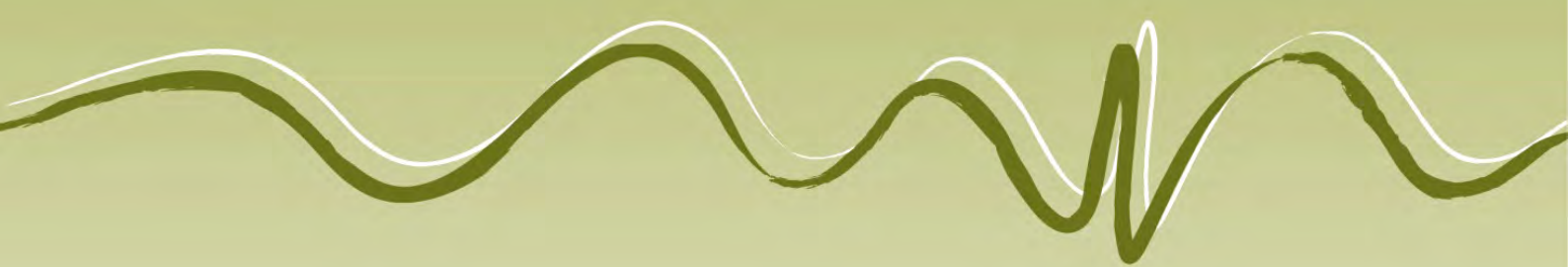


Biodiversity Assessment

North Facing Ramps – Warrell Creek to Nambucca Heads Pacific Highway Upgrade



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1. Introduction

1.1 Project Overview

The Pacific Highway Upgrade Program is a joint commitment by the Australian and New South Wales (NSW) Governments to improve the standard and safety of the Pacific Highway between Hexham and the Queensland border.

The Warrell Creek to Urunga (WC2U) project forms part of the Pacific Highway Upgrade Program and comprises approximately 42 kilometres of dual carriageway road that would bypass the towns of Warrell Creek, Macksville, Nambucca Heads and Urunga on the Mid North Coast of NSW. The Project has been divided into two stages with Stage 1 consisting of the approximate 22.5 kilometre stretch from Nambucca Heads to Urunga (NH2U) and Stage 2 consisting of the remaining approximate 19.5 kilometres of dual carriageway between Warrell Creek and Nambucca Heads (WC2NH). This biodiversity assessment relates to Stage 2 (WC2NH) which is referred to throughout this report as 'the Project'.

Pacifico, the Acciona and Ferrovial Joint Venture (AFJV) has been awarded the contract to design and construct the WC2NH upgrade.

1.2 Background

GeoLINK was engaged by the AFJV to undertake a biodiversity assessment of an area around the southern end of Old Coast Road and to the north of the existing Pacific Highway which has been nominated for the construction of North Facing Ramps (NFR) proposed as part of the WC2NH project (the Proposal) (refer to **Plate 1.1**). The general locality of the proposal is shown in **Illustration 1.1**.

The purpose of this biodiversity assessment is to provide an assessment to address the likely impacts of the Proposal on threatened species, ecological communities and migratory species under the *Threatened Species Conservation Act 1995* (TSC Act) and *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This assessment has been prepared to assess and compare the impacts of the Proposal with the overall biodiversity impacts assessed as part of the broader Warrell Creek to Urunga (WC2U) Pacific Highway upgrade project (SKM 2010) and provide additional assessment of the impacts on threatened species and endangered ecological communities where required.

This assessment covers additional areas outside the previously approved WC2NH project boundary which have not previously been assessed and are proposed to be included within a revised project boundary to encompass the North Facing Ramps proposal. The subject sites are shown in **Illustration 1.2** and include the following areas:

- Additional clearing required under the Consistency Assessment for North Facing Ramps.
- Additional clearing required under Modification for North Facing Ramps.

Additional areas subject to assessment include a 10 m buffer zone.

The contents of this report are set out as follows:

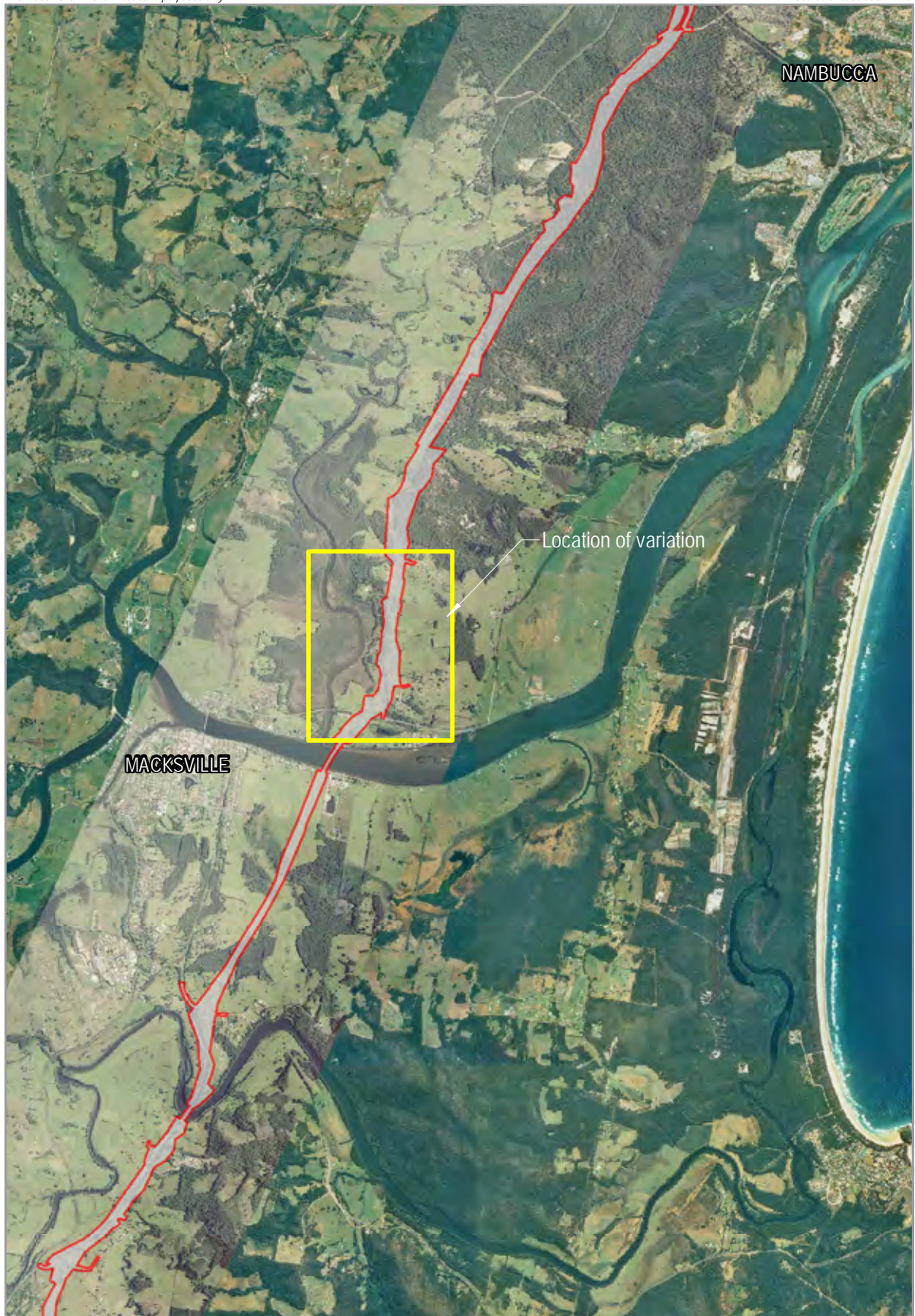
- **Section 2** describes the methodology for the survey.
- **Section 3** reports on the results of the survey.
- **Section 4** discusses the potential impacts associated with the Proposal.
- **Section 5** discusses mitigation of impacts on threatened and migratory species and EECs affected.

Extensive ecological surveys and assessments have been undertaken as part of the Project Approval and planning stages of the WC2U Project. These include:

- Biodiversity surveys undertaken as part of WC2U Project EA (SKM 2010).
- Targeted threatened flora surveys undertaken by Ecos Environmental of the Project footprint (2013) and utilities relocations for NH2U (2012).
- Targeted threatened orchid surveys undertaken by GeoLINK (2012).
- Mapping of habitat trees as part of the *Warrell Creek to Urunga: Nest Box Plan of Management* (Lewis 2012).
- Microbat surveys as part of the *Warrell Creek to Urunga: Microchiropteran Bat Management Strategy* (Lewis 2013a).
- Frog surveys associated with the *Warrell Creek to Urunga: Giant Barred Frog (Mixophyes iteratus) Management Strategy* (Lewis 2013b).
- Koala surveys and habitat assessment as part of the draft *Warrell Creek to Nambucca Heads Pacific Highway Upgrade - EPBC Act Koala Impact Assessment* (GeoLINK 2013a).
- Biodiversity surveys undertaken as part of the draft *Biodiversity Assessment – WC2NH Utilities Installation and Decommissioning as Part of the WC2U Project* (GeoLINK 2013b).
- Ecological Groundtruthing as part of the preliminary assessment for the WC2NH North Facing Ramps (GeoLINK 2015)

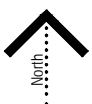
The following additional data corresponding to the above studies was provided by NSW Roads and Maritime Services and has been reviewed as part of this assessment:

- Spider_Orchids_Ecopro.
- Slender_Marsdenia_Ecopro.
- Giant_Barred_Frog_Habitat_18_04_13.
- LikelyGreenThighedFrogHabitat_18_04_13.
- Moderate_likelihood_Giant_barred_frog_18_04_13.
- Lewis_Ecological_Survey_HBT_121102.
- Lewis_Ecological_Survey_HBT_120414.



LEGEND

 Approved Project Boundary 02/12/14_V2



0 1.2 km

GeoLINK
environmental management and design

Biodiversity Assessment - North Facing Ramps - Warrell Creek to
Nambucca Heads Pacific Highway Upgrade
2378-1169

Context Map

Illustration 1.1

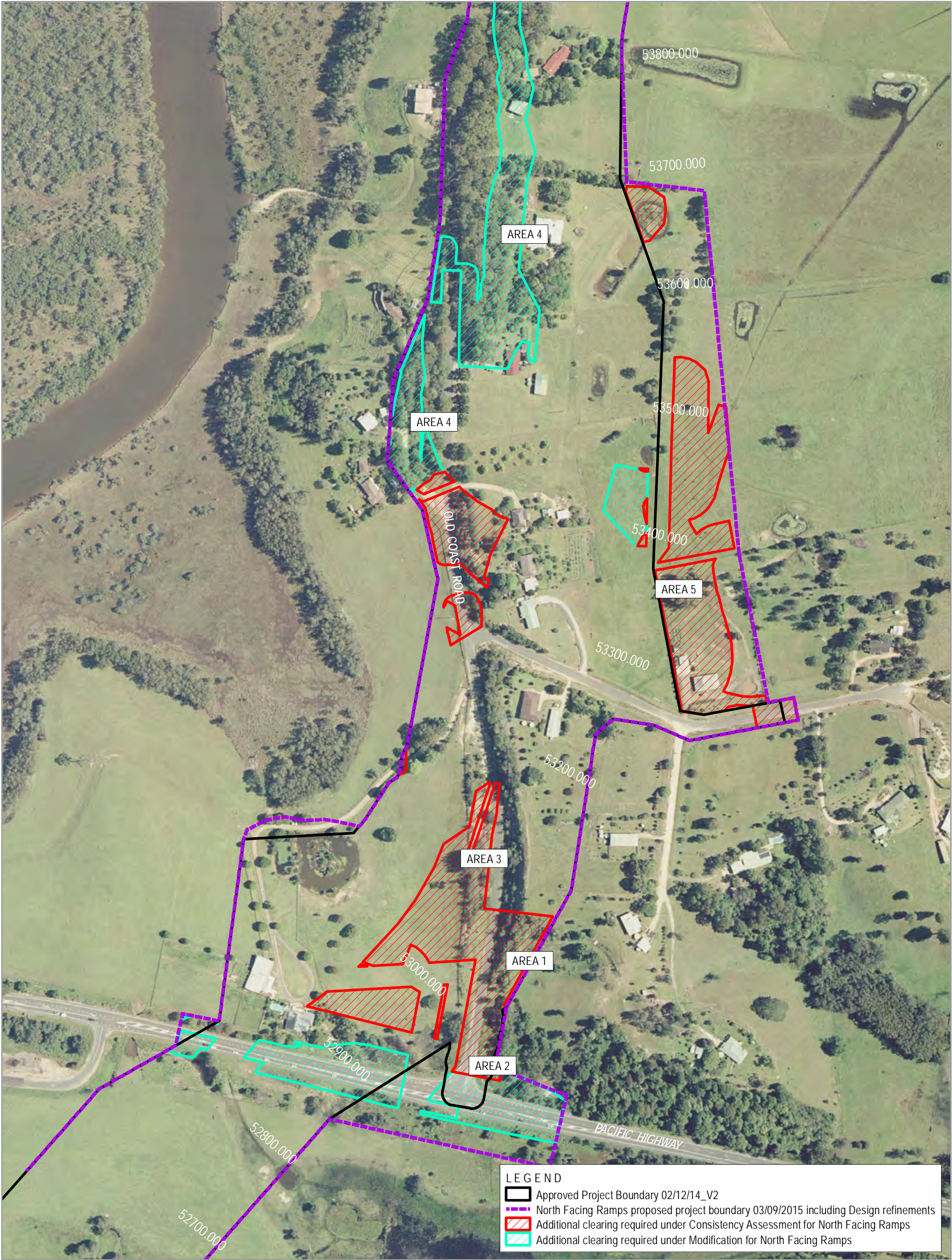




Plate 1.1 View of the proposal site, looking south

2. Methodology

2.1 Overview

The methodology for this biodiversity assessment has been formulated based on a review of the NSW Department of Environment and Conservation (DEC, now Office of Environment and Heritage) *Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft, November 2004* (DEC 2004a). The methodology is broadly as follows:

- Desktop review.
- Undertake flora and fauna field surveys.
- Assess the habitat value.
- Assess the ecological impacts.
- Outline mitigation measures to be implemented to reduce potential impacts.

The assessment covers the subject sites as shown in **Illustration 1.2**. Detailed methodology for the assessment is provided in the following sections.

2.2 Desktop Review

A desktop review was undertaken to determine the flora and fauna species and plant communities of conservation significance recorded previously, or potentially occurring at the site. The results of the desktop review were used to assist with consideration of species to be targeted during field surveys. Reviewed material included:

- Searching the OEH BioNET Atlas of NSW Wildlife and EPBC Act Protected Matters Online Search Tool databases for records of threatened species and endangered populations within approximately 10 kms of the site.
- Searching for records of Rare or Threatened Australian Plants (RoTAP) listed species from the Nambucca Shire Council (NSC) local government area (LGA) using the PlantNet website database.
- Relevant reports including the Project EA (SKM 2010), Threatened Flora Management Plan (Ecos Environmental 2013) and EPBC Act Koala Impact Assessment (GeoLINK 2013a).
- Review of the relevant WC2U fauna management plans and strategies (Lewis 2012, 2013a, 2013b).
- Review of the Office of Environment and Heritage (OEH) Critical Habitat register.
- Review of the Department of Planning (DoP) *State Environmental Planning Policy (SEPP) 14 – Coastal Wetland and SEPP 26 – Littoral Rainforest* mapping.

2.3 Field Surveys

Field surveys were undertaken on the 14 April 2015 and involved preliminary groundtruthing of the vegetation communities present at the sites. Additional surveys were undertaken on 6 November 2015 and involved undertaking a meander survey throughout the entire study area. These surveys involved:

- Identifying vegetation communities and EECs within the study area.
- Target threatened flora searches.
- Identification of significant fauna habitat features.

The meander survey methods adopted were conducted according to the *Threatened Species Biodiversity Survey and Assessment: Guidelines for Developments and Activities – Working Draft, November 2004* (DEC 2004).

3. Results

3.1 Desktop Review

3.1.1 Threatened Species Database Searches

OEH BioNet Atlas of NSW Wildlife

A search of the Atlas of NSW Wildlife for threatened flora for a search area encompassing approximately 10 km surrounding the site identified records of 33 threatened species (seven flora and 26 fauna species) listed under the TSC Act (refer to **Appendix A**). A potential occurrence assessment of these species (excluding marine species) within the study area is provided in **Appendix B**.

EPBC Protected Matters Report

Results from the Protected Matters Search Tool for a search area encompassing approximately 10 kilometres surrounding the site identified 65 threatened species (11 flora and 40 fauna species) listed under the EPBC Act that are 'likely to occur' or 'may occur' within the search area or have habitat that is 'likely to occur' or 'may occur' within the search area. Of the 40 fauna species listed, only 18 require further consideration as the remaining 22 fauna species are dedicated marine species, for which no suitable habitat occurs on or adjacent to the study area. The database search results are provided in **Appendix A**, while a potential occurrence assessment of the non-marine species within the study area is provided in **Appendix B**.

Migratory Species

A total of 60 migratory species listed by the EPBC Act were identified for the search area by the Protected Matters Search Tool (refer to **Appendix A**). Seven are listed as migratory terrestrial species, 15 are listed as migratory wetland species and the remainder are listed as migratory marine species.

Threatened Ecological Communities

Three threatened ecological communities Littoral Rainforest and Coastal Vine Thickets of Eastern Australia, Lowland Rainforest of Subtropical Australia and Subtropical and Temperate Coastal Saltmarsh are listed under the EPBC Act were identified as likely to occur within the search area by the Protected Matters Search Tool (refer to **Appendix A**).

3.1.2 Critical Habitat

A search of the Register of Critical Habitat (6/11/2015) indicated that the site does not contain or adjoin any areas of listed Critical Habitat.

3.1.3 SEPP14 Coastal Wetland

No occurrences of SEPP 14 Coastal Wetlands or SEPP 26 Littoral Rainforest are within the study area. The closest area of SEPP 14 Coastal Wetland is associated with the Nambucca River floodplain and Newee Creek to the west of the study area.

3.1.4 Review of Project Environmental Reports

Threatened fauna species identified as potential occurrences and needing consideration for impact assessment were identified through review of the Project EA with additional species identified through the updated EPBC Act Protected Matters Search Tool and OEH BioNet database searches (refer to **Appendix B**).

The Project EA confirmed 14 threatened species and considered a further 13 threatened species as potential occurrences within the WC2U study area (refer to Table 10-7 in Section 7 of the Project EA). The EPBC Act Protected Matters Search Tool and OEH BioNet database searches identified a further 24 threatened fauna species or species habitat that are known or likely to occur within 10 km of the WC2NH project footprint, excluding marine species. Refer to the potential occurrence assessment for these species in **Appendix B**.

Threatened flora species identified as being potential occurrences and needing consideration for impact assessment were based on the list of species identified in the *WC2U Threatened Flora Management Plan* (Ecos Environmental 2013). Twenty known or potentially occurring threatened flora species were identified as target species for threatened flora surveys of the Project construction footprint (plus 10 m) undertaken by Ecos Environmental (2013). No additional species were identified in the EPBC Act Protected Matters Search Tool and OEH BioNet database search.

3.2 Field Surveys



3.2.1 General Survey Results



In general the areas surveyed comprised largely cleared and modified lands which have been historically used for agricultural pursuits. Native vegetation on the sites is represented by isolated paddock trees and some small areas comprising the following native vegetation communities:


- *Moist Open Forest – White Mahogany – Grey Gum.*
- *Swamp Oak regrowth.*
- *Dry Open Forest – Blackbutt.*
- *Swamp Mahogany/ Paperbark Forest (Swamp Sclerophyll Forest EEC)*

A summary of the field survey results are shown in **Table 3.1**. Ecological constraints associated with the sites are shown in **Illustration 3.1** and **Illustration 3.2** and discussed in the sections below.

Table 3.1 Summary of Field Survey Results

Area	Vegetation Description	Fauna Habitats Present	Photos
Area 1	A small area of <i>Swamp Mahogany/ Paperbark Forest (Swamp Sclerophyll Forest EEC)</i> occurs in the south eastern corner of the site directly adjacent to the existing Pacific Highway. Weeds species such as Lantana, Camphor Laurel and Morning Glory also occur in this portion of the site.	<ul style="list-style-type: none"> Wetland areas surrounding the site provide potential habitat for locally occurring/ migratory wetland birds. Small areas of Swamp Forest provide potential roosting/ nesting habitat for locally occurring/ migratory bird species. Areas of Swamp Forest representing potential Koala habitat occur given the presence of Swamp Mahogany (<i>Eucalyptus robusta</i>) a preferred Koala food tree. 	
Area 2	A small area of <i>Swamp Mahogany/ Paperbark Forest (Swamp Sclerophyll Forest EEC)</i> occurs in the south eastern corner of the site directly adjacent to the existing Pacific Highway. The inundated portion of the site supports a number of common Freshwater Wetland species dominated by <i>Blechnum</i> Fern with nearby forested Swamp Forest EEC. Weed species such as Lantana, Camphor Laurel and Morning Glory also occur in this portion of the site.	<ul style="list-style-type: none"> The inundated area would provide habitat for aquatic fauna and locally occurring/ migratory wetland birds. 	

Area	Vegetation Description	Fauna Habitats Present	Photos
Area 3	The area is representative of regrowth Swamp Oak forest and flanks Old Coast Road and Letitia Close on steep cut batters. Also present is Camphor Laurel and Privet with scattered occurrences of Lantana, Blackberry and Bracken Fern occurring in the southern parts of this site around the intersection of Old Coast Road and the existing Pacific Highway.	<ul style="list-style-type: none"> Given the steep nature of the batters and the young regrowth vegetation present only low value fauna habitat would be available in this area. 	
Area 4	Area 4 is predominantly cleared pasture land dominated by Broad-leaved Paspalum with a remnant stand of mature <i>Moist Open Forest</i> – <i>White Mahogany</i> <i>Grey Gum</i> occurring in the western portion of the site, which runs parallel to Old Coast Road on both the eastern and western sides of the road. This vegetation contains a high density of hollow-bearing trees with a number of trees supporting multiple hollows. This area was nominated as <i>Nest Box Replacement Zone 'S'</i> , within the WC2NH Nest Box Management Plan. A total of 25 nest boxes have been installed (with a further 24 nest boxes prescribed for installation in this area) to compensate for hollow bearing trees cleared for highway construction. Scattered paddock trees also occur on cleared areas of the site including Swamp Turpentine, Tallowwood and conifer species.	<ul style="list-style-type: none"> Hollows within mature trees/ stags would provide nesting/ denning or roosting habitat for hollow dependant fauna species. This area also supports known records of Slender Marsdenia nominated for insitu roadside monitoring as the plants are outside of the current approved clearing limits. Areas of Moist Open Forest representing potential Koala habitat occur within the Moist Open Forest within the site and would be impacted by the proposal. Potential habitat for locally occurring arboreal mammals including Koala, Glider and Possums as part of the surrounding forested areas of the Nambucca State Forest. 	 <ul style="list-style-type: none"> Moist open forest on the eastern side of Old Coast Road.

Area	Vegetation Description	Fauna Habitats Present	Photos
			 <ul style="list-style-type: none"> Moist Open Forest on the western side of Old Coast Road.
Area 5	<p>Predominantly cleared pasture land surrounds a residential property which supports Swamp Forest EEC and adjacent low lying areas in the eastern part of the site. This stand includes some ephemeral wetland elements and has a small dam and drainage line which runs through the property.</p>	<ul style="list-style-type: none"> A small farm dams occurs on the site and would provide habitat opportunities for aquatic fauna and locally occurring migratory/ wetland birds. Wetland areas surrounding the site provide potential habitat for locally occurring migratory/ wetland birds. A small area of Swamp Forest EEC provides potential roosting/ nesting habitat for locally occurring/ migratory bird species. 1 Nest box installed by the landowner and two active bird nests are present within the stand. 	

3.2.2 Noxious Weeds

The following noxious weeds listed under the *Noxious Weeds Act 1993* (NW Act) are present within the study area:

- Fireweed.
- Lantana.
- Blackberry (mostly under control).

Additionally, environmental weeds including Whiskey Grass, Camphor Laurel and Coolatai Grass were detected over large parts of the subject sites. Measures to manage these weed species are outlined in the Weed and Pathogen Management Plan (WPMP) for the project.

3.2.3 Threatened Flora Species

One threatened flora species was de within the subject sites, namely Slender Marsdenia (*Marsdenia longiloba*) which is listed as endangered under the TSC Act and vulnerable under the EPBC Act. A number of Slender Marsdenia plants occur immediately adjacent to Old Coast Road (recorded previously as part of earlier studies on the project) associated with areas of Moist Open Forest (refer to **Illustration 3.1** and **Illustration 3.2**).

Slender Marsdenia plants identified within the subject site are included as part of the *WC2NH Threatened Flora Management Plan* as threatened plants which are to be retained and monitored in situ. It is envisaged that should impacts to Slender Marsdenia or other threatened species be unavoidable, translocation of impacted plants should be undertaken in accordance with the requirements of the *Threatened Flora Management Plan*.

Milky Silkpod (*Parsonsia dorrigoensis*) has been recorded at the southern extent of the WC2NH Project site associated with areas of Moist Open Forest. This species has some potential to occur within areas associated with the subject site, based on appropriate habitat type being present. However it is considered to have a very low potential to occur based on the extensive surveys undertaken associated with the subject site which have not detected this species to date.

3.2.4 Endangered Ecological Communities

The following TSC Act listed EECs occur within the broader area surrounding the subject sites (including a 50 m buffer zone):

- *Swamp Sclerophyll Forest EEC.*
- *Swamp Forest – Swamp Mahogany/ Paperbark EEC.*
- *Freshwater Wetland EEC.*
- *Swamp Oak Forest EEC.*

The NFR proposal would impact an additional 2,170 m² (0.217 ha) of *Swamp Forest – Swamp Mahogany/ Paperbark EEC* (refer to **Illustration 3.1** and **Illustration 3.2**). EEC to be affected is moderately to highly disturbed (following historic clearing, livestock grazing, drainage modification and dam construction, and edge effects). This vegetation comprises relatively small and fragmented patches of regrowth vegetation. Similar areas of EEC occur adjacent to the study area and within the broader locality, where equivalent and better quality examples occur on the Nambucca River and Warrell Creek floodplains.

3.2.5 Fauna Habitat Assessment

3.2.5.1 Fauna Habitat Types

The subject sites include the following general fauna habitat types as described in the Project EA:

- Aquatic/ riparian habitats: occurrences on site are of low to moderate habitat value.
- Modified habitats: dominant habitat type across the site and of low habitat value.
- Dry open forests: small areas of this habitat type (e.g. Blackbutt forest) associated with the site.
- Moist open forest: small areas of this habitat type associated with sites of moderate habitat value.
- Swamp forest: small occurrences on site are of low to moderate habitat value.

Descriptions of the values of these habitats are provided in the Project EA. The key habitat features within the study area include:

- **Aquatic/ riparian habitats:** occur within parts of the subject site consisting of disturbed swamp forest wetlands, farm dams and modified drainage lines providing potential habitat for common frogs (low likelihood of supporting threatened frog species) and birds, including the TSC Act listed species Black-necked Stork and Brolga.
- **Hollow-bearing trees:** a number of hollow-bearing trees are associated with mature trees occurring on the sites. It is envisaged that a number of mature trees containing hollows will be impacted by the proposal.
- **Nest Box Replacement Zone:** a total of 49 Nest boxes have been prescribed for installation within Nest Box Replacement Zone S with 25 already installed at this location. It is envisaged that a number of trees supporting nest boxes will be impacted by the proposal.
- **Koala food trees:** low densities of primary Koala food trees Tallowwood (*Eucalyptus microcorys*) and Swamp Mahogany are associated with areas of moist open forest and to a lesser extent swamp forest. However, scat and scratch searches below trees failed to record any evidence of Koala activity. Based on Koala Population Monitoring undertaken, it is currently considered that areas associated with the WC2NH project experience low level usage by Koalas.

In general, although the subject site was found to contain a variety of fauna habitat resources, relative to the extent of habitat within the Approved Project footprint and retained habitats within the broader locality the Proposal affects a minor portion of the habitat available locally.

3.2.5.2 Threatened Fauna

No threatened fauna species were detected during the field surveys within the NFR subject sites. The sites provides moderate to high value habitat locally throughout moist open forest due to the density of hollow bearing trees which is expected to be partially impacted by the proposal. A potential occurrence assessment of threatened fauna species is provided in **Appendix B** (excluding marine species).

The following threatened fauna species were considered known/ potential occurrences in areas associated with the subject sites:

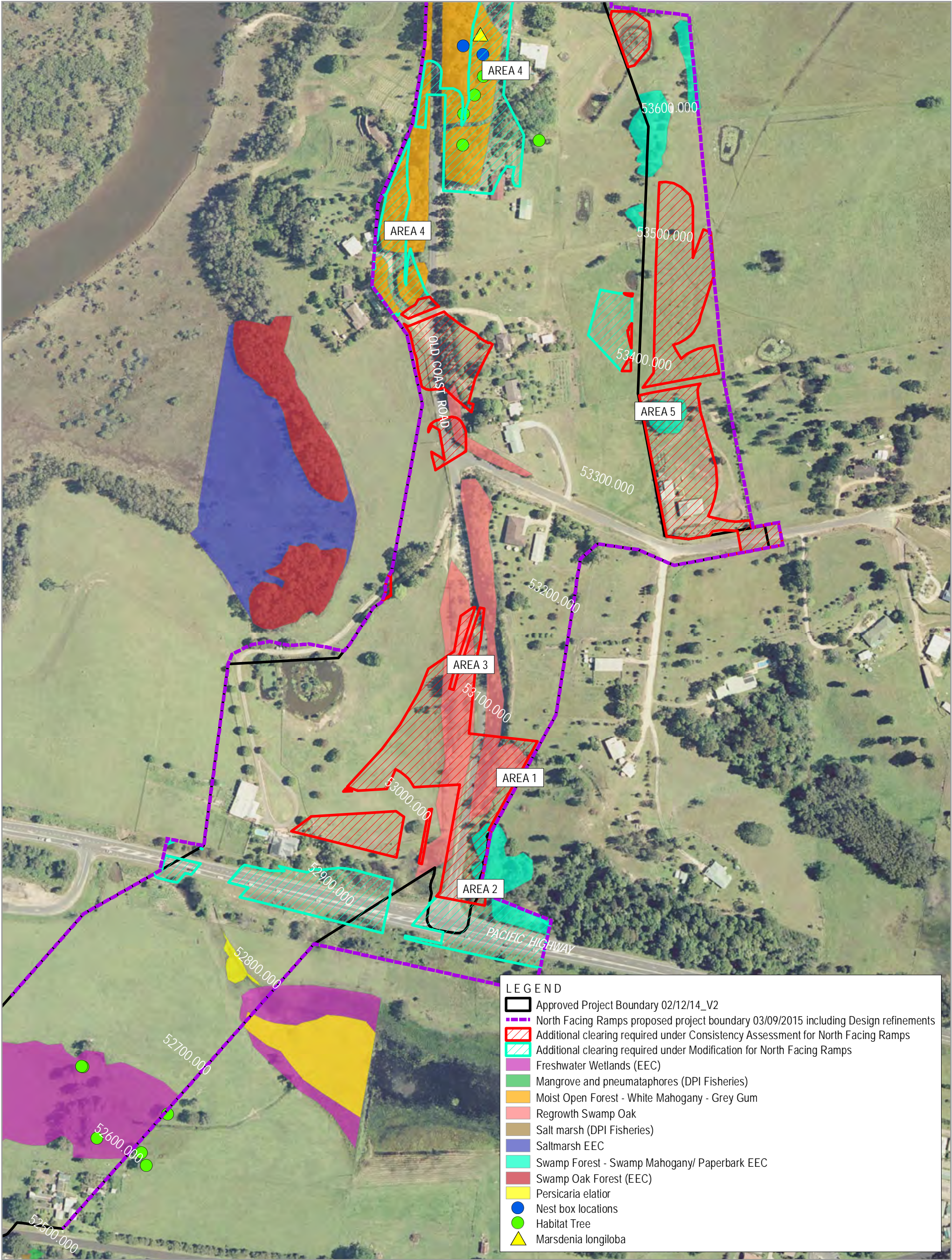
- Varied Sittella (*Daphoenositta chrysoptera*).
- Black-necked Stork (*Ephippiorhynchus asiaticus*).
- Little Lorikeet (*Glossopsitta pusilla*).
- Brolga (*Grus rubicunda*).
- Little Eagle (*Hieraaetus morphnoides*).

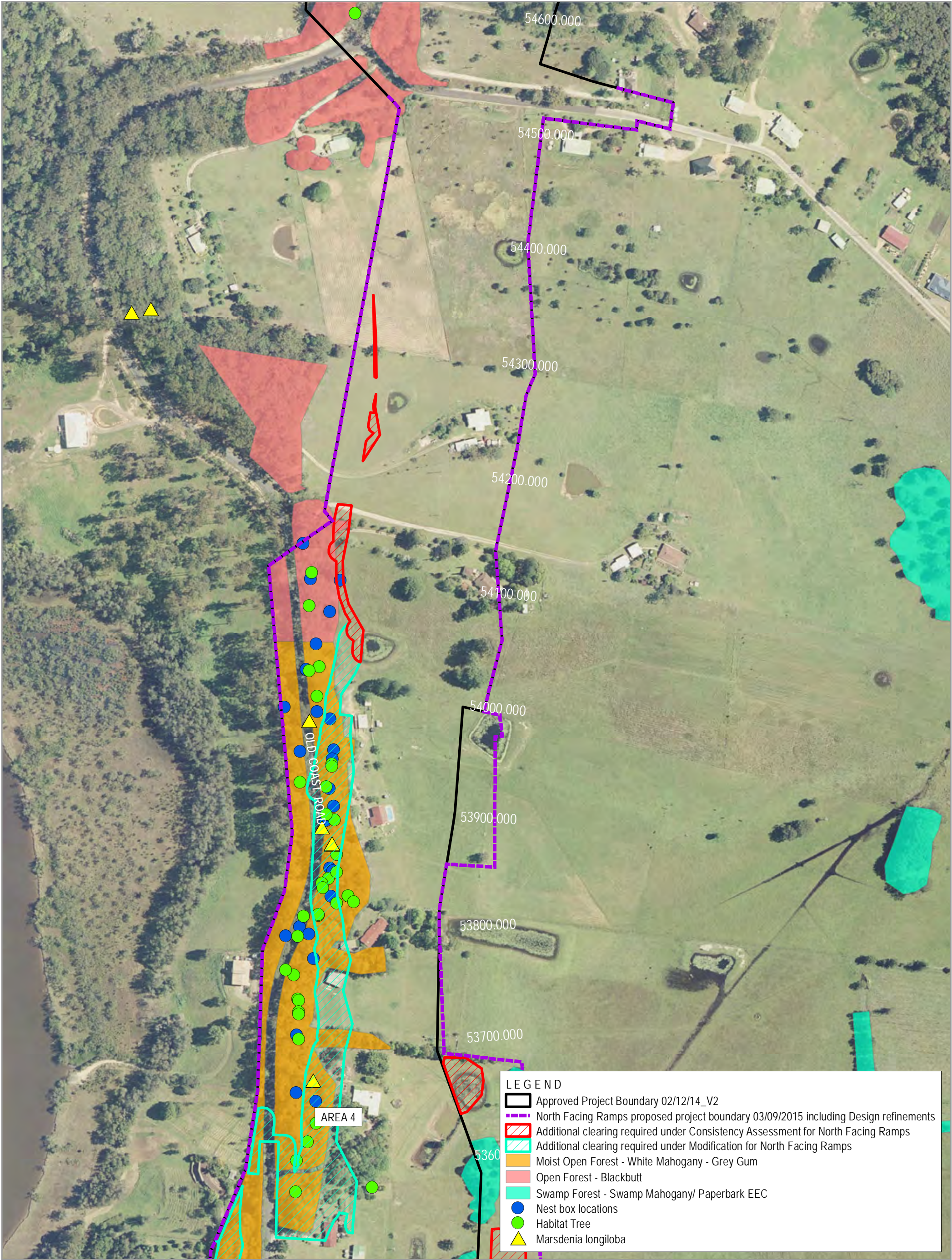
- Swift Parrot (*Lathamus discolor*).
- Square-tailed Kite (*Lophoictinia isura*).
- Masked Owl (*Tyto novaehollandiae*).
- Black Bittern (*Ixobrychus flavicollis*).
- Regent Honeyeater (*Xanthomyza phrygia*).
- Little Bentwing-bat (*Miniopterus australis*).
- Eastern Bentwing-bat (*Miniopterus schreibersii oceanensis*).
- Eastern Freetail-bat (*Mormopterus norfolkensis*).
- Grey-headed Flying-fox (*Pteropus poliocephalus*).
- Large-footed Myotis (*Myotis macropus*).
- Greater Broad-nosed Bat (*Scoteanax rueppellii*).
- Eastern Blossom bat (*Syconycteris australis*).
- Koala (*Phascolarctos cinereus*).
- Yellow-bellied Glider (*Petaurus australis*).
- Spotted-tailed Quoll (*Dasyurus maculatus*).

For all of these species, the habitat within the subject sites forms a minor portion of the habitat available to the known/ potentially occurring local populations of these species in the locality. Key habitat features (e.g. significant foraging habitat, potential breeding habitat, etc.) for most of these species either do not occur within the study area or are minor occurrences within the study area relative to their local occurrence.

3.2.6 EPBC Act Listed Migratory Species

The values of the site for EPBC Act listed migratory species is generally as described in the Project EA. Results of the field survey and the nature of the Proposal (small vegetation impacts) concur with the Project EA statement that: '*There is no evidence to suggest that an area of important habitat exists or that the study area is occupied by an ecologically significant proportion of a population of a migratory species.*' Consequently, it is unlikely that any EPBC Act listed migratory species would be significantly affected by the Proposal, triggering the need for referral to the Australian Government Department of Environment (DoE).





4. Potential Biodiversity Impacts

4.1 Potential Impacts

Clearing impacts to vegetation communities and threatened fauna habitats from the NFRs proposal are summarised in **Table 4.1**. Vegetation clearing impacts are separated into those affected as part of:

- additional clearing required under the Consistency Assessment for North Facing Ramps; and
- additional clearing required under Modification for North Facing Ramps.

Clearing areas are shown including a 10 m buffer and 15 m buffer.

In addition the proposal would have the following impacts on biodiversity:

- Potential clearing impacts to a number of Slender Marsdenia adjacent to Old Coast Road. Impacts to this species are to be avoided if possible (refer to further mitigation measures for this species in **Section 5**).
- Habitat removal for potentially occurring EPBC, TSC Act and ROTAP listed flora species (refer to **Table 4.1**).
- Likely loss of hollow-bearing trees but as mentioned it is envisaged that clearing of mature vegetation would be minimised where possible.
- Likely loss of trees currently supporting nest boxes installed for hollow bearing tree loss, however these boxes can be relocated. Partial loss of *Nest Box Replacement Zone S*.
- Habitat removal for locally occurring fauna, including EPBC listed species, (refer to **Table 4.1**) below, although habitats present are generally of low quality with the exception of native vegetation represented by the moist open forest stand which would be partially impacted. The Proposal may contribute to habitat fragmentation although this would be minor given that clearing of native vegetation would be avoided.
- The use of the subject sites for NFRs would have the potential to contribute to the risk of introducing/ and or spreading weeds and pathogens to/ from the site.
- The Proposal would incrementally contribute to the overall risk associated the wildlife injury and mortality associated with the Approved Project during vegetation/ habitat removal/ modification, though only to a relatively minor extent.

Table 4.1 Summary of Clearing Impacts

Vegetation/ Habitat Type Impacted	Clearing Areas (m²) including 10 m Buffer			Clearing Areas (m²) including 15 m Buffer		
	Clearing Required under Consistency Assessment for NFR	Clearing Required under Modification for NFR	Total Area	Clearing Required under Consistency Assessment for NFR	Clearing Required under Modification for NFR	Total Area
Vegetation Communities						
Open Forest – Blackbutt	222	-	222	620	10	630
Moist Open Forest – White Mahogany, Grey Gum	-	13,240	13,240	-	15,250	15,250
Swamp Mahogany/ Paperbark (Swamp Sclerophyll Forest EEC)	1,400	770	2,170	1,454	837	2,291
Regrowth Swamp Oak	5,557	-	5,557	5,704	-	5,704
Threatened Fauna Potential Habitat						
Regent Honeyeater	1,400	770-	2,170	1,454	837	1,454
Koala	1,622-	14,010-	15,632-	2,074	16,097	18,171
Grey-headed Flying-fox habitat (foraging habitat)	1,622-	14,010-	15,632-	2,074	16,097	18,171
Spotted-tailed Quoll habitat	1,622-	14,010-	15,632-	2,074	16,097	18,171
Threatened Flora Potential Habitat						
Slender Marsdenia	-	13,240	13,240	-	15,250	15,250
Milky Silkpod	-	13,240	13,240	-	15,250	15,250

4.2 Statutory Considerations

4.2.1 Threatened Flora

The proposal has the potential to impact one threatened flora species, Slender Marsdenia. A number of plants occurring in proximity to Old Coast Road may be impacted. The design should aim to avoid impacts to this plant. If this is not possible, translocation affected individuals should be undertaken in accordance with the *WC2NH Threatened Flora Management Plan*.

In the event that translocation of a number of Slender Marsdenia plants is required, additional impacts to this species would not be substantially different to that assessed as part of the WC2NH project. The conclusions of the Project EA would not be altered in relation to this species.

4.2.2 EEC

The proposal would impact an additional 2,170 square metres (0.217 ha) of *Swamp Forest – Swamp Mahogany/Paperbark EEC* (allowing for a 10 m buffer). Additional impacts to this EEC are relatively minor however cumulative in relation to impacts associated with the broader WC2U project. These additional impacts would not alter the conclusions of the Project EA in relation to this EEC.

4.2.3 Threatened/ Migratory Fauna

In relation to listed threatened/ migratory fauna species, while the project would affect some additional areas of low quality habitat for such species, the impacts of this would be unlikely to alter the conclusions of the Project EA.

As discussed in **Section 3.2.6**, it is unlikely that any EPBC Act listed migratory species would be significantly affected by the Proposal and trigger the need for referral to the DoE.

5. Mitigation Measures

5.1 Mitigation Measures

In order to minimise impacts to biodiversity it is recommended that the detailed design process would aim to position NFRs to:

- avoid direct impacts (clearing) to areas of EEC and provided a 10 m buffer to these areas where possible;
- avoid impacts to the identified locations of Slender Marsdenia with the final design of the NFR;
- avoid clearing of native vegetation where possible; and
- avoid clearing of hollow bearing trees where possible.

Additionally the following measures should be undertaken in order to ameliorate impacts to biodiversity.

- An additional Nest Box Replacement Zone of similar quality habitat should be selected for relocation of nest boxes.
- Should impacts to Slender Marsdenia be unavoidable, translocation of the affected individual must be undertaken in accordance with the *WC2NH Threatened Flora Management Plan*. In this instance, consideration of additional biodiversity offsetting requirements should be undertaken by RMS.

6. Conclusions

6.1 Conclusion

The Proposal would have a minor incremental negative effect on local biodiversity relative to the impacts of the Approved WC2NH Proposal.

Previous assessments of significance for threatened species, migratory species and EECs impacted by the broader WC2NH project have been prepared for the Project EA. These assessments have been reviewed and updated in relation to additional impacts to threatened species, migratory species and EECs from the potential clearing of the Project footprint. Whilst these works would contribute to additional incremental impacts to threatened species and EECs as part of the broader WC2NH project, the Proposal would not increase the risk of 'significant impacts' to threatened species and EECs.

References

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The dimensions, number, size and shape of lots shown on drawings are subject to detailed engineering design, final survey and Council conditions of consent.

Topographic information presented on the drawings is suitable only for the purpose of the document as stated above. No reliance should be placed upon topographic information contained in this report for any purpose other than that stated above.

Appendix A

BioNET and EPBC Act Database Searches

Data from the BioNet Atlas of NSW Wildlife website, which holds records from a number of custodians. The data are only indicative and cannot be considered comprehensive inventory, and may contain errors and omissions.

Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°).

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Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Animals in selected area [North: -30.62 Wes 152.82 East: 153.03 South: -30.82] returned a total of 930 records of 52 species.

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Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Animalia	Amphibia	Myobatrachidae	3073	<i>Mixophyes balbus</i>		Stuttering Frog	E1,P,2	V	1
Animalia	Amphibia	Hylidae	3166	<i>Litoria aurea</i>		Green and Golden Bell Frog	E1,P	V	2
Animalia	Amphibia	Hylidae	3169	<i>Litoria brevipalmata</i>		Green-thighed Frog	V,P		5
Animalia	Reptilia	Cheloniidae	2004	<i>Caretta caretta</i>		Loggerhead Turtle	E1,P	E	1
Animalia	Reptilia	Cheloniidae	2007	<i>Chelonia mydas</i>		Green Turtle	V,P	V	2
Animalia	Aves	Columbidae	0025	<i>Ptilinopus magnificus</i>		Wompoo Fruit-Dove	V,P		18
Animalia	Aves	Procellariidae	0929	<i>Macronectes giganteus</i>		Southern Giant Petrel	E1,P	E	2
Animalia	Aves	Procellariidae	0971	<i>Pterodroma solandri</i>		Providence Petrel	V,P	J	1
Animalia	Aves	Ciconiidae	0183	<i>Ephippiorhynchus asiaticus</i>		Black-necked Stork	E1,P		47
Animalia	Aves	Ardeidae	0196	<i>Ixobrychus flavicollis</i>		Black Bittern	V,P		5
Animalia	Aves	Accipitridae	0225	<i>Hieraaetus morphnoides</i>		Little Eagle	V,P		2
Animalia	Aves	Accipitridae	0230	<i>Lophoictinia isura</i>		Square-tailed Kite	V,P,3		14
Animalia	Aves	Accipitridae	8739	<i>Pandion cristatus</i>		Eastern Osprey	V,P,3		52
Animalia	Aves	Gruidae	0177	<i>Grus rubicunda</i>		Brolga	V,P		4
Animalia	Aves	Burhinidae	0175	<i>Esacus magirostris</i>		Beach Stone-curlew	E4A,P		15

Animalia	Aves	Haematopodidae	0131	<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V,P		6
Animalia	Aves	Haematopodidae	0130	<i>Haematopus longirostris</i>	Pied Oystercatcher	E1,P		14
Animalia	Aves	Scolopacidae	0166	<i>Calidris alba</i>	Sanderling	V,P	C,J,K	2
Animalia	Aves	Scolopacidae	0160	<i>Xenus cinereus</i>	Terek Sandpiper	V,P	C,J,K	2
Animalia	Aves	Laridae	0117	<i>Sternula albifrons</i>	Little Tern	E1,P	C,J,K	49
Animalia	Aves	Cacatuidae	0265	<i>^Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V,P,2		180
Animalia	Aves	Psittacidae	0260	<i>Glossopsitta pusilla</i>	Little Lorikeet	V,P		5
Animalia	Aves	Psittacidae	0309	<i>^^Lathamus discolor</i>	Swift Parrot	E1,P,3	E	2
Animalia	Aves	Strigidae	0246	<i>^^Ninox connivens</i>	Barking Owl	V,P,3		1
Animalia	Aves	Strigidae	0248	<i>^^Ninox strenua</i>	Powerful Owl	V,P,3		9
Animalia	Aves	Tytonidae	0250	<i>^^Tyto novaehollandiae</i>	Masked Owl	V,P,3		10
Animalia	Aves	Tytonidae	9924	<i>^^Tyto tenebricosa</i>	Sooty Owl	V,P,3		20
Animalia	Aves	Maluridae	0527	<i>Stipiturus mallee</i>	Mallee Emu-wren	P	E	1
Animalia	Aves	Meliphagidae	0603	<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A,P	E	1
Animalia	Aves	Neosittidae	0549	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P		3
Animalia	Aves	Campephagidae	0428	<i>Coracina lineata</i>	Barred Cuckoo-shrike	V,P		7
Animalia	Mammalia	Dasyuridae	1008	<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V,P	E	8
Animalia	Mammalia	Dasyuridae	1017	<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V,P		6
Animalia	Mammalia	Phascolarctidae	1162	<i>Phascolarctos cinereus</i>	Koala	V,P	V	32
Animalia	Mammalia	Petauridae	1136	<i>Petaurus australis</i>	Yellow-bellied Glider	V,P		119
Animalia	Mammalia	Petauridae	1137	<i>Petaurus norfolcensis</i>	Squirrel Glider	V,P		23
Animalia	Mammalia	Pteropodidae	1280	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V	109
Animalia	Mammalia	Pteropodidae	1294	<i>Syconycteris australis</i>	Common Blossom-bat	V,P		4

Animalia	Mammalia	Emballonuridae	1321	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V,P		1	
Animalia	Mammalia	Molossidae	1329	<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V,P		12	
Animalia	Mammalia	Vespertilionidae	1372	<i>Falsistrellus tasmaniensis</i>	Eastern False Pipistrelle	V,P		2	
Animalia	Mammalia	Vespertilionidae	1369	<i>Kerivoula papuensis</i>	Golden-tipped Bat	V,P		2	
Animalia	Mammalia	Vespertilionidae	1346	<i>Miniopterus australis</i>	Little Bentwing-bat	V,P		47	
Animalia	Mammalia	Vespertilionidae	1834	<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V,P		14	
Animalia	Mammalia	Vespertilionidae	1357	<i>Myotis macropus</i>	Southern Myotis	V,P		5	
Animalia	Mammalia	Vespertilionidae	1336	<i>Nyctophilus bifax</i>	Eastern Long-eared Bat	V,P		1	
Animalia	Mammalia	Vespertilionidae	1361	<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V,P		7	
Animalia	Mammalia	Vespertilionidae	1025	<i>Vespadelus trougtoni</i>	Eastern Cave Bat	V,P		1	
Animalia	Mammalia	Otariidae	1882	<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	V,P		1	
Animalia	Mammalia	Balaenopteridae	1575	<i>Megaptera novaeangliae</i>	Humpback Whale	V,P	V	2	
Animalia	Mammalia	Physeteridae	1578	<i>Physeter macrocephalus</i>	Sperm Whale	V,P		1	
Animalia	Insecta	Hesperiidae	1023	<i>Ocybadistes knightorum</i>	Black Grass-dart Butterfly	E1		50	

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Species listed under the Sensitive Species Data Policy may have their locations denatured (^ rounded to 0.1°; ^^ rounded to 0.01°).

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Search criteria : Public Report of all Valid Records of Threatened (listed on TSC Act 1995) or Commonwealth listed Plants in selected area [North: -30.62 West: 152.82 East: 153.03 South: -30.82] returned a total of 149 records of 11 species.

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Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Plantae	Flora	Apocynaceae	1233	<i>Marsdenia longiloba</i>		Slender Marsdenia	E1,P	V	34
Plantae	Flora	Apocynaceae	9505	<i>Parsonsia dorrigoensis</i>		Milky Silkpod	V,P	E	66
Plantae	Flora	Fabaceae (Faboideae)	11606	<i>Glycine clandestina</i> (broad leaf form)		Glycine clandestina (broad leaf form) in the Nambucca Local Government Area	E2		1
Plantae	Flora	Juncaginaceae	3363	<i>Maundia triglochinoides</i>			V,P		1
Plantae	Flora	Menispermaceae	7167	<i>Tinospora smilacina</i>		Tinospora Vine	E1,P		1
Plantae	Flora	Myrtaceae	4252	<i>Melaleuca groveana</i>		Grove's Paperbark	V,P		6
Plantae	Flora	Orchidaceae	6630	^ <i>Dendrobium melaleucaphilum</i>		Spider orchid	E1,P,2		15
Plantae	Flora	Poaceae	8979	<i>Alexfloydia repens</i>		Floyd's Grass	E1,P		4
Plantae	Flora	Rutaceae	6457	<i>Acronychia littoralis</i>		Scented Acronychia	E1,P	E	7
Plantae	Flora	Santalaceae	5871	<i>Thesium australe</i>		Austral Toadflax	V,P	V	1
Plantae	Flora	Sapotaceae	11957	<i>Niemeyera whitei</i>		Rusty Plum, Plum Boxwood	V,P		13



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.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

Report created: 07/11/13 15:43:19

[Summary](#)

[Details](#)

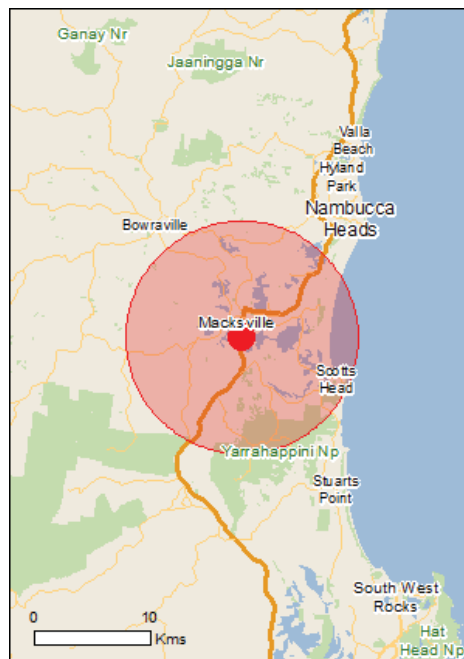
[Matters of NES](#)

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

[Extra Information](#)

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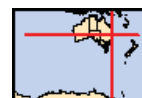
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Buffer: 10.0Km



Summary

Matters of National Environmental 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:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Listed Threatened Ecological Communities:	2
Listed Threatened Species:	65
Listed Migratory Species:	58

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 and the heritage values of a place on the Register of the National Estate.

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.

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 Land:	3
Commonwealth Heritage Places:	1
Listed Marine Species:	73
Whales and Other Cetaceans:	14
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

Place on the RNE:	2
State and Territory Reserves:	5
Regional Forest Agreements:	1
Invasive Species:	32
Nationally Important Wetlands:	1
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

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.

Name	Status	Type of Presence
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Critically Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area

Listed Threatened Species [\[Resource Information \]](#)

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Endangered	Species or species habitat known to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat likely to occur within area
Diomedea epomophora epomophora Southern Royal Albatross [25996]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea epomophora sanfordi Northern Royal Albatross [82331]	Endangered	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans antipodensis Antipodean Albatross [82269]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans exulans Tristan Albatross [82337]	Endangered	Species or species habitat may occur within area

Name	Status	Type of Presence
Diomedea exulans gibsoni Gibson's Albatross [82271]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Erythrorhynchus radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within 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
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Pterodroma neglecta neglecta Kermadec Petrel (western) [64450]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta cauta Shy Albatross, Tasmanian Shy Albatross [82345]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta salvini Salvin's Albatross [82343]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche cauta steadi White-capped Albatross [82344]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche melanophrys Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche melanophrys impavida Campbell Albatross [82449]	Vulnerable	Species or species habitat may occur within area
Fish		
Epinephelus daemeli Black Rockcod, Black Cod, Saddled Rockcod [68449]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Frogs		
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat may occur within area
Litoria booroolongensis Booroolong Frog [1844]	Endangered	Species or species habitat may occur within area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Endangered	Species or species habitat likely to occur within area
Insects		
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat likely to occur within area
Mammals		
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (SE mainland) [66645]	Vulnerable	Species or species habitat may occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area
Plants		
Acronychia littoralis Scented Acronychia [8582]	Endangered	Species or species habitat likely to occur within area
Allocasuarina defungens Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area
Hicksbeachia pinnatifolia Monkey Nut, Bopple Nut, Red Bopple, Red Bopple Nut, Red Nut, Beef Nut, Red Apple Nut, Red Boppel Nut, Ivory Silky Oak [21189]	Vulnerable	Species or species habitat likely to occur within area
Marsdenia longiloba Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Streblus pendulinus Siah's Backbone, Sia's Backbone, Isaac Wood [21618]	Endangered	Species or species habitat likely to occur within area
Taeniophyllum muelleri Minute Orchid, Ribbon-root Orchid [10771]	Vulnerable	Species or species habitat may occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Triplarina imbricata [64543]	Endangered	Species or species habitat likely to occur within area
Tylophora woollsii [20503]	Endangered	Species or species habitat likely to occur within area
Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Emydura macquarii signata (Bellinger River, NSW) Bellinger River Emydura [1785]	Vulnerable	Species or species habitat likely to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area

Name	Status	Type of Presence
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Sharks		
Carcharias taurus (east coast population) Grey Nurse Shark (east coast population) [68751]	Critically Endangered	Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Pristis zijsron Green Sawfish, Dindagubba, Narrowsnout Sawfish [68442]	Vulnerable	Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Listed Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Pterodroma leucoptera leucoptera Gould's Petrel [26033]	Endangered	Species or species habitat may occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Puffinus leucomelas Streaked Shearwater [66541]		Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species habitat may occur within area
Thalassarche eremita Chatham Albatross [64457]	Endangered	Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steady White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Migratory Marine Species		
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Carcharodon carcharias Great White Shark [64470]	Vulnerable	Species or species habitat may occur within area
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area

Name	Threatened	Type of Presence
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Lamna nasus Porbeagle, Mackerel Shark [83288]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Rhincodon typus Whale Shark [66680]	Vulnerable	Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Xanthomyza phrygia Regent Honeyeater [430]	Endangered*	Species or species habitat known to occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or

Name	Threatened	Type of Presence
Charadrius bicinctus Double-banded Plover [895]		related behaviour known to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour known to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Foraging, feeding or related behaviour known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Foraging, feeding or related behaviour known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area

Other Matters Protected by the EPBC Act

Commonwealth Land [\[Resource Information \]](#)

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.

Name
Commonwealth Land - Australian Postal Corporation
Commonwealth Land - Australian Telecommunications Commission
Commonwealth Land - Telstra Corporation Limited

Commonwealth Heritage Places [\[Resource Information \]](#)

Name	State	Status
Historic		
Macksville Post Office	NSW	Listed place

Listed Marine Species [\[Resource Information \]](#)

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Breeding known to occur within area
Ardea ibis Cattle Egret [59542]		Breeding likely to occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Foraging, feeding or related behaviour known to occur within area
Calidris ruficollis Red-necked Stint [860]		Foraging, feeding or related behaviour known to occur within area
Calonectris leucomelas Streaked Shearwater [1077]		Species or species habitat may occur within area
Catharacta skua Great Skua [59472]		Species or species habitat may occur within area
Charadrius bicinctus Double-banded Plover [895]		Foraging, feeding or related behaviour known to occur within area
Charadrius ruficapillus Red-capped Plover [881]		Foraging, feeding or related behaviour known to occur within area
Diomedea antipodensis Antipodean Albatross [64458]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea dabbenena Tristan Albatross [66471]	Endangered*	Species or species habitat may occur within area
Diomedea epomophora (sensu stricto) Southern Royal Albatross [1072]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea exulans (sensu lato) Wandering Albatross [1073]	Vulnerable	Foraging, feeding or related behaviour likely to occur within area
Diomedea gibsoni Gibson's Albatross [64466]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Diomedea sanfordi Northern Royal Albatross [64456]	Endangered*	Foraging, feeding or related behaviour likely to occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Foraging, feeding or related behaviour known to occur within area
Gallinago megala Swinhoe's Snipe [864]		Foraging, feeding or related behaviour likely to occur within area
Gallinago stenura Pin-tailed Snipe [841]		Foraging, feeding or related behaviour likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area
Himantopus himantopus Black-winged Stilt [870]		Foraging, feeding or related behaviour known to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat likely to occur within area
Limosa lapponica Bar-tailed Godwit [844]		Foraging, feeding or related behaviour known to occur within area
Macronectes giganteus Southern Giant-Petrel [1060]	Endangered	Species or species habitat may occur within area
Macronectes halli Northern Giant-Petrel [1061]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
Numenius madagascariensis Eastern Curlew [847]		Foraging, feeding or related behaviour known to occur within area
Numenius minutus Little Curlew, Little Whimbrel [848]		Foraging, feeding or related behaviour likely to occur within area
Numenius phaeopus Whimbrel [849]		Foraging, feeding or related behaviour known to occur within area
Pandion haliaetus Osprey [952]		Breeding known to occur within area
Pluvialis fulva Pacific Golden Plover [25545]		Foraging, feeding or related behaviour known to occur within area
Puffinus carneipes Flesh-footed Shearwater, Fleshy-footed Shearwater [1043]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area
Sterna albifrons Little Tern [813]		Species or species habitat may occur within area
Thalassarche bulleri Buller's Albatross [64460]	Vulnerable	Species or species habitat may occur within area
Thalassarche cauta (sensu stricto) Shy Albatross, Tasmanian Shy Albatross [64697]	Vulnerable*	Species or species

Name	Threatened	Type of Presence
Thalassarche eremita Chatham Albatross [64457]	Endangered	habitat may occur within area Species or species habitat may occur within area
Thalassarche impavida Campbell Albatross [64459]	Vulnerable*	Species or species habitat may occur within area
Thalassarche melanophris Black-browed Albatross [66472]	Vulnerable	Species or species habitat may occur within area
Thalassarche salvini Salvin's Albatross [64463]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Thalassarche steadi White-capped Albatross [64462]	Vulnerable*	Foraging, feeding or related behaviour likely to occur within area
Tringa stagnatilis Marsh Sandpiper, Little Greenshank [833]		Foraging, feeding or related behaviour known to occur within area
Fish		
Acentronura tentaculata Shortpouch Pygmy Pipehorse [66187]		Species or species habitat may occur within area
Festucalex cinctus Girdled Pipefish [66214]		Species or species habitat may occur within area
Filicampus tigris Tiger Pipefish [66217]		Species or species habitat may occur within area
Heraldia nocturna Upside-down Pipefish, Eastern Upside-down Pipefish, Eastern Upside-down Pipefish [66227]		Species or species habitat may occur within area
Hippichthys heptagonus Madura Pipefish, Reticulated Freshwater Pipefish [66229]		Species or species habitat may occur within area
Hippichthys penicillus Beady Pipefish, Steep-nosed Pipefish [66231]		Species or species habitat may occur within area
Hippocampus whitei White's Seahorse, Crowned Seahorse, Sydney Seahorse [66240]		Species or species habitat may occur within area
Histiogamphelus briggsii Crested Pipefish, Briggs' Crested Pipefish, Briggs' Pipefish [66242]		Species or species habitat may occur within area
Lissocampus runa Javelin Pipefish [66251]		Species or species habitat may occur within area
Maroubra perserrata Sawtooth Pipefish [66252]		Species or species habitat may occur within area
Solegnathus dunckeri Duncker's Pipehorse [66271]		Species or species habitat may occur within area
Solegnathus spinosissimus Spiny Pipehorse, Australian Spiny Pipehorse		Species or species

Name	Threatened	Type of Presence
[66275]		habitat may occur within area
Solenostomus cyanopterus Robust Ghostpipefish, Blue-finned Ghost Pipefish, [66183]		Species or species habitat may occur within area
Solenostomus paegnius Rough-snout Ghost Pipefish [68425]		Species or species habitat may occur within area
Solenostomus paradoxus Ornate Ghostpipefish, Harlequin Ghost Pipefish, Ornate Ghost Pipefish [66184]		Species or species habitat may occur within area
Stigmatopora nigra Widebody Pipefish, Wide-bodied Pipefish, Black Pipefish [66277]		Species or species habitat may occur within area
Syngnathoides biaculeatus Double-end Pipehorse, Double-ended Pipehorse, Alligator Pipefish [66279]		Species or species habitat may occur within area
Trachyrhamphus bicoarctatus Bentstick Pipefish, Bend Stick Pipefish, Short-tailed Pipefish [66280]		Species or species habitat may occur within area
Urocampus carinirostris Hairy Pipefish [66282]		Species or species habitat may occur within area
Vanacampus margaritifer Mother-of-pearl Pipefish [66283]		Species or species habitat may occur within area

Reptiles		
Caretta caretta Loggerhead Turtle [1763]	Endangered	Species or species habitat known to occur within area
Chelonia mydas Green Turtle [1765]	Vulnerable	Species or species habitat known to occur within area
Dermochelys coriacea Leatherback Turtle, Leathery Turtle, Luth [1768]	Endangered	Species or species habitat known to occur within area
Eretmochelys imbricata Hawksbill Turtle [1766]	Vulnerable	Species or species habitat known to occur within area
Hydrophis elegans Elegant Seasnake [1104]		Species or species habitat may occur within area
Natator depressus Flatback Turtle [59257]	Vulnerable	Breeding likely to occur within area
Pelamis platurus Yellow-bellied Seasnake [1091]		Species or species habitat may occur within area

Whales and other Cetaceans		[Resource Information]
Name	Status	Type of Presence
Mammals		
Balaenoptera acutorostrata Minke Whale [33]		Species or species habitat may occur within area
Balaenoptera edeni Bryde's Whale [35]		Species or species habitat may occur within

Name	Status	Type of Presence area
Balaenoptera musculus Blue Whale [36]	Endangered	Species or species habitat may occur within area
Caperea marginata Pygmy Right Whale [39]		Species or species habitat may occur within area
Delphinus delphis Common Dolphin, Short-beaked Common Dolphin [60]		Species or species habitat may occur within area
Eubalaena australis Southern Right Whale [40]	Endangered	Species or species habitat likely to occur within area
Grampus griseus Risso's Dolphin, Grampus [64]		Species or species habitat may occur within area
Lagenorhynchus obscurus Dusky Dolphin [43]		Species or species habitat may occur within area
Megaptera novaeangliae Humpback Whale [38]	Vulnerable	Species or species habitat known to occur within area
Orcinus orca Killer Whale, Orca [46]		Species or species habitat may occur within area
Sousa chinensis Indo-Pacific Humpback Dolphin [50]		Species or species habitat likely to occur within area
Stenella attenuata Spotted Dolphin, Pantropical Spotted Dolphin [51]		Species or species habitat may occur within area
Tursiops aduncus Indian Ocean Bottlenose Dolphin, Spotted Bottlenose Dolphin [68418]		Species or species habitat likely to occur within area
Tursiops truncatus s. str. Bottlenose Dolphin [68417]		Species or species habitat may occur within area

Extra Information

Places on the RNE		[Resource Information]
Note that not all Indigenous sites may be listed.		
Name	State	Status
Natural		
Warrell Creek Coastal Forest	NSW	Registered
Indigenous		
Nambucca Aboriginal Area	NSW	Registered
State and Territory Reserves		[Resource Information]
Name	State	
Gaagal Wanggaan (South Beach)	NSW	
Nambucca	NSW	
Unnamed FMZ1	NSW	

Name	State
Unnamed FMZ2	NSW
Yarriabini	NSW

Regional Forest Agreements [\[Resource Information \]](#)

Note that all areas with completed RFAs have been included.

Name	State
North East NSW RFA	New South Wales

Invasive Species [\[Resource Information \]](#)

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Pycnonotus jocosus Red-whiskered Bulbul [631]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Rhinella marina Cane Toad [83218]		Species or species habitat likely to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643]		Species or species habitat likely to occur within area
Asparagus aethiopicus Asparagus Fern, Ground Asparagus, Basket Fern, Sprengi's Fern, Bushy Asparagus, Emerald Asparagus [62425]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Eichhornia crassipes Water Hyacinth, Water Orchid, Nile Lily [13466]		Species or species habitat likely to occur within area
Genista sp. X Genista monspessulana Broom [67538]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Rubus fruticosus aggregate Blackberry, European Blackberry [68406]		Species or species habitat likely to occur within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur

Name	Status	Type of Presence
Senecio madagascariensis		within area
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area

Nationally Important Wetlands		[Resource Information]
Name		State
100 Acre Swamp		NSW

Coordinates

-30.72 152.92

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

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.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

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

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

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

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:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- [Natural history museums of Australia](#)
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA 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, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- [Geoscience Australia](#)
- [CSIRO](#)
- Other groups and individuals

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

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

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Appendix B

Threatened Species Potential Occurrence Assessment

Appendix B Threatened Fauna Potential Occurrence and Impact Risk Assessment

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
Amphibia								
<i>Crinia tinnula</i>	Wallum Froglet	V	-	Acid paperbark and sedge swamps known as 'wallum', this is a banksia-dominated lowland heath ecosystem characterised by acidic waterbodies.	Low. No potential habitat on or adjacent to the site.	Unlikely	No change	Not considered a potential occurrence in the Project EA.
<i>Litoria aurea</i>	Green and Golden Bell Frog	E	V	Amongst vegetation in and around permanent swamps, lagoons, farm dams and on flood-prone river flats, particularly where there are bullrushes or spikerushes.	Low-moderate. A relatively small area of potential low quality habitat occurs in the modified drainage line and at a farm dam at the site. Moderate quality habitat occurs in the freshwater wetlands at the site.	Unlikely. A single old record (1975) within 10 km of the site. However, due to contraction of the distribution of this species since this time and the nearest known key population being at Crescent Head approximately 50 km to the south, the site is highly unlikely to support this species.	No change	Not considered a potential occurrence in the Project EA.
<i>Litoria brevipalmata</i>	Green-thighed Frog	V	-	Rainforest, moist to dry eucalypt forest and heath, typically where surface water gathers after rain.	Low. Available forested and adjacent farmland habitat is of low quality and highly fragmented.	Unlikely.	No change	Low. Proposal would not impact on known/ potential habitat.
<i>Litoria olongburensis</i>	Olongburra Frog	V	V	Paperbark swamps and sedge swamps of the coastal 'wallum' country amongst sedges and rushes.	Low. Outside of the known range of this species (restricted to the slopes and tablelands in NSW).	Unlikely	No change	Not considered a potential occurrence in the Project EA.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Mixophyes iteratus</i>	Giant Barred Frog	E	E	Deep, damp leaf litter in rainforests, moist eucalypt forest and near dry eucalypt forest.	Low within the study area and adjacent habitats.	Unlikely. However, known from Warrell Creek.	No change	Low. Proposal would not impact on known/ potential habitat.
<i>Mixophyes balbus</i>	Stuttering Frog	V	V	Cool rainforest, moist eucalypt forest and occasionally along creeks in dry eucalypt forest.	Low	Unlikely	No change	Not considered a potential occurrence in the Project EA.
Aves								
<i>Anthochaera phrygia</i> (formerly <i>Xanthomyza phrygia</i>)	Regent Honeyeater	CE	E	Dry open forest and woodland with an abundance of nectar-producing eucalypts, particularly box-ironbark woodland, swamp mahogany forests, and riverine sheoak woodlands.	Moderate. Habitat on site is of low suitability. Foraging habitat exists in the broader locality as part of extensive range.	Possible as opportunistic seasonal foraging during non-breeding period (winter).	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E	E	Permanent freshwater wetlands with tall dense vegetation, particularly bullrushes and spikerushes.	Low in broad habitat terms in areas of dense vegetation within the Freshwater Wetlands.	Low. No records within the locality.	No change	Not considered a potential occurrence in the Project EA.
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	-	Sheoaks in coastal forests and woodlands, timbered watercourses, and moist and dry eucalypt forests of the coast and the Great Divide up to 1,000 m.	Low on or adjacent to the site. The subject species only very rarely feeds on the seeds of Swamp Oak. Therefore any habitat present within Swamp Sclerophyll Forest at the site is likely to be of low suitability. However, this species was recorded in surveys for the Project EA.	Low	No change	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Low-moderate in broad habitat terms.	Possible	Additional minor incremental impacts to habitat clearing	No species specific impact assessment undertaken as part of the Project EA.
<i>Dasyornis brachypterus</i>	Eastern Bristlebird	E	E	High elevation open forest, woodland with dense tussock or sedge understorey adjacent to rainforest or wet eucalypt forest.	Low. No potential habitat on or adjacent to the site.	Unlikely	No change	Not considered a potential occurrence in the Project EA.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	-	Swamps, mangroves, mudflats, dry floodplains.	Low to moderate. Potential foraging habitat is present adjacent to the site but not within the site. However, no breeding habitat was identified.	Possible. Sixteen records within 10 km of the site.	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Erythrotriorchis radiatus</i>	Red Goshawk	CE	V	Along or near watercourses, swamp forest and woodlands on the coastal plain.	Moderate in broad habitat terms.	Unlikely. No known records within the locality.	No change	Not considered a potential occurrence in the Project EA.
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	V	Distributed in forests and woodlands from the coast to the western slopes of the Great Dividing Range, extending westwards to the vicinity of Albury, Parkes, Dubbo and Narrabri.	Low-moderate. Potential foraging and nesting habitat amongst Moist Open Forest vegetation.	Possible. One record within 10 km of the site.	Additional minor incremental impacts to habitat clearing	No species specific impact assessment undertaken as part of the Project EA.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Grus rubicunda</i>	Brolga	V	-	Shallow swamps, floodplains, grasslands and pastoral lands, usually in pairs or parties.	Low as only opportunistic foraging habitat within the site. Better quality habitat occurs in the broader locality in less disturbed floodplain and wetland areas closer to the Nambucca River and Warrell Creek.	Possible four records within 10 km of the site as opportunistic foraging habitat.	Additional minor incremental impacts to habitat clearing	No species specific impact assessment undertaken as part of the Project EA.
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	Dense vegetation fringing and in streams, swamps, tidal creeks and mudflats, particularly amongst swamp sheoaks and mangroves.	Low within the study area. Potential habitat occurs within the broader locality in and around the Nambucca River and Warrell Creek.	Low on the site. No significant impact on key foraging or nesting habitat.	No change	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Lathamus discolor</i>	Swift Parrot	E	E	Forests, woodlands, plantations, and banksias.	Moderate as foraging habitat within an extensive range.	Possible as opportunistic seasonal forager during non-breeding period (winter).	Additional minor incremental impacts to habitat clearing	Yes. Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Dry woodland and open forest, particularly along major rivers and belts of trees in urban or semi-urban areas. Home range can extend over at least 100 km ² .	Moderate in broad habitat terms.	Possible.	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Pandion cristatus</i> (formerly <i>Pandion haliaetus</i>)	Eastern Osprey	V	-	Forage for fish in fresh, brackish or saline waters of rivers, lakes, estuaries with suitable nesting sites nearby.	Low within the study area. Potential habitat occurs within the broader locality in and around the Nambucca River and Warrell Creek. This species may on occasion transit the site between feeding and nesting areas, however the site has no particular value for foraging or nesting.	Low on the site. No significant impact from the proposal on key foraging or nesting habitat.	No change	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Rostratula benghalensis australis</i>	Australian Painted Snipe	E	V	Well-vegetated shallows and margins of wetlands, dams, sewage ponds, wet pastures, marshy areas, irrigation systems, lignum, tea-tree scrub, and open timber.	Low within the study area. Potential habitat occurs within the broader locality in and around the Nambucca River and Warrell Creek.	Unlikely. No known records within the locality.	No change	Not considered a potential occurrence in the Project EA.
<i>Sternula albifrons</i>	Little Tern	E	-	Coastal waters, bays, shallow inlets, salt or brackish lakes.	Low within the study area. Potential habitat occurs within the broader locality in and around the Nambucca River and Warrell Creek.	Low on the site. No significant impact from the proposal on key foraging or nesting habitat.	No change	Not considered a potential occurrence in the Project EA.
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	Dry eucalypt forest and woodlands.	Low within the study area and any usage of the site would be opportunistic foraging on occasion. However, potential habitat is present within the broader locality.	Low	No change	The outcomes of the Project EA assessment remain valid.
Mammals								
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Near cave entrances and crevices in cliffs.	Low. No potential habitat on or adjacent to the site	Unlikely	No change	Not considered a potential occurrence in the Project EA.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Dry and moist eucalypt forests and rainforests, fallen hollow logs, large rocky outcrops.	Low potential for suitable habitat on or adjacent to the site. In the broader locality habitat would exist within large territories.	Low	No change	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Miniopterus australis</i>	Little Bentwing-bat	V	-	Moist eucalypt forest, rainforest and dense coastal scrub.	Moderate. Forested areas at the site provide potential foraging habitat for this species as a small part of a larger area of potential foraging habitat. Medium density of tree hollows may also provide potential roosting (non-breeding) opportunities.	Possible. 34 OEH BioNet records within 10 km of site and recorded in project EA surveys.	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Miniopterus schreibersii oceanensis</i>	Eastern Bentwing-bat	V	-	Forest or woodland, roost in caves, old mines and stormwater channels.	Moderate. Forested areas at the site provide potential foraging habitat for this species as a small part of a larger area of potential foraging habitat.	Possible. Five OEH BioNet records within 10 km of site.	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Mormopterus norfolkensis</i>	Eastern Freetail-bat	V	-	Occurs in dry sclerophyll forest and woodland east of the Great Dividing Range. Roosts in tree hollows.	Moderate. Forested areas at the site provide potential foraging habitat for this species as a small part of a larger area of potential foraging habitat. Low density of tree hollows may also provide limited potential roosting (including breeding) opportunities.	Possible. Eight OEH BioNet records within 10 km of site.	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Myotis macropus</i>	Large-footed Myotis	V	-	Bodies of water, rainforest streams, large lakes, reservoirs.	Moderate. Open water habitats are of low-quality and minor extent at the site. However, habitat is present in the broader locality.	Possible	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Petaurus australis</i>	Yellow-bellied Glider	V	-	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Dens in tree hollows of large trees, often in family groups. 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.	Moderate. Forested areas at the site provide potential foraging habitat for this species as a small part of a larger area of potential foraging habitat. Medium density of tree hollows may provide habitat for refuge and breeding opportunities. Recorded in surveys for the project EA.	Moderate	Additional minor incremental impacts to habitat clearing	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	Blackbutt, bloodwood and ironbark eucalypt forest with heath understorey in coastal areas, and box-ironbark woodlands and River Red Gum forest inland.	Low on site. However, habitat is present within the broader locality.	Low on site	No change	Not considered a potential occurrence in the Project EA
<i>Petrogale penicillata</i>	Brush-tailed Rock Wallaby	V	V	North-facing cliffs and dry eucalypt forest and woodland, inhabiting rock crevices, caves, overhangs during the day, and foraging in grassy areas nearby at night.	Low. No potential habitat on or adjacent to the site.	Unlikely	No change	Not considered a potential occurrence in the Project EA.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
<i>Phascolarctos cinereus</i>	Koala	V	V	Appropriate food trees in forests and woodlands, and treed urban areas.	Low - moderate within the study area. A low density of Koala food trees in roadside mixed eucalypt vegetation. Recorded in surveys for the project EA but not in proximity of the site.	Possible. 16 records within 10 km of site.	Additional minor incremental impacts to habitat clearing.	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Pseudomys novaehollandiae</i>	New Holland Mouse	-	V	Occurs in open heathlands, open woodlands with a heathland understorey, and vegetated sand dunes.	Low. No potential habitat on or adjacent to the site.	Unlikely	No change	Not considered a potential occurrence in the Project EA.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	High. Areas of Swamp Sclerophyll Forest are suitable as foraging habitat. No known camps at the site.	Likely. Known to camp approximately 3 km to south of site.	Additional minor incremental impacts to habitat clearing.	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	Woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest.	Moderate. Forested areas at the site provide potential foraging habitat for this species as a small part of a larger area of potential foraging habitat. Medium density of tree hollows may also provide potential roosting opportunities.	Possible. Two OEH BioNet records within 10 km of site and recorded in surveys for the project EA.	Additional minor incremental impacts to habitat clearing.	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of Project EA assessment.
<i>Syconycteris australis</i>	Eastern Blossom-bat	V	-	Littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps.	Moderate as foraging habitat.	Possible	Additional minor incremental impacts to habitat clearing.	Not considered a potential occurrence in the Project EA.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Impact Risk and Update to Project EA Impact Assessment	Consistency Project EA Assessment Outcomes
Reptiles								
<i>Cacophis harriettae</i>	White-crowned Snake	V	-	Low to mid-elevation dry eucalypt forest and woodland with well-developed litter layer.	Low potential habitat on the site.	Low	No change	Not considered a potential occurrence in the Project EA.
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink	V	V	Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils.	Low as little suitable habitat is present on the site.	Possible	No change	Not considered a potential occurrence in the Project EA.
<i>Hoplocephalus bitorquatus</i>	Pale-headed Snake	V	-	Dry eucalypt forests and woodlands, cypress woodland and occasionally in rainforest or moist eucalypt forest. Favours streamside areas, particularly in drier habitats.	Low as little suitable habitat is present on the site.	Possible	No change	Not considered a potential occurrence in the Project EA.
<i>Hoplocephalus stephensii</i>	Stephens' Banded Snake	V	-	Rainforest and eucalypt forests and rocky areas up to 950 m.	Low as little suitable habitat is present on the site.	Possible	Additional minor incremental impacts to habitat clearing.	Not considered a potential occurrence in the Project EA.

V = Vulnerable; E = Endangered; CE = Critically Endangered; EP = Endangered Population

Appendix B Threatened Flora Potential Occurrence and Impact Risk Assessment

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Acacia chrysotricha</i>	Newry Golden Wattle	E	-	Grows as an understorey species on rainforest edges and in wet or dry eucalypt forest in steep narrow gullies on quartzite soils.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Acronychia littoralis</i>	Scented Acronychia*	E	E	Littoral rainforest on sand.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Alexfloydia repens</i>	Floyd's Grass*	E	-	Understorey of Swamp Oak (<i>Casuarina glauca</i>) forest and along the uppermost fringe of mangroves.	Moderate. Potential habitat beneath Swamp Oak in Swamp Sclerophyll Forest occurs at the site. However, due to extensive past disturbance (grazing and clearing) the overall suitability is low.	Unlikely. This species was not located during the survey despite a targeted search of suitable habitat areas. However, recorded in project surveys near Warrell Creek.	No additional impacts as part of the proposal.
<i>Allocasuarina defungens</i>	Dwarf Heath Casuarina	E	E	Tall heath on sand, also on clay and sandstone.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Arthraxon hispidus</i>	Hairy-joint Grass*	V	V	Moist shady places in or on the edges of rainforest and wet eucalypt forest, often near creeks or swamps.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Cryptostylis hunteriana</i>	Leafless Tongue-orchid	V	V	Does not have well defined habitat and is known from a range of communities, including swamp-heath and woodland.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Cynanchum elegans</i>	White-flowered Wax Plant	E	E	Dry, littoral or subtropical rainforest, and occasionally in scrub or woodland.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Dendrobium melaleucaphilum</i>	Spider Orchid	E	-	Grows frequently on <i>Melaleuca styphelioides</i> , less commonly on rainforest trees or on rocks in coastal districts. Occurs in coastal districts and nearby ranges, extending from Queensland to lower Blue Mountains.	Moderate. Potential habitat occurs on the site where <i>Melaleuca styphelioides</i> grows in Swamp Sclerophyll Forest.	Unlikely. This species was not located during the survey despite a targeted search of suitable habitat areas. However, recorded in project surveys.	Minor incremental impacts of the Proposal associated with habitat removal are unlikely to affect the outcomes of the impact assessment undertaken in the Threatened flora Species Management Plan.
<i>Diuris disposita</i>	Willawarrin Doubletail	E	-	Known only from eucalypt forest with grassy understorey in the Kempsey area,	Low. No potential habitat on or adjacent to the site and outside of known range.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Diuris flavescens</i>	—	CE	-	The confirmed populations grow on well-drained loam or heavy clay soils in and around remnants of grassy woodland, or sclerophyll forest, in which the groundcover is dominated by <i>Themeda australis</i> and <i>Imperata cylindrica</i> .	Low. Outside the range of this species.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Diuris sp. aff chrysantha</i>	Byron Bay Diuris	E	-	Known from a single location only, at Byron Bay in north-east NSW. Only about 20 plants have been recorded	Low. Outside the range of this species.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Euphrasia arguta</i>	-	PCE	CE	Known from three sites in/near Nundle State Forest in eucalypt forest with a mixed grass and shrub understorey. Habitat includes open forest country around Bathurst in subhumid places, grassy country near Bathurst and in meadows near rivers.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Glycine clandestina</i> (broad leaf form)	<i>Glycine clandestina</i> (broad leaf form) in the Nambucca Local Government Area	E	-	This form only occurs in coastal grassland at Scotts Head on the Mid North Coast of NSW.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Hicksbeachia pinnatifolia</i>	Red Bopple Nut	V	V	Subtropical rainforest, moist eucalypt forest and Brush Box forest.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Maundia triglochoides</i>	Maundia	V	-	Grows in swamps, lagoons, dams, channels, creeks or shallow freshwater 30 - 60 cm deep on heavy clay, low nutrients.	Moderate-High	Unlikely. This species was not located during the survey despite a targeted search of suitable habitat areas. However, recorded in project surveys.	Minor incremental impacts of the Proposal associated with removal of potential habitat are unlikely to affect the outcomes of the impact assessment undertaken in the Threatened flora Species Management Plan. Safeguards are provided to minimise the risk of indirect impacts of the Proposal on this species.
<i>Marsdenia longiloba</i>	Slender Marsdenia	E	V	Subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest and, sometimes, in areas with rock outcrops.	High	Known to occur within subject site.	Minor incremental impacts of the Proposal are unlikely to affect the outcomes of the impact assessment undertaken in the Threatened flora Species Management Plan.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V	V	Grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	Moderate in broad habitat terms.	Unlikely. This species was not located during the survey despite a targeted search of suitable habitat areas.	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Melaleuca* groveana</i>	Grove's Paperbark	V	-	Heath and shrubland, often in exposed sites, rocky outcrops and cliffs at high elevations, also in dry woodlands.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Niemeyera whitei</i> (formerly <i>Amorphospermum whitei</i>)	Rusty Plum	V	-	Rainforest and adjoining moist eucalypt forest.	Low. No potential habitat on or adjacent to the site.	Unlikely. However, recorded in project surveys.	No additional impacts as part of the proposal.
<i>Parsonsia dorrigensis</i>	Milky Silkpod	V	E	Subtropical and warm temperate rainforest, on rainforest margins, and in moist eucalypt forest up to 800 m, on brown clay soils.	Moderate. Potential habitat on or adjacent to the site.	Unlikely based on extensive survey effort in area not having identified this species.	Minor incremental impacts of the Proposal associated with removal of potential habitat are unlikely to affect the outcomes of the impact assessment undertaken in the Threatened flora Species Management Plan.
<i>Phaius australis</i>	Southern Swamp Orchid	E	E	Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest mostly in coastal areas.	Moderate. Potential habitat occurs within Swamp Sclerophyll Forest at the site. However, due to extensive past disturbance this habitat is of low quality.	Unlikely. This species was not located during the survey despite a targeted search of suitable habitat areas.	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Streblus pendulinus</i>	Siah's Backbone	-	E	Found in warmer rainforests, chiefly along watercourses at altitudinal range is from near sea level to 800 m above sea level. Grows in well-developed rainforest, gallery forest and drier, more seasonal rainforest. On Norfolk Island, the species is found in a variety of forest types, though it is rare.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly			Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest, restricted mainly to remnant stands of littoral (coastal) rainforest and gallery rainforest.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Taeniophyllum muelleri</i>	Minute Orchid	-	V	Grows on outer branches and branchlets of rainforest trees; coast and coastal ranges, from sea level to 250 m alt., north from the Bellinger River.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.

Scientific Name	Common Name	TSC Act	EPBC Act	Habitat Requirement (Source: OEH and/ or EPBC website profile 2013)	Suitability of Site Habitat	Potential Occurrence	Consistency Project EA Assessment Outcomes
<i>Thesium australe</i>	Austral Toadflax	V	V	Grassland or grassy eucalypt woodland where <i>Themeda australis</i> is predominant, on grassy headlands.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Tinospora smilacina</i>	Tinospora Vine	E	-	Dry rainforest and along the boundaries of dry rainforest and dry eucalypt forest.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Tinospora tinoporoides</i>	Arrow-head Vine	V	V	Wetter subtropical rainforest, including littoral rainforest, on fertile, basalt-derived soils.	Low. No potential habitat on or adjacent to the site.	Unlikely	No impact assessment undertaken in project EA/ Threatened Flora Species Management Plan. No additional assessment required.
<i>Tylophora woolsii</i>	Cryptic Forest Twiner	E	E	Grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins.	Moderate.	Unlikely as not detected during extensive surveys undertaken of the subject site.	Minor incremental impacts of the Proposal associated with removal of potential habitat are unlikely to affect the outcomes of the impact assessment undertaken in the Threatened flora Species Management Plan.

V = Vulnerable; E = Endangered; CE = Critically Endangered; EP = Endangered Population