

Port of Newcastle

Clean Energy Precinct Concept Plan

Preliminary Biodiversity Assessment

April 2023



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Clean Energy Precinct Concept Plan Preliminary Biodiversity Assessment

Port of Newcastle

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We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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1 Introduction

1.1 Background

Port of Newcastle (PON) propose to construct and operate the new Clean Energy Precinct (the project), a facility for clean energy production in Newcastle, New South Wales (NSW) (refer Figure 1.1 for the regional context of the project). Fully constructed, the project would facilitate clean energy production, storage, transmission, domestic distribution and international export using common user shared infrastructure. The first stages of the project would include the establishment of lead-in infrastructure (including utilities and electrical transmission) to enable the production, storage, distribution and export of clean energy types in future development stages (for example green hydrogen and green ammonia) as well as other potential future energy developments.

The proponent is seeking approval for the project under Part 4, Division 4.4 (Concept development application) and Division 4.7 (State Significant Development (SSD)) of the *Environmental Planning and Assessment Act 1979* (EP&A Act). The project would be staged with the Concept Plan and Stage 1 (lead-in infrastructure, buildings and storage) as the subject of the SSD application.

The national electricity market (NEM) is transitioning towards renewable energy production, as evidenced by the proposed Hunter-Central Coast Renewable Energy Zone (REZ) been identified as one of NSW's priority energy zones, the project would enable production, storage and transmission of clean energy at the precinct. This would assist the NSW and Commonwealth achieve their zero emission targets.

1.2 Purpose of the report

The purpose of this report is to present preliminary biodiversity findings within the project study area based on desktop research to inform the Scoping Report, and initial communications with determining authorities.

This report identifies potential data gaps and seasonal survey requirements that pose potential issues that would likely need to be addressed as part of a Biodiversity Development Assessment Report (BDAR), that would be prepared in accordance with the Biodiversity Assessment Method 2020 (BAM). It is likely that a BDAR would need to be prepared to support an Environmental Impact Statement (EIS) for the project in accordance with the *Biodiversity Conservation Act 2016* (BC Act).

This report also considers 'Matters of National Environmental Significance' (MNES) under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The overall purpose of this report is to:

- identify and describe the significance of biodiversity within the study area, including potential threatened species, populations and ecological communities or their habitats
 - prepare a list of threatened species, populations and ecological communities likely to occur in the study area
 - provide maps of Plant Community Types and other areas of high biodiversity value
 - provide recommendations on:
 - areas of high biodiversity value that should be considered for retention
 - future survey and reporting requirements.
-

1.3 Project study area

The Project study area is located on Kooragang Island within lands currently managed by the Hunter and Central Coast Development Corporation (HCCDC) (Figure 1.1) and are due to be handed back to PON management mid-2023. The site occurs within the boundaries of the Kooragang rail spur line, from where it crosses the South Arm of the Hunter River, extending east beyond the Tourle Street bridge, to the western boundary of the Coal Loaders operated by Port Waratah Coal Services (PWCS) and Newcastle Coal Infrastructure Group (NCIG).

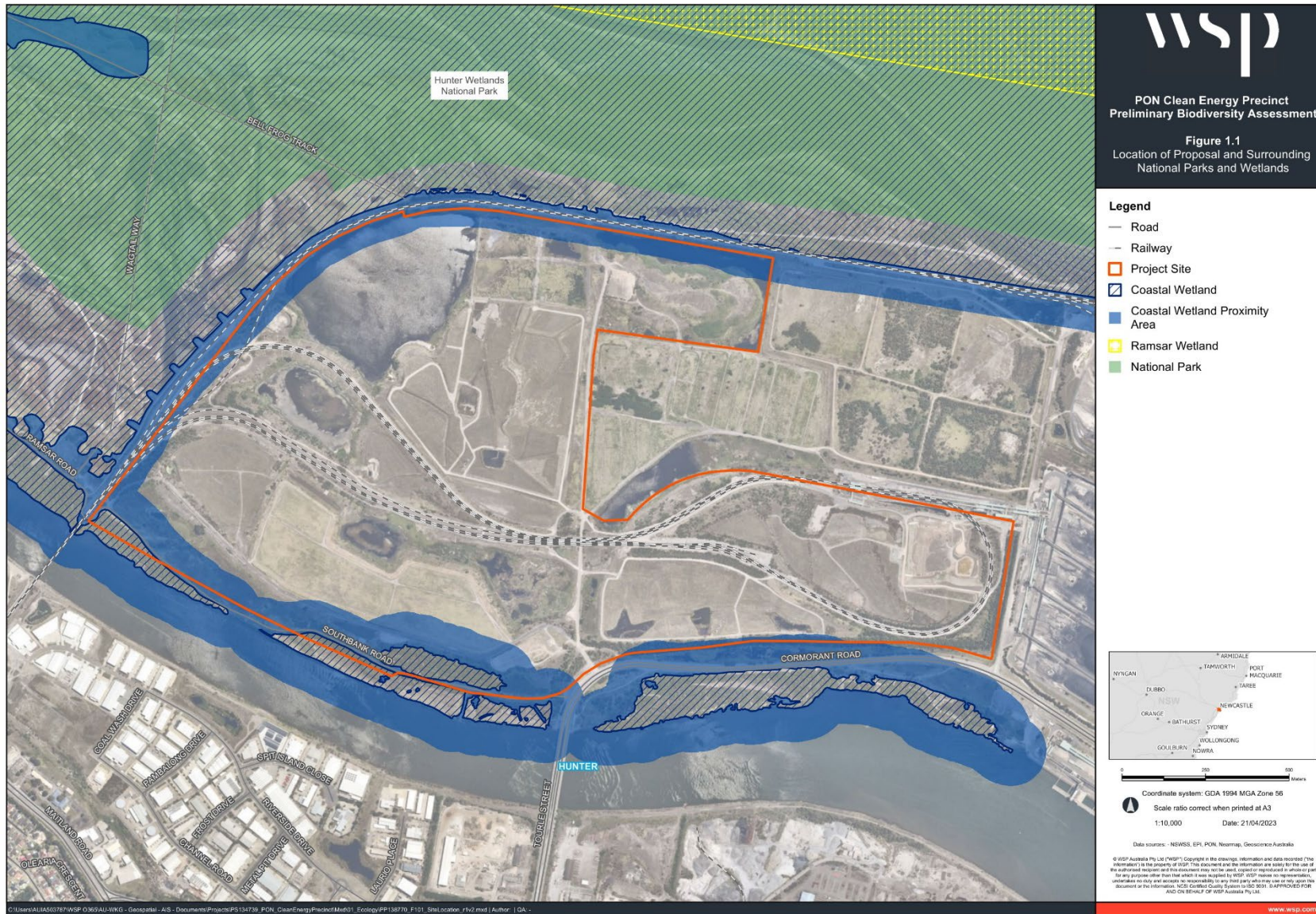


Figure 1.1 Location of the Proposal and surrounding National Parks and wetlands

2 Methods

2.1 Database and literature review

Relevant and available background information gathered through information searches were reviewed by WSP regarding the presence of vegetation communities and flora and fauna. Relevant databases were searched for records of threatened species within a 10 km radius of the project site. The desktop review included the following sources:

- existing vegetation maps of the local area including the State Vegetation Type Map (SVTM)
- Biodiversity Values Map and Threshold Tool
- Biodiversity Assessment Method (BAM) Calculator
- Commonwealth Protected Matters Search Tool (PMST)
- BioNet Atlas of NSW Wildlife
- Federal Bureau of Meteorology's Atlas of Groundwater Dependent Ecosystems (GDE)
- Department of Climate Change, Energy, the Environment and Water's Directory of Important Wetlands
- areas of outstanding biodiversity value and critical habitat
- Department of Planning's Coastal wetlands spatial data
- Department of Primary Industries database for threatened aquatic species, populations and ecological communities
- NSW Flora Online (PlantNET)
- information from local council and Local Land Services including Local Environment Plan (LEP) and Development Control Plan (DCP) controls
- existing ecology reports (e.g. Duplication of Tourle Street Bridge and Cormorant Road Biodiversity Impact Assessment)
- topographic maps and aerial photographs (current and historic).

3 Existing environment

An overview of the existing environment has been prepared based on a combination of broad scale State vegetation mapping, threatened species database searches and literature review.

3.1 Native vegetation and threatened ecological communities

3.1.1 *Native vegetation*

The project study area has been identified to contain Saline Wetlands vegetation formations from the Saltmarsh and Mangrove Swamps vegetation classes.

3.1.1.1 Plant community types

Based on broad scale state vegetation mapping (SVTM) two PCTs are likely to occur within the project study area:

- PCT 4097: Samphire Saltbush
- PCT 4091: Grey Mangrove – River Mangrove Forest.

The distribution of PCTs and mapped in the SVTM is illustrated in Figure 3.1.

However, it should be noted that this mapping is only high level at a state-wide scale. The actual presence of native PCT's is likely to be more extensive, based on aerial photo features.

3.1.1.2 Threatened ecological communities – BC Act

The desktop assessment identified that the Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC listed under the BC Act is likely to be present in the study area. This TEC corresponds directly to PCT 4097: Samphire Saltbush. The extent of PCT 4097: Samphire Saltbush and therefore the extent of Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC is illustrated in Figure 3.1, although as mentioned previously the occurrence may be more extensive than this. Other TEC's may also be present though this is subject to future field validation.

3.2 Habitat suitability for threatened species – BC Act

3.2.1 Identification of threatened species for assessment

In the BAM, threatened species are assessed as either ecosystem credit species, species credit species or a combination of the two (referred to as ‘dual credit species’). The BAM defines these threatened species categories as follows:

- **Ecosystem credit species** (predicted): are those threatened species where the likelihood of occurrence and/or elements of its habitat can be confidently predicted by vegetation surrogates and landscape features.
- **Species credit species** (candidate): are those threatened species that cannot be reliably predicted by habitat surrogates.
- **Dual credit species** are those threatened species where part of the habitat is assessed as an ecosystem credit (e.g. foraging habitat) and part as a species credit (e.g. breeding habitat). In this report, dual credit species would be included in both ecosystem and species credit assessment.

3.2.1.1 Ecosystem credit species

The results of likelihood of occurrence assessments identified 27 threatened ecosystem credit fauna species (including those that occur as dual credit species) that have a moderate or higher likelihood of occurrence within the study area (see Appendix A for further detail). A summary of ecosystem fauna species likely to occur within the project study area is provided in Table 3.1.

A map of threatened fauna species records from BioNet is illustrated in Figure 3.2.

Table 3.1 List of BAM-C and BioNet Atlas generated ecosystem credit species with a moderate or higher likelihood of occurrence

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII	Likelihood of occurrence
Birds					
<i>Anseranas semipalmata</i>	Magpie Goose	V	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris canutus</i>	Red Knot	–	E	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE; M	Yes	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris tenuirostris</i>	Great Knot	V	CE, M	Yes	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius leschenaultii</i>	Greater Sand-plover	V	V, M	No	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Charadrius mongolus</i>	Lesser Sand-plover	V	E, M	No	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL	Likelihood of occurrence
<i>Circus assimilis</i>	Spotted Harrier	V	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Epthianura albifrons</i>	White-fronted Chat	V	–	No	High – records for this species in the study area, may breed when habitat conditions are favourable.
<i>Falco subniger</i>	Black Falcon	V	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	–	No	High – records for this species in the study area, and it may occur within the home range of local individuals.
<i>Hieraaetus morphnoides</i>	Little Eagle	V	–	No	High – records for this species in the study area, and it may occur within the home range of local individuals.
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	M	No	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Limosa lapponica baueri</i>	Bar-tailed Godwit (baueri)	–	V	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Oxyura australis</i>	Blue-billed Duck	V	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Pandion cristatus</i>	Eastern Osprey	V	M	No	High – records for this species in the study area, and it may occur within the home range of local individuals.
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	No	Moderate – not commonly encountered locally but there are occurrences on Ash Island and elsewhere on the Hunter River floodplain. Despite the lack of records in the study area, it contains suitable habitat, and the lack of records is likely a function of the bird's spasmodic use of regional habitats, its cryptic nature and a paucity of survey effort owing to the site's inaccessibility to the general birding community.
<i>Stictonetta naevosa</i>	Freckled Duck	V	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tyto longimembris</i>	Eastern Grass Owl	V	–	No	High – the study area contains suitable foraging habitat for this species, and records adjacent to the study area.
<i>Xenus cinereus</i>	Terek Sandpiper	V	M	No	Moderate – old records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII	Likelihood of occurrence
Mammals					
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	–	No	Moderate – the study area contains potential foraging habitat for this species, there are potential roosting habitats adjacent to the study area and a single record from within the study area.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	–	No	High – the study area contains suitable foraging habitat for this species, there are potential roosting habitats adjacent to the study area and records from within the study area.
<i>Miniopterus australis</i>	Little Bent-winged Bat	V	–	No	High – the study area contains suitable foraging habitat for this species, and there are records from within the study area. The study area is unlikely to provide roosting habitats for this species.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	–	No	High – the study area contains suitable foraging habitat for this species, and there are records from within the study area. The study area is unlikely to provide roosting habitats for this species.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail Bat	V	–	No	Moderate – a large bat using a range of habitat types and records throughout the area. Occasional foraging over the cannot be discounted, but there are no roosting habitats in the study area.
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	–	No	Moderate – There is no suitable roosting habitat for this species within the study area or adjacent lands, but it may intermittently forage over the study area.

(1) Listed under the *Biodiversity and Conservation Act 2016*: E = Endangered, V = Vulnerable

(2) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory

(3) SAII= Serious and Irreversible Impact

3.2.1.2 Species credit species

Candidate threatened flora species credit species generated from BAM-C and database searches

The results of likelihood of occurrence assessments identified that one threatened flora species has a moderate or higher likelihood of occurrence within the project study area (see Appendix A for further detail). This species is *Zannichellia palustris*. A summary of threatened flora species likely to occur within the project study area is provided in Table 3.2. The potential presence of *Zannichellia palustris* is of concern as this species has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

A map of threatened flora species records from BioNet is illustrated in Figure 3.3.

Table 3.2 Candidate threatened flora species with a moderate or higher likelihood of occurrence

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII ³	Likelihood of occurrence	Survey months
<i>Zannichellia palustris</i>	Zannichellia palustris	E	E	No	High – records for this species in the study area, surveyable when habitat conditions are favourable.	October, November, December, January

(1) Listed under the *Biodiversity and Conservation Act 2016*: E = Endangered, V = Vulnerable

(2) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered; v = Vulnerable

(3) SAII= Serious and Irreversible Impact

Candidate threatened fauna species credit species generated from BAM-C and database searches

The results of likelihood of occurrence assessments identified that 15 threatened fauna species credit species (including dual credit species) have a moderate or higher likelihood of occurrence within the project study area (see Appendix A for further detail). A summary of threatened fauna species likely to occur within the project study area is provided in Table 3.3. Of most concern is the Green and Golden Bell Frog which has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species. Potential habitat for Green and Golden Bell Frog is illustrated in Figure 3.4.

Table 3.3 Candidate threatened fauna species with a moderate or higher likelihood of occurrence

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII ³	Likelihood of occurrence	Survey months
Amphibians						
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	V	No	High – records for this species occur in the study area, the study area is part of key local habitat for this species.	November, December, January, February, March
Birds						
<i>Calidris canutus</i>	Red Knot	–	E	No	High – records for this species in the study area, may occur when habitat conditions are favourable.	None listed
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE; M	Yes	High – records for this species in the study area, may occur when habitat conditions are favourable.	None listed
<i>Calidris tenuirostris</i>	Great Knot	V	CE, M	Yes	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.	None listed
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V	V, M	No	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.	None listed
<i>Charadrius mongolus</i>	Lesser Sand Plover	V	E, M	No	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.	None listed

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII ³	Likelihood of occurrence	Survey months
<i>Haematopus longirostris</i>	Pied Oystercatcher	E1	–	No	High – records for this species in the study area, may occur when habitat conditions are favourable.	August, September, October, November, December, January
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	V	–	No	High – records for this species in the study area, and it may occur within the home range of local individuals.	July, August, September, October, November, December
<i>Hieraaetus morphnoides</i>	Little Eagle	V	–	No	High – records for this species in the study area, and it may occur within the home range of local individuals.	August, September, October
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	M	No	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.	None listed
<i>Limosa lapponica</i>	Bar-tailed Godwit	–	M	No	High – records for this species in the study area, may occur when habitat conditions are favourable.	None listed
<i>Limosa limosa</i>	Black-tailed Godwit	–	M	No	High – records for this species in the study area, may occur when habitat conditions are favourable.	None listed
<i>Pandion cristatus</i>	Eastern Osprey	V	M	No	High – records for this species in the study area, and it may occur within the home range of local individuals.	April, May, June, July, August, September, October, November
<i>Xenus cinereus</i>	Terek Sandpiper	V	M	No	Moderate – old records for this species in the study area, may occur when habitat conditions are favourable.	None listed
Mammals						
<i>Myotis macropus</i>	Southern Myotis	V	–	No	High – the study area contains suitable foraging habitat for this species, there are potential roosting habitats adjacent to the study area and records from within the study area.	October, November, December, January, February, March

(1) Listed under the *Biodiversity and Conservation Act 2016*: E = Endangered, V = Vulnerable

(2) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered; v = Vulnerable

(3) SAI= Serious and Irreversible Impact



Figure 3.3 Threatened flora species mapping



3.3 Matters of National Environmental Significance

3.3.1 Threatened ecological communities

Desktop assessment identified seven threatened ecological communities (TECs) listed under the EPBC Act with potential to occur within the project study area. The PMST search results are provided in Appendix B. Of these TECs, Subtropical and Temperate Coastal Saltmarsh (listed as a Vulnerable ecological community under the EPBC Act), is likely to be present in the study area.

This TEC is likely to correspond directly to PCT 4097: Samphire Saltbush. The extent of PCT 4097: Samphire Saltbush and therefore the extent of this EPBC Act listed TEC is illustrated in Figure 3.1. It should be noted that this mapping is only at a regional scale and is likely to change following field validation.

3.3.2 Threatened flora species

Database searches have identified 21 threatened flora species listed under the EPBC Act that are predicted or known to occur within the 10 km of the study area (see Appendix A). The PMST search results are provided in Appendix B. The results of likelihood of occurrence assessments identified that one threatened flora species has a moderate or higher likelihood of occurrence within the project study area (see Appendix A for further detail). This species is *Zannichellia palustris*. A summary of EPBC Act listed threatened flora species likely to occur within the project study area is provided in Table 3.4. The potential presence of *Zannichellia palustris* is of concern as this species has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

A map of threatened flora species records from BioNet is illustrated in Figure 3.3.

Table 3.4 Summary of EPBC listed threatened flora species with a moderate or higher likelihood of occurrence

Scientific name	Common name	EPBC Act ¹	Likelihood of occurrence
<i>Zannichellia palustris</i>	Zannichellia palustris	E	High – records for this species in the study area, surveyable when habitat conditions are favourable.

(1) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered.

3.3.3 Threatened fauna species

The PMST search identified 50 threatened fauna species, and two conservation dependent fauna species, listed under the EPBC Act, that are predicted or known to occur within 10 km of the project site (see Appendix A). The PMST search results are provided in Appendix B. The results of likelihood of occurrence assessments have identified 10 threatened fauna species to have a moderate or higher likelihood of occurrence within the study area. A summary of threatened fauna species likely to occur within the project study area is provided in Table 3.5.

Of most concern is the Green and Golden Bell Frog which has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species. Potential habitat for Green and Golden Bell Frog is illustrated in Figure 3.4.

A map of threatened fauna species records from BioNet is illustrated in Figure 3.2.

Table 3.5 Summary of EPBC listed threatened fauna species with a moderate or higher likelihood of occurrence

Scientific name	Common Name	EPBC Act ¹	Likelihood of occurrence
Amphibians			
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
Birds			
<i>Botaurus poiciloptilus</i>	Australasian Bittern	V	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
<i>Calidris canutus</i>	Red Knot	E	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris tenuirostris</i>	Great Knot	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius leschenaultii</i>	Greater Sand Plover	CE, M	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius mongolus</i>	Lesser Sand Plover	V, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit	E, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Numenius madagascariensis</i>	Eastern Curlew	V	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Rostratula australis</i>	Australian Painted Snipe	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.

(1) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: E = Endangered; V = Vulnerable, M = Migratory

3.3.4 Migratory species

The PMST search results identified 77 listed migratory species from the 10 km search area. These species are outlined in Appendix A. Habitats for 35 of these listed migratory species are likely to be present in the study area. A summary of migratory fauna species likely to occur within the project study area is provided in Table 3.6 with records on BioNet illustrated in Figure 3.2.

Table 3.6 Summary of EPBC listed migratory fauna species with a moderate or higher likelihood of occurrence

Scientific name	Common name	EPBC Act ¹	Likelihood of occurrence
<i>Actitis hypoleucos</i>	Common Sandpiper	M	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Arenaria interpres</i>	Ruddy Turnstone	M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris ferruginea</i>	Curlew Sandpiper	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris melanotos</i>	Pectoral Sandpiper	M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Calidris ruficollis</i>	Red-necked Stint	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris tenuirostris</i>	Great Knot	CE, M	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius bicinctus</i>	Double-banded Plover	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Charadrius mongolus</i>	Lesser Sand Plover	E, M	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Chlidonias leucopterus</i>	White-winged Black Tern	M	High – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Gallinago hardwickii</i>	Latham's Snipe	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Hydroprogne caspia</i>	Caspian Tern	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	M	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Limosa lapponica</i>	Bar-tailed Godwit	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit	V	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	EPBC Act ¹	Likelihood of occurrence
<i>Limosa limosa</i>	Black-tailed Godwit	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Litoria aurea</i>	Green and Golden Bell Frog	V	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
<i>Monarcha melanopsis</i>	Black-faced Monarch	M	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there is a record adjacent to the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.
<i>Motacilla flava</i>	Yellow Wagtail	M	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Numenius madagascariensis</i>	Eastern Curlew	CE; M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Numenius phaeopus</i>	Whimbrel	M	High – a record for this species in the study area, may occur when habitat conditions are favourable.
<i>Pandion cristatus</i>	Eastern Osprey	M	High – records for this species in the study area, and it may occur within the home range of local individuals.
<i>Philomachus pugnax</i>	Ruff	M	Moderate – not common locally but there is a record for this species in the study area, and it may intermittently occur when habitat conditions are favourable.
<i>Pluvialis fulva</i>	Pacific Golden Plover	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Pluvialis squatarola</i>	Grey Plover	M	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Rhipidura rufifrons</i>	Rufous Fantail	M	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there are records adjacent to the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.
<i>Symposiachrus trivirgatus</i>	Spectacled Monarch	M	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there is a record in the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.
<i>Thalasseus bergii</i>	Crested Tern	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa brevipes</i>	Grey-tailed Tattler	M	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa glareola</i>	Wood Sandpiper	M	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa incana</i>	Wandering Tattler	M	Moderate – few records for this species locally, but it is a cryptic species, there is habitat in the study area, and it may rarely occur when habitat conditions are favourable.

Scientific name	Common name	EPBC Act ¹	Likelihood of occurrence
<i>Tringa nebularia</i>	Common Greenshank	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa stagnatilis</i>	Marsh Sandpiper	M	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Xenus cinereus</i>	Terek Sandpiper	M	Moderate – old records for this species in the study area, may occur when habitat conditions are favourable.

(1) Listed under the *Environmental Protection and Biodiversity Conservation Act* 1999: E = Endangered; V = Vulnerable, M = Migratory

3.3.5 Listed marine species

The PMST returned 101 listed marine species from the 10 km search area. The study area is upstream from the marine environment and is connected to the Hunter River so impacts to listed marine species should be considered in future assessments.

3.3.6 Whales and other cetaceans

The PMST returned 12 whales and cetaceans from the 10 km search area. The study area is upstream from the marine environment and is connected to the Hunter River so impacts to whales and cetaceans should be considered in future assessments at a high level, although substantial impacts are unlikely.

3.3.7 Biologically important areas

Biologically important areas (BIA) of Regionally Significant Marine Species are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as breeding, foraging, resting or migration.

The PMST returned a list of seven biologically important areas within the 10 km search area. These include:

- *Ardenna grisea* (Sooty Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA.
- *Ardenna pacifica* (Wedge-tailed Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA.
- *Ardenna tenuirostris* (Short-tailed Shearwater) foraging behaviour likely to occur. Study area is upstream from the mapped BIA.
- *Tursiops aduncus* (Indo-Pacific/Spotted Bottlenose Dolphin) Breeding behaviour likely to occur. Study area is upstream from the mapped BIA.
- *Tursiops aduncus* (Indo-Pacific/Spotted Bottlenose Dolphin) foraging behaviour known to occur. Study area is within the mapped BIA.
- *Carcharias taurus* (Grey Nurse Shark) foraging behaviour known to occur. Study area is upstream from the mapped BIA.
- *Megaptera novaeangliae* (Humpback Whale) foraging behaviour known to occur. Study area is upstream from the mapped BIA.

The study area is upstream from the marine environment and is connected to the Hunter River so impacts to these BIA should be considered in future assessments.

3.3.8 Wetlands of national and international importance

3.3.8.1 Wetlands of International Importance (RAMSAR wetlands)

One RAMSAR wetlands or Wetlands of International Importance were identified by the PMST which is the Hunter Estuary Wetlands. The study area is in the buffer zone of this RAMSAR wetland.

3.3.8.2 Nationally important wetlands

Three Nationally Important Wetlands were identified by the PMST which include:

- Shortlands Wetland Centre. Study area is downstream from this wetland.
- Hexham Swamp. Study area is downstream from this wetland.
- Kooragang Nature Reserve. Study area contains mapped areas of this Nationally Important Wetland.

3.4 Protected marine vegetation

The Saline Wetlands PCT 4097: Samphire Saltbush and PCT 4091: Grey Mangrove – River Mangrove Forest are classified as marine vegetation.

Marine vegetation is protected under the *Fisheries Management Act 1994* (FM Act) (e.g. saltmarsh, seagrasses, and mangroves). Removal of marine vegetation, such as mangroves, requires a permit. To avoid acquiring permits, removal of marine vegetation is to be avoided in certain areas, such as mapped Coastal Wetlands (formerly SEPP14 Wetlands).

3.5 Key fish habitat

The study area contains mapped Key Fish Habitat along the Hunter River and associated wetlands (see Figure 3.5).

3.6 Coastal wetlands

State Environmental Planning Policy (Resilience and Hazards) 2021 provides an integrated policy for coastal assets. Under Chapter 2 of State Environmental Planning Policy (Resilience and Hazards) 2021, areas of ‘Coastal Wetlands’ and ‘Proximity Coastal Wetlands (100 m buffer)’ have been mapped across the state.

The study area contains areas of mapped ‘Coastal Wetland’ and ‘Coastal Wetland Proximity Area’ (see Figure 1.1).



Figure 3.5 Key Fish Habitat mapping

4 Biodiversity constraints

Biodiversity values identified as known, predicted or considered likely to occur within the study area have been assigned to a three-tier biodiversity constraint hierarchy. This biodiversity constraint hierarchy has been mapped in Figure 4.1.

This hierarchy has been developed to assist with addressing the principle of avoid and minimise as required under section 7 of the BAM. The biodiversity constraints ranking has been based on the following criteria:

Tier 1 high biodiversity constraint – Areas to avoid

Tier 1 biodiversity constraints are areas of very high environmental sensitivity. These areas should be avoided to display good stewardship of a sensitive area. Environmental approvals may be considered unlikely, unachievable, or would add complexity and delay to approvals. Tier 1 constraints are:

- Mapped Coastal Wetlands
- Mapped Nationally Important Wetland Kooragang Nature Reserve
- Key Fish Habitat
- Protected Marine vegetation including Saltmarsh and Mangroves
- Habitat for the BC Act and EPBC Act listed Green and Golden Bell Frog.

The Tier 1 high biodiversity constraint areas should be identified for retention and the various components of the proposal designed around these features.

Tier 2 moderate biodiversity constraint – Areas where impacts should be minimised

Tier 2 biodiversity constraints are areas of moderate environmental sensitivity. Impact to these areas should be minimised to display good stewardship of a sensitive area. Environmental approvals are still considered complex and would result in triggers for biodiversity offsets and demonstration of avoid and minimising impacts on such biodiversity values. Tier 2 biodiversity constraints are:

- BC act listed Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC
- EPBC Act listed Subtropical and Temperate Coastal Saltmarsh TEC
- Known habitat for the BC Act and EPBC Act listed threatened wetland plant *Zannichellia palustris*
- Habitat for the BC Act and EPBC Act listed wetland bird species
- Habitat for EPBC Act listed migratory species
- Biologically important areas of Regionally Significant Marine Species
- Habitat for whales and cetaceans.

The Tier 2 Moderate biodiversity constraint areas should be considered for retention where possible.

Tier 3 low biodiversity constraint – Areas to target development

Tier 3 low biodiversity constraints are the disturbed parts of the study area that generally lack native vegetation or habitats. Tier 3 biodiversity constraints are:

- Disturbed areas with none or minimal native vegetation or habitats for threatened species.

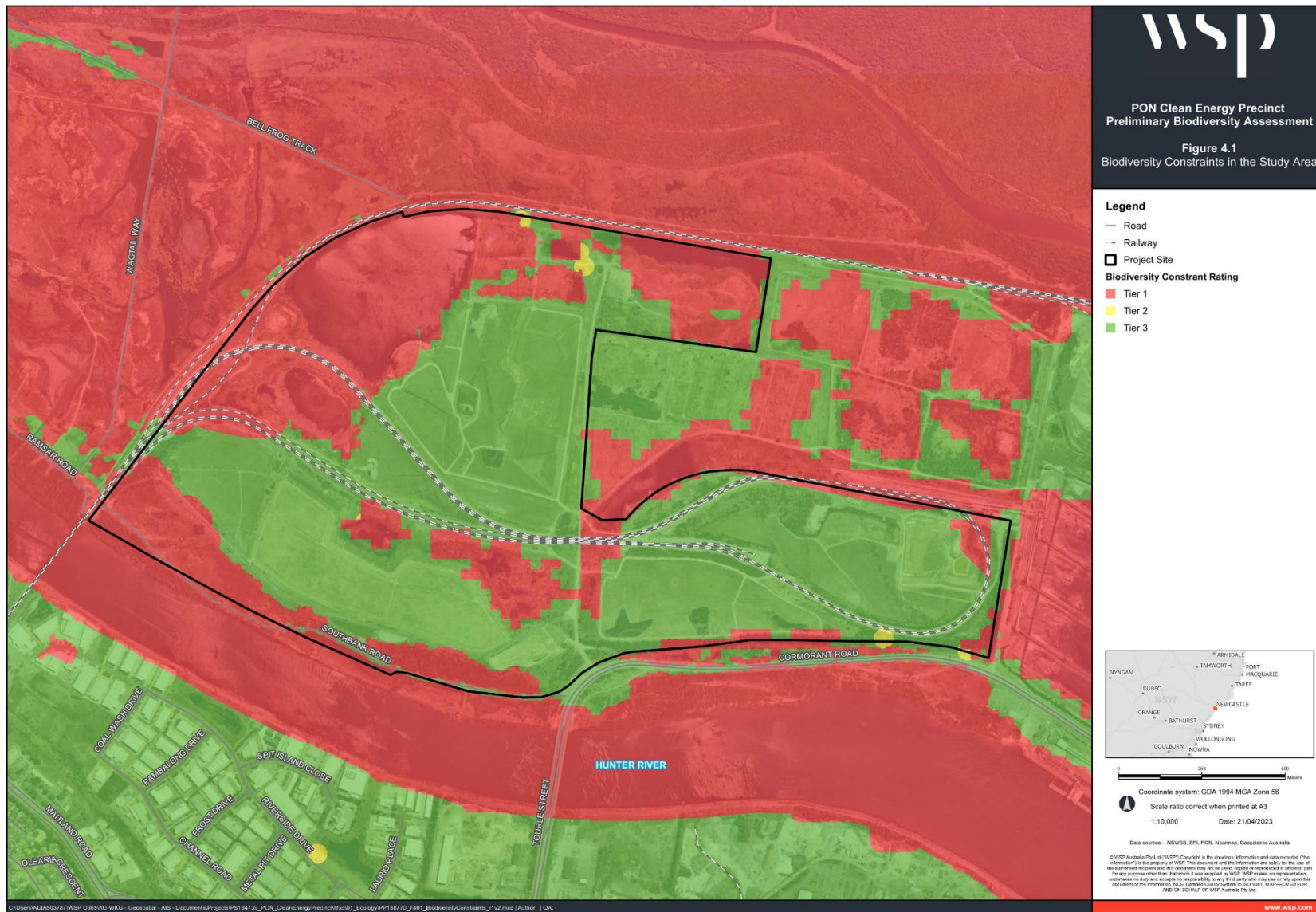


Figure 4.1 Biodiversity constraints in the study area

5 Recommendations

5.1 Native vegetation assessment

Detailed native vegetation survey and mapping would be required to be undertaken in accordance with section 5 of the BAM and Commonwealth requirements. This would include stratifying the vegetation types and broad condition states to define vegetation zones, that would be sampled using vegetation integrity survey plots in accordance with section 4 of the BAM. These native vegetation surveys would determine the vegetation integrity scores for each vegetation zone that would be utilised in the BAM Credit Calculator and inform impacts and potential biodiversity offset requirements.

The native vegetation survey and mapping would identify and refine the presence and extent of the BC Act listed Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC and the EPBC Act listed Subtropical and Temperate Coastal Saltmarsh TEC.

The extent of protected marine vegetation in the form of saltmarsh and mangroves would also be determined.

5.2 Targeted threatened species surveys

Threatened flora and fauna surveys would be required for species credit species listed under the BAM within the project study area. Targeted surveys would also be undertaken with due consideration of State and Commonwealth survey requirements. These surveys would address section 5 of the BAM and Commonwealth survey requirements and would consider each species individual seasonality requirements, including through the BAM Credit Calculator or directly from the Threatened Biodiversity Data Collection.

Targeted threatened species surveys are recommended for the following species:

- threatened wetland plant *Zannichellia palustris*
- Green and Golden Bell Frog
- wetland bird species including Australasian Bittern, Australian Painted Snipe, Eastern Curlew, Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Lesser Sand Plover, Pied Oystercatcher, Broad-billed Sandpiper, Bar-tailed Godwit (including Nunivak Bar-tailed Godwit), Black-tailed Godwit, and Terek Sandpiper
- Raptors including White-bellied Sea Eagle, Little Eagle and Eastern Osprey
- Southern Myotis.

6 Conclusion

The study area contains large areas of disturbed land. However, the study area is mapped as containing areas of PCT 4097: Samphire Saltbush and PCT 4091: Grey Mangrove – River Mangrove Forest. The study area is likely to contain the Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions TEC listed under the BC Act. The study area is also likely to contain Subtropical and Temperate Coastal Saltmarsh (listed as a Vulnerable ecological community under the EPBC Act).

One threatened flora species has a moderate or higher likelihood of occurrence within the project study area, *Zannichellia palustris*. This species is listed as Endangered under the BC Act and EPBC Act. The potential presence of *Zannichellia palustris* is of concern as this species has a high likelihood of occurrence as records for this species occur in the study area and the study area is part of key local habitat for this species.

Fifteen threatened species credit fauna species have a moderate or higher likelihood of occurrence within the study area. These species include:

- Green and Golden Bell Frog
- wetland bird species including Red Knot, Curlew Sandpiper, Great Knot, Greater Sand Plover, Lesser Sand Plover, Pied Oystercatcher, Broad-billed Sandpiper, Bar-tailed Godwit, Black-tailed Godwit, and Terek Sandpiper
- Raptors including White-bellied Sea Eagle, Little Eagle and Eastern Osprey
- Southern Myotis.

In addition to these species credit species, the EPBC Act listed species Australasian Bittern, Eastern Curlew and Australian Painted Snipe are also at least moderately likely to occur.

The PMST search results identified 77 EPBC Act listed migratory species from the 10 km search area. Habitats for 35 of these listed migratory species are likely to be present in the study area.

The study area is upstream from the marine environment and is connected to the Hunter River so impacts to listed marine species and BIA of Regionally Significant Marine Species should be considered in future assessments.

The Saline Wetlands PCT 4097: Samphire Saltbush and PCT 4091: Grey Mangrove – River Mangrove Forest are classified as marine vegetation.

Marine vegetation is protected under the FM Act (e.g. saltmarsh, seagrasses, and mangroves). Removal of marine vegetation, such as mangroves, requires a permit. To avoid acquiring permits, removal of marine vegetation is to be avoided in certain areas, such as mapped Coastal Wetlands (formerly SEPP14 Wetlands). The study area contains areas of mapped 'Coastal Wetland' and 'Coastal Wetland Proximity Area'. The study area contains mapped Key Fish Habitat along the Hunter River and associated wetlands.

The proponent is seeking SSD consent under Part 4, Division 4.7 of the EP&A Act. A BDAR would need to be prepared as part of the EIS, which would further identify and clarify the potential significance of biodiversity impacts associated with the project. The BDAR would be prepared in accordance with the BC Act and BAM. Further targeted detailed threatened species seasonal survey would be required to ensure compliance with the BAM along with vegetation integrity plot based native vegetation surveys. The biodiversity constraints identified in this report provide a starting point to consider avoidance and minimisation of biodiversity impacts.

A Referral under the EPBC Act to the Commonwealth would be required.

7 Limitations

Scope of services

This biodiversity impact assessment report (the report) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the client and WSP (scope of services). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

Reliance on data

In preparing the report, WSP has relied upon data, surveys, analyses, designs, plans and other information provided by the client and other individuals and organisations, most of which are referred to in the report (the data). Except as otherwise stated in the report, WSP has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (conclusions) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. WSP will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to WSP.

Environmental conclusions

In accordance with the scope of services, WSP has relied upon the data and has conducted environmental field monitoring and/or testing in the preparation of the report. The nature and extent of monitoring and/or testing conducted is described in the report.

The conclusions are merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions. Also, it should be recognised that site conditions, including the extent and concentration of contaminants, can change with time.

Within the limitations imposed by the scope of services, the monitoring, testing, sampling and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

Report for benefit of client

The report has been prepared for the benefit of the client (and no other party) but may be relied upon by determining authorities for consideration. WSP assumes no responsibility and will not be liable to any other person or organisation for or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of WSP or for any loss or damage suffered by any other party relying upon the matters dealt with or conclusions expressed in the report). Except as provided below parties other than the client should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

Other limitations

WSP will not be liable to update or revise the report to take into account any events or emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to or ownership of the properties, buildings and structures referred to in the report nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.

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Appendix A

Likelihood of occurrence assessment for
threatened species



A1 Likelihood of occurrence assessment

An assessment was completed to assess the likelihood of occurrence of each threatened species, population and community (threatened biodiversity) identified with the potential to occur. All threatened biodiversity identified during background research were considered. Assessments were based on the habitat profile for the species and other habitat information in the BioNet Atlas and the Species Profile and Threats Database. The assessment also included consideration of the dates and locations of nearby records and information about species populations in the locality.

For this report, the likelihood of occurrence of threatened and migratory species and populations was determined based on the criteria shown in Table A.1 below.

Table A.1 Likelihood of occurrence criteria for threatened species and populations

Classification	Definition
High	It is highly likely that a species inhabits the study area and is dependent on identified suitable habitat (i.e. for breeding or important life cycle periods such as winter flowing resources), has been recorded recently within the Locality and is known or likely to maintain resident populations in the study area. Also, includes known or likely to visit the study area during regular seasonal movements or migration.
Moderate	Potential habitat is present within the project study area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the study area opportunistically or during migration. The species is unlikely to be dependant (i.e. for breeding or important life cycle periods such as winter flowing resources) on habitat within the study area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the project study area and has not been recorded recently in the locality. It may be an occasional visitor, but habitat similar to the study area is widely distributed in the local areas, meaning that the species is not dependant (i.e. for breeding or important life cycle periods such as winter flowing resources) on available habitat. Specific habitat is not present in the study area or the species are a non-cryptic perennial flora species that were specially targeted by surveys and not recorded.
None	Suitable habitat is absent from project study area.

Table A.2 Threatened Flora likelihood of occurrence

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAI ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Angophora inopina</i>	Charmhaven Apple	V	V		PMST, PlantNet	Restricted to the Charmhaven – Wyee area where it grows in open dry sclerophyll woodland of Eucalyptus haemastoma and Corymbia gummifera with a dense shrub understorey. Occurs on deep white sandy soils over sandstone, often with some gravelly laterite (NSW Scientific Committee 1998, Harden 2002).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Caladenia tessellata</i>	Thick Lip Spider-orchid	E1	V		PMST	Occurs south of Swansea where it grows on clay loam or sandy soils (Harden 1993). Prefers low open forest with a heathy or sometimes grassy understorey (Bishop 2000). Within NSW, currently known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast. Previously known also from Sydney and South Coast areas (NSW Scientific Committee 2002).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V	–		PlantNet	Occurs chiefly from Georges to the Hawkesbury River where it grows in dry sclerophyll forest, open forest, scrubland or woodland on sandstone. Found in damp places, usually in gullies (Robinson 1994, Fairley and Moore 2002, Harden 2002). Within the Sydney region, recent records are limited to the Hornsby Plateau area near the Hawkesbury River (NSW Scientific Committee 1999).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Commersonia prostrata</i>	Dwarf Kerrawang	E1	E		PMST, PlantNet	Occurs south of Picton lakes where it mainly grows in gullies along the escarpment, south from Picton Lakes (Harden 2000), on the Southern Tablelands (one plant at Penrose State Forest, one plant at Rows Lagoon and one plant at Tallong) and on the North Coast (less than 100 plants at the Tomago sandbeds north of Newcastle). It occurs on sandy, sometimes peaty soils in a wide variety of habitats: Snow Gum (Eucalyptus pauciflora) Woodland at Rose Lagoon; Blue leaved Stringybark (E. agglomerata) Open Forest at Tallong; and in Brittle Gum (E. mannifera) Low Open Woodland at Penrose; Scribbly Gum (Eucalyptus haemostoma)/ Swamp Mahogany (E. robusta) Ecotonal Forest at Tomago. Associated native species may include Imperata cylindrica, Empodisma minus and Leptospermum continentale (Department of Environment and Climate Change 2007).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAI ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V		PMST	Occurs south from the Gibraltar Range, chiefly in coastal districts but also extends on to tablelands. Grows in swamp-heath and drier forest on sandy soils on granite & sandstone. Occurs in small, localised colonies most often on the flat plains close to the coast but also known from some mountainous areas growing in moist depressions and swampy habitats (Harden 1993, NSW National Parks and Wildlife Service 1999).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E1	E		Bionet, PMST	Occurs from the Gloucester district to the Wollongong area and inland to Mt Dangar where it grows in rainforest gullies, scrub and scree slopes (Harden 1992). This species typically occurs at the ecotone between dry subtropical forest/woodland communities (James 1997, NSW National Parks and Wildlife Service 2002).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diuris arenaria</i>	Sand Doubletail	E1	–		PlantNet	Restricted to the Tomaree Peninsula north of Newcastle where it grows in coastal heathy dry sclerophyll forest on sandy flats with patches of Themeda (Bishop 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diuris praecox</i>	Newcastle Doubletail	V	V		PMST, PlantNet	Occurs in coastal and near-coastal districts from Ourimbah to Nelson Bay where it grows in sclerophyll forest (Harden 1993) often on hilltops or slopes (Bishop 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V	V		PMST, PlantNet	Occurs in scattered locations within a restricted distribution in a narrow band with the most northerly records in the Raymond Terrace area south to Waterfall. Grows in poor coastal country in shallow sandy soils overlying Hawkesbury sandstone, in coastal heath mostly on exposed sandy ridges. Occurs mostly in small scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas (Office of Environment and Heritage 2012). Associated species frequently include Brown Stringybark (<i>E. capitellata</i>), Scribbly Gum (<i>E. haemastoma</i>), Narrow-leaved Stringybark (<i>E. oblonga</i>), Silvertop Ash (<i>E. sieberi</i>), Smooth-barked Apple (<i>Angophora costata</i>), Dwarf Apple (<i>A. hispida</i>), Red Bloodwood (<i>Corymbia gummifera</i>), Scrub She-oak (<i>Allocasuarina distyla</i>), Slender Tea Tree (<i>Leptospermum trinervium</i>), and Fern-leaved Banksia (<i>Banksia oblongifolia</i>) (Leigh, Boden et al. 1984, Benson and McDougall 1998).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAII ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Eucalyptus parramattensis</i> subsp. <i>decadens</i>	Earp's Gum	V	V		Bionet, PMST, PlantNet	Locally frequent, grows in dry sclerophyll woodland on sandy soils in low, often wet sites (Harden 2002). In the Lower Hunter Region, it occurs in coal fields west of the coastal ranges a characteristic canopy species in Kurri Sand Swamp Woodland and in coastal heathy woodlands to the north of the Hunter River estuary on sandy substrates.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Euphrasia arguta</i>		CE	CE		Bionet, PMST, PlantNet	Rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008, it had not been collected for 100 years. Historically, it was recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. Ecological information from historical records is scarce including, 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', 'in meadows near rivers'. The populations that are currently known are located in the Nundle State Forest and on nearby private land, in eucalypt forest with a mixed grass and shrub understorey (NSW Scientific Committee 2011).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Grevillea parviflora</i> subsp. <i>parviflora</i>	Small-flower Grevillea	V	V		Bionet, PMST, PlantNet	Mainly known from the Prospect area (but now extinct there) and lower Georges River to Camden, Appin and Cordeaux Dam areas, with a disjunct populations near Putty, Cessnock and Cooranbong. Grows in heath or shrubby woodland in sandy or light clay soils usually over thin shales (NSW Scientific Committee 1998, Harden 2002).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Grevillea shiressii</i>		V	V		PlantNet	Known from two populations near Gosford, on tributaries of the lower Hawkesbury River north of Sydney (Mooney Mooney Creek and Mullet Creek). Both populations occur within the Gosford Local Government Area. There is also a naturalised population at Newcastle. Grows along creek banks in wet sclerophyll forest with a moist understorey in alluvial sandy or loamy soils (Office of Environment and Heritage 2014).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Lindernia alsinoides</i>	Noah's False Chickweed	E1	–		PlantNet	Grows in swampy sites in sclerophyll forest and coastal heath, north from Bulahdelah.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAII ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Maundia triglochinoides</i>		V	–		PlantNet	Occurs north from Sydney. Grows in swamps, creeks or shallow freshwater 30 to 60 cm deep on heavy clay, low nutrients. Associated with wetland species such as <i>Triglochin procerum</i> (Harden 1993).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Melaleuca biconvexa</i>	Biconvex Paperbark		V		PMST, PlantNet	Occurs as disjunct populations in coastal New South Wales from Jervis Bay to Port Macquarie, with the main concentration of records is in the Gosford/Wyong area (NSW Scientific Committee 1998). Grows in damp places, often near streams, or low-lying areas on alluvial soils of low slopes or sheltered aspects (Harden 2002, Department of Environment and Climate Change 2008).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Persicaria elatior</i>	Tall Knotweed	V	V		PMST	Occurs infrequently in coastal regions where it grows in damp places especially beside streams and lakes. Also occasionally occurs in swamp forest or associated with disturbance (Harden 2000, Department of Environment and Conservation 2005).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Prasophyllum</i> sp. <i>Wybong</i> (C. Phelps ORG 5269)	A leek orchid	–	CE		PMST	<i>Prasophyllum</i> sp. <i>Wybong</i> (C. Phelps ORG 5269) is known from seven populations in open eucalypt woodland and grassland in NSW. The species' area of occupancy is estimated to be 1.5 km ² with an estimated population size based on surveys in 2006 of 460 mature individuals. This species occurs within the Sydney Basin, New England Tablelands, Brigalow Belt South and NSW South Western Slopes IBRA Bioregions and the Border Rivers-Gwydir, Namoi, Hunter-Central Rivers and Central West Natural Resource Management Regions. The distribution of this species overlaps with the White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland EPBC Act-listed threatened ecological community (Ausgrid 2011).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Pultenaea maritima</i>	Coast Headland Pea	V	–		Bionet	<i>Pultenaea maritima</i> occurs in New South Wales and Queensland and is restricted to grasslands on exposed coastal headlands. Within NSW, the species has been recorded from Newcastle north to Byron Bay.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAI ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Rhizanthella slateri</i>	Eastern Underground Orchid	V	E		PMST	Highly cryptic as only the flowers may occur above ground. It is more frequent in areas of soil disturbance, but further habitat characteristics or associated vegetation types are poorly known, possibly occurring in sclerophyll forests (Harden 1993). Endangered population in the Great Lakes local government area.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE		PMST	A mesic species occurring as a small tree in rainforests and vine thickets, largely in coastal areas, from Batemans Bay on the NSW South Coast to Bundaberg in Queensland. Although it is largely coastal, its range does extend west as far as the ranges in much of its range.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE		PMST	A mesic species occurring in rainforests, vine thickets, and the understoreys of wet sclerophyll forests predominantly in coastal areas, from Broken Bay on the NSW Central Coast to Southeast Queensland. Largely coastal throughout much of its range, it extends west up large coastal river systems and the border ranges.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Rutidosia heterogama</i>	Heath Wrinklewort	V	V		Bionet, PlantNet	Occurs in coastal districts from Maclean to the Hunter Valley and inland to the Torrington region. Grows in heath on sandy soils and moist areas in open forest, and has been recorded along disturbed roadsides (Department of Environment and Conservation 2005, Royal Botanic Gardens 2005).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E1	V		PMST, PlantNet	Occurs between Bulahdelah and St Georges Basin where it grows in subtropical and littoral rainforest on sandy soils or stabilized dunes near the sea (Harden 2002). On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities (Department of Environment and Climate Change 2008).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Tetradlea juncea</i>	Black-eyed Susan	V	V		Bionet, PMST, PlantNet	Occurs in coastal districts from Bulahdelah to Port Macquarie where it grows in dry sclerophyll forest and occasionally swampy heath in sandy, (Harden 1992) low nutrient soils with a dense understorey of grasses. Specifically it is known to occur within Coastal Plains Smooth-barked Apple Woodland and Coastal Plains Scribbly Gum Woodland (Payne, Stevenson et al. 2002).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC ACT ²	SAII ³	Source ⁴	Habitat suitability ⁵	Likelihood of occurrence
<i>Thesium Australe</i>	Austral Toadflax	V	V		PMST	Grows in grassland or woodland often in damp sites. It is a semi-parasitic herb and hosts are likely to be <i>Themeda australis</i> and <i>Poa</i> spp. (Harden 1992, Department of Environment and Climate Change 2008).	Low – no local records, the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Zannichellia palustris</i>		E1	–		Bionet, PlantNet	Grows in fresh or slightly saline stationary or slowly flowing water (Royal Botanic Gardens 2005).	High – records for this species in the study area, surveyable when habitat conditions are favourable.

- (1) Listed under the *Biodiversity and Conservation Act 2016*: CE = Critically endangered, E = Endangered, V = Vulnerable
- (2) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: CE = Critically endangered, E = Endangered, V = Vulnerable
- (3) SAII = Serious and Irreversible Impact
- (4) Sources include BAM-C = Biodiversity Assessment Method Calculator, PMST = The Department of the Environment and Energy's EPBC Protected Matters Search Tool, BioNet = ESS's Bionet Atlas of NSW Wildlife, ALA = Atlas of Living Australia spatial search tool
- (5) Unless otherwise stated (in-text references) all information for habitat suitability has been sourced from BioNet Atlas of NSW Wildlife (DPE 2022b)

Table A.3 Likelihood of occurrence for threatened fauna species

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
Fish								
<i>Epinephelus daemeli</i>	Black Rockcod	V (FM Act)	V		PMST	–	Adult black cod are usually found in caves, gutters and beneath bomboras on rocky reefs. They are territorial and often occupy a particular cave for life. Small juveniles are often found in coastal rock pools, and larger juveniles around rocky shores in estuaries. Black cod are opportunistic carnivores, eating mainly other fish and crustaceans. They can change from one colour pattern to another in just a few seconds. They are usually black in estuaries and banded around clear water reefs. Black cod are apparently slow growing. Smaller fish are mostly females, but they generally change sex to become males at around 100–110 cm in length.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Sphyrna lewini</i>	Scalloped Hammerhead	E (FM Act)	CD		PMST	–	On the east coast it occurs north of Sydney NSW with local populations dominated by immature individuals and adults generally preferring warmer waters. Occurs in coastal oceanic habitats often travelling in schools and moving south during the warmer months.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thunnus maccoyii</i>	Southern Bluefin Tuna	E (FM Act)	CD		PMST	–	An oceanic fish species largely inhabiting deep waters beyond the edge of the continental shelf. Their range covers the entire NSW coast, although their populations have significantly decreased due to impacts from commercial fishing.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
Amphibians								
<i>Litoria aurea</i>	Green and Golden Bell Frog	E1	V		Bionet, PMST	–	Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (<i>Typha</i> spp.) or spikerushes (<i>Eleocharis</i> spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (<i>Gambusia holbrooki</i>), have a grassy area nearby and diurnal sheltering sites available.	High – records for this species occur in the study area, the study area is part of key local habitat for this species.
<i>Mixophyes balbus</i>	Stuttering Frog	E1	V		PMST	–	Occur along the east coast of Australia from southern Queensland to north-eastern Victoria. Considered to have disappeared from Victoria and to have undergone considerable range contraction in NSW, particularly in south-east NSW. It is the only <i>Mixophyes</i> species that occurs in south-east NSW and in recent surveys it has only been recorded at three locations south of Sydney. The Dorrigo region, in north-east NSW, appears to be a stronghold for this species. Found in rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Outside the breeding season adults live in deep leaf litter and thick understorey vegetation on the forest floor.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Uperoleia mahonyi</i>	Mahony's Toadlet	E1	E		Bionet, PMST	–	Inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps, Mahony's Toadlet also is known to occur in wallum heath, swamp mahogany-paperbark swamp forest, heath shrubland and Sydney red gum woodland. Recent studies suggest intact vegetation adjacent to and within water bodies is an important habitat feature for this species. Known records are associated with shallow ephemeral/semi-permanent water bodies with limited flow of water. Aquatic vegetation at breeding sites includes sedges (<i>Shoenoplectus</i> spp., <i>Baumea</i> spp. and <i>Lepironia articulata</i>) and Broadleaf Cumbungi (<i>Typha orientalis</i>).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
Reptiles								
<i>Caretta caretta</i>	Loggerhead Turtle	E1	E		Bionet	–	Ocean dwellers that generally forage in deep water (NSW National Parks and Wildlife Service 2002). Females come ashore during summer to lay eggs on beaches, with some nesting sites recorded in northern NSW (Department of Environment and Climate Change, 2007).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Chelonia mydas</i>	Green Turtle	V	V		Bionet	–	The species has been recorded in coastal waters of all Australian states. Nesting has been recorded in the vicinity of Shark Bay and Lacépède Islands in Western Australia, Cobourg Peninsula in the Northern Territory, and in the Gulf of Carpentaria, Raine Island, and the Capricorn and Bunker Groups of islands on the southern Barrier Reef in Queensland (Cogger, Cameron et al. 1993).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
Birds								
<i>Actitis hypoleucos</i>	Common Sandpiper	–	M	No	Bionet	–	The Common Sandpiper frequents a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity. It is mostly encountered along muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves.	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Anas querquedula</i>	Garganey	–	M	No	Bionet	–	Shows a preference for freshwater wetlands, ponds and sewerage treatment settling ponds. Usually found in shallow water with high biological activity, but avoids wetlands with dense or broken vegetation cover. Likely annual visitor to north Australian wetlands and vagrant in the south (Marchant and Higgins). A rare annual visitor to Australia seen singly or in pairs usually in the company of other ducks.	Low – a previous record for this species adjacent to the study area but considered unlikely to occur other than a very rare occasion.
<i>Anseranas semipalmata</i>	Magpie Goose	V	–	No	Bionet, BAM-C	Predicted	A vagrant to NSW, normally following food sources to south-eastern NSW. Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW. Predicted habitat occurs within PCTs 15, 16, 24, 160, 163 & 181.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE		PMST	–	Inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. It inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. It feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar. Key eucalypt species include Mugga Ironbark, Yellow Box, White Box and Swamp Mahogany.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Apus pacificus</i>	Fork-tailed Swift	–	M	No	Bionet	–	Breeds in the northern hemisphere, wintering south to Australia. It is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground. It mostly occurs over inland plains but sometimes above foothills or in coastal areas over cliffs, beaches, islands and well out to sea. It also occurs over towns and cities. It mostly occurs over dry and/or open habitats, including riparian woodland and tea-tree swamps, low scrub, heathland or saltmarsh, grassland, spinifex sandplains, farmland and sand-dunes. It sometimes occurs above forests. It probably roosts aerially but has occasionally been observed to land.	Low – While local individuals are likely to fly over the study area seasonally, it contains no foraging or roosting habitats for this species.
<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	–	M	No	Bionet	–	An oceanic species only coming to land for breeding purposes and when severe anomalous weather forces them shoreward. Seasonally present off Australian coasts during from spring through to late autumn.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	–	M	No	Bionet	–	Nomadic marine species that seasonally occurs to breed on islands along the eastern and southern coastlines of Australia, from the central coast of NSW to Western Australia (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Arenaria interpres</i>	Ruddy Turnstone	–	M	No	Bionet	–	During non-breeding movements, it is found in most coastal regions, with occasional records of inland populations. Mainly found on coastal regions with exposed rock coast lines or coral reefs. It also lives near platforms and shelves, often with shallow tidal pools and rocky, shingle or gravel beaches. It can, however, be found on sand, coral or shell beaches, shoals, cays and dry ridges of sand or coral. It has occasionally been sighted in estuaries, harbours, bays and coastal lagoons, among low saltmarsh or on exposed beds of seagrass, around sewage ponds and on mudflats. In north Australia it is known to occur in a wide variety of habitats, and may prefer wide mudflats. In southern Australia the Ruddy Turnstone prefers rockier coastlines and is less numerous on large embayments with extensive mudflats.	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E1	E		Bionet, PMST BAM-C	Predicted	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (<i>Typha</i> spp.) and spikerushes (<i>Eleocharis</i> spp.). Breeding occurs in summer from October to January; nests are built in secluded places in densely-vegetated wetlands on a platform of reeds.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Burhinus grallarius</i>	Bush Stone-curlew	E	–	No	Bionet, BAM-C	Candidate	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common and, in the south-east, it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy ground layer and fallen timber. Largely nocturnal, being especially active on moonlit nights.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Calidris acuminata</i>	Sharp-tailed Sandpiper	–	M	No	Bionet, PMST	–	Occurs in a variety of habitats: tidal mudflat, mangrove swamps, saltmarshes, shallow fresh, brackish, salt inland swamps and lakes; flooded and irrigated paddocks, sewage farms and commercial saltfields.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris canutus</i>	Red Knot	–	E		PMST		In Australasia the Red Knot mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They are occasionally seen on terrestrial saline wetlands near the coast, such as lakes, lagoons, pools and pans, and recorded on sewage ponds and saltworks, but rarely use freshwater swamps. They rarely use inland lakes or swamps.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Calidris ferruginea</i>	Curlew Sandpiper	E	CE; M	Yes	Bionet, PMST, BAM-C	Predicted/ Candidate	Occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes, and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters. Note: migratory species, key threats occurring overseas. Note that it does not breed in NSW or elsewhere in Australia but relies on successful feeding here to migrate >10,000 km back to its breeding grounds. The species is a dual credit species, with the species credit component mapped as an important area. These mapped areas do NOT require survey as it is presumed that the species is present. Any impact from development could potentially be serious and irreversible. Ecosystem credit areas are unlikely to have potential serious and irreversible impacts. Note that whilst this is a partnership species in NSW it is listed nationally and therefore retained as a potential SAI species.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris melanotos</i>	Pectoral Sandpiper	–	M	No	Bionet, PMST	–	In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species frequents coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. It is usually found in coastal or near coastal habitat but occasionally further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. It has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands.	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Calidris ruficollis</i>	Red-necked Stint	–	M	No	Bionet, PMST	–	Distributed along most of the Australian coastline with large densities on the Victorian and Tasmanian coasts. The Red-necked Stint has been recorded in all coastal regions and found inland in all states when conditions are suitable. Mostly found in coastal areas, including in sheltered inlets, bays, lagoons and estuaries with intertidal mudflats, often near spits, islets and banks and, sometimes, on protected sandy or coralline shores. Occasionally they have been recorded on exposed or ocean beaches, and sometimes on stony or rocky shores, reefs or shoals. They also occur in saltworks and sewage farms; saltmarsh; ephemeral or permanent shallow wetlands near the coast or inland, including lagoons, lakes, swamps, riverbanks, waterholes, bore drains, dams, soaks and pools in saltflats.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Calidris tenuirostris</i>	Great Knot	V	CE, M		Bionet, PMST	–	Generally, a coastal species found on tidal mudflats and sandy ocean shores. A migratory species visiting Australian waters between September and March (Pizzey and Knight 2007).	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Callocephalon fimbriatum</i>	Gang-Gang Cockatoo	V	E		PMST	–	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as far north as Coffs Harbour and as far west as Mudgee. In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (<i>Eucalyptus pauciflora</i>) woodland and occasionally in temperate rainforests. Favours old growth forest and woodland attributes for nesting and roosting. Nests are in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	V		Bionet, PMST	–	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (<i>Allocasuarina littoralis</i>) and Forest Sheoak (<i>A. torulosa</i>) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, <i>Allocasuarina diminuta</i> , and <i>A. gymnathera</i> . Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (<i>Casuarina cristata</i>). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Charadrius bicinctus</i>	Double-banded Plover	–	M		PMST	–	The Double-banded Plover is found on littoral, estuarine and fresh or saline terrestrial wetlands and also saltmarsh, grasslands and pasture. It occurs on muddy, sandy, shingled or sometimes rocky beaches, bays and inlets, harbours and margins of fresh or saline terrestrial wetlands such as lakes, lagoons and swamps, shallow estuaries and rivers. It is sometimes associated with coastal lagoons, inland salt lakes, exposed seagrass beds, exposed reefs and rock platforms and coastal sand dunes.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Charadrius leschenaultii</i>	Greater Sand Plover	V	V, M		Bionet, PMST	–	Entirely coastal in NSW foraging on intertidal sand and mudflats in estuaries, and roosting during high tide on sand beaches or rocky shores. A migratory species it is found in New South Wales generally during the summer months (Pizzey and Knight 2007).	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Charadrius mongolus</i>	Lesser Sand Plover	V	E, M		Bionet, PMST	–	Migratory bird that migrates from the northern hemisphere to coastal areas of northern and east coast of Australia (Garnett and Crowley 2000). The species is almost strictly coastal during the non-breeding season, preferring sandy beaches, mudflats of coastal bays and estuaries, sand-flats and dunes near the coast, occasionally frequenting mangrove mudflats (IUCN Redlist entry).	Moderate – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Charadrius veredus</i>	Oriental Plover	–	M		Bionet	–	Oriental Plovers are found in coastal habitats, including estuarine mudflats and sandbanks, on sandy or rocky ocean beaches, nearby reefs, or near-coastal grasslands (Crawford 1972, Serventy and Whittell 1976, Storr 1977, Storr 1980, Bigg 1981, Storr 1984, Bransbury 1985, Murlis, Murlis et al. 1988). They also disperse further inland inhabiting flat, open, semi-arid or arid grasslands, where the grass is short and sparse, and interspersed with hard, bare ground, such as claypans, dry paddocks, playing fields, lawns and cattle camps (Carruthers 1968, Boekel 1980, Close 1982){Fletcher, 1980 #3672}(Storr 1980, Pedler 1982), or open areas that have been recently burnt (Boekel 1980){Chatto, 2003 #3668}(Crawford 1972, Storr 1977, Garnett 1986). Oriental Plovers may move to lightly wooded grasslands in wet season (Storr 1977) and sometimes roost on soft wet mud or in shallow waters of ocean or mudflats (Serventy and Whittell 1976, Close 1982, McCrie 1984, Bransbury 1985, Cox 1988), and also occasionally in dry, open habitats, such as saltmarsh or paddocks (McCrie 1984, Clarke and Martin 1999, Dique, Preece et al. 2004).	Low – very rare in the region, the study area does not provide highly suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Chlidonias leucopterus</i>	White-winged Black Tern	–	M		Bionet	–	The species is a non-breeding migrant to Australia, where it is widespread and common along south-western, northern and central-eastern coasts, with only scattered records of small numbers along the coasts elsewhere in southern Australia. the species mostly inhabits fresh, brackish or saline, and coastal or subcoastal wetlands. White-winged Black Terns frequent tidal wetlands, such as harbours, bays, estuaries and lagoons, and their associated tidal sandflats and mudflats. Terrestrial wetlands, including swamps, lakes, billabongs, rivers, floodplains, reservoirs, saltworks, sewage ponds and outfalls are also inhabited. Wetlands may be open, or with floating emergent or marginal vegetation. They rarely occur on inland wetlands in Australia. The species is usually only recorded offshore when on passage.	High – records for this species in habitats adjacent to the study area, may occur when habitat conditions are favourable.
<i>Circus assimilis</i>	Spotted Harrier	V	–		Bionet, BAM-C	Predicted	Occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Preys on terrestrial mammals (e.g. bandicoots, bettongs, and rodents), birds and reptile, occasionally insects and rarely carrion.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Cuculus optatus</i>	Oriental Cuckoo	–	M	No	Bionet, PMST	–	A non-breeding migrant to Australia, it often inhabits rainforest, vine thickets, wet sclerophyll forest and open woodland and sometimes occurs in mangroves, wooded swamps and as vagrants in gardens. The population trend appears to be stable (AECOM-GHD JV 2018).	Low – rare vagrant locally, the study area and adjacent habitats do not provide suitable habitat opportunities for this species, although very rare occurrences cannot be entirely discounted.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	–	No	Bionet,	–	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. Inhabits eucalypt forests and woodlands, especially those containing rough- barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diomedea antipodensis</i>	Antipodean Albatross	V	V		PMST	–	Breeds on Antipodes and Campbell Islands, New Zealand, foraging across the southwest Pacific and the Tasman Sea, including waters off the coasts of NSW (Garnett and Crowley 2000). Essentially an oceanic species, usually uncommon in inshore habitats and not entering enclosed waters.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diomedea antipodensis gibsoni</i>	Gibson’s Albatross	V	V		PMST	–	Breeds on Auckland Island, New Zealand, and forages throughout the Tasman Sea (Garnett and Crowley 2000) where it is commonly encountered off the NSW coast during seabird surveys in the Austral winter. An oceanic species uncommon in inshore habitats and avoiding enclosed waters.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diomedea epomophora</i>	Southern Royal Albatross	–	V		PMST	–	Predominantly breeds on Campbell Island with small numbers breeding on islands in the Auckland Island group. One of the great albatrosses, occurrences are very scarce off the Tasman Sea coasts of NSW and more northerly Australian coasts.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diomedea exulans</i>	Wandering Albatross	E1	V		PMST	–	Southern circumpolar distribution, breeding in Australian territory on Macquarie and Heard Islands (Garnett and Crowley 2000). Also breeds in subantarctic islands in the southern Atlantic and Indian oceans (Garnett and Crowley 2000). A pelagic species visiting mainland Australian waters seasonally occasionally occurring within sight of the coast.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Diomedea sanfordi</i>	Northern Royal Albatross	–	E		PMST	–	Breeds on Chatham Island and Taiaroa Head on South Island of New Zealand (Garnett and Crowley 2000). Observed regularly in Tasmanian and South Australian waters and extends into the southwest Atlantic, but more rarely off the NSW coast (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E1	–		Bionet	–	Widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas). In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Since 1995, breeding has been recorded as far south as Bulahdelah. Floodplain wetlands (swamps, billabongs, watercourses and dams) of the major coastal rivers are the key habitat in NSW for the Black-necked Stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries. Usually forage in water 5–30 cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish). (Office of Environment and Heritage 2014)	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Epthianura albifrons</i>	White-fronted Chat	V	–	–	Bionet, BAM-C	Predicted	Found across the southern half of Australia the species is mostly found in temperate to arid climates, more specifically along waterways in the western half of NSW. Individuals are typically found foraging on bare or grassy ground singly or in pairs. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.	High – records for this species in the study area, may breed when habitat conditions are favourable.
<i>Erythroriorchis radiatus</i>	Red Goshawk	CE	V		PMST	–	Lives in coastal and sub-coastal tall open forests and woodlands, tropical savannas traversed by wooded or forested rivers and along edges of rainforest. Nests are only built in trees taller than 20 meters which occur within 1 kilometre of a watercourse or wetland. Has a home range of 200 square kilometres and hunts for medium to large birds in open forests and gallery forest (Garnett and Crowley 2000). Functionally extinct in NSW.	Low – no recent records in NSW.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Falco hypoleucos</i>	Grey Falcon	E	V		PMST	–	Sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW. 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.	Low – an inland Australia species for which there are no records in the region.
<i>Falco subniger</i>	Black Falcon	V	–	No	Bionet	–	Widely, but sparsely, distributed in New South Wales, mostly occurring woodland, shrubland and grassland in the arid and semi-arid zones, especially wooded watercourses and agricultural land with scattered remnant trees. It is usually associated with streams or wetlands, visiting them in search of prey and often using standing dead trees as lookout posts. Habitat selection is generally influenced more by prey densities than by specific aspects of habitat floristics or condition, although in agricultural landscapes it tends to nest in healthy, riparian woodland remnants with a diverse avi-fauna.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Gallinago hardwickii</i>	Latham's Snipe	–	M	No	Bionet, PMST	–	Occurs in freshwater or brackish wetlands generally near protective vegetation cover. This species feeds on small invertebrates, seeds and vegetation. It migrates to the northern hemisphere to breed.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Gallinago megala</i>	Swinhoe's Snipe	–	M		PMST	–	During the non-breeding season Swinhoe's Snipe occurs at the edges of wetlands, such as wet paddy fields, swamps and freshwater streams. The species is also known to occur in grasslands, drier cultivated areas (including crops of rapeseed and wheat) and market gardens. Habitat specific to Australia includes the dense clumps of grass and rushes round the edges of fresh and brackish wetlands. This includes swamps, billabongs, river pools, small streams and sewage ponds. They are also found in drying claypans and inundated plains pitted with crab holes (ACT Government - Environment and Planning 2015).	Low – a northern Australia species for which there are no records in NSW.
<i>Gallinago stenura</i>	Pin-tailed Snipe	–	M		PMST	–	During non-breeding period the Pin-tailed Snipe occurs most often in or at the edges of shallow freshwater swamps, ponds and lakes with emergent, sparse to dense cover of grass/sedge or other vegetation. The species is also found in drier, more open wetlands such as claypans in more arid parts of species' range. It is also commonly seen at sewage ponds; not normally in saline or inter-tidal wetlands (Commonwealth of Australia 2015).	Low – a north-western Australia species for which there are no records in NSW.
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	–		Bionet	–	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. 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.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Grantiella picta</i>	Painted Honeyeater	V	V		PMST	–	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree/ Weeping Myall (<i>Acacia pendula</i>), Brigalow (<i>A. harpophylla</i>) and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias. Prefers mistletoes of the genus <i>Amyema</i> . Nest from spring to autumn in a small, delicate nest hanging within the outer canopy of drooping eucalypts, she-oak, paperbark or mistletoe branches.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	–		Bionet	–	The Sooty Oystercatcher is found on rocky headlands, rock shelves, exposed reefs with rock pools, beaches and muddy estuaries (Marchant and Higgins 1993). The species forages on exposed intertidal rocky shorelines at low tide (Garnett and Crowley 2000). It breeds almost exclusively on offshore islands, and occasionally on isolated promontories during spring and summer. They nest on the ground in amongst rocks, seaweed, shells and pebbles (Marchant and Higgins 1993).	Low – occurs locally but the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Haematopus longirostris</i>	Pied Oystercatcher	E1	–		Bionet	–	The species is distributed around the entire Australian coastline, although it is most common in coastal Tasmania and parts of Victoria, such as Corner Inlet. In NSW the species is thinly scattered along the entire coast, with fewer than 200 breeding pairs estimated to occur in the State. Favours intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Haliaeetus leucogaster</i>	White-bellied Sea Eagle	V	–	No	Bionet, BAM-C	Predicted/Candidate	In NSW it is widespread along the east coast, and along all major inland rivers and waterways. Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs in vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Note: The species is highly selective in nesting locations. Breeding habitat is live large old trees within 1 km of a rivers, lakes, large dams or creeks, wetlands and coastlines AND the presence of a large stick nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period. Due to the similarities in nest structure and use of the same nests by White-bellied Sea Eagles and Wedge-tailed Eagles, where a nest is observed without a bird present, searches for prey remains/feathers below the structure should be undertaken. The differing diets of both species and distinctive adult feathers, should provide evidence of nest use, however; where prey items/feathers are absent, repeat visits to the nest until a bird is observed should be undertaken.	High – records for this species in the study area, and it may occur within the home range of local individuals.
<i>Hieraaetus morphnoides</i>	Little Eagle	V	–	No	Bionet, BAM-C	Predicted/Candidate	Found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. Occupies open eucalypt forest, woodland or open woodland. Sheoak or Acacia woodlands and riparian woodlands of interior NSW are also used. Nests in tall living trees (occasionally dead) within a remnant patch, where pairs build a large stick nest in winter. Preys on birds, reptiles and mammals, occasionally adding large insects and carrion.	High – records for this species in the study area, and it may occur within the home range of local individuals.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Hirundapus caudacutus</i>	White-throated Needletail	–	V, M	No	Bionet, PMST BAM-C	Predicted	Widespread in eastern and south-eastern Australia. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. It is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable, but there are, nevertheless, certain preferences exhibited by the species. Although they occur over most types of habitat, they are probably 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. They also commonly occur over heathland, but less often over treeless areas, such as grassland or swamps. When flying above farmland, they are more often recorded above partly cleared pasture, plantations, or remnant vegetation at the edge of paddocks.	Low – While local individuals are likely to fly over the study area seasonally, it contains no foraging or roosting habitats for this species.
<i>Hirundo rustica</i>	Barn Swallow	–	M		Bionet	–	Usually found in airspace over open grassland and wetland habitats such as ponds, freshwater wetlands swimming pools, coastal lagoons, and tidal pools. This species is a regular visitor to northern Australia in Qld, NT, and WA. This species has been occasional records in NSW at Newcastle, Mullumbimby, and Nowra (Higgins, Peter et al. 2006).	Low – a very rare vagrant in NSW, although very rare occurrences cannot be entirely discounted under favourable conditions.
<i>Hydroprogne caspia</i>	Caspian Tern	–	M		Bionet	–	The Caspian Tern is found in sheltered coastal embayments preferring sandy or muddy margins. Also found in near-coastal or inland terrestrial wetlands. It forages in open wetlands, preferring sheltered shallow water near the margins. It usually breeds in low islands, cays, spits, banks, ridges, beaches of sand or shell, terrestrial wetlands and stony or rocky islets or banks and occasionally among beach-cast debris above the high-water mark or at artificial sites, including islands in reservoirs, or on dredge-spoil. Generally roosting occurs on bare exposed sand or shell spits, banks or shores.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Irediparra gallinacea</i>	Comb-crested Jacana	V	–		Bionet	–	Occurs in floating vegetation of permanent well-vegetated wetlands and dams. Walks on floating plants. Occasionally feeds along muddy wetland margins on east coast of NSW (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Ixobrychus flavicollis</i>	Black Bittern	V	–		Bionet	–	The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. 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. Feeds on frogs, reptiles, fish and invertebrates, including snails, dragonflies, shrimps and crayfish, with most feeding done at dusk and at night. During the day, roosts in trees or on the ground amongst dense reeds.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Lathamus discolor</i>	Swift Parrot	E	CE	Yes	Bionet, PMST	–	Migrates to the Australian south-east mainland between February and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany <i>Eucalyptus robusta</i> , Spotted Gum <i>Corymbia maculata</i> , Red Bloodwood <i>C. gummifera</i> , Forest Red Gum <i>E. tereticornis</i> , Mugga Ironbark <i>E. sideroxylon</i> , and White Box <i>E. albens</i> .	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Limicola falcinellus</i>	Broad-billed Sandpiper	V	M		Bionet, PMST	–	The eastern form of this species breeds in northern Siberia before migrating southwards in winter to Australia. In Australia, Broad-billed Sandpipers overwinter on the northern coast, particularly in the north-west, with birds located occasionally on the southern coast. In NSW, the main site for the species is the Hunter River estuary, with birds occasionally reaching the Shoalhaven estuary. There are few records for inland NSW. Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches.	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Limnodromus semipalmatus</i>	Asian Dowitcher	–	M		Bionet	–	In the Australian context, the Asian Dowitcher is most often encountered in northern Australia, with most records in the Northwest and only rarely observed on the east coasts of northern Australia. It is only a very rare vagrant to southeast Australian estuaries.	Low – a very rare vagrant in NSW, although very rare occurrences cannot be entirely discounted under favourable conditions.
<i>Limosa lapponica</i>	Bar-tailed Godwit	–	M		Bionet, PMST	–	The Bar-tailed Godwit has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW, and Victoria, including the offshore islands. Found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons, and bays. It is found often around beds of seagrass and, sometimes, in nearby saltmarsh. It has been sighted in coastal sewage farms and saltworks, salt lakes and brackish wetlands near coasts, sandy ocean beaches, rock platforms, and coral reef-flats. It is rarely found on inland wetlands or in areas of short grass, such as farmland, paddocks, and airstrips, although it is commonly recorded in paddocks at some locations overseas.	High – records for this species in the study area, may occur when habitat conditions are favourable.

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<i>Limosa lapponica baueri</i>	Nunivak Bar-tailed Godwit	–	V		PMST	–	See the above description, as the Nunivak Bar-tailed Godwit is the subspecies that occurs in eastern Australian estuaries.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Limosa limosa</i>	Black-tailed Godwit	–	M	N/A	Bionet, PMST BAM-C	Predicted / Candidate	Primarily a coastal species which is usually found in sheltered bays, estuaries and lagoons with large intertidal mudflats and/or sandflats. Further inland, it can also be found on mudflats and in water less than 10 cm deep, around muddy lakes and swamps.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Lophoictinia isura</i>	Square-tailed Kite	V	–		Bionet	–	Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Macronectes giganteus</i>	Southern Giant Petrel	E1	E		PMST	–	A partly nomadic marine species that forages off the coast of New South Wales during winter (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Macronectes halli</i>	Northern Giant Petrel	V	V		PMST	–	Nomadic marine species, that nest as dispersed pairs, often amidst tussocks in dense vegetation. Forages in inshore waters of southern Australia and occasionally visits the coast of NSW (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Monarcha melanopsis</i>	Black-faced Monarch	–	M	No	PMST	–	Occurs in rainforests, eucalypt woodlands, coastal scrubs, damp gullies in rainforest, eucalypt forest and in more open woodland when migrating.	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there is a record adjacent to the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.

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<i>Motacilla flava</i>	Yellow Wagtail	–	M	No	Bionet, PMST	–	This species occurs in a range of habitats including estuarine habitats such as sand dunes, mangrove forests and coastal saltmarshes. This species also occurs in open grassy areas including disturbed sites such as sports grounds and has been recorded on the edges of wetlands, swamps, lakes and farm dams. This species migrates from Asia to Australia in spring-summer. It has been recorded in the estuarine areas of the Hunter River in Newcastle NSW and in QLD and the north of NT and WA.	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	–	M	No	PMST	–	Widespread in eastern Australia. In Queensland, it is widespread but scattered in the east. In NSW, they are widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. In Victoria, the species is widespread in the south and east, in the area south of a line joining Numurkah, Maldon, the northern Grampians, Balmoral and Nelson. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests. Satin Flycatchers mainly inhabit eucalypt forests, often near wetlands or watercourses. They generally occur in moister, taller forests, often occurring in gullies. They also occur in eucalypt woodlands with open understorey and grass ground cover, and are generally absent from rainforest. In south-eastern Australia, they occur at elevations of up to 1400 m above sea level, and in the ACT, they occur mainly between 800 m above sea level and the treeline.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Neophema pulchella</i>	Turquoise Parrot	V	–		Bionet	–	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range. Lives on the edges of eucalypt woodland adjoining clearings, timbered ridges and creeks in farmland.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Ninox connivens</i>	Barking Owl	V	–	No	Bionet,	–	Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g. western NSW) due to the higher density of prey found on these fertile riparian soils. Requires very large permanent territories in most habitats due to sparse prey densities.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Ninox strenua</i>	Powerful Owl	V	–		Bionet	–	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing (Debus and Chafer 1994). Now at low densities throughout most of its eastern range, rare along the Murray River and former inland populations. It inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest (Soderquist and Gibbons 2007). It requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine <i>Syncarpia glomulifera</i> , Black She-oak <i>Allocasuarina littoralis</i> , Blackwood <i>Acacia melanoxylon</i> , Rough-barked Apple <i>Angophora floribunda</i> , Cherry Ballart <i>Exocarpus cupressiformis</i> and a number of eucalypt species. The main prey items are medium-sized arboreal marsupials, particularly the Greater Glider, Common Ringtail Possum and Sugar Glider (Department of Environment and Conservation 2005).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Numenius madagascariensis</i>	Eastern Curlew	–	CE; M	No	Bionet, PMST	–	Inhabits coastal estuaries, mangroves, mud flats and sand pits. It is a migratory shorebird which generally inhabits sea and lake shore mud flats, deltas and similar areas, where it forages for crabs and other crustaceans, clam worms and other annelids, molluscs, insects and other invertebrates. Its migration route ranges from its wintering grounds in Australia to its breeding grounds in northern China, Korea and Russia.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Numenius minutus</i>	Little Curlew	–	M		Bionet, PMST	–	On passage the species shows a preference for foraging and resting in swampy meadows near lakes and along river valleys. It overwinters on dry inland grassland, bare cultivation, dry mudflats and coastal plains of black soil with scattered shallow pools of freshwater, swamps, lakes or flooded ground. It shows a preference for short grass swards of less than 20 cm tall, and occasionally occurs in dry saltmarshes, coastal swamps, mudflats or sandflats in estuaries, or on the beaches of sheltered coasts (BirdLife International 2009).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Numenius phaeopus</i>	Whimbrel	–	M		Bionet, PMST	–	Migrates to Taiwan, Philippines, PNG, and a race breeding in NE Siberia is found on the north and south-eastern coastlines of Australia. Juveniles arrive to Australia from spring to early summer. Usually only juveniles remain in Australia but very occasionally adults in breeding plumage may be seen in Australian winters (Pizzey and Knight 2007).	High – a record for this species in the study area, may occur when habitat conditions are favourable.
<i>Oxyura australis</i>	Blue-billed Duck	V	–	No	Bionet,	-	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas. 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.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Pachyptila turtur subantarctica</i>	Fairy Prion (Southern)	–	V		PMST	–	The Fairy Prion is a marine bird which breeds on subantarctic and cool temperate islands within the South Pacific, including the Bass Strait Islands, Tasmania, and Macquarie Island. Fairy Prions are commonly seen offshore from mainland Australia, feeding across the continental shelf and in pelagic waters. The species is particularly common in Tasmania but does also visit the South-east coast of Australia and is often found beach cast. Fairy Prions mostly feed on euphausiids (e.g. krill), and other small crustaceans, with small fish also constituting a smaller portion of their diet. The species is a colonial breeder, which, when breeding, lays a single egg at the end of a burrow. The burrow is usually established in soil, or in crevices and caves in cliffs or rock falls (Marchant and Higgins 1990).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Pandion cristatus</i>	Eastern Osprey	V	M		Bionet, PMST	–	Eastern Ospreys are found right around the Australian coastline, except for Victoria and Tasmania. They are common around the northern coast, especially on rocky shorelines, islands, and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas. Favour coastal areas, especially the mouths of large rivers, lagoons, and lakes. Feed on fish over clear, open water.	High – records for this species in the study area, and it may occur within the home range of local individuals.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Petroica boodang</i>	Scarlet Robin	V	–		Bionet	–	The Scarlet Robin is found from southeast Queensland to southeast South Australia and also in Tasmania and southwest Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter. The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. 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. The Scarlet Robin breeds on ridges, hills and foothills of the western slopes, the Great Dividing Range and eastern coastal regions; this species is occasionally found up to 1000 metres in altitude.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Philomachus pugnax</i>	Ruff	–	M		Bionet, PMST	–	The Ruff is found on generally fresh, brackish or saline wetlands with exposed mudflats at the edges. It is found in terrestrial wetlands including lakes, swamps, pools, lagoons, tidal rivers, swampy fields and floodlands and occasionally on sheltered coasts, in harbours, estuaries, seashores, sewage farms and saltworks. It is also sometimes found on wetlands surrounded by dense vegetation including grass, sedges, saltmarsh and reeds and has been observed on sand spits and other sandy habitats including shingles. It forages on mudflats, in shallow water and occasionally on dry mud, dry waterside plants and in swampy areas in sewage farms. It prefers to roost amongst shorter vegetation (Higgins and Davies 1996).	Moderate – not common locally but there is a record for this species in the study area, and it may intermittently occur when habitat conditions are favourable.
<i>Pluvialis fulva</i>	Pacific Golden Plover	–	M		Bionet, PMST	–	Prefers sandy, muddy or rocky shores, estuaries and lagoons, reefs, saltmarsh, and or short grass in paddocks and crops. The species is usually coastal, including offshore islands; rarely far inland. Often observed on beaches and mudflats, sandflats and occasionally rock shelves, or where these substrates intermingle; harbours, estuaries and lagoons.	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Pluvialis squatarola</i>	Grey Plover	–	M		Bionet, PMST	–	In non-breeding grounds in Australia, Grey Plovers occur almost entirely in coastal areas, where they usually inhabit sheltered embayments, estuaries and lagoons with mudflats and sandflats, and occasionally on rocky coasts with wave-cut platforms or reef-flats, or on reefs within muddy lagoons. They also occur around terrestrial wetlands such as near-coastal lakes and swamps, or salt-lakes. The species is also very occasionally recorded further inland, where they occur around wetlands or salt-lakes (Marchant and Higgins 1993). They usually forage on large areas of exposed mudflats and beaches and occasionally in pasture and on muddy margins of inland wetlands (Marchant and Higgins 1993). They usually roost in sandy areas, such as on unvegetated sandbanks or sand-spits on sheltered beaches or other sheltered environments (Pegler 1983, Jaensch, Vervest et al. 1988).	Moderate – records for this species adjacent to the study area, may occur when habitat conditions are favourable.
<i>Pterodroma solandri</i>	Providence Petrel	V	–		Bionet	–	A marine species that breeds at Norfolk island and breeds within earth burrows often within rainforest. Occurs across the western Tasman Sea and the entire north Pacific Ocean (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Ptilinopus magnificus</i>	Wompoo Fruit-dove	V	–		Bionet	–	Occurs in rainforests, monsoon forests, adjacent eucalypt forests, fruiting trees on scrubby creeks or in open country (Garnett and Crowley 2000).	Low – the study area does not provide suitable habitat opportunities for this species.
<i>Ptilinopus superbus</i>	Superb Fruit-dove	V	–		Bionet	–	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. 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. Part of the population is migratory or nomadic.	Low – the study area does not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Pycnoptilus floccosus</i>	Pilotbird	–	V		PMST	–	The Pilotbird occurs in the ranges of south-eastern Australia. It is a wet forest bird generally frequenting dense vegetation on the forest floor. The name Pilotbird is derived from its association with the Superb Lyrebird, which it sometimes follows to pick up leaf litter invertebrates that the Lyrebird digs up. It does not occur further north than the Hunter River valley with the most northerly records occurring inland in Wollemi National Park and the Watagan Ranges on the western side of Lake Macquarie.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Rhipidura rufifrons</i>	Rufous Fantail	–	M		PMST	–	Occurs in a range of habitats including the undergrowth of rainforests/wetter eucalypt forests/gullies, monsoon forests paperbarks, sub-inland and coastal scrubs, mangroves, watercourses, parks and gardens. When migrating they may also be recorded on farms, streets and buildings. Migrates to SE Australia in October-April to breed, mostly in or on the coastal side of the Great Dividing Range (Pizzey and Knight 2012).	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there are records adjacent to the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.
<i>Rostratula australis</i>	Australian Painted Snipe	E	E	–	Bionet, PMST, BAM-C	Predicted	The Australian Painted Snipe is restricted to Australia. Most records are from the southeast, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (Department of the Environment and Heritage 2003).	Moderate – not commonly encountered locally but there are occurrences on Ash Island and elsewhere on the Hunter River floodplain. Despite the lack of records in the study area, it contains suitable habitat, and the lack of records is likely a function of the bird's spasmodic use of regional habitats, its cryptic nature and a paucity of survey effort owing to the site's inaccessibility to the general birding community.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Stagonopleura guttata</i>	Diamond Firetail	V	–	No	Bionet	–	Distributed through central and eastern NSW, extending north into southern and central Queensland and south through Victoria to the Eyre Peninsula, South Australia. In NSW, the species occurs predominantly west of the Great Dividing Range, although populations are known from drier coastal areas (Blakers, Davies et al. 1984, Schodde and Mason 1999). Occurs in a range of eucalypt dominated communities with a grassy understorey including woodland, forest and mallee. Most populations occur on the inland slopes of the dividing range (Garnett and Crowley 2000). Firetails nest in trees and bushes, and forage on the ground, largely for grass seeds and other plant material, but also for insects (Blakers, Davies et al. 1984, Houlden, Costello et al. 1999).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Sterna hirundo</i>	Common Tern	–	M		Bionet	–	A non-breeding migrant to Australia, occurring mainly on the east coast and inhabiting marine, pelagic and coastal habitats. Mostly oceanic but often recorded in bays, harbours and estuaries and occasionally in coastal wetlands. Roosting occurs on unvegetated intertidal sandy ocean beaches, shores of estuaries, lagoons and sand bars (Higgins and Davies 1996).	Low – occurs regularly in the Hunter estuary and while rare occurrences cannot be entirely discounted, the study area does not contain habitats preferred by this species.
<i>Sterna albifrons</i>	Little Tern	V	–		Bionet	–	Little Terns inhabit sheltered coastal environments, including lagoons, estuaries, river mouths and deltas, lakes, bays, harbours and inlets. They nest on sand-spits, sandbanks, ridges or islets in these habitats or gently sloping sandy ocean beaches and occasionally in sand-dunes (Garnett and Crowley 2000).	Low – occurs regularly in the Hunter estuary and while rare occurrences cannot be entirely discounted, the study area does not contain habitats preferred by this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Sternula nereis nereis</i>	Australian Fairy Tern	–	V		PMST	–	Fairy Terns utilise a variety of habitats including offshore, estuarine or lacustrine (lake islands, wetlands, beaches and spits. The subspecies may migrate within southern Western Australia and Tasmania, where they are seen less frequently during the winter months. They are more sedentary in the north of Western Australia, and in South Australia and Victoria (Hill 1988). Fairy Terns nest in small colonies on coral shingle on continental islands or coral cays, on sandy islands and beaches inside estuaries, and on open sandy beaches (Hill 1988, Higgins and Davies 1996). They nest above the high water mark often in clear view of the water and on sites where the substrate is sandy and the vegetation low and sparse. Colonies tend to occupy areas rather than specific sites, and nest sites are often abandoned after one year, even if they have been successful (Saunders 1985).	Low – there are no confirmed records for this species in NSW north of Sydney and available habitats not favoured by this species.
<i>Stictonetta naevosa</i>	Freckled Duck	V	–	No	Bionet	–	In most years this species appears to be nomadic between ephemeral inland wetlands. In dry years they congregate on permanent wetlands while in wet years they breed prolifically and disperse widely, generally towards the coast. In inland eastern Australia, they generally occur in brackish to hyposaline wetlands that are densely vegetated with <i>Lignum</i> (<i>Muehlenbeckia cunninghamii</i>) within which they build their nests (Garnett and Crowley 2000).	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Symposiachrus trivirgatus</i>	Spectacled Monarch	–	M		PMST	–	Seasonally frequents mountain/lowland rainforests, thickly wooded gullies, and riparian gallery vegetation. Migrates to NE NSW in summer to breed and generally common throughout its range but occurs sparsely as far south as Broken Bay.	Moderate – while the study area and adjacent habitats do not provide suitable habitat for territory establishment, there is a record in the study area and rare occurrences of migrating or dispersing individuals may seasonally occur.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Thalassarche bulleri</i>	Buller's Albatross	–	V		PMST	–	The subspecies most commonly encountered off NSW coasts is <i>T. b. platei</i>, see text below.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche bulleri platei</i>	Northern Buller's Albatross	–	V		PMST	–	The Pacific Albatross is a non-breeding visitor to Australian waters. Foraging birds are mostly limited to the Pacific Ocean and the Tasman Sea, although birds do reach the east coast of the Australian mainland (EA 2001f). The Pacific Albatross is a marine, pelagic species. It occurs in subtropical and subantarctic waters of the South Pacific Ocean (Marchant & Higgins 1990). Habitat preferences are poorly known (Marchant & Higgins 1990). In New Zealand, the species has been observed in association with fishing boats close inshore and over waters of 180–360 m depth (Robertson & Jenkins 1981; Secker 1969) although it is not so strongly associated with fishing grounds as are other albatrosses (Bartle 1974). Occurrence within the Australian Fishing Zone is likely (Garnett & Crowley 2000), however, the threat from longline injury is considered low (AGDEH 2006q).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche cauta</i>	Shy Albatross	V	E		PMST	–	An Australian territory endemic, which breeds on three islands off southern Tasmania; Albatross, Bass and Pedra Branca Islands (Marchant and Higgins 1990). Genetic data studies on shy-type albatross collected off New Zealand, Australia and South Africa, strongly suggest that most Shy Albatross remain close to the breeding grounds throughout the year, with few birds moving north beyond the southern NSW coasts (Abbott 2006).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche eremita</i>	Chatham Albatross	–	E		PMST	–	Very restricted breeding on Pyramid Rock, Chatham Island (Garnett and Crowley 2000). Many disperse eastwards as far as South America, but it is occasionally encountered off eastern Australia's southern coasts (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Thalassarche impavida</i>	Campbell Albatross	–	V		PMST	–	Recently separated from the closely related Black-browed Albatross and only separable from this species in individuals of sufficient age to develop the distinctive amber iris. Breeds on Campbell Island New Zealand foraging locally during this period (Garnett and Crowley 2000). Outside the breeding season forages around New Zealand, the Central Pacific and Australia (Garnett and Crowley 2000).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche melanophris</i>	Black-browed Albatross	V	V		PMST	–	Nomadic marine species that breeds on subantarctic island outside Australian waters, but moves northwards in non-breeding seasons. The waters off southern Australia between Brisbane and Perth are the principal feeding area of birds (Garnett and Crowley 2000). Black-browed-type albatross are more regularly observed from shore than more pelagic albatross species.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche salvini</i>	Salvin's Albatross	–	V		PMST	–	An oceanic species that breeds on Bounty, Snares and Chatham Islands, south of New Zealand, and Crozet Island in the southern Indian Ocean (Garnett and Crowley 2000). Most individuals disperse east to the eastern Pacific Ocean from the breeding grounds, but a few individuals visit Australian waters, although few reach north of southern NSW.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalassarche steadi</i>	White-capped Albatross	–	V		PMST	–	An oceanic species that breeds on Adams, Auckland, Bollons, Disappointment and Chatham Islands south of New Zealand (Garnett and Crowley 2000). Global population between 70,000 and 80,000 pairs the majority of which breed on Disappointment Island (Garnett and Crowley 2000). During the breeding season most birds remain around the breeding islands and into the Tasman Sea (Garnett and Crowley 2000). Outside of the breeding season genetic data from bycatch studies strongly indicates that White-capped Albatross wander widely in Australasian waters and west as far as South Africa (Abbott 2006).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Thalasseus bergii</i>	Crested Tern	–	M		Bionet	–	Mostly coastal, on exposed ocean beaches or in sheltered embayments, such as bays, harbours, inlets, estuaries and lagoons. Rarely far inland but may move up rivers and creeks, occasionally on coastal saline lakes and salt ponds (Higgins and Davies 1997).	High – records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Tringa brevipes</i>	Grey-tailed Tattler	–	M		Bionet, PMST	–	It is often found on sheltered coasts with reefs, rock platforms or with intertidal mudflats. It is also found at intertidal rocky, coral or stony reefs, platforms and islets that are exposed at low tide. It has also been found in embayments, estuaries and coastal lagoons, especially fringed with mangroves. It is rarely seen on open beaches and occasionally found around near-coastal wetlands, such as lagoons, lakes and ponds in sewage farms and saltworks. Inland records for the species are rare (Higgins and Davies 1996). The species forages in shallow water, hard intertidal substrates, rock pools, intertidal mudflats, mangroves, banks of seaweed and among rocks and coral rubble, over which water may surge. The species roosts in mangroves, dense stands of shrubs, snags, rocks, beaches, reefs, artificial structures (sea walls, oyster racks), occasionally in near-coastal saltworks and sewage ponds and rarely on sandy beaches or sand banks (Higgins and Davies 1996, Rogers 1999).	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa glareola</i>	Wood Sandpiper	–	M		Bionet	–	Found in well-vegetated, shallow, freshwater wetlands, such as swamps, billabongs, lakes, pools and waterholes. They are typically associated with emergent, aquatic plants or grass, and dominated by taller fringing vegetation, such as dense stands of rushes or reeds, shrubs, or dead or live trees and often with fallen timber. They also inhabit inundated grasslands, short herbage or wooded floodplains, where floodwaters are temporary or receding, and irrigated crops. This species uses artificial wetlands, including open sewage ponds, reservoirs, large farm dams, and bore drains and occasionally found in stony wetlands. The species forages on mud at the edges of wetlands, either along shores, among open scattered aquatic vegetation, or in clear shallow water.	Moderate – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa incana</i>	Wandering Tattler	–	M		Bionet	–	Generally found on rocky coasts with reefs and platforms, points, spits, piers, offshore islands and shingle beaches or beds. Occasionally seen on coral reefs or beaches and tends to avoid mudflats. Foraging habitat is among rocks or shingle, or in shallow pools at edges of reefs or beaches, mainly along the tideline. Wandering Tattlers have been recorded roosting or perching on top of boulders surrounded by or close to water (Higgins and Davies 1996).	Moderate – few records for this species locally, but it is a cryptic species, there is habitat in the study area, and it may rarely occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Tringa nebularia</i>	Common Greenshank	–	M		Bionet, PMST	–	Occurs in a range of inland and coastal environments. Inland, it occurs in both permanent and temporary wetlands, billabongs, swamps, lakes floodplains, sewage farms, saltworks ponds, flooded irrigated crops. On the coast, it occurs in sheltered estuaries and bays with extensive mudflats, mangrove swamps, muddy shallows of harbours and lagoons, occasionally rocky tidal ledges. It generally prefers wet and flooded mud and clay rather than sand.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tringa stagnatilis</i>	Marsh Sandpiper	–	M		Bionet, PMST	–	Occurs in coastal and inland wetlands (salt or fresh water), estuarine and mangrove mudflats, beaches, shallow or swamps, lakes, billabongs, temporary floodwaters, sewage farms and saltworks ponds.	High – records for this species in the study area, may occur when habitat conditions are favourable.
<i>Tyto longimembris</i>	Eastern Grass Owl	V	–		Bionet	–	Typically found in tussock-grasslands but also occur in heathland, swamps, coastal dunes, tree-lined creeks, treeless plains, grassy gaps between trees and crops. Nest on the ground generally under tussocks. They generally feed on rodents but will also eat insects (Pizzey and Knight 2012).	High – the study area contains suitable foraging habitat for this species, and records adjacent to the study area.
<i>Tyto novaehollandiae</i>	Masked Owl	V	–	No	Bionet,	–	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. 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.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Xenus cinereus</i>	Terek Sandpiper	V	M		Bionet, PMST	–	In Australia widespread and common along north and east coasts than along south coastlines. It inhabits coastal areas, mostly saline intertidal mudflats in sheltered estuaries, embayments, harbours and lagoons; on islets, mudbanks or sandbanks and spits; often around mangroves (Higgins and Davies 1997).	Moderate – old records for this species in the study area, may occur when habitat conditions are favourable.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
Mammals								
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	–		Bionet,		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. Found in a broad range of habitats from rainforest through sclerophyll (including Box-Ironbark) forest and woodland to heath, but in most areas woodlands and heath appear to be preferred, except in north-eastern NSW where they are most frequently encountered in rainforest. 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.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Yes	Bionet, PMST BAM-C	Candidate	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (<i>Petrochelidon ariel</i>), frequenting low to mid-elevation dry open forest and woodland close to these features. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Found in well-timbered areas containing gullies (Schultz, Coles et al. 1999).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll (Southeastern mainland population)	V	E		PMST	–	Occurs from the Bundaberg area in south-east Queensland, south through NSW to western Victoria and Tasmania. In NSW, it occurs on both sides of the Great Dividing Range and north-east NSW represents a national stronghold (NSW National Parks and Wildlife Service 1999). Occurs in wide range of forest types, although appears to prefer moist sclerophyll and rainforest forest types, and riparian habitat. Most common in large unfragmented patches of forest. It has also been recorded from dry sclerophyll forest, open woodland and coastal heathland, and despite its occurrence in riparian areas, it also ranges over dry ridges. Nests in rock caves and hollow logs or trees. Feeds on a variety of prey including birds, terrestrial and arboreal mammals, small macropods, reptiles and arthropods (NSW National Parks and Wildlife Service 1999, NSW National Parks and Wildlife Service 1999).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V	–		Bionet,	–	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. 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.	Moderate – the study area contains potential foraging habitat for this species, there are potential roosting habitats adjacent to the study area and a single record from within the study area.
<i>Megaptera novaeangliae</i>	Humpback Whale	V	V		Bionet,	–	Marine species with a worldwide distribution. Coastal off Australia in winter and spring, recorded from all states except Northern Territory. Annual migrations between warm water breeding grounds, ca 15-20°S (but some records much further north), and summer colder water (Antarctic) feeding grounds, to 60-70°S. May approach close to coast on migration (Bannister, Kemper et al. 1996).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	–		Bionet,	–	Thought to live in sclerophyll forest and woodland. Small colonies have been found in tree hollows or under loose bark. It feeds on insects above the forest canopy or in clearings at the forest edge (Churchill 1998).	High – the study area contains suitable foraging habitat for this species, there are potential roosting habitats adjacent to the study area and records from within the study area.
<i>Miniopterus australis</i>	Little Bent-winged Bat	V	–		Bionet,	–	Found along east coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. 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. Only five nursery sites /maternity colonies are known in Australia.	High – the study area contains suitable foraging habitat for this species, and there are records from within the study area. The study area is unlikely to provide roosting habitats for this species.
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	–		Bionet	–	Eastern Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer. At other times of the year, populations disperse within about 300 km range of maternity caves. Hunt in forested areas, catching moths and other flying insects above the tree tops.	High – the study area contains suitable foraging habitat for this species, and there are records from within the study area. The study area is unlikely to provide roosting habitats for this species.
<i>Myotis macropus</i>	Southern Myotis	V	–	No	Bionet, BAM-C	Candidate	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. Generally roosts in groups of 10–15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	High – the study area contains suitable foraging habitat for this species, there are potential roosting habitats adjacent to the study area and records from within the study area.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Petauroides volans</i>	Greater Glider	–	E		PMST	–	The Greater Glider has a restricted distribution in eastern Australia, from the Windsor Tableland in north Queensland to central Victoria, with an elevated range from sea level to 1200 m above sea level. The species is largely restricted to eucalypt forests and woodlands, feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. It is found in abundance in montane eucalypt forest with relatively old trees and an abundance of hollows. It also favours forests with a diversity of eucalypts to cater for seasonal variation in food abundance (McKay 2008), (Comport, Ward et al. 1996).	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	–		Bionet	–	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites. Diet varies seasonally and consists of Acacia gum, eucalypt sap, nectar, honeydew and manna, with invertebrates and pollen providing protein.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Petaurus australis australis</i>	Yellow-bellied Glider (Southeastern)	V	V		PMST	–	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria. Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Feed primarily on plant and insect exudates, including nectar, sap, honeydew and manna with pollen and insects providing protein. Extract sap by incising (or biting into) the trunks and branches of favoured food trees, often leaving a distinctive ‘V’-shaped scar. Very mobile and occupy large home ranges between 20 to 85 ha to encompass dispersed and seasonally variable food resources.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Phascolarctos cinereus</i>	Koala	V	E	No	Bionet, PMST	–	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. It was briefly historically abundant in the 1890s in the Bega District on the south coast of NSW, although not elsewhere, but it now occurs in sparse and possibly disjunct populations. Koalas are also known from several sites on the southern tablelands. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. Some preferred species include Forest Red Gum, Grey Gum. In coastal areas, Tallowwood and Swamp Mahogany are important food species, while in inland areas White Box, Bimble Box and River Red Gum are favoured. Home range size varies with quality of habitat, ranging from less than two hectares to several hundred hectares in size.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (Northern)	V	V		PMST	–	he 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 760mm. 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. The fruit-bodies of hypogeous (underground-fruited) fungi are a large component of the diet of the Long-nosed Potoroo. They also eat roots, tubers, insects and their larvae and other soft-bodied animals in the soil. Individuals are mainly solitary, non-territorial and have home range sizes ranging between 2-5 ha.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAIL ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	–	V		Bionet, PMST	–	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, New South Wales and Queensland. Genetic evidence indicates that the New Holland Mouse once formed a single continuous population on mainland Australia and the distribution of recent subfossils further suggest that the species has undergone a large range contraction since European settlement. Total population size of mature individuals is now estimated to be less than 10,000 individuals although, given the number of sites from which the species is known to have disappeared between 1999 and 2009, it is likely that the species' distribution is actually smaller than current estimates. Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	Low – the study area and adjacent habitats do not provide suitable habitat opportunities for this species.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V		Bionet, PMST	–	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. 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. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km (Department of Environment Climate Change and Water 2009). Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines (Eby 1991).	Low – While local individuals are likely to fly over the study area regularly, as they move between foraging resources, it supports no foraging or roosting habitats for this species.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail Bat	V	–	No	Bionet, BAM-C	Predicted	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range – most of Victoria, south-western NSW and adjacent South Australia – it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.	Moderate – a large bat using a range of habitat types and records throughout the area. Occasional foraging over the cannot be discounted, but there are no roosting habitats in the study area.

Scientific name	Common name	BC Act ¹	EPBC Act ²	SAII ³	Source ⁴	BAM–C ⁵	Habitat suitability ⁶	Likelihood of occurrence
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	–		Bionet	–	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. 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. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3–6 m.	Moderate – There is no suitable roosting habitat for this species within the study area or adjacent lands, but it may intermittently forage over the study area.
<i>Vespadelus troungtoni</i>	Eastern Cave Bat	V	–	Yes	Bionet	–	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally in colonies of up to 500 individuals. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Low – Local records for this species are associated with forested habitats at Tomago to the north, and habitat for this species within the study area and adjacent lands is of relatively poor quality.

- (1) Listed under the *Biodiversity and Conservation Act 2016*: CE = Critically endangered, E = Endangered, V = Vulnerable: Listed under the *Fisheries Management Act 1994*: E = Endangered, V = Vulnerable
- (2) Listed under the *Environmental Protection and Biodiversity Conservation Act 1999*: CD = Conservation Dependent, CE = Critically endangered, E = Endangered, V = Vulnerable, M = Migratory
- (3) SAII = Serious and Irreversible Impact
- (4) Sources include BAM-C = Biodiversity Assessment Method Calculator, PMST = The Department of the Environment and Energy's EPBC Protected Matters Search Tool, BioNet = ESS's Bionet Atlas of NSW Wildlife, ALA = Atlas of Living Australia spatial search tool, PlantNet = National Herbarium of New South Wales - NSW FLORA ONLINE Search Tool.
- (5) Credit type as output by the BAM-C: Predicted = predicted ecosystem credit species, Candidate = candidate species credit species
- (6) Unless otherwise stated (in-text references) all information for habitat suitability has been sourced from BioNet Atlas of NSW Wildlife

Appendix B

EPBC Act Protected matters search tool
results





Australian Government

Department of Climate Change, Energy,
the Environment and Water

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: 15-Dec-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	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	7
Listed Threatened Species:	92
Listed Migratory Species:	77

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 environment anywhere.

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 <https://www.dcceew.gov.au/parks-heritage/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:	110
Commonwealth Heritage Places:	2
Listed Marine Species:	101
Whales and Other Cetaceans:	12
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:	8
Regional Forest Agreements:	1
Nationally Important Wetlands:	3
EPBC Act Referrals:	71
Key Ecological Features (Marine):	None
Biologically Important Areas:	7
Bioregional Assessments:	1
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar Wetlands)		[Resource Information]
Ramsar Site Name	Proximity	Buffer Status
Hunter estuary wetlands	Within Ramsar site	In feature area

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
Central Hunter Valley eucalypt forest and woodland	Critically Endangered	Community may occur within area	In feature area
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
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may 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
Subtropical and Temperate Coastal Saltmarsh	Vulnerable	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In buffer area only

Listed Threatened Species			[<u>Resource Information</u>]
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			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely 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 feature area
Callocephalon fimbriatum Gang-gang Cockatoo [768]	Endangered	Species or species habitat known to occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known 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 feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Erythroriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to 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 feature area

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 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 may 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 may occur within area	In feature area
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FISH			
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Seriolella brama Blue Warehou [69374]	Conservation Dependent	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thunnus maccoyii Southern Bluefin Tuna [69402]	Conservation Dependent	Species or species habitat likely to occur within area	In feature area
FROG			
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat known to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In feature area
Uperoleia mahonyi Mahony's Toadlet [89189]	Endangered	Species or species habitat known to occur within area	In feature area
MAMMAL			
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may 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 likely to occur within area	In feature area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only
Notamacropus parma Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Petauroides volans Greater Glider (southern and central) [254]	Endangered	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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Roosting known to occur within area	In feature area
PLANT			
Angophora inopina			
Charmhaven Apple [64832]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Asperula asthenes			
Trailing Woodruff [14004]	Vulnerable	Species or species habitat may 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
Commersonia prostrata			
Dwarf Kerrawang [87152]	Endangered	Species or species habitat known 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
Diuris praecox			
Newcastle Doubletail [55086]	Vulnerable	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Eucalyptus camfieldii Camfield's Stringybark [15460]	Vulnerable	Species or species habitat known to occur within area	In feature area
Eucalyptus parramattensis subsp. decadens Earp's Gum, Earp's Dirty Gum [56148]	Vulnerable	Species or species habitat known to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Grevillea parviflora subsp. parviflora Small-flower Grevillea [64910]	Vulnerable	Species or species habitat known to occur within area	In feature area
Grevillea shiressii [19186]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat known to occur within area	In feature area
Pomaderris brunnea Rufous Pomaderris, Brown Pomaderris [16845]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Prasophyllum sp. Wybong (C.Phelps ORG 5269) a leek-orchid [81964]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pterostylis gibbosa Illawarra Greenhood, Rufa Greenhood, Pouched Greenhood [4562]	Endangered	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 known to occur within area	In feature area
Rutidosis heterogama Heath Wrinklewort [13132]	Vulnerable	Species or species habitat known to occur within area	In buffer area only
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat known to occur within area	In feature area
Tetratheca juncea Black-eyed Susan [21407]	Vulnerable	Species or species habitat known to occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat may occur within area	In feature area
REPTILE			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

SHARK			
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat likely 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 likely to occur within area	In feature area

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 likely to occur within area	In feature area
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 buffer area only
Ardenna grisea Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area

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

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 may 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 feature area
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 feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Migratory Marine Species

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Eubalaena australis as Balaena glacialis australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status	
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat likely to occur within area	In feature area	
Megaptera novaeangliae Humpback Whale [38]		Species or species habitat known to occur within area	In buffer area only	
Mobula alfredi as Manta alfredi Reef Manta Ray, Coastal Manta Ray [90033]		Species or species habitat may occur within area	In feature area	
Mobula birostris as Manta birostris Giant Manta Ray [90034]		Species or species habitat may occur within area	In feature area	
Natator depressus Flatback Turtle [59257]		Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Orcinus orca Killer Whale, Orca [46]		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
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
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 known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Roosting 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 melanotos Pectoral Sandpiper [858]		Species or species habitat known to occur within area	In feature area
Calidris ruficollis Red-necked Stint [860]		Roosting known to occur within area	In feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 feature area
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 feature area
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting known to occur within 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	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	In feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pluvialis fulva Pacific Golden Plover [25545]		Roosting known to occur within area	In feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area	In feature area
Tringa brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area
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 feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area	In feature area

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
Commonwealth Bank of Australia		
Commonwealth Land - Commonwealth Bank of Australia [11596]	NSW	In buffer area only
Commonwealth Trading Bank of Australia		
Commonwealth Land - Commonwealth Trading Bank of Australia [16019]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [11591]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [11703]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [11532]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [11682]	NSW	In buffer area only
Commonwealth Land - Commonwealth Trading Bank of Australia [11685]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Australian Broadcasting Corporation		
Commonwealth Land - Australian Broadcasting Corporation [11595]	NSW	In buffer area only
Communications, Information Technology and the Arts - Australian Postal Corporation		
Commonwealth Land - Australian Postal Commission [11592]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11593]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11710]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11653]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11680]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11594]	NSW	In buffer area only
Commonwealth Land - Australian Postal Commission [11687]	NSW	In buffer area only
Commonwealth Land - Australian Postal Corporation [11690]	NSW	In buffer area only
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Australian & Overseas Telecommunications Corporation [11686]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11600]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11671]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11672]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11701]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11619]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11597]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11658]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11700]	NSW	In feature area
Commonwealth Land - Australian Telecommunications Commission [11702]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11708]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11655]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Australian Telecommunications Commission [11656]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [16433]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11657]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11622]	NSW	In buffer area only
Commonwealth Land - Australian Telecommunications Commission [11681]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11618]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11711]	NSW	In buffer area only
Commonwealth Land - Telstra Corporation Limited [11689]	NSW	In buffer area only
Defence		
Commonwealth Land - Defence Service Homes Corporation [11679]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11675]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11598]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11673]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11617]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11615]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11705]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11524]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11640]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11616]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11693]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11692]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11691]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11698]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11699]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11696]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Service Homes Corporation [11697]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11694]	NSW	In buffer area only
Commonwealth Land - Defence Service Homes Corporation [11695]	NSW	In buffer area only
Commonwealth Land - Director of Defence Service Homes [11621]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11228]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11219]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11220]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11221]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11222]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11223]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11229]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11225]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11224]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11227]	NSW	In buffer area only
Defence - ADF CAREERS REFERENCE CENTRE [11226]	NSW	In buffer area only
Defence - OFFICES [11195]	NSW	In buffer area only
Defence - STOCKTON RIFLE RANGE [10057]	NSW	In buffer area only
Defence - TS TOBRUK [10053]	NSW	In buffer area only
Defence - Defence Housing Authority		
Commonwealth Land - Defence Housing Authority [16171]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16170]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16173]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16172]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11678]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16165]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16166]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11559]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - Defence Housing Authority [16169]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11555]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11554]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15442]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16167]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15444]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15443]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11556]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [16168]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11534]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11536]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11535]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11533]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [15484]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11569]	NSW	In buffer area only
Commonwealth Land - Defence Housing Authority [11688]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11676]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11677]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11704]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11652]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11654]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11620]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11683]	NSW	In buffer area only
Commonwealth Land - Director of War Service Homes [11639]	NSW	In buffer area only
Unknown		
Commonwealth Land - [15660]	NSW	In buffer area only
Commonwealth Land - [11599]	NSW	In buffer area only

Commonwealth Land Name	State	Buffer Status
Commonwealth Land - [11709]	NSW	In buffer area only
Commonwealth Land - [11707]	NSW	In buffer area only
Commonwealth Land - [11706]	NSW	In buffer area only
Commonwealth Land - [11501]	NSW	In buffer area only
Commonwealth Land - [11684]	NSW	In buffer area only
Commonwealth Land - [16434]	NSW	In buffer area only

Commonwealth Heritage Places		[Resource Information]	
Name	State	Status	Buffer Status
Historic			
Fort Wallace	NSW	Listed place	In buffer area only
Nobbys Lighthouse	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
Anous stolidus			
Common Noddy [825]		Species or species habitat likely to occur within area	In feature area
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 buffer area only
Ardenna grisea as Puffinus griseus			
Sooty Shearwater [82651]		Species or species habitat likely to occur within area	In feature area
Arenaria interpres			
Ruddy Turnstone [872]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Breeding likely to 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 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
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 feature area
Calidris tenuirostris Great Knot [862]	Critically Endangered	Roosting known to occur within area overfly marine area	In feature area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat known to occur within area	In feature area
Charadrius bicinctus Double-banded Plover [895]		Roosting known to occur within area overfly marine 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 feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Charadrius ruficapillus Red-capped Plover [881]		Roosting known to occur within area overfly marine area	In feature area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea antipodensis gibsoni as Diomedea gibsoni Gibson's Albatross [82270]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea epomophora Southern Royal Albatross [89221]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea exulans Wandering Albatross [89223]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered	Species or species habitat may occur within area	In feature area
Fregata ariel Lesser Frigatebird, Least Frigatebird [1012]		Species or species habitat known to occur within area	In feature area
Fregata minor Great Frigatebird, Greater Frigatebird [1013]		Species or species habitat likely to occur within area	In feature area
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 feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Gallinago stenura Pin-tailed Snipe [841]		Roosting likely to occur within area overfly marine area	In feature area
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 feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limicola falcinellus Broad-billed Sandpiper [842]		Roosting 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 feature area
Macronectes giganteus Southern Giant-Petrel, Southern Giant Petrel [1060]	Endangered	Species or species habitat may occur within area	In feature area
Macronectes halli Northern Giant Petrel [1061]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 known to occur within area overfly marine area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]		Species or species habitat may 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 feature area
Numenius phaeopus Whimbrel [849]		Roosting known to occur within area	In feature area
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Phaethon lepturus White-tailed Tropicbird [1014]	Vulnerable	Species or species habitat known to occur within area	In feature area
Philomachus pugnax Ruff (Reeve) [850]		Roosting known to occur within area overfly marine area	In feature area
Phoebetria fusca Sooty Albatross [1075]		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 feature area
Pluvialis squatarola Grey Plover [865]		Roosting known to occur within area overfly marine area	In feature area
Recurvirostra novaehollandiae Red-necked Avocet [871]	Endangered	Roosting known to occur within area overfly marine area	In feature area
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]		Species or species habitat known to occur within area overfly marine area	In feature area
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 may 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

Scientific Name	Threatened Category	Presence Text	Buffer Status
Thalassarche bulleri Buller's Albatross, Pacific Albatross [64460]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche bulleri platei as Thalassarche sp. nov. Northern Buller's Albatross, Pacific Albatross [82273]	Vulnerable	Species or species habitat may occur within area	In feature area
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 feature area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Foraging, feeding or related behaviour may occur within area	In feature area
Thalassarche impavida Campbell Albatross, Campbell Black-browed Albatross [64459]	Vulnerable	Species or species habitat may occur within area	In feature area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area	In feature area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Tringa brevipes as Heteroscelus brevipes Grey-tailed Tattler [851]		Roosting known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
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 feature area
Xenus cinereus Terek Sandpiper [59300]		Roosting known to occur within area overfly marine area	In feature area
Fish			
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		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
Hippocampus abdominalis Big-belly Seahorse, Eastern Potbelly Seahorse, New Zealand Potbelly Seahorse [66233]		Species or species habitat may 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
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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

Scientific Name	Threatened Category	Presence Text	Buffer Status
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
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
Dugong dugon Dugong [28]		Species or species habitat may occur within area	In buffer area only
Reptile			
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area	In feature area
Chelonia mydas Green Turtle [1765]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area	In feature area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
Natator depressus Flatback Turtle [59257]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may 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 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
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 likely 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
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 may occur within area	In buffer area only

Current Scientific Name	Status	Type of Presence	Buffer Status
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may 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
Blue Gum Hills	Regional Park	NSW	In buffer area only
Glenrock	State Conservation Area	NSW	In buffer area only
Hexham Swamp	NRS Addition - Gazettal in Progress	NSW	In buffer area only
Hunter Wetlands	National Park	NSW	In feature area
Pambalong	Nature Reserve	NSW	In buffer area only
Tilligerry	State Conservation Area	NSW	In buffer area only
Worimi	State Conservation Area	NSW	In buffer area only
Worimi	Regional Park	NSW	In buffer area only

Regional Forest Agreements	[Resource Information]
Note that all areas with completed RFAs have been included.	
RFA Name	State
North East NSW RFA	New South Wales

Nationally Important Wetlands	[Resource Information]
Wetland Name	State
Hexham Swamp	NSW
Kooragang Nature Reserve	NSW
Shortland Wetlands Centre	NSW

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
M1 Motorway extension to Raymond Terrace, NSW	2018/8288		Approval	In buffer area only
Controlled action				
Cabbage Tree Road Sand Quarry, Williamtown, NSW	2016/7852	Controlled Action	Post-Approval	In buffer area only
Construction and Sequential Filling of Waste Emplacement Facility	2008/4652	Controlled Action	Post-Approval	In feature area
Former Rifle Range Residential Development, Popplewell Road, Fern Bay, NSW	2017/7993	Controlled Action	Proposed Decision	In buffer area only
Gas Transmission Pipeline	2011/5917	Controlled Action	Completed	In feature area
Gloucester Coal Seam Methane Gas Project	2008/4432	Controlled Action	Post-Approval	In buffer area only
Hunter River Port and Transport Corridor	2001/419	Controlled Action	Completed	In feature area
Hunter River south arm dredging	2003/950	Controlled Action	Post-Approval	In feature area
Kooragang Island Waste Emplacement Facility - Area 2 Closure Works, NSW	2016/7670	Controlled Action	Post-Approval	In feature area
Kooragang Wetland Rehabilitation Project	2007/3220	Controlled Action	Post-Approval	In feature area
Kurri Kurri Lateral Pipeline Project	2021/9113	Controlled Action	Assessment Approach	In buffer area only
Newcastle gas storage facility project	2010/5752	Controlled Action	Post-Approval	In buffer area only
Newcastle inner city bypass Rankin Park to Jesmond NSW	2015/7550	Controlled Action	Post-Approval	In buffer area only
Newcastle LNG export facility	2011/5915	Controlled Action	Completed	In buffer area only
Newcastle Power Station Project, Tomago, NSW	2019/8425	Controlled Action	Post-Approval	In buffer area only
Nobby's Lighthouse redevelopment	2006/3179	Controlled Action	Completed	In buffer area only
Northbank Enterprise Hub	2021/9058	Controlled Action	Guidelines Issued	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Northbank Enterprise Hub, Industrial and Business Park	2010/5660	Controlled Action	Completed	In buffer area only
Port Site and Materials Handling Development	2001/242	Controlled Action	Completed	In feature area
Protech Cold Mill Facility	2001/274	Controlled Action	Post-Approval	In feature area
Queensland Hunter Gas Pipeline, approximately 825 km in length	2008/4483	Controlled Action	Completed	In feature area
Remediation Works, Kooragang island waste facility emplacement facility NSW	2011/5920	Controlled Action	Completed	In feature area
Residential development, Hillsborough, NSW	2014/7217	Controlled Action	Further Information Request	In buffer area only
River Dredging Operations	2001/249	Controlled Action	Completed	In feature area
Rutile and Zircon Mining on Stockton Rifle Range	2000/8	Controlled Action	Post-Approval	In buffer area only
Steel Mill	2001/231	Controlled Action	Completed	In buffer area only
Terminal 4 Coal Export Terminal Project, Kooragang Island	2011/6029	Controlled Action	Post-Approval	In feature area
Tomago Road Industrial Subdivision	2007/3343	Controlled Action	Post-Approval	In buffer area only
Williamtown Aerospace Park, industrial subdivision and development to service e	2009/5063	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Abel Coal Project	2007/3695	Not Controlled Action	Completed	In buffer area only
Blue Gum Vista Estate Residential development off Minmi Road	2004/1507	Not Controlled Action	Completed	In buffer area only
construction of a hydrological control structure at the mouth of Wader Creek and	2002/780	Not Controlled Action	Completed	In feature area
Construction of a Jetty	2002/784	Not Controlled Action	Completed	In buffer area only
Controlling Water Levels in Shortland Wetlands	2010/5468	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Demolition of Ablutions Block, Snapper Island, NSW	2018/8303	Not Controlled Action	Completed	In buffer area only
Expansion to Kooragang Coal Terminal	2007/3352	Not Controlled Action	Completed	In feature area
Fort Scratchley refurbishment works	2005/2283	Not Controlled Action	Completed	In feature area
Fort Scratchley site remediation	2005/2075	Not Controlled Action	Completed	In feature area
Geological exploration and historical research of convict coal mines beneath For	2004/1421	Not Controlled Action	Completed	In feature area
Green & Golden Bell Frog Habitat Enhancement Project	2004/1795	Not Controlled Action	Completed	In feature area
Hexam Train Support Facility	2012/6285	Not Controlled Action	Completed	In buffer area only
Hexham Relief Roads Project	2012/6309	Not Controlled Action	Completed	In buffer area only
Hunter Natural Gas Pipeline	2004/1902	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
Industrial and Residential Subdivision, Minmi and Black Hill, Lower Hunter	2008/4603	Not Controlled Action	Completed	In buffer area only
Kooragang Coal Terminal Arrival Roads Stage 2 Upgrade, Newcastle, NSW	2014/7229	Not Controlled Action	Completed	In feature area
Nelson Bay Rd and Seaside Blvd intersection development, Nelson Bay, NSW	2019/8433	Not Controlled Action	Completed	In buffer area only
Newcastle Inner City Bypass - Sandgate to Shortland	2007/3633	Not Controlled Action	Completed	In buffer area only
Nobbys Headland Redevelopment	2008/4672	Not Controlled Action	Completed	In buffer area only
Northlakes Estate Residential Subdivision	2009/5111	Not Controlled Action	Completed	In buffer area only
Proposed maintenance and manufacturing facility to support industrial activities	2007/3592	Not Controlled Action	Completed	In buffer area only

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action				
Queensland Hunter Gas Pipeline, approximately 833 km in length	2008/4620	Not Controlled Action	Completed	In feature area
Revised alignment Hunter Natural Gas Pipeline	2005/2470	Not Controlled Action	Completed	In buffer area only
Richmond Vale Rail Trail	2019/8568	Not Controlled Action	Completed	In buffer area only
sale of property located at 96, Hunter Street	2003/1097	Not Controlled Action	Completed	In feature area
Sandgate Rail Grade Separation	2005/1948	Not Controlled Action	Completed	In feature area
Shorebird and wader habitat rehabilitation	2001/457	Not Controlled Action	Completed	In feature area
Stockpiling of lump coal up to 40,000 tonnes	2003/1304	Not Controlled Action	Completed	In buffer area only
Tomago Aluminium Rod & Conductor Manufacturing Facility	2011/6085	Not Controlled Action	Completed	In buffer area only
Tomago to Tomaree Electricity Supply Upgrade	2003/1023	Not Controlled Action	Completed	In feature area
Tomago Trunk Watermain Upgrade	2008/4049	Not Controlled Action	Completed	In feature area
Tomago Wetland Rehabilitation Project	2011/5894	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Exploration Pilot Appraisal Program PEL 458	2011/6154	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Fort Wallace Residential Development Proposal, north of Newcastle, NSW	2017/7951	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Kooragang Island coal export terminal	2006/2987	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Kooragang Island Waste Emplacement Facility Closure Works	2012/6464	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Rehabilitation of Hexham Swamp	2003/1244	Not Controlled Action (Particular Manner)	Post-Approval	In feature area

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Not controlled action (particular manner)				
Star of the South Offshore Surveys	2019/8525	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
TransGrid 132kV Power Transmission Line	2002/794	Not Controlled Action (Particular Manner)	Post-Approval	In feature area
Wastewater Transfer Scheme	2011/5985	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only

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
Tursiops aduncus				
Indo-Pacific/Spotted Bottlenose Dolphin [68418]		Foraging	Known to occur	In feature area

Seabirds				
Ardenna grisea				
Sooty Shearwater [82651]		Foraging	Likely to occur	In buffer area only
Ardenna pacifica				
Wedge-tailed Shearwater [84292]		Foraging	Likely to occur	In buffer area only
Ardenna tenuirostris				
Short-tailed Shearwater [82652]		Foraging	Likely to occur	In buffer area only

Sharks				
Carcharias taurus				
Grey Nurse Shark [64469]		Foraging	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

SubRegion	BioRegion	Website	Buffer Status
Hunter	Northern 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](#)

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

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