*) and other plant species that provide foraging resources for the Common Blossom Bat and that the project would entail clearance of significant areas of this resource. Consequently, proposals were developed for compensatory plantings of foraging resources for the Common Blossom Bat and the conditions of consent for the Master Plan included:

- The planting of approximately 15,000 Coast Banksias and other relevant plant species as a future foraging resource to replace the stems of Coast Banksia to be removed as a whole for the development. Those 'contemporary plantings' were located on lands to be retained and conserved to the west and north west of Casuarina Beach development area;
- The planting of Coast Banksias over the eight management lots within the Casuarina Beach project itself; and
- The deferral of development in two portions of the Casuarina Beach site for a period of 4 years (in the case of the Town Centre site) or some other period agreed by NPWS (now Department of Environment and Climate Change), Gunnedah and the applicant.

By 2003 there had been approximately 38,000 Coast Banksias planted in the vicinity of Casuarina Beach and a further 7,500 are to be planted. That foraging resource now exceeds that which was originally required to satisfy the development consent and is substantially greater than the foraging resource that was and is proposed to be removed.

The success of plantings has been reviewed by Gunnedah Environmental Consultants in 2003 and the review found that some of the initial compensatory plantings have had poor success. However, there has been a high success rate within the foredune area and these plantings currently provide excellent resources for the Common Blossom Bat.

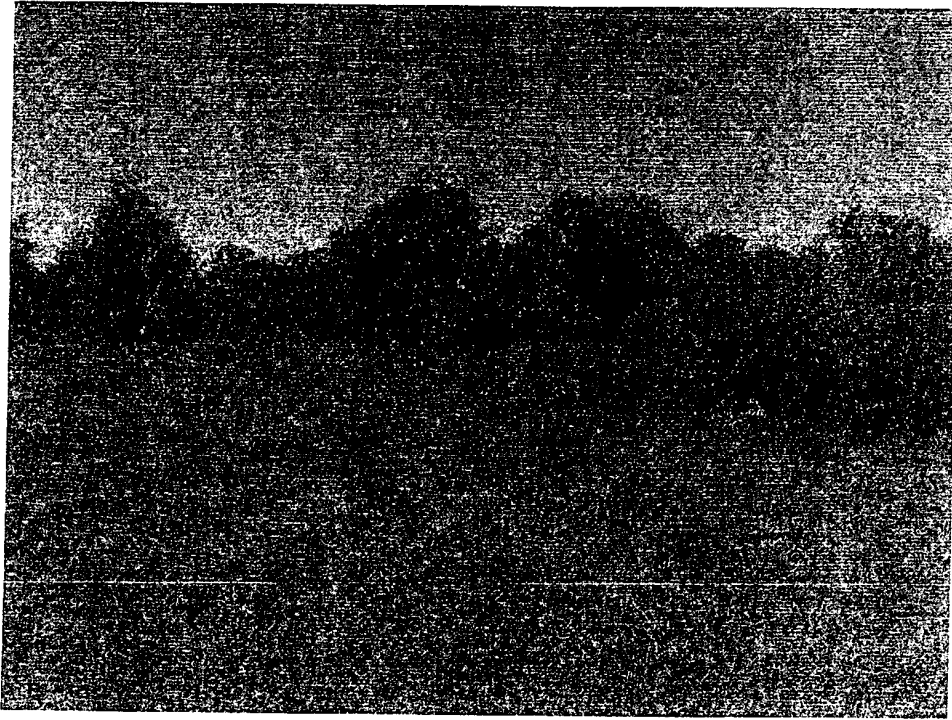
The 2003 review by Gunnedah found that to facilitate development of the remainder of the Casuarina Beach Estate site and to ensure the provision of foraging resources for the Common Blossom Bat at this location, further compensatory habitat is proposed including:

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Based upon the information provided in the review of compensatory plantings by Gunninah Environmental Consultants I have prepared an Assessment of Significance as specified under Section 5a of the *Environmental Planning and Assessment Act 1979*, though such an assessment is not required for projects assessed under Part 3A of that Act. The Assessment of Significance, which is provided in Appendix C to the letter, concludes that there will be no significant impact upon the Blossom Bat from the development of the Town Centre.



Photograph 1: Aerial photograph of the proposed Town Centre (bounded by red polygons). Note the completed and partially completed developments on north and south of the proposed Town Centre site.



Photograph 2: Partially cleared and sand mined area within the proposed Casuarina Town Centre.



Photograph 3: Coast Banksia (*Banksia integrifolia*) Coast Tea-tree (*Leptospermum laevigatum*), and Bitou Bush (*Chrysanthemoides monilifera* ssp *rotunda*) in eastern portion of the proposed Town Centre.

A.5 Conclusion

Since the original flora and fauna assessment was prepared for the Town Centre site in 2005, there have been no additional threatened species or populations listed that would be likely to be of relevance to the Town Centre site. Two endangered ecological communities occur within the vicinity of the Town Centre land. These are Littoral Rainforest which occurs on the conserved and rehabilitated coastal strip and Coastal Swamp Sclerophyll Forest which occurs in land conserved along Cudgen Creek. Neither of these plant communities occurs within the land proposed for the Town Centre and neither will be significantly impacted by the proposed development.

Due to the disturbed nature of the vegetation, it is unlikely that it provides substantial habitat for threatened species other than foraging habitat for the Common Blossom Bat. For this reason I support the findings of the flora and fauna assessments made within the Part 3A Application. I do not believe that there will be significant detrimental impacts upon threatened flora and fauna.

There will be very minor impact on potential foraging habitat for this species and such habitat is well represented on the subject land and in the study area. The overall conservation of native vegetation and provision of compensatory plantings is likely to aid the long term survival of the existing Common Blossom Bat population and has potential to facilitate an increase in the size of that population. No significant impacts on the local population of this species are likely.

A.6 References

Cardno (2005) **Ecological Assessment Report Casuarina Beach Town Centre**. Kings Beach No 3 Pty Ltd. Cardno Pty Ltd.

Cardno MBK Engineers (January 2008), **Report on Engineering and Environmental Matters – Development Application for Town Centre Site, Kings Beach (No.2)**

Davey, G (2003) **Letter to Mr D Broyd re Casuarina Beach Development – Consent Conditions issued by the Land and Environment Court on 17 December 1998** NSW National Parks and Wildlife Service.

Gunninah (1996a) **Kings Beach Development, Tweed Shire, NSW. Species Impact Statement** Gunninah Environmental Consultants, Crows Nest, NSW

Gunninah (1996b) **Kings Beach Development, Tweed Shire, NSW. Flora and Fauna Report** Gunninah Environmental Consultants, Crows Nest, NSW

Gunninah Environmental Consultants (2003) **Casuarina Beach Project Compensatory Habitat for the Common Blossom Bat**. Gunninah Environmental Consultants, Crows Nest, New South Wales.

NSW Department of Planning – Director Generals Office (March 2007), **Amended Director General's Environmental Assessment Requirements, Casuarina Town Centre, Coast Road, Casuarina Beach (MP 06_0258)**

NSW Department of Planning – Director Generals Office (March 2008) **MP 06_0258 Comments on Revised Draft EA**

Victor G Ferros – Town Planning Consultants. (March 2008). **Environmental Assessment to Department of Planning in Relation to Concept Plan for Town Centre Casuarina Beach Including a Project Application for Stage 1 Works on Land Described as Lot 223 on DP 1048494 and Lot 3 on DP 1042119, Parish of Cudgen, County of Rous and Situated on the Coast Road, Casuarina Beach Township, Kingscliff South.**



Appendix B

Threatened Species Tables

Table 1 ANALYSIS OF THURIA FINED FLORA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Ochrosia moorei</i>	Southern Ochrosia	E	E1	Southern Ochrosia is found in riverine and lowland subtropical rainforest.	No suitable habitat. Not likely to occur.	No
<i>Davidsonia jerseyana</i>	Davidson's Plum		E1	Lowland subtropical rainforest and wet eucalypt forest at low altitudes (below 300m). Many trees are isolated in paddocks and on roadsides in former rainforest habitats.	No suitable habitat. Not likely to occur.	No
<i>Davidsonia johnsonii</i>	Smooth Davidson's Plum	E	E1	Lowland subtropical rainforest and wet eucalypt forest at low altitudes (below 300m). Many trees are isolated in paddocks and on roadsides in cleared land.	No suitable habitat. Not likely to occur.	No
<i>Diospyros malayana</i>	Red fruited Ebony	E	E1	Usually grows as an understorey tree in lowland subtropical rainforest, often close to rivers. Soils are generally basalt derived or alluvial.		
<i>Chamaesyce psammogeton</i>	Sand Spurge		E1	Grows on fore-dunes and exposed	Sub-optimal	No

Table 1 ANALYSIS OF THREATENED FLORA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Cassia brewsteri</i> var. <i>markiana</i>	Brush Cassia	E1		headlands, often with <i>Spiraea</i> (Spiraea sericea). Flowering occurs in summer. Found in littoral and riverine rainforest, and in regrowth vegetation on farmland and along roadsides. It prefers more fertile soil types and is often found in low and flat sites.	Habitat: Not likely to occur. No suitable habitat. Not likely to occur.	No
<i>Desmodium acanthocladdum</i>	Thorny Pea	V	V	Dry rainforest and fringes of riverine subtropical rainforest	No suitable habitat. Not likely to occur.	No
<i>Acacia bakeri</i>	Marblewood	V	V	On basalt derived soils at low elevations. In or near lowland subtropical rainforest, in adjacent eucalypt forest and in regrowth of both. Usually occurs in the understorey but may occur as a large canopy tree.	No suitable habitat. Not likely to occur.	No
<i>Archidendron hendersonii</i>	White Lace Flower	V		Riverine and lowland subtropical rainforest and littoral rainforest	No suitable habitat. Not likely to occur.	No
<i>Xylocarpus tannian-reginae</i>	Queensland Xylocarpus	E1		Littoral and subtropical rainforest on coastal sands or soils derived from metasediments.	No suitable habitat. Not likely to occur.	No

Table 1 ANALYSIS OF THREATENED FLORA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Cryptocarya laetida</i>	Stinking Cryptocarya	V	V	Found in littoral rainforest, usually on sandy soils, but mature trees are also known on basalt soils.	No suitable habitat. Not likely to occur.	No
<i>Endiandra floydii</i>	Crystal Creek Walnut	F	F1	Warm temperate or subtropical rainforest with Brush Box overstorey, and in regrowth rainforest and Camphor Laurel forest	No suitable habitat. Not likely to occur.	No
<i>Endiandra hayesii</i>	Rusky Rose Walnut	V	V	Sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils	No suitable habitat. Not likely to occur.	No
<i>Syzygium hodgekinsoniae</i>	Red Lilly Pilly	V	V	Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils.	Sub-optimal Habitat. May utilise area for roosting.	Yes
<i>Syzygium moreci</i>	Durobby	V	V	Durobby is found in subtropical and riverine rainforest at low altitude. Often occurs as isolated remnant paddock trees.	No suitable habitat. Not likely to occur.	No
<i>Geodorum densiflorum</i>	Pink Nodding Orchid	E1	E1	Dry eucalypt forest and coastal swamp forest at lower altitudes, often on sand	No suitable habitat. Not likely to occur.	No

Table I ANALYSIS OF THREATENED FLORA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Peristernanthus liliifolius</i>	Brown Fairy-chain Orchid		V	Restricted to coastal and near-coastal environments, particularly Littoral Rainforest and the threatened ecological community Lowland Rainforest on Floodplain. The species is an epiphyte, growing in clumps on tree trunks and thick vines.	No suitable habitat. Not likely to occur.	No
<i>Flourensia citreola</i>	Lemon-scented Grass		E1	Lemon-scented Grass grows in sandy soils near rivers or along the coast in wallum areas or sand dunes.	Sub-optimal habitat. Not likely to occur.	Yes
<i>Dryandra nigricans</i>	Basket Fern		E1	Grows on plants, rocks or on the ground. Usually found in rainforest but also in moist eucalypt and Swamp Oak forest.	No suitable habitat. Not likely to occur.	No
<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut		V	Found in subtropical rainforest, usually near the coast.	No suitable habitat. Not likely to occur.	No
<i>Hedyotis corymbosa</i>	Sweet False Gallium		E1	Margins of seasonally inundated wetlands in paperbark swamps and Forest Red Gum Eucalyptus tereticornis woodlands.	No suitable habitat. Not likely to occur.	No
<i>Randia moorei</i>	Spry Gardenia		E1	Subtropical riverine, littoral and dry	No suitable habitat.	No

Table 1 ANALYSIS OF THREATENED FLORA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Acronychia littoralis</i>	Scented Acronychia	E	E1	rainforest, in NSW Hoop Pine and Brush Box are common canopy species. Scented Acronychia grows in littoral rainforest on sand.	habitat, Not likely to occur. No suitable habitat, Not likely to occur.	No
<i>Bostelia transversa</i>	Yellow Salignea	V	V	Lowland subtropical rainforest up to 300 m in altitude	No suitable habitat, Not likely to occur.	No
<i>Diploglottis campbellii</i>	Small-leaved Tamarind	E	E1	Confined to the warm subtropical rainforests of the NSW-Queensland border lowlands and adjacent low ranges	No suitable habitat, Not likely to occur.	No
<i>Lepidorema pulchella</i>	Fine-leaved Tuckeria	V	V	Lowland subtropical rainforest in NSW Found on infertile metasediments and on fertile basalts in the Tweed Valley.	No suitable habitat, Not likely to occur.	No
<i>Dendrocnide morosoides</i>	Gympie Stinger	E1	E1	Occurs in lowland rainforest, especially in gaps or other disturbed sites.	No suitable habitat, Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Amphibians</i>						
<i>Critta tinula</i>	Wallum Froglet	V	V	Found only in acid paperbark swamps and sedge swamps.	No suitable habitat. Not likely to occur.	No
<i>Litoria oblongipennis</i>	Olongburna Frog	V	V	Paperbark swamps and sedge swamps of the coastal wallum country. Wallum is a Banksia dominated lowland heath ecosystem characterised by acidic waterbodies	No suitable habitat. Not likely to occur.	No
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E1	Giant Barred Frogs forage and live amongst deep, damp leaf litter in rainforests, moist eucalypt forest and nearby dry eucalypt forest, at elevations below 1000 m.	No suitable habitat. Not likely to occur.	No
<i>Birds</i>						
<i>Pandon haliaetus</i>	Osprey	V (TSC)	V	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breed from July to September in	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Todiramphus chloris</i>	Collared Kingfisher	V (TSC)	V (TSC)	NSW Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea. Collared Kingfishers are virtually restricted to mangroves and other estuarine habitats and mainly occur about the mouths of the larger coastal rivers.	No suitable habitat. Not likely to occur.	No
<i>Anseranas semipalmata</i>	Magic Goose	V (TSC)	V (TSC)	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats: often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes.	No suitable habitat. Not likely to occur.	No
<i>Ixobrychus exilis</i>	Black Bittern	V (TSC)	V (TSC)	Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC		TSC		Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
		Act	Legal Status	Act	Legal Status			
<i>Bulinus gaffanus</i>	Bush Stone curlew			E1		present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber. Largely nocturnal, being especially active on moonlit nights. Feed on insects and small vertebrates, such as frogs, lizards and snakes.	No suitable habitat. Not likely to occur.	No
<i>Esacus hexoctus</i>	Beach Stone-curlew			E1		Occurs on open, undisturbed beaches, islands, reefs, and estuarine intertidal sandflats and mudflats beaches with estuaries or mangroves nearby are preferred; may also frequent river mouths, offshore sandbars and rock platforms.	No suitable habitat. Not likely to occur.	No
<i>Calyptolynchus banksii</i>	Red-tailed Cockaton			E1		Red tailed Black Cockatoos are found in a wide variety of habitats. In coastal north-east NSW they have been	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Calyptrorhynchus lathamii</i>	Glossy Black cockatoo	V		recorded in dry open forest and areas of mixed rainforest/eucalypt forest Dependent on large hollow-bearing eucalypts for nest sites. One or two eggs are laid between March and August. Inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of she oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) occur.	No suitable habitat. Not likely to occur	No
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V		Rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit.	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Charadrius leschenaultii</i>	Greater Sand plover		V	Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders.	Sub-optimal Habitat May utilise area for roosting	Yes
<i>Charadrius mongolus</i>	Lesser Sand-plover		V	Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats, occasionally occurs on sandy beaches, coral reefs and rock platforms.	No suitable habitat. Not likely to occur	No
<i>Hydrophilus aculeatus</i>	Black-necked Stork		E1	Inhabits permanent freshwater wetlands including margins of	No suitable habitat. Not	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
S						
Ptilinopus magnificus	Wompoo Fruit Dove		V	billabongs, swamps, shallow floodwaters, and adjacent grasslands and savannah woodlands; can also be found occasionally on inter-tidal shorelines, mangrove margins and estuaries.	likely to occur.	
Ptilinopus regina	Rose-crowned Fruit Dove		V	Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	No suitable habitat. Not likely to occur.	No
				Rose-crowned Fruit-doves occur mainly in sub tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful	No suitable habitat. Not likely to occur.	No
Monarcha leucotis	White-eared Manarch		V	In NSW this species occurs primarily in coastal rainforest, swamp forest and wet eucalypt forest. It appears to favour rainforest edges where trees are frequently covered with vines and through the canopy of more extensive	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Diomedea exulans</i>	Wandering Albatross	V	E1	patches of rainforest Wandering albatross spend the majority of their time in flight, soaring over the southern oceans. They breed on a number of islands just north of the Antarctic Circle. South Georgia Island (belonging to the UK), Prince Edward and Marion Islands (South Africa), Crozet and Kerguelen Islands (French Southern Territories) and Macquarie Island (Australia).	No suitable habitat. Not likely to occur	No
<i>Thalassarche melanophrys</i>	Black-browed Albatross	V	V	Breeding takes place on exposed ridges and hillocks, amongst open and patchy vegetation. Inhabits antarctic, subantarctic, subtropical marine and coastal waters over upwellings and boundaries of currents. Can tolerate water temperatures between 0oC and 24oC.	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	V	Spends most of its time at sea, breeding on small isolated islands. Favours rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries. Forages on exposed rock or coral at low tide for foods such as limpets and mussels.	No suitable habitat. Not likely to occur.	No
<i>Haematopus longirostris</i>	Pied Oystercatcher	V	V	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. The chisel-like bill is used to pry open or break into shells of oysters and other shellfish.	No suitable habitat. Not likely to occur.	No
<i>Ardeotis galinacea</i>	Corn-billed Jacana	V	V	Inhabits permanent wetlands with a good surface cover of floating vegetation, especially water-lilies.	No suitable habitat. Not likely to occur.	No
<i>Gygis alba</i>	White Tern	V	V	A recent arrival to Lord Howe Island, only breeding there since the 1960s.	No suitable habitat. Not	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Sterna albifrons</i>	Little Tern		E1	This species nests in the high branches of trees. On Lord Howe Island it nests in the introduced Norfolk Island Pine as well as native Salywood, Blackbutt, Greybark, Banyan and Pandanus.	likely to occur	No
				Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records).	No suitable habitat. Not likely to occur.	
<i>Lichenostomus fasciatus</i>	Mangrove Honeyeater		V	Nests in small, scattered colonies in low dunes or on sandy beaches just above high tide mark near estuary mouths or adjacent to coastal lakes and islands. Primary habitat is mangrove forest but the species also occurs in other near coastal forests and woodlands including casuarina and paperbark	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT ISLAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Xanthomyza phrygia</i>	Regent Honeyeater	E	E1	swamp forests. The species inhabits dry open forest and woodland, particularly Box ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes.	No suitable habitat. Not likely to occur.	No
<i>Pachycephala olivacea</i>	Olive Whistler		V	Mostly inhabit wet forests above about 500m. During the winter months they may move to lower altitudes. Forage in trees and shrubs and on the ground, feeding on berries and insects.	No suitable habitat. Not likely to occur.	No
<i>Puffinus carneipes</i>	Flesh-footed Shearwater		V	Nest on Lord Howe Island in forests on sandy soils from Ned's Beach to	No suitable habitat. Not	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Lathamus discolor</i>	Swift Parrot	V	E1	Clear Place, with smaller colonies below Transit Hill and at Old Settlement Beach. Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant leop (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> .	likely to occur. No suitable habitat. Not likely to occur.	No
<i>Ammodramus olivaceus</i>	Bush hen	V	V	Occurs in a variety of coastal wetlands from mangroves, lagoons and swamps, to river margins and	No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Calidris alba</i>	Sanderling	V	V	creaks running through rainforest. It has also been recorded away from water in dense low vegetation, including Bladey Grass and the introduced Lantana.	No suitable habitat. Not likely to occur	No
<i>Calidris tenuirostris</i>	Great Knot	V	V	Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms	Sub optimal habitat. Not likely to occur	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Limosa limosa</i>	Black-tailed Godwit		V	Primarily a coastal species. Usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats	No suitable habitat. Not likely to occur	No
<i>Xenus cinereus</i>	Terck Sandpiper		V	In Australia has been recorded on coastal mudflats, lagoons, creeks and estuaries.	No suitable habitat. Not likely to occur	No
<i>Ninox connexus</i>	Barking Owl		V	Inhabits eucalypt woodland, open forest, swamp woodlands and, especially in inland areas, timber along watercourses. Denser vegetation is used occasionally for roosting.	No suitable habitat. Not likely to occur	No
<i>Tyto capensis</i>	Grass Owl		V	Grass Owls are found in areas of tall grass, including grass tussocks in swampy areas, grassy plains, swampy heath, and cane grass, or sedges on flood plains.	No suitable habitat. Not likely to occur	No
<i>Mollusca</i>						
<i>Thersites mitchellae</i>	Mitchell's Rainforest Snail	E	E1	Remnant areas of lowland subtropical	No suitable	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
Mammals						
<i>Cercartetus nanus</i>	Eastern Pygmy possum	V		rainforest and swamp forest on alluvial soils. Slightly higher ground around the edges of wetlands with palms and fig trees are particularly favoured habitat	habitat. Not likely to occur.	No
				Found in a broad range of habitats from rainforest through sclerophyll (including Box Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north eastern NSW where they are most frequently encountered in rainforest.	No suitable habitat. Not likely to occur.	No
<i>Dasyurus maculatus</i>	Spotted tailed Quail	V		Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub alpine zone to the coastline.	No suitable habitat. Not likely to occur.	No
Individual animals use hollow-bearing						

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
Planigale maculata	Common Planigale		V	trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites. Common Planigales inhabit rainforest, eucalypt forest, heathland, marshland, grassland and rocky areas where there is surface cover, and usually close to water.	No suitable habitat. Not likely to occur.	No
Saccolaimus flaviventris	Yellow-bellied Sheath-tail bat		V	Roosts singly or in groups of up to six, in tree hollows and buildings, in treeless areas they are known to utilise mammal burrows.	No suitable habitat. Not likely to occur.	No
Thylogale stigmatica	Red-legged Pademelon		V	Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub. Wet gullies with dense, shrubby ground cover provide shelter from predators.	No suitable habitat. Not likely to occur.	No
Mormopterus beccarii	Beccari's Freetail bat		V	A range of vegetation types in	No suitable	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	V	northern Australia, from rainforests to open forests and woodlands, and are often recorded along watercourses Occur in dry sclerophyll forest and woodland east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Habitat: Not likely to occur. No suitable habitat. Not likely to occur.	No
<i>Phascolarctos cinereus</i>	Koala	V	V	Inhabit eucalypt woodlands and forests.	No suitable habitat. Not likely to occur.	No
<i>Potorous tridactylus</i>	Long-nosed Potoroo	V	V	Inhabits coastal heath and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat and may consist of grass trees, sedges, ferns or heath, or of low shrubs of tea trees or melaleucas. A sandy loam soil is also a common	likely to occur. No suitable habitat. Not likely to occur.	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Pteropus alecto</i>	Black Flying fox		V	feature. Large communal day-time camps in remnants of coastal subtropical rainforest or swamp forest, often with Grey-headed Flying-foxes	No suitable habitat. Not likely to occur	No
<i>Pteropus poliocephalus</i>	Grey-headed Flying fox	V	V	Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	No suitable habitat. Not likely to occur	No
<i>Syconycteris australis</i>	Common Blossom-bat		V	Common Blossom-bats often roost in littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps.	No suitable habitat. Not likely to occur	No
<i>Miniopterus australis</i>	Little Bentwing-bat		V	Moist eucalypt forest, rainforest or dense coastal banksia scrub. Little Bentwing-bats roost in caves, tunnels and sometimes tree hollows during the day and at night forage for small insects beneath the canopy of	No suitable habitat. Not likely to occur	No

Table 2 ANALYSIS OF THREATENED FAUNA RECORDS FROM WITHIN 10 KM OF THE SUBJECT LAND

Scientific Name	Common Name	EPBC Act Legal Status	TSC Act Legal Status	Habitat Requirements	Likelihood of Occurrence on subject site	Assessment of Significance Required?
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat		V	densely vegetated habitats. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	No suitable habitat. Not likely to occur.	No
<i>Myotis adversus</i>	Large footed Myotis		V	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	No suitable habitat. Not likely to occur.	No
<i>Nyctophilus bifax</i>	Eastern Long-eared Bat		V	Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly	No suitable habitat. Not likely to occur.	No

Table 2

Scientific Name

favoured



Appendix C

Assessment of Significance for the Common
Blossom Bat

C.1 Assessment of Significance for the Common Blossom Bat

The major threatened species of concern for the entire Casuarina Beach Estate development was the Common Blossom Bat. A Species Impact Statement (SIS) was prepared to assess the impacts of the Master Plan on this species. The SIS found that although the Common Blossom Bat forages across the Casuarina Beach site, it is not solely dependent upon that land and roosts within rainforest vegetation in the vicinity of Wollumbin Scout Camp on the eastern side of Cudgen Lake to the south of the Casuarina site. The SIS found that the Casuarina Beach site contained stands of Coast Banksia (*Banksia integrifolia*) and other plant species that provide foraging resources for the Common Blossom Bat and that the project would entail clearance of significant areas of this resource. Consequently, proposals were developed for compensatory plantings of foraging resources for the Common Blossom Bat and the conditions of consent for the Master Plan included:

- The planting of approximately 15,000 Coast Banksias and other relevant plant species as a future foraging resource to replace the stems of Coast Banksia to be removed as a whole for the development. Those 'contemporary plantings' were located on lands to be retained and conserved to the west and north west of Casuarina Beach development area;
- The planting of Coast Banksias over the eight management lots within the Casuarina Beach project; and
- The deferral of development in two portions of the Casuarina Beach site for a period of 4 years (in the case of the Town Centre site) or some other period agreed by NPWS (now Department of Environment and Climate Change), Gunnedah and the applicant.

By 2003 there had been approximately 38,000 Coast Banksias planted in the vicinity of Casuarina Beach and a further 7,000 are to be planted. That foraging resource now exceeds that which was originally required to satisfy the development consent and is substantially greater than the foraging resource that was and is proposed to be removed.

The success of plantings has been reviewed by Gunnedah Environmental Consultants in 2003 and the review found that some of the initial compensatory plantings have had poor success. However, there has been a high success rate within the foredune area and these plantings currently provide excellent resources for the Common Blossom Bat.

The 2003 review by Gunnedah found that to facilitate development of the remainder of the Casuarina Beach Estate site and to ensure the provision of foraging resources for the Common Blossom Bat at this location, further compensatory habitat is proposed including:

- The rehabilitation of part of Cudgen Nature Reserve to the immediate south of the Casuarina Beach Estate site by removal of Bitou Bush and Coastal Tea Tree and their replacement by Coast Banksias (for foraging) and littoral rainforest (for roosting);
- Remediation of the initial compensatory plantings by the application of fertiliser and water as necessary and by fencing or protecting plantings from browsing; and

- i) *the extent to which habitat is likely to be removed or modified as a result of the action proposed, and*
- ii) *whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and*
- iii) *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.*

The Common Blossom Bat is highly mobile and will be able to fly across the site. The proposed development will not result in any known habitat becoming isolated from currently interconnecting or proximate areas of habitat for the species.

The area proposed for clearance is not a significant area of known habitat. Rather it is an area of regrowth shrubland that provides some opportunity for foraging by the species. The vegetated area proposed for clearance is small and in poor condition in comparison with the areas that have been conserved and replanted in the Casuarina Beach Estate. It is also small in comparison with the areas within the locality that provide habitat for the species.

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



No critical habitat has been declared in the area.

- f) *whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan*

No threat abatement plan is relevant to the Common Blossom Bat. No recovery plan has been prepared for this species. However the DEC recommends the following actions to assist in its recovery:

- Control of serious coastal weed species such as Bitou Bush;
- Protect areas of littoral rainforest, coastal heath and paperbark swamp;
- Plant Common Blossom-bat feed trees such as local species of banksia, bottlebrush and Paperbark; and
- Initiate and support rainforest and heath regeneration projects.

The Casuarina Beach Estate development has entailed all of the above works in substantial areas that will be conserved in the long term. As such the proposed Town Centre development forms part of a larger development that is entirely consistent with the aforementioned recommendations.

Recent changes to the TSC Act have initiated priority actions and recovery strategies for this species. At this stage, no priority actions have been identified for this species.

Littoral Rainforest and Swamp Sclerophyll Forest in the study area are not being directly affected by the development. A wide range of feed trees will be retained in the study area which

can provide foraging habitat for this species. As such, the development is consistent with priority actions for the Common Blossom Bat.

- 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*

Clearing of native vegetation which results in habitat loss is a listed Key Threatening Process (KTP) under the TSC Act³. However, the loss of the disturbed regenerating shrubland habitat through clearing will be balanced by the conservation and rehabilitation of the coastal strip and land added to Cudgen Nature Reserve, together with the areas of compensatory plantings.

Invasion, establishment and spread of Lantana⁴ is also listed as a KTP under the TSC Act⁴. Lantana (*Lantana camara*) readily invades disturbed sites and communities, including various types of rainforest and dry rainforest. In woodlands and open forests Lantana can become the dominant understorey species and dense Lantana thickets suppress less competitive native vegetation. Lantana can also alter fire regimes (frequency and intensity). Lantana has been identified as a threat to various threatened species in NSW. The proposed development is unlikely to lead to further increases in lantana infestations. Lantana control is proposed within the riparian zone. However Lantana may increase in some sectors if not controlled.

Conclusion

There will be very minor impact on potential foraging habitat for this species and such habitat is well represented on the subject land and in the study area. The overall conservation of native vegetation and provision of compensatory plantings is likely to aid the long term survival of the existing Common Blossom Bat population and has potential to facilitate an increase in the size of that population. No significant impacts on the local population of this species are likely.

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