# Subdivision and Urban Development at Fishermans Bay

## Construction
## Flora and Fauna Management Plan


Prepared by:

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## Document Status

| Version | Purpose of Document | Orig | Review | Review Date |
|---|---|---|---|---|
| A | Draft Flora and Fauna Management Plan | LV | MD | 11-11-2014 |
| B | Final Draft for submission to Council | LV | MD | 18-11-2014 |
| C | Final for submission to Council | LV | MD | 22-1-2015 |

## Approval for Issue

| Name | Signature | Date |
|---|---|---|
| Matt Doherty |  | 22-1-2015 |

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# 1.0 Background

## 1.1 Introduction

RPS has been engaged by UrbanGrowth NSW Pty Ltd to prepare a Construction Flora and Fauna Management Plan (CFFMP) for a residential subdivision at Fishermans Bay, NSW (the Project). The Project occurs within the Port Stephens Local Government Area (LGA), on the New South Wales north coast, approximately 34 kilometres northeast of Newcastle. The Fishermans Bay site is bounded by Tomaree National Park to the north and east, residential development to the west and Fishermans Bay Road and vegetation to the south (**Figure 1**). It contains the development footprint for the subdivision and the proposed Environmental Protection Areas, which will comprise retained vegetation.

## 1.2 Project Description

The site covers 23 hectares and involves the subdivision of land and construction of 104 dwellings. The purpose of the subdivision is to subdivide Lot 4561 and 4562 into 4 separate lots (proposed lots 1 to 4) which will create one residential lot and three lots zoned 7(f1) Environment Protection (Coastal Lands). The proposed residential subdivision will be on the residential zoned lot (proposed Lot 1), while two lots zoned 7(f1) Environment Protection (Coastal Lands) will be dedicated to National Parks and a third dedicated to Port Stephens Council following minor works associated with the residential subdivision. A raised pedestrian boardwalk will be established within the conservation areas to allow access for the public through the conservation areas. The proposed development will occur within the Development Area, which is the basis of this CFFMP and is displayed in **Figure 2**.

The Project involves clearing of the Development Area in a single stage, including required Asset Protection Zones (APZ). Permanent APZs are required to the south and east of the Development Area at the interface of the retained bushland and NPWS lands. Within the 35m APZ, retention of reduced canopy vegetation in the form of an Outer Protection Area will be achieved. Larger southern lots with the capacity for tree retention will be selected to retain any mature and/or hollow bearing trees where possible. A development concept is displayed in **Figure 2**.

## 1.3 Definitions

- Project: the residential subdivision and development at Fishermans Bay.
- Site: The entire area encompassing both the development footprint and Environmental Protection Areas.
- Development Area: the 15.08 hectare (approximately) development footprint in which residential subdivision and development will occur.
- Environmental Protection Area: Land within the site being retained for conservation purposes.
- Environmental Manager: On site Contractor.
- Project Ecologist: Ecologist responsible for undertaking pre clearance and clearing surveys.
- Threatened Species: a plant or animal species listed under the NSW Threatened Species Conservation Act 1995 and/or the Commonwealth Environment Protection and Biodiversity Conservation Act 1999.

WARNING
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

**Legend**

Study Area

National Park

N

Tomaree National Park

0 500

metres

Scale: 1:10,000



| | | | | | | | |
|---|---|---|---|---|---|---|---|
| TITLE: | FIGURE 1: SITE LOCATION | LOCATION: | FISHERMANS BAY | DATUM: | (GDA 94) | DATE: | 27/11/2014 |
| | | | | PROJECTION: | MGA ZONE 56 | PURPOSE: | CONSTRUCTION FLORA & FAUNA MANAGEMENT PLAN |

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VERSION (PLAN BY): A A4 (LV -NW)

CLIENT: URBANGROWTH NSW
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Legend

Study Area

Conservation Lands

***Vegetation***

1 - Paperbark Swamp Forest

2 - Coastal Sand Wallum - Woodland Heath

3 - Coastal Sand Apple Blackbutt Forest

4 - Nerong Smooth-barked Apple Woodland

N

**WARNING**
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**Environmental Protection Area**

**National Parks and Wildlfe Service Lands**

0 100

metres

Scale: 1:3,200



TITLE: FIGURE 3: VEGETATION MAP AND ENVIRONMENTAL PROTECTION AREA

LOCATION: FISHERMANS BAY

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## 1.4 Aims and Objectives

The Construction Flora and Fauna Management Plan (CFFMP) is a sub-component of the Construction Management Plan (CMP) for the Project at Fishermans Bay.

This CFFMP has been developed to identify potential impacts of construction on flora and fauna, and detail mitigation measures that will be adopted to minimise these impacts. This CFFMP responds to Conditions of Consent issued by Port Stephens Council.

The objectives of the Plan are:

- Identify the legislative requirements, Conditions of Consent issued by Port Stephens Council and any other guidelines that have been considered in the development of this Plan;
- Identify significant ecological values in the Project, such as threatened species, native vegetation and fauna habitat that will be impacted as a result of construction activities;
- Provide specific safeguards and procedures to avoid, minimise or mitigate impacts on these ecological values; and
- Prescribe a monitoring and reporting framework to assess the effectiveness of the controls implemented, and outline the responsibilities of those involved in management control.

## 1.5 Objectives specific to Flora and Fauna

The main objectives in the protection of flora and fauna within this CFFMP are as follows:

**Fauna**

- Develop pre-clearing survey methods and clearing protocols to minimise adverse effects on fauna.
- Protect habitat features and resources being retained within and adjoining the Development Area during the construction.
- Establish an effective monitoring and reporting framework to determine the effectiveness of any mitigation measures used during and post construction.

**Flora**

- To protect all vegetation outside of the Development Area from disturbance during construction.
- To provide procedures for the protection of vegetation to be retained.
- To manage weeds within the Development Area and to minimise their establishment in uninfested areas.
- To recover and reuse existing natural resources such as cleared vegetation, bush rock, topsoil, leaf litter, and to minimise any materials required to be disposed off site.

## 1.6 Structure of this Plan

The structure of this CFFMP is outlined in **Table 1**.

**Table 1 Structure of this Flora and Fauna Management Plan**

| Chapter | Content |
|---|---|
| 1 | Provides an overview of the Project, previous environmental assessments of the Project, and the purpose and scope of this plan. |

| Chapter | Content |
|---|---|
| 2 | Details the statutory requirements for the Plan and other legislative requirements. |
| 3 | Identifies biodiversity that may be impacted as a result of construction of the Project. |
| 4 | Details the actions to be implemented to avoid or minimise impacts on flora and fauna prior to, and during construction activities. |
| 5 | Describes the training, monitoring and review requirements relating to this plan |

# 2.0 Statutory Requirements

## 2.1 Conditions of Consent

Construction matters relating to Flora and Fauna Management will be undertaken in accordance with the approved Construction Flora and Fauna Management Plan dated 22 January 2015.

## 2.2 Relevant Legislation

Key environmental legislation relating to flora and fauna management includes:

- *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- *NSW Threatened Species Conservation Act 1995* (TSC Act)
- *NSW Fisheries Management Act 1994* (FM Act)
- *NSW Environment Planning and Assessment Act 1979* (EP&A Act)
- *NSW National Parks and Wildlife Act 1974* (NPW Act)
- *NSW Noxious Weeds Act 1993* (NW Act)
- *NSW Native Vegetation Act 2003* (NV Act)
- *NSW Water Management Act 2000* (WM Act)

## 2.3 Guidelines and Standards

- *Code of Practice for Injured, Sick and Orphaned Protected Fauna* (OEH 2011).
- *Code of Practice for injured, sick and orphaned flying foxes* (OEH 2012).
- *Code of Practice for injured, sick and orphaned koalas* (OEH 2011).
- *Guidelines for the rehabilitation of birds of prey* (DECCW 2011).
- *Prevention of Cruelty to Animals Act 1979*.
- *Florabank Native Seed Collection Code of Practice (Greening Australia NSW 1999).*

## 2.4 Approvals, Licences and Permits

The Project Ecologist must conduct all works under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence.
- Animal Research Authority issued by NSW Agriculture.
- Certificate of Accreditation of a Corporation as an Animal Research Establishment issued by NSW Agriculture.
- Animal Care and Ethics Committee Certificate of Approval issued by NSW Agriculture.

## 2.5 Related Documents

This Construction Flora and Fauna Management Plan is intended to function as a sub-plan of the Construction Management Plan (CMP) which will be submitted to Council for approval prior to the issue of the Construction Certificate for the project.

Other relevant and supporting plans include the Bushfire Threat Assessment, Habitat Rehabilitation Plan (RPS 2015), Sediment and Erosion Plan and Landscaping Plan prepared for the Fishermans Bay Project.

This document should be used in conjunction with the full CMP to ensure compliance with Project environmental objectives and goals, and to ensure consistency in approach to monitoring, reporting and project delivery.

# 3.0 Impacts on Flora and Fauna

## 3.1 Biodiversity values occurring in the Site

### 3.1.1 Threatened Species

The Project will directly impact habitat for known and/or potentially occurring threatened flora and fauna species. Threatened species previously assessed as having potential to occur in the Development Area are outlined in the Flora and Fauna Assessment for Fishermans Bay (RPS 2012). Two threatened species, namely the Little Bentwing-bat (*Miniopterus australis*) and Eastern False Pipistrelle (*Falsistrellus tasmaniensis*) were recorded on site during surveys. A full list of all fauna and flora species previously identified in the site are listed in **Appendix 1** and **2** respectively.

### 3.1.2 Native Vegetation

Four vegetation communities were mapped within the site, of which three occur within the Development Area as detailed in **Table 2**. The fourth vegetation community, namely Paperbark Swamp Forest, was recorded within the site, however it is not proposed to be impacted by the Project and will be retained for conservation purposes. **Figure 3** displays the vegetation to be impacted by the Project.

**Table 2 Vegetation communities in the Development Area**

| Vegetation Community | Area to be removed (hectares) | Area to be reduced for APZ (hectares) | Conservation Areas | Total (hectares) |
|---|---|---|---|---|
| Coastal Sand Wallum-Woodland Heath | 9.68 | 0.80<br>(Within the 35m APZ all other 20m area anticipated to be cleared.) | **3.64** | **14.12** |
| Coastal Sand Apple Blackbutt Forest | 3.61 | 0.64 | **3.09** | **7.34** |
| Nerong Smooth-barked Apple Woodland | 0.08 | 0.27 | **0** | **0.35** |
| Paperbark Swamp Forest | 0 | 0 | **0.88** | **0.88** |
| **TOTAL** | **13.37** | **1.71** | **7.61** | **22.69** |

Legend

Study Area

Conservation Lands

***Vegetation***

1 - Paperbark Swamp Forest

2 - Coastal Sand Wallum - Woodland Heath

3 - Coastal Sand Apple Blackbutt Forest

4 - Nerong Smooth-barked Apple Woodland

N

**WARNING**
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**Environmental Protection Area**

**National Parks and Wildlfe Service Lands**

0 100

metres

Scale: 1:3,200



TITLE: FIGURE 3: VEGETATION MAP AND ENVIRONMENTAL PROTECTION AREA

LOCATION: FISHERMANS BAY

DATUM: (GDA 94)

PROJECTION: MGA ZONE 56

DATE: 27/11/2014

PURPOSE: CONSTRUCTION FLORA AND FAUNA MANAGEMENT PLAN

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### 3.1.3 Threatened Ecological Communities

Paperbark Swamp Forest is commensurate with *Swamp Sclerophyll Forest on Coastal Floodplains of the NSW North Coast, Sydney Basin and South East Corner Bioregions* Endangered Ecological Community listed under the NSW TSC Act. A total of 0.83 hectares of this Endangered Ecological Community occurs on site, and is being retained for conservation purposes. No areas of this EEC will be removed as a result of the Project. Retention of this EEC is discussed in the associated Habitat Rehabilitation plan (RPS 2014).

### 3.1.4 Fauna Habitat

The Project involves clearing of up to 15.08 hectares (approximately) of vegetation at Fishermans Bay. Clearing of native vegetation will result in the loss of woodland and wallum forest communities that offer habitat to various reptiles, amphibians, birds and mammals.

Habitat within the overall site was assessed for its potential to support native flora and fauna species including threatened species, for which records occur within the wider locality. Three broad habitat types were recorded within the site being Dry Open Forest, Heath and Ephemeral Swamp Forest. The latter is to be conserved by the development.

The canopy trees across the site were dominated by five species, *Angophora costata* (Smooth-barked Apple), *Eucalyptus pilularis* (Blackbutt), *E. umbra* (Broad-leaved White Mahogany), *Corymbia gummifera* (Red Bloodwood) and *Banksia serrata* (Old Man Banksia). Canopy species have a variety of flowering periods, providing seasonal foraging opportunities for nectivorous species. Outside of flowering season, gliders are known to feed off sap flow of *C. gummifera and Banksia* sp. that are present within the study area. The heath/shrub understorey vegetation provides nesting and foraging opportunities for several avian species and the thick leaf litter and fallen logs provides habitat for a range of herpetofauna.

No permanent water bodies were located within the site and although areas of swamp forest are evident, the sandy nature of the site suggests that inundation of these areas would be intermittent following heavy precipitation and the period of inundation would likely be short. This intermittency may limit the potential for the site to contain many frog species that depend on permanent or regular inundation for breeding. Wallum Froglet (*Crinia tinnula*), found only in acid paperbark/sedge swamps, has some potential to occur within the ephemeral wetlands of the Paperbark Swamp Forest, though the lack of permanent water is likely to limit long term usage of the study area.

Invasive weeds species such as *Chrysanthemoides monilifera* subsp. *rotundata* (Bitou Bush) and *Lantana camara* (Lantana) were found in high densities, particularly within the Open Forest Communities. Potential for threatened flora species are often affected by the spread of these weed species, with the weeds often out-competing the native vegetation for vital resources such as water and light.

The site exhibited a moderate to high density of small, medium and large hollows within open and swamp forest communities, particularly within the south and western portions of the site with a total of 142 hollows recorded. This provides potential nesting, refuge and breeding habitat for a range of hollow dependent birds and arboreal mammals including the threatened Squirrel Glider (*Petaurus norfolcensis*) and Bush-tailed Phascogale (*Phascogale tapoatafa*). Larger hollows may provide roosting habitat for large forest owls including Powerful Owl (*Ninox strenua*), Barking Owl (*Ninox connivens*) and Masked Owl (*Tyto novaehollandiae*). Notably none of these species were recorded on site despite targeted searches. **Figure 4** shows the hollow-bearing trees recorded on site and also nominates the likely hollow-bearing trees to be removed and retained under the current proposal. **Table 3** outlines the habitat values within the site.

Landscape connectivity to adjacent vegetated patches will be maintained across the conserved southern area of the site. In addition to the existing linear fragmentation of Fishermans Bay Road, one additional point of linear fragmentation will occur to establish site access for the development.

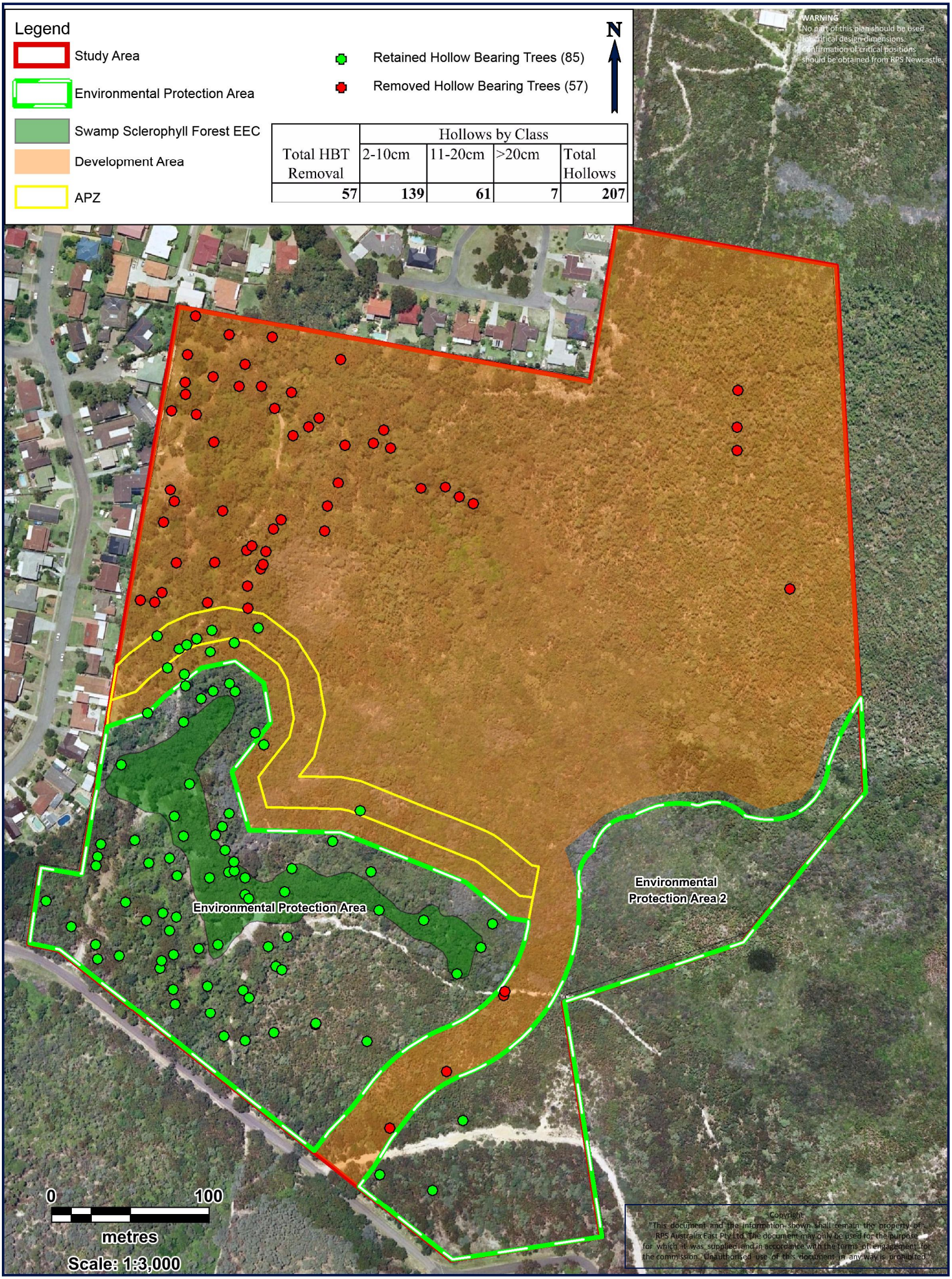
**Table 3 Summary of fauna habitat values occurring in the Development Area**

| Attribute | Comment |
|---|---|
| Tree Hollows | 57 hollow-bearing trees containing a total of 207 hollows. |
| Flowering trees and shrubs | The Development Area supports a diversity of shrub and trees species that offer nectar, blossom and fruit to birds, arboreal mammals and Grey-headed flying-fox. |
| Logs and ground debris | Logs and ground debris provide shelter for small ground dwelling mammals and reptiles. |
| Dense infestations of weeds | Dense infestations of woody weeds such as *Lantana camara* (Lantana) offer habitat to small birds and terrestrial mammals. |

### 3.1.5 Conservation Areas

The site adjoins Tomaree National Park which protects the majority of remaining natural bushland within Fishermans Bay. The National Park contributes to the conservation of the local area's biodiversity and provides important habitat for threatened species and ecological communities. For example, over 350 plant species occurring within thirteen vegetation communities occur within the National Park, which is considerably high for its size (NPWS 2006). Known threatened flora include Sand-doubletail (*Diurus arenaria*), Leafless Tongue Orchid (*Cryptostylis hunteriana*) and Groves Paperbark (*Melaleuca groveana*). It also contains threatened fauna species such as Koalas, Spotted-tailed Quolls, Powerful Owls, Osprey and the Wallum Froglet.

Areas within the site designated for conservation includes two separate parcels of land identified as Environmental Protection Area (EPA) 1 and Environmental Protection Area 2 with EPA 2 being transferred to NPWS as an addition to Tomaree National Park (refer to **Figure 4**).




| Total HBT Removal | Hollows by Class | | | |
|---|---|---|---|---|
| | 2-10cm | 11-20cm | >20cm | Total Hollows |
| 57 | 139 | 61 | 7 | 207 |

TITLE: FIGURE 4: HOLLOW BEARING TREES, ECOLOGICAL FEATURES AND CONSERVATION AREAS WITHIN THE SITE

LOCATION: FISHERMANS BAY

DATUM: (GDA 94)
PROJECTION: MGA ZONE 56

DATE: 27/11/2014
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## 3.2 Summary of Impacts

Impacts on flora and fauna were assessed under the Flora and Fauna Assessment Report (RPS 2012) in accordance with the provisions of the EPBC Act and TSC Act.

A summary of potential impacts that may result from the Project is provided in **Table 4**. The extent, or scale, of the impact generally refers to areas of a number of individuals that are located within the Development Area, unless stated otherwise.

**Table 4 Likely impacts of the Project**

| Impact | Details | Extent/scale |
|---|---|---|
| Loss of native vegetation | Coastal Sand Wallum-Woodland Heath | 10.48 hectares |
| | Coastal Sand Apple Blackbutt Forest | 4.25 hectares |
| | Nerong Smooth-barked Apple Woodland | 0.35 hectares |
| Loss of fauna habitat | Woodland, forest and swamp forest communities offer habitat to a diversity of reptiles, amphibians, birds and mammals. | 15.08 hectares |
| | Loss of hollow-bearing trees that support a diversity of tree hollow sizes | 57 hollow-bearing trees containing a total of approximately 207 hollows (139 small hollows, 61 medium hollows and 7 large hollows). |
| Fauna fragmentation | May reduce the capacity of some less mobile fauna to move within and between patches of remaining habitat. | Vegetation clearing will reduce the width of a vegetation corridor that links Tomaree National Park with native vegetation to the south.<br>Access road to the south of the site will also create permanent fragmentation between two Environmental Protection Areas. |
| Fauna mortality | May result from collisions with vehicles or plant, or accidental entrapment in plant, trenches or other earthworks. | Most likely during clearing activities and early stages of construction. |
| Edge effects and weed invasion | Vehicles and plant may transport weed propagules into the study area. Creation of new edges will increase fragmentation and vulnerability of native vegetation to weed incursions. | New edges, areas of soil disturbance, areas in proximity to existing weed infestations are most likely to be susceptible to weed invasion. |
| Alteration to air quality and noise environments | May impact upon the roosting, breeding and foraging activities of locally occurring fauna. | Temporary and localised scale impacts during construction. Potential longer-term impacts during operation. |
| Infection of native plants by *Phytophthora cinnamomi* | May be transported with infected soil or plant material adhering to vehicles, people (clothes or shoes), animals, or by percolating through the soil, in creeks or storm runoff. | Potential for fungus to be introduced to study area during construction phase, when there is frequent movement of machinery, contractors, vehicles or tools. |

# 4.0 Flora and Fauna Management Measures

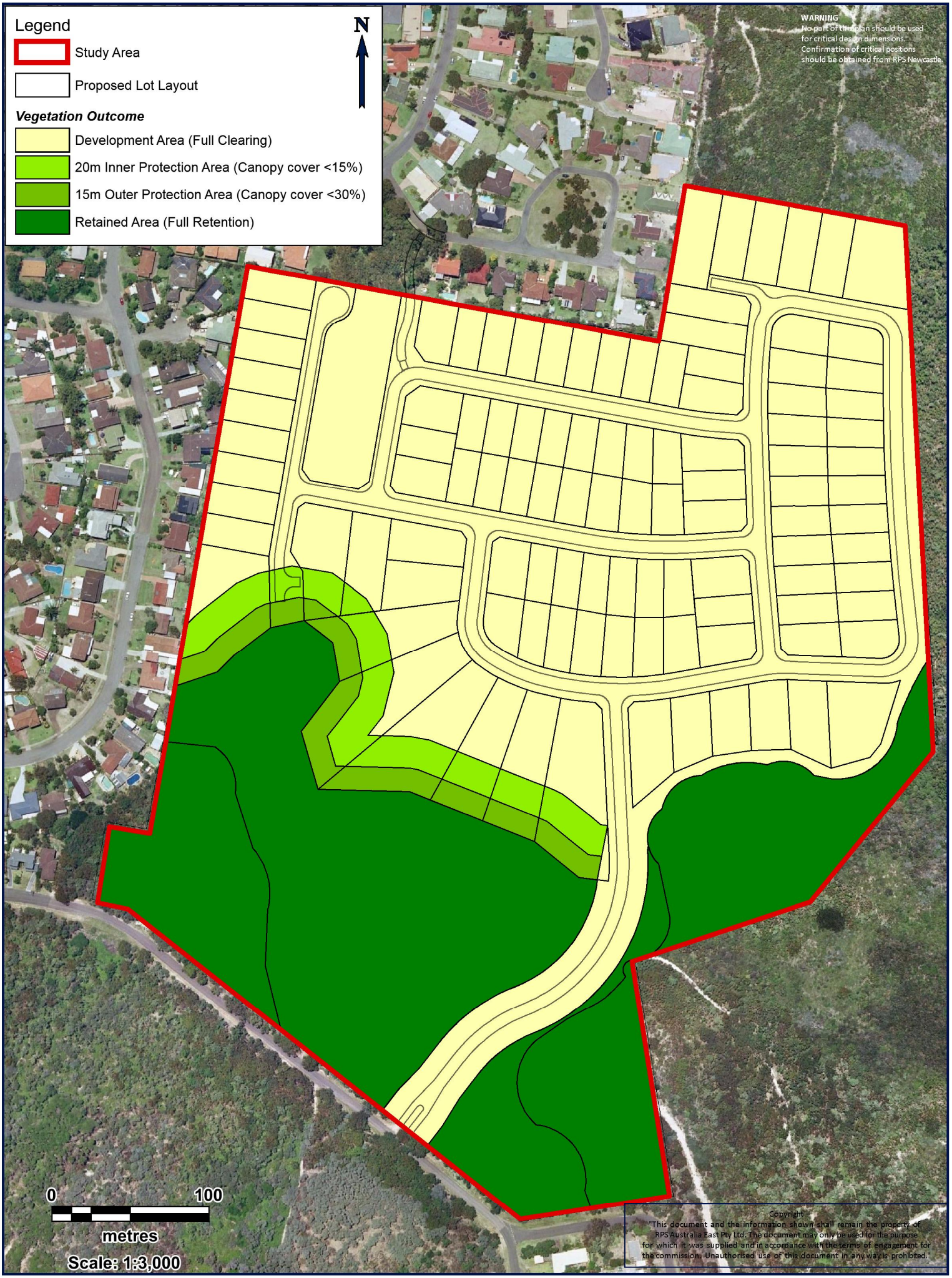
## 4.1 Pre-Construction Management Actions

Pre-construction activities include clearly delineating clearing extents, establishing clearing protocols, implementing flora and fauna habitat protection measures and undertaking pre-clearing surveys (refer to **Table 5** and **Figure 5**).

**Table 5 Pre-construction activities**

| Action | Timing | Responsibility |
|---|---|---|
| In accordance with the approved Habitat Restoration Plan (RPS 2015), salvaged natural hollows (and supplementary artificial nesting boxes) are to be installed into the designated areas of the conservation lands. | Commencement following clearing and salvage of natural hollows. | Vegetation Management Contractor |
| The extent of clearing, Tomaree National Park Boundary and the EEC buffer zone must be clearly identified on all design, construction and operational drawings.<br><br>Extent of clearing for the 'large lots' bordering the Environmental Protection Area should also be clearly identified on all design, construction and operational drawings.<br><br>The extent of clearing for all Asset Protection Zones, including details of Inner and Outer Protection Zones, should also be clearly identified on all design, construction and operational drawings.<br><br>Prior to the commencement of clearing, the clearing limits for the development area are to be clearly defined on the ground by the civil contractor to ensure no accidental plant machinery or other incursions into the conserved areas. Methods include highly visible pegs/ flagging at regular intervals or a fence consisting of para-webbing and star pickets.<br><br>No barbed wire is to be used for any purpose on the site. | Define clearing area prior to the commencement of clearing.<br><br>Maintain fencing during construction. | Civil Contractor |
| Pre-clearance surveys are to be undertaken to clearly mark all hollow-bearing trees and trees offering faunal habitat containing large bark fissures, termite mounds, dead trees (stags) or active nests within the Development Area that could potentially be used by resident and migratory fauna as habitat. | Prior to the commencement of clearing | Project Ecologist |
| Identification of suitable habitat for the release of any fauna encountered during pre-clearing (or actual clearing) should occur prior to the commencement of clearing - not within 7 days of the clearing commencing as the plan currently states. | Within seven days of the commencement of clearing | Project Ecologist |

| Action | Timing | Responsibility |
|---|---|---|
| Appropriate sediment and erosion controls will be installed during the initial stages of construction. Temporary mitigation measures for soil and water management control during construction will include sediment fencing, diversion drains, geotextile fabric, sediment control basins and gravel shaker ramps for construction traffic (refer to sediment and erosion control plan) . | Prior to the commencement of bulk earthworks. | Contractor's Environmental Manager |
| Contact proprietors for the reuse of suitable timber at the discretion of the contractor pending quantity of suitable timber that could be harvested.<br><br>Mulch generated by the clearing process is to be reused onsite for landscaping and rehabilitation works within the conserved areas on site. | Prior to the commencement of clearing<br><br>During the course of construction | Contractor's Environmental Manager |




TITLE: FIGURE 5: CLEARING EXTENT

LOCATION: FISHERMANS BAY

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## 4.2 Construction Management Actions

The following actions listed in **Table 6** are to be undertaken throughout the construction period.

**Table 6 Vegetation Management Actions**

| Action | Timing | Responsibility |
|---|---|---|
| **Pre-start up** | | |
| All site personnel involved in construction activities must be inducted during Toolbox Talks on the requirements of this Environmental Work Method Statement prior to commencing work on the site. Site personnel are to be:<br>▪ Made aware of the clearing limits, 'No Go' areas and how they are marked.<br>▪ Informed that they are not to encroach on areas beyond the clearing limits.<br>▪ Made aware of the locations of Endangered Ecological Communities, Tomaree National Park and trees that will be retained, measures required to protect them, and the consequences of damage to these areas.<br>▪ Made aware of the local fauna of the site and identification of protocols to be undertaken if fauna are encountered. | Immediately prior to the commencement of works | Foreman / Contractor's Environment Manager |
| A pre-start up check for sheltering native fauna on all infrastructure, plant and equipment and/or during relocation of stored construction materials is to be undertaken. | Daily, prior to commencement of works | Contractor's Environmental Manager |
| **General Habitat Protection** | | |
| Appropriate sediment and erosion controls will be installed prior to the commencement of earthworks and construction. | Prior to commencement of bulk earthworks | Contractor's Environmental Manager |
| Sensitive areas and areas for construction will be clearing marked on plans so that clearing activities are constrained to approved areas only. | Prior to commencement of construction | Project Ecologist<br>Contractor's Environmental Manager |
| To maximise the preservation of the biological aspects of topsoil, stockpiles of topsoil should be separate from all other soils and mulch to be reintroduced in the development area following bulk earthworks and/or utilised in rehabilitation activities in the conservation areas. | During construction | Contractor's Environmental Manager |

| Action | Timing | Responsibility |
|---|---|---|
| Dust suppression activities will be undertaken where appropriate. During windy weather, large unprotected areas will be kept moist by sprinkling with water for dust control purposes. | During construction | Contractor's Environmental Manager |
| Stabilisation of disturbed areas, including mulching and/ or seeding will be undertaken as soon as practicable after disturbance. | During construction | Contractor's Environmental Manager |
| Emergency response protocols and procedures for implementation in the event of a contaminant spill or leak will be clearly articulated in the Construction Management Plan. | During construction | Contractor's Environmental Manager |
| Spill kits will be located to allow for timely response to uncontained spills. Site inductions will include a briefing on the use of spill kits. | During construction | Contractor's Environmental Manager |
| No spoil or excavation material is to be stockpiled within the drip line of native trees retained outside the limits of clearing. | During construction | Contractor's Environmental Manager |
| Any additional construction areas, such as site offices, construction stockpile locations and machinery/equipment lay down will be located, where possible, within existing cleared or disturbed areas. No construction areas are to be located within habitat to be retained. | During construction | Contractor's Environmental Manager |
| Directional lighting will be used where lighting is required in construction areas to minimise light pollution impacts on microbats and nocturnal birds. | During construction | Contractor's Environmental Manager |
| Frequent maintenance of construction machinery and plant will be undertaken to minimise unnecessary noise. | During construction | Contractor's Environmental Manager |
| Vehicles, equipment, materials and footwear are to be clean on entry (free of soil, mud and/or seeds) to minimise the introduction or spread of *Phytophora cinnamomi* | During Construction | Contractor's Environmental Manager |
| **Vegetation Management Issues** | | |
| The clearing of native vegetation will be limited to the Development Footprint as shown on detailed design drawings (refer to **Figure 5**). | During construction | Contractor's Environmental Manager |
| Clearing to occur in accordance with the clearing protocol set out in this CFFMP. | During clearing activities | Project Ecologist<br><br>Contractor's Environmental Manager |

| Action | Timing | Responsibility |
|---|---|---|
| Natural hollows that are less than 150mm in diameter, as their condition allows, will be subject for reuse as arboreal tree hollows in the retained habitats. Natural hollows greater than 150mm will be assessed on site by an ecologist to determine the suitability and safety of reuse as arboreal replacement hollows. If a hollow is deemed unsatisfactory for reuse due to excessive size, safety issues, damage or other appropriate reasons, it will be used as terrestrial habitat within the retained habitats. In accordance with the council's technical specification, supplementary habitat in the form or nest boxes will be installed to compensate for natural hollow loss at a ratio of one box for one hollow. | Prior to Construction | Contractor's Environmental Manager<br><br>Supervised by Project Ecologist |
| **Fauna Management** | | |
| A qualified and experienced ecologist shall be engaged to conduct pre-clearance surveys and supervise habitat tree removal. | During construction | Project Ecologist |
| Any displaced and/or injured fauna must be assessed by the ecologist and if appearing healthy released or ushered into the retained (refuge) habitat areas. Injured fauna is to be handed over to a local wildlife carer and/or vet. | During construction | Project Ecologist<br><br>Contractor's Environmental Manager |
| Any pits/trenches are to be thoroughly checked before they are filled in for the presence of fauna. | During construction | Contractor's Environmental Manager |
| Environmental exclusion fencing of retained vegetation, fauna rescue, weed infestations and plant weed hygiene inspections will be monitored and reported in the Weekly Checklist and maintained as required. | During construction | Contractor's Environmental Manager |
| **Weed Management** | | |
| Weed infestations occurring following construction and subdivision will be monitored and managed to ensure no incursion into conserved vegetation on site. | Prior to commencement and during construction | Contractor's Environmental Manager |
| **Rehabilitation and Revegetation** | | |
| Topsoil should be appropriately stockpiled separately from other soil excavated during civil works. This resource is, in part, to be made available for reuse in areas of disturbance requiring rehabilitation within the conservation areas as outlined in the *Habitat Rehabilitation Plan*. | During construction | Contractor's Environmental Manager |

| Action | Timing | Responsibility |
|---|---|---|
| Wherever possible native species proposed for any future landscaping works and revegetation of open space areas within the development area should be sourced from the locality to maintain local genetic diversity as outlined in the *Habitat Rehabilitation Plan*. | Upon completion of construction | Contractor's Environmental Manager / Landscape Architect |
| The mulch/tub grindings generated from the removal and thinning of native vegetation associated with the development is/are to be re-used in landscaping and made available for reuse in areas of disturbance requiring rehabilitation within the conservation areas outlined in the *Habitat Rehabilitation* Plan. | Upon completion of construction | Contractor's Environmental Manager |
| Stabilisation of disturbed areas, including mulching and/or revegetation will be undertaken as soon as practicable after disturbance. | Upon completion of construction | Contractor's Environmental Manager |
| **Unauthorised access control** | | |
| The Development Area will be adequately fenced as previously outlined to deter unauthorised access into the area. | During and upon completion of construction | Contractor's Environmental Manager |
| All non formalised tracks throughout the conservation lands will be subject to the placement of suitably sized logs, derived from the Development Area, along the edges to prevent unauthorised vehicle access.<br><br>(Formal preventative access measures surrounding designated areas of the conservation lands will be decided upon at a later date by Port Stephens Council). | During clearing activities | Contractor's Environmental Manager |

## 4.3 Clearing Protocol

This protocol explains the actions and measures to be implemented prior to the commencement of vegetation clearing in the Development Area. Where practical all clearing works should be undertaken in the cooler months (Autumn-Winter) to avoid the key breeding seasons for most locally occurring threatened fauna species.

### Prior to Commencement of Clearing

Prior to proposed vegetation clearing, the Contractor's Environmental Manager will ensure:

- The boundary of the clearing footprint is clearly fenced or delineated, and shown on all relevant plans;
- The Project Ecologist has undertaken an assessment of vegetation within and adjacent to the clearing zone, clearly marking and recording all habitat trees within the clearing zone. The Project Ecologist is to be present during the felling of habitat trees;
- Sediment control measures have been installed in accordance with the Sediment and Erosion Management Plan to ensure that no indirect impacts occur to conserved areas on site (south of the

development area); and

- All construction personnel (subcontractors and employees) involved in the clearing are trained via toolbox talks or pre-starts on the environmental risks and aspects of during clearing including:
  - » Clearing limits including environmentally sensitive conservation areas and exclusion zones; and
  - » Clearing protocol for habitat trees.

## Clearing

Site clearing is proposed to generally occur in the following manner:

(1) A buffer of vegetation will be established adjacent to the existing residences to the west and north of the development footprint. This will assist in noise attenuation and filtering of dust during the clearing.

(2) Clearing of the remainder of vegetation within the Development area will take place. Generally clearing will commence from the northwest corner southward towards the conservation areas and eastward towards the Tomaree National Park.

(3) Following clearing of the area outlined in Point 2 above the vegetated buffer will be cleared. This area will be cleared moving from east to west and then north to south in order to encourage displaced fauna to move toward retained (refuge) habitat.

During the initial clearing phase outlined in points 2 and 3 above, all habitat trees, marked up by the project ecologist during pre-clearance surveys previously, are to be retained along with a matrix of additional trees to facilitate arboreal fauna to evacuate safely when habitat trees are removed. Habitat trees (and the matrix of retained trees where required) will be cleared in the following manner:

- After a minimum period of 2 days following clearing of non-habitat vegetation where habitat trees are isolated from other vegetation, clearing of habitat trees may commence.
- Habitat trees (and the matrix of retained trees where required) are to be cleared toward retained vegetation to ensure fauna are able to self-relocate.
- To ensure that no felled trees impact upon retained vegetation, all trees within 15 metres (or canopy height) will be felled away from, or at least parallel with, retained vegetation boundary.
- The main trunk of hollow-bearing trees are to be knocked by the plant operator followed by period of waiting and if required knocked again. This will generally alert resident fauna and encourage fauna to evacuate the tree immediately prior to felling. If an animal is detected in a tree prior to pushing over, the clearing of that tree is to cease to allow fauna time to leave.
- Tree should be “soft-felled”.
- Felled hollow-bearing trees must be inspected immediately by an ecologist for any trapped or injured fauna.
- Any animals found in fallen trees will be inspected for injury and either treated by a wildlife carer (if required) or released into the environmental lands.
- Natural hollows are to be salvaged from each felled tree and stockpiled for reuse as arboreal habitat where suitable or placed within the conservation areas as habitat for terrestrial fauna.

Trees must be left on the ground for at least 24 hours before being mulched and stockpiled to allow any resident fauna to self-evacuate.Reporting

Monitoring of the habitat tree clearing on site will be undertaken by the Project Ecologist and subsequent compliance reporting will be required to address the completion of clearing activities and record matters arising including records of faunal observations during clearing, faunal injuries or mortalities and any non-compliance issues with clearing protocols. A single report collating the data from throughout the construction

period is required to be submitted to the Principle Certifying Authority within 30 days of the completion of clearing works.

## 4.4 Weed Management

Weed management within the Development Area will consist of the removal of all vegetative cover from the Development Area (including weeds) and ongoing monitoring and maintenance to ensure effective control of any new weed infestation that occurs. Likely causes of weed spread within the site are:

- Equipment brought onto site contaminated with weed seeds;
- Vehicle transporting seeds within the Site along access roads and tracks;
- Use of weed contaminated soil, mulch or other horticulture products; and
- Spread of weed seed or propagules on clothing and boots.

### 4.4.1 Methods of Removal

#### 4.4.1.1 Mechanical

Mechanical removal of weeds will be undertaken where weeds occur within the construction footprint as part of the clearing activities.

Mechanical techniques include:

- Excavators or bulldozers to be used to remove larger trees and root systems. Stumps are to be ground out of the soil.
- Slashers or bulldozers to be used to remove shrubby weeds.
- Seedlings or regrowth of weed species can be slashed.

#### 4.4.1.2 Chemical Treatment of weeds

Chemical treatment is another treatment method to be used to treat weeds following clearing operations. Chemical treatment is to be used for the treatment of general annual and perennial weeds or young trees; and for regrowth of tree species. Herbicide application is to be administered by authorised personnel, with ChemCert Accreditation AQF 3 (in accordance with Workcover requirements).

Herbicide application

Noxious and environmental weeds are to be treated in accordance with the herbicide specific to each species, as listed in the *Noxious and Environmental Weed Control Handbook* (DPI 2011). Although in the tables trade names are used, in most cases there are other products with the same active constituents and quantities. Any product with the same active constituents may be used.

Herbicides are not to be sprayed:

- In wind speeds of 10km/h or greater, causing spray to drift into non-target areas.
- On hot days when plants are stressed.
- After weeds seeds have set.
- Within 24 hours of imminent rain.
- In proximity to threatened flora species, as the spray can drift onto the threatened species. In this case, undertake cut-stump or stem injection methods of weed control.
- Where they will detrimentally affect water quality, or so close to a watercourse that the herbicide can enter the water and contaminate the waterway. Only pesticides registered for use near water may be

used near water.

Within 24 hours of applying the herbicide, an Herbicide Application Record Sheet must be completed. A copy must be submitted to the Environmental Manager and development Certifier.

# 5.0 Training, Monitoring and Review

## 5.1 Training

Appropriate training and induction should include, but not be limited to:

- Raising awareness of on-site environmental management issues;
- Providing information on the location and importance of threatened flora and fauna species (and habitat);
- Providing information on the boundaries for vegetation clearing;
- Training on procedures on encountering fauna; and
- Training on weed identification and the appropriate guidelines for removing weeds, driving vehicles in weed infested locations and the disposal of weed infested topsoil etc.

## 5.2 Monitoring

Monitoring actions to be undertaken for the Project are outlined in **Table 7**. A monitoring checklist is provided in **Appendix 3** and should be completed on at least a weekly basis and filed for inclusion in to the post-construction Report.

**Table 7 Monitoring actions to be undertaken**

| Inspection/ Monitoring Activities | Frequency | Delegated Responsibility |
|---|---|---|
| Inspections of work areas to ensure all mitigation measures in this plan are being adhered to, and are operating successfully. | Daily | Contractor's Environmental Manager |
| Inspections of work areas to ensure flora and fauna mitigation measures in this plan are being adhered to, and are operating successfully. | Weekly | Contractor's Environmental Manager |
| Inspections, where deemed necessary, of clearing areas to ensure environmental controls are being followed. | As required | Contractor's Environmental Manager |
| Inspections of conservation areas and EEC to check the integrity of protective fencing. | Weekly | Contractor's Environmental Manager |
| Inspection of sediment control measures (sediment fencing / silt curtains). | Weekly, and as soon as practical following rainfall | Contractor's Environmental Manager |

## 5.3 Review

Any non-compliance identified during monitoring of management and mitigation measures, will be reported to Port Stephens Council within two working days of identification. In accordance with the Conditions of Consent a compliance report must be submitted to council within 30 days of the completion of clearing

works. A final report is to be prepared by the Contractor and submitted to the PCA at the completion of construction. If Port Stephens Council is not the PCA then a copy of the final report is to be provided to Council.

Any non-compliance identified during monitoring will be resolved via a range of contingency measures. Types of contingency measures that would be implemented, in the event that a mitigation measure is deemed non-compliant, are dependent upon the nature, location and magnitude of the impact. Generally, the Contractor's Environmental Manager will be notified by the Project Ecologist of non-compliance and the relevant mitigation measure will be reviewed, modified (e.g. increase the frequency of monitoring, amend existing procedures, repair damaged fencing or signage) and implemented.

The non-conformance will typically require:

- A new or revised procedure to be established and implemented; and / or
- Training to be provided to relevant personnel/ sub-contractors; and / or

Additional specific environmental management inspections to be detailed in this Construction Flora and Fauna Management Plan.

The non-compliance issue is not considered unresolved until has been approved by the Site Superintendent.

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# Appendix 1

## Fauna Species Inventory

*Appendix Key:*

** = Introduced species*

*(E) = Species listed as Endangered on the TSC Act.*

*(V) = Species listed as Vulnerable on the TSC Act.*

*(E*) = Species listed as Endangered on the EPBC Act.*

*(V*) = Species listed as Vulnerable on the EPBC Act.*

*(M*) = Species listed as Migratory on the EPBC Act.*

*X = recorded from sighting or characteristic call.*

*D = 'Definite' identification during Anabat analysis.*

| Family Name | Scientific Name | Common Name | Record Type |
|---|---|---|---|
| **Frogs** | | | |
| Myobatrachidae | *Crinia signifera* | Common Eastern Froglet | X |
| **Reptiles** | | | |
| Scincidae | *Lampropholis delicata* | Garden Skink | X |
| **Birds** | | | |
| Pelecanide | *Pelecanus conspicillatus* | Australian Pelican | X |
| Ardeidae | ***Ardea ibis*** | **Cattle Egret (M*)** | X |
| | *Egretta novaehollandiae* | White-faced Heron | X |
| Threskiornithidae | *Threskiornis molucca* | Australian White Ibis | X |
| Accipitridae | ***Haliaeetus leucogaster*** | **White-bellied Sea-Eagle (M*** | X |
| Falconidae | *Falco cenchroides* | Nankeen Kestrel ( | X |
| Charadriidae | *Vanellus miles* | Masked Lapwing | X |
| Columbidae | *Geopelia humeralis* | Bar-shouldered Dove | X |
| | *Ocyphaps lophotes* | Crested Pigeon | X |
| | *Streptopelia chinensis* | Spotted Turtle-Dove * | X |
| Cacatuidae | *Cacatua galerita* | Sulphur-crested Cockatoo | X |
| Psittacidae | *Platycercus eximius* | Eastern Rosella | X |
| | *Trichoglossus chlorolepidotus* | Scaly-breasted Lorikeet | X |
| | *Trichoglossus haematodus* | Rainbow Lorikeet | X |
| Cuculidae | *Chrysococcyx basalis* | Horsfield's Bronze-Cuckoo | X |
| | *Cuculus pallidus* | Pallid Cuckoo | X |
| Halcyonidae | *Dacelo novaeguineae* | Laughing Kookaburra | X |
| Maluridae | *Malurus cyaneus* | Superb Fairy-wren | X |
| | *Malurus lamberti* | Variegated Fairy-wren | X |
| Pardalotidae | *Sericornis frontalis* | White-browed Scrubwren | X |
| | *Acanthiza pusilla* | Brown Thornbill | X |
| | *Acanthiza chrysorrhoa* | Yellow-rumped Thornbill | X |
| Meliphagidae | *Anthochaera carunculata* | Red Wattlebird | X |
| | *Anthochaera chrysoptera* | Brush Wattlebird | X |
| | *Philemon corniculatus* | Noisy Friarbird | X |
| | *Manorina melanocephala* | Noisy Miner | X |

| Family Name | Scientific Name | Common Name | Record Type |
|---|---|---|---|
| | *Lichenostomus chrysops* | Yellow-faced Honeyeater | X |
| | *Melithreptus lunatus* | White-naped Honeyeater | X |
| | *Lichmera indistincta* | Brown Honeyeater | X |
| | *Phylidonyris nigra* | White-cheeked Honeyeater | X |
| | *Acanthorhynchus tenuirostris* | Eastern Spinebill | X |
| Eopsaltriidae | *Eopsaltria australis* | Eastern Yellow Robin | X |
| Cinclosomidae | *Psophodes olivaceus* | Eastern Whipbird | X |
| Pachycephalidae | *Pachycephala pectoralis* | Golden Whistler | X |
| | *Colluricincla harmonica* | Grey Shrike-thrush | X |
| Dicruridae | *Grallina cyanoleuca* | Magpie-lark | X |
| | *Rhipidura fuliginosa* | Grey Fantail | X |
| | *Rhipidura leucophyrs* | Willie Wagtail | X |
| Campephagidae | *Coracina novaehollandiae* | Black-faced Cuckoo-shrike | X |
| Artamidae | *Cracticus torquatus* | Grey Butcherbird | X |
| | *Cracticus nigrogularis* | Pied Butcherbird | X |
| | *Gymnorhina tibicen* | Australian Magpie | X |
| | *Strepera graculina* | Pied Currawong | X |
| Corvidae | *Corvus coronoides* | Australian Raven | X |
| Passeridae | *Neochmia temporalis* | Red-browed Finch | X |
| Hirundinidae | *Hirundo neoxena* | Welcome Swallow | X |
| Zosteropidae | *Zosterops lateralis* | Silvereye | X |
| **Mammals** | | | |
| Dasyuridae | *Antechinus stuartii* | Brown Antechinus | X |
| Molossidae | *Tadarida australis* | White-striped Freetail-bat | D |
| Muridae | *Rattus rattus** | Black Rat | X |
| Phalangeridae | *Trichosurus vulpecula* | Common Brushtail Possum | X |
| Pseudocheiridae | *Pseudocheirus peregrinus* | Common Ringtail Possum | X |
| Vespertilionidae | ***Miniopterus australis*** | **Little Bentwing-bat (V)** | **D** |
| | ***Falsistrellus tasmaniensis*** | **Eastern False Pipistrelle(V)** | **D** |
| | *Chalinolobus gouldii* | Gould's Wattled Bat | D |
| | *Vespadelus pumilus* | Eastern Forest Bat | D |
| | *Vespadelus vulturnus* | Little Forest Bat | D |

# Appendix 2

## Flora Species Inventory

* Denotes an introduced species.

| Family/Subfamily | Scientific Name | Common Name |
|---|---|---|
| **Trees** | | |
| Arecaceae | *Livistona australis* | Cabbage Tree Palm |
| Casuarinaceae | *Allocasuarina littoralis* | Black She-oak |
| Eleocarpaceae | *Elaeocarpus reticulatus* | Blueberry Ash |
| Euphorbiaceae | *Glochidion ferdinandii* | Cheese Tree |
| Lauraceae | *Cinnamomum camphora** | Camphor Laurel |
| Mimosoideae | *Acacia irrorata* subsp. *irrorata* | Sydney Green Wattle |
| Myrtaceae | *Angophora costata* | Smooth-barked Apple |
| Myrtaceae | *Corymbia gummifera* | Red Bloodwood |
| Myrtaceae | *Eucalyptus pilularis* | Blackbutt |
| Myrtaceae | *Eucalyptus piperita* | Sydney Peppermint |
| Myrtaceae | *Eucalyptus umbra* | Broad-leaved White Mahogany |
| Myrtaceae | *Melaleuca linariifolia* | Snow in Summer |
| Myrtaceae | *Melaleuca quinquenervia* | Broad-leaved Paperbark |
| Pittosporaceae | *Pittosporum undulatum* | Sweet Pittosporum |
| Proteaceae | *Banksia serrata* | Old Man Banksia |
| Salicaceae | *Salix babylonica** | Weeping Willow |
| Santalaceae | *Exocarpos cupressiformis* | Native Cherry |
| **Shrubs** | | |
| Apiaceae | *Platysace lanceolata* | Lance-leaf Platysace |
| Apiaceae | *Xanthosia tridentata* | Rock Xanthosia |
| Apocynaceae | *Nerium oleander** | Oleander Bush |
| Apocynaceae | *Plumeria obtusa** (Cultivar) | Frangipani |
| Araceae | *Monstera deliciosa** | Fruit-salad Plant |
| Asteraceae | *Chrysanthemoides monilifera* subsp. *rotundata** | Bitou Bush |
| Casuarinaceae | *Allocasuarina distyla* | - |
| Cesalpinioideae | *Senna pendula* var. *glabrata** | - |
| Epacridaceae | *Epacris pulchella* | Wallum Heath |
| Epacridaceae | *Monotoca elliptica* | Tree Broom-heath |
| Epacridaceae | *Monotoca scoparia* | Prickly Broom-heath |
| Euphorbiaceae | *Breynia oblongifolia* | Coffee Bush |
| Euphorbiaceae | *Ricinocarpus pinifolius* | Wedding Bush |
| Faboideae | *Aotus ericoides* | - |
| Faboideae | *Bossiaea ensata* | Small Leafless Bossiaea |
| Faboideae | *Bossiaea heterophylla* | Variable Bossiaea |
| Faboideae | *Bossiaea obcordata* | Spiny Bossiaea |
| Faboideae | *Bossiaea rhombifolia* | - |
| Faboideae | *Dillwynia floribunda* var. *floribunda* | Parrot Pea |
| Faboideae | *Dillwynia retorta* | Eggs and Bacon |
| Faboideae | *Gompholobium latifolium* | Broad-leaf Wedge-pea |

| Family/Subfamily | Scientific Name | Common Name |
|---|---|---|
| Magnoliaceae | *Magnolia* sp.* (Cultivar) | Magnolia |
| Mimosoideae | *Acacia binervia* | Coast Myall |
| Mimosoideae | *Acacia longifolia* var. *longifolia* | Sydney Golden Wattle |
| Mimosoideae | *Acacia longifolia* var. *sophorae* | Coastal Wattle |
| Mimosoideae | *Acacia myrtifolia* | Red Stem Wattle |
| Mimosoideae | *Acacia suaveolens* | Sweet Scented Wattle |
| Mimosoideae | *Acacia ulicifolia* | Prickly Moses |
| Myrtaceae | *Callistemon rigidus* | Stiff Bottlebrush |
| Myrtaceae | *Leptospermum polygalifolium* subsp. *polygalifolium* | Tantoon |
| Myrtaceae | *Leptospermum trinervium* | Slender Tea-tree |
| Myrtaceae | *Melaleuca thymifolia* | Thyme Honey Myrtle |
| Polygalaceae | *Comesperma ericinum* | Pyramid Flower |
| Proteaceae | *Banksia aemula* | Wallum Banksia |
| Proteaceae | *Banksia spinulosa* var. *spinulosa* | Hairpin Banksia |
| Proteaceae | *Hakea dactyloides* | Broad-leaved Hakea |
| Proteaceae | *Hakea sericea* | Needlebush |
| Proteaceae | *Isopogon anemonifolius* | Flat-leaved Drumsticks |
| Proteaceae | *Lambertia formosa* | Mountain Devil |
| Proteaceae | *Lomatia silaifolia* | Crinkle Bush |
| Proteaceae | *Persoonia lanceolata* | Lance-leaved Geebung |
| Proteaceae | *Persoonia levis* | Broad-leaved Geebung |
| Proteaceae | *Persoonia linearis* | Narrow-leaved Geebung |
| Rosaceae | *Rubus ulmifolius** | Blackberry |
| Rutaceae | *Crowea exalata* | - |
| Rutaceae | *Eriostemon australasius* | Pink Wax Flower |
| Sapindaceae | *Dodonaea triquetra* | Hop-bush |
| Sterculiaceae | *Lasiopetalum ferrugineum* var. *ferrugineum* | Rusty Velvet-bush |
| Verbenaceae | *Lantana camara** | Lantana |
| Zamiaceae | *Macrozamia communis* | Burrawang |
| **Groundcovers** | | |
| Acanthaceae | *Thunbergia alata** | Black-eyed Susan |
| Apiaceae | *Centella asiatica* | Swamp Pennywort |
| Apiaceae | *Hydrocotyle laxiflora* | Stinking Pennywort |
| Apiaceae | *Xanthosia pilosa* | Woolly Xanthosia |
| Apocynaceae | *Vinca minor** | Blue Periwinkel |
| Araceae | *Dieffenbachia* sp. (cultivar) | Dumb Cane |
| Asparagaceae | *Protasparagus aethiopicus** | Asparagus Fern |
| Asteraceae | *Actinotus helianthi* | Flannel Flower |
| Asteraceae | *Senecio madagascariensis** | Fireweed |
| Asteraceae | *Taraxacum officinale** | Dandelion |
| Asteraceae | *Tragopogon porrifolius** | Salsify |

| Family/Subfamily | Scientific Name | Common Name |
|---|---|---|
| Clusiaceae | *Hypericum gramineum* | Small St Johns Wort |
| Commelinaceae | *Commelina cyanea* | Scurvy Weed |
| Convolvulaceae | *Dichondra repens* | Kidney Weed |
| Crassulaceae | *Bryophyllum delagoense** | Mother of Millions |
| Cyperaceae | *Baumea rubiginosa* | Twig Rush |
| Cyperaceae | *Carex appressa* | Tall Sedge |
| Cyperaceae | *Caustis flexuosa* | Curly Wig |
| Cyperaceae | *Cyperus brevifolius** | Mullumbimby Couch |
| Cyperaceae | *Cyperus eragrostis** | Umbrella Sedge |
| Cyperaceae | *Cyperus papyrus** | Papyrus |
| Cyperaceae | *Gahnia clarkei* | Tall Saw-sedge |
| Cyperaceae | *Lepidosperma laterale* | Variable Sword-sedge |
| Cyperaceae | *Lepidosperma limicola* | - |
| Cyperaceae | *Lepidosperma longitudinale* | Pithy Sword Sedge |
| Cyperaceae | *Ptilothrix deusta* | - |
| Cyperaceae | *Schoenus brevifolius* | Bog-rush |
| Davalliaceae | *Nephrolepis cordifolia** | Fish-bone Fern |
| Dennstaedtiaceae | *Pteridium esculentum* | Bracken |
| Dicksoniaceae | *Calochlaena dubia* | Rainbow Fern |
| Dilleniaceae | *Hibbertia aspera* | Rough Guinea Flower |
| Dilleniaceae | *Hibbertia linearis* | - |
| Doryanthaceae | *Doryanthes excelsa* | Gymea Lily |
| Euphorbiaceae | *Euphorbia peplus** | Spurge |
| Gentianaceae | *Centaurium erythraea** | Common Centaury |
| Goodeniaceae | *Dampiera stricta* | Blue Dampiera |
| Goodeniaceae | *Scaevola ramosissima* | Purple Fan Flower |
| Haemodoraceae | *Haemodorum planifolium* | Bloodroot |
| Haloragaceae | *Gonocarpus teucroides* | Raspwort |
| Iridaceae | *Patersonia glabrata* | Leafy Purple-flag |
| Iridaceae | *Romulea rosea* var. *australis** | Onion Grass |
| Juncaceae | *Juncus usitatus* | Common Rush |
| Liliaceae | *Chlorophytum comosum** | Spider Plant |
| Liliaceae | *Lilium formosanum** | Formosan Lily |
| Lobeliaceae | *Pratia purpurascens* | Whiteroot |
| Lomandraceae | *Lomandra filiformis* subsp. *filiformis* | Wattle Mat-rush |
| Lomandraceae | *Lomandra glauca* | Pale Mat-rush |
| Lomandraceae | *Lomandra longifolia* | Spiky-headed Mat-rush |
| Lomandraceae | *Lomandra obliqua* | Twisted Mat-rush |
| Orchidaceae | *Dipodium variegatum* | Blotched Hyacinth Orchid |
| Phormiaceae | *Dianella caerulea* var. *producta* | Blue Flax Lily |
| Plantaginaceae | *Plantago lanceolata** | Ribwort |

| Family/Subfamily | Scientific Name | Common Name |
|---|---|---|
| Poaceae | *Andropogon virginicus** | Whisky Grass |
| Poaceae | *Anisopogon avenaceus* | Oat Speargrass |
| Poaceae | *Cymbopogon refractus* | Barbwire Grass |
| Poaceae | *Cynodon dactylon* | Common Couch |
| Poaceae | *Dichelachne micrantha* | Short-hair Plume Grass |
| Poaceae | *Digitaria parviflora* | Small-flowered Finger Grass |
| Poaceae | *Entolasia marginata* | Bordered Panic |
| Poaceae | *Entolasia stricta* | Wiry Panic |
| Poaceae | *Imperata cylindrica* | Blady Grass |
| Poaceae | *Lachnagrostis filiformis* | Blown Grass |
| Poaceae | *Oplismenus aemulus* | Basket Grass |
| Poaceae | *Paspalum dilatatum** | Paspalum |
| Poaceae | *Paspalum urvillei** | Vasey Grass |
| Poaceae | *Poa affinis* | - |
| Poaceae | *Poa poiformis* | Coast Tussock Grass |
| Poaceae | *Setaria gracilis** | Slender Pigeon Grass |
| Poaceae | *Sporobolus elongatus* | Slender Rat's Tail Grass |
| Poaceae | *Stenotaphrum secundatum** | Buffalo Grass |
| Poaceae | *Themeda australis* | Kangaroo Grass |
| Polygonaceae | *Rumex bidens* | Mud Dock |
| Polygonaceae | *Rumex crispus** | Curled Dock |
| Primulaceae | *Anagallis arvensis** | Scarlet Pimpernel |
| Restionaceae | *Baloskion tetraphyllum* subsp. *tetraphyllum* | Plume Rush |
| Restionaceae | *Empodisma minus* | - |
| Restionaceae | *Leptocarpus tenax* | Slender Twine-rush |
| Rubiaceae | *Pomax umbellata* | Pomax |
| Rubiaceae | *Richardia brasiliensis** | White Eye |
| Thymelaeaceae | *Pimelea linifolia* subsp. *linifolia* | Slender Rice Flower |
| Tremandraceae | *Tetratheca ericifolia* | Black-eyed Susan |
| Xanthorrhoaceae | *Xanthorrhoea latifolia* subsp. *latifolia* | - |
| Zingiberaceae | *Hedychium gardnerianum** | Ginger Lily |
| **Epiphytes** | | |
| Aspleniaceae | *Asplenium australasicum* | Birds Nest Fern |
| Orchidaceae | *Cymbidium suave* | Snake Orchid |
| **Climbers** | | |
| Bignoniaceae | *Pandorea pandorana* | Wonga Vine |
| Faboideae | *Hardenbergia violacea* | False Sarsparilla |
| Faboideae | *Kennedia prostrata* | Running Postman |
| Lauraceae | *Cassytha glabella* forma *glabella* | Slender Devil's Twine |
| Menispermiaceae | *Sarcopetalum harveyanum* | Pearl Vine |
| Pittosporaceae | *Billardiera scandens* | Hairy Appleberry |

| Family/Subfamily | Scientific Name | Common Name |
|---|---|---|
| Vitaceae | *Cayratia clematidea* | Native Grape |

# Appendix 3

## Monitoring Checklist

## Monitoring Checklist

| Action | Undertaken | Comments | Action |
|---|---|---|---|
| Spot check contractors and employees working on site to ensure they have been inducted | Yes/No | | |
| Sediment control structure are installed and functioning<br>▪ Check for unforeseen runoff or sedimentation issues<br>▪ Are controls adequate<br>▪ Are all points that sediment can potentially leave site or enter Conservation Area managed<br>▪ Do controls require repair or desilting | Yes/No | | |
| Is dust suppression required | Yes/No | | |
| Check for spills and ensure spill kits are in place | Yes/No | | |
| Ensure all vehicles and equipment are parked in designated parking areas | Yes/No | | |
| Are there any weed infestations that require control | Yes/No | | |
| Conservation boundary demarcation in serviceable condition | Yes/No | | |
| Is there any sign of unauthorised access into Conservation Area | Yes/No | | |

Recorder:_____ Signed:_____

Date:_____