

New Shellharbour Hospital: Enabling Works - High Voltage Services

Flora and Fauna Impact Assessment

Prepared for Savills Australia

October 2022

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Savills Australia

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1 Introduction

In September 2020, the NSW Government announced a \$700 million package to build a new state-of-the-art greenfield hospital for the Shellharbour region (known as the New Shellharbour Hospital or NSH). To support the delivery of this significant project, separate early and enabling works will be undertaken to service and prepare the site for the development of the hospital (which will be subject to a separate scope of work and planning approval pathway for State Significant Development). These early and enabling works would commence in advance of, and separate to, the hospital development.

The proposal associated with this Flora and Fauna Assessment involves the installation of electricity infrastructure to service the proposed hospital site at 86 Dunmore Road, Dunmore (Lot 10/DP1281639 and Lot 1/DP302910), including installation of a high-voltage (HV) feeder cable between the Shellharbour Zone Substation (Lot 1 DP439066) and the new hospital site (a distance of about 3.6km), construction of a substation on the hospital site, and associated works.

These works are permitted without development consent pursuant to State Environmental Planning Policy (Transport and Infrastructure) 2021 and are being assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) in a Review of Environmental Factors. These works will be delivered in advance of, and separate to, the NSH development.

Further detailed description of the works is provided below.

1.1 Description of the proposed works

The proposed works involve construction of HV infrastructure to supply the new hospital and to supply construction power for the development.

Endeavour Energy has confirmed that HV feeders from Shellharbour one Substation are required to serve the electricity requirement for the development. In addition, these same feeders will provide the builder's construction power.

1.2 Project location

The project is located southeast of the Shellharbour City Centre in the suburbs of Flinders and Dunmore within the Shellharbour LGA (Figure 1.1). The project will comprise installation of HV cable beginning at the Shellharbour Zone Substation and heading in an easterly direction along Wattle Rd. The route then goes south adjacent to Flinders Field and continues along Burrinjuck Ave until Mumurah Cct. From there, it travels along Lakewood Blvd until it intersects with Shellharbour Road and then turns southwest until the intersection with Dunmore Rd. The route then continues along Dunmore Road to the site located at 86 Dunmore Road.

1.3 Construction methods

An overview of the proposed works is shown in Figure 1.2. The proposed works utilises existing conduits where possible and will underbore Shellharbour Road to minimise ground disturbance.

The construction method can be broken into two parts, the HV feeder and temporary construction power works, including installation of a small substation. The construction method for each works package is described in the following sections.

1.3.1 HV feeder & temporary construction power works

This works package comprises elements as below.

- Progressive trenching (utilising conventional excavation and potentially hydro excavation where suitable/proximal to trees) along the designed route, within footway, roadways and inside the NSH site, occurring between the NSH site and the Shellharbour Zone Substation. Where possible, the conduits are to be separated to either side of the electricity alignment to reduce the risk of future excavation striking both cables.
- Excavation methodology is expected to be:
 - trenching 750 mm deep and 1,200 mm wide (maximum);
 - trenching a further two individual trenches, 430 mm deep (1,180 mm total depth) and 240 mm wide;
 - backfilling the 430 mm deep individual trenches with clean sand;
 - backfilling the remainder of the trench with already excavated fill; and
 - underboring existing New Shellharbour Rd as shown on the drawings (subject to utility feedback).
- Conduits and bedding sand shall be progressively installed, and trenches backfilled.
- Excavation width is nominally 1,200 mm wide. It is planned to be within the electricity alignment when in footways, within Endeavour Energy easement inside the site, and parallel to footway when crossing roads.
- In areas where spare conduits are used, conduit ends shall be excavated/uncovered to allow cable installation.
- Generally, up to 500 m in length cable drums (depending on availability) shall be set up in footway/verges and cable segments pulled between jointing sand pits.
- In-ground HV cable jointing shall occur between each segment to complete the circuit.
- HV cables shall be installed into the zone substation via underground cable ducts and trenches. Cables are to be terminated onto HV switchgear, nominated by Endeavour Energy, within the zone substation.
- Restoration of footpaths and driveways shall occur along the route once cabling is installed.
- A flat easement area of 5.5 m x 2.75 m shall be created on the NSH to install the construction power kiosk substation. The easement shall be adjacent to the boundary to allow 24-7 access by Endeavour Energy.
- The full kiosk easement area shall be excavated, and a cable culvert installed.
- Cabling to be installed beneath the kiosk substation and terminated onto the switchgear.
- A flat area of 2 m x 2.75 m shall be created for a Site Main Switchboard (MSB) to be installed adjacent to the kiosk substation.
- The site MSB area shall be excavated, and conduit and LV cables installed between the kiosk substation and MSB.

- Further excavation between the Site MSB and the proposed builder's compound area shall occur. LV conduits will be installed to supply the builder's compound area.
- The kiosk substation and MSB shall be installed above their respective culvert and plinths.
- The entire electrical system shall be commissioned and energised to relevant Australian Standards and Endeavour Energy's requirements.

1.4 Purpose of this report

The provisions of Part 5 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) apply and, as such, a Review of Environmental Factors (REF) will be prepared that will be determined by Health Infrastructure (as the Proponent and Determining Authority). This Flora and Fauna Assessment is intended to accompany a REF being prepared for the proposed works.

The purpose of this report is to assess the likely impacts of the proposed works on biodiversity, and to determine whether there is likely to be a significant impact on threatened species or ecological communities or their habitats.

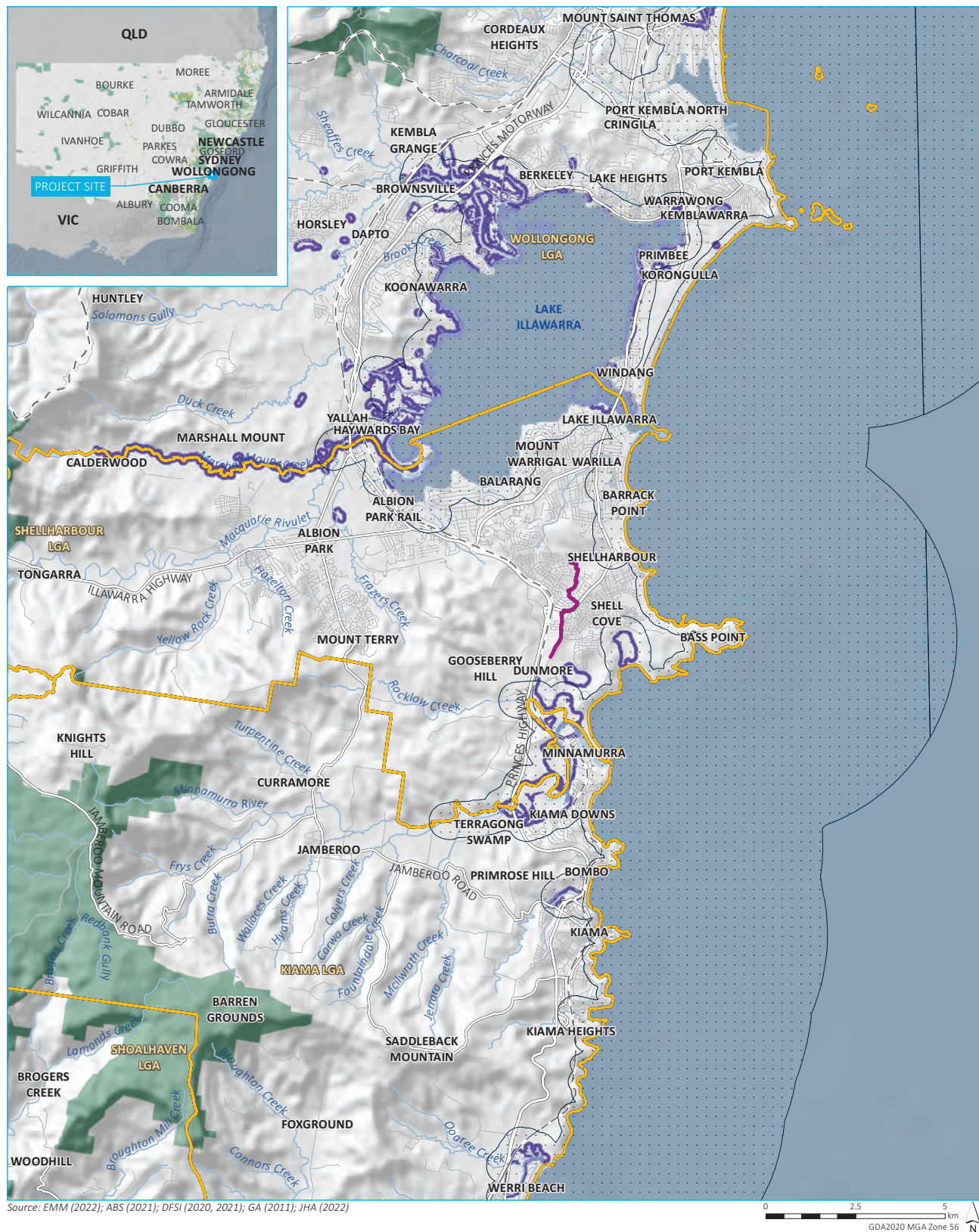
Threatened species or ecological communities or their habitats refers to those threatened biota listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), NSW *Biodiversity Conservation Act 2016* (BC Act) and NSW *Fisheries Management Act 1994* (FM Act).

1.5 Terminology

Terminology used in this report is listed in Table 1.1.

Table 1.1 Terminology referred to in this report

Term	Definition
The proposed works	The installation of underground HV cables and associated works as described in Section 1.1
Locality	10 km radius centred on the proposed works, in which threatened species records database searches were conducted.
Study area	Area surveyed for ecological values (Figure 1.1)
Disturbance footprint	The area directly impacted by the proposed works (Figure 1.2)



KEY

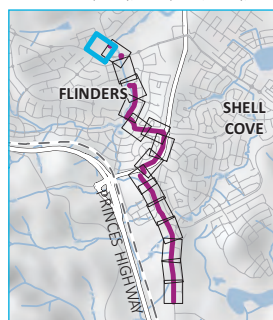
- HV electricity cable alignment
 - Rail line
 - Major road
 - Minor road
 - Named watercourse
 - Named waterbody
 - NPWS reserve
 - Local government area
 - SEPP Coastal Environmental Area
 - SEPP Coastal Wetland Proximity Area
- INSET KEY
- Major road
 - State forest

Regional context

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.1



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)

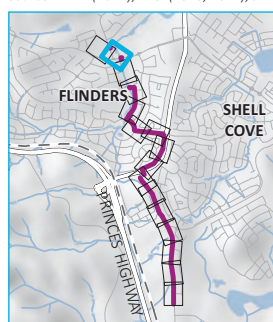


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing ducts to utilise for new HV cable
- Existing PM substation

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 1)

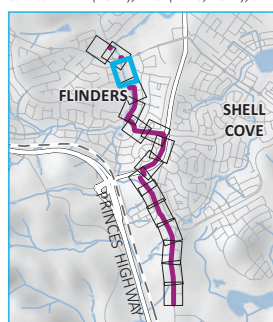


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing ducts to utilise for new HV cable
- Joint Bay (2 x 5 m)

Project features

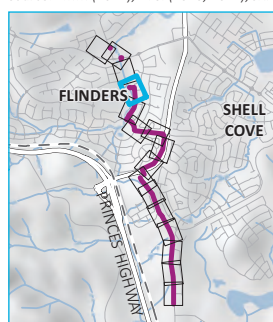
New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 2)



- KEY**
- Cadastral boundary
 - Existing ducts to utilise for new HV cable

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 3)

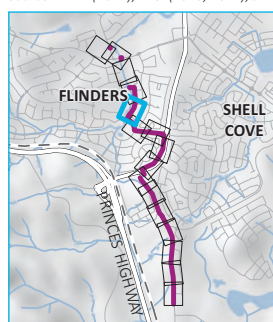


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing ducts to utilise for new HV cable
- Existing PM substation
- Joint Bay (2 x 5 m)

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 4)

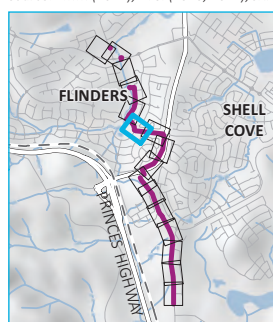


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Proposed road crossing duct
- Joint Bay (2 x 5 m)
- Proposed road crossing duct

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 5)

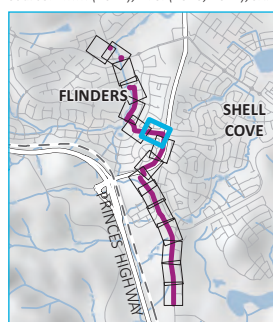


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Proposed road crossing duct
- Joint Bay (2 x 5 m)
- Proposed road crossing duct

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 6)

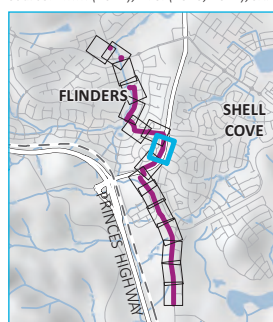


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Proposed road crossing duct
- Joint Bay (2 x 5 m)

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 7)



KEY

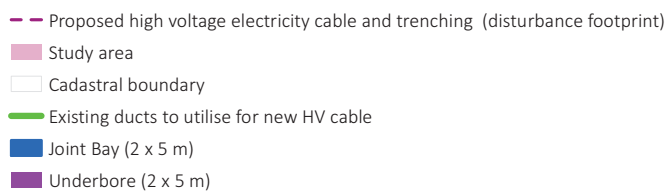
- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Joint Bay (2 x 5 m)

Project features

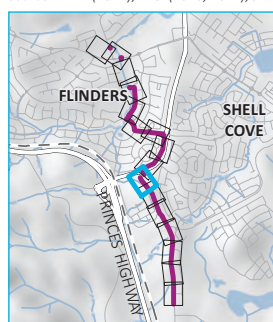
New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 8)



0 20 40 m
GDA2020 MGA Zone 56



New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 9)

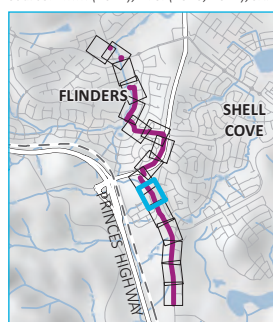


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing ducts to utilise for new HV cable
- Underbore (2 x 5 m)

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 10)

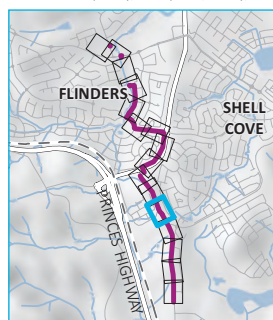


KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing PM substation

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 11)

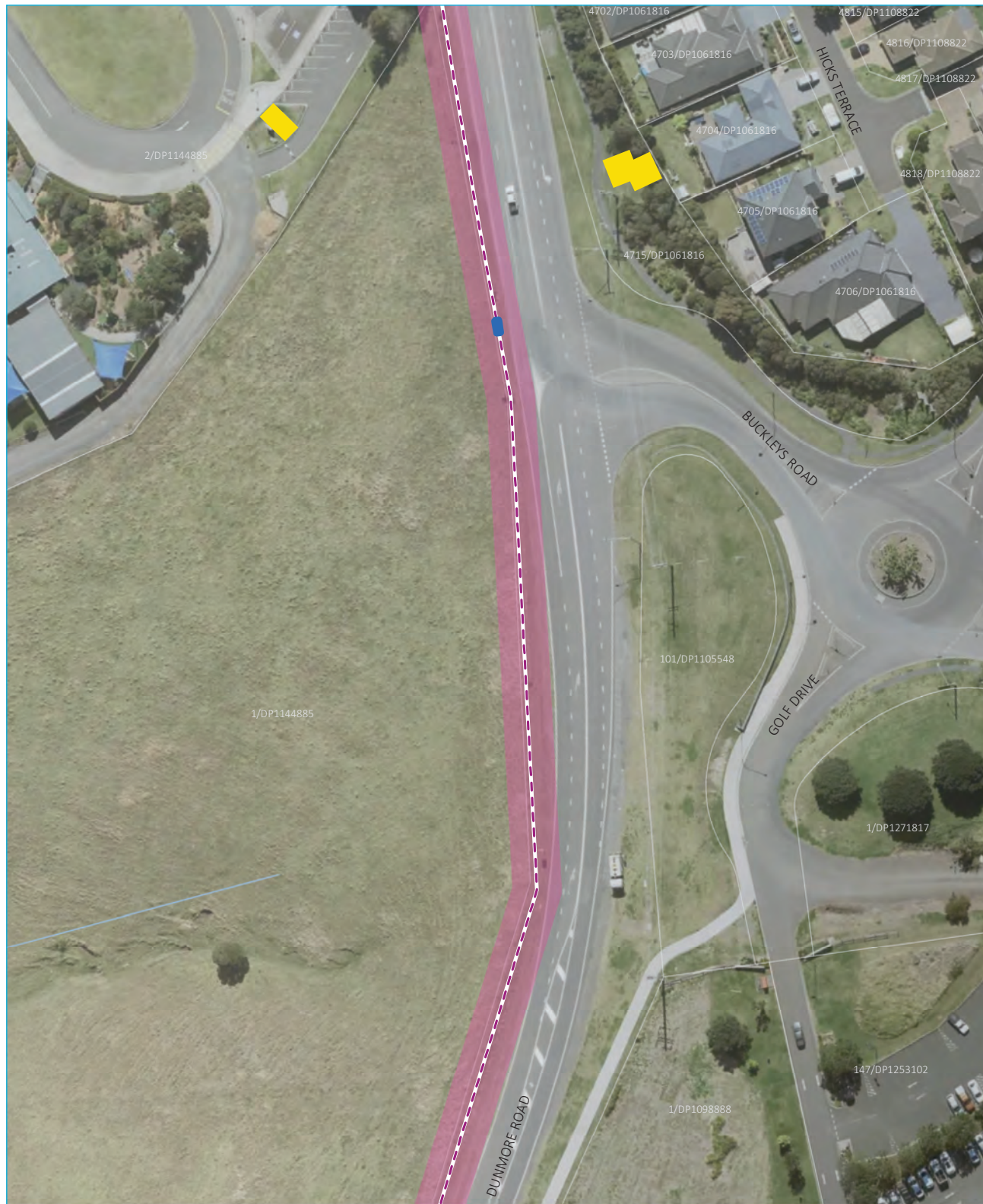


KEY

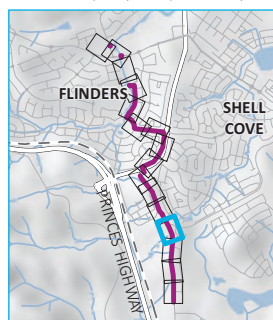
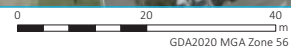
- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Proposed road crossing duct
- Existing PM substation

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 12)



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)



KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Existing PM substation
- Joint Bay (2 x 5 m)

Project features

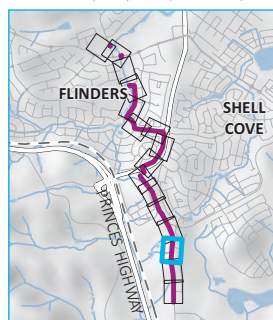
New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 13)



\\emmsvr1\EMM\3\2021\211110 - New Shellharbour Hospital Biodiversity Assessment\GIS\02_Maps\G004_Detailed\Alignment_20220721_04.mxd 26/07/2022



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)



KEY

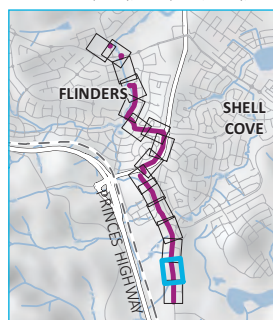
- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 14)



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)

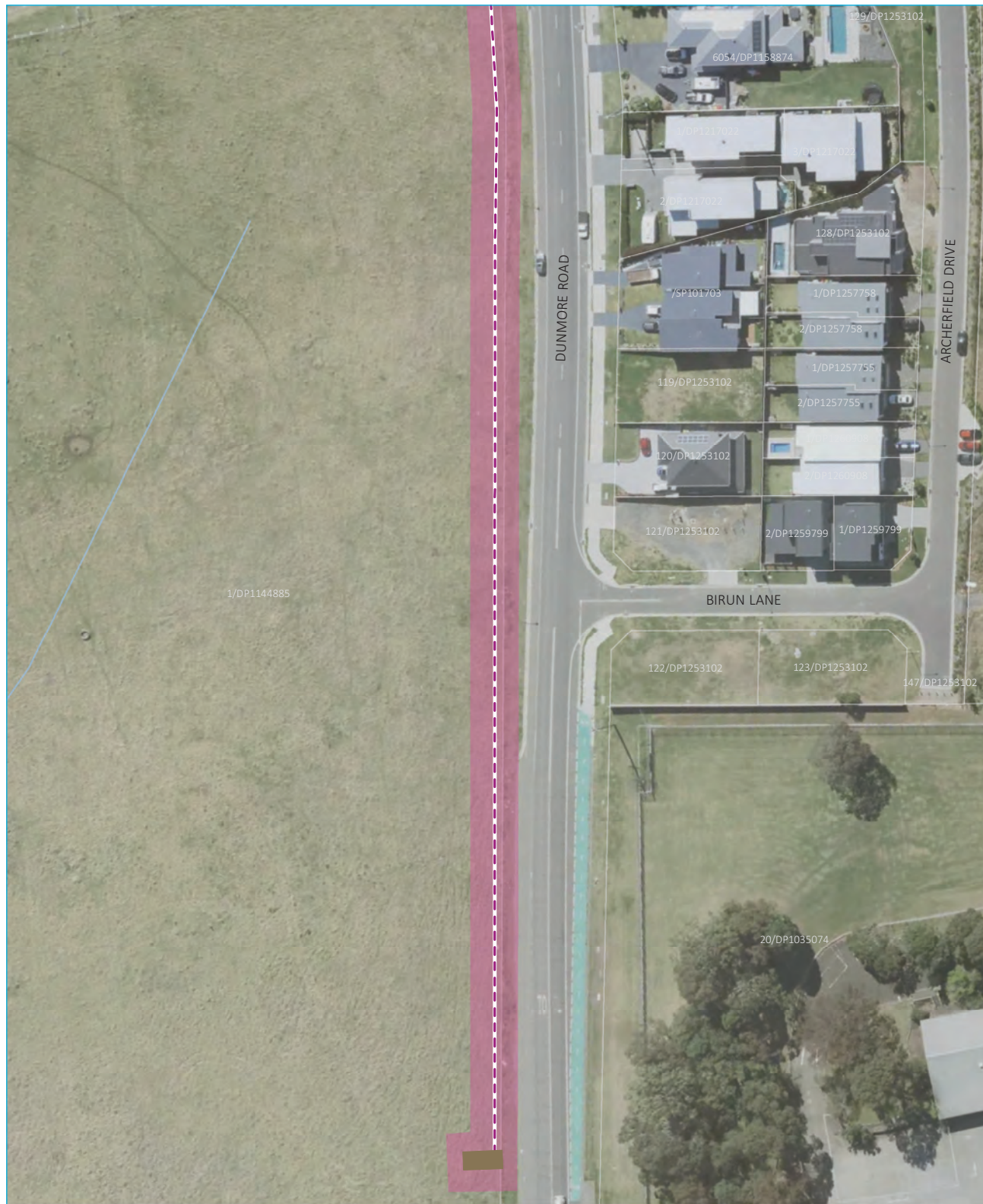


KEY

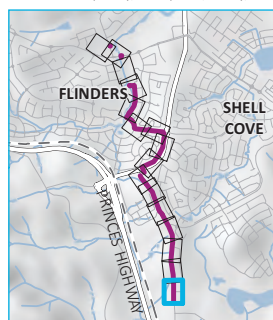
- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Joint Bay (2 x 5 m)

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 15)



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)



KEY

- Proposed high voltage electricity cable and trenching (disturbance footprint)
- Study area
- Cadastral boundary
- Proposed substation

Project features

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 1.2 (Map 16)

2 Legislative context

The proposed works have been assessed against key biodiversity legislation and government policy. A brief outline of the key biodiversity legislation and government policy considered in this assessment is provided below. An assessment of the proposed works against relevant legislation is provided in Section 6.

2.1 Commonwealth

2.1.1 *Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)*

The EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities, heritage places and water resources which are defined as Matters of National Environmental Significance (MNES) under the EPBC Act. These are:

- world heritage properties;
- places listed on the National Heritage Register;
- Ramsar wetlands of international significance;
- threatened flora and fauna species and ecological communities;
- migratory species;
- Commonwealth marine areas;
- the Great Barrier Reef Marine Park;
- nuclear actions (including uranium mining); and
- water resources, in relation to coal seam gas or large coal mining development.

Under the EPBC Act, an action that may have a significant impact on a MNES is deemed to be a 'controlled action' and can only proceed with the approval of the Commonwealth Minister for the Environment. An action that may have a significant impact on a MNES is to be referred to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) for determination as to whether or not it is a controlled action. If deemed a controlled action the proposed works is assessed under the EPBC Act and a decision made as to whether or not to grant approval.

An assessment of the proposed works against the EPBC Act is provided in Section 6.1.

2.2 State

2.2.1 *Environmental Planning and Assessment Act 1979 (EP&A Act)*

The EP&A Act was enacted to encourage the consideration and management of impacts of proposed development or land-use changes on the environment and the community. The EP&A Act is administered by the NSW Department of Planning and Environment (DPE).

The proposed works will be undertaken under Part 5 of the EP&A Act. The proposed works requires the preparation of a REF for submission to, and determination by Health Infrastructure, as the Determining Authority. This report has been prepared to accompany the REF and assess the biodiversity values within the subject site.

The EP&A Act provides the overarching structure for planning in NSW; however, is supported by other statutory environmental planning instruments (EPIs) including State Environmental Planning Policies (SEPPs). State Environmental Planning Policy (Transport and Infrastructure) 2021 (TISEPP) aims to facilitate the effective delivery of infrastructure across NSW and provides for bush fire hazard reduction works; TISEPP therefore applies to the proposed works. Other EPIs relevant to the management of biodiversity are discussed below with respect to the proposed works.

i State Environmental Planning Policy (Biodiversity and Conservation) 2021

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) was ratified on 1 March 2022 and consolidates, transfers and repeals provisions of numerous SEPPs, which includes the former *State Environmental Planning Policy (Koala Habitat Protection) 2020* (Koala SEPP 2020) and *State Environmental Planning Policy (Koala Habitat Protection) 2021* (Koala SEPP 2021). No policy changes have been made to the Koala SEPPs.

The former Koala SEPP 2020 and 2021 together aimed to encourage the proper conservation and management of areas of natural vegetation that provide habitat for Koalas to ensure a permanent free-living population over their present range and reverse the current trend of Koala population decline. In nine metropolitan Sydney local government areas (Blue Mountains, Campbelltown, Hawkesbury, Ku-Ring-Gai, Liverpool, Northern Beaches, Hornsby and Wollondilly) and the Central Coast LGA Koala SEPP 2021 applies to all land use zones. Outside of these areas Koala SEPP 2020 continues to apply to all land zoned RU1, RU2, and RU3.

The proposed works do not require a development application and do not require approval from Council, and thus consideration of the Koala Habitat Protection SEPP is not triggered under Part 2 of the SEPP. Nonetheless, consideration has been given to the potential occurrence and impacts upon the Koala within Section 5.

ii State Environmental Planning Policy (Resilience and Hazards) 2021

Chapter 2 (Coastal Management) of the State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP) applies to the coastal zone in NSW and aims to manage development and environmental assets on the coast, as well as establish a framework for decision-making in the coastal zone. The coastal zone includes areas mapped as coastal wetlands and littoral rainforests, as well as land mapped as proximity areas to coastal wetlands and littoral rainforests.

The disturbance footprint will not be located in areas mapped as coastal wetland or littoral rainforests areas under the Resilience and Hazards SEPP, however the southern tip of the study area is located in a within Proximity Area for Coastal Wetlands boundary (however none of the proposed works are within this Proximity Area). Consideration has been given to the Coastal Management SEPP within Section 6.2.1.

2.3 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) is the legislation responsible for the conservation of biodiversity in NSW through the protection of threatened flora and fauna species, populations, and ecological communities. The BC Act, together with the *Biodiversity Conservation Regulation 2017* (BC Regulation), established the Biodiversity Offsets Scheme (BOS).

The BOS includes establishment of the Biodiversity Assessment Method (the BAM, DPIE 2020) for use by accredited persons in biodiversity assessment under the scheme. The purpose of the BAM is to assess the impact of actions on threatened species and threatened ecological communities, and their habitats and determine offset requirements. The BAM provides for the preparation of a Biodiversity Development Assessment Report (BDAR), which details the biodiversity credits required to offset the residual impacts of proposed development on biodiversity values. For major projects, use of the BAM is mandatory, unless a BDAR waiver is granted.

The BAM sets out the requirements for a repeatable and transparent assessment of terrestrial biodiversity values on land in order to:

- identify the biodiversity values on land subject to proposed development area;
- determine the impacts of a proposed development, following all measures to avoid, minimise and mitigate impacts; and
- quantify and describe the biodiversity credits required to offset the residual impacts of proposed development on biodiversity values.

2.3.1 Biodiversity assessment pathway

The proposed works are permitted without development consent pursuant to State Environmental Planning Policy (Transport and Infrastructure) 2021 and are being assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act). For activities that are assessed under Part 5 of the EP&A Act, an activity is likely to significantly affect threatened species or communities if determined as such in accordance with the 'five-part' test of significance in Section 7.3 of the BC Act, or if it is carried out in a declared area of outstanding biodiversity value.

Under Section 7.8 of the BC Act, if an activity proposed under Part 5 of the EP&A Act is likely to significantly affect threatened species or communities, the preparation of a species impact statement (SIS) is required or, if the proponent elects to do so, a Biodiversity Development Assessment Report (BDAR) can be prepared. That is, where an activity is likely to significantly affect threatened species or communities, entry into the BOS and the preparation of a BDAR is not automatic, unless the proponent elects to prepare a BDAR.

The proposed works will not be undertaken in a declared area of outstanding biodiversity value. The remainder of this report provides a description and assessment of the likely impacts of the proposed works on threatened species and communities, and their habitats and assesses the significance of the predicted impacts in accordance with the five-part test of significance.

2.4 Biosecurity Act 2015

The primary objective of the Biosecurity Act is to provide a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers.

The Biosecurity Act stipulates management arrangements for weed biosecurity risks in NSW, with the aim to prevent, eliminate and minimise risks. Management arrangements include:

- any land managers and users of land have a responsibility for managing weed biosecurity risks that they know about or could reasonably be expected to know about;
- applies to all land within NSW and all waters within the limits of the State; and
- local strategic weed management plans will provide guidance on the outcomes expected to discharge duty for the weeds in that plan.

The study area is located within the South East Local Land Services (LLS) region and is subject to *South East Regional Strategic Weed Management Plan 2017-2022* (South East LLS 2017)

The provisions of the Biosecurity Act are discussed further in Section 6.4.

3 Method

3.1 Desktop assessment

To determine the field investigation scope, a desktop assessment was undertaken. The desktop assessment comprised database searches and review of relevant information, including:

- DCCEEW Protected Matters Search Tool (PMST) for Matters of National Environmental Significance (MNES) likely to occur within the subject lands (DCCEEW 2022) (a copy of the search results is provided in Appendix A);
- NSW Biodiversity and Conservation Division (BCD) BioNet Atlas of NSW Wildlife, for items listed under the BC Act and EPBC Act (EES (Environment Energy and Science) 2022);
- NSW Plant Community Types (PCTs), as held within the BioNet Vegetation Classification database (DPE 2022);
- regional vegetation mapping, *State Vegetation Type Map: Shellharbour LGA Vegetation Map, 2001. VIS_ID 3962* (DPE 2018);
- a review of NSW Vegetation Information System (VIS), managed by BCD, to review plant community types (PCTs) that may occur;
- a review of the NSW Weedwise website to determine priority weeds for the South East LLS region (LLS 2017);
- a review of aerial imagery for the survey area and locality; and
- New Shellharbour Hospital Threatened Species Surveys. Prepared for NSW Health Infrastructure. (Eco Logical Australia (ELA) 2022).

Base map data was obtained from NSW Department of Finance, Services and Innovation (DFSI) databases, with cadastral data obtained from DFSI digital cadastral database. Mapping for stream orders was obtained from NSW Department of Primary Industry (DPI). Spatial data encompassing the study area and disturbance footprint was provided by Savills.

The following spatial datasets were utilised during the development of this report:

- Mitchell Landscapes Version V3.1 (DAWE 2018);
- Interim Biogeographic Regionalisation of Australia (IBRA) Version 7 (DoEE 2018);
- NSW Department of Primary Industries (Fisheries) Freshwater threatened species distribution maps; (DPI 2021); and
- Australian Ramsar Wetlands (DAWE 2021).

Mapping undertaken during the assessment was conducted using a hand-held GPS unit, a mobile tablet running Field Maps for ArcGIS™ and Survey123 for ArcGIS™, and aerial photo interpretation. Accuracy is subject to accuracy of GPS devices, generally ± 5 m. Mapping has been produced using a Geographic Information System (GIS; ArcGIS 10.5).

3.2 Field investigations

3.2.1 Vegetation and threatened flora habitat assessment

Field investigations within the NSH site were conducted on 28 February to 1 March 2022 by two EMM ecologists. A site walk-over was undertaken to identify plant community types within the study area through observation and recording of dominant plant species, landscape and terrain and soil characteristics. Photographs were taken to assist with evaluation of vegetation type and condition.

Rapid data points (RDP) were recorded at various locations and notes taken of the dominant (ie most frequently recorded and/or apparent) species at these locations. Focus was given to species that are characteristic of threatened ecological communities (TECs) known to occur in the search area to evaluate the likely presence of such TECs within the study area.

No targeted flora surveys were undertaken, however vegetation mapping and floristic plot surveys provided ample opportunity to detect conspicuous threatened plant species and assess habitat for threatened flora not readily detectable during the survey. Targeted threatened fauna surveys were completed previously by ELA (Section 3.2.2). The survey methods are outlined below.

3.2.2 Threatened fauna habitat assessment

A habitat assessment was undertaken to identify the presence and abundance of the following fauna habitat features within the study area:

- buildings or culverts that may provide roosting habitat for microbats;
- habitat trees, including large hollow-bearing trees and trees containing large stick nests;
- availability of flowering shrubs and feed tree species;
- waterway condition;
- ground litter and fallen logs; and
- rock outcrops, cliffs and caves.

3.2.3 Street trees

The proposed HV powerline route was traversed on foot by two ecologists on 6 June 2022 to identify biodiversity values and identify and map any street trees that may potentially be impacted by the proposed works.

3.3 Likelihood of occurrence assessment

Matters considered in determining the likelihood of occurrence include:

- known natural distributions including prior records (database searches) and site survey results;
- geological/ soil preferences;
- specific habitat requirements (eg aquatic environs, seasonal nectar resources, tree hollows, etc);
- climatic considerations (eg wet summers; snow fall);
- home range size and habitat dependence; and
- topographical preferences (eg coastal headlands, ridgetops, midslopes, gilgai, wetlands).

The criteria for assessing likelihood of occurrence for threatened species, used to inform the impact assessment of the proposed works (Section 5), is listed in Table 3.1.

Table 3.1 Likelihood of occurrence criteria

Likelihood	Description	Further assessment conducted?
Negligible	<ul style="list-style-type: none">• The potential for the species to occur is considered so low as to not be worth considering.	No
Low	<ul style="list-style-type: none">• Based on data collected during field investigations, it was considered that the species was unlikely to occur in the investigation envelope or use habitats in the investigation envelope. A species may utilise the investigation envelope on rare occasions.• Species is considered vagrant in the bioregion and is thus considered unlikely to occur in the investigation envelope.	No
Moderate	<ul style="list-style-type: none">• The species is known to occur in the bioregion and the investigation envelope provides some habitat value for the species. Includes species for which optimal habitat is present that have not been recorded in the locality and species that have been recorded in the locality for which habitat on site is considered suboptimal.	Yes
High	<ul style="list-style-type: none">• The species is known to occur in the bioregion, the investigation envelope supports optimal habitat features for the species and it has been recorded in the locality.	Yes
Recorded	<ul style="list-style-type: none">• The species was recorded during site visit or reliable, recent and spatially accurate records of the species strongly indicate its presence in the investigation envelope.	Yes

3.4 Limitations

While the biodiversity assessments outlined above provide a robust assessment of the biodiversity values, the assessment is subject to a number of limitations outlined below. In both cases these limitations do not represent a significant limitation on this survey:

- while some species have been assessed as having a low likelihood of occurrence, it is acknowledged that this does not indicate the species will never occur. Rather, it means that based on data collected during desktop and field surveys it was considered that the species may only utilise the study area on rare occasions; and
- Pelagic species have been excluded from the assessment due to the absence of habitat within the disturbance footprint.

4 Results

4.1 Vegetation

The majority of the works will be undertaken along roadsides through rural and urban environments. There will be a small substation constructed within the NSH site. The NSH site is dominated by exotic grasses with some planted trees and exotic species around the existing homestead and outbuildings. A list of species recorded during field survey is provided in Appendix B.

Most of the vegetation to be affected by the works comprises planted native street trees and exotic grassland.

A description of the vegetation types is provided in the following sections.

4.1.1 Riparian vegetation

A section of the proposed HV feeder route adjacent to Flinders Field off Burrinjuck Avenue contains a forested wetland community associated with an unnamed fourth order stream. The forested wetland could be aligned with Coastal Creekline Dry Shrubby Swamp Forest (plant community type 4021) or Coastal Creekflat Layered Grass-Sedge Swamp Forest (plant community type 4020) but has been modified within the urban landscape. It contains tree species such as Swamp Mahogany (*E. robusta*), Blackbutt (*E. pilularis*), Forest Red Gum (*E. tereticornis*) and Broad-leaved Paperbark (*Melaleuca quinquenervia*).

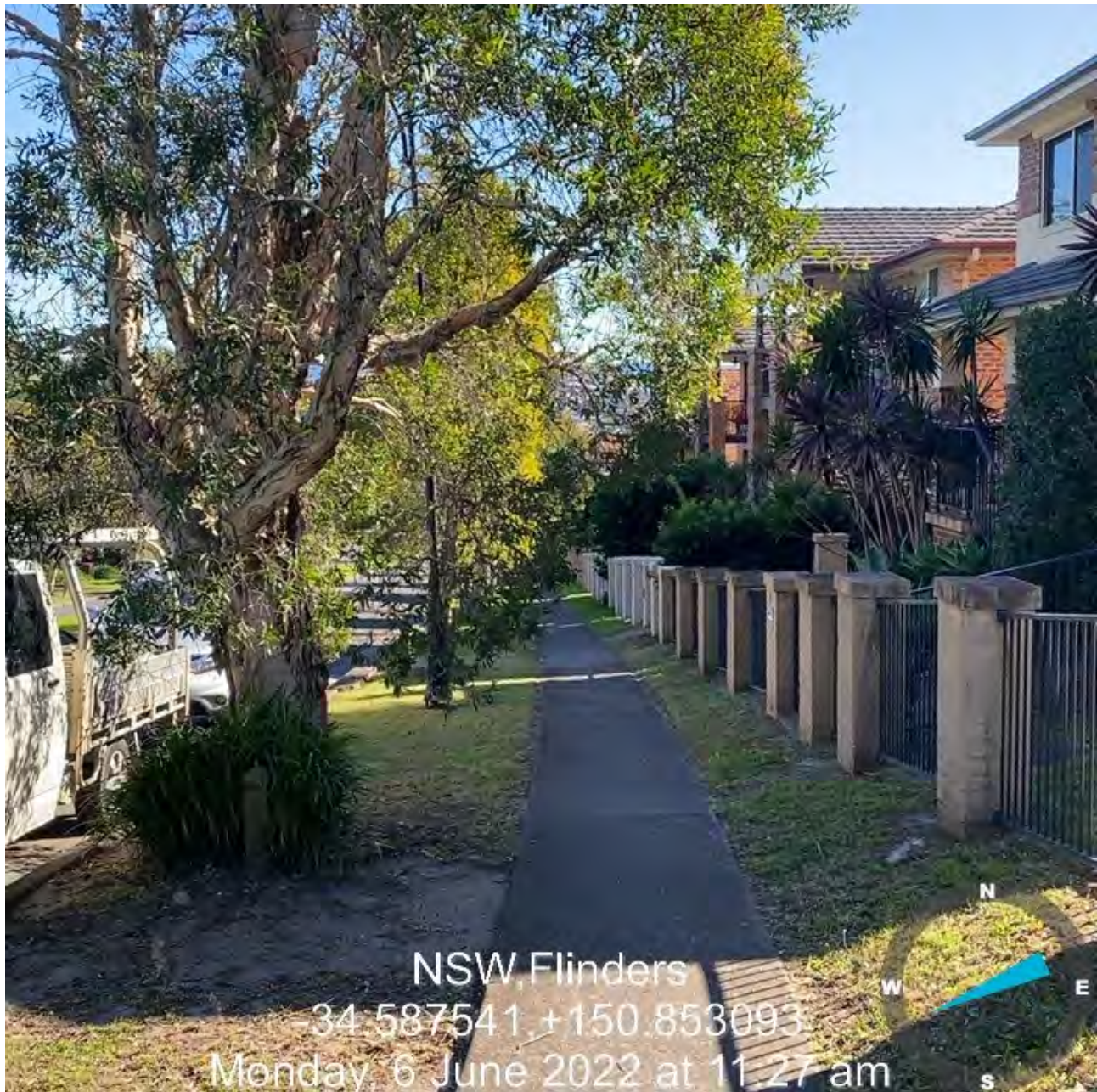
The ground and shrub layer of this riparian vegetation within the study area has been highly modified and managed and includes some exotic grass species such as Kikuyu (*Cenchrus clandestinus*). The patch also includes some planted native species.



Photograph 4.1 Riparian vegetation along Burrinjuck Avenue, adjacent to Flinders Field

4.1.2 Native street trees

Planted native street trees are adjacent to the proposed HV power line route along Lakewood Blvd, Munmorah Cct and Burrinjuck Ave. The majority of the street trees are Broad-leaved Paperbark (*Melaleuca quinquenervia*) with some Blackbutt (*Eucalyptus pilularis*), Forest Red Gum (*Eucalyptus tereticornis*) and Swamp Mahogany (*Eucalyptus robusta*). A small number of planted shrubs also occur within the HV powerline route including Lemon-scented Tea-tree (*Leptospermum petersonii*) and are planted between the footpath and roadway (Figure 4.1). Mitigation measures to avoid and mitigate impacts to these trees are outlined in Section 5.1.



Photograph 4.2 Native street trees (*Melaleuca quinquenervia*)



Photograph 4.3 Native street trees (Blackbutt and Swamp Mahogany) and shrubs (Lemon-scented Tea-tree)

4.1.3 Exotic grassland

The NSH site primarily consists of exotic grassland with few small paddock trees. The grassland has a history of cattle grazing and is dominated by Kikuyu Grass (*Cenchrus clandestinus*) and Paspalum (*Paspalum dilatatum*), with patches of Fennel (*Foeniculum vulgare*), Fireweed (*Senecio madagascariensis*) and Lantana (*Lantana camara*).



Photograph 4.4 Exotic grassland



Source: EMM (2022); DFSI (2020, 2021); JHA (2022); Metromap (2022)

KEY

- | | |
|----------------------------------|-----------------------------|
| — HV electricity cable alignment | Existing environment |
| Study area | — Rail line |
| ● <i>Melaleuca Quinquenervia</i> | — Major road |
| | — Minor road |
| | — Watercourse/drainage line |
| | Waterbody |

Street tree locations

New Shellharbour Hospital
Flora and Fauna Assessment
Figure 4.1

4.2 Fauna habitat values

Two fauna habitat types were identified within the study area, comprising roadside exotic grass and native street trees. These are discussed in more detail below.

No hollow bearing trees, wetland habitat or microbat habitat was observed within the disturbance footprint of the proposed works.

4.3 Matters of conservation significance

4.3.1 Threatened ecological communities

The riparian vegetation along Burrinjuck Avenue is likely to conform to one endangered ecological community (EEC) listed under the BC Act; *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* and one EPBC Act listed community; *Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland* EEC.

The conforming points under the BC Act include:

- occurs in Illawarra subregion of the Sydney Basin Bioregion, in the Shellharbour LGA;
- occurs on alluvial flat / along drainage line on the coastal floodplain and has potential to be waterlogged periodically;
- occurs below 20 m elevation; and
- is dominated by characteristic species Swamp Mahogany and Broad-leaved Paperbark.

The conforming points under the EPBC Act include:

- occurs within 20 km of the coast within the Sydney Basin Bioregion;
- occurs below 20 m elevation;
- occurs on soils that have potential to be inundated at least periodically or episodically;
- has a canopy of at least 10% cover; and
- dominated by characteristic species Swamp Mahogany and Broad-leaved Paperbark.

The riparian vegetation is conservatively estimated to meet the Class C2 condition class defined in the listing advice for the EEC (DAWE 2021) as it is likely to be at least 2 hectares and less than 5 hectares in size, with at least 20% native vegetation cover in the ground layer.

4.3.2 Threatened species

i Threatened fauna

A likelihood of occurrence assessment was undertaken as mentioned in Section 3.3, the detailed results are presented in Appendix C. Of the 62 species assessed, none of the species are considered likely to occur within the disturbance footprint.

ii Threatened flora

No threatened flora species were recorded in the study area or have a moderate or higher likelihood of occurrence.

iii Fish

No threatened fish have been recorded in the locality and no threatened fish distributions are mapped within the study area. No threatened fish species are considered likely to occur.

4.3.3 Migratory species

Based on the desktop assessment, no migratory fauna species listed under the EPBC Act are known or have potential to occur in the study area.

5 Impact assessment

This chapter identifies the potential impacts of the proposed works on biodiversity values. Measures to avoid, minimise and mitigate impacts on biodiversity are provided.

5.1 Avoidance, minimisation and mitigation

Placement of the disturbance footprint on roadsides has avoided most of the potential disturbance to native plant communities to the west and has restricted vegetation removal to a small section of riparian vegetation near Burrinjuck Avenue and roadside exotic grass species. Planted native street trees will be subject to encroachment during trenching.

The potential biodiversity impacts of the proposed works are likely to be from construction impacts, including unintended clearing of native vegetation; transportation of construction waste, pollutants; and dust and/or weed propagules via surface run-off into the nearby waterways.

Mitigation measures during construction are recommended to manage construction impacts and are listed in Table 5.1.

Table 5.1 Mitigation and management measures

Impact	Action	Intended outcome	Timing	Responsibility
General	Preparation of a construction environmental management plan. The plan should incorporate the design, construction and post-construction environmental management measures proposed. This should include (but not be limited to) issues relating to vegetation management, weed control, and erosion and sediment control and should include plans clearly showing areas to be cleared, trees to be retained and any other 'no go zones'. This Site Plan is to be placed in an accessible location to be viewed by all site personnel (site office for example).	-	Prior to construction	Contractor
Unintended clearing of native vegetation	Clearing is to be to the minimum extent necessary. If parts of the development footprint areas are identified during construction as not needing use for construction activities, clearing will be avoided. Define clearing limits using clearly visible barrier, such as flagging tape. This should be maintained and checked daily through construction.	Reduce risk to retained vegetation during construction	Prior to and during construction	Contractor
Encroachment on street trees	Existing trees are legally protected by Council's Tree Preservation Order. Electrical Installer shall ensure that the works will not directly impact the existing trees. Any works identified that requires the removal of protected trees shall not commence unless approved by the Superintendent. For bulk and harmful materials, do not store, stockpile, dump or otherwise place under or near trees materials such as oil, waste concrete, clearings and boulders. Prevent windblown materials from harming trees and plants. When working near trees: <ul style="list-style-type: none"> • prevent damage to tree bark. Do not attach stays and guys to trees. • do not remove topsoil within the dripline of the trees. • if required, use hand or trenchless methods so that root systems remain intact and undamaged. • where excavations under tree canopies will be open for some time, ensure that the CTPO is notified of the intent. 	Reduced risk to street trees and adjacent vegetation.	During construction	Superintendent and Contractor
Tree root cutting	Where root cutting is required for roots more than 50 mm diameter, obtain approval from the CTPO before proceeding. Cut using methods that do not unduly disturb the remaining root system. Immediately after cutting, water the tree and apply a liquid rooting hormone to stimulate the growth of new roots. Do not compact the ground or use skid-steel vehicles under the tree driplines.	Reduced risk to street trees and adjacent vegetation.	During construction	Superintendent and Contractor

Table 5.1 **Mitigation and management measures**

Impact	Action	Intended outcome	Timing	Responsibility
Increased sedimentation due to construction	Sediment controls, including fencing and sediments traps, should be installed in any areas where works will occur in proximity to low lying vegetation or streams.	Minimise indirect impacts on retained vegetation, particularly on riparian vegetation	Prior to and during construction	Contractor
Increased weed encroachment into adjacent vegetation	<p>All weeds should be appropriately removed offsite and where possible, without stockpiling.</p> <p>If stockpiling of weeds is required before removal from site, weeds are to be stockpiled and appropriately covered and located in areas away from vegetation to be retained to minimise the spread of seed and other propagules.</p> <p>Where feasible it is recommended weeds are cut and roots are kept minimising erosion.</p> <p>Hygiene protocols should be implemented including hygiene procedures for equipment, footwear and clothing. Ensure works vehicles are washed down prior to entering the works area.</p>	Minimise indirect impacts on retained vegetation, particularly on nearby streams	Prior to and during construction	Contractor
Pathogen introduction	Hygiene measures should be implemented as part of the CEMP to minimise the risk of pathogen spread on site and should include procedures for equipment, footwear and clothing. Ensure works vehicles are washed down prior to entering the works area.	Minimise indirect impacts on vegetation.	Prior to and during construction	Contractor
Weed establishment	Complete post construction weed control activities in accordance with the weed control protocol	No exotic species becoming established in the area.	Prior to and during construction	Contractor

5.2 Residual impacts

The residual impacts of the proposed works, after application of the hierarchy of avoid, minimise and mitigate, are described below.

5.2.1 Direct impacts

This section outlines the direct impacts of the proposed works, following the implementation of avoidance, minimisation and mitigation measures outlined in Table 5.1. Direct impacts for the proposed works comprise of:

- trenching across a small section of riparian vegetation near Flinders Field and Burrinjuck Avenue (approximately 20 metres by 1.2 metres, or 24 m²);
- potential impacts on street trees from encroachment during trenching;
- clearing of a small number of planted native shrubs; and
- clearing of exotic grassland.

The majority of the disturbance footprint is already cleared or consists of non-native vegetation. Therefore, the direct impacts from the proposed works on biodiversity are expected to be minimal.

i Impacts on threatened ecological communities

The trenching route crosses the northern end of the riparian corridor at Flinders Field, Burrinjuck Avenue. This vegetation is likely to conform to Swamp Sclerophyll Forest EEC.

The proposed trenching will follow an existing service line where previous trenching has already taken place. The trenching works will be undertaken using methods such as hydro excavation and may not necessitate the removal of trees (ie only understorey disturbance).

A five part test prepared in accordance with Section 7.3 of the BC Act is provided in Appendix D. This assessment conservatively assesses approximately 24 m² of disturbance to EEC, although it noted that the actual impact may only require disturbance to understorey / groundcover. The five part test indicates that the works is unlikely to have a significant impact on the EEC.

ii Impacts on threatened species

No threatened species were recorded or are likely to occur in the disturbance footprint, and therefore no impacts are anticipated.

iii Impacts on migratory species

No migratory species were considered to have habitat within the disturbance footprint of the proposed works. Therefore, it is unlikely that the proposed works will have a significant impact on migratory species.

5.2.2 Indirect impacts

Indirect impacts are likely to be associated with the construction phase of the proposed works and include the following:

- potential inadvertent disturbance of retained habitats;
- weed and pathogen introduction and spread; and
- erosion and sedimentation.

The measures presented in Table 5.1 outline key mitigation measures to address the construction risks identified above.

5.2.3 Contribution to key threatening processes

Key threatening processes are listed under the BC Act and under the EPBC Act. A process is defined as a key threatening process if it threatens or may threaten the survival, abundance, or evolutionary development of a native species or ecological community. A process can be listed as a key threatening process if it could cause a native species or ecological community to become eligible for adding to a threatened status category (other than conservation dependant), or if it could cause an already listed threatened species or community to become more threatened, or if it adversely affects two or more listed threatened species or ecological communities.

The works have the potential to contribute to the following threatening processes:

- BC Act Key Threatening Processes:
 - invasion of native plant communities by exotic perennial grasses; and
 - invasion, establishment and spread of Lantana (*Lantana camara*); and
- EPBC Act Key Threatening Processes:
 - loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants.

The works are not likely to significantly increase the introduction or spread of exotic weed species and pathogens, if undertaken in accordance with mitigation measures provided in Section 5.2.3.

6 Assessment of key legislation and policy

The current key legislation that is relevant to the proposed works is discussed in Section 2, the assessment against each is set out below.

6.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999

i Threatened ecological communities

The trenching route crosses the northern end of the riparian corridor at Flinders Field, Burrinjuck Avenue. This vegetation is likely to conform to Swamp Sclerophyll Forest EEC.

The proposed trenching will follow an existing service line where previous trenching has already taken place. The trenching works will be undertaken using methods such as hydro excavation and may not necessitate the removal of trees (ie only understorey disturbance).

An assessment in accordance with the EPBC Act significant impact guidelines for endangered ecological communities is provided in Appendix E. This assessment conservatively assesses approximately 24 m² of disturbance to EEC, although it is noted that the actual impact may only require disturbance to understorey / groundcover. The assessment indicates that the works is unlikely to have a significant impact on the EEC.

ii Threatened and migratory species

The likelihood of occurrence assessment (included in Appendix C) concluded that no threatened species or migratory species listed under the EPBC Act are likely to occur within the study area. Therefore, the proposed works is unlikely to have a significant impact on EPBC Act listed threatened species or migratory species.

6.2 New South Wales Environmental Planning and Assessment Act 1979

6.2.1 State Environmental Planning Policy (Resilience and Hazards) 2021

A proximity area for Coastal Wetlands occurs to the south of the study area (Figure 1.1); however, it does not occur within the Coastal Wetlands mapped areas. Therefore, the proposed works will not directly impact upon any Coastal Wetlands. Given the mitigation measures which will be applied for the works (refer Section 5.1), the proposed works are unlikely to result in any indirect impacts to the Coastal Wetlands area. The study area does not occur within areas mapped as Littoral Rainforest, Coastal Environment Area or Coastal Use Area. Therefore, the Coastal Management SEPP is not relevant to the proposed works.

6.2.2 The State Environmental Planning Policy (Biodiversity and Conservation) 2021

The study area does not contain core koala habitat as defined under (Biodiversity and Conservation SEPP). There are no koala records within 5 km of the study area within the last 18 years. Notwithstanding this, the proposed works are likely to have a low impact on koala habitat and unlikely to have an impact on koalas; the proposed works will avoid clearing of suitable habitat.

6.3 NSW Biodiversity Conservation Act 2016

The NSW BC Act is the key piece of legislation responsible for the conservation of biodiversity in NSW through the protection of threatened flora and fauna species, populations and ecological communities. The BC Act, together with the NSW Biodiversity Conservation Regulation 2017, establishes the Biodiversity Offsets Scheme (BOS), the Biodiversity Assessment Method (the BAM) and a method for determining whether a development or activity is considered likely to significantly affect threatened species, ecological communities or their habitats. A development or activity is likely to result in a significant effect if:

- the development exceeds the biodiversity offsets scheme native vegetation clearing threshold;
- the development or activity is carried out in a declared area of outstanding biodiversity value; or
- the development or activity is likely to significantly affect threatened species or ecological communities, or their habitats, according to the five-part test.

For activities assessed under Part 5 of the EP&A Act, where there is likely to be a significant effect on threatened entities or their habitats, a species impact statement or (if the proponent elects) a BDAR must be prepared.

EMM has assessed the proposed works against the above, as summarised in Table 6.1.

Table 6.1 Assessment of significance of effects on threatened entities and their habitats

Criteria	Assessment
Biodiversity offsets scheme native vegetation clearing threshold	Not triggered, does not apply to activities assessed under Part 5 of the EP&A Act as per subsection 7.2(2) of the BC Act.
Declared area of outstanding biodiversity value	Proposed works not carried out in an area of outstanding biodiversity value
Section 7.3 five-part test of significance	No significant impact on threatened species or ecological communities or their habitats based on likelihood of occurrence assessment (Appendix C) and impact assessment (Section 5)

6.4 Biosecurity Act 2015

Two weed species; Fireweed (*Senecio madagascariensis*) and Lantana (*Lantana camara*) have specific biosecurity duties under the Biosecurity Act as listed in Table 6.2. These species and the biosecurity security duties described should be a key focus of weed management activities associated with the proposed Works.

Table 6.2 **Biodiversity duties for priority weeds**

Priority weed and location on site	Biosecurity duty for the Southeast weed management area.
Fireweed <i>(Senecio madagascariensis)</i>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.</p> <p>Regional Recommended Measure Exclusion zone: whole of region except the core infestation area of Wollongong, Kiama, Shellharbour, Eurobodalla, Shoalhaven, Bega Valley and Wingecaribee councils Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Core area: Land managers reduce impacts from the plant on priority assets.</p>
Lantana <i>(Lantana camara)</i>	<p>Prohibition on certain dealings Must not be imported into the state, sold, bartered, exchanged or offered for sale.</p> <p>Regional Recommended Measure Exclusion zone: whole region excluding the core infestation area of Eurobodalla, Kiama, Shellharbour, Wollongong and the Shoalhaven local government area north of the Lantana Containment Line at 35°11'42 S Whole region: Land managers should mitigate the risk of new weeds being introduced to their land. The plant should not be bought, sold, grown, carried or released into the environment. Exclusion zone: The plant should be eradicated from the land and the land kept free of the plant. Core area: Land managers reduce impacts from the plant on priority assets.</p>

7 Conclusions

This Flora and Fauna Assessment has been completed to assess potential impacts of the proposed works on species and communities listed under the BC Act, FM Act and EPBC Act. The disturbance footprint is generally located in areas of low biodiversity value that avoids impact on threatened communities, threatened species and their habitats (Section 5.1). Residual impacts arising from the proposed works, following all measures to avoid, minimise and mitigate impacts, include:

- trenching across a small section of riparian vegetation near Burrinjuck Avenue representing disturbance on approximately 24 m² of Swamp Sclerophyll Forest EEC listed under both the BC Act and EPBC Act;
- potential impacts on street trees from encroachment during trenching;
- clearing of a small number of planted native shrubs; and
- clearing of exotic grassland.

The impacts resulting from the proposed works are not considered to be significant to threatened communities, threatened species or their habitats. Therefore, the preparation of a species impact statement or a BDAR is not required under the BC Act. No matter of national environmental significance is likely to be significantly impacted by the proposed works and as such no referral to the Commonwealth is required.

References

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Appendix A

Protected matters search tool



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 10-Jun-2022

[Summary](#)

[Details](#)

[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	1
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	102
Listed Migratory Species:	76

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	23
Commonwealth Heritage Places:	1
Listed Marine Species:	101
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	2
Regional Forest Agreements:	1
Nationally Important Wetlands:	4
EPBC Act Referrals:	18
Key Ecological Features (Marine):	None
Biologically Important Areas:	8
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Commonwealth Marine Area

[Resource Information]

Approval is required for a proposed activity that is located within the Commonwealth Marine Area which has, will have, or is likely to have a significant impact on the environment. Approval may be required for a proposed action taken outside a Commonwealth Marine Area but which has, may have or is likely to have a significant impact on the environment in the Commonwealth Marine Area.

Feature Name	Buffer Status
EEZ and Territorial Sea	In buffer area only

Listed Threatened Ecological Communities

[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area	In feature area
Illawarra and south coast lowland forest and woodland ecological community	Critically Endangered	Community likely to occur within area	In feature area
Illawarra-Shoalhaven Subtropical Rainforest of the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In feature area
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area	In buffer area only
River-flat eucalypt forest on coastal floodplains of southern New South Wales and eastern Victoria	Critically Endangered	Community likely to occur within area	In feature area
Robertson Rainforest in the Sydney Basin Bioregion	Critically Endangered	Community likely to occur within area	In buffer area only
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In buffer area only

Listed Threatened Species

[Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In buffer area only
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat likely to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Fregetta grallaria grallaria White-bellied Storm-Petrel (Tasman Sea), White-bellied Storm-Petrel (Australasian) [64438]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat known to occur within area	In feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterodroma leucoptera leucoptera Gould's Petrel, Australian Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area	In buffer area only
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In buffer area only
Pycnoptilus floccosus Pilotbird [525]	Vulnerable	Species or species habitat known to occur within area	In feature area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
FISH			
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Macquaria australasica Macquarie Perch [66632]	Endangered	Species or species habitat may occur within area	In buffer area only
Prototroctes maraena Australian Grayling [26179]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In buffer area only
FROG			
Heleioporus australiacus Giant Burrowing Frog [1973]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Litoria littlejohni Littlejohn's Tree Frog, Heath Frog [64733]	Endangered	Species or species habitat may occur within area	In buffer area only
Litoria watsoni Watson's Tree Frog [91509]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In feature area
MAMMAL			
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat known to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Isoodon obesulus obesulus Southern Brown Bandicoot (eastern), Southern Brown Bandicoot (south-eastern) [68050]	Endangered	Species or species habitat likely to occur within area	In feature area
Petauroides volans Greater Glider [254]	Vulnerable	Species or species habitat known to occur within area	In feature area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus trisulcatus Long-nosed Potoroo (southern mainland) [86367]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Acacia bynoeana Bynoe's Wattle, Tiny Wattle [8575]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Boronia deanei Deane's Boronia [8397]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Caladenia tessellata Thick-lipped Spider-orchid, Daddy Long-legs [2119]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat known to occur within area	In feature area
Daphnandra johnsonii Illawarra Socketwood [67186]	Endangered	Species or species habitat likely to occur within area	In feature area
Genoplesium baueri Yellow Gnat-orchid, Bauer's Midge Orchid, Brittle Midge Orchid [7528]	Endangered	Species or species habitat likely to occur within area	In feature area
Haloragis exalata subsp. exalata Wingless Raspwort, Square Raspwort [24636]	Vulnerable	Species or species habitat known to occur within area	In feature area
Irenepharsus trypherus Delicate Cress, Illawarra Irene [14664]	Endangered	Species or species habitat known to occur within area	In buffer area only
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Persoonia acerosa Needle Geebung [7232]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Persoonia hirsuta Hairy Geebung, Hairy Persoonia [19006]	Endangered	Species or species habitat may occur within area	In feature area
Pimelea spicata Spiked Rice-flower [20834]	Endangered	Species or species habitat known to occur within area	In feature area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Prasophyllum affine Jervis Bay Leek Orchid, Culburra Leek-orchid, Kinghorn Point Leek-orchid [2210]	Endangered	Species or species habitat known to occur within area	In feature area
Prostanthera densa Villous Mintbush [12233]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	Species or species habitat known to occur within area	In feature area
Pterostylis pulchella Pretty Greenhood [6448]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pultenaea aristata [18062]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Rhizanthella slateri Eastern Underground Orchid [11768]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat may occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Zieria granulata Hill Zieria, Hilly Zieria, Illawarra Zieria [17147]	Endangered	Species or species habitat likely to occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Hoplocephalus bungaroides Broad-headed Snake [1182]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
SHARK			
Carcharias taurus (east coast population)			
Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat known to occur within area	In buffer area only
Carcharodon carcharias			
White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Galeorhinus galeus			
School Shark, Eastern School Shark, Snapper Shark, Tope, Soupfin Shark [68453]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only
Rhincodon typus			
Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sphyrna lewini			
Scalloped Hammerhead [85267]	Conservation Dependent	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Anous stolidus			
Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Ardenna carneipes			
Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea			
Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Ardenna pacifica			
Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Sternula albifrons Little Tern [82849]		Breeding known to occur within area	In buffer area only
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Migratory Marine Species			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Carcharhinus longimanus Oceanic Whitetip Shark [84108]		Species or species habitat may occur within area	In buffer area only
Carcharodon carcharias White Shark, Great White Shark [64470]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area	In buffer area only
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ruficollis Red-necked Stint [860]	Critically Endangered	Roosting known to occur within area	In buffer area only
Calidris tenuirostris Great Knot [862]		Roosting known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In buffer area only
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]		Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area	In buffer area only

Other Matters Protected by the EPBC Act

Commonwealth Lands

[[Resource Information](#)]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Australian Academy of Science		
Commonwealth Land - Australian Academy of Science [12031]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [11890]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11893]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian Telecommunications Commission [12036]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12228]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11891]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [12026]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [11892]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11894]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [12039]	NSW	In buffer area only

Defence		
Commonwealth Land - Defence Service Homes Corporation [11896]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11897]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11895]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [12029]	NSW	In buffer area only
Defence - LAKE ILLAWARRA CADET FACILITY [10241]	NSW	In buffer area only
Defence - THROSBY TRG DEPOT-PORT KEMBLA [10056]	NSW	In buffer area only

Defence - Defence Housing Authority		
Commonwealth Land - Director of War Service Homes [12032]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12030]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12028]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [12027]	NSW	In buffer area only

Unknown		
Commonwealth Land - [12231]	NSW	In buffer area only
Commonwealth Land - [12232]	NSW	In buffer area only
Commonwealth Land - [12229]	NSW	In buffer area only

Commonwealth Heritage Places	[Resource Information]		
Name	State	Status	Buffer Status
Historic			
Kiama Post Office	NSW	Listed place	In buffer area only

Listed Marine Species	[Resource Information]		
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anous stolidus Common Noddy [825]		Species or species habitat may occur within area	In buffer area only
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Ardenna carneipes as Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [82404]		Foraging, feeding or related behaviour likely to occur within area	In feature area
Ardenna grisea as Puffinus griseus Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In buffer area only
Ardenna pacifica as Puffinus pacificus Wedge-tailed Shearwater [84292]		Breeding known to occur within area	In buffer area only
Arenaria interpres Ruddy Turnstone [872]		Roosting known to occur within area	In buffer area only
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting known to occur within area	In feature area
Calidris alba Sanderling [875]		Roosting known to occur within area	In buffer area only
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area overfly marine area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area overfly marine area	In buffer area only
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In buffer area only
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In buffer area only
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius mongolus Lesser Sand Plover, Mongolian Plover [879]	Endangered	Roosting known to occur within area	In buffer area only
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In buffer area only
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In buffer area only
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat likely to occur within area	In buffer area only
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Gallinago megala Swinhoe's Snipe [864]		Roosting likely to occur within area overfly marine area	In buffer area only
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In buffer area only
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Himantopus himantopus Pied Stilt, Black-winged Stilt [870]		Roosting known to occur within area overfly marine area	In buffer area only
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In feature area
Limosa limosa Black-tailed Godwit [845]		Roosting known to occur within area overfly marine area	In buffer area only
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In buffer area only
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In buffer area only
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysogaster Orange-bellied Parrot [747]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat likely to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Numenius minutus Little Curlew, Little Whimbrel [848]		Roosting likely to occur within area overfly marine area	In buffer area only
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In buffer area only
Pachyptila turtur Fairy Prion [1066]		Species or species habitat known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Phaethon lepturus White-tailed Tropicbird [1014]		Species or species habitat known to occur within area	In buffer area only
Phoebetria fusca Sooty Albatross [1075]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In buffer area only
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Stercorarius skua as Catharacta skua Great Skua [823]		Species or species habitat may occur within area	In buffer area only
Sternula albifrons as Sterna albifrons Little Tern [82849]		Breeding known to occur within area	In buffer area only
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche carteri Indian Yellow-nosed Albatross [64464]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Thalassarche cauta Shy Albatross [89224]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In buffer area only
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat known to occur within area overfly marine area	In feature area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Roosting known to occur within area overfly marine area	In buffer area only
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area	In buffer area only
Cosmocampus howensis Lord Howe Pipefish [66208]		Species or species habitat may occur within area	In buffer area only
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area	In buffer area only
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area	In buffer area only
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area	In buffer area only
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]	Endangered	Species or species habitat may occur within area	In buffer area only
Hippocampus breviceps Short-head Seahorse, Short-snouted Seahorse [66235]		Species or species habitat may occur within area	In buffer area only
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat likely to occur within area	In buffer area only
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In buffer area only
Kimblaeus bassensis Trawl Pipefish, Bass Strait Pipefish [66247]		Species or species habitat may occur within area	In buffer area only
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area	In buffer area only
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area	In buffer area only
Notiocampus ruber Red Pipefish [66265]		Species or species habitat may occur within area	In buffer area only
Phyllopteryx taeniolatus Common Seadragon, Weedy Seadragon [66268]		Species or species habitat may occur within area	In buffer area only
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse [66275]		Species or species habitat may occur within area	In buffer area only
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area	In buffer area only
Stigmatopora argus Spotted Pipefish, Gulf Pipefish, Peacock Pipefish [66276]		Species or species habitat may occur within area	In buffer area only
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area	In buffer area only
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area	In buffer area only
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area	In buffer area only
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area	In buffer area only
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area	In buffer area only
Vanacampus phillipi Port Phillip Pipefish [66284]		Species or species habitat may occur within area	In buffer area only
Mammal			
Arctocephalus forsteri Long-nosed Fur-seal, New Zealand Fur-seal [20]		Species or species habitat may occur within area	In buffer area only
Arctocephalus pusillus Australian Fur-seal, Australo-African Fur-seal [21]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Breeding likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In buffer area only

Whales and Other Cetaceans		[Resource Information]	
Current Scientific Name	Status	Type of Presence	Buffer Status
Mammal			
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area	In buffer area only
Balaenoptera borealis Sei Whale [34]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area	In buffer area only
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area	In buffer area only
Balaenoptera physalus Fin Whale [37]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Caperea marginata Pygmy Right Whale [39]		Foraging, feeding or related behaviour may occur within area	In buffer area only
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area	In buffer area only
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat known to occur within area	In buffer area only
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area	In buffer area only
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area	In buffer area only
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only
Orcinus orca Killer Whale, Orca [46]		Species or species habitat likely to occur within area	In buffer area only
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area	In buffer area only
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area	In buffer area only

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Berkeley	Nature Reserve	NSW	In buffer area only
Bushrangers Bay	Aquatic Reserve	NSW	In buffer area only

Regional Forest Agreements

[Resource Information]

Note that all areas with completed RFAs have been included.

RFA Name	State	Buffer Status
Southern RFA	New South Wales	In feature area

Nationally Important Wetlands

[Resource Information]

Wetland Name	State	Buffer Status
Coomaditchy Lagoon	NSW	In buffer area only
Killalea Lagoon	NSW	In buffer area only
Lake Illawarra	NSW	In buffer area only
Minnamurra River Estuary	NSW	In feature area

EPBC Act Referrals

[Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Albion Park Quarry Extraction Area Stage 7 Extension	2020/8871	Controlled Action	Assessment Approach	In buffer area only
Albion Park Rail Bypass, NSW	2017/7909	Controlled Action	Post-Approval	In buffer area only
Calderwood Mod 4	2021/8981	Controlled Action	Assessment Approach	In buffer area only
Pilot Offshore Artificial Reefs	2008/4176	Controlled Action	Post-Approval	In buffer area only
Residential subdivision, Lot 101 DP 785139 Crest Road, Albion Park, NSW	2017/8048	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Calderwood Clover Hill Estate Subdivision, Wollongong	2019/8542	Not Controlled Action	Completed	In buffer area only
Calderwood Urban Development	2010/5381	Not Controlled Action	Completed	In buffer area only
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
INDIGO Central Submarine Telecommunications Cable	2017/8127	Not Controlled Action	Completed	In feature area
Lake Illawarra entrance works, Stage 2	2004/1696	Not Controlled Action	Completed	In feature area
Shellcove Boatharbour Marine, Commercial & Residential Development	2007/3935	Not Controlled Action	Completed	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Tallawarra Lands: Urban Development	2011/6002	Not Controlled Action	Completed	In buffer area only
Tullimbar subdivision, Stage 9, 21 km south-west of Wollongong, NSW	2020/8729	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
INDIGO Marine Cable Route Survey (INDIGO)	2017/7996	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Kiama Post Office alterations	2006/2940	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Lake Illawarra Entrance Works (stage 2)	2005/1997	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
NBN Transit Fibre Minnamurra Wetlands Section	2011/5900	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Referral decision				
Breeding program for Grey Nurse Sharks	2007/3245	Referral Decision	Completed	In buffer area only
Biologically Important Areas				
Scientific Name		Behaviour	Presence	Buffer Status
Dolphins				
Tursiops aduncus				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Breeding	Likely to occur	In buffer area only
Seabirds				
Ardenna carneipes				
Flesh-footed Shearwater [82404]		Foraging	Known to occur	In buffer area only
Diomedea exulans antipodensis				
Antipodean Albatross [82269]		Foraging	Known to occur	In buffer area only
Eudyptula minor				
Little Penguin [1085]		Breeding	Likely to occur	In buffer area only
Procellaria parkinsoni				
Black Petrel [1048]		Foraging	Likely to occur	In buffer area only
Sharks				

Scientific Name	Behaviour	Presence	Buffer Status
Carcharias taurus Grey Nurse Shark [64469]	Foraging	Known to occur	In buffer area only
Carcharodon carcharias White Shark [64470]	Distribution	Known to occur	In buffer area only
Whales			
Megaptera novaeangliae Humpback Whale [38]	Foraging	Known to occur	In buffer area only

Bioregional Assessments			
SubRegion	BioRegion	Website	Buffer Status
Sydney	Sydney Basin	BA website	In feature area

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data are available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-Other groups and individuals](#)

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Appendix B

Flora species list

Table B.1 **Flora species list**

Scientific Name	Common Name	Native (N) or exotic (E)
<i>Cenchrus clandestinus</i>	Kikuyu Grass	E
<i>Chenopodium album</i>	Fat Hen	E
<i>Cirsium vulgare</i>	Spear Thistle	E
<i>Conyza spp.</i>	A Fleabane	E
<i>Cynodon dactylon</i>	Common Couch	N
<i>Cyperus brevifolius</i>	-	E
<i>Dichondra repens</i>	Kidney Weed	N
<i>Echinochloa crus-galli</i>	Barnyard Grass	E
<i>Ehrharta erecta</i>	Panic Veldtgrass	E
<i>Eleusine indica</i>	Crowsfoot Grass	E
<i>Eucalptus robusta</i>	Swamp Mahogany	N
<i>Eucalyptus pilularis</i>	Blackbutt	N
<i>Eucalyptus tereticornis</i>	Forest Red Gum	N
<i>Gomphocarpus fruticosus</i>	Narrow-leaved Cotton Bush	E
<i>Holcus lanatus</i>	Yorkshire Fog	E
<i>Hypochaeris radicata</i>	Catsear	E
<i>Juncus cognatus</i>	-	E
<i>Lantana camara</i>	Lantana	E
<i>Leptospermum petersonii</i>	Lemon-scented Teatree	N
<i>Lolium spp.</i>	A Ryegrass	E
<i>Lysimachia arvensis</i>	Scarlet Pimpernel	E
<i>Malva parviflora</i>	Small-flowered Mallow	E
<i>Melaleuca quinquenervia</i>	Broad-leaved Paperbark	N
<i>Modiola caroliniana</i>	Red-flowered Mallow	E
<i>Oxalis corniculata</i>	Creeping Oxalis	E
<i>Paspalum dilatatum</i>	Paspalum	E
<i>Phalaris spp.</i>	-	E
<i>Plantago lanceolata</i>	Lamb's Tongues	E
<i>Senecio madagascariensis</i>	Fireweed	E
<i>Setaria pumila</i>	Pale Pigeon Grass	E
<i>Sida rhombifolia</i>	Paddy's Lucerne	E

Table B.1 **Flora species list**

Scientific Name	Common Name	Native (N) or exotic (E)
<i>Solanum nigrum</i>	Black-berry Nightshade	E
<i>Sporobolus africanus</i>	Parramatta Grass	E
<i>Taraxacum officinale</i>	Dandelion	E
<i>Trifolium repens</i>	White Clover	E
<i>Verbena bonariensis</i>	Purpletop	E
<i>Vicia sativa</i>	Common vetch	E
<i>Vulpia spp.</i>	Rat's-tail Fescue	E

Appendix C

Likelihood of occurrence table

Table C.1 Likelihood of occurrence of threatened species within the site

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Bird	<i>Anthochaera phrygia</i>	Regent Honeyeater	E	CE	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. These birds are also found in drier coastal woodlands and forests in some years. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany (<i>Eucalyptus robusta</i>) and Spotted Gum (<i>Corymbia maculata</i>) forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast.	Low	The site lacks suitable foraging or nesting resources. No associated PCT's within the site. PMST; Species or species habitat known to occur within area.
Bird	<i>Apus pacificus</i>	Fork-tailed Swift	-	Mi	In Australia, the Fork-tailed Swift mostly occurs over inland plains but sometimes above foothills or in coastal areas. This species can also occur over cliffs and beaches and also over islands and sometimes well out to sea.	Negligible	Species may forage aerially over the site but unlikely to land within.
Bird	<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	The species occurs throughout most of NSW, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range. The most common habitat for this species is in woodlands and dry open sclerophyll forests, usually dominated by eucalyptus, including mallee associations. The species has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests; very occasionally in moist forests or rainforests. Understorey is typically open with sparse Eucalyptus saplings, Acacia and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris (OEH 2018).	Low	Site lacks suitable foraging and nesting resources. Not commonly recorded within the locality.
Bird	<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	The Australasian Bittern is widespread and found over most of NSW except for far north-west. Preferred habitat is comprised of wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and reeds or cutting grass (<i>Gahnia</i> sp.) growing over a muddy or peaty substrate (OEH 2018).	Low	The dam within the study area is unlikely to provide suitable foraging habitat for this species. Low number of records from the locality. PMST; Species or species habitat known to occur within area.
Bird	<i>Burhinus grallarius</i>	Bush Stone-curlew	E	-	The Bush Stone-curlew has previously been recorded in all but the most arid parts of mainland Australia. Today the species is scarce or largely absent in many parts of its former range south and east of the Great Dividing Range. It inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. The curlew likes to roost and nest in grassy woodlands of Bull Oak, gum or box with low, sparse grassy or herb understorey. Nests are usually beside a fallen log, which probably makes it harder for foxes to find. Curlews prefer a sparse understorey so they can see predators while foraging for insects (OEH 2018).	Low	Species not known from the locality. No suitable habitat within the study area
Bird	<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	E	In summer, the Gang-gang Cockatoo is generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In winter, they may occur at lower altitudes in drier more open eucalypt forests and woodlands, and often found in urban areas.	Low	Site lacks heavily timbered areas. No hollow-bearing trees suitable for breeding within the subject site. No records within the locality. PMST; Species or species habitat likely to occur within area.
Bird	<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	The Glossy Black Cockatoo inhabits open forest and woodlands of the coast and the Great Dividing Range up to 1000 m in which stands of She-oak species, particularly Black She-oak (<i>Allocasuarina littoralis</i>), Forest She-oak (<i>A. torulosa</i>) or Drooping She-oak (<i>A. verticillata</i>) occur.	Low	Site lacks heavily timbered areas and she-oak species. No hollow-bearing trees suitable for breeding within the subject site. Species not associated with any PCT within the site. Not commonly recorded within the locality.
Bird	<i>Circus assimilis</i>	Spotted Harrier	V	-	The Spotted Harrier occurs widely in NSW, mainly within grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. The species also occurs in agricultural land, foraging over open woodlands (OEH 2018).	Low	Species has been recorded 11 times within the locality. This species may fly over the site on occasion, however the site is unlikely to provide significant foraging or habitat The site may be part of an individual or pairs foraging range.
Bird	<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	Habitat of the Eastern Bristlebird is characterised by dense, low vegetation including heath and open woodland with a heathy understorey; in northern NSW, this species occurs in open forest with tussocky grass understorey; all of these vegetation types are fire prone.	Negligible	The site lacks low dense vegetation. Species not associated with PCT's within the site. No records of this species within the locality. PMST; Species or species habitat likely to occur within area.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Bird	<i>Epthianura albifrons</i>	White-fronted Chat	V	-	Gregarious species, usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Have been observed breeding from late July through to early March, with 'open-cup' nests built in low vegetation. Nests in the Sydney region have also been seen in low isolated mangroves. Nests are usually built about 23 cm above the ground (but have been found up to 2.5 m above the ground).	Low	Species known from the locality. Not associated with PCT's within the site, however can occur within a variety of habitats.
Bird	<i>Falco hypoleucos</i>	Grey Falcon	E	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The species is usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey (OEH 2018).	Low	No suitable wooded watercourses or woodland habitat within the site. Species not associated with PCT's within the site. PMST; Species or species habitat may occur within area.
Bird	<i>Gallinago hardwickii</i>	Latham's Snipe	-	Mi	Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia. Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level. They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies).	Negligible	No suitable wetland habitat within the site.
Bird	<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards. The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.	Low	No records of this species within the locality. The site does not contain suitable foraging or breeding habitat
Bird	<i>Grantiella picta</i>	Painted Honeyeater	E	V	The species is sparsely distributed from south-eastern Australia to north-western Queensland, with its greatest concentrations and breeding locations occurring on the inland slopes of the Great Dividing Range in NSW. It inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of Black Box (<i>E. largiflorens</i>) and River Red Gum (<i>E. camaldulensis</i>), Box-Ironbark-Yellow Gum woodlands, Acacia-dominated woodlands, Paperbarks, Casuarina, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips although it breeds in quite narrow roadside strips if ample mistletoe fruit is available (OEH 2018).	Negligible	No records of this species within the locality. PMST; Species or species habitat may occur within area.
Bird	<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	The White-bellied Sea-Eagle is found in coastal habitats (especially those close to the sea-shore) and around terrestrial wetlands in tropical and temperate regions of mainland Australia and its offshore islands. The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes and the sea).	Low	Site lacks large trees suitable for breeding. No suitable foraging habitat within the site.
Bird	<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. This species occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used.	Low	Site lacks large trees suitable for breeding. No degraded potential foraging habitat within the site.
Bird	<i>Hirundapus caudacutus</i>	White-throated Needletail	-	Mi	The White-throated Needletail is widespread in eastern and south-eastern Australia. In NSW this species extends inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. In Australia, the White-throated Needletail is almost exclusively aerial, recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland (DoEE 2018).	Low	This species may forage aerially over the site, however is unlikely to be impacted by the project. PMST; Species or species habitat known to occur within area.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Bird	<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	-	Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation. Forage on floating vegetation, primarily on insects and other invertebrates, as well as some seeds and other vegetation. The Comb-crested Jacana occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW, with stragglers recorded in south-eastern NSW (possibly in response to unfavourable conditions further north).	Low	No suitable wetland habitat within the site. Only two records within the locality.
Bird	<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	The Black Bittern inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest and mangroves.	Low	No suitable wetland habitat within the site. Only one record within the locality.
Bird	<i>Lathamus discolor</i>	Swift Parrot	E	CE	This species migrates in the autumn and winter months to south-eastern Australia. In NSW, it mostly occurs on the coast and south-west slopes in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations (OEH 2018). Favoured feed trees include winter flowering species such as Swamp Mahogany, Spotted Gum, Red Bloodwood (C. gummifera), Mugga Ironbark and White Box. Commonly used lerp infested trees include Inland Grey Box, Grey Box (E. moluccana) and Blackbutt (E. pilularis).	Low	An individual Eucalyptus tereticornis occurs within the site. This is unlikely to be an important foraging resource for this species. PMST; Species or species habitat likely to occur within area.
Bird	<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Within NSW the Square-tailed Kite is a regular resident in the north, north-east and along major flowing river systems and migrates to the south-east for breeding. The species is found in a variety of timbered habitats including dry woodlands and open forests, showing a particular preference for timbered watercourses. The species is a specialist hunter of passerines, especially honeyeaters, and most particularly nestlings, and insects in the tree canopy, picking most prey items from the outer foliage The species appears to occupy large hunting ranges of more than 100km2. Nest sites are generally located along or near watercourses, in a fork or on large horizontal limbs (OEH 2018).	Low	Site lacks large trees suitable for breeding. No degraded potential foraging habitat within the site. Species not associated with PCTs within the site.
Bird	<i>Neophema chrysogaster</i>	Orange-bellied Parrot	E	CE	Spends winter mostly within 3 km of the coast in sheltered coastal habitats including bays, lagoons, estuaries, coastal dunes and saltmarshes. The species also inhabits small islands and peninsulas and occasionally saltworks and golf courses. Birds forage in low samphire herbland or taller coastal shrubland. Some birds have been seen foraging on weed species several hundred metres from the coast.	Low	Species has been recorded foraging in exotic grassland near Shellharbour. PMST; Species or species habitat may occur within area.
Bird	<i>Ninox connivens</i>	Barking Owl	V	-	The Barking Owl inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. This species roosts in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Low	Site lacks suitable tree hollows for breeding and would not provide a suitable foraging habitat.
Bird	<i>Ninox strenua</i>	Powerful Owl	V	-	In NSW, the Powerful Owl is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered, mostly historical records on the western slopes and plains. This species roosts by day in dense vegetation comprising species such as Turpentine (Syncarpia glomulifera), Black She-oak (Allocasuarina littoralis), Blackwood (Acacia melanoxylon), Rough-barked Apple (Angophora floribunda), Cherry Ballart (Exocarpus cupressiformis) and a number of eucalypt species.	Low	Site lacks suitable tree hollows for breeding and would not provide a suitable foraging habitat.
Bird	<i>Oxyura australis</i>	Blue-billed Duck	V	-	The Blue-billed Duck is widespread in NSW, but most common in the southern Murray-Darling Basin area. This species prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover (OEH 2018).	Low	Not commonly recorded within the locality. Species has been observed in Killalea Lagoon to the West of the site. Farm dams within the subject site do not contain dense aquatic vegetation favoured by this species.
Bird	<i>Pandion cristatus</i>	Eastern Osprey	V	-	Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water. Breed from July to September in NSW. Nests are made high up in dead trees or in dead crowns of live trees, usually within one kilometre of the sea.	Low	Species may fly over the site on rare occasion due to the sites close proximity to the coast, however the site is unlikely to provide suitable foraging or nesting habitat.
Bird	<i>Petroica boodang</i>	Scarlet Robin	V	-	In NSW, the Scarlet Robin occurs from the coast to the inland slopes. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. Scarlet Robin habitat usually contains abundant logs and fallen timber: these are important components of its habitat.	Negligible	Site lacks habitat requirements such as mature or regrowth vegetation and abundant logs and fallen timber. One record from locality. Species not associated with PCT within the site.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Bird	<i>Petroica phoenicea</i>	Flame Robin	V	-	Within NSW the Flame Robin breeds in upland areas and during winter many birds move to the inland slopes and plains. The species breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. In winter, birds migrate to drier more open habitats in the lowlands (i.e. valleys below the ranges, and to the western slopes and plains). Here, the species lives in dry forests, open woodlands and in pastures and native grasslands, with or without scattered trees (OEH 2018).	Negligible	Site lacks habitat requirements such as native grassland or woodland. One record from locality. Species not associated with PCT within the site.
Bird	<i>Ptilinopus regina</i>	Rose-crowned Fruit-Dove	V	-	Rose-crowned Fruit-doves occur mainly in sub-tropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. They are shy pigeons, not easy to see amongst the foliage, and are more often heard than seen. They feed entirely on fruit from vines, shrubs, large trees and palms, and are thought to be locally nomadic as they follow the ripening of fruits. Some populations are migratory in response to food availability - numbers in north-east NSW increase during spring and summer then decline in April or May.	Low	Site lacks plentiful fruit sources for foraging.
Bird	<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania.	Low	Site lacks rainforest or similar habitat types. No records of this species within the locality.
Bird	<i>Rostratula australis</i>	Australian Painted Snipe	E	E	The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. The species also uses inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains (OEH 2018).	Negligible	Site lacks shallow freshwater wetland areas of suitable quality to be utilised by this species. PMST; Species or species habitat known to occur within area.
Bird	<i>Stictonetta naevosa</i>	Freckled Duck	V	-	The Freckled Duck is found primarily in south-eastern and south-western Australia, and breeds in large temporary swamps created by floods in the Murray Darling System. The species prefers permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. Generally rest in dense cover during the day, usually in deep water. Nests are usually located in dense vegetation at or near water level (OEH 2018).	Low	Not commonly recorded within the locality. Species has been observed in Killalea Lagoon to the West of the site. Farm dams within the subject site do not contain dense aquatic vegetation favoured by this species.
Bird	<i>Tyto novaehollandiae</i>	Masked Owl	V	-	Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. The typical diet consists of tree-dwelling and ground mammals, especially rats. Pairs have a large home-range of 500 to 1000 hectares. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution.	Low	No records of this species within the locality. Site lacks suitable foraging or nesting habitat.
Bird	<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Occurs in rainforest, including dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests. Roosts by day in the hollow of a tall forest tree or in heavy vegetation; hunts by night for small ground mammals or tree-dwelling mammals such as the Common Ringtail Possum (<i>Pseudocheirus peregrinus</i>) or Sugar Glider (<i>Petaurus breviceps</i>). Nests in very large tree-hollows. Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Territories are occupied permanently.	Low	No records of this species within the locality. Site lacks suitable foraging or nesting habitat.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Fish	<i>Prototroctes maraena</i>	Australian Grayling	-	V	Currently, the Australian Grayling occurs in streams and rivers on the eastern and southern flanks of the Great Dividing Range, from Sydney, southwards to the Otway Ranges of Victoria and in Tasmania. The species is found in fresh and brackish waters of coastal lagoons, from Shoalhaven River in NSW to Ewan Ponds in South Australia. It is absent from the inland Murray-Darling system. The Australian Grayling is diadromous, spending part of its lifecycle in freshwater and at least part of the larval and/or juvenile stages in coastal seas. Adults (including pre spawning and spawning adults) inhabit cool, clear, freshwater streams with gravel substrate and areas alternating between pools and riffle zones such as the Tambo River, which is also known to have granite outcrops. The species has also been associated with clear, gravel-bottomed habitats in the Mitchell and Wonnangatta Rivers (Victoria) and in a muddy-bottomed, heavily silted habitat in the Tarwin River (Victoria). The species has been found over 100 km upstream from the sea.	Negligible	The creek downstream of the site is highly disturbed and modified, unlikely to support suitable habitat. PMST; Species or species habitat likely to occur within area.
Flora	<i>Boronia deanei</i>	Deane's Boronia	V	V	Grows in wet heath, often at the margins of open forest adjoining swamps or along streams. The species mainly occurs in conservation reserves and once grew profusely in Morton National Park near Bundanoon but has rarely been seen in that area since being impacted by devastating bushfires of the 1960s.	Negligible	No suitable habitat within study area.
Flora	<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E	The rare species is known in rainforest gullies scrub and scree slopes. Associated vegetation types include littoral rainforest; Coastal Tea-tree <i>Leptospermum laevigatum</i> – Coastal Banksia <i>Banksia integrifolia</i> subsp. <i>integrifolia</i> coastal scrub; Forest Red Gum <i>Eucalyptus tereticornis</i> aligned open forest and woodland; Spotted Gum <i>Corymbia maculata</i> aligned open forest and woodland; and Bracelet Honeymyrtle <i>Melaleuca armillaris</i> scrub to open scrub.	Low	Species not recorded during field surveys. Species records within the locality. Species associated with PCT 1300 PMST; Species or species habitat known to occur within area.
Flora	<i>Daphnandra johnsonii</i>	Illawarra Socketwood	E	E	Restricted to the Illawarra region where it has been recorded from the local government areas of Shoalhaven, Kiama, Shellharbour and Wollongong. Occupies the rocky hillsides and gullies of the Illawarra lowlands, occasionally extending onto the upper escarpment slopes. Associated vegetation includes rainforest and moist eucalypt forest. Associated soils are loams and clay loams derived from volcanic and fertile sedimentary rocks. Possibly killed by fire.	Negligible	Site does not have rocky hillsides, gullies or and does not have characteristic rainforest or moist eucalypt forest species. PMST; Species or species habitat likely to occur within area.
Flora	<i>Gossia acmenoides</i>	-	E	-	Found in subtropical and dry rainforest on the ranges and coastal plain of eastern Australia. Estimated less than 100 mature plants, through approximately 30 sites. Occurring often as a single individual or small group. Known from Shellharbour, Wollongong and Kiama LGAs and encompasses all occurrences south of the Georges River. This population is the southern most occurrence of the species and is approximately 175 km from the nearest population to the north in the Hunter region of NSW.	Negligible	Not recorded during surveys. Not associated with PCT1300
Flora	<i>Haloragis exalata</i> subsp. <i>exalata</i>	Square Raspwort	V	V	Square Raspwort occurs in 4 widely scattered localities in eastern NSW. It is disjunctly distributed in the Central Coast, South Coast and North Western Slopes botanical subdivisions of NSW. Square Raspwort appears to require protected and shaded damp situations in riparian habitats.	Low	Site lacks protected and shaded riparian habitat. PMST; Species or species habitat likely to occur within area. One recorded within the locality.
Flora	<i>Irenepharsus trypherus</i>	Illawarra Irene	E	E	The species has been recorded from 18 sites within the local government areas of Kiama, Shellharbour, Shoalhaven, Tallaganda, Wingecarribee, and Wollongong. Found at such places as Minnamurra Falls, the Jamberoo area, and Morton and Macquarie Pass National Parks. The species has rarely been collected, perhaps because it looks like a weed. Typically inhabits steep rocky slopes near cliff lines and ridge tops. The species is less typically found growing out of rock crevices or on narrow benches along cliff lines. The vast majority of sites are recorded from the upper slopes of the ridge systems that extend south and east of the Illawarra escarpment, although the species has also been recorded from the deep sandstone gorges of the Shoalhaven River. Associated vegetation includes moist sclerophyll forest, Ironwood <i>Backhousia myrtifolia</i> thicket, and rainforest.	Low	Site lacks steep rocky slopes or similar habitat types where this species is found. Species associated with PCT 1300
Flora	<i>Persoonia acerosa</i>	Needle Geebung	V	V	The Needle Geebung occurs in dry sclerophyll forest, scrubby low-woodland and heath on low fertility soils. The Needle Geebung has been recorded only on the central coast and in the Blue Mountains, from Mt Tomah in the north to as far south as Hill Top where it is now believed to be extinct. Mainly in the Katoomba/ Wentworth Falls/ Springwood area.	Low	No suitable habitat within study area and not within known geographic distribution
Flora	<i>Pimelea spicata</i>	Spiked Rice-flower	E	E	Found on well-structured clay soils. It occurs commonly in Coast Banksia open woodland with a better developed shrub and grass understorey. Coastal headlands and hilltops are the favoured sites.	Low	Site is highly disturbed. Species not associated with PCTs within the site. PMST; Species or species habitat known to occur within area.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Flora	<i>Prostanthera densa</i>	Villous Mintbush	V	V	Prostanthera densa generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea.	Negligible	No suitable areas of sandstone or dry sclerophyll woodland within study area
Flora	<i>Pterostylis pulchella</i>	Pretty Greenhood	V	V	The Waterfall Greenhood is found on cliff faces close to waterfalls and creek banks and mossy rocks alongside running water. The Waterfall Greenhood is found only at Fitzroy Falls, Belmore Falls, upper Bundanoon Creek (Mervla) and Minnamurra Falls.	Negligible	No suitable habitat within study area and not within known geographic distribution
Flora	<i>Pultenaea aristata</i>	Prickly Bush-pea	V	V	The species occurs in either dry sclerophyll woodland or wet heath on sandstone. Prickly Bush-pea is restricted to the Woronora Plateau, a small area between Helensburgh, south of Sydney, and Mt Kiera above Wollongong.	Negligible	No suitable areas of sandstone or dry sclerophyll woodland within study area
Flora	<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of R. rubescens typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Negligible	Unsuitable habitat for the species to occur. Species not recorded during surveys. Soils unsuitable in addition to the vegetation within the site. Species associated with PCT 1300. PMST; Species or species habitat likely to occur within area.
Flora	<i>Solanum celatum</i>	-	E	-	Grows in rainforest clearings, or in wet sclerophyll forests. Restricted to an area from Wollongong to just south of Nowra, and west to Bungonia. Majority of records are prior to 1960 and the majority of populations are likely to have been lost to clearing.	Negligible	Not recorded during field surveys. Habitat unsuitable. Species associated with PCT 1300
Flora	<i>Zieria granulata</i>	Illawarra Zieria	E	E	The typical habitat is dry ridge tops and rocky outcrops on shallow volcanic soils, usually on Bumbo Latite. Less frequently found on the moist slopes of the Illawarra escarpment and in low-lying areas on Quaternary sediments. Associated vegetation includes Bracelet Honey-myrtle Melaleuca armillaris scrub, Forest Red Gum Eucalyptus tereticornis woodland and rainforest margins, although the species has been recorded from a number of other vegetation types. Most vegetation types are also listed as Endangered Ecological Communities. Restricted to the Illawarra region where it is recorded from a number of sites. The species primarily occupies the coastal lowlands between Oak Flats and Toolijooa, in the local government areas of Shellharbour and Kiama. This is a range of approximately 22 kilometres.	Low	Species not recorded during surveys. Habitat degraded. Species associated with PCT 1300. PMST; Species or species habitat likely to occur within area.
Frog	<i>Heleioporus australiacus</i>	Giant Burrowing Frog	V	V	The Giant Burrowing Frog is found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. They spend more than 95% of their time in non-breeding habitat in areas up to 300 m from breeding sites. Whilst in non-breeding habitat, the Giant Burrowing Frog burrows below the soil surface or in the leaf litter.	Low	Species mostly found in heath or woodland with deep leaf litter. PMST; Species or species habitat may occur within area. Species not known from locality.
Frog	<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. It has also been found to inhabit many disturbed sites, including abandoned mines and quarries.	Low	Species has the potential to occur in the dam and drainage line within the site. PMST; Species or species habitat known to occur within area.
Frog	<i>Litoria littlejohni</i>	Littlejohn's Tree Frog, Heath Frog	V	V	This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heath based forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground. Littlejohn's Tree Frog has a distribution that includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria.	Low	Study area lacks upper reaches of streams or swamps. The study area also lacks deep leaf litter.
Frog	<i>Litoria watsoni</i>	Watson's Tree Frog	-	E	Watson's Tree Frog is a forest-dependent species, recorded from wet and dry forest, woodland, bushland, and heathland at low to high elevations. Watson's Tree Frog prefers moister areas, with most records from wet forest, followed by damp forest, and warm temperate rainforest. Watson's Tree Frog is distributed from the Budderoo National Park (NP) in south-eastern New South Wales (NSW) to the eastern side of the Snowy River NP in the East Gippsland region of Victoria.	Low	Study area forest vegetation and other suitable habitat.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Frog	<i>Mixophyes balbus</i>	Stuttering Frog	E	V	The Stuttering Frog is restricted to the eastern slopes of the Great Divide, from the Cann River catchment in far East Gippsland, Victoria, to tributaries of the Timbarra River near Drake, New South Wales. They are found in association with permanent streams through temperate and sub-tropical rainforest and wet sclerophyll forest, rarely in dry open tableland rinarian vegetation.	Low	No records of this species within the locality. PMST; Species or species habitat may occur within area.
Frog	<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E	Giant Barred Frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation. Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they provide for shelter and foraging, as well as open perching sites on the forest floor. However, Giant Barred Frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams. The Giant Barred Frog is distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Declines appear to have occurred at the margins of the species' range, with no recent records south of the Hawkesbury River and disappearances from a number of streams in QLD. Northern NSW, particularly the	Negligible	Site lacks deep leaf litter used by this species. No records of this species within the locality.
Mammal	<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	Feeds largely on nectar and pollen collected from banksias, eucalypts and bottlebrushes; an important pollinator of heathland plants such as banksias; soft fruits are eaten when flowers are unavailable. Also feeds on insects throughout the year; this feed source may be more important in habitats where flowers are less abundant such as wet forests. Shelters in tree hollows, rotten stumps, holes in the ground, abandoned bird-nests, Ringtail Possum dreys or thickets of vegetation, (e.g. grass-tree skirts); nest-building appears to be restricted to breeding females; tree hollows are favoured but spherical nests have been found under the bark of eucalypts and in shredded bark in tree forks. The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	Negligible	No records of this species within the locality. Habitat within the site is degraded.
Mammal	<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	In NSW this species has been recorded from a large range of vegetation types including: dry and wet sclerophyll forest; Cyprus Pine (<i>Callitris glauca</i>) dominated forest; tall open eucalypt forest with a rainforest sub-canopy; sub-alpine woodland; and sandstone outcrop country. The species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors which are used for foraging. Roosting has also been observed in disused mine shafts, caves, overhangs and disused Fairy Martin (<i>Hirundo ariel</i>) nests, also possibly roosts in the hollows of trees.	Low	Potential foraging habitat within the site and potential roosting habitat within buildings. No records of this species within the locality. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E	This species has been recorded from a wide range of habitats, including: coastal heathlands, open and closed eucalypt woodlands, wet sclerophyll and lowland forests (OEH 2018). Unlogged forest or forest that has been less disturbed by timber harvesting is preferable. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food, such as birds and small mammals, and large areas of relatively intact vegetation through which to forage. Home ranges are estimated to be 620–2,560 ha for males and 90–650 ha for females (DoFF 2018).	Low	Site lacks preferred habitat structure and foraging resources. Species may travel through the site on a very rare occasion while dispersing. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	-	Prefers moist habitats, with trees taller than 20 m. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings. Hunts beetles, moths, weevils and other flying insects above or just below the tree canopy. Hibernates in winter. Females are pregnant in late spring to early summer. The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.	Low	Species may forage aerially within the site. No roosting or breeding habitat present.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Mammal	<i>Isoodon obesulus obesulus</i>	Southern Brown Bandicoot	E	E	The Southern Brown Bandicoot has a patchy distribution. It is found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River, southern coastal Victoria and the Grampian Ranges, south-eastern South Australia, south-west Western Australia and the northern tip of Queensland. Southern Brown Bandicoots are largely crepuscular (active mainly after dusk and/or before dawn). They are generally only found in heath or open forest with a heathy understorey on sandy or friable soils. Males have a home range of approximately 5-20 hectares whilst females forage over smaller areas of about 2-3 hectares. Nest during the day in a shallow depression in the ground covered by leaf litter, grass or other plant material. Nests may be located under Grass trees <i>Xanthorrhoea</i> spp., blackberry bushes and other shrubs, or in rabbit burrows. The upper surface of the nest may be mixed with earth to waterproof the inside of the nest.	Negligible	There are no records of this species within the locality and the site does not contain suitable foraging or breeding habitat. PMST; Species or species habitat may occur within area.
Mammal	<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	-	Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous. The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW.	Low	Species may forage aerially within the site. No roosting or breeding habitat present.
Mammal	<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	The Little Bentwing Bat is distributed on the East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. It is generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	Low	Species may forage aerially within the site. No roosting or breeding habitat present.
Mammal	<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. This species hunts in forested areas, catching moths and other flying insects above the tree tops. Eastern Bentwing-bats occur along the east and north-west coasts of Australia.	Low	Species may forage aerially within the site. No roosting or breeding habitat present.
Mammal	<i>Myotis macropus</i>	Southern Myotis	V	-	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. They generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Southern Myotis forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Low	Species may forage aerially within the site. No roosting or breeding habitat present.
Mammal	<i>Petauroides volans</i>	Greater Glider	-	V	Largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. The greater glider favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species.	Negligible	Site lacks mature forest and hollows. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Petaurus australis australis</i>	Yellow-bellied Glider (south-eastern)	V	-	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	Negligible	Site lacks abundance of mature Eucalyptus species with hollows. No records from locality. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	In NSW the Brush-tailed Rock Wallaby occurs from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. This species occupies rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. The Brush-tailed Rock Wallaby browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	Negligible	Site lacks suitable rocky areas and escapements. No records of this species within the locality.

Class	Scientific name	Common name	BC Act status	EPBC Act status	Habitat and geographic distribution	Likelihood of occurrence	Justification
Mammal	<i>Phascolarctos cinereus</i>	Koala	V	E	The Koala inhabits eucalypt woodlands and forests and feeds on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species (OEH 2018). Large populations of koalas occur on the western slopes and plains, in particular the Pilliga region (Kavanagh and Barrott 2001) and in Gunnedah (Smith 1992) and Walgett LGAs (J. Callaghan, Australian Koala Foundation, pers. comm.). Primary feed trees within the Western Slopes and Plains Koala Management Area (KMA) are River Red Gum (<i>E. camalduensis</i>) and Coolabah (<i>E. coolabah</i>). These do not occur within the study area. White box (<i>E. albens</i>) which occurs within the woodland to the north and north-east of the existing DWD is listed as secondary feed tree within the Western Slopes and Plains KMA. No koalas, koala scratches or scats were detected within this area, despite targeted searches by DPM Envirosciences in 2015.	Low	One <i>Eucalyptus</i> species within the site. No records of the species from the locality. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Phoniscus papuensis</i>	Golden-tipped Bat	V	-	Found in rainforest and adjacent wet and dry sclerophyll forest up to 1000m. Also recorded in tall open forest, Casuarina-dominated riparian forest and coastal Melaleuca forests. Bats will fly up to two kilometres from roosts to forage in rainforest and sclerophyll forest on mid and upper-slopes. Roost mainly in rainforest gullies on small first- and second-order streams in usually abandoned hanging Yellow-throated Scrubwren and Brown Gerygone nests modified with an access hole on the underside. Bats may also roost under thick moss on tree trunks, in tree hollows, dense foliage and epiphytes. The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. It also occurs	Low	Species not known from locality. No records of this species within the locality.
Mammal	<i>Potorous tridactylus trisulcatus</i>	Long-nosed Potoroo	V	V	The long-nosed potoroo is found on the south-eastern coast of Australia, from Queensland to eastern Victoria and Tasmania, including some of the Bass Strait islands. There are geographically isolated populations in western Victoria. In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Inhabits coastal heaths and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an essential part of habitat, and may consist of grass-trees, sedges, ferns or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature. Mainly nocturnal, hiding by day in dense vegetation - however, during the winter months animals may forage during daylight hours. Individuals are mainly solitary, non-territorial and have home range sizes ranging between 2-5 ha.	Negligible	There are no records of this species within the locality and the site does not contain suitable foraging or breeding habitat. PMST; Species or species habitat may occur within area.
Mammal	<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	Found from coastal areas and up to 100 km inland on sandstone country. Known to inhabit a range of habitats including open heathland, open woodland with a heathland understorey and vegetated sand dunes. Soil type may be an important indicator of suitability of habitat with deeper top soils and softer substrates being preferred for digging burrows. Other factors such as slope, geology and the amount of sun received in an area may also influence site selection.	Negligible	There are no records of this species within the locality and the site does not contain suitable foraging or breeding habitat. PMST; Species or species habitat likely to occur within area.
Mammal	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Grey-headed Flying foxes occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. 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.	Low	Species may forage within the site on rare occasion. Would likely fly over the site. PMST; Species or species habitat known to occur within area.
Mammal	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	-	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows.	Low	Species may forage aerially within the site. No roosting or breeding habitat present. One record of this species within the locality.
Mammal	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. This species utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Low	Species may forage aerially within the site. No roosting or breeding habitat present. Two records of this species within the locality.
Plant	<i>Caladenia tessellata</i>	Thick-lipped Spider-orchid	E	V	Thick-lipped Spider Orchid is generally found in grassy sclerophyll woodland on clay loam or sandy soils, though the population near Braidwood is in low woodland with stony soil. The single leaf regrows each year. Flowers appear between September and November (but apparently generally late September or early October in extant southern populations).	Low	Species not known from locality. Site highly disturbed. PMST; Species or species habitat likely to occur within area.

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Plant	<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	The larger populations of these species typically occur in woodland dominated by Scribbly Gum (<i>Eucalyptus sclerophylla</i>), Silvertop Ash (<i>E. sieberi</i>), Red Bloodwood (<i>Corymbia gummifera</i>) and Black Sheoak (<i>Allocasuarina littoralis</i>); appears to prefer open areas in the understorey of this community and is often found in association with the Large Tongue Orchid (<i>C. subulata</i>) and the Tartan Tongue Orchid (<i>C. erecta</i>). Little is known about the ecology of the species; being leafless it is expected to have limited photosynthetic capability and probably depends upon a fungal associate to meet its nutritional requirements from either living or dead organic material. In addition to reproducing from seed, it is also capable of vegetative reproduction and thus forms colonies which can become more or less permanent at a site.	Low	Site highly disturbed and lacks suitable habitat. PMST; Species or species habitat likely to occur within area.
Plant	<i>Genoplesium baueri</i>	Yellow Gnat-orchid	E	E	Usually found growing in heathland to shrubby woodland on sands or sandy loams or open forest, shrubby forest and heathy forest on well-drained sandy and gravelly soils.	Low	Species not known from locality. Site highly disturbed. PMST; Species or species habitat likely to occur within area.
Plant	<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Not recorded within a 10km radius of the project. Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects. Flowering occurs over just 3-4 weeks in September and October. This species resprouts following fire.	Negligible	Conspicuous species not observed during field surveys. PMST; Species or species habitat may occur within area.
Plant	<i>Persicaria elatior</i>	Knotweed	V	V	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland. This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Negligible	Species not recorded during field surveys. No known records from locality. PMST; Species or species habitat likely to occur within area.
Plant	<i>Persoonia hirsuta</i>	Hairy Geebung	E	E	<i>Persoonia hirsuta</i> has a scattered distribution around Sydney. The species is distributed from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west. <i>Persoonia hirsuta</i> has a large area of occurrence, but occurs in small populations, increasing the species' fragmentation in the landscape. The Hairy Geebung is found in sandy soils in dry sclerophyll open forest, woodland and heath on sandstone. It is usually present as isolated individuals or very small populations. It is probably killed by fire (as other <i>Persoonia</i> species are) but will regenerate from seed.	Negligible	Species not recorded during field surveys. No known records from locality. PMST; Species or species habitat likely to occur within area.
Plant	<i>Pomaderris brunnea</i>	Brown Pomaderris	E	V	Brown Pomaderris grows in moist woodland or forest on clay and alluvial soils of flood plains and creek lines. Brown Pomaderris is found in a very limited area around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands and in far eastern Gippsland in Victoria.	Negligible	Species not recorded during field surveys. No known records from locality. PMST; Species or species habitat likely to occur within area.
Plant	<i>Prasophyllum affine</i>	Jervis Bay Leek Orchid	E	E	Jervis Bay Leek Orchid is currently known from three areas south-east of Nowra on South Coast. These are Kinghorne Point, Wowly Gully near the town of Callala Bay, and near the township of Vincentia. Grows on poorly drained grey clay soils that support low heathland and sedgeland communities. The underground dormant tubers commence shooting in mid winter and leaves are known to have emerged above ground by June.	Negligible	Suitable soils for the species do not occur within the site. PMST; Species or species habitat likely to occur within area.
Plant	<i>Pterostylis gibbosa</i>	Illawarra Greenhood	E	E	All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage. In the Hunter region, the species grows in open woodland dominated by Narrow-leaved Ironbark <i>E. crebra</i> , Forest Red Gum and Black Cypress Pine <i>Callitris endlicheri</i> . The Illawarra Greenhood is a deciduous orchid that is only visible above the ground between late summer and spring, and only when soil moisture levels can sustain its growth. The leaf rosette grows from an underground tuber in late summer, followed by the flower stem in winter. After a spring flowering, the plant begins to die back and seed capsules form (if pollination has taken place). As with many other greenhoods, male fungus gnats are believed to be the pollinator. The Illawarra Greenhood can survive occasional burning and grazing because of its capacity to reshoot from an underground tuber.	Low	Habitat within the site is highly disturbed. No records from the locality. Species not associated with PCTs on site. PMST; Species or species habitat likely to occur within area.
Plant	<i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E	Occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	Low	Site is highly disturbed. Despite unknown vegetation associations, the site does not occur near a known population. PMST; Species or species habitat may occur within area.

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Plant	<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Negligible	Unsuitable habitat for the species to occur. Not associated with PCTs on site. Not recorded during surveys PMST; Species or species habitat may occur within area.
Plant	<i>Senna acclinis</i>	Rainforest Cassia	E	-	Grows on the margins of subtropical, littoral and dry rainforests. Often found as a gap phase shrub. Occurs in coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland.	Negligible	Species not recorded during surveys. No records of this species within the locality. Species associated with PCT 1300.
Plant	<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E	V	On the central coast, the Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Negligible	Species not recorded during field surveys. No known records from locality. PMST; Species or species habitat likely to occur within area.
Plant	<i>Thesium australe</i>	Austral Toadflax	V	V	Occurs on the coast, tablelands and western slopes in shrubland, grassland or woodland, often on damp sites.	Low	Habitat within the site is highly disturbed. No records from the locality. Species not associated with PCTs on site. PMST; Species or species habitat likely to occur within area.
Plants	<i>Acacia bynoeana</i>	Bynoe's Wattle	E	V	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	Negligible	Habitat within the site is highly disturbed. No records from the locality. Species not associated with PCTs on site. PMST; Species or species habitat likely to occur within area.
Reptile	<i>Hoplocephalus bungaroides</i>	Broad-headed Snake	E	V	Often found in rocky outcrops and adjacent sclerophyll forest and woodland, the most suitable sites occur in sandstone ridgetops. Recorded sightings in forests growing on shale or conglomerate slopes and bluffs with canopy species include Corymbia eximia, C. gummifera, Eucalyptus sieberi, E. punctata and E. piperita. Adult snakes show a seasonal, temperature induced, shift in habitat use. Adults use rocks and crevices as shelter sites in rocky outcrops in autumn, winter and early spring. During late spring and summer, adults move up into adjacent woodlands. Juvenile snakes remain in rocky habitat year round. The majority of occupied retreat sites occur on exposed cliff edges. In woodland, snakes shelter in hollows in a variety of tree species including Red Bloodwood (Eucalyptus gummifera), Grey Gum (E. punctata), Sydney Peppermint (E. piperita) and Blue Leaf Stringybark (E. agglomerata). Snakes show preferences for large trees, trees with multiple hollows, and dead trees. Most snakes use hollow branches rather than hollow stems. Individual snakes use between one and nine trees. Snakes spend long periods of inactivity in a single hollow, up to 48 days.	Negligible	No records of this species within the locality. Site lacks suitable habitat such as woody debris and tree hollows. PMST; Species or species habitat may occur within area.
	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland. Feeds on arthropods gleaned from crevices in rough or decortivating bark, dead branches, standing dead trees and small branches and twigs in the tree canopy. Builds a cup-shaped nest of plant fibres and cobwebs in an upright tree fork high in the living tree canopy, and often re-uses the same fork or tree in successive years. The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades.	Low	This species forages in the canopy of trees in woodlands. The vegetation within the site is not suitable foraging or breeding habitat for this species. No records of this species within the locality. Species associated with PCT 1300.

Appendix D

BC Act test of significance – Swamp Sclerophyll Forest

D.1 Swamp Sclerophyll Forest endangered ecological community

The endangered ecological community (EEC) listed under the BC Act, Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions is patchily distributed along the entire east coast of NSW including the Shellharbour area.

This community has an open to dense tree layer of eucalypts and paperbarks, although some remnants now only have scattered trees as a result of partial clearing. The trees may exceed 25 m in height but can be considerably shorter in regrowth stands or under conditions of lower site quality where the tree stratum is low and dense. For example, stands dominated by *Melaleuca ericifolia* typically do not exceed 8 m in height. The most widespread and abundant dominant trees include Swamp Mahogany (*Eucalyptus robusta*), Broad-leaved Paperbark (*Melaleuca quinquenervia*) and, south from Sydney Bangalay (*Eucalyptus botryoides*) and Woollybutt (*Eucalyptus longifolia*).

This EEC is associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains. It Generally occurs below 20 m (though sometimes up to 50 m) elevation.

D.1.1 Section 7.3 test of significance

Table D.1 Test of significance –Swamp Sclerophyll Forest (endangered)

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
Not applicable
(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
The proposed activity will impact on less than 0.01 ha of Swamp Sclerophyll Forest, as represented by PCT 4021. Approximately 800-1400 km ² of Swamp Sclerophyll Forest EEC is estimated to occur within NSW, with around 1000 ha predicted to occur in the Sydney – South Coast region (DPE 2011). The proposed activity is therefore likely to reduce the extent of the EEC by less than 0.001%. Considering the above, the proposed activity is unlikely to reduce the extent of the EEC to the degree that its local occurrence is likely to be placed at risk of extinction.
(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction
The proposed activity will modify less than 0.01 ha of Swamp Sclerophyll Forest. This area of EEC is located in an urban setting adjacent to a footpath in a highly disturbed area and is already modified. The trenching is unlikely to further modify the composition of the EEC such that its local occurrence would be placed at risk of extinction.
(c) in relation to the habitat of a threatened species or ecological community:
(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or action, and
The proposed activity will impact less than 0.01 ha of Swamp Sclerophyll Forest EEC within the site.
(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or action, and
The Swamp Sclerophyll Forest EEC within the site occurs adjacent to a footpath in a highly disturbed area, which already fragments the community. The proposed activity will directly impact a small area (1.2 m wide, 35 m in length) area of Swamp Sclerophyll Forest. The loss of up to 0.01 ha will cause a negligible increase on the fragmentation and isolation of the locally available habitat.

Table D.1 Test of significance –Swamp Sclerophyll Forest (endangered)

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

The habitat within the site is considered sub-optimal habitat for the ecological community due to its occurrence adjacent to a footpath in a highly disturbed area. This allows for weed encroachment to occur into the community. Weeds were observed within the Swamp Sclerophyll Forest EEC. Due to its location, and the nature of the proposed activity, the ecological community is unlikely to be fragmented.

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

The proposed activity is not located within or adjacent to any declared areas of outstanding biodiversity value.

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

The proposed activity will result in clearing of native vegetation, which is considered to be a key threatening process under the BC Act. However, this vegetation is not considered important habitat for the community given its location adjacent to a footpath in a highly disturbed area and the remaining local habitat outside the proposed activity.

The proposed activity may contribute to the 'invasion of native plant communities by exotic perennial grasses' threatening process, by clearing vegetation on the site and thereby allowing other species a chance to establish themselves. This threat will be managed by weed hygiene mitigation measures (Section 5.1).

Conclusion

The proposed activity is unlikely to result in a significant impact to Swamp Sclerophyll Forest EEC due to:

- Less than 0.01 ha of the EEC occurring within the site, which equates to less than 0.01% within the locality;
- the proposed activity is unlikely to substantially and adversely modify the composition of the EEC such that its local occurrence is likely to be placed at risk of extinction;
- the proposed activity is unlikely to further exacerbate fragmentation to the EEC;
- the proposed activity is not located within or adjacent to any declared areas of outstanding biodiversity value; and
- key threatening processes are likely to be minor (clearing of vegetation) and will be mitigated to reduce impact where possible.

Appendix E

EPBC Act test of significance – Coastal Swamp
Sclerophyll Forest

E.1 Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland

Table E.1 Significant impact assessment – Coastal Swamp Sclerophyll Forest (endangered)

Criteria	Discussion
Reduce the extent of an ecological community	The proposed activity would reduce the extent of the ecological community by less than 0.01 ha. Approximately 800-1400 km ² of Swamp Sclerophyll Forest EEC is estimated to occur within NSW, with around 1000 ha predicted to occur in the Sydney – South Coast region (DPE 2011). The proposed activity is therefore likely to reduce the extent of the EEC by less than 0.001%.
Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	The proposed activity involves the installation of an underground high voltage (HV) feeder line. The majority of the route is adjacent to roadways in cleared areas. There is a small amount of Coastal Swamp Sclerophyll Forest (less than 0.01 ha) that may be directly impacted by the proposed activity. The nature of the works is unlikely to further exacerbate the fragmentation of the TEC.
Adversely affect habitat critical to the survival of an ecological community	<p>The approved conservation advice for the TEC (DAWE 2021) describes habitat critical to the survival of the species as <i>‘those where the hydrological regime remains reasonably intact such that the vegetative diagnostic features are maintained... those parts of the ecological community... with more intact hydrology, other ecological function, and other critical habitat features, as demonstrated by the largest, most connected and/or most intact native vegetation and species diversity of the ecological community’</i>. This includes those patches which are considered to be Category A, B1, B2 and C1 as a condition class (DAWE 2021).</p> <p>As the TEC within the subject land is likely to meet the condition class C2, the TEC within the subject site is not considered to contain habitat critical to the survival of an ecological community.</p> <p>This habitat is located adjacent to a footpath in a highly disturbed area and is therefore affected by edge effects such as weed encroachment. The proposed activity will adversely affect less than 0.01 ha of the TEC, which is less than 0.01% of the TEC within the locality.</p>
Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community’s survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	<p>The groundwater table within the study area is high, which characteristically is associated with the TEC, due to the nature of the vegetation and its natural location within the landscape. The proposed activity does not include direct alteration of drainage patterns or structures that would affect ground water levels.</p> <p>The proposed activity is not likely to influence additional abiotic factors such as nutrients or soil.</p>
Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The habitat within the subject site is considered sub-optimal habitat for the ecological community due to its occurrence on adjacent to a footpath in a highly disturbed area. This allows for weed encroachment to occur into the community. Weeds were observed within the Coastal Swamp Sclerophyll Forest EEC. Due to its occurrence on adjacent to a footpath in a highly disturbed area, and the nature of the proposed activity, the proposed activity is unlikely to cause a substantial change in the species composition of the occurrence of the TEC.

Table E.1 Significant impact assessment – Coastal Swamp Sclerophyll Forest (endangered)

Criteria	Discussion
<p>Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:</p> <p>— assisting invasive species, that are harmful to the listed ecological community, to become established; or</p> <p>— causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community</p>	<p>Invasive weeds were observed within the study area and are an existing threat to the quality or integrity of the TEC. Weed management and hygiene protocols will be in place to limit the potential spread of these species during the proposed works. These mitigation measures will also ensure that no new or existing weed species will be introduced to the area by plant or machinery.</p> <p>Mitigation measures will also reduce the potential for chemicals and pollutants to impact the TEC, these include:</p> <ul style="list-style-type: none"> • Fuel cans will be banded. • Chemicals will be restricted to staging areas and managed in accordance with Safe Work Australia guidelines (eg employ use of barriers, inspecting tanks and containers, etc). • Appropriate spill containment materials (or spill kits) will be used to clean-up spills if they occur.
<p>Interfere with the recovery of an ecological community</p>	<p>No recovery plan is available for this TEC.</p> <p>Recovery actions identified in the conservation advice reports identifies a number of threats to the TEC including:</p> <ul style="list-style-type: none"> • changed hydrological regimes; • native vegetation clearing; • fragmentation of remnants and habitats; • invasive fauna; • disturbance from urbanisation and recreational activity; • weeds, diseases and pathogens; • grazing pressures; and • altered fire regimes. <p>As discussed above, the proposed activity is unlikely to fragment the TEC or change hydrological regimes it depends upon. Weed invasion is a threat, in addition to infection of plants by <i>Phytophthora cinnamomi</i> (a key threatening process under the EPBC Act); and the introduction and establishment of exotic rust fungi of the order Pucciniales which is pathogenic on plants of the family Myrtaceae. With the proposed mitigation measures in place (eg weed management and hygiene protocols), the proposed activity is not likely to interfere with recovery. The proposed activity will reduce the extent of the TEC by less than 0.01 ha, which is less than 0.01% of the TEC within the locality.</p>
<p>Conclusion</p>	<p>The proposed activity is unlikely to result in a significant impact to Coastal Swamp Sclerophyll Forest EEC due to:</p> <ul style="list-style-type: none"> • less than 0.01 ha of the EEC occurring within the subject site, which equates to less than 0.01% within the locality; • the nature of the works is unlikely to further exacerbate the fragmentation of the TEC; • the proposed activity is unlikely to modify or destroy abiotic factors necessary for an ecological community's survival; and • the proposed activity is unlikely to cause a substantial change in the species composition of the occurrence of the TEC.

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