# Catherine McAuley Catholic College: Fauna Management Plan

FINAL REPORT

Prepared for North Construction & Building Pty Ltd

29 October 2019

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## Document information

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## Acknowledgements


Biosis acknowledges the contribution of the following people and organisations in undertaking this study:

- North Construction & Building Pty Ltd: Paul Sniekers

# Contents

## Tables



## Figures

# 1 Introduction

This Fauna Management Plan (FMP) forms part of the Construction Environmental Management Plan (CEMP) to manage the impacts to biodiversity during the Medowie Catholic College construction works. This FMP has been prepared to address the requirements of the Development Consent (DC) for SSD 8989, dated 26 July 2019 (DPIE 2019) and all applicable legislation relating to the project.

## 1.1 Project background

The proposed development of Catherine McAuley College has been assessed under Part 4 Division 4.1 Section 89C of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) as a State Significant Development (SSD). The College will provide a childcare centre, Chapel, primary and high school. The Secretary's Environmental Assessment Requirements (SEARS) issued by the Department of Planning and Environment (DPE) stipulated the project to be assessed in accordance with the Biodiversity Assessment Method (BAM)(OEH 2017) and Biodiversity Offset Scheme (BOS) in accordance with the *Biodiversity Conservation Act 2016* (BC Act). The SEARs also included requirement of the project to be assessed in accordance with the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Biosis Pty Ltd was commissioned by North Construction & Building Pty Ltd (NCB) to prepare a Fauna Management Plan (FMP) to mitigate impacts to fauna during the construction phase of the project. In accordance with the consent conditions (CC) this FMP will form part of the Biodiversity Management Sub-plan (BMSP) for inclusion in the Construction Environment Management Plan and is required to be implemented prior to construction.

The Biodiversity Assessment Development Report (BDAR) (Biosis 2018) outlined measures to avoid and minimise impacts during the construction phase, these recommendations have been included as part of this FMP.

## 1.2 Study area

The proposed Catherine McAuley College is located in Medowie NSW. The study area is located in the Port Stephens Local Government Area, approximately 20 kilometres north-east of the Newcastle CBD and four kilometres south of the Medowie town centre at 2 Kingfisher Close. The study area is displayed in Figure 1.

## 1.3 Subject site

The subject site is defined as the extent of the approved development footprint which will include all construction works. Development is limited to the approved subject site. Remediation works will be conducted within the study area outside of, but not limited to the subject site and include replanting and removal of exotic species as outlined in the Vegetation Management Plan (VMP). The study area and subject site are provided in Figure 1.

## 1.4 Scope of works

Works involved in the construction phase of the project are all activities involved in the demolition, construction and operation of Catherine McAuley Catholic College, as outlined in the Environmental Impact Statement (EIS), Response to submissions and as per the consent conditions (DPIE 2019). This includes but is not limited to:

- Removal of buildings
- Bulk earthworks
- Erection of buildings and other infrastructure as per development consent.

The following are excluded from the approved works:

- Building and road dilapidation surveys,
- Establishing temporary site offices (in locations other than identified by the Conditions of consent)
- Installation of environmental impact mitigation measures, fencing, enabling works and minor adjustments to services or utilities.

### 1.4.1 Demolition works

Existing infrastructure within the subject site include a single-storey dwelling, storage shed, tennis court, sealed vehicle track and driveway. Demolition works required as part of the project will involve the removal of existing buildings and associated infrastructure as required. The existing buildings are not considered to provide habitat for fauna.

### 1.4.2 Remediation works

Remediation works will include restoration of vegetation within the areas adjacent to the waterway in the south of the study area and within cleared areas in the west of the study area. Remediation works will be completed in accordance with the site VMP (Biosis 2018) Remediation works will include:

- Planting of appropriate local native species for restoration of the riparian corridor.
- Planting of appropriate local native species for restoration of low condition Swamp Sclerophyll Forest.
- Treatment and removal of exotic species with ongoing maintenance.
- Use of non-hollow sections of trees for fauna habitat outside of the subject site.

## 1.5 Environmental management document system

The FMP is part of the Biodiversity management Sub-plan, provided in support of the CEMP and in accordance with the requirements of the Development Consent (SSD 8989).

Construction personnel will be required to undertake works in accordance with the mitigation measures identified by this FMP. The combination of the CEMP, sub-plans strategies and procedures identify the required environmental management actions for implementation by North Construction and Building personnel and contractors.

The review and document control procedures for this FMP are described in the CEMP.

## 1.6 Purpose and objectives

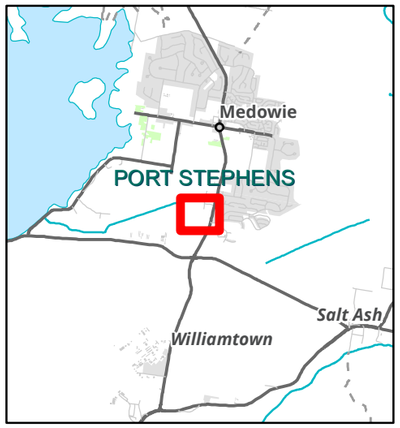
The purpose of this FMP is to describe how construction works are likely to impact on biodiversity and provide a plan for impact minimisation and management.

The key objective of this FMP is to ensure that impacts to fauna are minimised and are within the scope permitted by the conditions of consent (CoC). To achieve this objective, North Construction and Building will undertake the following:

- Ensure controls and procedures are implemented during construction activities to avoid, minimise or manage potential adverse impacts to fauna within and adjacent to the works.
- Ensure appropriate measures are implemented to address the relevant CoC outlined in Table 1.
- Ensure measures are implemented to comply with all relevant legislation and other requirements as described in Section 2 of this FMP.

## 1.7 Contributors

This report was prepared by Sarah Allison, Project Zoologist at Biosis Pty Ltd. This report has been reviewed by Tony Cable, Senior Ecologist at Biosis with subsequent updates and reviews as outlined at the beginning of this document and in Section 1.5 above.


**Legend**

- Study area
- Subject site

**Figure 1 Study area**

0 50 100 150

Metres
Scale: 1:3,000 @ A3
*Coordinate System: GDA 1994 MGA Zone 56*

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Biosis Pty Ltd

Albury, Ballarat, Melbourne,
Newcastle, Sydney, Wangaratta & Wollongong

*Matter: 30449*
*Date: 01 August 2019,*
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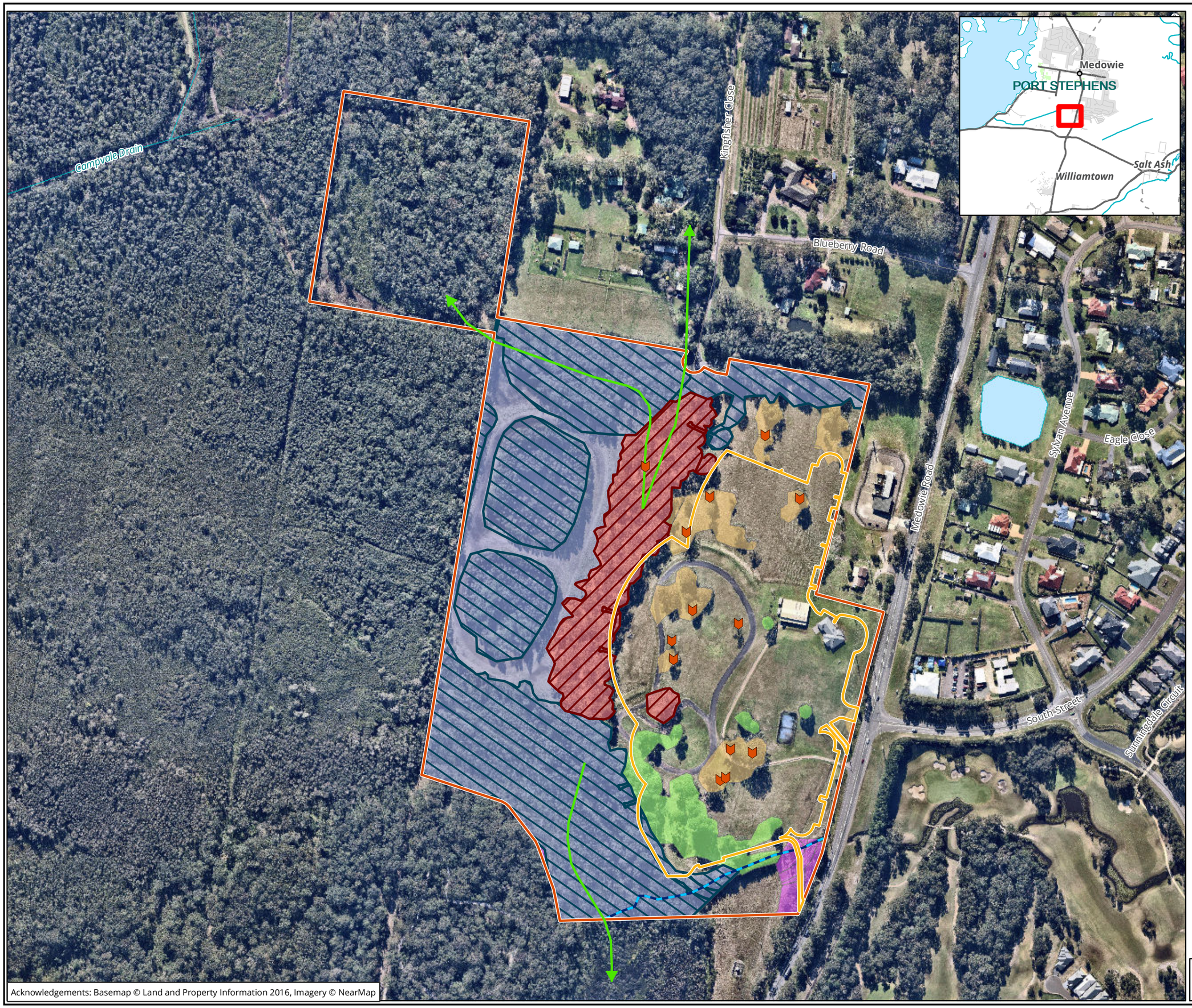


**Legend**

- Study area
- Subject site
- HydroLine (Biosis 2018)
- Hollow-bearing tree
- Habitat connectivity

**Vegetation community**

- PCT 1564 Blackbutt - Rough-barked Apple - Turpentine - ferny tall open forest of the Central Coast
- PCT 1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter
- PCT 1619 Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands
- PCT 1718 Swamp Mahogany - Flax-leaved Paperbark swamp forest on coastal lowlands of the Central Coast
- Exotic vegetation (Slash Pine)

**Threatened Ecological Community**

- Hunter Lowland Redgum Forest EEC
- Swamp Sclerophyll Forest EEC



## Figure 2 Ecological values of the study area

0 50 100 150

Metres

Scale: 1:3,500 @ A3

*Coordinate System: GDA 1994 MGA Zone 56*

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# 2 Environmental requirements

## 2.1 Relevant legislation and guidelines

The following section outlines the environmental requirements of the works including relevant legislation and guidelines that have been used to assist in the formulation of this FMP.

Legislation relevant to ecological values includes:

- *Environmental Planning and Assessment Act 1979* (EP&A Act).
- *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth).
- *Threatened Species Conservation Act 1995* (TSC Act).
- Fisheries Management Act 1994 (FM Act).

In accordance with the relevant legislation, Development Consent has been granted by the Minister and includes conditions of consent to be implemented prior to commencement of construction. Relevant conditions of consent are provided in the section below.

## 2.2 Ministers consent conditions

**Table 1 Conditions of Consent relevant to this FMP**

| CC No. | Condition | Condition requirements |
|---|---|---|
| **C10** | Management plans required under this consent must be prepared in accordance with relevant guidelines and include | a) Detailed baseline data |
| | | b) Details of:<br>i. The relevant statutory requirements (including any relevant approval, licence or lease conditions)<br>ii. Any relevant limits or performance measures and criteria; and<br>iii. The specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; |
| | | c) A description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria. |
| | | d) A program to monitor and report on the<br>i. Impacts and environmental performance of the development.<br>ii. Effectiveness of the management measures set out pursuant to paragraph (c) above. |
| | | e) A contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible. |
| | | f) a program to investigate and implement ways to improve the environmental performance of the development over time. |

| CC No. | Condition | Condition requirements |
|---|---|---|
| | | g) a protocol for managing and reporting any:<br>i. incident and any non-compliance (specifically including any exceedance of the impact assessment criteria and performance criteria);<br>ii. compliant;<br>iii. failure to comply with statutory requirements. |
| | | h) A protocol for periodic review/update of the plan and as updates in response to incidents or matters of non-compliance. |
| **C12** | Prior to the commencement of construction, the Applicant must submit a Construction Environment Management Plan (CEMP) to the satisfaction of Planning Secretary. The CEMP must include, but not be limited to, the following: | g) Biodiversity Management Sub-Plan (see condition c18). |
| **C18** | The Biodiversity Management Sub-Plan (BMSP) must address, but not be limited to the following: | g) include a Fauna Management Plan for the site including details of impacts and proposed mitigation measures due to impact on<br>o movement<br>o construction traffic<br>o proposed construction hours<br>o details of any fencing<br>o restricting developments in identified areas<br>o light spill<br>o construction noise<br>o on-site crane movements. |

The Development consent defines Construction as it related to the development of the Catherine McAuley Catholic College as:

All physical works to enable operation, including but not limited to the removal of buildings, the carrying out of works for the purposes of the development, including bulk earthworks, and erection of buildings and other infrastructure permitted by this consent, but excluding the following:

- Building and road dilapidation surveys.
- Establishing temporary site offices (in locations identified by the conditions of this consent).
- Installation of environmental impact mitigation measures, fencing, enabling works.
- Minor adjustments to services or utilities.

# 3 Existing Environment

## 3.1 Permits and licences

This FMP has been composed in accordance with the Minister's consent conditions (SSD 8989), Biosis' Scientific Licence issued by the Office of Environment and Heritage under the *National Parks and Wildlife Act 1974* (SL100758, expiry date 31 March 2020) and approval 17/892 from the NSW Animal Care and Ethics Committee (expiry date 31 January 2020).

During tree clearing and construction works, fauna handling and any resultant relocation of fauna should be undertaken by an appropriately qualified and experienced ecologist and in accordance with the above mentioned appropriate permits and licences.

## 3.2 Desktop review

The desktop review consisted of background research and review of available databases and key documents relevant to the works, including:

- Development Consent application number SSD 8989, Minister for Planning 2019.
- Catherine McAuley Catholic College, Medowie BDAR. Report for Webber Architects (Biosis 2018).
- Catherine McAuley Catholic College, Medowie, VMP for Webber Architects (Biosis 2018).
- Response to Submissions Report – Proposed Catholic College - Medowie – SSD 8989. (de Witt Consulting 2018).
- Environmental Impact Statement (EIS) – Proposed Catholic College at Medowie (de Witt Consulting 2018).

Field investigation undertaken as part of the Biodiversity Development Assessment Report (BDAR).

## 3.3 Ecological values of the study area

The study area encompasses 21 hectares within Lot 412 and 413 DP 1063902. The study area is bounded to the east by Medowie Road which is a north-south oriented single carriageway road providing access to the town of Medowie. East of Medowie Road is a golf course (in the south) and urbanised residential areas. The surrounding land use includes residential subdivision to the north east, a golf course to the south east and large residential lots to the north. To the west and south are large areas of native vegetation within Campvale Swamp, situated within both private land Tilligerry State Conservation Area.

The study area was assessed as containing 12.1 hectares of native vegetation (Biosis 2018), with large areas of cleared exotic pasture occurring within the east of the study area. Impacts of the development have been restricted to the previously cleared eastern portion of the study area (the subject site) with 1.56 hectares of native vegetation to be impacted, including threatened species habitat.

### 3.3.1 Ecological values of the Catherine McAuley College development area

Native vegetation mapped within the subject land includes:

- 0.96 hectares *PCT 1564 Blackbutt - Rough-barked Apple - Turpentine - ferny tall open forest of the Central Coast*.
- 0.11 hectares *PCT 1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter* listed Endangered under the BC Act.

- 0.11 hectares *PCT 1619 Smooth-barked Apple - Red Bloodwood - Brown Stringybark - Hairpin Banksia heathy open forest of coastal lowlands*.
- 0.04 hectares *PCT 1718 Swamp Mahogany – Flax leaved Paperbark swamp forest on coastal lowlands of the Central Coast* listed Endangered under the BC Act.
- 0.43 hectares of Koala habitat as assessed by the BDAR.

One first order waterway which traverses the south of the study area crosses the subject land in the south-east corner. Habitat for fauna is limited within the subject site due to previous clearing, introduced weed species and ongoing land management including mowing of exotic grasses and collection of fallen timber. A total of 10 hollow-bearing trees will be impacted by the proposed development within the subject site.

Part of the study area is listed as Coastal Wetlands and Coastal Wetlands Proximity Area under *State Environmental Planning Policy (Coastal Management) 2018* (Coastal Management SEPP). The subject site will impact on 0.34 hectares of land mapped under the SEPP. The subject site has been situated to largely avoid the Coastal Management area.

# 4 Environmental aspects and impacts

## 4.1 Ecological impacts

Potential impacts to fauna may occur from the movement of goods, machinery and vehicles, construction traffic, disturbance from construction during proposed construction hours including light spill and noise, construction fencing and crane movements. Impacts to fauna related to these activities are provided in Table 2 below.

**Table 2 Construction activities and impacts to fauna**

| Action | Impact |
|---|---|
| **Vegetation Clearing**<br>• Removal of hollow-bearing trees<br>• Removal of other native vegetation<br>• Trimming of canopy as part of fire hazard reduction | • Loss of vegetation and habitat<br>• Habitat fragmentation and loss of wildlife connectivity.<br>• Increased Edge effects<br>• Injury and mortality of Wildlife<br>• Spread of weeds reducing habitat quality |
| **Construction movement including:**<br>• Heavy and light vehicle<br>• Machinery<br>• Material stockpiles<br>• Construction traffic increased on Medowie Road<br>• Crane movements | • Injury/mortality of Wildlife<br>• Wildlife connectivity and habitat fragmentation<br>• Spread of Weeds reducing habitat quality |
| **Disturbance (during construction hours)** | • Edge effects<br>• Noise, Vibration and light spill |
| **Fencing** | • Wildlife connectivity and habitat fragmentation<br>• Injury of Wildlife |

More details on these impacts are provided in the sections below. The mitigation and management measures provided in Table 3 aim to minimise these potential impacts.

### 4.1.1 Loss of vegetation and habitat

Works have been restricted to the subject site assessed by the BDAR.

Habitat within the study area includes 10 hollow-bearing trees impacted by the works. Surrounding vegetation retained within the study area does not contain a high number of hollows and hollows removed from the subject site are required to be retained and placed in adjacent vegetation.

Any tree removal that is undertaken should be done so in accordance with the mitigation measures outlined in Table 3 of this FMSP. These management actions are comprised of the conditions of consent and management/mitigation measures outlined in the BDAR.

### 4.1.2 Habitat fragmentation and loss of wildlife connectivity.

The extent and quality of vegetation through the subject site will be reduced by the proposed vegetation removal. However, this is not likely to result in a significant impact to threatened fauna due to the limited scope of vegetation to be removed across the entire study area, and surrounds. In addition, the vegetation within the subject site to be impacted occurs at the edge of a larger patch of vegetation which provides connectivity to the north, south, east and west.

Fencing erected during construction works will aim at keeping fauna out of the construction footprint to prevent injury and mortality. Fencing is not considered likely to reduce habitat connectivity as surrounding vegetation will

continue to provide north-south movement corridors. In addition, fencing may assist in preventing wildlife from moving on to Medowie Road in the area of increased construction traffic.

### 4.1.3 Increased edge effects

Removal of vegetation may result increased edge effects on vegetation retained within study area. These effects are expected to be minimal following the completion of the project given the nature of the development, being a school.

Edge effects may also include introduction or spread of weeds within the study area, mitigation measures outlined in the Vegetation Management Sub-plan (VMSP) will prevent the spread of weeds. Remediation measures for the site are outlined in the VMP and include removal of exotic and priority weed species.

### 4.1.4 Noise, vibration and light

Noise, movement, vibration and light resulting from construction may result in disturbance of the surrounding habitat and could result in the exclusion of fauna from the immediate vicinity. There is potential for resident native fauna to temporarily avoid habitats directly adjacent to the study area during construction, with Owl and bat species being particularly sensitive to any change in lighting that may occur. Restriction of construction activities to daylight hours is expected to reduce this effect for nocturnal foraging species. Species roosting in adjacent habitat during the day may be displaced for the duration of construction activities.

### 4.1.5 Injury and mortality

Injury and mortality to fauna species is possible during construction, particularly during habitat removal when fauna may be forced to move. Habitat clearing may result in an increase in ground-dwelling mammals, reptiles and frogs being injured or killed by construction vehicles. A two stage clearing process is described in Table 3 which specifies the procedures to specifically minimise harm to resident fauna. It is expected that fauna will be able to move to safety via connected habitat during a two stage clearing process.

One threatened species, the Koala was found to have habitat within the subject site. The Koala Management Sub-plan (KMSP) includes additional detail on mitigation of impacts to the Koala.

Movement and construction traffic will be restricted to the subject site. All areas outside of the subject site as identified in the BDAR, approved plans and sensitive area mapping (Figure 1) are to be identified as no-go zones during construction to prevent accidental encroachment of fauna habitat. Mitigation measures outlined in Table 3 and include fauna exclusion construction fencing which will be implemented to mitigate this impact.

### 4.1.6 Weeds

The proposed works are not likely to significantly increase the presence or distribution of weeds in the area that may impact on fauna habitat suitability. There is, however, the potential for weeds to be spread during vegetation clearance, and through the movement of vehicles and machinery. The Biodiversity Management Plan and Vegetation Management sub-plan prepared as part of the CEMP outline measures to mitigate the spread of weeds.

### 4.1.7 Aquatic habitats

A vegetated riparian zone (VRZ) of 10 metres wide will be established and maintained along the length of the waterway in the south of the subject site. Rehabilitation of the VRZ to remove weed species and improve native flora cover will improve the overall health of the waterway through reducing erosion and increasing bank stability. Rehabilitation of the waterway will also provide improved fauna habitat and improve connectivity to areas both upstream and downstream. Erosion and sedimentation control measures outlined in the CEMP will reduce the potential for impacts to the waterway. Mitigation measures for impact to fauna potentially utilising this waterway are also provided in Table 3.

### 4.1.8 Impacts to threatened fauna

The vegetation and fauna habitat throughout the majority of the study area has been modified by past disturbances which have included clearing and the construction of private racetracks, a tennis court, a single story dwelling, a large storage shed and electrical substation. As such the subject site contains limited habitat for threatened fauna.

Targeted survey for threatened fauna detected six threatened fauna species within the study area. This includes two species which are likely resident within the study area, Koala *Phascolarctos cineraeus* and Wallum Froglet *Crinia tinnula* and four species which occur on occasion for foraging or during dispersal movements; Grey-headed Flying-fox *Pteropus poliocephalus*, White-bellied Sea-eagle, Powerful Owl *Ninox strenua* and Masked Owl *Tyto novaehollandiae.* Species considered to forage across the subject site have been assessed as unlikely to be impacted given that large areas of more suitable habitat occurs within the vegetation retained. In addition, no important breeding habitat was identified within the study area for these species.

Suitable habitat for the Wallum Froglet exists within the study area and wider locality, however, the subject site does not contain suitable habitat for this species. This species may occasionally utilise the waterway within the subject site for dispersal. Potential impacts to this species may occur from improper erosion and sediment control, the mitigation measures are outlined in the Biodiversity Management Sub-plan (BMSP) in Table 3 below

Connectivity to larger areas of suitable habitat for the Koala is expected to be maintained through vegetation to the west during and post construction. Wallum Froglet may utilise the waterway in the south of the study area for dispersal. There is unlikely to be significant impacts on the Koala or Wallum Froglet provided mitigation measures outlined in Section 5 are implemented.

# 5 Environmental mitigation measures

## 5.1 Environmental mitigation measures

The following table outlines tasks, potential environmental hazards and recommended actions associated with demolition, construction and remediation works.

The environmental mitigation measures and associated actions have been adopted from the BDAR, consent conditions and relevant guidelines.

The locations of the ecological values within the study area are indicated in Figure 2.

**Table 3 Environmental mitigation measures – Demolition, construction and remediation works**

| Task | Potential Hazard | Action | Monitoring response |
|---|---|---|---|
| **Site establishment and protection of native vegetation and habitats** | | | |
| **Pre-clearance surveys** | Clearing / damage to threatened fauna | Project Ecologist to undertake a pre-clearing survey of the vegetation one week prior to clearing works to identify any potential threatened species, endangered vegetation, weed infestation and habitat trees. The ecologist will identify at a minimum:<br>• Locations of threatened fauna habitat or hollow bearing trees;<br>• Identification of pest fauna species.<br>• If hollow-bearing or habitat trees are identified as requiring removal the two-staged clearing process is to be implemented and the clearing supervised by an ecologist.<br>• Pre-clearing surveys are to include dusk stagwatch for microbats with anabat units not more than one week prior to commencement of clearing.<br>Trees in clearing zones to be marked as follows:<br>• Habitat trees to be clearly marked with a flagging tape and an 'H' painted on the trunk to indicate an ecologist is required to supervise its removal. | • Pre-clearance report to be prepared detailing actions undertaken and compliance. |
| **Contractor / Sub-contractor training and inductions** | Accidental damage to threatened fauna | • Training will be provided to all project personnel, including relevant sub-contractors on requirements from this FMP, the KMSP and VMSP through inductions and toolbox talks, e.g. construction workers shown pictures of all threatened fauna with a high likelihood of occurrence within the works area, and provided with identification information.<br>• Training to be provided on the unexpected finds procedure (Appendix 1).<br>• All exclusions zones will be included in sensitive areas maps and clearly marked.<br>• If fauna is present, allow to move through worksite or contact the ecologist, fauna handler or WIRES to assist in relocation to adjacent retained habitat. If fauna is visibly injured assistance should be sought from WIRES and the nearest veterinary hospital. | • Fauna encountered within the site to be reported to the Environmental/Site manager. |
| **Exclusion fencing** | Clearing / damage to threatened fauna and habitat. | • All site perimeter fencing is to be of a design that excludes terrestrial fauna, in particular Koala, fencing to exclude Koala is detailed in the Koala Management Plan (KMSP).<br>• Signage to be placed to inform all personnel of the exclusion zone.<br>• Retained trees will be fenced off and marked as exclusion zones within Environmental Control Plans. Fencing will be placed at the drip line of the tree at a minimum.<br>• Where roots or branches are identified as being within the pre-construction zone, an arborist will be contacted to assess the likely impact on the tree prior to works commencing. | • Compliance with actions is to be included in the pre-clearance report. |

| Task | Potential Hazard | Action | Monitoring response |
|---|---|---|---|
| **Vegetation clearing** | | | |
| **Two-Stage clearing process of Early Works footprint.** | Injury to fauna | **General**<br>• Clearing of vegetation outside of the defined boundary is not permitted.<br>• If feasible clearing of any hollow-bearing vegetation (if required) is to be undertaken between March and April to minimise impacts to microbats and threatened bird species. If clearing of hollow-bearing vegetation is required outside this timeframe, this two-staged clearing process, under the supervision of an Ecologist is considered sufficient to minimise impacts to threatened species.<br>• .<br>• Ecologist to be present on site during the clearing of hollow-bearing trees and to relocate fauna for release within a designated area as required.<br>• Select appropriate size/type of machines and equipment for clearing. Remove trees to avoid damage to surrounding vegetation or to areas outside the project boundary (ensuring groundcover disturbance is kept to a minimum).<br>• Local wildlife and vets to be contacted to assist in treating injured animals if necessary<br><br>**Clearing protocol**<br>• Non-habitat vegetation removal is to be conducted 24-48 hours prior to habitat trees being removed. Habitat trees are to remain standing overnight before further clearing, to allow fauna to vacate the habitat.<br>• Habitat trees should be disturbed through agitation with machinery (e.g. excavator 'tapping' or gently pushing the tree) 24 hours prior to removal.<br>• After remaining standing overnight habitat trees are to be agitated again (where safe and practicable) under the supervision of an ecologist to encourage roosting fauna to leave the trees, which may then be felled, commencing with the most distant trees from secure habitat.<br>• Felled habitat trees are to be immediately moved to the edge of retained vegetation, or left on the ground for a further 24 hours before being removed from the construction area, at the discretion of the supervising ecologist.<br>• Hollows to be retained are to be marked and stockpiled in a safe location for re-use in adjacent vegetation.<br>• Important habitat elements (e.g. large woody debris) are to be moved to locations within the conservation area (under supervision of the ecologist), which will not be cleared during the Project, or to stockpiles for later use in vegetation/habitat restoration.<br>• Only the ecologist or fauna handler is to touch or move fauna. If fauna is present, allow to move through worksite or contact the ecologist, fauna handler or WIRES to assist in relocation to adjacent retained habitat. | • Non-compliance to be reported to the environment manager.<br>• Ecologist to be present during clearing of habitat trees.<br>• Clearing supervision report to be completed by an ecologist following clearing of hollow-bearing trees. |

| Task | Potential Hazard | Action | Monitoring response |
|---|---|---|---|
| **Re-use of fauna habitat** | Loss of fauna habitat | • Hollow sections of trees are to be removed carefully and lowered to the ground to ensure hollows are retained for relocation.<br>• Hollows retained are to be re-used as supplementary habitat in adjacent vegetation and shall be relocated to areas identified for conservation.<br>• Where hollows are not salvageable, a total of two nest boxes will be erected for each hollow lost. If required, nest boxes are to be considered in accordance with Council's Technical Specification Tree 2014. | • Compliance and outcomes to be included in an Ecologist report detailing location of relocated hollows and if required, nest-box number and location. |
| **During construction** | | | |
| **Aerial crane movements** | Injury to fauna and damage to habitat | • Crane movements are to be limited to within the subject site.<br>• Aerial crane movement over vegetation to be retained in no-go zones should be limited where possible to prevent damage to habitat and disturbance to fauna. | • Non-compliance to be reported to Environmental/ Site manager. |
| **Vehicle movement** | | • Tool box talks/inductions to include awareness of potential for fauna in the area, in particular crossing Medowie Road. All workers to follow speed restrictions to prevent collision with fauna crossing roads.<br>• Only the ecologist or fauna handler to touch or move live fauna. If fauna is present, allow to move through worksite or contact the ecologist, fauna handler or wildlife carer to assist in relocation to adjacent retained habitat.<br>• In the case of accidental collision with fauna, local wildlife carers and/or the local veterinarian should be contacted for assistance. | |
| **Waste management** | Fauna entering site – injury/mortality of fauna. Increase in pest species. | • Appropriate waste disposal to be maintained to prevent pest species scavenging from scraps and waste.<br>• Ensure waste does not enter the environment. | • Non-compliance to be reported to Environmental/ Site manager. |
| **Erosion and sedimentation control** | Loss of fauna habitat. | • Procedures to prevent and mitigate soil and erosion impacts are outlined in the CEMP and VMSP. | • Non-compliance to be reported to Environmental/ Site manager.<br>• Reporting/ monitoring requirements outlined in the CEMP. |

| Task | Potential Hazard | Action | Monitoring response |
|---|---|---|---|
| **Noise** | Edge effects leading to loss of fauna habitat | • Construction works will be conducted between the hours of 7am-6pm Monday-Friday and 8am-1pm Saturday, limiting noise disturbance to daylight hours.<br>• Impacts from noise will be short term while construction is ongoing.<br>• Noise during the operation of the development will mostly occur during daylight hours from Monday-Friday, irregular events such as weddings may occur but will be infrequent and this is considered unlikely to have a significant impact on suitable surrounding fauna habitat.<br>• Loading and unloading of plant and material will be carried out away from sensitive receivers (Figure 1) where possible.<br>• Any portable equipment with the potential to create high levels of noise e.g. compressors, generators etc. will only be selected for use if it incorporates effective noise control. This equipment will be located where practical so that natural ground barriers or site sheds etc. are between it and the nearest potentially affected receivers.<br>• Mechanical plant will be silenced using best available control technology. Noise suppression devices will be maintained to manufacturer's specifications. Internal combustion engines will be fitted with appropriate, well maintained, high efficiency mufflers. | • Non-compliance to be reported to Environmental/ Site manager.<br>• Reporting/ monitoring requirements outlined in the CEMP. |
| **Light Spill** | Edge effects leading to loss of fauna habitat | • Construction works are limited to daylight hours as above and will reduce potential for impacts from light spill.<br>• Light should be directed inward to the construction area and used only when required.<br>• Following completion of the project, lighting should be limited where possible and directed inward. | • Reporting/ monitoring requirements outlined in the CEMP. |

# 6 Compliance management

## 6.1 Monitoring and reporting

Reporting requirements and responsibilities of biodiversity related matters should be documented in accordance with the environmental management processes in the BMSP and CEMP. These are to include:

- Pre-clearance inspections and reports as outlined in FMP TABLE, with any urgent issues communicated and rectified prior to commencement of clearing works.
- Post-clearing report with results of clearing supervision and compliance with mitigation measures outlined in Table 3.
- Reporting in accordance with the VMSP, BSMP and CEMP.

Monitoring is required to ensure actions outlined in Table 3 are completed. Monitoring for additional actions listed in Table 3 have been included in the Vegetation Management Sub-plan and Biodiversity Management Sub-Plan.

The pre-clearance inspection and post clearing reports are to be undertaken by the supervising ecologist. The construction contractor is responsible for the implementation of construction phase environmental controls.

## 6.2 Auditing

Audits (both internal and external) will be undertaken to assess the effectiveness of environmental controls / management measures, compliance with this sub-plan, Consent Conditions and other relevant approvals, licenses and guidelines.

The Biodiversity Management Sub-plan outlines the requirement and frequency of auditing.

## 6.3 Incidents

If an incident occurs that results in actual or potential impacts on known threatened ecological values and/or threatened ecological values that are discovered unexpectedly, works are to stop and the DPIE and other relevant government agencies are to be notified immediately.

# 7 Review and improvement

## 7.1 FMP update and amendment

Although mitigation measures provided by the Biodiversity Management Sub-plan, Koala Management Sub-plan and herein aim to mitigate and manage impacts to Biodiversity, an adaptive management approach should be undertaken.

The cycle of 'do, monitor, evaluate and respond' is the foundation of adaptive management and is widely applied to terrestrial and aquatic ecosystem management (Kingsford et al. 2011). Monitoring results will be reviewed and actions revised from time to time where documented improved knowledge of ecosystem management becomes available or where on-ground evidence supports a change in management trajectory.

Adaptive management for this site primarily relates to maintenance and improvement of vegetation extent and health to achieve a net gain in condition based on the following activities and related monitoring results:

- Management of vegetation retained including active rehabilitation of riparian corridors and passive improvement of areas retained to the west.
- Monitoring of vegetation planted within the development footprint as part of landscaping (in accordance with the VMSP).
- Fire management protocols adapted to planned and unplanned fire.

Adaptive management requires an agreed monitoring, evaluation, reporting and improvement cycle (MERI). As the various management plans and strategies for the site contain a range of objectives, activities and monitoring programs, a framework for MERI is provided below and will be further developed with the site manager:

- Monitoring – activities and programs outlined in this plan and others to measure biodiversity condition and achievement of objectives.
- Evaluation – collation of results by the site manager (or their agents) and assessment of trajectory towards desired objectives.
- Reporting – internal and external reporting cycles that document results, general observations and suggest changes or maintenance of the status quo.
- Improvement – the actual changes to management, and attendant monitoring programs, to ensure they remain relevant as conditions change or management challenges arise.

# References

Biosis 2019. Catherine McAuley Catholic College Biodiversity Management Sub-plan. Report for North Construction and Building Pty Ltd. Scheid T. Biosis Pty Ltd, Newcastle. Project no. 30449.

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De Witt 2018. Environment Impact Statement – Proposed Catholic College. Prepared for Trustees of the Roman Catholic Church for the Diocese of Maitland – Newcastle.

De Witt Consulting 2018. Response to Submissions Report – Proposed Catholic College - Medowie – SSD 8989. Prepared for Trustees of the Roman Catholic Church for the Diocese of Maitland – Newcastle.

Department of Planning, Industry and Environment 2019. Development Consent - SSD Application Number 8989, Dated 26 July 2019. New South Wales Government.

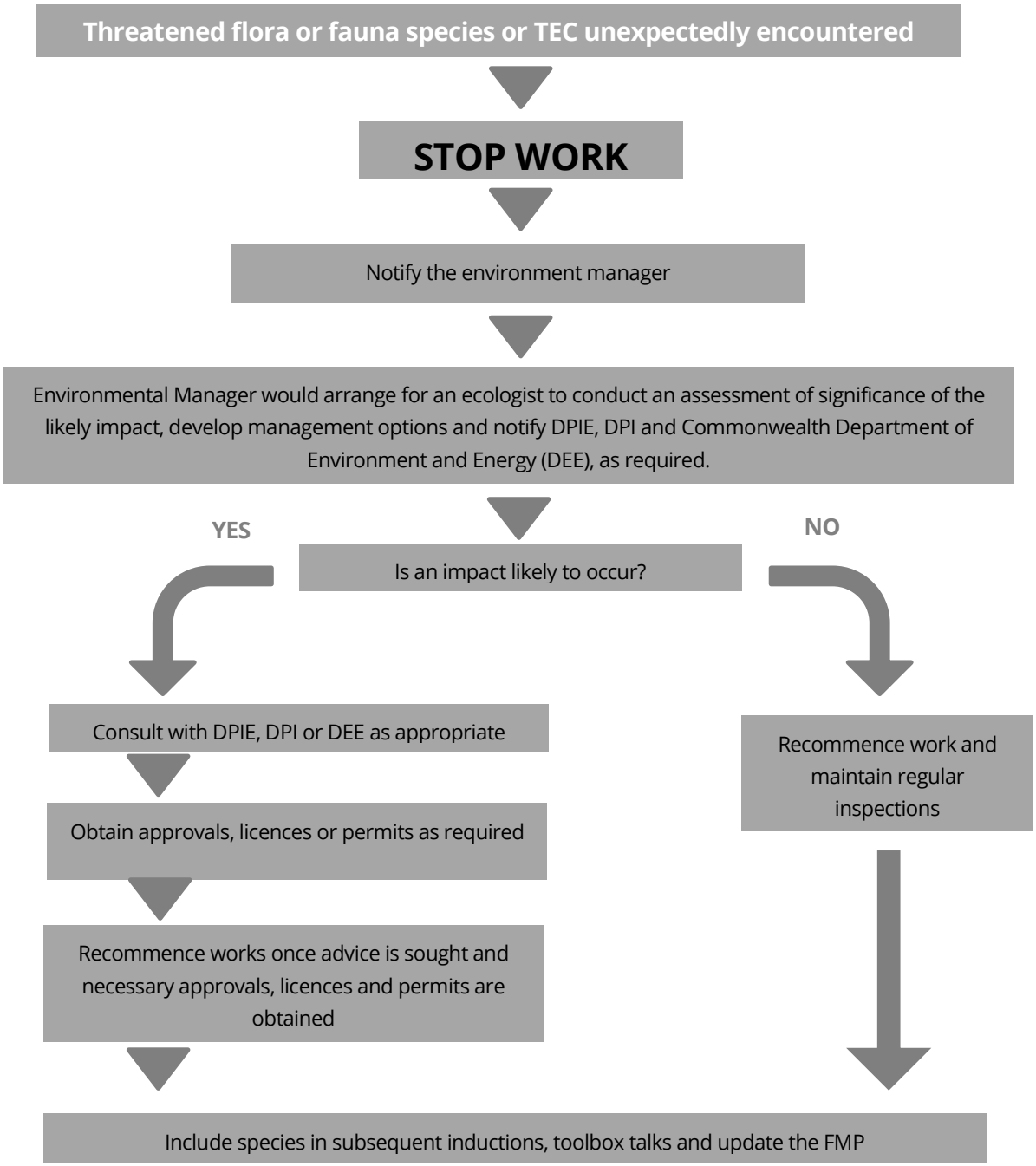
# Appendices

# Appendix 1 Threatened species procedure

The unexpected EEC/threatened species procedure details the actions to be taken when a threatened fauna species is unexpectedly encountered on site.

**Induction/Training**

All site personnel are to be inducted on the potential threatened species occurring on site and the unexpected threatened species finds procedure. Fact sheets including photos and descriptions of threatened species that construction personnel should keep watch for during construction works are included.



## Threatened species present on site – Grey-headed Flying-fox *Pteropus poliocephalus*

The Grey-headed Flying-fox is the largest Australian bat, with a head and body length of 23 - 29 cm. It has dark grey fur on the body, lighter grey fur on the head and a russet collar encircling the neck. The wing membranes are black and the wingspan can be up to 1 metre (OEH TSPD 2016).

Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines (OEH TSPD 2016).

**Grey-headed Flying-fox Pteropus poliocephalus (OEH 2016)**

## Threatened species present on site – Koala *Phascolarctos cinereus*

The Koala is a large arboreal mammal ranging from grey to brown in colour. It has large furry ears and feeds on eucalyptus tree leaves spending much of it's time sleeping in the forks of trees or upper branches of trees (OEH 2019). The Koala often descends to move between trees or to change areas and is capable of moving across open ground (OEH 2019).

**Koala *Phascolarctos cineraeus* (OEH 2019) sourced from:**
**https://www.environment.nsw.gov.au/threatenedspeciesapp/profile.aspx?id=10616#**