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Biodiversity Assessment Report

Lot 406 // DP 1061103, Sunshine Bay, NSW

Proposed Modification Application (MP05-0029), Sunshine Bay Sub-Division

Prepared for: urPlan Consulting

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Glossary and abbreviations

Acronym	Description
BAM	Biodiversity Assessment Method
BC Act	NSW *Biodiversity Conservation Act 2016*
BC Reg	NSW *Biodiversity Conservation Regulation 2017*
BOS	Biodiversity Offset Scheme
DA	Development Application
DECCW	Department of Environment, Climate Change and Water (now OEH)
D-G	Director-General
DotEE	Department of the Environment and Energy
DPE	NSW Department of Planning and Environment
EEC	Endangered Ecological Community
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
ha	hectare(s)
IBRA	Interim Bio-regionalisation of Australia
km	kilometre
LGA	Local Government Area
masl	Metres above sea level
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
PCT	Plant Community Type
Subject land	Lot 406 // DP1061103, Freycinet Drive, Sunshine Bay NSW
*	Denotes exotic species
†	Denotes both native and exotic

1 Introduction

1.1 Purpose of report and legislative context

This Biodiversity Assessment Report has been undertaken to accompany a proposed Modification Application (MP05-0029) to be assessed under Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), and relates to the subdivision of Lot 406 // DP 1061103, Freycinet Drive, Sunshine Bay, NSW 2536 (the project). The purpose of this report is to identify and assess the flora and fauna within the subject land and to identify potential ecological values and constraints that may affect the proposed modification application. This report addresses the legislative context provided in (**Table 1.1**). The proposal is to be assessed under Part 4 of the EP&A Act.

Table 1.1: Legislative framework addressed in this report

Instrument	Considerations	Context
Commonwealth		
Environment Protection and Biodiversity Conservation (EPBC) *Act 1999*	Matters of National Environmental Significance	An action will require approval from the Minister if the action has, will have, or is likely to have, a significant impact on a matter of national environmental significance.
State (New South Wales)		
Biosecurity Act 2015	Priority weeds	Describes the state and regional priorities for weeds in New South Wales.
Environmental Planning and Assessment (EP&A) *Act 1979*	Section 5.7	Requires Council to assess whether an activity is likely to significantly affect the environment.
Biodiversity Conservation Act 2016	Part 4, Divisions 2 and 5	Lists threatened species, populations, ecological communities to be considered against s7.3 of the BC Act (i.e. Test of Significance).
Local		
Eurobodalla Local Environment Plan	Part 6: Biodiversity, riparian lands and wetlands	Provides measures for consideration regarding the protection of biodiversity, riparian lands, and wetlands

1.2 Background

The Sunshine Bay subdivision is an on-going stage of the existing Sunshine Bay residential development, being a Major Project under consent MP05-0029 dated 6 June 2010 (under Part

3A, EP&A Act, now repealed). This consent provided for the development of 138 residential lots and associated civil works, drainage areas, pumping station and reserve land and is currently under construction. Conditions of consent were outlined in the DGRs and the Department of Planning and Environment (DPE) approval, documentation and are provided in **Section 2.2**.

It is understood that the original layout included areas of reserve land that, as a condition of consent, were to be dedicated for Eurobodalla Council ownership and control upon completion of the subdivision. One of these areas is the subject of this report and comprises a small ephemeral gully which had its inception and conjunction within the development area. Proposed changes to the original lot layout, initiated by the developer and Council, will be the in-filling of this gully allowing the addition of five new allotments.

Following discussions between DPE, Council and the developer, Council advised they do not wish to retain and take control of this area upon completion of the subdivision. The transfer of the land from reserve to development land will thus require removal of an area of retained vegetation and the subsequent in-filling of this small gully.

In preparing documentation for the proposed Modification Application, urPlan Consulting sought advice from the Land Management and Biodiversity Conservation (LMBC) service centre of the NSW Office of Environment and Heritage (OEH). Given the recent changes to environmental legislation, the OEH advised urPlan Consulting of the following:

- *The Biodiversity Conservation Act (BC Act) requires that the original development as proposed to be modified is to be used to determine whether the biodiversity offset scheme applies (as per Section 7.17(2)(b) of the Act and Clause 30 of the Biodiversity Conservation (Savings and Transitional) Regulations 2017). This means that the cumulative footprint, (and other impacts on threatened species, ecological communities and their habitats of the original development), all prior approved modifications and the proposed modification are to be considered when applying the biodiversity offset scheme threshold and the test of significance. This applies whether the approved impacts have already occurred of not. Information to be addressed included:*
    - *Outline available information concerning the original impact (from the original development and all prior approved modifications);*
    - *Identify original offset requirements (from the original development and all prior approved modifications);*
    - *Identify those requirements that have been discharged;*
    - *Provide an assessment, in accordance with the Biodiversity Assessment Method (BAM) of any new biodiversity impacts that result from the modification; and*
    - *Identify offset requirements and any new measures to avoid and minimise impacts in accordance with the BAM.*
- *Where the biodiversity offset scheme does not apply to the development as proposed to be modified, a biodiversity development assessment report is not*

required. The application for modification must be supported by evidence that the biodiversity offset scheme does not apply, including a test of significance.

This report presents a background to the original approved development, describes the site, outlines a background of the development (and answers information requested by OEH), assesses whether the Biodiversity Offset Scheme (BOS) applies to the development as proposed to be modified, and provides the results of the biodiversity assessment undertaken for the proposed modification development works.

1.3 Location and site identification

1.3.1 Site description

For the purposes of this report, the site is identified as follows:

The **subject land** covers a total area of 17.11 ha located within Lot 406 // DP 1061103, Freycinet Drive, Sunshine Bay, NSW 2536 (**Figure 1.1**). The subject land is situated in the Eurobodalla Shire Local Government Area (LGA), and currently comprises land containing woodland vegetation within two drainage reserves, and cleared land for the development of a 138 lot subdivision and public reserve.

The subject site is defined as the area directly impacted upon by the proposed modification application. It includes approximately 0.212 ha of vegetation within a small drainage reserve (**Figure 1.1**).

1.3.2 Local area

Provided below are details relating to the subject land and include the relevant NSW landscape regions (Mitchell Landscapes) and other features, such as rivers, streams, estuaries, wetlands, habitat connectivity.

Within 5 km of the study area the local area contains native vegetation (43.6%), mostly found to the west of the subject land becoming more fragmented in and around the coastal development areas including Sunshine Bay (**Figure 1.2**).

The subject site and subject land occur in only one NSW Mitchell Landscape, being the *'Clyde Valley Foothills*' (Mitchell Landscapes V3).

Two drainage lines are mapped within the subject land, both being first order streams. The northern drainage line flows in a westerly direction and is located within the subject site. The southern drainage line flows in a north westerly direction within the subject land. Both drainage lines enter into a constructed retention basin located on the eastern side of Freycinet Drive, developed as part of the Sunshine Bay Subdivision works. Water flow exiting the retention basin is via piping under Freycinet Drive, and then through a drainage easement eventually linking to Short Beach Creek located west of George Bass Drive. The riparian buffers associated with drainage lines are shown in **Figure 1.1**. Under the Eurobodalla LEP, both these watercourses are identified as Category 2 watercourses which require a 20 m buffer zone from the top of bank.

No wetlands are present within the subject land. The nearest wetland to the subject land is a linear coastal estuarine wetland associated with an un-named north-flowing creek located approximately 850 m north-east of the subject land. The larger estuarine wetlands of McLeods Creek and Pelican Inlet (associated with the Clyde River) are located approximately 5 and 6 km north-west of the subject land, respectively.

The Eurobodalla Local Environment Plan (ELEP 2012) provides a Terrestrial Biodiversity Map indicating endangered ecological communities, extant native vegetation and biocorridors. The subject land is not identified as having endangered ecological communities present or as being part of a recognised biocorridor or habitat corridor under the ELEP Terrestrial Biodiversity Map.

Figure 1.1: Site Location

Figure 1.2: Mapped native vegetation within 5 km of the study area (Tozer et al 2010)

1.4 Description of the proposed development

The proposed Development Modification application includes the transfer of land (the subject site), originally set aside as a vegetated drainage reserve, back to the developer as mutually agreed by Council, the DPE and the developer. Discussions were initiated with Council in December 2017 on the basis of the following:

- Some trees were removed as a result of clearing being carried out adjacent to the subject site for road construction and APZ establishment;
- The construction of Brooke Way, upslope of the subject site, has altered the natural gully flow. Overland flow is intercepted from the watershed and drains into the road stormwater network.
- That the landform is further diminished in length leaving the natural intermittently flowing gully with a lead length from Brook Way to the engineered detention/infiltration pond of less than 80 m.
- The subject site will leave a legacy of high maintenance costs for Council into the future and due to the high embankments and topography it was argued that it will be an eyesore and waste urban land.
- Council's Dedication of Land Policy on unstructured public open space - public ownership is usually a last resort choice, unless the land has community and environmental benefits including (but not limited to) significant environmental features, cultural landscapes, significant views, and assists in adaptation to inundation from flooding. Eurobodalla Shire Council encourages land owners and developers to find the best and most innovative use and ownership of these lands having regard to the particular circumstances of each case.

The subject land is zoned R2 Low Density Residential under the Eurobodalla Local Environmental Plan LEP (2012). Land zonings are similar to the north, east and south, and R5 Large Lot Residential areas are located to the west subject land. Several E2 Environmental Conservation Reserves are also present to the east and north with one adjoining the land, located on the south-eastern boundary. The objectives of each of these zones are outlined in the LEP.

1.5 Determining BAM thresholds

The Biodiversity Conservation Regulation 2017 sets out two threshold levels for when the BOS will be triggered, and if either of these two thresholds are triggered, the BOS applies. Details of these threshold limits are provided in **Appendix 1** (OEH 2018b).

The threshold has two elements:

- whether the impacts occur on an area mapped on the Biodiversity Values Map published by the Minister for the Environment, and
- whether the amount of native vegetation being cleared exceeds a threshold area.

For the Sunshine Bay subdivision modification application, neither of these two thresholds apply to the development as proposed to be modified as:

- the subject land is not identified on the Biodiversity Values Map, and
- the vegetation to be cleared on the subject land does not exceed the area threshold of 0.25 ha as the proposed lot sizes are less than 1 ha (**Appendix 1**).

As such, the BOS does not apply to the proposed Modification Application (MP05-0029).

2 The Development - original impacts and offsets

Approval for the Sunshine Bay subdivision was grated in June 2010 subject to requirements and conditions as provided by Director General and the Planning Approval and in consultation with other agencies including the then Department of Environment, Climate Change and Water (DECCW). A summary is provided below.

The proposed subdivision of Lot 406 // DP 1061103, approved under Part 3A Major projects (State Significant Project consent MP05_0029), represents a further stage of the Sunshine Bay Estate that has been developing since the mid-1980s. The development was for a 138 lot residential subdivision on land having an area of approximately 17 ha, most of which was covered by native vegetation (**Figure 2.1**).

A number of specialised studies were undertaken to inform the subdivision design and address environmental issues of the proposed development and these were included in the Environmental Assessment (EA) prepared by Planning Initiatives in August 2009. Key biodiversity issues to be addressed included impacts to threatened flora, fauna, aquatic species and riparian vegetation and were provided in the following reports appended to the EA:

- A Flora and Fauna Assessment was completed by PMA consulting in September 2003.
- A Biodiversity Assessment Addendum was completed by NGH Environmental in August 2007.
- An Analysis of Fauna Movement Corridors was completed by NGH Environmental in 2008.

Prior to development approval, the subject land was described as vacant land covered with an open eucalypt forest which had previously been subjected to selective logging and under-scrubbing, had been fire affected, and use by trail bikes and four-wheel drives was evident. The land had apparently been cleared in the past and that most trees on site were of young to medium aged growth. The site was largely disconnected from neighbouring vegetated areas as a result of residential development, roads and an easement that runs along the western boundary of the property (Planning Initiatives 2009).

2.1 Consultant findings and recommendations

PMA Consulting and NGH Environmental conducted the flora and fauna and biodiversity assessments and the findings and conclusions of these reports were as follows:

- Although disturbed, the subject land provided foraging area for a number of species, in particular birds.
- Five fauna species of conservation significance were detected on the subject land, utilising it for foraging: Powerful Owl (*Ninox strenua*) and the microchiropteran bats Eastern Freetail Bat (*Mormopterus norfolkensis*), Large-footed Myotis (*Myotis macropus*), Greater Broad-nosed Bat (*Scoteanax rueppellii*) and the Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*).

- The subject land did not contain high-quality habitat apart from large hollow-bearing trees situated to the east of the subject land within a public reserve.
- The subject land was neither potential or core Koala (*Phascolarctos cinerea*) habitat (SEPP44).
- No Yellow-bellied Glider (*Petaurus australis*) were recorded on the subject land. Consideration was given to Council's Policy for the Conservation of the Yellow-bellied Glider.
- Vegetation on the subject land was identified as the Spotted Gum - Blackbutt open forest consistent with 'Forest Ecosystem 21: Northern Foothills Moist Shrub Forest (NPWS 2000). This community was considered to be reasonably common on a regional and local basis.
- Floristic diversity was considered reasonably high across the subject land although other biodiversity values were considered low
- Ecological integrity of the site was compromised by disturbance (selective logging and felled trees, under-scrubbing, vehicular damage to ground layer, mechanical damage to trees).
- Removal of trees should only occur between February and August to avoid breeding seasons of bats, most birds and other fauna.
- The vegetated drainage reserves should be protected to maintain current integrity - no vegetation to be pushed or dumped into these areas and implement a sediment control plan.
- Any trees to be retained should include *Corymbia maculata* (Spotted Gum) as this species may provide winter food source
- Evidence of weed invasion was limited and together with regrowth in the understorey, including eucalyptus regeneration, the site was considered to have relatively good resilience.
- Although a number of threatened flora species were recorded within 10 km of the subject land (NGH 2007), no threatened flora species were detected on site. Consideration was given to *Correa baeuerlenii* (Chef's Cap Correa) and targeted searches were undertaken for this species.

The Test of Significance undertaken for threatened fauna species indicated that the proposed residential development should not have a significant impact on threatened species, populations or communities or their habitats, and that those species detected on the subject land are likely to be able to maintain their populations in the area.

2.2 Director-General's Report

2.2.1 Flora and fauna offsets

The Director-General (D-G) acknowledged that the Sunshine Bay subdivision proposal as, advertised, included the removal of approximately 15 ha of regenerating Spotted Gum and Blackbutt Forest, as well as the removal and infill of the smaller of the two ephemeral drainage

lines (the subject site). The report also acknowledged the findings of the DPE and DECCW that the Environmental Assessment submitted in support of the proposed development neither met, nor considered, the maintain and improve principle in accordance with Part 3A Threatened Species Assessment guidelines.

However, on the basis that the proposed development was an infill development zoned for residential expansion for 11 years, and that the site did not contain any threatened flora species or endangered ecological communities, the proposal was approved by the D-G following an amendment to the subdivision layout. This requested amendment was to modify the proposed layout to retain the smaller drainage line (the subject site) and its associated vegetation to preserve additional foraging resources and to meet the objectives of water sensitive urban design, to be compliant with Eurobodalla's Residential Design Code, and the Eurobodalla Settlement Strategy. The proponents Principal Project Requirements apparently addressed this issue. The development of a bush regeneration plan was also a condition of approval aimed to encourage the natural regeneration of the drainage reserves and to maintain them free of weeds.

2.2.2 Landscaping

The D-G report acknowledged that a landscape plan was prepared as part of the DA, which proposed landscaping works within the larger ephemeral drainage line dissecting the site. As part of the approval, the landscaping plan was to be amended such that landscaping within the reserve areas to be only within those areas affected by cut and fill, and that only endemic species to the site are to be used. The bush regeneration plan was to inform the landscaping onsite.

Figure 2.1: Development footprint

3 The Development - proposed modification application

As discussed in **Section 1.1** the subject site comprises a small ephemeral gully with retained vegetation. The proposed modification application is the in-filling of this gully allowing the addition of five new allotments. **Figure 3.1** illustrates the clearing areas and position of the new allotments under the proposed modification application.

The following section provides details of the vegetation and identifies the PCTs within the subject site subject land.

3.1 Methods

3.1.1 Literature and data base review

A site specific literature and database review was undertaken prior to undertaking field survey and the preparation of this report. This included a review of previous DA biodiversity assessment reports, desktop analysis of aerial photography and regional scale resources from the following sources:

- Original DA documentation, DPE Approvals and DGRs for MP05-0029, June 2010
- Previous Flora and Fauna Assessments (PMA Consulting 2007, NGH Environmental, 2007, 2008)
- NSW Planning Portal (NSW Dept. of Planning and Environment 2018)
- BioNet Atlas of NSW Wildlife (NSW Office of Environment and Heritage 2018a)
- Protected Matters Search Tool (Commonwealth Department of the Environment and Energy 2018)
- Native vegetation of Southeast NSW: a revised classification (Tozer et al 2010))
- Near earth imagery (2018)
- SIX Maps (LPI 2018)

Threatened species, populations and migratory species recorded or with potential to occur within 5 km of the study area were identified in a search of the Atlas of NSW Wildlife (OEH 2018a) and the EPBC Protected Matters Search Tool (DotEE 2018). Results from these database searches were consolidated and their likelihood of occurrence was assessed by:

- Review of location and date of recent (<5 years) and historical (>5-20 years)
- Review of available habitat within the subject land and surrounding areas
- Review of scientific literature pertaining to each species and population
- Applying expert knowledge of each species

The potential for threatened species, populations and/or migratory species to occur was then considered and the necessity for targeted field surveys was determined. Following field survey and review of available habitat within the study area, the potential for species to utilise the site and to be affected directly or indirectly by the proposal were considered as either:

- "Recent record" = species has been recorded in the study area within the past 5 years
- "High" = species has previously been recorded in the study area (>5 years ago) or in proximity to (for mobile species), and/or habitat is present that is likely to be used by a local population
- "Moderate" = suitable habitat for a species is present onsite but no evidence of a species detected and relatively high number of recent records (5-20 years) in the locality or species is highly mobile
- "Low" = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively low number of recent records in the locality
- "Not present" - suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the study area

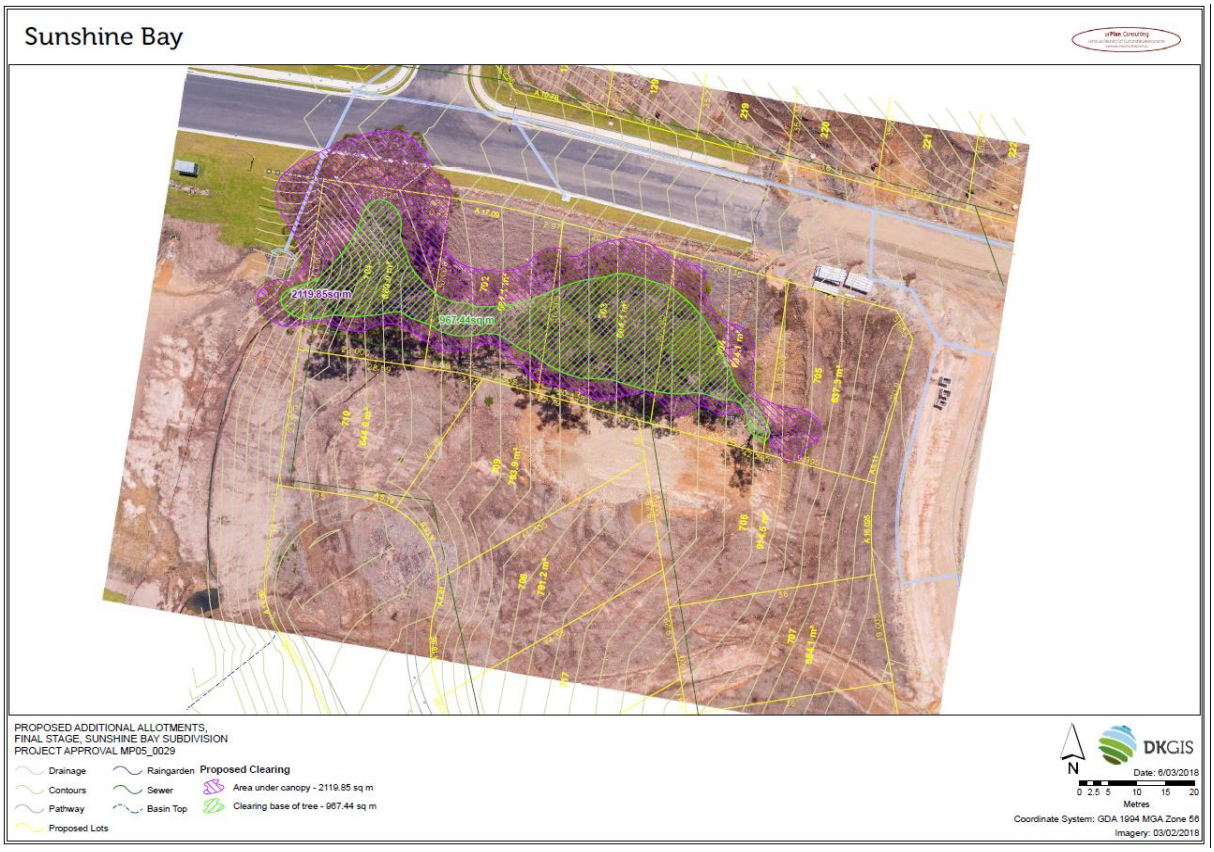

Figure 3.1: Proposed modification and clearing areas (provided by urPlan Consulting)

3.1.2 Field Survey

Assessment and mapping of Plant Community Types (PCTs) was undertaken on 28 August 2018 by Elizabeth Norris (Senior Ecologist/Botanist) and Justin Merdith (Ecologist) over approximately 6 hours. Vegetation within the subject land was traversed to identify the vegetation structure and dominant species within patches of native vegetation, to identify any boundaries between potential PCTs and to identify and validate vegetation on the subject land. Weather conditions on the day were sunny with clear skies and moderate south-easterly winds (**Table 3.1**).

Table 3.1: Daily weather observations at Batemans Bay Meteorological Station (069134), approximately 5 km north west of the subject land

Date	Temperatures °C		Rain (mm)	Max Wind		
	Min	Max		Direction	Speed	Time
11/9/2018	11.9	24.0	0	SSE	35	11:59

The floristics the PCTs were then sampled within a 20x20 m plot-based floristic vegetation survey, consistent with the BAM method (Section 5.2.1.9 of the BAM). The location of the floristic vegetation plot was based upon a representative area within the subject site and avoided, where possible, edge effects (i.e. located close to edges of vegetation extent).

The identification of potential PCTs was in accordance with the NSW PCT classification as described in the BioNet Vegetation Classification. Determination of the most appropriate PCTs for vegetation communities within the study area used the BioNet Vegetation Classification database to identify PCT types which matched the geographic distribution (based upon IBRA subregions), vegetation formation and floristics of vegetation within the subject land. The data for each potential PCT including vegetation formation, descriptive attributes and distribution information were then reviewed to determine the most appropriate PCT for vegetation within the subject land. Previous mapping was also taken into consideration when identifying PCTs on the subject land (Tozer et al 2010).

3.1.3 Flora

Flora species were recorded through the collection of both floristic plot data and opportunistic observations whilst traversing the subject site and area. Nomenclature follows the Flora of NSW (Harden 1990-2002) and updates provided in PlantNET (RBGDT 2018).

Targeted surveys for threatened flora species were conducted in accordance with the NSW Guide to Surveying Threatened Plants (OEH 2016). Targeted surveys for threatened flora were undertaken on 11 September 2018 by Elizabeth Norris (Senior Ecologist) within the vegetated areas of the subject land. Targeted surveys initially involved identification of areas of potential habitat for threatened flora species within the subject land.

3.1.4 Fauna and fauna habitat

Incidental observations of fauna were noted during the field survey. Targeted surveys for microchiropteran bats was undertaken using an ultrasonic call recording device (Anabat Express) over three nights (11, 12 and 13 September) in accordance with the DEC (2004) guidelines. Fauna habitat searches were conducted for potential foraging, roosting, breeding or nesting habitat of nocturnal and diurnal species. This includes inspection for the presence of tree hollows, stags, bird nests, possum dreys, decorticating bark, mature / old growth trees, food trees (e.g. winter-flowering eucalypts), as well as any culverts, riparian areas and refuge habitats of man-made structures that may occur on site.

Primary sources of literature accessed for species nomenclature were:

- Birds - Christidis and Boles (2008)
- Mammals - Van Dyck and Strahan (2008), Churchill (2008)
- Reptiles and amphibians - Cogger (2014)

3.1.5 Survey limitations

The flora survey aimed to record as many species as possible. However, a definitive list of the flora within the subject land and subject site cannot be gathered without systematic traverses and survey across several seasons. Additional species would be recorded during a longer survey over various seasons. Further, ongoing earthmoving works on the subject land limited access to the upper section of the large retained vegetation along the southern drainage easement. However, the techniques used in this investigation are considered adequate to gather the data necessary to validate the vegetation communities and vegetation condition in the subject land, and detect any threatened flora.

A full fauna survey following Threatened Species Survey and Assessment Guidelines (DEC 2004) was not undertaken as sufficient detail to determine the likelihood of occurrence of threatened and migratory species for the purpose of this report was achieved through habitat assessment during the field survey.

4 Results

4.1 Plant community types (PCTs) and threatened ecological communities

Review of previous vegetation mapping (Tozer et al 2010) identified only one native vegetation community as having been previously mapped within the subject land, 'Batemans Bay Cycad Forest' (p90), which was mapped across the full extent of the subject land and adjoining areas. The 'Batemans Bay Cycad Forest' corresponds to PCT 1220 Spotted Gum - White Stringybark - Burrawang shrubby open forest on hinterland foothills, northern South East Corner Bioregion. The 'Batemans Bay Cycad Forest' vegetation community, as described by Tozer et al (2010) does not correspond to any Threatened Ecological Communities (TECs) listed under the BC Act or the EPBC Act.

A review of previous reports undertaken for the Sunshine Bay subdivision identified the following vegetation community occurring across the subject land: Forest Ecosystem 21: Northern Foothills Moist Shrub Forest - *C. maculata -E. pilularis*' as described in Terrestrial Ecosystems of the Eurobodalla LGA (NPWS 2000) (PMA Consulting 2005, NGH Environmental 2007).

A review of the floristic plot-based data collected from the subject land and other areas of native vegetation inspected on site indicated that PCT 1206 was more consistent with the vegetation identified on site, and which supports the findings of PMA Consulting (2005) and NGH Environmental (2007), and was equivalent to the Southern Lowland Wet Forest (p104) described by Tozer et al (2010).

A summary of the equivalent PCTs, vegetation communities (Tozer et al 2010) and TECs are summarised in **Table 4.1**.

Table 4-1: Corresponding vegetation communities, PCTs and TECs

Vegetation communities (Tozer et al 2010)	Plant Community Types (PCTs)	Threatened Ecological Communities (TECs)	
		BC Act	EPBC Act
Batemans Bay Cycad Forest (p90)	PCT 1220 Spotted Gum – White Stringybark – Burrawang shrubby open forest on hinterland foothills, norther South East Corner Bioregion	Not listed	Not listed
Southern Lowland Wet Forest (p104) and identified on site	PCT 1206 Spotted Gum – Blackbutt shrubby open forest on the coastal foothills, southern Sydney Basin and Northern South East Corner Bioregion	Not Listed	Not Listed

4.2 Vegetation of the subject land

Extant vegetation within the subject land was located along the two drainage reserves and was dominated by a canopy of *Corymbia maculata* (Spotted Gum) and *Eucalyptus pilularis* (Blackbutt) with the occasional *Eucalyptus paniculata* (Grey Ironbark) present.

The shrub layer of these drainage reserves commonly included *Elaeocarpus reticulatus* (Blueberry Ash), *Acacia longifolia* subsp. *longifolia* (Sydney golden wattle), *Acacia irrorata* subsp. *irrorata* (Green wattle), *Breynia oblongifolia* (Coffee bush) and *Acacia longissima* (Long-leaf wattle), *Leucopogon juniperinus* and the occasional *Macrozamia communis* (Burrawang). Exotic shrub species were not recorded.

Commonly observed native understorey species included *Lepidosperma urophorum*, *Pteridium esculentum* (Common Bracken), *Calochlaena dubia* (Rainbow Fern), *Dianella revoluta* (Blue Flax-lily), *Lomandra longifolia* (Spiny-headed Mat-rush), *Entolasia stricta* (Wiry Panic) and *Microlaena stipoides* (Weeping Grass).

4.3 Vegetation of the subject site

Within the subject site, the vegetation was found to be in a modified and disturbed condition as a result of the spreading of mulch across the soil surface, the installation of bunds and deposited timber along the drainage line and assorted household rubbish (**Figures 4.1** to **4.4**). Canopy species were dominated *Corymbia maculata* (Spotted Gum) and *Eucalyptus pilularis* (Blackbutt) with one *Eucalyptus paniculata* (Grey Ironbark) and one *Eucalyptus globoidea* (White Stringybark). The shrub layer was generally sparse with some areas of the ground layer, particularly at the edges of the subject land, covered by a dense layer of chipped vegetation. Few exotic ground layer species were recorded but included *Lysimachia arvensis* (Scarlet Pimpernel), *Gamochaeta* sp. and *Hypochaeris radicata* (Catsear) all occurring in low abundance (**Figure 4.1** and **Figure 4.2**).

The drainage line contained several earth and timber bunds most likely installed to slow water flow. Sediment build-up has occurred upslope of these bunds, and rubbish and litter were also present. The upslope end of the drainage line had been truncated by the development of road access as part of the approved subdivision planning (**Figures 4.1** to **4.4**).

4.4 Flora species

A total of 64 flora species were identified on the subject land during the field survey, of which 61 were native and five were exotic (**Appendix 2**). Many of the shrub and the ground layer species recorded where young and regenerating.

4.5 Fauna habitat

The subject site contained minimal habitat components, which may provide refuge for a small diversity of native fauna (**Table 4.2**):

- Woodland
- Tussock grasses and sedges

- Areas of woody debris

The subject site contained one hollow bearing tree; a *Corymbia maculata* containing one small hollow that may provide habitat for microbats and other fauna. No stag trees were recorded. The single hollow bearing tree was located within the subject site and will be removed as part of the proposed subdivision. Several piles of course woody debris (refer **Section 4.1.3**) occurred along the drainage line and may also provide minor habitat.

Overall, the value of the habitat in the study area was minimal, however, it may provide potential occasional foraging habitat for species that rely on large areas for food resources, particularly microbats and Grey-headed Flying-fox (*Pteropus poliocephalus*).

Table 4.2: Key fauna habitat features across the subject site

Habitat features	Fauna species
Woodland	Diurnal and nocturnal birds, arboreal mammals and microchiropteran bats
Tussock grasses and sedges	Birds, microchiropteran bats and reptiles
Coarse woody debris	Refuge for reptiles, invertebrates, birds and mammals

4.6 Fauna species

The field survey undertaken for this report recorded a total of nine fauna species: seven microchiropteran bats (four definite species and three possible species), one bird and one amphibian (**Appendix 3**). Excluding two species of microchiropteran bats, no threatened fauna species were recorded during the field survey. The low incidence of fauna sightings were most likely attributable to the small area of the subject site and impacts to the immediate ground layer as described in **Section 4.1.3** and the adjoining cleared development site (**Figures 4.1** to **4.4**).

4.7 Threatened species, populations and migratory species

A search of relevant databases and literature identified a potential 42 threatened or migratory species including four threatened flora species and 38 threatened fauna species (20 birds, seven microbats, one megabat, three amphibians, and seven marsupials recorded within 5 km of the study area (**Figure 4.5**).

The likelihood of occurrence analysis undertaken prior to the field survey reduced the primary list to nine threatened species that have a 'moderate' potential to use the study area, and thus may be impacted by the proposed works (**Appendix 4**) including:

Microchiropteran bats:

- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)
- *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat)
- *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat) - recorded on site

- *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

Large forest owls:

- *Ninox strenua* (Powerful Owl)
- *Tyto novaehollandiae* (Masked Owl)

Figure 4.1: Subject site - view upslope along drainage line

Figure 4.2: Subject site – view downslope along drainage line

Figure 4.3: Northern side of the drainage easement within the subject site

Figure 4.4: Southern side of the drainage easement within the subject site

4.7.1 State Environmental Planning Policy No. 44 (SEPP 44) - Koala Habitat Protection

State Environmental Planning Policy applies to land that was listed in Schedule 1 of SEPP 44, and that has:

- *Has an area of more than 1 ha, or*
- *Has, together with any adjoining land in the same ownership, an area of more than 1 ha, whether or not the development application applies to the whole, or only part, of the land.*

The subject land is in Eurobodalla LGA which is listed in Schedule 1 of SEPP 44 and is >1 ha, hence the SEPP 44 has been applied to the subject site.

To conclude if a development consent can be granted using SEPP 44, a two-step assessment is required:

> *Step 1: Is the land potential Koala habitat (where potential Koala habitat means 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)?*
>
> The subject land did not contain any feed trees currently listed under Schedule 2 of the SEPP, therefore, did not constitute potential Koala habitat.

Step 2: Is the land core koala habitat (where core Koala habitat means 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 historical records of a population)?

There were no historical or recent records of the Koala in the locality (10 km) and no signs of Koala were recorded within the study area, such as scratch marks or scats during field assessment. The vegetation in the subject land was fragmented and situated a substantial distance from intact bushland. Therefore, the land did not constitute core Koala habitat, and the study area was substantially fragmented and unlikely to be used by the Koala.

4.7.2 Targeted field surveys - flora

Survey effort for threatened flora is shown on **Figure 4.6**. No threatened flora species listed under the BC Act or EPBC Act were recorded in the subject land.

4.7.3 Targeted surveys - fauna

There were no obvious areas of greatest potential activity for microchiropteran bats in which to locate call detectors, such as in the vicinity of potential roost sites, flyways or near watering points. The call detector was located within and close to the western edge of the subject site adjacent to the established retention basin in an attempt to record any bats foraging on the margins of the patch of vegetation within the subject land (**Figure 4.6**). Weather (temperature and rainfall) conditions for the two nights of survey, as recorded from the Batemans Bay Meteorological Station (station 069134; BOM 2018), which is located approximately 5 km north of the subject land, are summarised in **Table 4.3**.

Table 4.3: Weather conditions during the survey period, as recorded Batemans Bay Meteorological Station

Date	Temperatures °C		Rain (mm)	Max Wind		
	Min	Max		Direction	Speed	Time
11/9/2018	12.1	24.4	0	Calm	-	9.00 am
12/9/2018	11.9	N/A	0	NNW	28	9.00 am
13/9/2018	N/A	N/A	0	N/A	N/A	N/A

Over the three survey nights, calls of microchiropteran bats were infrequent, however, four species were recorded positively including the vulnerable Eastcoast Freetail Bat (*Mormopterus norfolkensis*), and a further four species were considered possible including the vulnerable Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*) (**Table 4.4**).

The low level of microchiropteran bat activity within the subject land and subject site is most likely due to the now cleared vegetation across the entire site, with better quality habitat available within the surrounding areas including the bushland to the west of the subject land. Nonetheless, based upon the surveys undertaken and the modified habitat available, the

subject site is not identified as crucial habitat for Eastcoast Freetail Bat, Eastern Bentwing Bat and other microchiropteran species.

Table 4.4: Microchiropteran bats recorded within and adjacent to the subject site

Species	Common name	Definite	Possible
Chalinolobus gouldii	Gould's Wattled Bat	x	x
Mormopterus (Micronomus) norfolkensis	**Eastcoast Freetail Bat**	x	x
Miniopterus schreibersii oceanensis	**Eastern Bentwing Bat**		x
Nyctophilus sp.	Long-eared Bat	x	
Ozimops ridei	Eastern Freetail Bat	x	x
Scotorepens orion	Eastern broad-nosed Bat		x
Vespadelus darlingtoni	Large Forest Bat		x

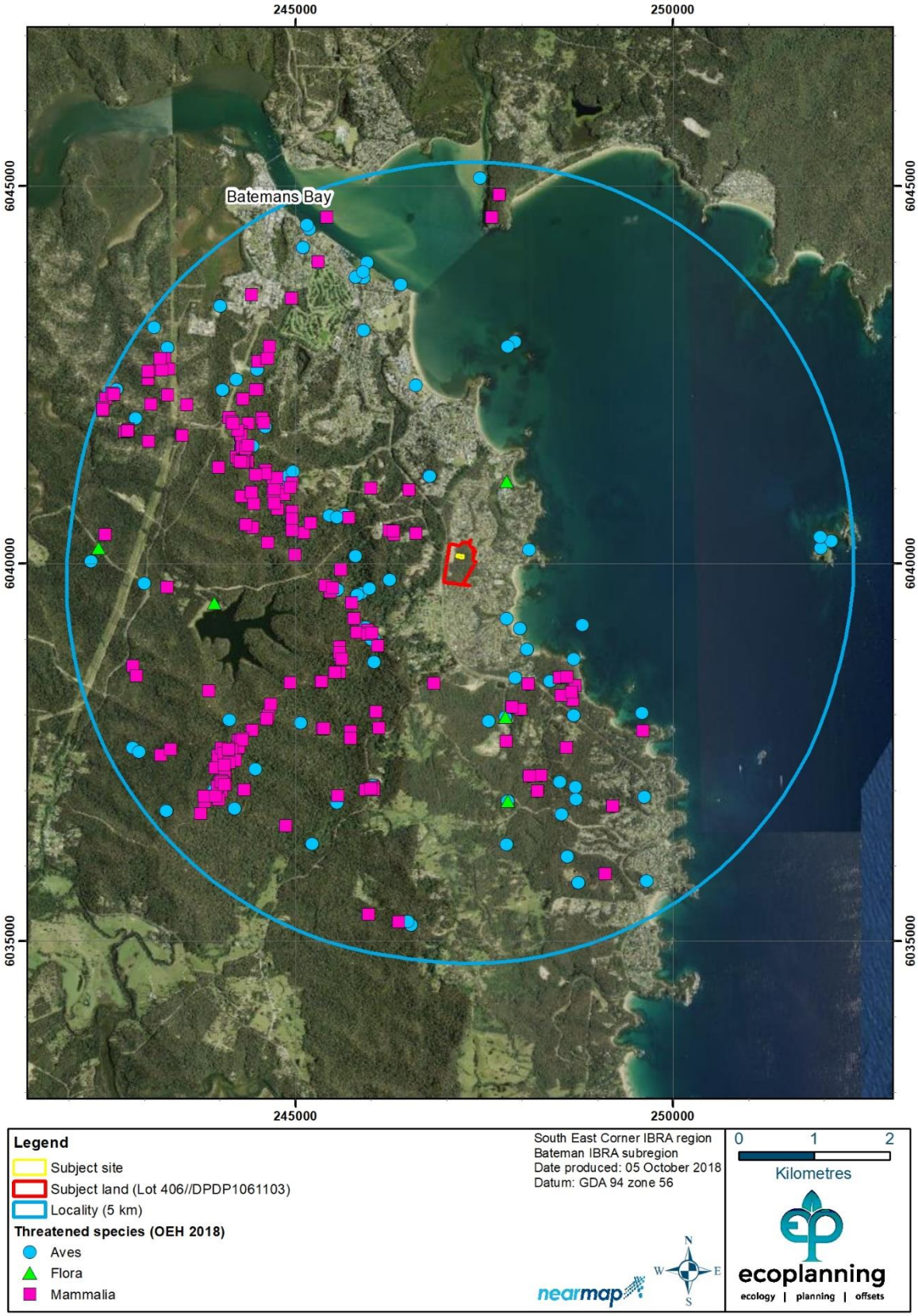

Figure 4.5: Threatened species records (OEH 2018a)

Figure 4.6: Validated vegetation and field survey details

5 Impact assessment

This section outlines the anticipated direct and indirect impacts of the proposed modification application development on the ecological values of the subject site.

5.1 Direct impacts

5.1.1 Vegetation clearing

A total of 0.211 ha of native vegetation, comprising Spotted Gum - Blackbutt shrubby open forest (PCT 1206) would be cleared by the modification proposal. This clearing would remove all retained vegetation within the small ephemeral gully.

5.1.2 Corridors and connectivity

The subject site is disconnected from other areas of bushland, with the closest patch being the larger ephemeral drainage reserve located approximately 60 m to the south. The subject site provides a weak linkage across the site, which will be further reduced once houses are constructed.

5.1.3 Threatened flora and ecological communities

No threatened flora species or threatened ecological communities are considered likely to occur within the subject land and, as such, no impacts are anticipated.

5.1.4 Loss of fauna habitat

The proposal will require the removal of native vegetation (approximately 0.211ha), including scattered ground layer plants and some woody debris. This includes one tree with a small hollow.

All remaining vegetation on the subject land is located within the larger vegetated drainage reserve dissecting the subject land and which provides some habitat value for native fauna species (**Figure 1.1**).

5.1.5 Threatened fauna

The subject site provides some foraging habitat for threatened microchiropteran bats and may also provide potential foraging habitat for large forest owls. However, direct impacts are likely to be low as:

- The subject site contains few habitat features; and
- Threatened fauna are not likely to be resident on the subject site

Tests of Significance was applied for the following species:

Microchiropteran bats:

- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)

- *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat)
- *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat) - recorded on site
- *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

Large forest owls:

- *Ninox strenua* (Powerful Owl)
- *Tyto novaehollandiae* (Masked Owl)

The proposed development modification would have minimal impact on the habitat values on the site. Within mitigation suggested for preserving and enhancing the retained vegetation over the subject land, it is considered unlikely that the proposed development modification would have notable impacts on any threatened fauna.

5.2 Indirect Impacts

Potential indirect impacts from resulting from the modification proposal are likely to be limited to the ongoing construction phase of the development and include:

- Noise from equipment and machinery;
- Dust and/or erosion associated with the clearing of vegetation;
- Weed invasion within retained areas of vegetation adjacent to the subject site.

Indirect impacts to the retained native vegetation adjacent to the subject site will probably be minimal as its location along the main drainage line is distant from the subject site. Given the modified nature of the subject land, and its proximity to urban roads, the proposal is considered unlikely to reduce the viability of any adjacent native vegetation or habitat due to edge effects, noise dust or light spill, or disturbance to breeding habitats.

5.3 Avoidance and mitigation

5.3.1 Vegetation clearing

A total of 0.211 ha of native vegetation consisting of Spotted Gum - Blackbutt shrubby open forest (PCT 1206) in a modified and disturbed condition will be removed under the proposal.

Areas of native vegetation that would not be subject to direct removal (areas of vegetation within the study area but outside the subject site) should continue to be protected during the construction and development phase. Indirect impacts can be avoided and minimised through correct sedimentation controls, some of which are already in place; i.e. sediment control fences.

The Bush Regeneration Plan, developed as part of the D-G conditions of approval, should continue to guide the management and enhancement of retained vegetation within the subject land.

Given the presence of one small hollow, and the lack of stags within the subject site, it is not considered necessary to have an ecologist onsite during pre-clearance. However, the site Construction Environmental Management Plan (CEMP) should include the contact details of local WIRES representatives in the unlikely event that fauna reside in the trees to be removed.

5.4 Legislative context

5.4.1 Commonwealth considerations

No matters of National Environmental Significance were identified within, or were considered likely to occur, within the study area. A referral to the DotEE is not required.

5.4.2 State considerations

Biodiversity Conservation Act 2016 (BC Act)

No EECs listed under the BC Act will be impacted by the proposal.

The following threatened species listed under the BC Act may be impacted by the proposal:

Microchiropteran bats:

- *Falsistrellus tasmaniensis* (Eastern False Pipistrelle)
- *Miniopterus schreibersii oceanensis* (Eastern Bentwing-bat)
- *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat) - recorded on site
- *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat)

Large forest owls:

- *Ninox strenua* (Powerful Owl)
- *Tyto novaehollandiae* (Masked Owl)

Impact assessment in accordance with s7.3 of the BC Act (i.e. Test of Significance) and the associated guidelines (OEH 2018c) have been undertaken. These assessments found that subject to the avoidance and mitigation measures outlined in **Section 5.3**, the impacts to threatened fauna would not be significant.

6 Conclusions & recommendations

This report has been prepared to assess the flora, fauna and habitat values, and the potential impacts on those values from the clearing of retained vegetation and the subsequent infilling of a small ephemeral gully (the subject site) on Lot 406 // DP 1061103 Freycinet Drive, Sunshine Bay, NSW.

This report has also been prepared to address the matters raised by OEH by the proposed Modification Application (MP05-0029) with regards to the impacts and offsets of the original approved DA and how these have been addressed.

6.1 Flora, Fauna and habitat values

The site inspection found that the area to be impacted (the subject site) was floristically diverse with few weed species recorded, but had experienced some impacts as follows:

- Road construction - the development of Brooke Way as part of the approved DA, truncating the gully upslope and thus diverting overland water flow into the stormwater network, and away from the remaining ephemeral drainage line;
- Edge effects to the vegetation as a result of the deposition of mulch;
- The site is small in area and is disconnected from larger, more intact areas of bushland providing a weak habitat linkage;
- The installation of bunds and woody debris along the drainage line;
- Household rubbish.

Impacts to threatened species, including their habitats, have been considered and assessed. No threatened flora species or EECs listed under the EPBC Act or BC Act were identified in the subject land during field assessment. Given the modified condition of the subject site, there is a low likelihood of any listed threatened flora species to occur.

Threatened fauna occur or have the potential to occur on the subject land, utilising the site for foraging resources, particularly for the more wide-ranging species such as birds and microchiropteran bats. Some fauna habitat will be removed under this proposal and includes some woody debris and tussocks.

Consequently, it was determined that the proposed works would be unlikely to impact upon any threatened flora or fauna species.

Matters for consideration within the subject site under the Eurobodalla LEP are Part 6.6 Biodiversity and Part 6.7 Riparian lands and watercourses.

6.2 Biodiversity Offsets Scheme

The Biodiversity Conservation Regulation 2017 sets out two threshold levels for when the BOS will be triggered, namely whether the impacts occur on an area mapped on the Biodiversity Values Map (published by the Minister for the Environment), and/or whether the area of native vegetation being cleared exceeds a prescribed threshold. For the Sunshine Bay subdivision

proposed Modification Application (MP05-2009) neither of these thresholds were met, and as such, the BOS was not triggered.

6.3 Conditions of the original approval

The original DA provided a number of conditions including several relating to biodiversity. One of the key conditions was the retention of the small ephemeral gully and its contained vegetation - the subject site. This condition was requested as an amendment to the DA, prior to approval, on the basis that the maintain and improve criteria hand not been met. At present, retained vegetation of the subject land is located along the two ephemeral drainage lines, including the subject site, and are surrounded by sediment control fencing.

Discussions between Council, the developer and the DPE have revealed that Council do not wish to take control of the subject site upon completion of the subdivision, with a suggestion the area be retained by the developer for infilling and the creation of five additional lots to the subdivision development.

6.4 Recommendations

The proposed development will directly impact on 0.211 ha of native vegetation which has been identified as PCT 1206 Spotted Gum - Blackbutt shrubby open forest on the coastal foothills. Further, some habitat values will be lost through direct impacts. Recommendations are provided below to enhance the values of the retained vegetation on the subject land, located within the larger drainage reserve, and to minimise impacts to flora and fauna as a result of the proposed Modification Application:

- Preserve where possible any trees within the subject site, in particular the large *Eucalyptus paniculata* (Grey Ironbark) adjacent to Freycinet Drive.
- Ensure the Landscape Plan makes provision for the planting of local provenance species throughout the subdivision post-construction to enhance foraging across the development area.
- Continue to maintain and preserve retained vegetation along the larger drainage reserve, following the Bush Regeneration Management Plan (a former Condition of Consent),
- Supplementary tree plantings along buffer areas of the retained vegetation to include the following local provenance species:
    - *Corymbia maculata* (Spotted Gum)
    - *Eucalyptus pilularis* (Blackbutt)
    - *Eucalyptus globoidea* (White Stringybark)
    - *Eucalyptus paniculata* (Grey Ironbark)
    - *Allocasuarina littoralis* (Black She-oak)
    - *Elaeocarpus reticulatus* (Blueberry Ash)

- Weed management - few weed species recorded, however, weed management should be implemented to prevent spread of weeds into the retained vegetation within he subject land.

With the recommendations provided above, the proposed modification application will have minimal impacts on existing habitat values, may enhance foraging values post-development, and it would be unlikely that the proposed modification application would have notable impacts on any local threatened fauna.

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Appendix A BAM thresholds

AREA CLEARING THRESHOLD

The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP).

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

Appendix B Flora species recorded

Family	Species	Common name	Opportunistic records	Native/Exotic HTE
Asteraceae	*Coronidium elatum*			N
	Gamochaeta sp.			E
	Hypochaeris radicata			E
	Ozothamnus diosmifolius			N
	Sigesbeckia orientalis			N
Bignoniaceae	*Pandorea pandorana*			N
Blechnaceae	*Blechnum cartilagineum*			N
	Blechnum neohollandicum		X	N
Casuarinaceae	*Allocasuarina littoralis*		X	N
Cyperaceae	*Lepidosperma neesii*			N
Dennstaedtiaceae	*Pteridium esculentum*			N
Dicksoniaceae	*Calochlaena dubia*	Rainbow Fern		N
Dilleniaceae	*Hibbertia aspera*			N
	Hibbertia dentata			
	Hibbertia diffusa		X	N
Elaeocarpaceae	*Elaeocarpus reticulatus*			N
Ericaceae	*Leucopogon juniperinus*		X	N
	Leucopogon lanceolatus			N
Euphorbiaceae	*Breynia oblongifolia*			N
	Poranthera microphylla			N
Fabaceae (Faboideae)	*Glycine clandestina*			N
	Hardenbergia violacea			N
	Kennedia rubicunda			N
Fabaceae (Mimosoideae)	*Acacia longifolia* subsp. *longifolia*			N
	Acacia longissima			N
	Acacia irrorata subsp. *irrorata*			N
	Acacia terminalis			N
Geraniaceae	*Pelargonium capitatum*			E
Goodeniaceae	*Goodenia ovata*			N

Family	Species	Common name	Opportunistic records	Native/Exotic HTE
Haloragaceae	*Gonocarpus teucrioides*			N
Iridaceae	*Patersonia glabrata*	Leafy Purple-flag	X	N
Lomandraceae	*Lomandra glauca*			N
	Lomandra filiformis subsp. *filiformis*			N
	Lomandra longifolia			N
	Lomandra multiflora subsp. *multiflora*			N
Luzuriagaceae	*Eustrephus latifolius*	Wombat Berry		N
Myrtaceae	*Corymbia maculata+*	Spotted Gum		N
	Eucalyptus globoidea	White Stringybark		N
	Eucalyptus paniculata	Grey Ironbark		N
	Eucalyptus pilularis	Blackbutt	X	N
	Kunzea ambigua	Tick Bush		N
	Leptospermum polygalifolium			N
Orchidaceae	*Cryptostylis erecta*			N
Oxalidaceae	*Oxalis perennans*			N
Phormiaceae	*Dianella caerulea*		X	N
	Dianella revoluta			N
Pittosporaceae	*Billardiera scandens*			N
	Pittosporum undulatum		X	N
Poaceae	*Cenchrus clandestinus*	Kikuyu		HTE
	Dichelachne micrantha			N
	Digitaria sp.			N
	Entolasia stricta	Wiry Panic		N
	Imperata cylindrica			N
	Rytidosperma pallidum	Red-anther Wallaby Grass		N
	Microlaena stipoides			N
	Panicum simile			N
Primulaceae	*Lysimachia arvensis*	Scarlet pimpernel		E
Proteaceae	*Persoonia linearis*		X	N
Ranunculaceae	*Clematis glycinoides*			N

Family	Species	Common name	Opportunistic records	Native/Exotic HTE
Rubiaceae	*Opercularia hispida*			N
Santalaceae	*Exocarpos cupressiformis*			N
Smilacaceae	*Smilax glyciphylla*			N
Solanaceae	*Solanum prinophyllum*			N
Verbenaceae	*Clerodendrum tomentosum*			N
Zamiaceae	*Macrozamia communis*	Burrawang		N

Appendix C Fauna species recorded

Class	Family	Scientific name	Common name	Native/ Exotic
Aves	Psittaculidae	*Trichoglossus moluccanus*	Rainbow Lorikeet	Native
Amphibia	Myobatrachidae	*Crinia signifera*	Eastern Common Froglet	Native
Mammalia	Miniopteridae	*Miniopterus schreibersii oceanensis*	Eastern Bentwing Bat**	Native
	Molossidae	*Mormopterus (Micronomus) norfolkensis*	Eastcoast Freetail Bat	Native
		Ozimops ridei	Eastern Freetail Bat	Native
	Vespertilionidae	*Chalinolobus gouldii*	Gould's Wattled Bat	Native
		Nyctophilus sp.	Long-eared Bat	Native
		Scotorepens orion	Eastern Broad-nosed Bat**	Native
		Vespadelus darlingtoni	Large Forest Bat**	Native

** Results of anabat data analysis not definitive for these species, but presence considered possible.

Appendix D Species likelihood of occurrence

The potential for each threatened species, population and/or migratory species to occur was then considered and the necessity for targeted field surveys was determined. Following field surveys and review of available habitat within the study area, the potential for species to utilise the site and be affected directly or indirectly by the proposal were considered as either:

- “Recent record” = species has been recorded in the study area within the past 5 years
- “High” = species has previously been recorded in the study area (>5 years ago) or in proximity (for mobile species), and/or habitat is present that is likely to utilised by a local population
- “Moderate” = suitable habitat for a species is present onsite but no evidence of a species detected and relatively high number of recent records (5-20 years) in the locality or species is highly mobile
- “Low” = suitable habitat for a species is present onsite but limited or highly degraded, no evidence of a species detected and relatively low number of recent records in the locality
- “Not present” – suitable habitat for the species is not present onsite or adequate survey has determined species does not occur in the study area

Scientific Name Common Name	Legal Status	Number of records within 5 km radius	Closest record	Most recent record	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
KINGDOM: Animalia; CLASS: Aves						
Artamus cyanopterus cyanopterus Dusky Woodswallow	BC Act: V	12	1.5 km	6/10/2006	Moderate	Low
Callocephalon fimbriatum Gang-gang Cockatoo	BC Act: V	13	1.4 km	1/11/2017	Low	Low
Calyptorhynchus lathami Glossy Black Cockatoo	BC Act: V	61	1.8 km	1/05/2018	Low	Low
Climacteris picumnus victoriae Brown Treecreeper (eastern subspecies)	BC Act: V	2	0.89	2/03/2016	Low	Low
Daphoenositta chrysoptera Varied Sittella	BC Act: V	14	1.5 km	30/05/2012	Low	Low
Glossopsitta pusilla Little Lorikeet	BC Act: E1	39	0.99 km	23/05/2017	Low	Low
Hieraaetus leucogaster White-bellied Sea-Eagle	BC Act: V EPBC: C	14	0.87 km	13/10/2013	Low	Low
Hieraaetus morphnoides Little Eagle	BC Act: V	1	9.69 km	25/07/2016	Low	Low
Hirundapus caudacutus White-throated Needletail	EPBC: M	4	1.6 km	9/01/2001	Low	Low
Lathamus discolor Swift Parrot	BC Act: E EPBC: CE	32	1.8 km	12/01/2009	Low	Low
Lophoictinia isura Square-tailed Kite	BC Act: V	9	0.71 km	13/07/2017	Moderate	Low

Scientific Name Common Name	Legal Status	Number of records within 5 km radius	Closest record	Most recent record	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
Ninox strenua Powerful Owl	BC Act: V	12	1.2 km	16/05/2017	Moderate	Moderate
Tyto novaehollandiae Masked Owl	BC Act: V	5	1.4 km	26/10/2016	Moderate	Moderate
Tyto tenebricosa Sooty Owl	BC Act: V	4	1.5 km	26/10/2016	Moderate	Low
KINGDOM: Animalia; CLASS: Mammalia						
Dasyurus maculatus Spotted-tailed Quoll	BC Act: V EPBC: E	1	4.5 km	3/09/2014	Low	Low
Falsistrellus tasmaniensis Eastern False Pipistrelle	BC Act: V	3	0.89 km	2/03/2016	Moderate	Moderate
Isoodon obesulus obesuslus Southern Brown Bandicoot	BC Act: E EPBC: E	1	2.9 km	3/01/1998	Low	Low
Miniopterus schreibersii oceanensis Eastern Bentwing-bat	BC Act: V	6	1.8 km	12/01/2009	Moderate	Moderate
Mormopterus (Micronomus) norfolkensis Eastern Freetail-bat	BC Act: V	6	0.89 km	2/03/2016	Moderate	Present
Myotis macropus Southern Myotis	BC Act: V	17	1.9 km	12/01/2009	Low	Low
Petauroides volans Greater Glider Greater Glider population in the Eurobodalla LGA	BC Act: EP EPBC Act: V	28	0.46 km	16/02/2018	Low	Low
Petaurus australis Yellow-bellied Glider	BC Act: V	201	0.74 km	17/01/2018	Low	Low

Scientific Name Common Name	Legal Status	Number of records within 5 km radius	Closest record	Most recent record	Likelihood of occurrence	
					Prior to field assessment	Post field assessment
Petaurus norfolcensis Squirrel Glider	BC Act: V	2	0.89 km	2/03/2016	Low	Low
Phascogale tapoatafa Brush-tailed Phascogale	BC Act: V	1	2.9 km	1/5/1997	Not present	Not present
Phascolarctos cinereus Koala	BC Act: V EPBC: V	1	4.2 km	`30/06/2016	Low	Low
Pteropus poliocephalus Grey-headed Flying-fox	BC Act: V EPBC Act: V	100545	0.89 km	3/01/2017	Moderate	Low
Saccolaimus flaviventris Yellow-bellied Sheathtail-bat	BC Act: V	3	1.7 km	12/01/2009	Moderate	Moderate
Scoteanax rueppellii Greater Broad-nosed Bat	BC Act: V	3	0.89 km	2/03/2016	Moderate	Moderate
KINGDOM: Plantae						
Correa baeuerlenii Chef's Cap Correa	BC Act: V EPBC Act: V	1	3.01 km	30/12/1999	Moderate	Low
Cryptostylis hunteriana Leafless Tongue Orchid	BC Act: V EPBC Act: V	3	1.8 km	20/11/2008	Not present	Not present
Persicaria elatior Tall Knotweed	BC Act: V	14	0.9 km	17/04/2016	Not present	Not present
Pomaderris bodalla Bodalla Pomaderris	EPBC Act: E	1	4.5 km	1/03/2005	Not present	Not present

Appendix E Tests of Significance

State listings under the BC Act

For the purposes of s7.3 of the BC Act, the following factors and any assessment guidelines must be taken into account when deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats. The below assessments have been prepared in accordance with the appropriate guidelines (OEH 2018c) and include five microchiropteran bat species and three bird species.

Microchiropteran Bats – tree hollow roosting species

The following test of significance is for the microchiropteran bat species that typically roost in tree hollows, namely *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat).

The ecology of the four microchiropteran is as follows:

- Wide-ranging species
- Mostly roost in tree hollows, but can also roost in man-made structures
- Utilise a range of habitats including moist and dry eucalypt forest
- Foraging varies between the species

a) *in the case of a threatened species, whether the proposed development or activity is likely to 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 proposed development is unlikely to have an adverse effect on the life cycle of *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat) as there is only one hollow-bearing tree within the subject site.

b) *in the case of an endangered ecological community or critically endangered ecological community whether the proposed development or activity:*

i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*

ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

Not applicable

c) *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 proposed development or activity, 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 development or activity, and*

iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality.*

The proposed development modification requires the removal of 0.211 ha within the subject land, which equates to less than 0.05% of the local occurrence of PCT 1206 – Spotted Gum – Blackbutt shrubby open forest (Batemans Bay Cycad Forest) within a 5 km radius of the subject land. The proposed development will not result in the fragmentation or isolation of habitat as it is already a small isolated patch fragmented from more intact vegetation to the south and west. The subject site does not form part of a corridor linking other areas of similar habitat, but may act as an intermediary patch between two (or more) areas of habitat. The vegetation in the subject land and subject site constitutes a patch of vegetation in an already fragmented landscape, which has been subject to other activities including previous logging, vehicular access, fire and minor earthworks. One small tree hollow was recorded on the subject site and will be removed as part of the proposed development modification. A number of hollow-bearing trees occur within the adjoining bush reserve to the south-east where more intact vegetation occurs providing better habitat potential for roosting bat species.

d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

The proposed development modification will not have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly) as no such declared areas are present within or adjacent to the subject area. The subject site is not identified on the Biodiversity Values Map, as defined by the Biodiversity Conservation Regulation 2017.

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

There are three key threatening process of relevance to this proposal:

- Clearing of native vegetation
- Loss of hollow bearing trees
- Loss of dead wood

Conclusion of s7.3 Test of significance for microchiropteran bats – tree hollow roosting

The proposed development is unlikely to significantly impact the microchiropteran bats *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat), as:

- a small amount of disturbed vegetation and associated habitat is being removed (0.211 ha)
- the proposal is unlikely to place the local occurrence of these species at risk of extinction

- the proposal is unlikely to impact the life cycle of this species, given that only one small hollow, potentially suitable for roosting and breeding is present within the subject site
- the proposal will not result in the further isolation of habitat

Microchiropteran Bats – cave roosting species

The following test of significance is for the microchiropteran *Miniopterus schreibersii oceanensis* (Eastern Bentwing Bat), a species that typically roosts in caves, and occurs along the east and north-west coast of Australia. Their habitat and ecology includes the following:

- primary roosts are caves, but they also utilise derelict mines, storm water tunnels, buildings and other man-made structures
- form discrete populations centred on maternity caves
- their populations can disperse within about 300 km of maternity caves
- hunt in forested areas, catching moths and other flying insects above the tree tops

a) *in the case of a threatened species, whether the proposed development or activity is likely to 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 proposed development is unlikely to have an adverse effect on the life cycle of *Miniopterus schreibersii oceanensis* (Eastern Bentwing Bat), as there are no maternity caves within the subject site or subject land. Maternity caves are used annually in spring and summer to rear young. Inspection under a bridge over Short Creek, west of the subject land found no evidence of roosting Eastern Bentwing Bats.

b) *in the case of an endangered ecological community or critically endangered ecological community whether the proposed development or activity:*

i. *is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or*

ii. *is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.*

The ***local occurrence*** of an ecological community is defined by DECC (2007) as that which: *occurs within the study area… including any adjacent areas of the ecological community that forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.*

Not applicable

c) *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 proposed development or activity, 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 development or activity, and*

iii. *the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.*

The proposed development modification requires the removal of 0.211 ha within the subject land, which equates less than 0.05% of the local occurrence of PCT 1206 – Spotted Gum – Blackbutt shrubby open forest (Batemans Bay Cycad Forest) within a 5 km radius of the subject land. The proposed development will not result in the fragmentation or isolation of habitat as it is already a small isolated patch fragmented from more intact vegetation to the south and west, and does not form part of a corridor linking other areas of similar habitat. The vegetation in the subject land and subject site constitutes a patch of vegetation in an already fragmented landscape, which has been subject to other activities including previous logging, vehicular access, fire and minor earth disturbance.

One small tree hollow was recorded on the subject site and will be removed as part of the proposed development modification. A number of hollow-bearing trees occur within the adjoining bush reserve to the south-east where more intact vegetation occurs providing better habitat potential for roosting bat species. The loss of one small hollow is not critical to the long-term survival of the species in the locality, given the presence of habitat in the adjoining reserve to the south-east of the subject land and the more extensive areas of bushland in the locality and region.

d) *whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),*

The proposed development modification will not have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly) as no such declared areas are present within or adjacent to the subject area. The subject site is not identified on the Biodiversity Values Map, as defined by the Biodiversity Conservation Regulation 2017. area has been subject to past logging, vehicular access, minor earthworks wind-blown rubbish dumping (building rubble, wind-blown rubbish).

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

There are four key threatening process of relevance to this proposal:

- Clearing of native vegetation
- Loss of hollow bearing trees
- Loss of dead wood

The proposed action will result in the removal of approximately 0.211 ha of disturbed PCT 1206 Spotted Gum – Blackbutt shrubby open forest. However, this is unlikely to constitute a net loss throughout its geographic region, given that this PCT is not uncommon in the local or regional area. The site-specific Bush Regeneration Plan that includes tree protection and weed control measures, should specify procedures to minimise and mitigate the impact of these key threatening processes across the site where vegetation to be retained is found, as well as to provide an enhancement of the habitat by provenance planting of local species.

Conclusion of s7.3 Assessment of significance for microchiropteran bats – cave roosting

The proposed development is unlikely to significantly impact the microchiropteran bats *Falsistrellus tasmaniensis* (Eastern False Pipistrelle), *Mormopterus (Micronomus) norfolkensis* (Eastern Freetail-bat), *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat) and *Scoteanax rueppellii* (Greater Broad-nosed Bat), as:

- a small amount of disturbed vegetation and associated habitat is being removed (0.211 ha)
- the proposal is unlikely to place the local occurrence of these species at risk of extinction
- the proposal is unlikely to impact the life cycle of this species, given that no caves suitable for roosting and breeding are located within the subject site
- the proposal will not result in the further isolation of foraging habitat

Large Forest Owls

The following test of significance is for the large forest owls, namely the *Ninox strenua* (Powerful Owl) and the *Tyto novaehollandiae* (Masked Owl).

The habitat and ecology of the large forest owls include the following:

- Inhabit a range of vegetation types from woodland to open forest and moist eucalypt forests and rainforests,
- Occupy large territories
- Nest in large tree hollows
- Roost in gullies and sheltered areas, usually in dense vegetation, and for *Tyto novaehollandiae* (Masked Owl), optimal habitat includes undulating forest of the coastal areas.

a) in the case of a threatened species, whether the proposed development or activity is likely to 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 proposed development is unlikely to have an adverse effect on the life cycle of *Ninox strenua* (Powerful Owl) and *Tyto novaehollandiae* (Masked Owl) as trees with large hollows are not present on the subject site or subject land. Trees with large hollows have been recorded within the adjacent reserve adjoining the south-eastern side of the site where the vegetation will not be impacted by the proposed development modification.

These three species occupy large territories and would not rely solely on the foraging and roosting resources available on and adjacent to the subject land.

b) in the case of an endangered ecological community or critically endangered ecological community whether the proposed development or activity:

iii. 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

iv. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

The ***local occurrence*** of an ecological community is defined by DECC (2007) as that which: *occurs within the study area… including any adjacent areas of the ecological community that forms part of a larger contiguous area of that ecological community and the movement of individuals and exchange of genetic material across the boundary of the study area can be clearly demonstrated.*

Not applicable

c) in relation to the habitat of a threatened species, population or ecological community:

iv. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and,

v. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

vi. the importance of the habitat to be removed, modified, fragmented or isolated to the long term survival of the species or ecological community in the locality.

The proposed development modification requires the removal of 0.211 ha within the subject land, which equates to less than 0.05% of the local occurrence of PCT 1206 – Spotted Gum – Blackbutt shrubby open forest (Batemans Bay Cycad Forest) within a 5 km radius of the subject land.. The proposed development will not result in the fragmentation or isolation of habitat as it is already a small isolated patch fragmented from more intact vegetation to the south and west, and does not form part of a corridor linking other areas of similar habitat. The vegetation in the subject land and subject site constitutes a patch of vegetation in an already fragmented landscape, which has been subject to other activities including previous logging, vehicular access, fire and minor earth disturbance.

One small tree hollow was recorded on the subject site and will be removed as part of the proposed development modification. A number of hollow-bearing trees occur within the adjoining bush reserve to the south-east where more intact vegetation occurs providing better habitat potential for roosting bat species. The loss of one small hollow is not critical to the long-term survival of the species in the locality, given the presence of habitat in the adjoining reserve to the south-east of the subject land and the more extensive areas of bushland in the locality and region.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposed development modification will not have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly) as no such declared areas are present within or adjacent to the subject area. The subject site is not identified on the Biodiversity Values Map, as defined by the Biodiversity Conservation Regulation 2017. The subject land has been previously impacted by past logging, vehicular access, minor earthworks and wind-blown rubbish.

e) *whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.*

There are four key threatening process of relevance to this proposal:

- Clearing of native vegetation
- Loss of one hollow bearing tree
- Loss of dead wood

The proposed action will result in the removal of approximately 0.211 ha of disturbed PCT 1206 Spotted Gum – Blackbutt shrubby open forest. However, this is unlikely to constitute a net loss throughout its geographic region, given that this PCT is not uncommon in the local or regional area. The site-specific Bush Regeneration Plan that includes tree protection and weed control measures, should specify procedures to minimise and mitigate the impact of these key threatening processes across the site where vegetation to be retained is found, as well as to provide an enhancement of the habitat by provenance planting of local species.

The loss of one hollow bearing tree will not impact roosting or nesting sites for the large forest owls as the hollow is small in size and unsuitable for these large birds.

Conclusion of s7.3 Assessment of significance for large forest owls

The proposed development is unlikely to significantly impact the large forest owls *Ninox strenua* (Powerful Owl), the *Tyto tenebricosa* (Sooty Owl) and the *Tyto novaehollandiae* (Masked Owl). as:

- a small amount of disturbed vegetation and associated habitat is being removed (0.211 ha)
- the proposal is unlikely to place the local occurrence of these species at risk of extinction as the owls are wide-ranging and forage over broad areas, and are not reliant on the food resources potentially available on the subject land
- the proposal is unlikely to impact the life cycle of this species, as the site lacks suitable habitat for roosting and nesting, the proposal will not result in the further isolation of habitat