

**Dorrigo ARC Rainforest Centre** Matters of National Environmental Significance Report



DISCLAIMER This report was prepared by ELA in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation. The views expressed within are not necessarily the views of the Department of Climate Change, Energy, the Environment and Water and may not represent department policy.

© 2025 State of NSW and the Department of Climate Change, Energy, the Environment and Water.

# Contents

1. Introduction	1
1.1. Description of proposal	1
1.1.1. Description of proposed works	1
2. Desktop assessment - Protected Matters Search Tool and BioNet	3
2.1. Ecology	3
2.2. Heritage	3
3. Field survey	4
3.1. Ecology	4
3.2. Heritage	4
3.2.1. Building exteriors and interiors	5
3.2.2. Landscape and landscape elements	5 -
3.2.3. Archaeological potential	5
4. Likelihood of occurrence	6
5. Matters of national environmental significance	7
5.1. World Heritage properties	7
5.1.1. World Heritage properties with natural heritage values	7
5.1.2. World Heritage properties with cultural heritage values	14
5.2. National Heritage places	14
5.3. Wetlands of international importance (Ramsar wetlands)	
5.4. The Great Barrier Reef Marine Park	14
5.6. Threatened ecological communities	14
5.7. Listed threatened and migratory species	
5.7.1. Vulnerable amphibians	
5.7.2. Vulnerable birds	
5.7.3. Vulnerable mammals	
5.7.4. Vulnerable reptiles	24
5.7.6. Endangered and critically endangered birds	
5.7.7. Endangered and critically endangered mammals	
5.7.8. Migratory species	
6. References	35
Appendix A: PMST Tool search	
Appendix B: Likelihood Table	54
Appendix C: Ecology Field Survey	76

# List of tables

Table 1: Tools 1 & 2 – heritage values, attributes and potential impacts	10
Table 2: Tool 3 – evaluation of potential impacts	11
Table 3: Species profile – pouched frog (Assa darlingtoni)	16
Table 4: Assessment of significance – pouched frog (Assa darlingtoni)	16
Table 5: Species profile – Black-breasted button-quail (Turnix melanogaster)	18
Table 6: Assessment of significance – black-breasted button-quail (Turnix melanogaster)	19
Table 7: Species profile – grey-headed flying-fox (Pteropus poliocephalus)	20
Table 8: Assessment of significance – grey-headed flying-fox (Pteropus poliocephalus)	21
Table 9: Species profile – parma wallaby (Notamacropus parma)	22
Table 10: Assessment of significance – parma wallaby (Notamacropus parma)	23
Table 11: Species profile – rainforest cool-skink (Harrisoniascincus zia)	24
Table 12: Assessment of significance – rainforest cool-skink (Harrisoniascincus zia)	25
Table 13: Species profile – milky silkpod (Parsonsia dorrigoensis)	26
Table 14: Assessment of significance – milky silkpod (Parsonsia dorrigoensis)	27
Table 15: Species profile – rufous scrub-bird (Atrichornis rufescens)	28
Table 16: Assessment of significance – rufous scrub-bird (Atrichornis rufescens)	29
Table 17: Species profile – spotted-tailed quoll (Dasyurus maculatus)	31
Table 18: Assessment of significance – spotted-tailed quoll (Dasyurus maculatus)	31
Table 19: Species profile – migratory birds	33
Table 20: Assessment of significance – migratory birds	34
Table 21: TECs likelihood table	56
Table 22: Threatened flora species likelihood table	58
Table 23: Threatened fauna species likelihood table	65

# Abbreviations

Abbreviation	Description
AOO	area of occupancy
CEMP	construction environmental management plan
СМА	Commonwealth marine area
DARC	Dorrigo Arc Rainforest Centre
DAWE	Department of Agriculture, Water and Environment
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment and Water
DEGW	Dorrigo Escarpment Great Walk
DELWP	Department of Environment, Land, Water and Planning
Dorrigo NP	Dorrigo National Park
DRC	Existing Dorrigo Rainforest Centre
ELA	Eco Logical Australia Pty Ltd
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Cth)
FFA	flora and fauna assessment
GHHF	grey-headed flying-fox
НВТ	hollow-bearing tree
LoO	likelihood of occurrence
LWD	large woody debris
MNES	matters of national environmental significance
NHL	National Heritage List
NP	national park
NPWS	NSW National Parks and Wildlife Service
PMST	Protected Matters Search Tool
SHR	State Heritage Register
TEC	threatened ecological community
WHL	World Heritage List

# Terms and definitions

Term	Definition
Compound site	Facilities used to support the operation of a construction site including site offices, workshops, delivery areas, storage areas, sheds, staff vehicle parking, materials, plant and equipment.
Cumulative impacts	Impacts that, when considered together, have different or more substantial impacts than a single impact assessed on its own.
DARC (the proposal)	Dorrigo Arc Rainforest Centre is the new visitor centre on the footprint of the existing Dorrigo Rainforest Centre. The DARC includes an elevated platform.
Direct impacts	Direct impacts affect the habitat of species and ecological communities and of individuals using the study area. They include, but are not limited to, death through predation, trampling, poisoning of the animal or plant itself and the removal of suitable habitat. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development. When applying each factor, both long-term and short-term impacts are to be considered.
Environment	As defined within the <i>Environmental Planning and Assessment Act 1979</i> (NSW), all aspects of the surroundings of humans, whether affecting any human as an individual or in his or her social groupings.
Hollow-bearing tree	Hollow bearing tree being alive or dead and with at least one hollow. A tree is an HBT if:
(HBT)	• the hollow entrance can be seen
	• the hollow entrance width is at least 5 cm
	• the hollow appears to have depth (that is, you cannot see solid wood beyond the entrance)
	• the hollow is at least 1 m above the ground.
Indirect impact	Indirect impacts occur when activities affect species or ecological communities within the subject site. Indirect impacts may sterilise or reduce the habitability of adjacent or connected habitats. Indirect impacts can include loss of individuals, starvation, exposure to predators, loss of breeding habitat or disruption, loss of shade or shelter, reduction in habitat, weed invasion, noise, light spill, or increased human activity within or directly adjacent to sensitive habitat areas.
Local population	Local population comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to use habitats in the study area, and includes the following definitions:
	• The local population of a threatened plant species comprises those individuals occurring in the study area or the cluster of individuals that extend beyond the study area that could reasonably be expected to be cross-pollinating with those in the study area.
	• The local population of resident fauna species comprises those individuals known or likely to occur in the study area, as well as any individuals occurring in adjoining areas (contiguous or otherwise) that are known or likely to use habitats in the study area.
	• The local population of migratory or nomadic fauna species comprises those individuals that are likely to occur in the study area from time to time or return year to year.
Dorrigo Arc Rainforest Centre (DARC or 'the activity')	The DARC is a new, modern, international-standard visitor centre located in Dorrigo NP, and partly within the Gondwana Rainforests of Australia World Heritage property. The DARC is a single-storey building with an Arc elevated walkway (including an integrated weather room). The DARC proposal includes:
	demolition of the existing Dorrigo Rainforest Centre (DRC) and skywalk lookout

Term	Definition				
	• a new car park (including 293 spaces), entry road upgrades, car parking spaces with drive- through trailer parking, EV charging, 2 coach parks and landscaping				
	construction of a single-storey visitor centre, including:				
	$\circ$ an arrival forecourt east of the car park linking the car park to the DARC				
	<ul> <li>improvements to the existing Pademelon Lawn</li> </ul>				
	<ul> <li>a nature play area and grassed picnic area with BBQ structures</li> </ul>				
	<ul> <li>entrance hall interpretation space</li> </ul>				
	<ul> <li>a retail space including a reception counter and information point</li> </ul>				
	<ul> <li>a café with indoor and outdoor seating</li> </ul>				
	<ul> <li>staff and first aid area</li> </ul>				
	<ul> <li>DEGW counter and briefing room</li> </ul>				
	<ul> <li>a group gathering point</li> </ul>				
	<ul> <li>amenities including accessible toilet and parents' room</li> </ul>				
	<ul> <li>a Gumbaynggirr courtyard, with seating</li> </ul>				
	<ul> <li>the Arc elevated walkway</li> </ul>				
	<ul> <li>connecting ramps to the rainforest floor</li> </ul>				
	<ul> <li>a weather room over the forest to allow for an all-weather experience of the rainforest through sun, rain and fog</li> </ul>				
	<ul> <li>at ground level, Wonga walk track improvements to provide accessibility and connection to the broader network of Dorrigo NP rainforest tracks.</li> </ul>				
Study area	The area consisting of land in the vicinity of, and including, the proposal area. The study area is the wider area surrounding the proposal area, including land that has the potential to be indirectly impacted by the proposal beyond the immediate works area. For the purposes of this assessment the study area includes an approx 5 ha to include micro-siting and design adjustment to avoid impacts to threatened species. The study area also includes a 5-km or 10-km radius associated with threatened entity searches.				
The 'activity area'	The area that may be directly or indirectly impacted by construction and operation of the proposal.				
	The activity area includes both the:				
	<ul> <li>construction footprint, which is the area where construction activities would occur for the proposal and includes land that would be temporarily impacted for the construction including compound sites</li> </ul>				
	<ul> <li>operational footprint, which includes the areas that would be permanently impacted by the proposal including the tracks, campgrounds, maintenance access, and supporting infrastructure.</li> </ul>				

# 1. Introduction

This report assesses and addresses the impacts of the proposed Dorrigo Arc Rainforest Centre (DARC) on matters of national environmental significance (MNES) listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The MNES relevant to the DARC are:

- World Heritage properties
- National Heritage places
- nationally threatened species and ecological communities
- migratory species.

The assessment in this report is based on information gathered from data searches and field investigations and should be read in conjunction with the DARC ecological assessment report (including flora and fauna assessment) (ELA 2024a). The EPBC Act aims to protect MNES including World Heritage and National Heritage areas, threatened species and communities, and listed migratory species. An action that may or is likely to have a significant impact on MNES should be referred to the Australian Government to determine whether it is a controlled action that requires approval from the Australian Government.

The study area is within the Gondwana Rainforests of Australia, listed on both the World Heritage List (WHL #368) and the National Heritage List (NHL #105704). An impact assessment was prepared against the significant impact criteria for natural heritage values of a World Heritage property (Section 5.1.1); this determined the impacts to be negligible, and considered the proposal will not significantly impact the natural heritage values of a World Heritage values of the property are considered the same as the World Heritage values, so an additional assessment against Natural Heritage criteria is not required.

An additional 13 MNES listed as threatened or migratory species are known or have been identified as having the potential to occur within the study area (Appendix B). An assessment of significance was prepared against the significant impact criteria for each of these species and determined the proposed impacts are unlikely to result in a significant impact (Section 5).

## 1.1. Description of proposal

The Dorrigo Arc Rainforest Centre (DARC) is a new, modern, international-standard visitor centre located in Dorrigo National Park (NP), and within the Gondwana Rainforests of Australia World Heritage property.

## 1.1.1. Description of proposed works

The DARC is a single-storey building with an Arc elevated walkway (including an integrated weather room). The DARC and Arc elevated walkway is a transformative investment by the NSW National Parks and Wildlife Service (NPWS) to establish a world-class visitor centre that will significantly contribute to an important and developing nature tourism industry. The DARC and Arc elevated walkway will deliver a vibrant centre, showcasing the Gondwana Rainforests of Australia and cultural heritage of the Gumbaynggirr People, and presenting programs to support NPWS environmental and educational goals.

The objectives of the development are:

- Deliver an international-standard visitor centre on the site of the existing Dorrigo Rainforest Centre that operates in conjunction with the Arc elevated walkway and several walking trails and picnic areas.
- Provide a space that is flexible and adaptable to ensure the visitor centre is capable of showcasing the rainforest and Gumbaynggirr culture.
- Support existing strategies to protect the rainforest.
- Improve the relationship between the visitor centre and the rainforest, including refocusing the entrance into a significant public space.
- Integrate the DARC and Arc elevated walkway with the surrounding rainforest and create new publicly accessible ramps and paths to welcome visitors to the rainforest and the DARC entrance.
- Leverage the natural heritage and history of the area through conservation, education and adaptation to provide for the ongoing requirements of a contemporary visitor centre.
- Establish spaces for new educational opportunities that operate in synergy with the DARC and Arc elevated walkway, which enhance the range of experiences.

The DARC proposal includes:

- demolition of the existing Dorrigo Rainforest Centre and skywalk lookout
- construction of a new car park (including 293 spaces), entry road upgrades, car parking spaces with drive-through trailer parking, EV charging, 2 coach parks and landscaping
- construction of single-storey visitor centre, including:
  - $\circ$   $\,$  an arrival forecourt east of the car park linking the car park to the DARC  $\,$
  - o improvements to the existing Pademelon Lawn
  - $\circ ~$  a nature play area and grassed picnic area with BBQ structures
  - o entrance hall interpretation space
  - $\circ$   $\;$  a retail space including a reception counter and information point
  - o a café with indoor and outdoor seating
  - o staff and first aid area
  - o Dorrigo Escarpment Great Walk (DEGW) counter and briefing room
  - o a group gathering point
  - o amenities including accessible toilet and parents' room
  - o a Gumbaynggirr courtyard, with seating
  - $\circ$   $\;$  the Arc elevated walkway
  - o connecting ramps to the rainforest floor and the Wonga walk
  - a weather room over the forest to allow for an all-weather experience of the rainforest through sun, rain and fog
  - at ground level, Wonga walk track improvements to provide accessibility and connection to the broader network of Dorrigo NP rainforest tracks.

Construction is expected to start in early 2026 and to take 18 to 24 months to complete.

# 2. Desktop assessment - Protected Matters Search Tool and BioNet

# 2.1. Ecology

A desktop assessment involved a search of the Protected Matters Search Tool (PMST, Appendix A) for MNES listed under the EPBC Act within a 5-km square radius from the study area (dated 20 September 2023). The PMST identified:

- one World Heritage place and one National Heritage place: Gondwana Rainforests of Australia
- 5 possible listed threatened ecological communities (TECs), 25 threatened flora species, and 41 threatened fauna species listed under the EPBC Act, considered in this assessment
- 15 migratory bird species listed under the EPBC Act were predicted to be present.

Results of the PMST were further supplemented through a NSW BioNet Atlas search which identified:

• 97 threatened entities listed under the EPBC Act recorded within a 5-km square radius from the study area.

All TECs and threatened species identified within the PMST and BioNet Atlas searches have been considered according to their likelihood of occurrence (LoO), which is summarised in section 4 and presented in Appendix B. Relevant potential impacts to MNES were further assessed in section 5.

# 2.2. Heritage

Gondwana Rainforests of Australia are listed on the World Heritage List (WHL #368) and the National Heritage List (NHL #105704). They are considered to have outstanding universal value (OUV) under the following criteria for selection:

- (viii) outstanding examples representing major stages of earth's history, including the record of life, significant ongoing geological processes in the development of landforms, or significant geomorphic or physiographic features
- (ix) outstanding examples representing significant ongoing ecological and biological processes in the evolution and development of terrestrial, freshwater, coastal and marine ecosystems and communities of plants and animals
- (x) containing the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation.

The brief synthesis of the OUV states:

The Gondwana Rainforests of Australia is a serial property comprising the major remaining areas of rainforest in southeast Queensland and northeast New South Wales. It represents outstanding examples of major stages of the Earth's evolutionary history, ongoing geological and biological processes, and exceptional biological diversity. A wide range of plant and animal lineages and communities with ancient origins in Gondwana, many of which are restricted largely or entirely to the Gondwana Rainforests, survive in this collection of reserves. The Gondwana Rainforests also provides the principal habitat for many threatened species of plants and animals.

The MNES impact assessment in sections 5.1 and 5.2 follows *Guidance and Toolkit for Impact Assessments in a World Heritage Context* (UNESCO 2022) and *Matters of National Environmental Significance, Significant impact guidelines 1.1* (CoA 2013) and where necessary the relevant sections of *World Heritage Central Eastern Rainforest Reserves of Australia Strategic Overview for Management* (DEH 2000).

# 3. Field survey

# 3.1. Ecology

The field survey was conducted by ELA ecologists Ronnie Hill, Phoebe Smith, Liam Scanlon, Samantha Patch and Claire Peacock on 9 and 10 October 2023. The field survey covered the majority of the study area and the entirety of the impact area. The field survey included:

- validation of existing vegetation mapping, determining type, condition and extent of plant community types (PCTs) and other vegetation types through the collection of rapid data points (RDPs). These PCTs were later associated with any relevant EPBC-listed threatened ecological communities based on their commensuration with the conservation advice.
- threatened flora survey for potential or likely threatened flora species listed under the EPBC Act, similar to the parallel field traverse method described in *Surveying Threatened Plants and their Habitats* (DPIE 2020a).
- fauna habitat assessment including the identification and use assessment of habitat features including foraging resources, habitat trees (HBTs), dens and burrows, nests, hollow logs and large woody debris (LWD), leaf litter, flaking bark, other identifiable foraging habitat, rocky habitat and aquatic habitat.
- opportunistic fauna sightings.

One threatened species listed under the EPBC Act was recorded within the study area:

• Macadamia tetraphylla (rough-shelled bush nut)

However, this species is confined to the north of the Richmond River, and all occurrences south of this area are thought to be propagated. The individuals recorded within the study area were underneath the skywalk, suggesting that the occurrence was propagated. Refer to the flora and fauna assessment (ELA 2024a) for further information.

One threatened species listed under the EPBC Act was recorded directly adjacent to the study area:

• Parsonsia dorrigoensis (milky silkpod).

## 3.2. Heritage

A site inspection of the study area was undertaken by ELA senior heritage consultants Jessica Horton and Jennifer Norfolk over the period 17 to 21 July 2023 with representatives of the Gumbaynggirr People and NPWS staff. The site inspection was primarily focused on the potential impacts the construction and use of the project would have on the Aboriginal and historical heritage within the study area, as well as the impact to the OUV. The inspection involved visiting parts of the study area where impact is planned to occur and searching for evidence of Aboriginal or historical occupation, and for evidence of the OUV. In all instances, detailed notes of the locations of the survey were taken, including GPS coordinates and the use of digital real-time mapping. These notes were supplemented by digital photography that recorded, where necessary, items of potential Aboriginal or historical heritage value, or OUV.

The current building is nearing the end of its useable lifespan and is limited in size. Weathering issues and water damage are evident on the external surfaces. Demolition is considered necessary as the structure is no longer fit for purpose The current facilities are not adequate for the increasing visitation demands. The current infrastructure and services would rapidly deteriorate or fail with the increase in use.

## 3.2.1. Building exteriors and interiors

The existing Dorrigo Rainforest Centre is a single-storey red brick and timber building, L-shaped in plan, and with a wrap-around verandah. Internally, the building is divided into offices, educational rooms, gift shop and café. It connects with a picnic area to the south west and a timber skywalk overlooking Dorrigo NP to the east.

## 3.2.2. Landscape and landscape elements

The existing rainforest centre was built on a cleared property, previously used for aggregate extraction and then cattle grazing. During the 1980s, following World Heritage listing, the construction of the visitor centre began. Large-scale earth movement was carried out to level the property.

The skywalk was constructed on a ledge of the escarpment below the Dorrigo Plateau, with the footings excavated in 1989. The landform to the north, a former aggregate quarry, was subjected to cut and fill. The profile of the soils visible in the excavated footings for the existing skywalk were shallow mixed reddish-brown loams over a large angular gravel layer. This dense rocky layer is likely the remnant spoil from the quarry activities or the eroding face of the escarpment. A few old trees were visible in the photos taken at the time; however, these trees have not survived until today.

The project area has evidently experienced disturbance from the past land use and the large-scale earth movement for the construction of the existing rainforest centre. Large areas of previous clearing have slowly been re-establishing a cover of mostly native vegetation, and plant species and animal species are returning.

## 3.2.3. Archaeological potential

Analysis of the documentary evidence, aerial imagery, and parish mapping demonstrates the study area has never been in private ownership. Early 19th-century activities within the region (c 1830s-40s) were largely limited to timber logging. Archaeological evidence of timber logging can be ephemeral, with remnant evidence usually restricted to tree stumps with cutters' board holes, and scattered sawing materials.

Analysis of the parish maps indicates the study area had been included within a dedicated nature reserve by the c 1920s but does not provide evidence of substantial structural development in the area at this time. Dorrigo NP was formalised in 1967. Examination of aerial imagery taken from the 1950s to the 1980s shows the study area within a small clearing, which NPWS representatives have indicated is likely linked with a mid 20th-century small stone quarry at the site, used for local road development. Aside from the negative scars left by quarrying, archaeologically this activity is very hard to distinguish as it leaves evidence which can be similar to the surrounding soils and geology. Evidence of a mid 20th-century informal rubbish dump was encountered at the site during the inspection. Evidence included glass bottles, glass and ceramic fragments, and pieces of metal. The existing rainforest was constructed from 1988 and images of the construction process at the site show widespread land clearances and levelling, with footings constructed for the installation of the skywalk (Appendix B). This activity would have impacted any historical archaeological resource that may have formed before construction. Evidence of the later 20th-century rubbish pit does not meet the threshold of local significance and is therefore not considered archaeological.

# 4. Likelihood of occurrence

The LoO for TECs, threatened species and migratory species within the study area has been assessed based on the presence of potential habitat. Results from the database searches were combined to produce a list of threatened species, populations and communities known or predicted to occur within the locality. Following the field survey each species' LoO was determined using database records, habitat availability within the study area based on the field survey, and literature available on the species' ecology. The LoO identified 13 MNES that require impact assessments including 5 vulnerable species, 3 endangered species and 5 migratory species.

The following species have the potential to be impacted by the proposed works and have been assessed in accordance with the EPBC Act significant impact guidelines, referred to as an assessment of significance (CoA 2013):

## VULNERABLE

- Pouched frog (Assa darlingtoni)
- Black-breasted button-quail (Turnix melanogaster)
- Parma wallaby (Notamacropus parma)
- Grey-headed flying-fox (Pteropus poliocephalus)
- Rainforest cool-skink (Harrisoniascincus zia)

## ENDANGERED

- Rufous scrub-bird (Atrichornis rufescens)
- Spotted-tailed quoll (Dasyurus maculatus)
- Milky silkpod (Parsonsia dorrigoensis)

## MIGRATORY

- Black-faced monarch (Monarcha melanopsis)
- Oriental cuckoo (Cuculus optatus)
- Rufous fantail (*Rhipidura rufifrons*)
- Spectacled monarch (Symposiachrus trivirgatus)
- White-throated needletail (*Hirundapus caudacutus*).

Impact assessments were conducted and are outlined in sections 5.6 and 5.7. The LoO is presented in Appendix B.

# 5. Matters of national environmental significance

MNES likely to be impacted by the activity have been assessed in accordance with *Matters of National Environmental Significance, Significant impact guidelines 1.1* (CoA 2013). The relevant considerations are addressed below.

# 5.1. World Heritage properties

The study area is partially within Dorrigo NP which is located in the New England Group of the Gondwana Rainforests of Australia listed on the World Heritage List (WHL #368). A statement of heritage impact and an Aboriginal cultural heritage assessment report have been prepared to assess the cultural heritage impacts and provide recommendations (ELA 2024b, ELA 2024c).

World Heritage values are protected under the EPBC Act. Approval is required for any action occurring within or outside a declared World Heritage place that has, will have, or is likely to have a significant impact on the World Heritage values of the place.

According to the MNES significant impact guidelines for World Heritage values, an action is likely to have a significant impact on the World Heritage values of a declared World Heritage property if there is a real chance or possibility that it will cause one or more of the World Heritage values to be lost, degraded or damaged, or notably altered, modified, obscured or diminished.

## 5.1.1. World Heritage properties with natural heritage values

Under the MNES significant impact guidelines, an action is likely to have a significant impact on the natural heritage values of a World Heritage property if there is a real chance or possibility the action will result in any of the following:

- Values associated with geology or landscape:
  - o damage, modify, alter or obscure important geological formations
  - $\circ$  damage, modify, alter or obscure landforms or landscape features, for example, by excavation or infilling of the land surface
  - modify, alter or inhibit landscape processes, for example, by accelerating or increasing susceptibility to erosion, or stabilising mobile landforms, such as sand dunes
  - $\circ$  divert, impound or channelise a river, wetland or other water body
  - substantially increase concentrations of suspended sediment, nutrients, heavy metals, hydrocarbons, or other pollutants or substances in a river, wetland or water body.
- Biological and ecological values:
  - o reduce the diversity or modify the composition of plant and animal species
  - $\circ$   $\,$  fragment, isolate or substantially damage habitat important for the conservation of biological diversity
  - cause a long-term reduction in rare, endemic or unique plant or animal populations or species
  - $\circ\,$  fragment, isolate or substantially damage habitat for rare, endemic or unique animal populations or species.

- Wilderness, natural beauty, or rare or unique environmental values:
  - involve construction of buildings, roads, or other structures, vegetation clearance, or other actions with substantial, long-term or permanent impacts on relevant values
  - introduce noise, odours, pollutants or other intrusive elements with substantial, long-term or permanent impacts on relevant values.

### ASSESSMENT OF IMPACTS

The concept design states, 'interventions are minimal and designed to enhance the character and experience of the rainforest.' The development would replace an existing structure and keep within areas of the landscape that have previously been cleared. There would be only very minor impact to the environmental significance of the surrounding item as the new landscaping works are largely contained to the western side of the study area, away from the rainforest and important views. Due to the significance of the surrounding rainforest, tree and vegetation removal would be undertaken 'as much as necessary, as little as possible'.

The DARC is to be characterised by a mix of natural environments and vegetation communities which will be preserved and improved through the management of vehicle and pedestrian movement and remediation works to reduce the impacts on the rainforest. Sensitive ecological design, landscaping and planting will ensure the natural environment continues to dominate the aesthetics of the site.

Recognition of Aboriginal heritage will be incorporated into the fabric of proposed works with the involvement of the Gumbaynggirr Aboriginal community. This can take many forms, from an understanding of and approach to the site, information on signage, use of Gumbaynggirr language, creative interpretation through artwork, and incorporation of cultural elements into the built form.

No disturbance to important geological, landscape features or land formations are expected under this proposal. A construction environmental management plan (CEMP) and operational management plan (OMP) will be developed with relevant mitigation measures to ameliorate potential impacts to biodiversity values outside and within the development footprint via sedimentation, surface runoff and erosion, off-target damage to native vegetation, injured wildlife, noise, odours and pollutants. The CEMP will include a separate chapter for hygiene wash-down procedures to ameliorate biosecurity risks. Further details on the CEMP are provided in Table 16 of the DARC ecological assessment report (ELA 2024a).

Flora species known as important Gondwana Rainforest relicts recorded within the study area include large numbers of ferns and conifers occurring within the mapped PCT 4107 Mid North Escarpment Coachwood Warm Temperate Rainforest (PCT 4107). Songbird species belonging to some of the oldest lineages of passerines, including the superb lyrebird (*Menura novaehollandiae*), various scrub-birds (*Atrichornithidae*), treecreepers (*Climacteridae*) and bowerbirds and catbirds (*Ptilonorhynchidae*) were observed within the study area via sightings, bird calls and nests. These species occur predominately in rainforest habitats. A detailed impact assessment of the threatened flora and fauna species can be found in section 5.7 and in the DARC ecological assessment (ELA 2024a).

In terms of the impacts on rainforests, an analysis was undertaken on the impacts of the proposal on Keith formation 'Rainforest' PCTs mapped by ELA as PCT 4107. A total area of 3.35 ha of 'Rainforest' Keith formation PCTs occurs within the study area, which is located within Dorrigo NP, where up to 0.63 ha will be directly impacted.

The proposal has a very small overall footprint measuring just 2.23 ha, where 0.63 ha of native vegetation or 'Rainforest' will be impacted. Within the confines of the World Heritage listed Gondwana Rainforests area in Dorrigo NP, which measures 11,773 ha, this represents less than 0.005% of the total area.

Removal of vegetation is to be minimised as far as possible. Furthermore, the vegetation to be removed or disturbed is primarily regenerating vegetation, as the site the existing rainforest centre was built on was essentially cleared before the 1950s. The regrowth vegetation is only 40–50 years old and does not represent mature primary rainforest. Thus, the impact on the natural landscape is significantly less than would be the case if primary rainforest was affected as this habitat is in a successional stage. The vegetation removed is to be offset through plantings to recreate the extant rainforest using local species. The aim is to reproduce as quickly as possible the naturally occurring rainforest vegetation so the impacts, in terms of clearing, will be short term only and the succession back to rainforest will restart. The selection of plants to use in the vegetation offset will come from local stock and can also consider the potential for climate change effects and include species most likely to tolerate any expected changes. This will improve the resilience of the local rainforest under future expected climatic conditions.

Given the very small area, and the design focus on minimising impacts and enhancing the character and experience of the rainforest, this assessment considers the cumulative impact to be negligible. The assessment concludes the activity will not significantly impact the natural heritage values of a World Heritage property.

The assessment has found the proposal will have a negligible impact on the World Heritage values ascribed to the study area according to its World Heritage listing. This finding is supported by Table 1 and Table 2, which follow the toolkit approach in *Guidance and Toolkit for Impact Assessments in a World Heritage Context* (UNESCO 2022).

#### Table 1: Tools 1 & 2 – heritage values, attributes and potential impacts

Element of proposal the	at has the potential to cause an impac	t					
Heritage / conservation values	Attributes	Criterion	Initial site survey	Demolition of existing structures	Construction of new rainforest centre	Construction of new Arc walkway	Use of the site by visitors
Outstanding examples of major stages of Earth's evolutionary history	Major remaining area of rainforest across eastern Australia	viii	None	None	None	None	None
	Margin along Australia's eastern edge characterised by an asymmetrical marginal swell that runs parallel to the coastline, eroded into the Great Divide and the Great Escarpment	viii	None	None	None	None	None
Sequence of volcanos is significant as it enables the dating of the geomorphic evolution of eastern Australia	Volcanoes erupted in sequence along the east coast resulting in the Tweed, Focal Peak, Ebor and Barrington volcanic shields	viii	None	None	None	None	None
Outstanding examples of major stages of Earth's ongoing geological and biological processes	Wide range of plant and animal lineages and communities with ancient origins in Gondwana	ix	None – area already highly disturbed	None – area already highly disturbed	None – area already highly disturbed	None – area already highly disturbed and not primary rainforest	None – area already highly disturbed
Multiple major stages of earths evolutionary history	'Age of the Pteridophytes' from the Carboniferous Period, 'Age of Conifers' in the Jurassic Period, Age of the Angiosperms' in the Early Cretaceous, the 'golden age' of the Early Tertiary, and a unique record of Miocene vegetation	ix	None – area already highly disturbed	None – area already highly disturbed	None – area already highly disturbed	None – area already highly disturbed and not primary rainforest	None – area already highly disturbed
Outstanding number of songbird species	Lyrebirds ( <i>Menuridae</i> ), scrub-birds (Atrichornithidae), treecreepers ( <i>Climacteridae</i> ) and bowerbirds and catbirds ( <i>Ptilonorhynchidae</i> ),	ix	Potential positive benefit by raising awareness of species and	Potential positive benefit by raising awareness of species	Potential positive benefit by raising awareness of species	Potential positive benefit by raising awareness of species and	Potential positive benefit by raising awareness of

Element of proposal that	Element of proposal that has the potential to cause an impact							
	belonging to some of the oldest lineages of passerines that evolved in the Late Cretaceous		advising visitors of the need for care	and advising visitors of the need for care	and advising visitors of the need for care	advising visitors of the need for care	species and advising visitors of the need for care	
Outstanding examples of major stages of Earth's exceptional biological diversity	Principal habitat for many threatened species of plants and animals	x	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	
Significant and important natural habitats for species of conservation significance, particularly those associated with the rainforests	Gondwana Rainforests provide the principal habitat for many species of plants and animals of outstanding universal value, including more than 270 threatened species as well as relict and primitive taxa	x	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	Potential positive benefit by raising awareness of species and advising visitors of the need for care	

#### Table 2: Tool 3 – evaluation of potential impacts

Element of proposed action	Attributes	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Quality of action	Evaluation of impact
Demolition of existing structure	'Age of the Pteridophytes' from the Carboniferous Period, 'Age of Conifers' in the Jurassic Period, Age of the Angiosperms' in the Early Cretaceous, the 'golden age' of the Early Tertiary, and a unique record of Miocene vegetation	Excessive or unnecessary demolition, unintentional destruction of habitat or species; inadequate clearance of demolished material	Once	Short-term	Reversible	Negative	Potential minor negative impact
Demolition of existing structure	Lyrebirds ( <i>Menuridae</i> ), scrub-birds ( <i>Atrichornithidae</i> ), treecreepers ( <i>Climacteridae</i> ) and bowerbirds and catbirds ( <i>Ptilonorhynchidae</i> ), belonging	Noise and alteration to vegetation disrupting local environment	Once	Short-term	Reversible	Negative	Potential minor negative impact

Element of proposed action	Attributes	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Quality of action	Evaluation of impact
	to some of the oldest lineages of passerines that evolved in the Late Cretaceous						
Construction of new rainforest centre and construction of new walkway	Principal habitat for many threatened species of plants and animals	Disruption of unknown ecosystems during construction	Once	Short-term	Reversible	Negative	Potential minor negative impact
Construction of new rainforest centre and construction of new walkway	Gondwana Rainforests provide the principal habitat for many species of plants and animals of outstanding universal value, including more than 270 threatened species as well as relict and primitive taxa	Carelessness of workers during construction and use leading to unintentional destruction of habitat or species	Once	Short-term	Reversible	Negative	Potential minor negative impact
Use of the site by visitors	Wide range of plant and animal lineages and communities with ancient origins in Gondwana	Carelessness of visitors leading to disruption of habitats, species or ecosystems	Intermittent	Short-term	Reversible	Negative	Potential minor negative impact
Use of the site by visitors	'Age of the Pteridophytes' from the Carboniferous Period, 'Age of Conifers' in the Jurassic Period, Age of the Angiosperms' in the Early Cretaceous, the 'golden age' of the Early Tertiary, and a unique record of Miocene vegetation	Carelessness of visitors leading to disruption of habitats, species or ecosystems	Intermittent	Short-term	Reversible	Negative	Potential minor negative impact
Use of the site by visitors	Lyrebirds ( <i>Menuridae</i> ), scrub-birds ( <i>Atrichornithidae</i> ), treecreepers ( <i>Climacteridae</i> ) and bowerbirds and catbirds ( <i>Ptilonorhynchidae</i> ), belonging to some of the oldest lineages of passerines that evolved in the Late Cretaceous	Raised awareness of importance of taking care of habitat and awareness of importance of the park	Intermittent	Long-term	Reversible	Positive	Potential minor positive impact
Use of the site by visitors	Principal habitat for many threatened species of plants and animals	Raised awareness of importance of taking care of	Intermittent	Long-term	Reversible	Positive	Potential minor positive impact

Element of proposed action	Attributes	Description of potential impact	Frequency of action	Duration of action	Reversibility of action	Quality of action	Evaluation of impact
		habitat and awareness of importance of the park					
Use of the site by visitors	Gondwana Rainforests provide the principal habitat for many species of plants and animals of outstanding universal value, including more than 270 threatened species as well as relict and primitive taxa	Raised awareness of importance of taking care of habitat and awareness of importance of the park	Intermittent	Long-term	Reversible	Positive	Potential minor positive impact

### 5.1.2. World Heritage properties with cultural heritage values

A statement of heritage impact and an aboriginal cultural heritage assessment report have been prepared to assess the cultural heritage impacts and provide recommendations (ELA 2024b, 2024c). The site is not listed for World Heritage cultural values and an assessment of cultural values against the MNES significant impact guidelines is not required.

## 5.2. National Heritage places

The Gondwana Rainforests of Australia are also on the National Heritage List (NHL #105704). A statement of heritage impact and an aboriginal cultural heritage assessment report have been prepared to assess the heritage impacts and provide recommendations (ELA 2024b, 2024c).

The criteria and values in the National Heritage listing mirrors that of the World Heritage listing, and so the above assessment, set out in Table 1 and Table 2, applies.

### 5.3. Wetlands of international importance (Ramsar wetlands)

The study area is not located in a Ramsar-listed wetland.

## 5.4. The Great Barrier Reef Marine Park

The Great Barrier Reef Marine Park does not occur within or adjacent to the study area.

### 5.5. Commonwealth marine area

The study area is not within a Commonwealth marine area, and is not proposed to impact a Commonwealth marine area.

## 5.6. Threatened ecological communities

Field investigations recorded no TECs occurring within the study area.

### 5.7. Listed threatened and migratory species

The EPBC Act PMST (Appendix A) combined with an LoO assessment (Appendix B) returned a list of 8 threatened species and 5 migratory species that are known or likely to occur within the study area. These species have the potential to be impacted by the proposed works and have been assessed in accordance with the EPBC Act significant impact guidelines (CoA 2013):

#### VULNERABLE

- Pouched frog (Assa darlingtoni)
- Black-breasted button-quail (*Turnix melanogaster*)
- Parma wallaby (Notamacropus parma)
- Grey-headed flying-fox (Pteropus poliocephalus)
- Rainforest cool-skink (Harrisoniascincus zia)

#### ENDANGERED

• Rufous scrub-bird (Atrichornis rufescens)

- Spotted-tailed quoll (Dasyurus maculatus)
- Milky silkpod (Parsonsia dorrigoensis)

## MIGRATORY

- Black-faced monarch (Monarcha melanopsis)
- Oriental cuckoo (*Cuculus optatus*)
- Rufous fantail (*Rhipidura rufifrons*)
- Spectacled monarch (Symposiachrus trivirgatus)
- White-throated needletail (*Hirundapus caudacutus*).

## 5.7.1. Vulnerable amphibians

### Table 3: Species profile – pouched frog (Assa darlingtoni)

Overview	Comment
EPBC Act status	Vulnerable
Threat abatement plan	Yes (chytridiomycosis)
Recovery plan	No
Habitat and ecology	Restricted to refugial closed forest communities (>90% canopy cover), at elevations largely above 800 m. The species is mainly found in temperate and subtropical rainforests but has also been recorded in wet sclerophyll forests
Extent of local occurrence	7 records in a 5-km square radius of the study area
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.
Important population	The Dorrigo Plateau (NSW) subpopulation is considered an important population because it is near the southern limit of the species' range (DCCEEW 2023a).

### Table 4: Assessment of significance – pouched frog (Assa darlingtoni)

Criterion	Question	Response
An action is lil	kely to have a significant impact on	a vulnerable species if there is a real chance or possibility that it will:
1)	lead to a long-term decrease in the size of an important population of a species	It is considered unlikely the disturbance of up to 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of the important population given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of an important population	The area of occupancy (AoO) of the pouched frog is estimated to be 740 km <sup>2</sup> (DCCEEW 2023a). A portion of this estimate includes the important population that occurs within the Dorrigo Plateau with known sites occurring in the Dorrigo and Nymboi-Binderay NPs. Given the disturbance occurs primarily in a pre-disturbed area (76 %), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AoO in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this species.

Criterion	Question	Response
3)	fragment an existing important population into 2 or more populations	The Dorrigo Plateau important population of this species occurs in the Dorrigo, Nymboi-Binderay NPs and the wider Dorrigo Plateau. Given the context of the proposal, including the location, size and proposed vegetation clearing, the proposal will not fragment this important population.
4)	adversely affect habitat critical to the survival of a species	No critical habitat, as defined under s 207A of the EPBC Act, has been identified or included in the register of critical habitat, although the conservation advice for this species lists habitat critical to the survival of this species as closed forest communities (>90% canopy cover), with an established layer of damp leaf litter (DCCEEW 2023a). A total of 0.63 ha of closed forest occurs within the impact area, although most of this area has previously been impacted by the construction, operation and maintenance of the existing Dorrigo Rainforest Centre. Lemckert (2000) observed the pouched frog does not recolonise sites when the canopy is lost through disturbance, even after leaf litter is re-established. Given this information, the action is considered to not adversely affect habitat critical to the survival of this species.
5)	disrupt the breeding cycle of an important population	Pouch frog eggs are laid under damp leaf litter, logs, rocks or anywhere on the forest floor (DPIE 2020b) and despite year-round calling, breeding is limited to spring and summer (DCCEEW 2023a). Given the majority of the potential habitat has been previously disturbed, and the species is unlikely to recolonise sites when the canopy is lost (Lemckert 2000) it is considered unlikely the breeding cycle for this species will be disrupted.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive species listed in the conservation advice (DCCEEW 2023a) for this species include weeds, due to the potential habitat for this species containing little understorey growth and high amounts of leaf litter. Given the previous construction and current operation of the Dorrigo Rainforest Centre has resulted in limited weed species becoming established within the potential habitat, it is considered unlikely the proposal will result in invasive species that are harmful to this species becoming established. The proposal will also incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds.
8)	introduce disease that may cause the species to decline	Disease listed in the conservation advice (DCCEEW 2023a) for this species includes Chytridiomycosis caused by chytrid fungus. Chytrid fungi distribution is widespread in coastal eastern Australia and has previously been recorded on the Dorrigo Plateau (Berger et al. 1999; Kriger et al. 2006). However, it is not known if natural populations of pouched frogs are susceptible to this disease as it is associated with species that use permanent waterbodies (DCCEEW 2023a). Given the above, and the context that current operation has had the potential for traffic to introduce Chytrid to the population, it is considered unlikely the disease would be introduced or exacerbate the occurrence to the extent that it causes the species to decline. A wash-down station for visitors will also mitigate this risk.

Criterion	Question	Response
9)	interfere substantially with the recovery of the species.	A national recovery plan for this species is not available at this time, and recovery is guided by the conservation advice. The primary conservation objective listed is to ensure there is no further decline in the distribution of the pouched frog, and population size is stable or increasing, with existing habitat being protected and maintained (DCCEEW 2023a). Given the context of the proposal and limited impacts predicted to occur to this species, the proposal will not interfere substantially with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this vulnerable species.

## 5.7.2. Vulnerable birds

### Table 5: Species profile – Black-breasted button-quail (Turnix melanogaster)

Overview	Comment
EPBC Act status	Vulnerable
Threat abatement plan	Yes (feral cats, feral pigs, European red fox)
Recovery plan	Yes
Habitat and ecology	South-east Queensland and far north-east New South Wales, mainly on and east of the Great Divide but extending inland to the inner western slopes. Very few NSW records in recent times. Dry rainforests, vine forest and vine thickets. May also occupy wetter subtropical rainforests, sometimes in association with moist eucalypt forest.
Extent of local occurrence	Suitable habitat occurs within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.
Important population	Important population is any subpopulation or NSW populations in the southern distribution. All populations in New South Wales are important, especially those at the southern limit of the species' range near Dorrigo and Walcha. These are important source populations which are required to be maintained if the species is to persist in the long-term in New South Wales (DCCEEW 2024a).

#### Table 6: Assessment of significance – black-breasted button-quail (Turnix melanogaster)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	It is considered unlikely the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of the important population given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of an important population	The total AoO is estimated to be approximately 750 km <sup>2</sup> , but this estimate is of low reliability, and it is likely that the AoO is underestimated (DCCEEW 2024a). The AoO of this important population is unknown, although given the disturbance occurs primarily in a pre-disturbed area (76%), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AoO in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this species.
3)	fragment an existing important population into 2 or more populations	Given the context of the proposal, including the location, size and proposed vegetation clearing, the proposal will not fragment this important population and it is reasonable to assume the important population that may still occur within the locality would occur in the wider region.
4)	adversely affect habitat critical to the survival of a species	No critical habitat has been defined under s 207A of the EPBC Act. Habitat critical to the survival of this species is given within the recovery plan (CoA 2022). Habitat critical to the survival of the species occurs within the study area as potential foraging and breeding habitat. The extent of this habitat to be removed is 0.63 ha, of which the majority has been previously disturbed. This amount of habitat removal is considered unlikely to endanger the long-term survival of the species within the broader area given the high amount of contiguous potential habitat within the locality.
5)	disrupt the breeding cycle of an important population	The breeding season generally occurs from September to April–May, in which nests are created and consist of a scrape in the ground, lined with leaves, grass or moss (DCCEEW 2024a). Given the shy nature of this species, it is considered unlikely the species will situate its nests close to the existing rainforest centre where the proposed disturbance will occur. Pre-clearance surveys will also aim to identify potential signs of nesting to limit impacts to this species.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.
7)	result in invasive species that are harmful to a vulnerable species	Currently, the main invasive threat to this species is weed invasion and predation. This includes weeds (particularly those that gradually smother the leaf-litter layer), cats and European foxes (CoA 2022). Given the previous construction and current operation of the Dorrigo Rainforest Centre has resulted in limited invasive species becoming established within the potential habitat, it is considered unlikely the

Criterion	Question	Response
	becoming established in the vulnerable species' habitat	proposal will result in invasive species which are harmful to this species. The proposal will also incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.
8)	introduce disease that may cause the species to decline	Disease transmission by feral pigs may be a threat for this species, however the proposed impacts are unlikely to exacerbate this threat within the locality.
9)	interfere substantially with the recovery of the species.	The National Recovery Plan for Black-breasted Button-quail (CoA 2022) identifies objectives and actions to assist in the recovery of this species. Given the context of the proposal and limited impacts predicted to occur to this species, the proposal will not interfere substantially with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this vulnerable species.

### 5.7.3. Vulnerable mammals

#### Table 7: Species profile – grey-headed flying-fox (Pteropus poliocephalus)

Overview	Comment
EPBC Act status	Vulnerable
Threat abatement plan	No
Recovery plan	Yes
Habitat and ecology	Along the eastern coast of Australia, from Bundaberg in Queensland to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.
Extent of local occurrence	No flying-fox camps are identified within the study area. However, there is suitable foraging habitat within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat. No flying-fox camps are present within the study area. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.
Important population	The grey-headed flying-fox is considered to be a single, mobile population with individuals distributed across Queensland, New South Wales, Victoria, South Australia, Tasmania and the ACT and therefore the entire population is considered important.

#### Table 8: Assessment of significance – grey-headed flying-fox (Pteropus poliocephalus)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	The grey-headed flying-fox (GHFF) is considered one population due to the constant exchange of genetic material between individuals and its movement between camps throughout its entire geographic range (DAWE 2021). Maternity or other roosting habitat is considered important habitat for this species. According to the National Flying-fox Monitoring Program, no GHFF camps currently occur or have ever been recorded within the study area. The nearest active GHFF camp occurs at Bellingen Island approximately 20 km south-east of the study area and is considered a nationally important camp. The DARC will impact 0.63 ha of potential foraging habitat for the GHFF. Given the proximity of other suitable habitat outside the study area this removal would not constitute an impact that would lead to the long-term decrease in the size of an important population of GHFF.
2)	reduce the area of occupancy of an important population	There is currently no estimate of the AoO for this species, although its distribution occurs over most of eastern Australia. The proposal will reduce the extent of available foraging habitat for the GHFF (0.63 ha). Given the GHFF is known to fly long distances (up to 20 km per night) and move between camps, in the context of this proposal the impacts are not considered likely to reduce the AoO of this species.
3)	fragment an existing important population into 2 or more populations	Given the context of the proposal, including the location, size, proposed vegetation clearing and this species mobility, the proposal will not fragment this important population.
4)	adversely affect habitat critical to the survival of a species	Habitat critical to the survival of the GHFF is listed within the recovery plan for this species (DAWE 2021). Critical habitat may occur where the existence of important winter and spring flowering vegetation communities occur. The vegetation listed does not occur within the study area. Habitat critical to the survival of this species also may be considered species used for roosting at a nationally important camp or for foraging within 20 km of an important camp. The nearest active GHFF camp occurs at Bellingen Island approximately 20 km south-east of the study area and is considered a nationally important camp. However, given the context of the impacts, the removal of mostly previously disturbed potential foraging habitat it is not considered likely to adversely affect this species.
5)	disrupt the breeding cycle of an important population	The proposed action will not disrupt the breeding cycle of GHFF given that no camps will be affected.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential foraging habitat is unlikely to result in the decline of this species given that most of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.
7)	result in invasive species that are harmful to a vulnerable	Invasive species are not listed as a threat within the recovery plan for this species (DAWE 2021), however the proposal will incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.

Criterion	Question	Response
	species becoming established in the vulnerable species' habitat	
8)	introduce disease that may cause the species to decline	There is very little information available on the impact of disease on Australian flying-fox populations, including GHFF (DAWE 2021). Given the context of this proposal, disease that could affect these species is unlikely to be introduced.
9)	interfere substantially with the recovery of the species.	The disturbance of 0.63 ha of foraging habitat is unlikely to interfere substantially with the species recovery as there has never been a camp within the STUDY area and this foraging habitat represents a very minor proportion of available habitat in the immediate and broader area.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this vulnerable species.

#### Table 9: Species profile – parma wallaby (Notamacropus parma)

Overview	Comment
EPBC Act status	Vulnerable
Threat abatement plan	Yes (feral cats, European red fox)
Recovery plan	No
Habitat and ecology	Their range is now confined to the coast and ranges of central and northern New South Wales from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.
Extent of local occurrence	Suitable habitat occurs within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.
Important population	Populations important to the survival of the parma wallaby include populations at the limits of the species' range, outlying populations, stronghold populations, research populations and other populations where recovery actions, such as predator control and reintroductions, are being implemented (DCCEEW 2022). Upper altitudinal sites include the Dorrigo Plateau and therefore this has been precautionarily assumed to be important.

#### Table 10: Assessment of significance – parma wallaby (Notamacropus parma)

Criterion	Question	Response
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1)	lead to a long-term decrease in the size of an important population of a species	It is considered unlikely the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of the important population given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of an important population	The AoO for this species is estimated to be 590 km <sup>2</sup> (DCCEEW 2022). The assumed important populations' AoO is unknown, however given the disturbance occurs primarily in a pre-disturbed area (76%), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AoO of the entire species, in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this important population.
3)	fragment an existing important population into 2 or more populations	Given the context of the proposal, including the location, size, proposed vegetation clearing and this species mobility, the proposal will not fragment this important population.
4)	adversely affect habitat critical to the survival of a species	The habitat critical to the survival of the parma wallaby includes:
		occupied forested habitat
		<ul> <li>unoccupied forested areas adjacent or near known occurrences, which can provide future habitat for natural range expansion, dispersal or translocation</li> </ul>
		• areas of habitat that supported the species in the past, but from which they are now absent (DCCEEW 2022).
		Potential habitat for parma wallaby was identified within the study area, with one record retrieved within a 5-km radius of the study area. Therefore the study area may represent unoccupied forested habitat, although given the context of the proposal, the impact to this habitat is considered negligible.
5)	disrupt the breeding cycle of an important population	There are no predicted impacts to the breeding cycle of this important population.
6)	modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given tha the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.

Criterion	Question	Response
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	Invasive species including feral animals and weeds are a risk to this species. However, it is unlikely the proposal will introduce any new invasive species that are a threat. The proposal will incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.
8)	introduce disease that may cause the species to decline, or	Disease that could affect these species is unlikely to be introduced as a result of the proposed works.
9)	interfere substantially with the recovery of the species.	The objective within the recovery plan for this species is that population decline is arrested and reversed, geographic range is increased by reintroductions to parts of the range from which the species has disappeared, and population connectivity is maintained or restored (DCCEEW 2022). Given the context of the proposal and limited impacts predicted to occur to this species, the proposal will not interfere substantially with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this vulnerable species.

## 5.7.4. Vulnerable reptiles

#### Table 11: Species profile – rainforest cool-skink (Harrisoniascincus zia)

Overview	Comment
EPBC Act status	Vulnerable
Threat abatement plan	No
Recovery plan	No
Habitat and ecology	Generally, occur at high elevation in New South Wales and Queensland ranging from >500 m elevation, with most occurrences from >700 m. Inhabit elevation areas with Nothofagus moorei (Antarctic beech).
Extent of local occurrence	Species distribution overlaps with study area and suitable habitat occurs.
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.

Overview	Comment
Important population	All populations are critical to the survival of the rainforest cool-skink. Populations that have the capacity to move to higher elevation or have an increased resilience
	to changes in climatic conditions due to their physiology (thermal and dehydration tolerances) or ecology (e.g. inhabiting bouldered areas), may be more resilient to
	climate change impacts and are therefore important populations (DCCEEW 2023b).

#### Table 12: Assessment of significance – rainforest cool-skink (Harrisoniascincus zia)

Criterion	Question	Response
An action is l	ikely to have a significant impact on	a vulnerable species if there is a real chance or possibility that it will:
1)	lead to a long-term decrease in the size of an important population of a species	It is considered unlikely the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of the important population given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of an important population	The AoO for this species is estimated to be between 250–2,000 km <sup>2</sup> (DCCEEW 2023b). The AoO of this important population is unknown, however given the disturbance occurs primarily in a pre-disturbed area (76%), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AoO of the entire species in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this important population.
3)	fragment an existing important population into 2 or more populations	Given the context of the proposal, including the location, size, proposed vegetation clearing and this species mobility, the proposal will not fragment this important population.
4)	adversely affect habitat critical to the survival of a species	No critical habitat, as defined under s 207A of the EPBC Act, has been identified or included in the register of critical habitat. The conservation advice lists critical habitat for rainforest cool-skink as all areas with habitat attributes and that occur above 500-m elevation within the species distribution (DCCEEW 2023b). In the absence of targeted survey, the habitat within the study area is considered critical habitat. The extent of this habitat to be removed is 0.63 ha, of which the majority has been previously disturbed. This amount of habitat removal is considered unlikely to endanger the long-term survival of the important population within the study area.
5)	disrupt the breeding cycle of an important population	The rainforest cool-skink lays eggs in early January in shallow depressions under a surface structure of moss or bark (DCCEEW 2023b). The potential disturbance of up to 0.63 ha of potential habitat is considered unlikely to impact the breeding cycle of the important population given the extensive areas of habitat that will remain in and adjacent to the study area. The project will also incorporate pre-clearance surveys which aims to reduce the risk of incidental fatality and impact to nests.
6)	modify, destroy, remove or isolate or decrease the	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.

Criterion	Question	Response
	availability or quality of habitat to the extent that the species is likely to decline	
7)	result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	No threats from invasive species are listed within the conservation advice for this species (DCCEEW 2023b). It is also unlikely the proposal will introduce any new invasive species that are a threat. The proposal will also incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.
8)	introduce disease that may cause the species to decline, or	No threats from disease are listed within the conservation advice for this species (DCCEEW 2023b). In lieu of this and given the context of the proposal it is considered unlikely the proposal would introduce or exacerbate any disease that may cause the species to decline.
9)	interfere substantially with the recovery of the species.	There is no national current recovery plan for rainforest cool-skink. Conservation and recovery actions are listed in the conservation advice (DCCEEW 2023b). The proposed action is unlikely to interfere with any of the listed actions.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this vulnerable species.

## 5.7.5. Endangered and critically endangered flora

#### Table 13: Species profile – milky silkpod (Parsonsia dorrigoensis)

Overview	Comment
EPBC Act status	Endangered
Threat abatement plan	No
Recovery plan	Yes – Northern Rivers
Habitat and ecology	Found only within New South Wales, in the north coast region between Kendall and Woolgoolga. Subtropical and warm-temperature rainforest, rainforest margins, and moist eucalypt forest up to 800 m, on brown clay soils.
Extent of local occurrence	Species known from the locality and suitable habitat occurs within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat and potential indirect impacts to one individual during construction. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.

Overview	Comment
Important populations	No definition of important population is provided within the conservation advice for <i>Parsonsia dorrigoensis</i> . The MNES significant impact guidelines define 'important population' as a population that is necessary for a species long-term survival and recovery. This may include populations identified as such in recovery plans, or that are:
	key source populations either for breeding or dispersal

- populations that are necessary for maintaining genetic diversity
- populations that are near the limit of the species' range.

An assessment of significance is required for all populations of this endangered species, regardless of whether they are considered important.

#### Table 14: Assessment of significance – milky silkpod (Parsonsia dorrigoensis)

Criterion	Question	Response
An action is lil	ely to have a significant impact	on a critically endangered or endangered species if there is a real chance or possibility that it will:
1)	lead to a long-term decrease in the size of a population	It is considered unlikely that the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, and a potential indirect impact to one individual would constitute an impact that would lead to a long-term decrease in the size of a population given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of the species	No AoO of this species is listed. Given the disturbance occurs primarily in a previously disturbed area (76%) and the removal of 0.63 ha of potential habitat in the context of the proposal and the available habitat within the surrounding area, the proposed impact is unlikely to reduce the AoO to an extent this species would decline.
3)	fragment an existing population into 2 or more populations	Given the context of the proposal, including the location, size, and proposed vegetation clearing, the proposal will not fragment this population. It is expected that genetic material and seeds will be able to be transferred across any newly created gaps.
4)	adversely affect habitat critical to the survival of a species	No critical habitat has been identified for this species within the conservation advice (DEWHA 2008). The DARC may disturb up to 0.63 ha of potential habitat and could indirectly impact one individual.
5)	disrupt the breeding cycle of a population	This action is unlikely to disrupt the breeding cycle of a population given the scale of the removal of potential habitat in the context of the additional habitat that will remain. Additionally, a potential indirect impact to one individual is unlikely to disrupt the breeding cycle of a population to the extent that it would decline. The project will also incorporate pre-clearance surveys which will aim to identify any previously unrecorded individuals that may occur or have germinated within the study area.

Criterion	Question	Response
6)	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.
7)	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive weeds are a risk to this species through competition and shading. However, it is unlikely the proposal will introduce any new invasive species that are a threat. The proposal will incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.
8)	introduce disease that may cause the species to decline	Potential spread of <i>Phytophthora cinnamomi</i> is a threat to this species although Phytophthora is already known to occur within the study area. To mitigate the potential spread of Phytophthora and other harmful pathogens, wash-down stations will be installed at positions where the chemicals will not be able to directly enter the local waterways. Appropriate management actions will be implemented to control the spread of <i>Phytophthora cinnamomi</i> .
9)	interfere with the recovery of the species	There is currently a Northern Rivers Regional Biodiversity Management Plan (DECCW 2010) which lists recovery actions for threatened species in the Northern Rivers region and is not specific to <i>Parsonsia dorrigoensis</i> . The DARC is unlikely to interfere with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this endangered species.

## 5.7.6. Endangered and critically endangered birds

Table 15: Species profile – rufous scrub-bird (Atrichornis rufescens)

Overview	Comment
EPBC Act status	Endangered
Threat abatement plan	No
Recovery plan	No

Overview	Comment
Habitat and ecology	The northern subspecies ( <i>A. rufescens rufescens</i> ) occurs between the Mistake Range in Queensland and the Gibraltar Range in northern New South Wales. The southern subspecies ( <i>A. rufescens ferrieri</i> ) is confined to New South Wales, from the Dorrigo Plateau to Barrington Tops. High-altitude (above 600 m) subtropical, warm temperate and cool temperate rainforests, and wet sclerophyll forests.
Extent of local occurrence	Species known from the locality and suitable habitat occurs within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs.
Important populations	The rufous scrub-bird is found in isolated populations along the Great Dividing Range, spanning from Mistake Mountains in southern Queensland to Barrington Tops in New South Wales. Six key subpopulations include Gibraltar Ranges, Border Ranges, the northern McPherson Range, Barrington Tops, Hastings Range, and the Dorrigo/Ebor area (DAWE 2014).

### Table 16: Assessment of significance – rufous scrub-bird (Atrichornis rufescens)

Criterion	Question	Response		
An action is	An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility that it will:			
1)	lead to a long-term decrease in the size of a population	It is considered unlikely the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of a population given the abundance of habitat adjacent to the study area.		
2)	reduce the area of occupancy of the species	The rufous scrub-bird species predicted AoO is 410 km <sup>2</sup> (DAWE 2014). Given the disturbance occurs primarily in a previously disturbed area (76%), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AoO in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this species.		
3)	fragment an existing population into 2 or more populations	Given the context of the proposal, including the location, size, proposed vegetation clearing and this species mobility, the proposal will not fragment this population.		
4)	adversely affect habitat critical to the survival of a species	No critical habitat has been identified within the conservation advice (DAWE 2014) or the register of critical habitat. However, the conservation advice suggests important habitat for rufous scrub-bird as rainforests above 600 m elevation, including subtropical, warm temperate and cool temperate rainforests, and nearby moist and wet eucalypt forests provide important habitat for the species. The DARC would impact 0.63 ha of potential important habitat for this species although this is not predicted to adversely affect habitat that is critical to the survival of the species given the context of the proposal.		
Criterion	Question	Response		
------------	--	--		
5)	disrupt the breeding cycle of a population	This action is unlikely to disrupt the breeding cycle of a population given the scale of the removal of potential habitat in the context of the additional habitat that will remain. The project will also incorporate pre-clearance surveys which will aim to identify any potential nests within the study area.		
6)	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential habitat is unlikely to result in the decline of this species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.		
7)	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No threats from invasive species are listed within the conservation advice for this species (DAWE 2014). It is also unlikely the proposal will introduce any new invasive species that are a threat. The proposal will incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and invasive pests.		
8)	introduce disease that may cause the species to decline	No threats from disease are listed within the conservation advice for this species (DAWE 2014). In lieu of this and the context of the proposal it is considered unlikely the proposal would introduce or exacerbate any disease that may cause the species to decline.		
9)	interfere with the recovery of the species	There is no national current recovery plan for rufous scrub-bird. Conservation and recovery actions are listed in the conservation advice (DAWE 2014). The proposed action is unlikely to interfere with any of the listed actions.		
Conclusion	Is there likely to be a significant impact?	No. The proposed action is unlikely to have a significant impact on rufous scrub-bird.		

#### 5.7.7. Endangered and critically endangered mammals

#### Table 17: Species profile – spotted-tailed quoll (Dasyurus maculatus)

Overview	Comment
EPBC Act status	Endangered
Threat abatement plan	Yes (feral cats, European red fox)
Recovery plan	Yes
Habitat and ecology	Occurs on the east coast of New South Wales, Tasmania, eastern Victoria and north-eastern Queensland. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the subalpine zone to the coastline.
Extent of local occurrence	Suitable foraging habitat occurs within the study area.
Impacts	Disturbance of 0.63 ha of potential habitat. An increase in ongoing indirect disturbance of adjacent habitat from increased human interaction and maintenance is anticipated, however this is considered marginal given the high volume of visitors and maintenance that currently occurs. No suitable large hollows were recorded within the study area that may be used as den sites for the spotted-tailed quoll.
Important population	Northern Tablelands (Dorrigo Plateau) (AGDE 2016).

#### Table 18: Assessment of significance – spotted-tailed quoll (Dasyurus maculatus)

Criterion	Question	Response
An action is l	ikely to have a significant impact	on a critically endangered or endangered species if there is a real chance or possibility that it will:
1)	lead to a long-term decrease in the size of a population	It is considered unlikely the disturbance of 0.63 ha of potential habitat, including 0.48 ha of previously disturbed areas, would constitute an impact that would lead to a long-term decrease in the size of a population of these species given the abundance of habitat adjacent to the study area.
2)	reduce the area of occupancy of the species	The AoO for spotted-tailed quoll is 2,512 km <sup>2</sup> (DAWE 2020). Given the disturbance occurs primarily in a previously disturbed area (76%), the removal of 0.63 ha of potential habitat and possibly 0.0063 km <sup>2</sup> of the AOO in the context of the proposal and the available habitat within the surrounding area, the proposed impact is not considered a significant reduction in the AoO of this species.
3)	fragment an existing population into two or more populations	Given the context of the proposal, including the location, size, proposed vegetation clearing and these species mobility, the proposal will not fragment a population.

Criterion	Question	Response
4)	adversely affect habitat critical to the survival of a species	Habitat that is critical to the survival of the spotted-tailed quoll includes large patches of forest with adequate denning resources and relatively high densities of medium-sized mammalian prey. The study area is part of a large contiguous patch of forest, likely to have these suitable characteristics, however impacts are considered negligible given the scale of habitat removal proposed and that no denning resources are proposed to be removed.
5)	disrupt the breeding cycle of a population	No potential denning habitat for spotted-tailed quoll was recorded within the study area. Therefore, it is unlikely the DARC will disrupt the breeding cycle of this species.
6)	modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The disturbance of 0.63 ha of potential foraging habitat is unlikely to result in the decline of this species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP.
7)	result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Invasive threats, specifically European foxes, feral cats and dogs are harmful to this species (AGDE 2016). However given the context of the proposal including existing threats from these species within the study area, it is considered unlikely the proposal will exacerbate these threats. Additionally, the proposal will incorporate a site-specific CEMP which will include measures to reduce the spread and introduction of weeds and these invasive pests.
8)	introduce disease that may cause the species to decline	No threats from disease are known for these species. In lieu of this and the context of the proposal it is considered unlikely that the proposal would introduce or exacerbate any unknown disease that may cause the species to decline.
9)	interfere with the recovery of the species	Recovery action for spotted-tailed quoll is listed in the National Recovery Plan (AGDE 2016). Impacts to these objectives are unlikely given the context of the proposal and that no potential denning habitat would be removed.
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on this species.

#### 5.7.8. Migratory species

The LoO identified 5 species listed as migratory under the EPBC Act as having the potential to occur within the study area. Under the MNES significant impact guidelines (CoA 2013), an action is likely to have a significant impact on a migratory species if there is a real chance or possibility it will:

- substantially modify, destroy or isolate an area of important habitat for a migratory species
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species
- seriously disrupt the life cycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Important habitat for migratory species considered to have potential to occur on site is presented in the *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act* (CoA 2015) and in Table 19 for the species with potential to occur within the study area.

	Significant impact	thresholds (CoA 2015)	- Important habitat (CoA 2015)	
Species	Area of habitat (ha)	Ecologically significant proportion of the population		
Black-faced monarch (Monarcha melanopsis)	2,600	4,600	Wet forest specialist, found mainly in rainforest and wet sclerophyll forest, especially in sheltered gullies and slopes with a dense understorey of ferns or shrubs.	
Oriental cuckoo ( <i>Cuculus optatus</i> )	250,000	10,000	Non-breeding habitat only: monsoonal rainforest, vine thickets, wet sclerophyll forest or open casuarina, acacia or eucalyptus woodlands. Frequently at edges or ecotones between habitat types. Riparian forest is favoured habitat in the Kimberley region.	
Rufous fantail (Rhipidura rufifrons)	7,500	48,000	Moist, dense habitats, including mangroves, rainforest, riparian forests and thickets, and wet eucalypt forests with a dense understorey. When on passage a wider range of habitats are used including dry eucalypt forests and woodlands and Brigalow shrublands.	
Spectacled monarch (Symposiachrus trivirgatus)	2,100	6,500	Dense vegetation, mainly in rainforest but also in moist forest or wet sclerophyll and occasionally in other dense vegetation such as mangroves, drier forest and woodlands.	
White-throated needletail ( <i>Hirundapus</i> <i>caudacutus</i> )	*	*	Non-breeding habitat only: found across a range of habitats, more often over wooded areas, where it is almost exclusively aerial. Large tracts of native vegetation, particularly forest, may be a key habitat requirement for species. Found to roost in tree hollows in tall trees on ridge-tops, on bark or rock faces. Appears to have traditional roost sites.	

#### Table 19: Species profile – migratory birds

\* No threshold area can be determined at this time or has identified given lack of knowledge or rarity. Research on white-throated needletail may reveal site thresholds in tall forest used by roosting birds.

The second consideration in the process is whether an ecologically significant proportion of whitethroated needletail occurs within the development footprint and could be impacted by the proposed works. Under the MNES significant impact guidelines (CoA 2013), an 'ecologically significant proportion' for a migratory species differs between species.

Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns. ELA has deemed it unlikely that any ecologically significant proportion of any of these species could be impacted by the proposed works. Australian rainforests do not provide breeding habitat for the white-throated needletail or oriental cuckoo, and while both the black-faced monarch and rufous fantail do breed in this habitat (CoA 2015), the study area was surveyed during their appropriate migration visiting periods (Nietmann and Ha 2018; Schodde and Tidemann 1993) and none of these species were recorded foraging or breeding within the development footprint. Little information regarding spectacled monarch migration was found, however, sightings have been recorded in Australia during October (Butterfield 2022), aligning with the site visit where no individuals were recorded. An abundance of appropriate breeding and foraging habitat is also present adjacent to the study area and within the wider national park estate.

Considering the information provided above, an assessment following the significant impact criteria for migratory species (CoA 2013) is provided in Table 20.

Criterion	Question	Kesponse		
An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:				
1)	Will the proposal substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species?	The disturbance of 0.63 ha of potential habitat for these migratory species is unlikely to result in the decline of these species given the majority of the habitat has previously been disturbed and there are extensive areas of similar habitat present around the study area including Dorrigo NP. Additionally, the study area does not constitute known important habitat for these species.		
2)	Will the proposal result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species?	Invasive threats for white-throated needletail and oriental cuckoo are unknown. The remaining potential migratory species are threatened by <i>Rattus rattus</i> (black rat) and by invasive vines of riparian habitat (rubber vine [ <i>Cryptostegia grandiflora</i> ], CoA 2015). Given the context of the proposal including likely existing threats from black rat and that the study area does not contain riparian habitat, it is considered unlikely the proposal will exacerbate these threats. Additionally, the study area does not constitute known important habitat for these species.		
3)	Will the proposal seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species?	No. An ecologically significant proportion of these species does not occur within the study area. Only non-breeding habitat for white- throated needletail and oriental cuckoo occurs in Australia. Potential impacts to the life cycle of the remaining species will be minimised through pre-clearance surveys to record and avoid any nests.		
Conclusion	Is there likely to be a significant impact?	No. The DARC is unlikely to have a significant impact on these listed migratory species.		

Table 20: Assessment of significance – migratory birds

## 6. References

AGDE (Australian Government Department of the Environment) (2016) *National Recovery Plan for the Spotted-tailed Quoll* Dasyurus maculatus, Department of Environment, Land, Water and Planning, Australian Government, Canberra, <u>www.dcceew.gov.au/sites/default/files/documents/national-recovery-plan-spotted-tailed-quoll.pdf</u>.

Berger L, Speare R and Hyatt AD (1999) 'Chytrid fungi and amphibian declines: overview, implications and future directions', in: Campbell A (ed) *Declines and disappearances of Australian frogs*, Environment Australia, Canberra, 23–33.

Butterfield M (2022) 'Assessing the number of rare birds in an area', *Canberra Bird Notes* 47(1) 29–33, canberrabirds.org.au/wp-content/uploads/2022/05/CBN-471-final-1.pdf.

CoA (Commonwealth of Australia) (2013) *Matters of National Environmental Significance, Significant impact guidelines 1.1,* Environment Protection and Biodiversity Conservation Act 1999, Australian Government Department of the Environment, Commonwealth of Australia, <u>www.dcceew.gov.au/environment/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance</u>.

CoA (2015) *Draft referral guideline for 14 birds listed as migratory species under the EPBC Act,* Australian Government Department of the Environment, Commonwealth of Australia, www.dcceew.gov.au/sites/default/files/documents/migratory-birds-draft-referral-guideline.pdf.

CoA (2022) National Recovery Plan for Black-breasted Button-quail (Turnix melanogaster), Australian Government Department of Climate Change, Energy, the Environment and Water, Commonwealth of Australia, www.dcceew.gov. au/sites/default/files/documents/national-recovery-plan-black-breasted-button-quail.pdf.

DAWE (Department of Agriculture, Water and the Environment) (2014) *Conservation Advice,* Atrichornis rufescens, *rufous scrub-bird*, Department of Agriculture, Water and the Environment, environment. gov. au/biodiversity/threatened/species/pubs/655-conservation-advice.pdf.

DAWE (2020) *Conservation Advice,* Dasyurus maculatus maculatus *(southeastern mainland population), Spotted-tailed Quoll, south eastern mainland*, Department of Agriculture, Water and the Environment, Australian Government,

environment.gov.au/biodiversity/threatened/species/pubs/75184-conservation-advice-01092020.pdf.

DAWE (2021) National Recovery Plan for the Grey-headed Flying-fox Pteropus poliocephalus, Department of Agriculture, Water and the Environment, Australian Government, www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/grey-headed-flyingfox.

DCCEEW (Cth Department of Climate Change, Energy, the Environment and Water) (2022), *Conservation Advice for* Notamacropus parma (*Parma wallaby*), Australian Government Department of Climate Change, Energy, the Environment and Water, www.environment.gov.au/biodiversity/threatened/species/pubs/89289-conservation-advice-05102022.pdf

DCCEEW (Cth) (2023a) *Conservation Advice for* Assa darlingtoni *(pouched frog)*, Australian Government Department of Climate Change, Energy, the Environment and Water,

www.environment.gov.au/biodiversity/threatened/species/pubs/1965-conservation-advice-07092023.pdf.

DCCEEW (Cth) (2023b) *Conservation Advice for* Harrisoniascincus zia *(rainforest cool-skink)*, Australian Government Department of Climate Change, Energy, the Environment and Water,

www.environment.gov.au/biodiversity/threatened/species/pubs/84785-conservation-advice-07092023.pdf.

DCCEEW (Cth) (2024) *Species Profile and Threats Database,* Turnix melanogaster — *Black-breasted Button-quail*, Australian Government Department of Climate Change, Energy, the Environment and Water, <u>environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon\_id=923</u>, accessed 28 May 2024.

DCCEEW (Cth) (2015) *National Flying-fox monitoring viewer*, Australian Government Department of Climate Change, Energy, the Environment and Water, <u>www.environment.gov.au/webgis-framework/apps/ffc-wide/ffc-wide.jsf</u>, accessed 30 May 2024.

DECCW (NSW Department of Environment, Climate Change and Water) (2010) *Northern Rivers Regional Biodiversity Management Plan*, Department of Environment, Climate Change and Water NSW, <u>www.dcceew.gov.au/environment/biodiversity/threatened/recovery-plans/northern-rivers-</u> <u>regional-biodiversity-management-plan-2010</u>

DEH (Department of Environment and Heritage) (2000) *World Heritage Central Eastern Rainforest Reserves of Australia Strategic Overview for Management*, Australian Government Department of Environment and Heritage, <u>www.dcceew.gov.au/sites/default/files/documents/mgtoverview.pdf</u>.

DEWHA (Department of the Environment, Water, Heritage and the Arts) (2008) *Conservation Advice for* Parsonsia dorrigoensis — *Milky Silkpod*, Australian Government Department of the Environment, Water, Heritage and the Arts, <u>www.environment.gov.au/biodiversity/threatened/species/pubs/64684-conservation-advice.pdf</u>.

DPIE (Department of Planning, Industry and Environment) (2020a) *Surveying threatened plants and their habitats, NSW survey guide for the Biodiversity Assessment Method*, NSW Department of Planning, Industry and Environment, <u>www.environment.nsw.gov.au/publications/surveying-threatened-plants-and-their-habitats-bam-survey-guide</u>.

DPIE (2020b) *NSW Survey Guide for Threatened Frogs, A guide for the survey of threatened frogs and their habitats for the Biodiversity Assessment Method,* NSW Department of Planning, Industry and Environment, <u>www.environment.nsw.gov.au/publications/nsw-survey-guide-threatened-frogs</u>.

ELA (Eco Logical Australia) (2024a) *Dorrigo Arc Rainforest Centre – Ecological Assessment*, report prepared for NSW National Parks and Wildlife Service, Eco Logical Australia.

ELA (2024b) *Dorrigo Arc Rainforest Centre – Statement of Heritage Impact,* report prepared for NSW National Parks and Wildlife Service, Eco Logical Australia.

ELA (2024c) *Aboriginal Cultural Heritage Assessment Report, Dorrigo Arc Rainforest Centre (DARC),* report prepared for NSW National Parks and Wildlife Service, Eco Logical Australia.

Kriger KM, Pereoglou F and Hero J-M (2007) 'Latitudinal Variation in the Prevalence and Intensity of Chytrid (*Batrachochytrium dendrobatidis*) Infection in Eastern Australia', *Conservation Biology* 21(5) 1280–1290.

Lemckert F (2000) 'Observations on the effects of fire on the hip-pocket frog *Assa darlingtoni'*, *Herpetofauna* 30(2) 32–33.

Nietmann L and Ha RR (2018) 'Variation in age-dependent nest predation between island and continental Rufous Fantail (*Rhipidura rufifrons*) subspecies', *The Auk: Ornithological Advances* 135(4) 1064-1075.

Schodde R and Tidemann SC (1993) *Reader's Digest complete book of Australian birds*, 2nd ed, Readers Digest Services, Sydney, 639 p.

UNESCO (United Nations Educational, Scientific and Cultural Organization) (2022) *Guidance and Toolkit for Impact Assessments in a World Heritage Context*, United Nations Educational Scientific and Cultural Organization, <u>whc.unesco.org/en/guidance-toolkit-impact-assessments/</u>.

# Appendix A PMST Tool Search

## PMST Tool search

## **EPBC Act Protected Matters Report**



Australian Government

## **Department of Climate Change, Energy, the Environment and Water**

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

#### Report created: 29-Nov-2023

1. Summary	40
1.1. Matters of National Environment Significance	40
1.2. Other Matters Protected by the EPBC Act	40
1.3. Extra Information	41
2. Details	42
2.1. Matters of National Environmental Significance	42
2.2. Listed Threatened Ecological Communities	42
2.3. Listed Threatened Species	42
2.4. Listed Migratory Species	47
3. Other matters protected by the EPBC Act	48
3.1. Commonwealth Lands	48
3.2. Listed Marine Species	48
4. Extra Information	50
4.1. State and Territory reserves	
4.2. Regional Forestry Agreements	50
4.3. EPBC Act referrals	50
5. Caveat	51
5.1. PURPOSE	51
5.2. DISCLAIMER	51
5.3. DATA SOURCES	51
Threatened ecological communities	51
Threatened, migratory and marine species	51
5.4. LIMITATIONS	52
6. Acknowledgements	52

## 1. Summary

## 1.1. Matters of National Environment Significance

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

MNES category	Number
World Heritage properties:	1
National Heritage Places:	1
Wetlands of International Importance (Ramsar)	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	5
Listed Threatened Species:	66
Listed Migratory Species:	15

#### 1.2. Other Matters Protected by the EPBC Act

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

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

A <u>permit</u> 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.

Other matters	Number
Commonwealth Lands:	3
Commonwealth Heritage Places:	None
Listed Marine Species:	22
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

## 1.3. Extra Information

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

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

## 2. Details

### 2.1. Matters of National Environmental Significance

Name	State	Legal status
World Heritage Properties		
Gondwana Rainforests of Australia	QLD	Declared property
National Heritage Places		
Gondwana Rainforests of Australia	NSW	Listed place

#### 2.2. Listed Threatened Ecological Communities

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

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

Community Name	Threatened Category	Presence Text
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	n Endangered	Community may occur within area – buffer only
Dunn's white gum (Eucalyptus dunnii) moist forest in north east New South Wales and south-east Queensland	_ Endangered	Community likely to occur within area – feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area – feature area
<u>New England Peppermint (Eucalyptus nova-anglica) Grassy</u> Woodlands	Critically Endangered	Community may occur within area – buffer only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area – feature area

## 2.3. Listed Threatened Species

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

Scientific Name	Threatened category	Presence text
Bird		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area

Scientific Name	Threatened category	Presence text
Atrichornis rufescens Rufous Scrub-bird [655]	Endangered	Species or species habitat known to occur within area
<u>Botaurus poiciloptilus</u> Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calyptorhynchus lathami lathami South- eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area
<u>Climacteris picumnus victoriae</u> Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat likely to occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area
<u>Falco hypoleucos</u> Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area
<u>Grantiella picta</u> Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
<u>Melanodryas cucullata cucullata</u> South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
<u>Stagonopleura guttata</u> Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat may occur within area
Crustacean		
Euastacus simplex Simple Crayfish, Small Mountain Crayfish [83156]	Endangered	Species or species habitat may occur within area

Scientific Name	Threatened category	Presence text
Fish		
Maccullochella ikei	Endangered	Species or species habitat may occur
Clarence River Cod, Eastern Freshwater Cod [26170]		within area
Frog		
Assa darlingtoni	Vulnerable	Species or species habitat known to
Pouched Frog [1965]		occur within area
<u>Litoria subglandulosa</u> New England Tree Frog, Glandular Frog [1807]	Vulnerable	Species or species habitat may occur within area
Mixonhues halbus	Vulnerable	Species or species habitat known to
Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	vunerable	occur within area
Mixophyes iteratus	Vulnerable	Species or species habitat known to
Giant Barred Frog, Southern Barred Frog [1944		occur within area
Philoria sphagnicola	Vulnerable	Species or species habitat known to
Sphagnum Frog [59709]		occur within area
Insect		
Argynnis hyperbius inconstans	Critically Endangered	Species or species habitat may occur
Australian Fritillary [88056]		within area
Phyllodes imperialis smithersi	Endangered	Species or species habitat known to
Pink Underwing Moth [86084]		
Mammal		
Chalinolobus dwyeri	Endangered	Species or species habitat likely to
Large-eared Pied Bat, Large Pied Bat [183]		occur within area
Dasyurus maculatus maculatus (SE mainland	Endangered	Species or species habitat known to
Spot-tailed Quoll, Spotted-tail Quoll, Tiger		occur within area
Quoll (southeastern mainland population) [75184]		
Notamacropus parma	Vulnerable	Species or species habitat known to
Parma Wallaby [89289]		occur within area
Petauroides volans	Endangered	Species or species habitat known to
Greater Glider (southern and central) [254]		occur within area
Petaurus australis australis	Vulnerable	Species or species habitat known to
Yellow-bellied Glider (south-eastern) [87600]		occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area

Scientific Name	Threatened category	Presence text	
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	
<u>Potorous tridactylus tridactylus</u> Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat known to occur within area	
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat known to occur within area	
<u>Pseudomys oralis</u> Hastings River Mouse, Koontoo [98]	Endangered	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	
Plant			
<u>Arthraxon hispidus</u> Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	
Asperula asthenes Trailing Woodruff [14004]	Vulnerable	Species or species habitat may occur within area	
Bertya sp. Clouds Creek (M.Fatemi 4) [84675]	Endangered	Species or species habitat may occur within area	
Callistemon pungens [55581]	Vulnerable	Species or species habitat likely to occur within area	
Coleus nitidus listed as Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [91380]	Endangered	Species or species habitat likely to occur within area	
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat may occur within area	
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	
<u>Endiandra hayesii</u> Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat may occur within area	
Eucalyptus nicholii Narrow-leaved Peppermint, Narrow- leaved Black Peppermint [20992]	Vulnerable	Species or species habitat may occur within area	
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	
Gingidia rupicola Mountain Angelica, Broad-leafed Carrot [86880]	Endangered	Species or species habitat may occur within area	

Scientific Name	Threatened category	Presence text	
Haloragis exalata subsp. velutina Tall Velvet Sea-berry [16839]	Vulnerable	Species or species habitat likely to occur within area	
<u>Hicksbeachia pinnatifolia</u> 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 known to occur within area	
Leichhardtia longiloba listed as Marsdenia longiloba	Vulnerable	Species or species habitat known to occur within area	
Clear Milkvine [91911]			
<u>Macadamia integrifolia</u> Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area	
Neoastelia spectabilis [6404]	Vulnerable	Species or species habitat likely to occur within area	
<u>Olearia flocktoniae</u> Dorrigo Daisy-bush [2083]	Endangered	Species or species habitat known to occur within area	
Parsonsia dorrigoensis Milky Silkpod [64684]	Endangered	Species or species habitat known to occur within area	
<u>Persicaria elatior</u> Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	
<u>Rhodamnia rubescens</u> Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	
Sarcochilus fitzgeraldii Ravine Orchid [19131]	Vulnerable	Species or species habitat known to occur within area	
Syzygium hodgkinsoniae Smooth-bark Rose Apple, Red Lilly Pilly [3539]	Vulnerable	Species or species habitat may occur within area	
<u>Thesium australe</u> Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	
<u>Vincetoxicum woollsii listed as Tylophora</u> woollsii [40080]	Endangered	Species or species habitat known to occur within area	
Reptile			
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area	
Harrisoniascincus zia Rainforest Cool-skink [84785]	Vulnerable	Species or species habitat known to occur within area	

Scientific Name	Threatened category	Presence text
Myuchelys georgesi listed as Wollumbinia georgesi	Critically Endangered	Species or species habitat known to occur within area
Bellinger River Snapping Turtle, Georges' Snapping Turtle, Georges Helmeted Turtle [88103]		

## 2.4. Listed Migratory Species

Scientific Name	Threatened category	Presence text
Migratory marine bird		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Migratory terrestrial species		
<u>Cuculus optatus</u> Oriental Cuckoo, Horsfield's Cuckoo [86651		Species or species habitat may occur within area
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area
Migratory wetland species		
<u>Actitis hypoleucos</u> Common Sandpiper [59309]		Species or species habitat may occur within area
<u>Calidris acuminata</u> Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area

Scientific Name	Threatened category	Presence text
<u>Numenius madagascariensis</u> Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area

## 3. Other matters protected by the EPBC Act

#### 3.1. Commonwealth Lands

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

Commonwealth Land name	State
Commonwealth Land - Australian Postal Commission [11612]	NSW
Commonwealth Land - Australian Telecommunications Commission [11611]	NSW
Commonwealth Land - Australian Telecommunications Commission [11613]	NSW

#### 3.2. Listed Marine Species

Scientific Name	Threatened category	Presence text
Bird		
<u>Actitis hypoleucos</u> Common Sandpiper [59309]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area
<u>Calidris ferruginea</u> Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area
<u>Calidris melanotos</u> Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area
<u>Gallinago hardwickii</u> Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area

Scientific Name	Threatened category	Presence text
<u>Hirundapus caudacutus</u> White-throated Needletail [682]	Vulnerable Species or species habitat known occur within area overfly marine	
<u>Lathamus discolor</u> Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area overfly marine area
<u>Merops ornatus</u> Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area
<u>Monarcha melanopsis</u> Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area
<u>Motacilla flava</u> Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area
<u>Myiagra cyanoleuca</u> Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area
<u>Neophema chrysostoma</u> Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
<u>Pterodroma cervicalis</u> White-necked Petrel [59642]		Species or species habitat may occur within area
<u>Rhipidura rufifrons</u> Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area
<u>Sterna striata</u> White-fronted Tern [799]		Migration route may occur within area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area

## 4. Extra Information

## 4.1. State and Territory reserves

Protected area name	Reserve type	State
Bellinger River	National Park	NSW
Dorrigo	National Park	NSW

## 4.2. Regional Forestry Agreements

RFA name	State
North East NSW RFA	NSW

#### 4.3. EPBC Act referrals

Title of referral	Reference	Outcome	Status
Not controlled action			
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not controlled action	Completed
Telecommunications Cable Installation	2001/223	Not controlled action	Completed

## 5. Caveat

## 5.1. PURPOSE

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

The report contains the mapped locations of:

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

## 5.2. DISCLAIMER

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

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

#### 5.3. DATA SOURCES

#### Threatened ecological communities

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

#### Threatened, migratory and marine species

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

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

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

## **5.4. LIMITATIONS**

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

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

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

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

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

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

## 6. 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:

- <u>-Office of Environment and Heritage, New South Wales</u>
- <u>-Department of Environment and Primary Industries, Victoria</u>
- <u>-Department of Primary Industries</u>, Parks, Water and Environment, Tasmania
- -Department of Environment, Water and Natural Resources, South Australia
- -Department of Land and Resource Management, Northern Territory
- <u>-Department of Environmental and Heritage Protection, Queensland</u>
- <u>-Department of Parks and Wildlife</u>, Western Australia
- -Environment and Planning Directorate, ACT
- <u>-Birdlife Australia</u>
- <u>-Australian Bird and Bat Banding Scheme</u>

- -Australian National Wildlife Collection
- -Natural history museums of Australia
- <u>-Museum Victoria</u>
- <u>-Australian Museum</u>
- <u>-South Australian Museum</u>
- <u>-Queensland Museum</u>
- -Online Zoological Collections of Australian Museums
- -Queensland Herbarium
- <u>-National Herbarium of NSW</u>
- <u>-Royal Botanic Gardens and National Herbarium of Victoria</u>
- <u>-Tasmanian Herbarium</u>
- -State Herbarium of South Australia
- <u>-Northern Territory Herbarium</u>
- -Western Australian Herbarium
- <u>-Australian National Herbarium, Canberra</u>
- <u>-University of New England</u>
- <u>-Ocean Biogeographic Information System</u>
- -Australian Government, Department of Defence Forestry Corporation, NSW
- <u>-Geoscience Australia</u>
- <u>-CSIRO</u>
- <u>-Australian Tropical Herbarium, Cairns</u>
- -eBird Australia
- -Australian Government Australian Antarctic Data Centre
- -Museum and Art Gallery of the Northern Territory
- -Australian Government National Environmental Science Program
- <u>-Australian Institute of Marine Science</u>
- <u>-Reef Life Survey Australia</u>
- -American Museum of Natural History
- -Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
- -Tasmanian Museum and Art Gallery, Hobart, Tasmania
- -Other groups and individuals

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

© Commonwealth of Australia

Department of Climate Change, Energy, the Environment and Water

GPO Box 3090

Canberra ACT 2601 Australia

+61 2 6274 1111

# Appendix B Likelihood Table

丽

dist.

The table below provides the collated results from the 5 km database searches (buffered around the Study Area) of the NSW BioNet Wildlife Atlas search and the EPBC Protected Matters Search Tool. An assessment of LoO was made for threatened and migratory species identified from the database searches. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. Five terms for the LoO are used in this report. The terms for LoO are defined below:

- "Known" the TEC or species was or has been observed on the site.
- "Likely" a medium to high probability that a TEC or species uses the site.
- "Potential" suitable habitat for a TEC or species occurs on the site, but there is insufficient information to categorise the TEC or species as likely to occur, or unlikely to occur.
- "Unlikely" a very low to low probability that a TEC or species uses the site.
- "None" habitat on site and in the vicinity is unsuitable for the TEC or species.

The LoO was only one factor among other factors, which was used to determine whether to apply the EPBC Significant Impact Criteria assessments to threatened species, populations, communities or migratory species.

#### Table 21: TECs likelihood table.

Scientific Name	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required	Justification
Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and Southeast Queensland ecological community	Ε	This ecological community occurs in sub-tropical, sub-humid and temperate climatic zones from Curtis Island, north of Gladstone, in Queensland to Bermagui in southern NSW. The ecological community is found within the Southeastern Queensland (SEQ), NSW North Coast (NNC), Sydney Basin (SYB) and Southeast Corner (SEC) Bioregions. The ecological community occurs in coastal catchments, mostly at elevations of less than 20 m above sea-level (asl) that are typically found within 30 km of the coast. However, this distance varies by catchment; for example, low elevations can occur as far as 40 km inland on the Hawkesbury River, or more than 100 km on the Clarence River.	None	No	TEC does not occur within the Study Area
White Gum Moist Forest in the NSW North Coast Bioregion	Ε	Occurs in the NNC bioregion and adjacent bioregions in SEQ and New England Tablelands (NET), with a scattered distribution north from Dorrigo and Coffs Harbour in NSW to Warwick and Canungra in Queensland. The ecological community typically occurs on deep, fertile soils and is largely confined to fertile basaltic derived soils, or fine-grained sediments of colluvium or alluvium depending on upstream environments. Dunn's White Gum moist forest, in its undisturbed state, is a structurally complex, layered wet sclerophyll forest that generally occupies areas of transition between rainforest and drier eucalypt forest. The ecological community is generally a tall, open forest with a multi-stratum understory of rainforest trees, shrubs and vines (typically mesic). The canopy of the ecological community may occur as pure stands of <i>Eucalyptus dunnii</i> (Dunn's White Gum), though more often the canopy is co-dominated by <i>Eucalyptus dunnii</i> with <i>E. saligna</i> (Sydney Blue Gum), <i>E. grandis</i> (Flooded Gum), <i>E. microcorys</i> (Tallowwood) and/or <i>Lophostemon confertus</i> (Brush Box).	None	Νο	TEC does not occur within the Study Area
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions	CE	The ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in NSW. The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings Valleys. The ecological community occurs on basalt and alluvial soils, including sand and old/elevated alluvial soils as well as floodplain alluvia. It also occurs occasionally on historically enriched rhyolitic soils and basaltically enriched metasediments. Lowland Rainforest mostly occurs in areas <300 m above sea level. Aspect can result in the community being found at >300 m altitude on north-facing slopes, but typically 300 m defines the extent of the lowlands. In addition, Lowland Rainforest typically occurs in areas with high annual rainfall (>1300 mm). The canopy comprises a range of tree species but in some areas a particular species may	None	No	TEC does not occur within the Study Area

Scientific Name	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required	Justification
		dominate e.g. palm forest, usually dominated by <i>Archontophoenix cunninghamiana</i> (Bangalow Palm) or <i>Livistona australis</i> (Cabbage Palm); and riparian areas dominated by <i>Syzygium floribundum</i> (syn. <i>Waterhousea floribunda</i> ) (Weeping Satinash/Weeping Lilly Pilly).			
New England Peppermint ( <i>Eucalyptus nova-anglica</i> ) Grassy Woodlands	CE	The ecological community occurs from Dumaresq, Guyra, Inverell, Severn and Tenterfield Local Government Areas (LGA), but may occur elsewhere on the NET. The ecological community is typically an open forest or woodland that occurs at high elevations on valley flats and depressions that are subject to cold air drainage. Soils are poorly drained loam-clays derived from basalt, fine-grained sedimentary or acid volcanic substrates. The tree layer, when present, is usually 8 m to 20 m tall and dominated by <i>Eucalyptus nova-anglica</i> (New England Peppermint), occasionally in association with other tree species including <i>Eucalyptus dalrympleana</i> subsp. <i>heptantha</i> (Mountain Gum) and <i>E. blakelyi</i> (Blakely's Red Gum). The shrub layer is either sparse or absent. There is a dense ground layer of various grasses and herbs.	None	No	TEC does not occur within the Study Area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and Southeast Queensland bioregions	Ε	Occurs in the NNC and SEQ IBRA bioregions and on Curtis Island in the Brigalow Belt North (BBN) IBRA Bioregion. This encompasses an area from just north of Newcastle, New South Wales (around Raymond Terrace) in the south, to just north of Gladstone in Queensland. The ecological community is found on alluvial landforms, including floodplains, the riparian zones of parent rivers and other order tributaries, alluvial flats, floodplain/alluvial terraces and periodically flooded depressions. It generally occurs below 50 m asl, although it can occur up to 250 m asl. The structure of the ecological community, in its undisturbed state, varies from tall open forest to woodland, although partial clearing may have reduced the canopy to scattered trees in some areas. Elsewhere, there may be localised areas of denser closed forest and/or low forest, often associated with other disturbance (including flooding). The tree canopy is dominated by eucalypts and/or other myrtaceous trees (specifically from the <i>Angophora, Corymbia, Lophostemon</i> and <i>Syncarpia</i> genera), often as a mixture of species.	None	Νο	TEC does not occur within the Study Area
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, Southeastern Highlands, NSW Southwestern Slopes, Southeast corner and	Ε	Occurs in in the Brigalow Belt South, Nandewar, NET, SEQ, SYB, NNC, Southeastern Highlands, SEC, NSW Southwestern Slopes, Victorian Midlands and Riverina Bioregions. The ecological community occurs on a variety of soil parent material without apparent strong overall patterns in floristics. However, in areas with heavier textured soils derived from basalt substrates (for example north of Tamworth and on the Inverell Plateau) the grass <i>Dichanthium sericeum</i> (Queensland Blue Grass) has been found to be dominant.	None	No	TEC does not occur within the Study Area

V = Vulnerable, E= Endangered Ecological Community, CE = Critically Endangered Ecological Community.

#### Table 22: Threatened flora species likelihood table

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
7	Acronychia littoralis	Scented Acronychia	Ε	Found between Fraser Island in Queensland and Port Macquarie on the north coast of NSW. Occurs in transition zones between littoral rainforest and swamp sclerophyll forest; between littoral and coastal cypress pine communities; and margins of littoral forest.	0	None	No	No transition zones between littoral rainforest and sclerophyll or coastal cypress pine communities occur within the Study Area. Additionally, no associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
8	Arthraxon hispidus	Hairy Jointgrass	V	Occurs over a wide area in SEQ, and on the northern tablelands and north coast of NSW, but is never common. Also found from Japan to central Eurasia. Moisture and shade-loving grass, found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps.	0	Unlikely	No	Species was not recorded from the Study Area during field surveys. Additionally, no associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
9	Asperula asthenes	Trailing Woodruff	V	Occurs only in NSW. It is found in scattered locations from the Central Coast (Mandalong area) north to near Kempsey, with several records from the Port Stephens / Karuah / Wallis Lakes area / Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR). Occurs in damp sites, often along riverbanks.	0	None	No	The distribution of this species does not overlap with the Study Area.
10	Boronia umbellata	Orara Boronia	V	Found at only a few locations between Glenreagh and Lower Bucca, north of Coffs Harbour, but it is locally common in the restricted area where it occurs. This Boronia grows as an understorey shrub in and around gullies in wet open forest. It appears to regenerate well after disturbance, but it is not known whether prolonged or repeated disturbance affects long-term persistence.	0	Unlikely	No	Species was not recorded from the Study Area during field surveys. The Study Area also occurs outside of the known few locations this species has been recorded in.
11	Callistemon pungens		V	In NSW, the species occurs from near Inverell to the eastern escarpment in New England National Park. Habitats range from riparian areas dominated by <i>Casuarina cunninghamiana</i> subsp. <i>cunninghamiana</i> to woodland and rocky shrubland.	0	None	No	The distribution of this species does not overlap with the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
12	Cryptostylis hunteriana	Leafless Tongue Orchid	V	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp- heath and woodland. The larger populations typically occur in woodland dominated by <i>Eucalyptus sclerophylla</i> (Scribbly Gum), <i>E. sieberi</i> (Silvertop Ash), <i>Corymbia</i> <i>gummifera</i> (Red Bloodwood) and <i>Allocasuarina littoralis</i> (Black Sheoak); appears to prefer open areas in the understorey of this community and is often found in association with the <i>C. subulata</i> (Large Tongue Orchid) and the <i>C. erecta</i> (Tartan Tongue Orchid)	0	None	No	The distribution of this species does not overlap with the Study Area.
13	Cynanchum elegans	White-flowered Wax Plant	E	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley. Occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest; <i>Leptospermum laevigatum</i> (Coastal Tea-tree), <i>Banksia</i> <i>integrifolia subsp. integrifolia</i> (Coastal Banksia) coastal scrub; <i>Eucalyptus tereticornis</i> (Forest Red Gum) aligned open forest and woodland; <i>Corymbia maculata</i> (Spotted Gum) aligned open forest and woodland; and <i>Melaleuca</i> <i>armillaris</i> (Bracelet Honeymyrtle) scrub to open scrub.	0	None	No	No potential habitat for this species occurs within the Study Area. Additionally, no associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
14	Dichanthium setosum	Bluegrass	V	Occurs on the NET, Northwest Slopes and Plains and the Central Western Slopes of NSW, extending to northern Queensland. It occurs widely on private property, including in the Inverell, Guyra, Armidale and Glen Innes areas. Often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants and highly disturbed pasture.	0	None	No	The distribution of this species does not overlap with the Study Area.
15	Endiandra hayesii	Rusty Rose Walnut, Velvet Laurel	V	A restricted distribution from Burleigh Heads in Queensland to the Richmond River in north-east NSW. It is locally abundant in some parts of its range in NSW.	0	None	No	The distribution of this species does not overlap with the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				Sheltered moist gullies in lowland subtropical and warm temperate rainforest on alluvium or basaltic soils. The species occurs in regrowth and highly modified forms of these habitats.				
16	Eucalyptus nicholii	Narrow-leaved Peppermint	V	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Found largely on private property and roadsides, and occasionally in conservation reserves. Planted as urban trees, windbreaks and corridors. Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	0	None	No	No grassy woodland occurs within the Study Area. Additionally, no individuals were identified from the Study Area during the field survey. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
17	Euphrasia arguta		CE	Known from Nundle State Forest and adjacent private land, in NSW, where it was rediscovered in 2008. These populations occur at the border between the NET and the NNC Bioregions occur in eucalypt forest with a mixed grass and shrub understorey.	0	None	No	The distribution of this species does not overlap with the Study Area.
18	Euphrasia collina subsp. muelleri	Mueller's Eyebright	Ε	In NSW it was recorded more than 100 years ago in the upper Murray and McIntyre Rivers and near Dorrigo and Cootamundra. The only NSW collections in the past 50 years were made in the vicinity of the Tinderry Range between Canberra and Cooma (1970) and between Uralla and Tamworth (1987).	0	None	No	The distribution of this species does not overlap with the Study Area.
19	Gingidia rupicola	Mountain Angelica	Ε	Endemic to NSW and known from only two locations within New England National Park. Occurs in <i>Eucalyptus pauciflora</i> (Snow Gum) Woodland and at the edge of <i>Nothofagus moorei</i> (Antarctic Beech) forest. Species is known to grown in cracks and ledges of rocks on cliff faces at altitudes of 1400 - 1750 m asl.	0	No	No	The Study Area is below the altitude this species occurs in. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
20	Haloragis exalata subsp. velutina	Tall Velvet Sea- berry	V	This subspecies of Tall Sea-berry occurs on the north coast of NSW and southeastern Queensland. It is plentiful in inaccessible areas of the upper Macleay River. Grows in damp places near watercourses.	0	None	No	The distribution of this species does not overlap with the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
21	Hicksbeachia pinnatifolia	Red Boppel Nut	V	Coastal areas of north-east NSW from the Nambucca Valley north to south-east Qld. Subtropical rainforest, moist eucalypt forest and Brush Box forest.	3	Unlikely	No	Species was not recorded from the Study Area during the field survey. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
22	Kardomia prominens		CE	An NSW endemic that is known from only two locations: Nymboida and Moses Rock (Nymboi-Binderay National Park). Dry open forest on rocky ridges and steep rocky slopes with very shallow soils. Associated with species that favour poor soils, such as <i>Eucalyptus pyrocarpa</i> (Large-fruited Blackbutt), <i>Leptospermum petersonii</i> (Lemon-scented Teatree) and <i>Leptospermum</i> <i>microcarpum</i> .	0	None	No	No dry open forest habitat occurs within the Study Area. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
23	Macadamia tetraphylla	Rough-shelled Bush Nut	V	Confined chiefly to the north of the Richmond River in north-east NSW, extending just across the border into Queensland. Many records, particularly those further south, are thought to be propagated. Found in subtropical rainforest, usually near the coast.	0	Known	No	Species is confined to the north of the Richmond River, all occurrences south of this area are thought to be propagated. Individual recorded at the ARC was underneath the skywalk, suggesting that the occurrence was propagated. No further assessment was considered necessary.
24	Marsdenia longiloba	Slender Marsdenia	E	In NSW, occurs at scattered locations on the north coast north from Barrington Tops. Subtropical and warm temperate rainforest, lowland moist eucalypt forest adjoining rainforest, areas with rock outcrops.	1	Unlikely	No	Species wasn't identified during field survey and the survey effort was extensive enough to conclude absence.
25	Neoastelia spectabilis	Silver Sword Lily	V	Restricted to NSW and has only been recorded in New England National Park, on the eastern edge of the New England Tablelands. Grows in rock crevices near waterfalls and in seepage lines on rocky slopes in Antarctic Beech rainforest, between 900 - 1150 m altitude.	0	None	No	The distribution of this species does not overlap with the Study Area.
26	Olearia flocktoniae	Dorrigo Daisy Bush	E	Northern fall of the Dorrigo Plateau in north-east NSW. Disturbed locations, such as roadsides or timber plantations adjacent to wet eucalypt forest or rainforest.	6	Unlikely	No	Species was not recorded from the Study Area during the field survey and the survey effort was extensive enough to conclude absence.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
27	Owenia cepiodora	Onion Cedar	V	North from the Richmond River in north-east NSW extending just across the border into Queensland. Subtropical and dry rainforest on or near soils derived from basalt.	0	None	No	The distribution of this species does not overlap with the Study Area.
28	Parsonsia dorrigoensis	Milky Silkpod	E	Found only within NSW, in the north coast region between Kendall and Woolgoolga. Subtropical and warm-temperature rainforest, rainforest margins, and moist eucalypt forest up to 800 m, on brown clay soils.	5	Unlikely	No	A population of this species was recorded adjacent to the Study Area. No AoS required as species was not identified within the Study Area.
29	Persicaria elatior	Tall Knotweed	V	Occurs in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	0	None	No	The distribution of this species does not overlap with the Study Area.
30	Phaius australis	Southern Swamp Orchid	Ε	Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	0	None	No	Recent molecular studies have demonstrated that <i>Phaius australis</i> falls within the variation of the widespread and variable <i>Phaius tankervillae</i> which is known to grow in the NSW north coast North from Kempsey in paperbark Melaleuca species swamps and amongst grasses and low shrubs in damp to swampy sites in open forest at altitudes that range from 0-50 m (Copeland and Backhouse 2022). This habitat or altitude range does not occur within the Study Area.
31	Plectranthus nitidus	Nightcap Plectranthus	Ε	In NSW it was previously known only from Nightcap National Park near Terania Creek in northern NSW. However, the species has now been recorded as far south as Chaelundi National Park near Nymboida. Grows on rocky cliff-faces and boulders, in the shelter and shade provided by the adjacent rainforest and dry rainforest.	0	None	No	Species occurs from the Nightcap to McPherson Ranges which is north of the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
32	Rhodamnia rubescens	Scrub Turpentine	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	8	Unlikely	No	Species was not recorded from the Study Area during the field survey and the survey effort was extensive enough to conclude absence.
33	Rhodomyrtus psidioides	Native Guava	CE	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	0	None	No	Species populations are typically restricted to coastal and sub-coastal areas. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
34	Samadera sp. Moonee Creek	Moonee Quassia	E	Scattered distribution from the Moonee Creek area north of Coffs Harbour to north-east of Grafton. Shrubby layer below tall moist eucalypt forest and tall dry eucalypt forest, including forest edges, mostly at lower altitudes.	0	None	No	Species was not recorded from the Study Area during the field survey. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
35	Sarcochilus fitzgeraldii	Ravine Orchid	V	North-east NSW, north of the Macleay River, to Maleny in south-east Qld. On rocks or rarely on bases of trees, in subtropical rainforest, usually near streams, from 500- 700 m.	5	None	No	Species was not recorded from the Study Area during the field survey. No associated PCTs occur within the Study Area according to the TBDC (DCCEEW 2024).
36	Syzygium hodgkinsoniae	Red Lilly Pilly	V	A restricted range from the Richmond River in north-east NSW to Gympie in Queensland. Usually found in riverine and subtropical rainforest on rich alluvial or basaltic soils.	0	None	No	This species is restricted to a range that is north of the Study Area.
37	Thesium australe	Austral Toadflax	V	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast.	0	None	No	No grassland or grassy woodland habitat occurs within the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
38	Triplarina imbricata	Creek Triplarina	Ε	Found only in a few locations in the escarpment ranges and near Tabulam in north-east NSW. Occurs along watercourses in low open forest with <i>Tristaniopsis</i> <i>laurina</i> (Water Gum) or in montane bogs, often with <i>Baekea amissa</i> .	0	None	No	Species closest known population is in Nymboida which is north of the Study Area. Additionally, this species was not recorded within the Study Area during the field survey.
39	Tylophora woollsii	Cryptic Forest Twiner	Ε	found from the NSW north coast and NET to southern Queensland but is very rare within that range. Known on the Tablelands from the Bald Rock and Boonoo Boonoo areas north of Tenterfield. This species grows in moist eucalypt forest, moist sites in dry eucalypt forest and rainforest margins.	0	Unlikely	No	Species was not recorded from the Study Area during the field survey and the survey effort was extensive enough to conclude absence.

Key: V = Vulnerable, E = endangered, CE =Critically Endangered, X = Extinct

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
	Amphibians							
40	Assa darlingtoni	Pouched Frog	V	North-east NSW and far south-east Qld. There are three isolated populations in NSW: Dorrigo Plateau and Gibraltar Range, Border Ranges. Cool, moist rainforest (including Antarctic Beech), or moist eucalypt forest in mountainous areas, mostly above 800 m.	7	Likely	Yes	Suitable habitat occurs within the Study Area. Abundance of records in a 5 km square radius of the Study Area.
41	Litoria booroolongensis	Booroolong Frog	Ε	Restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. Several populations have recently been recorded in the Namoi catchment. Permanent rocky streams with some fringing vegetation cover such as ferns, sedges or grasses.	1	None	No	The species is rare throughout most of the remainder of its range and there are no current records of this species within the region. Suitable stream habitat is not present in the Study Area.
42	Litoria subglandulosa	Glandular Frog	V	Occurs on the eastern escarpment of the Great Dividing Range from the "The Flags" near Walcha north to Girraween National Park. Occur in rainforest and moist and dry eucalypt forest within 200m of permanent streams, or in subalpine swamps.	1	None	No	No permanent streams occur within 200m of the Study Area.
43	Mixophyes balbus	Stuttering Frog	V	Along the east coast of Australia from southern Qld to north- eastern Victoria. Rainforest and wet, tall open forest in the foothills and escarpment on the eastern side of the Great Dividing Range. Habitat consists of native vegetation within 500m of permanent streams.	10	None	No	No suitable stream habitat was identified within 500m (DPIE 2020) of the Study Area.
44	Mixophyes iteratus	Giant Barred Frog	E	Coast and ranges from Eumundi in south-east Qld to Warrimoo in the Blue Mountains. Freshwater permanent/semi-permanent streams, generally at lower elevation. Riparian rainforest or wet sclerophyll forest within 50m of the bank is favoured.	1	None	No	No suitable permanent or semi-permanent streams occur within 50m of the Study Area.
45	Philoria sphagnicolus	Sphagnum Frog	V	Eastern escarpment of the Great Dividing Range in north-east NSW from Chaelundi State Forest south to Killabakh Nature Reserve near Comboyne. Rainforest (including Antarctic Beech forest) and wet sclerophyll forests at high elevation,	32	None	No	No permanent soaks along flowing streams occur within 50m of the Study Area.

#### Table 23: Threatened fauna species likelihood table
No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				Sphagnum Moss beds and in native vegetation within 50m of soaks in gullies, streams or seepages on steep slopes. They can also occur at lower elevation in wet coastal foothills.				
	Birds							
46	Actitis hypoleucos	Common Sandpiper	Μ	Occur along coastlines and inhabits coastal and inland wetlands.	0	None	No	No suitable wetlands occur within the Study Area.
47	Anthochaera phrygia	Regent Honeyeater	CE	In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands.	0	Unlikely	No	Species is not known from the locality and there is no key eucalypt species or riparian she-oak habitat within the Study Area.
48	Apus pacificus	Fork-tailed Swift	Μ	Recorded in all regions of NSW. Riparian woodland, swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand- dunes.	2	None	No	No suitable habitat and this species are almost exclusively aerial in Australia.
49	Ardenna pacifica	Wedge-tailed Shearwater	Μ	Marine	0	None	No	The Study Area is not a marine environment.
50	Atrichornis rufescens	Rufous Scrub-bird	E	The southern subspecies ( <i>A. r. ferrieri</i> ) is confined to NSW, from the Dorrigo Plateau to Barrington Tops. High-altitude (above 600 m) subtropical, warm temperate and cool temperate rainforests, and wet sclerophyll forests.	4	Likely	Yes	Species known from the locality and suitable habitat occurs within the Study Area.
51	Botaurus poiciloptilus	Australasian Bittern	E	In NSW they may be found over most of the state except for the far north-west. Favours permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha spp</i> . (Bullrushes) and <i>Eleocharis spp</i> . (Spikerushes).	0	None	No	No permanent freshwater wetlands with tall dense vegetation within the Study Area.
52	Calidris acuminata	Sharp-tailed Sandpiper	Μ	Widespread in both inland and coastal locations and in both freshwater and saline habitats.	0	None	No	No suitable habitat within the Study Area.
53	Calidris canutus	Red Knot, Knot	E, M	Occurs along the coast of Australia. Inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs.	0	None	No	No suitable coastal marine habitat within the Study Area

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
54	Calidris ferruginea	Curlew Sandpiper	CE, M	In NSW, they are widespread east of the Great Divide, especially in coastal regions. Occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms.	0	None	No	No suitable coastal marine habitat within the Study Area
55	Calidris melanotos	Pectoral Sandpiper	Μ	In NSW, the species is widespread but scattered. Occurs in shallow fresh to saline wetlands. Found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands.	0	None	No	No suitable coastal marine habitat within the Study Area
56	Calyptorhynchus Iathami	Glossy Black- Cockatoo	V	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. <i>Allocasuarina littoralis</i> (Black Sheoak) and <i>A. torulosa</i> (Forest Sheoak) are important foods. Potential nest trees must contain hollows with a diameter of at least 15cm.	3	Unlikely	No	No suitable feed or nest trees occur within the Study Area
57	Charadrius Ieschenaultii	Greater Sand Plover	V	In NSW, the species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	0	None	No	No suitable coastal marine habitat within the Study Area
58	Climacteris picumnus victoriae	Brown Treecreeper (south-eastern)	V	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges.	0	Unlikely	No	This species generally inhabits open habitat and there are no records within the locality.
59	Cuculus optatus	Oriental Cuckoo	Μ	Migratory bird that spends non-breeding season (Sept- May) in coastal regions across northern and eastern Australia as well as offshore islands. Occur in rainforest, vine thickets, wet	0	Potential	Yes	Suitable rainforest and wet sclerophyll forest occurs within the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				sclerophyll forest or open Casuarina, Acacia or Eucalyptus woodlands. Frequently at edges or ecotones between habitat types.				
60	Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	Ε	Limited to about five populations scattered between Bundaberg in Queensland and the Hastings River in NSW. Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in NSW.	0	None	No	Study Area is south of the species known distribution.
61	Erythrotriorchis radiatus	Red Goshawk	V	The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens. Inhabit open woodland and forest, preferring a mosaic of vegetation types, a large population of birds as a source of food, and permanent water, and are often found in riparian habitats along or near watercourses or wetlands. In NSW, preferred habitats include mixed subtropical rainforest, <i>Melaleuca</i> swamp forest and riparian <i>Eucalyptus</i> forest of coastal rivers.	0	Unlikely	No	This species is very rare and is only found north of the Study Area.
62	Falco hypoleucos	Grey Falcon	V	In NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast.	0	None	No	Th species known distribution is west of the Study Area
63	Gallinago hardwickii	Latham's Snipe	Μ	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW. Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	5	None	No	No permanent and ephemeral wetlands occur within the Study Area
64	Grantiella picta	Painted Honeyeater	V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in	0	None	No	Species distribution is west of the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				the north of its distribution. Inhabits Acacia pendula (Boree/ Weeping Myall), A. harpophylla (Brigalow) and Box-Gum Woodlands and Box-Ironbark Forests.				
65	Hirundapus caudacutus	White-throated Needletail	Μ	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	8	Potential	Yes	Species is known from the locality.
66	Lathamus discolor	Swift Parrot	CE	In NSW mostly occurs on the coast and southwest slopes. Occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as <i>Eucalyptus robusta</i> (Swamp Mahogany), <i>Corymbia maculata</i> (Spotted Gum), <i>C. gummifera</i> (Red Bloodwood, <i>Eucalyptus tereticornis, E. sideroxylon</i> (Mugga Ironbark), and <i>Eucalyptus albens</i> .	0	Unlikely	No	Species is not known from the region, although is highly nomadic.
67	Melanodryas cucullata cucullata	Hooded Robin (south-eastern)	Ε	The south-eastern form (subspecies <i>cucullata</i> ) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies <i>picata</i> . Two other subspecies occur outside NSW. Requires structurally diverse habitats featuring mature eucalypts, saplings, some small shrubs and a ground layer of moderately tall native grasses	0	Unlikely	No	Generally, occurs in open woodland and is not known from the region.
68	Monarcha melanopsis	Black-faced Monarch	Μ	In NSW, the species occurs around the eastern slopes and tablelands of the Great Divide. Occurs in rainforest ecosystems.	0	Potential	Yes	Species occurs within the region and there is suitable rainforest ecosystems present within the Study Area.
69	Motacilla flava	Yellow Wagtail	Μ	Migratory bird inhabits well-watered open grasslands and the fringes of wetlands. Roosts in mangroves and other dense vegetation.	0	Unlikely	No	No suitable habitat within the Study Area in the form of open grassy flats near water or open areas with low vegetation.
70	Myiagra cyanoleuca	Satin Flycatcher	Μ	In NSW, they are widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Inhabit heavily vegetated gullies in eucalypt-dominated forests and taller	0	Unlikely	No	No suitable eucalypt habitat occurs within the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				woodlands, and on migration, occur in coastal forests, woodlands, mangroves and drier woodlands and open forests				
71	Neophema chrysostoma	Blue-winged Parrot	V, M	Migratory bird during non-breeding period, from autumn to early spring, birds are recorded from northern Victoria, eastern South Australia, south-western Queensland and western New South Wales, with some birds reaching south- eastern New South Wales and eastern Victoria. Occur in grasslands and grassy woodlands and are often found near wetlands both near the coast and in semi-arid zones	0	Unlikely	No	The species distribution is typically west and south of the Study Area.
72	Numenius madagascariensis	Eastern Curlew	CE	In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts.	0	None	No	No suitable coastal habitat within the Study Area.
73	Pandion haliaetus	Osprey	Μ	Migratory bird, occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands.	0	None	No	No suitable coastal marine habitat within the Study Area.
74	Rhipidura rufifrons	Rufous Fantail	Μ	Occurs in coastal and near coastal districts of northern and eastern Australia. Mainly inhabits wet sclerophyll forests, often in gullies. They also occur in subtropical and temperate rainforests	0	Likely	Yes	Suitable habitat within the Study Area.
75	Rostratula australis	Australian Painted Snipe	Ε	In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and Wanganella. Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber.	0	None	No	No suitable habitat marshy within the Study Area.
76	Stagonopleura guttata	Diamond Firetail	V	It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Central and Southwestern Slopes and the Northwest Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney,	0	Unlikely	No	Suitable eucalypt habitat does not occur within the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River. Found in grassy eucalypt woodlands, including Box-Gum Woodlands and <i>Eucalyptus pauciflora</i> Woodlands.				
77	Sternula nereis nereis	Australian Fairy Tern	V	Occurs along the coasts of Victoria, Tasmania, South Australia and Western Australia, occurring as far north as the Dampier Archipelago near Karratha. The subspecies has been known from New South Wales (NSW) in the past, but it is unknown if it persists there. Found in embayment of a variety of habitats including offshore, estuarine or lacustrine (lake) islands, wetlands and mainland coastline	0	None	No	No coastal marine habitat occurs within the Study Area.
78	Symposiachrus trivirgatus	Spectacled Monarch	Μ	Coast and eastern slopes of Great Dividing Range to northern Hunter Region. Occasional records further south at sites around Newcastle, Central Coast and Sydney	0	Potential	Yes	Suitable rainforest and wet sclerophyll habitat occur within the Study Area.
79	Turnix melanogaster	Black-breasted Button-quail	V	South-eastern Qld and far north-eastern NSW, mainly on and east of the Great Divide but extending inland to the inner western slopes. Very few NSW records in recent times. Dry rainforests, vine forest and vine thickets. May also occupy wetter subtropical rainforests, sometimes in association with moist eucalypt forest.	1	Potential	Yes	Suitable habitat occurs within the Study Area.
	Insects							
80	Argynnis hyperbius inconstans	Australian Fritillary	CE	Occur on the south-east Queensland and north-east NSW in open swampy coastal areas where the larval food plant <i>Viola</i> <i>betonicifolia</i> (Arrowhead Violet) occurs. Most recently known from a few widespread localities between Port Macquarie and Gympie.	0	None	No	This species is known from swampy habitat in coastal areas.
81	Phyllodes imperialis southern subspecies	Pink Underwing Moth	Е	In NSW it is known to occur in a small number of localities from the QLD border to Wardell, and there is a disjunct population in the Bellingen area. Subtropical rainforest below about 600 m elevation; breeding habitat is restricted to areas where the caterpillar's food plant <i>Carronia multisepalea</i> occurs.	4	None	No	Species is only known from below 600 m in elevation. The Study Area sits at approximately 710 – 760 m asl. Additionally, no food plant was

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
								recorded within the Study Area.
	Mammals							
82	Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	V	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the NET and Northwest Slopes.	0	Unlikely	No	Species generally roosts in caves and forages in dry open forest and woodland. No records within 5 km square radius of the Study Area and no caves present.
83	Dasyurus maculatus	Spotted-tailed Quoll	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	14	Likely	Yes	Suitable rainforest habitat occurs within the Study Area.
84	Notamacropus parma	Parma Wallaby	V	Their range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino. Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest.	1	Likely	Yes	Suitable rainforest habitat within the Study Area.
85	Petauroides volans	Southern Greater Glider	Ε	Occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria.	5	Unlikely	No	This species feeds exclusively on eucalypt leaves, buds, flowers and mistletoe. No foraging habitat in the form of Eucalyptus forests or suitable large hollows occur within the Study Area.
86	Petaurus australis	Yellow-bellied Glider	V	Along the eastern coast to the western slopes of the Great Dividing Range, from southern Qld to Victoria. Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	1	Unlikely	No	This species occurs in mostly tall mature eucalypt forests and feeds primarily on plant and insect exudates, including nectar, sap, honeydew and manna. No foraging habitat in the form of known preferred sap trees or Eucalyptus trees

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
								occur within the Study area. Additionally, no suitable large hollows occur for denning.
87	Petrogale penicillata	Brush-tailed Rock- wallaby	V	In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	0	Unlikely	No	Rocky habitat occurs within the Study Area although it generally lacks the structural complexity and connectivity required to host a population of this species.
88	Phascolarctos cinereus	Koala	Ε	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Eucalypt woodlands and forests.	11	Unlikely	No	No Koala preferred food or use trees occur within the Study Area. No Eucalyptus forests occur within the Study Area.
89	Potorous tridactylus	Long-nosed Potoroo	V	In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm. Coastal heaths and dry and wet sclerophyll forests.	0	Unlikely	No	Suitable habitat does not occur within the Study Area.
90	Pseudomys novaehollandiae	New Holland Mouse	V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	None	No	No suitable coastal heathland habitat occurs within the Study Area.
91	Pseudomys oralis	Hastings River Mouse	Ε	A patchy distribution spanning the Great Dividing Range from the Hunter Valley, south of Mt Royal, north to the Bunya Mountains near Kingaroy in south-east Queensland, at elevations between 300 m and 1100 m. A variety of dry open forest types with dense, low ground cover and a diverse mixture of ferns, grass, sedges and herbs.	0	Unlikely	No	No suitable habitat does not occur within the Study Area and no records are known form the locality.
92	Pteropus poliocephalus	Grey-headed Flying- fox	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	17	Likely	Yes	No flying-fox camps identified within the Study Area. However, suitable foraging habitat occurs, and the Study Area is 20 km from a known camp.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
	Reptiles							
93	Coeranoscincus reticulatus	Three-toed Snake- tooth Skink	V	The Three-toed Snake-tooth Skink occurs on the coast and ranges from the Macleay valley in NSW to south-eastern Queensland. It is very uncommon south of Grafton. Rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. The Three-toed Snake-tooth Skink lives in loose soil, leaf litter and rotting logs, and feeds on earthworms and beetle grubs.	0	Unlikely	No	No records within a 5 km radius of the Study Area and it is very uncommon south of Grafton.
94	Harrisoniascincus zia	Rainforest Cool-skink	V	Generally, occur at high elevation in NSW and QLD ranging from > 500 m elevation, with most occurrences from > 700 m. Inhabits elevation areas with <i>Nothofagus moorei</i> (Antarctic Beech)	0	Likely	Yes	Species distribution overlaps with Study Area and suitable habitat occurs.
95	Myuchelys georgesi	Bellinger River Snapping Turtle	CE	Endemic to the Bellinger Catchment on the north coast of NSW. The species has only been found in a 60-kilometre stretch of the Bellinger River in Northern New South Wales. Habitat preference is for moderate to deep pools with a rocky substrate	0	None	No	Bellinger River does not occur within the Study Area.
	Crustaceans							
96	Euastacus morgani	Morgan's Crayfish	CE	Endemic to a single known highland site at Bindarri National Park in the coastal mountains of the mid north coast of eastern New South Wales.	0	Unlikely	No	The species is only known to occur north of the Study Area.
97	Euastacus simplex	Simple Crayfish	Ε	The simple crayfish is endemic to the headwater reaches (typically between approximately 1100 and 1400 m above sea level) of the New England region of New South Wales (NSW). This species was once considered a widespread species, occurring in various drainage systems including the Styx River (Macleay River Basin) and Nymboida and Guy Fawkes Rivers (Clarence River Basin) in the north and the Hastings River Basin in the south. However, the southern extent of what was thought to be the range of this species is now considered to be that of other species of <i>Euastacus</i> . The species has been collected from a range of streams (small and medium sized),	0	Unlikely	No	Species distribution does not overlap with the Study Area.

No	Scientific Name	Common Name	EPBC Act Status	Distribution and habitat	Number of records within 5 km	Likelihood of Occurrence	Impact Assessment Required	Justification
				both in vegetated (dry sclerophyll forest and heath) and areas cleared for pasture.				

EPBC Act Key: V = Vulnerable, E = Endangered, CE = Critically Endangered, X = Extinct, M = Migratory, Mar = Marine

## Appendix C: Ecology Field Survey

Dates	Staff	Sections	Season	Methods
9 October 2023	Ronnie Hill, Phoebe Smith, Liam Scanlon, Samantha Patch and Claire Peacock	DARC Spi		Targeted threatened flora surveys for potential or likely threatened flora species similar to the parallel field traverse method described in Surveying threatened plants and their habitats (DPIE 2020).
				Fauna habitat assessment including the identification and use assessment of habitat features which included foraging resources, HBTs, dens/burrows, nests, hollow logs and Large Woody Debris (LWD), leaf litter, flaking bark, foraging habitat, rocky habitat and aquatic habitat.
				Opportunistic fauna surveys including opportunistic sightings for threatened and common fauna.
				Validation of existing vegetation mapping, determining type, and extent of PCTs and other vegetation types through the collection of Rapid Data Points (RDPs).
10 October 2023	Ronnie Hill, Phoebe Smith, Liam Scanlon, Samantha Patch and Claire Peacock	DARC	Spring	Targeted threatened flora surveys for potential or likely threatened flora species similar to the parallel field traverse method described in Surveying threatened plants and their habitats (DPIE 2020).
				Fauna habitat assessment including the identification and use assessment of habitat features which included foraging resources, HBTs, dens/burrows, nests, hollow logs and Large Woody Debris (LWD), leaf litter, flaking bark, foraging habitat, rocky habitat and aquatic habitat.
				Opportunistic fauna surveys including opportunistic sightings for threatened and common fauna.
				Validation of existing vegetation mapping, determining type, and extent of PCTs and other vegetation types through the collection of Rapid Data Points (RDPs).

