



Overhead Transmission Line - MacIntyre Wind Energy Precinct

EPBC Act threatened
bird habitat and
regional assessment

Prepared for ACCIONA Energy
Australia Global Pty Ltd

August 2021
Report No. 20033 (15.3)



Nature
Advisory

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1. Executive summary

ACCIONA Energy Australia Global Pty Ltd engaged Nature Advisory Pty Ltd to conduct threatened bird habitat and regional assessments for Regent Honeyeater (*Anthochaera phrygia*), Painted Honeyeater (*Grantiella picta*), Swift Parrot (*Lathamus discolor*) and White-throated Needletail (*Hirundapus caudacutus*) for the proposed MacIntyre Wind Farm transmission line corridor between Tummaville and Cement Mills, QLD. The proposed project covers an area of 508 hectares as shown in Figure 1 (from here on referred to as the 'project area'). The project area includes two switching stations and access tracks and is located approximately 40 kilometres south-west of Warwick within the Toowoomba Regional, Southern Downs Regional and Goondiwindi Regional local government areas. The development footprint is the area of disturbance for the MacIntyre Wind Farm transmission line corridor (426 hectares) as shown that lies within this project area (Figure 2).

The threatened birds targeted in this habitat and regional assessment are listed below including their status under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

- Regent Honeyeater (*Anthochaera phrygia*) - Critically Endangered
- Painted Honeyeater (*Grantiella picta*) - Vulnerable
- Swift Parrot (*Lathamus discolor*) - Critically Endangered
- White-throated Needletail (*Hirundapus caudacutus*) - Vulnerable and Migratory

This report is based on data obtained from a review of background information including documents prepared under the EPBC Act and previous ecological reporting for the project area as well as field surveys conducted by Nature Advisory Pty Ltd between the 22nd and 30th of May, 15th and 19th of June, 21st and 24th of July and the 26th and 29th of October, 2020.

Previous records and reports indicate that the targeted threatened species occur in the region at times. While extensive clearing has occurred within the project area, patches of remnant vegetation remain, some of which provides habitat for some of the targeted species. The quality and extent of this habitat has been characterised and mapped, refining the initial potential habitat mapping previously prepared for each species (GHD 2020a) to provide a more accurate understanding of the possible occurrence of these species on the site and of the impacts of the project on them.

Regent Honeyeater habitat (4.665 hectares, which is also considered habitat critical to the survival of the species), Painted Honeyeater habitat (2.994 hectares) and Swift Parrot habitat (4.466 hectares) has been mapped within the development footprint and represents a small proportion of the total project area and development footprint. The removal of this habitat is considered acceptable as evidence indicates these species are utilising habitat adjacent to the project area and within the wider region rather than more fragmented habitat within the project area. It is noted that no White-throated Needletail roosting habitat is present within the project area.

Mortality and indirect impacts to these species during construction and operation of the proposed MacIntyre Wind Farm transmission line corridor are considered unlikely.

2. Introduction

ACCIONA Energy Australia Global Pty Ltd engaged Nature Advisory Pty Ltd to conduct threatened bird habitat and regional assessments for Regent Honeyeater (*Anthochaera phrygia*), Painted Honeyeater (*Grantiella picta*), Swift Parrot (*Lathamus discolor*) and White-throated Needletail (*Hirundapus caudacutus*) for proposed MacIntyre Wind Farm transmission line corridor between Tummaville and Cement Mills, QLD. The proposed project covers an area of 508 hectares as shown in Figure 1 (from here on referred to as the project area). The project area includes two switching stations and access tracks and is located approximately 40 kilometres south-west of Warwick within the Toowoomba Regional, Southern Downs Regional and Goondiwindi Regional local government areas. The development footprint is the area of disturbance for the MacIntyre Wind Farm transmission line corridor (426 hectares) that lies within the project area (Figure 2).

This report has been prepared in response to the Commonwealth Department of Agriculture, Water and the Environment (DAWE) request for further information following the referral (EPBC 2020/8759) decision that the MacIntyre Wind Farm transmission line project is a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and is to be assessed through the preliminary documentation approach.

The report is divided into the following sections.

Section 3 describes the sources of information.

Section 4 describes the field methodology and information review approach for the assessment.

Section 5 presents the assessment results, including habitat mapping.

Section 6 describes the regional context for each species

Section 7 outlines the impacts on each species

Section 8 presents the conclusions of the assessment.

This assessment was undertaken by a team from Nature Advisory comprising Tom Cotter (Zoologist), Ahmad Barati (Zoologist), Candice Larkin (Zoologist), Tom Cotter (Zoologist), Curtis Doughty (Senior Zoologist), Bernard O'Callaghan (Director) and Brett Lane (Principal Consultant). The team is very grateful for information on the species investigated provided by Dr Stephen Debus of the University of New England.

3. Existing information

Existing information used for this investigation is described below.

3.1. Existing reporting and documentation

- National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (Department of the Environment 2016)
- Conservation Advice *Anthochaera phrygia* Regent Honeyeater (Department of the Environment 2015)
- Conservation Advice *Grantiella picta* Painted Honeyeater (Department of the Environment 2015)
- National Recovery Plan for the Swift Parrot *Lathamus discolor* (Birds Australia 2011)
- Background Document - National Recovery Plan for the Swift Parrot *Lathamus discolor*. (Department of Environment, Climate Change and Water and Birds Australia 2010)
- Conservation Advice *Lathamus discolor* Swift Parrot (Threatened Species Scientific Committee 2016)
- Conservation Advice *Hirundapus caudacutus* White-throated Needletail (Threatened Species Scientific Committee 2019)
- Ecological assessment report of the MacIntyre Wind Farm (GHD 2020a)
- MacIntyre Wind Farm Project - Overhead Transmission Line MNES Significant Impact Assessment Report (GHD 2020b)
- MacIntyre and Karara Wind Farms – Threatened woodland bird assessment (Nature Advisory 2020a).

3.2. Background information

The following provides a background on the targeted bird species.

3.2.1. Regent Honeyeater

The Regent Honeyeater is listed as Critically Endangered under the EPBC Act.

The species is highly nomadic and mobile, with a patchy distribution that extends from south-east Queensland to central Victoria. Records are widely distributed across the species' range, but it is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded (Department of the Environment 2015a). There are records of the species to the east, west and south of the project area, including breeding events in the Cement Mills-Durikai region (Department of the Environment 2016; Hines 2008). The southern portion of the project area is located within the Traprock Important Bird Area for Regent Honeyeater (BirdLife International 2020).

The Regent Honeyeater is most commonly associated with box-ironbark eucalypt woodlands, spotted gum-ironbark woodlands and dry sclerophyll forest and seems to prefer more fertile sites with higher soil water content, including creek flats, broad river valleys and lower slopes. Mature, large individual trees tend to be more important as they produce more nectar more reliably. The species also uses road-side remnant vegetation, remnant patches in farmland and urban areas, and travelling stock routes. Nests are typically in the canopy of mature, rough-barked trees such as ironbarks, sheoaks and Rough-barked Apple (*Angophora floribunda*) (Department of the Environment 2015a, 2016; Geering and French, 1998; Oliver et al. 1998).

Key tree and mistletoe species for the Regent Honeyeater are listed below (Department of the Environment 2015a).

- Mugga Ironbark (*Eucalyptus sideroxylon*)
- Yellow Box (*E. melliodora*)
- White Box (*E. albens*)
- Yellow Gum (*E. leucoxylon*)
- Spotted Gum (*Corymbia maculata*)
- Swamp Mahogany (*E. robusta*)
- Needle-leaf Mistletoe (*Amyema cambagei*) on River Sheoak (*Casuarina cunninghamiana*)
- Box Mistletoe (*A. miquelii*)
- Long-flower Mistletoe (*Dendrophthoe vitellina*).

Other tree species are considered regionally important for the species include Broad-leaved Ironbark (*E. fibrosa*) and Thin-leaved Stringybark (*E. eugenioides*) (Department of the Environment 2015a).

3.2.2. Painted Honeyeater

The Painted Honeyeater is listed as Vulnerable under the EPBC Act.

The species is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory, and exhibits seasonal north-south movements governed principally by the fruiting of mistletoe (Department of the Environment 2015b).

The highly specialised diet of Painted Honeyeater consists mainly of mistletoe fruit, although when there is a shortage of this food item, nectar and arthropods will also be consumed (Garnett et al. 2011, Higgins et al. 2001, Oliver et al. 2003). The species is strongly associated with the presence of mistletoe, particularly during the breeding season. The species prefers woodlands that contain a higher number of mature trees that host more mistletoe (Department of the Environment 2015b).

There is a record of the species in Karara, immediately adjacent to the project area as well as immediately outside the town of Karara and in Durikai State Forest to the east of the project area.

3.2.3. Swift Parrot

The Swift Parrot (*Lathamus discolor*) is listed as Critically Endangered under the EPBC Act.

The Swift Parrot breeds in Tasmania in summer and the entire population migrates north and leaves the island for the winter. While on mainland Australia, the Swift Parrot typically disperses through Victoria and New South Wales, however, smaller numbers are observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011). The species preferentially forages in large, mature trees in eucalypt forests and woodlands, particularly box-ironbark forest and woodlands as well as grassy woodlands (Saunders & Tzaros 2011).

In south-east Queensland, records indicate that Swift Parrot typically feed on lerp and nectar from Yellow Box, Grey Box (*Eucalyptus microcarpa*), Forest Red Gum (*E. tereticornis*) and Swamp Mahogany. There is a strong association between Swift Parrot and Mugga Ironbark, White Box and Spotted Gum elsewhere in their mainland distribution (Saunders & Tzaros 2011). The species has been recorded in Durikai State Forest to the east of the project area.

3.2.4. White-throated Needletail

The White-throated Needletail (*Hirundapus caudacutus*) is listed as Vulnerable and Migratory under the EPBC Act.

This species is widespread in eastern and south-eastern Australia and is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Dividing Range and occasionally onto the adjacent inland plains. The species is also widespread in Victoria and Tasmania and occurs in south-eastern South Australia (Threatened Species Scientific Committee 2019).

The White-throated Needletail subspecies that occurs in Australia is *Hirundapus caudacutus caudacutus*. This subspecies is a trans-equatorial migrant that breeds in the Northern Hemisphere summer and migrates south for the Southern Hemisphere summer. The White-throated Needletail is mostly aerial in Australia, flying at heights of less than one metre up to more than 1000 metres above the ground. It has been recorded eating a wide variety of insects, including beetles, cicadas, flying ants, bees, wasps, flies, termites, moths, locusts and grasshoppers (Threatened Species Scientific Committee 2019).

The species occurs over most habitat types and is recorded most often above wooded areas, including open forest and rainforest, and may also fly below the canopy between trees or in clearings. When flying above farmland, it is more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks (Threatened Species Scientific Committee 2019).

In Australia, confirmed and high confidence records of White-throated Needletail roosting indicate the species roosts in dense foliage of canopy trees in large tracts of treed remnant vegetation along or contiguous with mountain ranges as detailed in the records below:

- very dense foliage in the crown of a eucalypt (16 metre tall) on a spur at Mt Coot-tha, Brisbane Queensland (D'Aguilar Range) (Corben et al. 1982).
- fairly thick foliage in the crown of two acacias (14 metre tall) and one banksia at Little Waterloo Bay, Wilsons Promontory, Victoria (mainland southern extremity of Great Dividing Range) (Day 1993).
- eucalypt on a spur at Nearum, Queensland (Gongiberoo Range) (Tarburton 1993).
- outer branch of a large Narrow-leaved Ironbark (*Eucalyptus crebra*) and near the top of mid-sized White Cypress Pine (*Callitris glaucophylla*) in West Pilliga, New South Wales (remnant vegetation contiguous with Warrumbungle Mountain Range and mountain range within Pilliga Nature Reserve) (Stanton 2011).

It is also noted the species has been recorded landing in the crown of a Rough-barked Apple at Munghorn Gap New South Wales (Great Dividing Range) where the individual remained for four minutes (Quested 1982) although this is not considered a confirmed or high confidence record of the species roosting as the individual was only observed in the tree for a short period of time.

The species is also reported to roost in tree hollows (Threatened Species Scientific Committee 2019), bark on trees or rock faces and is likely to have traditional roost sites (Department of the Environment 2015c). It has been noted that the number of references to White-throated Needletail roosting in trees possibly over-emphasizes such occurrences. During extreme conditions including bushfires and cold, hot or inclement weather, the species is also known to take refuge in tree hollows, trees and stunted scrub (Department of Agriculture, Water and the Environment 2021).

White-throated Needletail has been observed over the northern portion of the project area at four locations.

4. Methodology

4.1. Field methods

Habitat assessment and mapping was conducted in the project area by team members from Nature Advisory between the 22nd and 30th of May, 15th and 19th of June, 21st and 24th of July and the 26th and 29th of October, 2020. Habitat assessment and mapping for the project area within the MacIntyre Wind Farm and Karara Wind Farm was completed as part of the Threatened woodland bird assessment (Nature Advisory 2020a).

A total of 13 habitat assessments were completed within the project area. Habitat Assessment locations were selected after a detailed review of the potential habitat mapping (based on field-verified Regional Ecosystem mapping) presented in the Ecological assessment report of the MacIntyre Wind Farm (GHD 2020a) and based on a review of aerial and satellite imagery to identify sections of the project area where larger trees were present. At each location the following was recorded.

- Median canopy height
- Canopy crown cover percentage
- Percentage of senescent trees in the canopy layer
- Canopy layer flora species
- Mistletoe species
- Flowering intensity
- Presence of lerp
- Ground cover percentage
- Percentage of canopy dieback
- Disturbances.

In addition, a total of 57 habitat observations were completed within and immediately adjacent to the project area. At each of these locations a sub-set of the foregoing habitat attributes were recorded, namely the canopy layer flora species, percentage of senescent trees in the canopy layer and mistletoe species presence in order to rapidly note habitat characteristics across parts of the project area where a habitat assessment was not considered necessary.

Habitat assessment and habitat observation locations are shown in Figure 1.

Table 1 presents the habitat assessment criteria defined for high quality and potential habitat for each woodland bird species. Parts of the project area that met habitat requirements were defined as high quality habitat for each species while parts of the project area that partially met habitat requirements were defined as potential habitat for each species. The habitat assessment criteria were derived from the Conservation Advice for Regent Honeyeater, Painted Honeyeater and Swift Parrot and the National Recovery Plans for Regent Honeyeater and Swift Parrot (see Section 3.1).

Once high quality and potential habitat was identified for a species, the extent of the habitat was mapped.

Table 1: High quality and potential habitat assessment criteria for woodland bird species

Regent Honeyeater		Painted Honeyeater		Swift Parrot	
High Quality	Potential	High Quality	Potential	High Quality	Potential
≥ 50% old growth threshold in	≥ 30% to < 50% old growth threshold in	≥ 50% old growth threshold and ≥ 20% of trees in the canopy layer with mistletoe in	≥ 30% to < 50% old growth threshold and ≥ 5% to < 20% of trees with mistletoe in	≥ 50% old growth threshold in	≥ 30% to < 50% old growth threshold in
<ul style="list-style-type: none"> Box-ironbark woodland Ironbark-box woodland Box woodland Ironbark woodland Spotted gum-ironbark woodland Rough-barked Apple riparian woodland Sheoak riparian woodland Dry sclerophyll forest Woodland with ≥ 20% of trees in the canopy layer with mistletoe 		<ul style="list-style-type: none"> Eucalypt forest Eucalypt woodland Black Box and River Red Gum riparian woodland Box-ironbark-Yellow Gum woodland Acacia-dominated woodland Paperbark woodland Sheoak woodland Callitris woodland 		<ul style="list-style-type: none"> Box-ironbark woodland Ironbark-box woodland Box woodland Ironbark woodland Box-ironbark forest Grassy woodland Swamp Mahogany forest Spotted Gum woodland Blackbutt woodland Forest Red Gum woodland Coastal Banksia woodland 	
<p>Definitions: (Department of Environment, Land, Water and Planning 2020) Old growth threshold - ≥ 10% of trees in the canopy layer senescent Senescent - trees that are ≥ 20m height, Diameter at Breast Height (DBH) ≥ 70cm and bumps, burls or dead limbs present</p> <p>Old growth threshold calculation: High Quality: ≥ 5% of trees in the canopy layer senescent [(0.5 * 0.1) 100] Potential: ≥ 3% to < 5% of trees in the canopy layer senescent [(0.3 * 0.1) 100 and (0.5 * 0.1) 100]</p>					

During the survey between the 26th and 29th of October 2020, searches for White-throated Needle-tail were also conducted while traversing through the project area. Searches for White-throated Needle-tail were also completed as part of Bird Utilisation Surveys (BUS) at the proposed MacIntyre Wind Farm and Karara Wind which are immediately adjacent to the project area between 3rd and 14th December 2020 and 1st and 12th February 2021 (Nature Advisory 2020b, Nature Advisory 2020c). The number of individuals and minimum and maximum flight heights were recorded for each observation of the species.

Roosting habitat for White-throated Needle-tail was defined as treed remnant vegetation along or contiguous with a mountain range where the species may roost in dense foliage of canopy trees. It is also possible that tree hollows, bark on trees or rock faces in such areas may also provide roosting habitat but this is not confirmed. High quality and potential roosting habitat categories for the species were not generated due to limited records and information on roosting habitat for the species in Australia. The habitat assessment criteria for White-throated Needle-tail was derived from a detailed review of the records of the species roosting in Australia and the Conservation Advice for the species as listed in Section 3.1 and outlined in Section 3.2.4.

4.2. Limitations

Wherever appropriate, a precautionary approach has been adopted. It is noted that limited flowering of foraging tree species was occurring during field surveys which limits ability to detect the targeted woodland bird species. As a result, the precautionary approach has been adopted that any high quality or potential habitat within the project area could be utilised by the target bird species.

4.3. Habitat critical to the survival of species

Based on the outcome of the field habitat assessment, the presence of habitat critical to the survival of Regent Honeyeater, Swift Parrot, Painted Honeyeater and White-throated Needletail within the project area was assessed for each species against the EPBC Act documentation as listed below.

- National Recovery Plan for the Regent Honeyeater (*Anthochaera phrygia*) (Department of the Environment 2016)
- National Recovery Plan for the Swift Parrot *Lathamus discolor* (Birds Australia 2011)
- Matters of National Environmental Significance - Significant impact guidelines 1.1 (Department of the Environment 2013).

4.4. Species database review

Records for Regent Honeyeater, Painted Honeyeater, Swift Parrot and White-throated Needletail were viewed and extracted where possible from the following databases:

- Queensland Government Department of Environment and Science WildNet
- Atlas of Living Australia
- BirdLife Australia Birdata

4.5. Expert input and review

Dr Stephen Debus (Adjunct Lecturer at University of New England) from the BirdLife Australia Regent Honeyeater Recovery Team has also provided input to and reviewed this report. Dr Debus has extensive expertise in research and survey of threatened forest and woodland birds (particularly Regent Honeyeater, Painted Honeyeater and Swift Parrot); ecology, biology and behaviour of birds; conservation and management of threatened bird species; editing ornithological papers and the review of ornithological documents and species impact statements. Nature Advisory Pty Ltd is very grateful for Dr Debus' advice and accepts responsibility for all conclusions presented in this report.

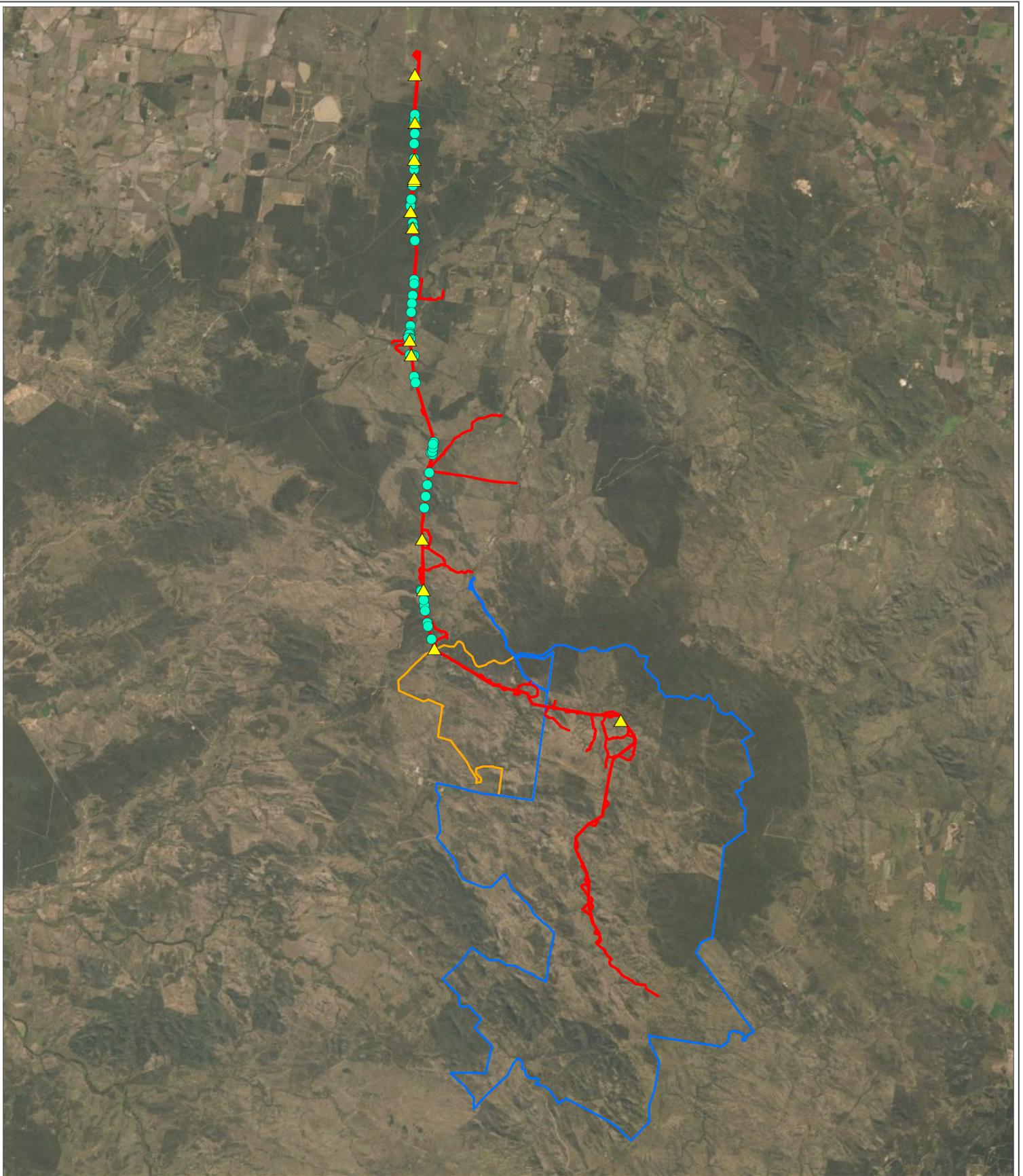
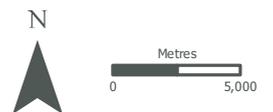


Figure 1: Habitat Assessment and Habitat Observation Locations

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- Project Area
- Karara Wind Farm
- MacIntyre Wind Farm
- ▲ Habitat Assessment
- Habitat Observation



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5. Results

5.1. Site description

The project area consists of a range of habitat types from cleared, intensively grazed agricultural land on lowlands to eucalypt woodland on rocky granite hills. Overall, the vegetation structure of the project area is fragmented, open woodland with eucalypts to 20 metres tall with shrubs, grasses and herbs.

Most of the habitat in the northern section of the project area is dominated by Narrow-leaved Ironbark (*Eucalyptus crebra*) and Smooth-barked Apple (*Angophora leiocarpa*) open woodland with a White Cypress Pine and Buloke (*Allocasuarina luehmannii*) low tree layer and mixed native herb and grass ground cover on sandy soil. The central portion of the project area is dominated by Tumble-down Red Gum (*E. dealbata*) with Narrow-leaved Ironbark on rocky granite hills and slopes. Limited alluvial areas support box woodland and box-ironbark woodland dominated by White Box, Gum-topped Box (*E. moluccana*), Rough-barked Apple, Poplar Box (*E. populnea*) and Narrow-leaved Ironbark and mixed native and herb ground cover. The southern portion of the project area is dominated by Narrow-leaved Ironbark, Tumble-down Red Gum and White Box on undulating hills and lowlands. Extensive parts of the central and southern portion of the study have been cleared for grazing.

Four species of mistletoe were observed within the project area: Box Mistletoe (*Amyema miquelii*); Bald Mistletoe (*Dendrophthoe glabrescens*); Grey Mistletoe (*A. quandang*) and Harlequin Mistletoe (*Lysiana exocarpis*). Minimal flowering of Bald Mistletoe and Narrow-leaved Ironbark was observed within the project area during the field investigations.

During the assessments, the region was severely drought-affected, with significant canopy, low tree layer and shrub layer dieback present throughout the project area. The majority of the lowlands within the project area have been cleared for cattle and sheep grazing with vegetation restricted to creek lines and scattered pasture trees. There is limited old growth treed habitat within the project area due to historical timber harvesting and thinning of the canopy for grazing throughout the lower slopes.

5.2. Habitat assessment

The project area contains limited habitat for the targeted species listed below.

- Regent Honeyeater
- Painted Honeyeater
- Swift Parrot

The quantity of habitat for each species within the project area and development footprint is presented in Table 2 below.

Table 2: Targeted species habitat within the project area and development footprint.

Species	Development Footprint (ha)			Project Area (ha)		
	High quality	Potential	Total	High quality	Potential	Total
Regent Honeyeater	1.889	2.776	4.665	2.004	3.058	5.062
Painted Honeyeater	0	2.994	2.994	0	3.309	3.309
Swift Parrot	1.690	2.776	4.466	1.775	3.058	4.833
White-throated Needletail	N/A	N/A	0	N/A	N/A	0

5.2.1. *Regent Honeyeater*

High quality and potential habitat for Regent Honeyeater was identified and mapped within the project area based on the methodology described in Section 4.

Regent Honeyeater high quality habitat is mapped in three locations in the lowlands in the central portion of the project area (Figure 2).

The northern-most patch is located along Sandy Creek in box woodland containing old growth and is dominated by White Box with Gum-topped Box, Forest Red Gum, Rough-barked Apple and Poplar Box also present, with a low tree layer of Buloke and White Cypress Pine and mixed native grass and herb groundcover on clayey sand.

Another patch is located to the south in a low depression that drains into Sandy Creek in the Millmerran Road corridor. This narrow strip of habitat is box-ironbark woodland containing old growth and dominated by Gum-topped Box with Poplar Box, Narrow-leaved Ironbark, White Box, Forest Red Gum present on clayey sand. There is a low tree layer of White Cypress Pine and Buloke with a native grass and herb groundcover.

A third patch is located along Washpool Creek and comprises a narrow strip of Rough-barked Apple on clayey sand.

Regent Honeyeater potential habitat is mapped in two locations within the project area (Figure 2). The northern-most patch is located within two small gullies and contains two vegetation community types: ironbark-box woodland containing old growth and dominated by Narrow-leaved Ironbark and Yellow Box with Gum-topped Box, Forest Red Gum and White Box also present and a native grass and herb groundcover on gravelly clay in the eastern gully; ironbark woodland containing old growth and dominated by Broad-leaved Ironbark and Mugga Ironbark with a native grass and herb groundcover on rocky sandy clay in the western gully. The southern-most patch of Regent Honeyeater potential habitat is located along a tributary of Muckinboy Creek and is dominated by Rough-barked Apple, White Box and Yellow Box.

High quality and potential habitat within the project area contains Mugga Ironbark, Yellow Box, White Box and Box Mistletoe which are key tree and mistletoe species for Regent Honeyeater as well as Broad-leaved Ironbark which can be regionally important for the species.

Habitat critical to the survival of the Regent Honeyeater includes the following (Department of the Environment 2016).

- any breeding or foraging habitat in areas where the species is likely to occur (as defined by the distribution map provided in the National Recovery Plan for the Regent Honeyeater)

- any newly discovered breeding or foraging locations.

As the high quality and potential Regent Honeyeater within the project area is within the 'likely to occur' portion of the distribution map in the National Recovery Plan for the Regent Honeyeater, the high quality and potential habitat within the project area is considered habitat critical to the survival of the species.

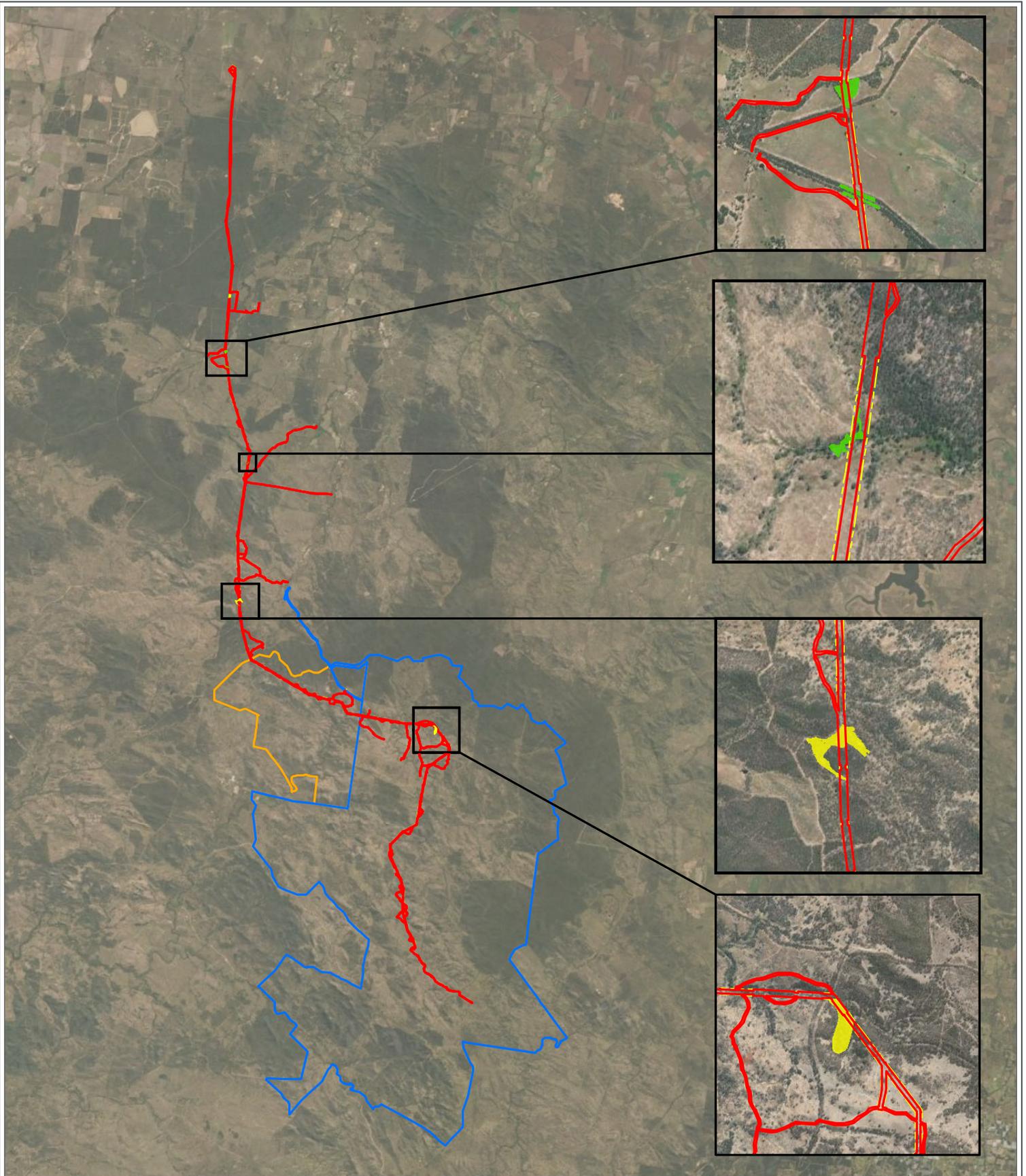
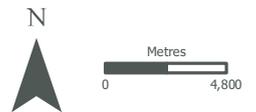


Figure 2: Regent Honeyeater Habitat

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- Project Area
- Development Footprint
- MacIntyre Wind Farm
- Karara Wind Farm
- Regent Honeyeater Habitat**
- High Quality
- Potential



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5.2.2. *Painted Honeyeater*

Potential habitat for Painted Honeyeater has been identified and mapped within the project area based on the methodology described in Section 4. No high quality habitat for the species has been mapped within the project area.

Painted Honeyeater potential habitat is mapped in three locations in the central and southern portion of the project area (Figure 3).

The potential habitat located in the central portion of the study is in a low depression that drains into Sandy Creek in the Millmerran Road corridor. This narrow strip of habitat is box-ironbark woodland containing old growth and is dominated by Gum-topped Box with Poplar Box, Narrow-leaved Ironbark, White Box, Forest Red Gum present on clayey sand. Seven percent of the trees within the canopy layer contain Box Mistletoe on both Gum-topped Box and White Box. There is a low tree layer of White Cypress Pine and Buloke, with a native grass and herb groundcover. There is also a record of Painted Honeyeater 1.3 kilometres west-north-west of this patch from 2018.

The second patch of potential habitat for Painted Honeyeater is in a minor gully in the central portion of the project area comprising ironbark-box woodland containing old growth and is dominated by Narrow-leaved Ironbark and Yellow Box, with Gum-topped Box, Forest Red Gum and White Box also present and with a native grass and herb groundcover on gravelly clay. Five percent of the trees in the canopy layer in this patch contain Box Mistletoe or Bald Mistletoe.

The southern-most patch of potential habitat for Painted Honeyeater is located along a tributary of Muckinboy Creek and is dominated by Rough-barked Apple, White Box and Yellow Box with Box Mistletoe.

It is noted that Weeping Myall (*Acacia pendula*) with Grey Mistletoe (*Amyema quandang*) was not observed within the project area.

Habitat critical to the survival of Painted Honeyeater refers to areas that are necessary (Department of the Environment 2013):

- for activities such as foraging, breeding, roosting or dispersal;
- for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the reintroduction of populations or recovery of the species.

Areas that are considered *necessary* for the processes outlined immediately above to function in a region contain the following characteristics:

- large, continuous blocks of remnant woodland (Department of the Environment 2015b);
- a significant quantity of mistletoe for Painted Honeyeater; and/or
- records of the species within or adjacent to the habitat.

Examples of areas that meet the characteristics outlined immediately above are the larger tracts of remnant vegetation in the region (such as Durikai State Forest where the species has been recorded) with fruiting and flowering mistletoe. Painted Honeyeater preferentially forage and breed in these areas where and when ample mistletoe fruit and flower are available (Department of the Environment 2015b).

The Painted Honeyeater habitat mapped within the project area is not considered *necessary* for the processes outlined above to function in the region as:

- the patches of Painted Honeyeater habitat that occur within the project area are small and isolated rather than large, continuous blocks of remnant woodland; and
- the majority of habitat within the project area does not contain a significant quantity of mistletoe for Painted Honeyeater.

As a result, Painted Honeyeater habitat within the project area is not considered habitat critical to the survival of the species.

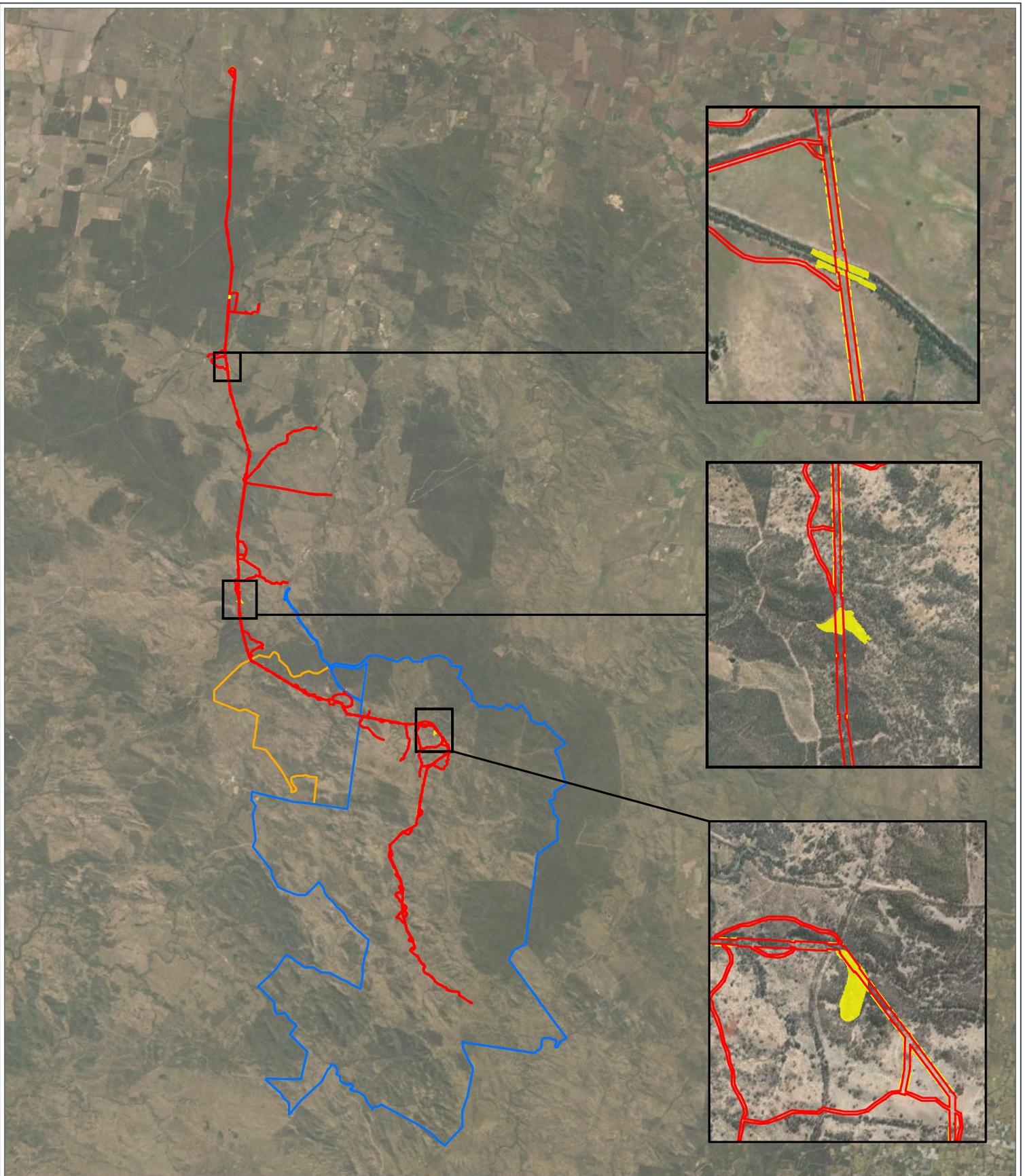
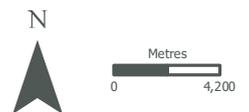


Figure 3: Painted Honeyeater Habitat

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- ▭ Project Area
- ▭ Development Footprint
- ▭ MacIntyre Wind Farm
- ▭ Karara Wind Farm
- Painted Honeyeater Habitat**
- ▭ Potential



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5.2.4. *Swift Parrot*

High quality and potential habitat for Swift Parrot has been identified and mapped within the project area based on the methodology described in Section 4.

Swift Parrot high quality habitat has been mapped in two locations on the lowlands of the central portion of the project area (Figure 4).

The northern-most patch is located along Sandy Creek in box woodland containing old growth and is dominated by White Box with Gum-topped Box, Forest Red Gum, Rough-barked Apple and Poplar Box also present, with a low tree layer of Buloke and White Cypress Pine and mixed native grass and herb groundcover on clayey sand.

The other patch is located to the south in a low depression that drains into Sandy Creek in the Millmerran Road corridor. This narrow strip of habitat is box-ironbark woodland containing old growth and is dominated by Gum-topped Box with Poplar Box, Narrow-leaved Ironbark, White Box, Forest Red Gum on clayey sand. There is a low tree layer of White Cypress Pine and Buloke with a native grass and herb groundcover.

Swift Parrot potential habitat is mapped in two locations within the project area (Figure 4). The northern-most patch is located within two minor gullies and contains two vegetation community types: in the eastern gully, Ironbark-box woodland containing old growth and dominated by Narrow-leaved Ironbark and Yellow Box with Gum-topped Box, Forest Red Gum and White Box present and a native grass and herb groundcover on gravelly clay; in the western gully, Ironbark woodland containing old growth and dominated by Broad-leaved Ironbark and Mugga Ironbark with a native grass and herb groundcover on rocky sandy clay is present. The southern-most patch of Swift Parrot potential habitat is located along a tributary of Muckinboy Creek and is dominated by Rough-barked Apple, White Box and Yellow Box.

High quality and potential habitat within the project area contains Mugga Ironbark, Yellow Box, White Box and Forest Red Gum which are key tree species for Swift Parrot.

Habitat critical to the survival of the Swift Parrot includes (Saunders & Tzaros 2011):

- those areas of priority habitat for which the Swift Parrot has a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot: or
- are otherwise identified by the recovery team.

Priority habitat for Swift Parrot are areas of particular importance for conservation management which are used (Saunders & Tzaros 2011):

- for nesting;
- by large proportions of the Swift Parrot population;
- repeatedly between seasons (site fidelity); or
- for prolonged periods of time (site persistence).

The Swift Parrot habitat within the project area is not considered priority habitat for the species as the patches of Swift Parrot habitat within the project area are:

- not used for nesting with nesting occurring in Tasmania (Saunders & Tzaros 2011);
- not used by large proportions of the Swift Parrot population with no records of the species within the project area from WildNet, Birddata and Atlas of Living Australia databases and following targeted surveys for the species as well as following Bird Utilisation Surveys and fauna surveys throughout the project area (GHD 2020b, Nature Advisory 2020b, Nature Advisory 2020c). It is noted there are some Swift Parrot records within the adjacent Durikai State Forest (as shown in Figure 7 and detailed in Section 6.3);

- not repeatedly used between seasons (lack of site fidelity) with no records of the species within the project area. It is noted there are some Swift Parrot records within the adjacent Durikai State Forest with records from July 2017 to September 2017, from May 2018 to September 2018 and in June 2021; and
- not used for prolonged periods of time (lack of site persistence) with no records of the species within the project area.

The Swift Parrot habitat within the project area is also not identified by the recovery team as priority habitat for the species (Saunders & Tzaros 2011). It is noted that the WildNet, Birddata and Atlas of Living Australia records for the species in the adjacent Durikai State Forest indicate a level of Swift Parrot site fidelity with records from July 2017 to September 2017, from May 2018 to September 2018 and in June 2021, and as a result these areas within Durikai State Forest are considered priority habitat and habitat critical to the survival of the species.

It is noted that the Swift Parrot habitat within the project area may possess phenological characteristics that may support Swift Parrot foraging if sufficient levels of lerp and nectar are available in winter flowering eucalypt species, however, there are no Swift Parrot records within any of these patches and high quantities of lerp was not observed in these patches. This indicates that these patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage and are therefore not considered likely to be of importance to the Swift Parrot. If one or more of the patches of Swift Parrot habitat within the project area (or within the adjacent proposed MacIntyre Wind Farm or Karara Wind Farm) contained one or more records of Swift Parrot and/or high quantities of lerp or very heavy flowering in winter flowering eucalypt species had been observed in these patches, the Swift Parrot habitat within the project area would be considered to possess phenological characteristics likely to be of importance to the Swift Parrot and therefore habitat critical to the survival of the species.

As a result of the above, Swift Parrot habitat mapped within the project area is not considered habitat critical to the survival of the species.

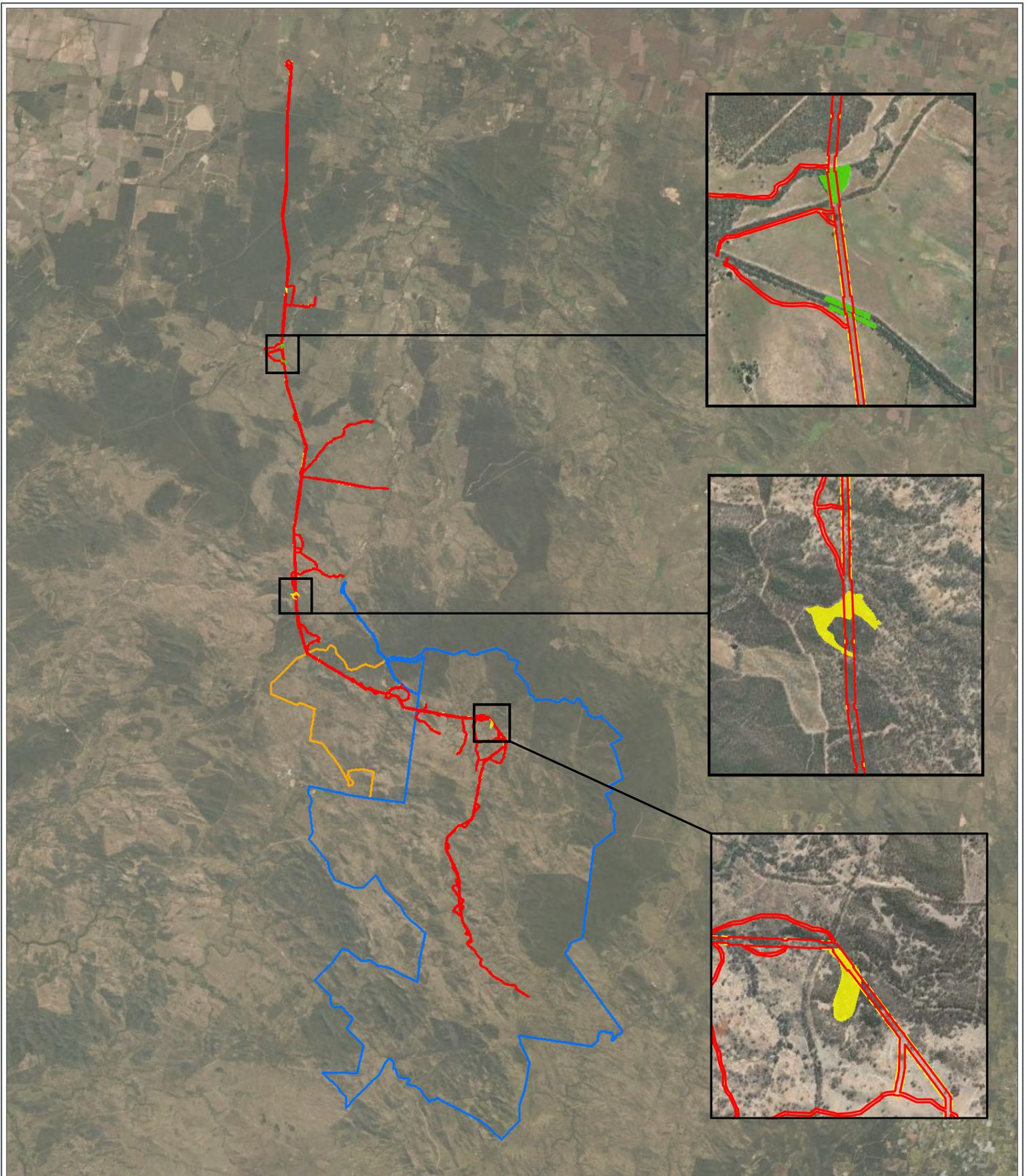


Figure 4: Swift Parrot Habitat

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- Project Area
- Development Footprint
- MacIntyre Wind Farm
- Karara Wind Farm
- Swift Parrot Habitat**
- High Quality
- Potential

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5.2.5. *White-throated Needletail*

No roosting habitat for White-throated Needletail was present within the project area based on the methodology described in Section 4.

While treed remnant vegetation is present within the project area consisting of low eucalypt woodland on rocky rises, ironbark open woodland, mixed eucalypt woodland/forest and mixed eucalypt woodland on alluvial flats, it did not occur along or was contiguous with a mountain range. Confirmed and high confidence records of the species roosting in Australia are in treed remnant vegetation along or contiguous with a mountain range. During extreme conditions including bushfires and cold, hot or inclement weather, the species may infrequently take refuge in trees within the project area.

White-throated Needletail has been observed over the northern portion of the project area (Figure 8) with a total of four records consisting of one observation at two locations and nine and ten observations at two locations. Individuals have been recorded flying between 30 metres and 200 metres above ground level. The species is considered likely to occupy the airspace throughout the project area.

Habitat critical to the survival of White-throated Needletail refers to areas that are necessary (Department of the Environment 2013):

- for activities such as foraging, breeding, roosting, or dispersal;
- for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators);
- to maintain genetic diversity and long term evolutionary development; or
- for the reintroduction of populations or recovery of the species.

While the airspace above the project area provides an area for White-throated Needletail to forage and disperse; will assist with the long-term maintenance of the species; will help to maintain genetic diversity and long-term evolutionary development; and provides habitat for the recovery of the species; the airspace above the project area is not considered necessary for these processes to occur. The species also breeds in the Northern Hemisphere and roosting habitat is not considered to be present within the project area. As a result, habitat critical to the survival of the species is not considered to be present within or above the project area.

6. Regional context

6.1. Regent Honeyeater

Regent Honeyeater records are widely distributed across the species' range from south-eastern Queensland to central Victoria. While there are records of the species to the east, west and south of the project area, including breeding events in the Cement Mills-Durikai region, the species is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded (Department of the Environment 2015a; Department of the Environment 2016; Hines 2008).

Within 50 kilometres of the project area there are 17 records of Regent Honeyeater (16 Birddata records and one record from Dr Stephen Debus) with 14 records within the Traprock Important Bird Area for Regent Honeyeater (Figure 5). The southern portion of the project area is within the Traprock Important Bird Area. Habitat within the development footprint for the species is restricted to five small and isolated patches which totals 4.665 hectares (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) as shown in Figure 2, with only one patch of Regent Honeyeater potential habitat of 1.645 hectares within the development footprint *and* within the Traprock Important Bird Area.

The Durikai State Forest and MacIntyre State Forest are within the Traprock Important Bird Area and contain significant tracts of selectively logged (in places) eucalypt forest and woodlands comprised mainly of Lemon-scented Gum (*Corymbia citriodora*) associations and box-ironbark associations (BirdLife International 2020). The Durikai State Forest totals 12,357 hectares and MacIntyre State Forest totals 1,002 hectares. Thirteen of the 14 records of Regent Honeyeater within the Traprock Important Bird Area are within larger tracts of Regent Honeyeater habitat within Durikai State Forest and along MacIntyre Brook. There is also one record of Regent Honeyeater within the Traprock Important Bird Area from a patch of habitat on Coopers Creek that is connected to larger tracts of Regent Honeyeater habitat along Branch Creek (tributary of MacIntyre Brook). The three Regent Honeyeater records outside the Traprock Important Bird Area and within 50 kilometres of the project area are within large tracts of Regent Honeyeater habitat within Wondul Range National Park and Connolly Dam and immediately adjacent to Sundown National Park which are between 36 kilometres and 46 kilometres from the project area.

At times when key tree and mistletoe species are flowering within the Regent Honeyeater habitat within the project area, the species may forage in these patches. It is noted that there have been no records of the species within these small and isolated patches indicating that these patches may not provide sufficient quantities of reliable nectar for the species. There is also no evidence that the Regent Honeyeater utilises these patches for roosting or breeding. These isolated patches provide small areas which may be utilised by the species, although the majority of Regent Honeyeater activity within the region is within larger tracts of Regent Honeyeater habitat within Protected Areas and along waterways. It is also noted that the species is most often recorded in a few localities in NSW and Victoria. While breeding events have been recorded in the Cement Mills-Durikai area, which has significance as the only remaining outpost of Regent Honeyeater breeding in Queensland (S Debus 2021, pers. comm. 15 January), there are no key breeding areas or other breeding areas mapped for the species within Queensland (Department of the Environment 2016).

While the 4.665 hectares of Regent Honeyeater habitat within the development footprint is considered to be habitat critical to the survival of the species, much larger tracts of habitat critical to the survival of the species are located in the region and within the Traprock Important Bird Area including Durikai State Forest. Regent Honeyeater appear to preferentially utilise these areas rather than small, isolated patches of habitat, such as those occurring within the project area.

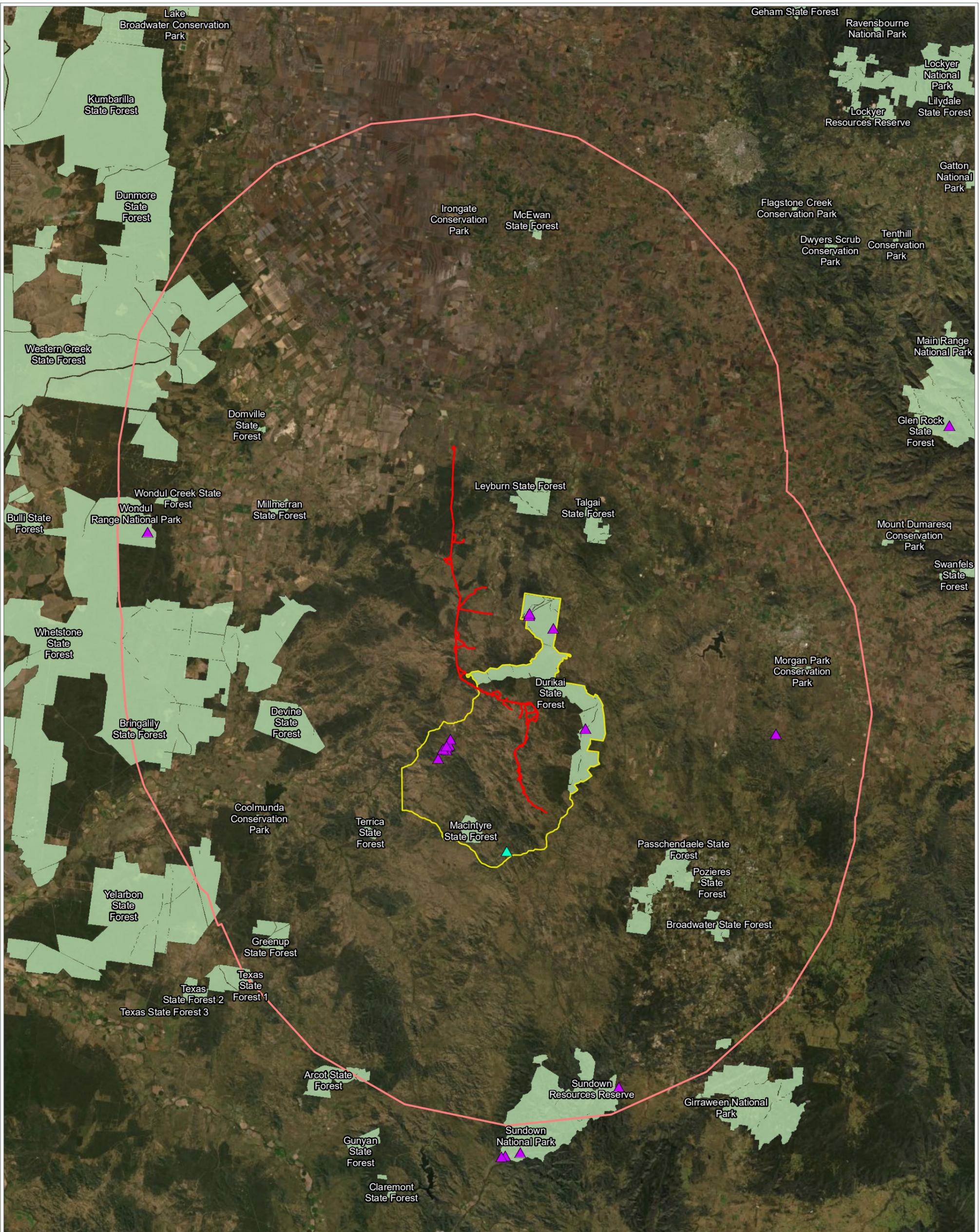
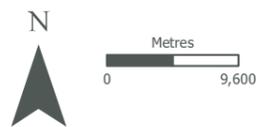


Figure 5: Regent Honeyeater Records

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- | | | | |
|--|------------------------------|---|----------|
|  | Project Area | Regent Honeyeater | |
|  | Project Area Buffer (50km) |  | Birddata |
|  | Traprock Important Bird Area |  | Debus |
|  | Protected Area | | |



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6.2. Painted Honeyeater

The Painted Honeyeater is sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The species exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched (Department of the Environment 2015b).

Within 50 kilometres of the project area there are 20 records of Painted Honeyeater (4 WildNet records, 3 Birddata records and 13 Atlas of Living Australia records) (Figure 6). Two records of the species come from within the Traprock Important Bird Area in Durikai State Forest and an additional record of the species from Karara, immediately adjacent to the project area. An additional record occurs immediately outside the town of Karara to the east of the project area.

Three small, isolated patches of Painted Honeyeater potential habitat occur within the development footprint. A total of 2.994 hectares of these patches are within the development footprint with the largest portion within the development footprint being 1.645 hectares. A maximum of seven percent of the trees in the canopy layer contain mistletoe in these patches.

Painted Honeyeater is more common in more extensive blocks of remnant woodland than in narrower strips, although it breeds in quite narrow roadside strips if ample mistletoe fruit is available (Department of the Environment 2015b). The distribution of records of the species within 50 kilometres of the project area (Figure 6) demonstrates this with more records in Protected Areas (particularly noting Durikai State Forest which is the closest Protected Area to the project area and covers an area of 12,357 hectares) and larger tracts of remnant vegetation compared with one record within remnant vegetation in the Millmerran Road corridor.

At times when mistletoe is fruiting and flowering within the three small, isolated patches of Painted Honeyeater potential habitat within the project area, the species may occasionally forage in these areas. These patches do not contain large amounts of mistletoe and there are no records of the species within them. When mistletoe is fruiting and flowering in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest), the species would prefer these areas to the small fragmented areas of potential habitat within the project area. Painted Honeyeater would also preferentially breed in these areas, as well as narrow roadside remnants if ample mistletoe fruit is available (Department of the Environment 2015b) rather than within the project area.

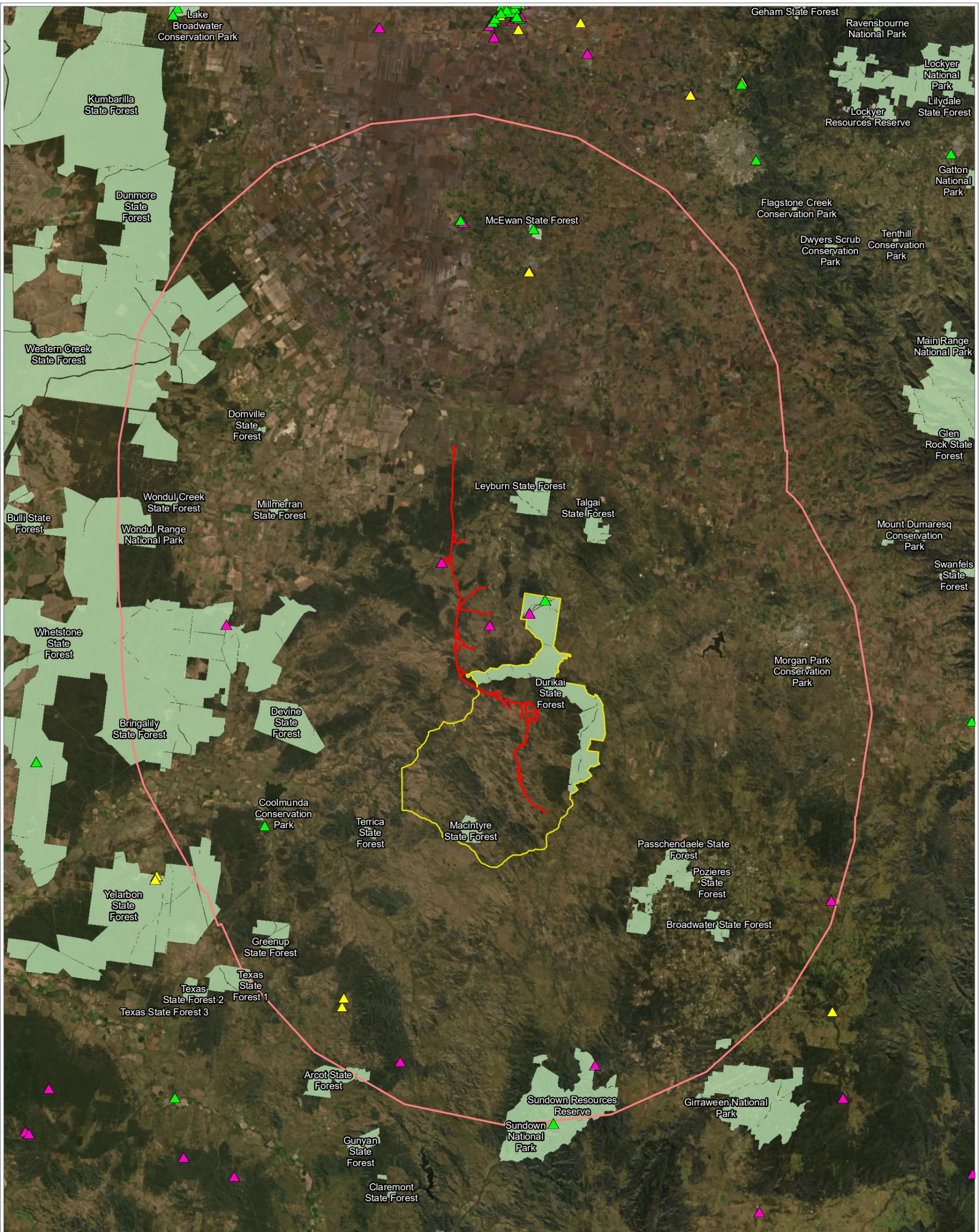


Figure 6: Painted Honeyeater Records

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- | | | | |
|--|------------------------------|---|---------------------------|
|  | Project Area |  | WildNet |
|  | Project Area Buffer (50km) |  | Birddata |
|  | Traprock Important Bird Area |  | Atlas of Living Australia |
|  | Protected Area | | |



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6.3. Swift Parrot

The Swift Parrot breeds in Tasmania in summer and the entire population leaves the island and migrates north for the winter. While on mainland Australia, the Swift Parrot typically disperses through Victoria and New South Wales, however, smaller numbers are observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011). The species exhibits high site fidelity, returning to locations on an irregular cyclic basis (Threatened Species Scientific Committee 2016).

Within 50 kilometres of the project area there are 27 records of Swift Parrot (one WildNet record, nine Birddata records and 17 Atlas of Living Australia records) (Figure 7). The species is reported occasionally within the Traprock Important Bird Area (BirdLife International 2020). A total of 23 records of Swift Parrot come from within the Traprock Important Bird Area, all of which are within Durikai State Forest.

The species preferentially forages in large, mature trees in eucalypt forests and woodlands, particularly box-ironbark forest and woodlands, as well as grassy woodlands (Saunders & Tzaros 2011). Within the development footprint 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) has been found in small, isolated patches. The largest section of Swift Parrot habitat within the development footprint is 1.645 hectares of potential habitat within the Traprock Important Bird Area. It is noted that there are no records of Swift Parrot within the patches of Swift Parrot habitat mapped within the project area.

The species exhibits high site fidelity and the production of lerp and nectar food resources are considered the main limiting factors to the species (Saunders & Tzaros 2011). At times, when sufficient levels of lerp and nectar are available, the species may occasionally forage within the small, isolated patches in the project area. It is noted though that the lack of records within these patches indicates that these patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage. Based on the distribution of records in Figure 7, the species is preferentially foraging in habitat within the Durikai State Forest which covers an area of 12,357 hectares compared to the 4.466 hectares of Swift Parrot habitat within the project area.

Habitat characteristics of roosting sites for Swift Parrot are relatively unknown. Based on the lack of records within the project area, the Swift Parrot habitat within the project area is not considered roosting habitat. The species is likely roosting in areas such as Durikai State Forest where it has been recorded, as proximity to foraging habitat is likely to be important in roost site selection (Saunders & Tzaros 2011).

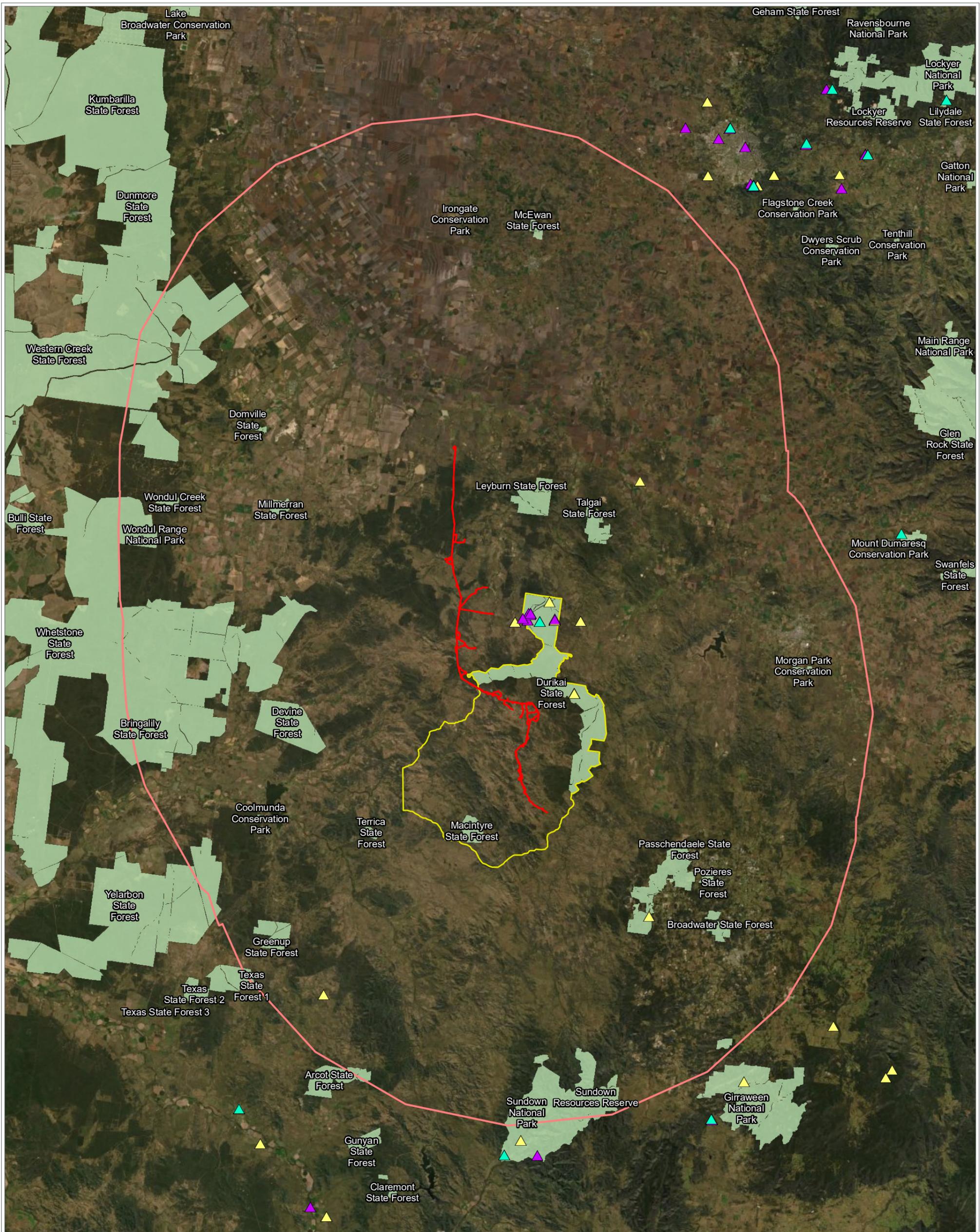


Figure 7: Swift Parrot Records

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

- | | | | |
|--|------------------------------|---|---------------------------|
|  | Project Area |  | WildNet |
|  | Project Area Buffer (50km) |  | Birdata |
|  | Traprock Important Bird Area |  | Atlas of Living Australia |
|  | Protected Area | | |



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6.4. White-throated Needletail

The White-throated Needletail is widespread in eastern and south-eastern Australia with the species being mostly aerial over most habitat types while in Australia (Threatened Species Scientific Committee 2019). Within 50 kilometres of the project area, there are 232 records of White-throated Needletail (23 Nature Advisory records, one GHD record, 29 WildNet records, 73 Birddata records and 106 Atlas of Living Australia records) as shown in Figure 8. White-throated Needletail has been recorded over the northern portion of the project area with a total of four records consisting of one observation at two locations and nine and 10 observations at two locations (Nature Advisory 2020b, Nature Advisory 2020c). There is generally an even distribution of records within 50 kilometres of the project area and the species is considered to occupy the airspace throughout the project area.

White-throated Needletail roosting habitat is considered to be absent from the project area. The Sundown National Park is located 39 kilometres to the south of the project area and contains a large tract of treed remnant vegetation along a mountain range that is expected to contain White-throated Needletail roosting habitat. If the species is roosting within the region, it is most likely to be in this location.

During extreme conditions including bushfires and cold, hot or inclement weather, the species may infrequently take refuge in trees within the project area. It is noted that there are larger tracts of treed remnant vegetation adjacent to the project area in Durikai State Forest where the species is likely to preferentially seek refuge during extreme conditions rather than within the project area.

In addition to the four records over the project area, there are also 25 records of the species within the immediately adjacent proposed MacIntyre Wind Farm and Karara Wind Farm (Nature Advisory 2020b, Nature Advisory 2020c, GHD 2020b). Each time White-throated Needletail has been recorded by Nature Advisory (including close to dusk) over the project area and proposed MacIntyre Wind Farm and Karara Wind Farm, the species has been observed foraging and it has not been recorded within the tree canopy searching for or landing at a roosting location. In locations elsewhere in Australia where roosting locations have been confirmed or there is high confidence of the species roosting at a location, the species has been observed exhibiting roost searching behaviour close to dusk which includes flying through the tree canopy and landing and leaving a location a number of times before settling to roost (Corben et al. 1982; Day 1993; Tarburton 1993; Stanton 2011).

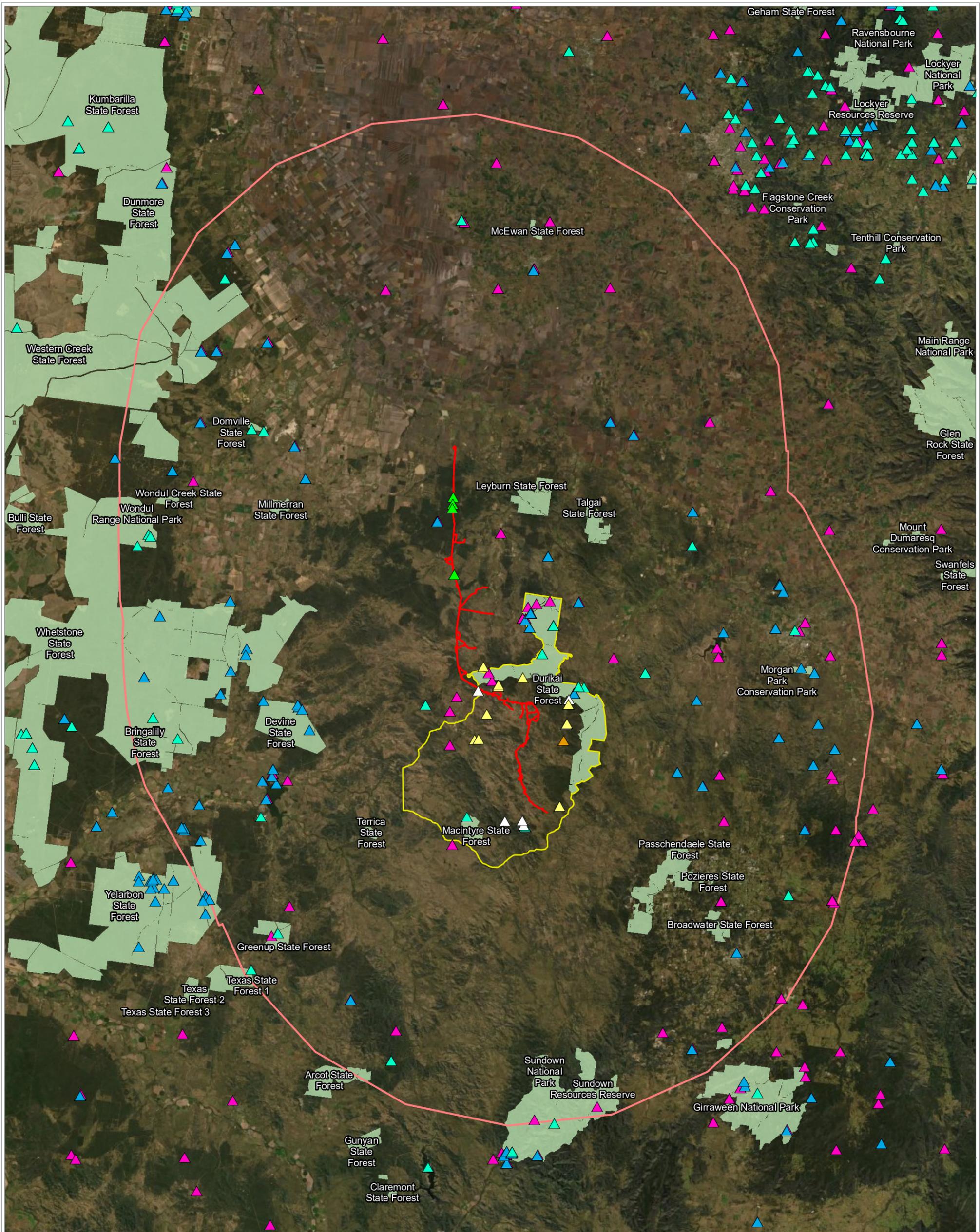


Figure 8: White-throated Needletail Records

Project: MacIntyre Wind Farm Transmission Line **Client:** ACCIONA Energy Australia Global Pty Ltd **Date:** 5/08/2021

	Project Area		White-throated Needletail		WildNet
	Project Area Buffer (50km)		Nature Advisory (Oct 2020)		Birddata
	Traprock Important Bird Area		Nature Advisory (Dec 2020)		Atlas of Living Australia
	Protected Area		Nature Advisory (Feb 2021)		
			GHD (Jan 2019)		



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7. Impact assessment

7.1. Direct impacts

7.1.1. *Regent Honeyeater*

The development footprint contains 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) that is proposed to be removed (Figure 2). This habitat is also considered habitat critical to the survival of the species. Five patches of Regent Honeyeater habitat occur within the project area and the removal of part of these patches is considered acceptable for the reasons summarised below based on the detailed findings in Sections 5 and 6:

- larger tracts of Regent Honeyeater habitat that are also considered habitat critical to the survival of the species are located within Protected Areas and along waterways within close proximity to the project area, including in Durikai State Forest and along MacIntyre Brook and Branch Creek;
- habitat for the species within the development footprint is restricted to five small and isolated patches, with one patch containing 1.645 hectares of potential habitat within the development footprint and within the Traprock Important Bird Area for Regent Honeyeater;
- the species is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded (Department of the Environment 2015a; Department of the Environment 2016);
- the species has not been recorded within the project area, although when key tree and mistletoe species are flowering in the identified patches within the project area, the species may forage here; and
- there is no evidence that Regent Honeyeater utilise the patches of habitat within the project area for roosting or breeding.

Based on the information presented here, the Regent Honeyeater preferentially utilises the larger tracts of habitat critical to the survival of the species surrounding the project area rather than small, isolated patches of habitat, such as those within the project area.

There is a very small possibility of injury or mortality during clearing within these patches of habitat, although due to the limited Regent Honeyeater activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

7.1.2. *Painted Honeyeater*

The development footprint contains 2.994 hectares of Painted Honeyeater potential habitat that is proposed to be removed (Figure 3). This habitat is not considered habitat critical to the survival of the species and the removal of this habitat is considered acceptable for reasons summarised below based on the detailed findings in Sections 5 and 6:

- a maximum of seven percent of the trees in the canopy layer contain mistletoe in these patches, which is not considered a significant quantity of mistletoe for Painted Honeyeater;
- the species may occasionally forage in the patches of habitat within the project area at times when mistletoe is fruiting and flowering;
- the species is more common in larger, continuous blocks of remnant woodland than in narrower strips (Department of the Environment 2015b) such as the patches of Painted Honeyeater habitat within the project area; and

- the distribution of records in the region demonstrates that the species is found in Protected Areas and larger tracts of remnant vegetation with one record within remnant vegetation in the Millmerran Road corridor and no records of the species within the patches of habitat within the project area.

When mistletoe is fruiting and flowering in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest) Painted Honeyeater would preferentially forage and breed in these areas as well as narrow roadside strips, where and when ample mistletoe fruit is available (Department of the Environment 2015b), rather than within the three small, isolated patches of habitat within the project area.

There is a very small possibility of injury or mortality during clearing within these patches of habitat, and due to the limited Painted Honeyeater activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

7.1.3. *Swift Parrot*

The development footprint contains 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) that is proposed to be removed (Figure 4). This habitat is not considered habitat critical to the survival of the species and the removal of this habitat is considered acceptable for the reasons summarised below based on detailed information in Sections 5 and 6:

- the species typically disperses through Victoria and New South Wales, however, smaller numbers are observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011);
- 23 of the 27 records of Swift Parrot within 50 kilometres of the project area are within the Traprock Important Bird Area, all of which are within the Durikai State Forest where the species is foraging and likely roosting; and
- there are no records of the species within the patches of Swift Parrot habitat mapped in the project area. The species exhibits high site fidelity, returning to locations on an irregular cyclic basis (Threatened Species Scientific Committee 2016). The lack of records indicates that these patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly.

Based on the distribution of records in Figure 7 and the small and isolated patches of habitat within the project area, the Swift Parrot is likely to be foraging preferentially and likely roosting in habitat within the Durikai State Forest, which covers an area of 12,357 hectares and would contain more extensive high quality and potential habitat compared with the 4.466 hectares of habitat for the species within the development footprint.

There is a very small possibility of injury or mortality during clearing of these patches of habitat, although due to the limited Swift Parrot activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

7.1.4. *White-throated Needletail*

The project area does not contain White-throated Needletail roosting habitat, as such no roosting habitat for this species is proposed to be removed. If White-throated Needletail are roosting within the region, it is most likely to be within Sundown National Park (39 kilometres south of the project area) which contains treed remnant vegetation along a mountain range. The airspace over the project area is not of particular

significance to the species as there is a generally an even distribution of records of the species over the project area as there is within 50 kilometres of the project area.

There is a very small possibility of injury or mortality of the species during clearing within the development footprint, although due to the absence of White-throated Needletail roosting habitat within the project area, this possibility is considered remote. Any residual risk of impacts can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

White-throated Needletail mortality from collision with overhead wires within Australia is known to occur, although is a low severity threat and affects a small number of birds (Hull et al. 2013). A threshold of mortality of 10 individuals annually can be considered a significant impact on the species (Department of the Environment 2015c). Given there are not extensive records of the species within the project area and that overhead wires affect a small number of individuals, this threshold is not expected to be exceeded with the construction and operation of the proposed MacIntyre Wind Farm transmission line corridor.

7.2. Indirect impacts

The removal of Regent Honeyeater, Painted Honeyeater and Swift Parrot habitat for the proposed MacIntyre Wind Farm transmission line corridor will result in the fragmentation of patches with a clearing of up to 60 metres wide. This minor level of habitat fragmentation is considered to have minimal impact on each species, given the availability of larger tracts of habitat adjacent to the project area and elsewhere in the region. The removal of the habitat within the development footprint will also result in an inconsequential reduction in habitat connectivity, particularly considering these species are highly mobile. It is noted that this clearing will not completely remove these patches of habitat.

The construction of the proposed MacIntyre Wind Farm transmission line corridor may indirectly impact Regent Honeyeater, Painted Honeyeater, Swift Parrot and White-throated Needletail as listed below, although each of these impacts can be sufficiently mitigated through the implementation of a CMP, especially considering that the species are expected to utilise the habitat within the project area very infrequently (if at all):

- Disturbance from increased light, noise and vibration;
- Habitat degradation through increased dust, run-off and sedimentation;
- Introduction and spread of invasive fauna species; and
- Introduction and spread of weed species.

7.2.1. White-throated Needletail

The loss of forest and woodland habitats may have resulted in the decline of invertebrate prey for White-throated Needletail, which may be contributing to the decline of the species (Threatened Species Scientific Committee 2019). While 133 hectares of remnant vegetation may be removed for the proposed MacIntyre Wind Farm transmission line corridor, approximately 20,500 hectares of remnant vegetation occurs within five kilometres of the project area. This is not considered a significant reduction in treed remnant vegetation that would reduce invertebrate prey to an extent that would impact the capacity for the airspace over the project area to provide foraging habitat for the species.

Given the long-ranging daily movements and flight height range of White-throated Needletail, the construction of the 64 kilometres long and 60 metres wide proposed MacIntyre Wind Farm transmission

line corridor is not considered to create a barrier for the species to access the airspace over or adjacent to the project area.

The use of insecticides, particularly organochlorines, has been identified as a possible cause of decline of White-throated Needletails, either through a decrease in the abundance of invertebrates from wide use of insecticides or from secondary poisoning by insecticides accumulated as sublethal doses in prey (Threatened Species Scientific Committee 2019). The use of insecticides is not expected to increase as a consequence of the proposed MacIntyre Wind Farm transmission line corridor.

7.3. Significant impact assessment

7.3.1. Regent Honeyeater

An assessment against the significant impact criteria outlined in the Matters of National Environmental Significance Significant impact guidelines 1.1 (Department of the Environment 2013) is provided for Regent Honeyeater in Table 3 and identifies that the action is likely to significantly impact the species.

Table 3: Significant impact assessment for Regent Honeyeater

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
Lead to a long-term decrease in the size of a population.	<p>Unlikely</p> <p>The removal of 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) that is also considered habitat critical to the survival of the species is unlikely to lead to a long-term decrease in the size of the population as:</p> <ul style="list-style-type: none"> ▪ larger tracts of Regent Honeyeater habitat that are also considered habitat critical to the survival of the species (and is habitat where the species has been recorded) are located within Protected Areas and along waterways within close proximity to the project area, including in Durikai State Forest and along MacIntyre Brook and Branch Creek; ▪ habitat for the species within the development footprint is restricted to five small and isolated patches, with one patch containing 1.645 hectares of potential habitat within the development footprint and within the Traprock Important Bird Area for Regent Honeyeater; ▪ the species is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded (Department of the Environment 2015a; Department of the Environment 2016); ▪ the species has not been recorded within the project area, although when key tree and mistletoe species are flowering in the identified patches within the development footprint, the species may forage here; ▪ there is no evidence that Regent Honeyeater utilise the patches of habitat within the project area for roosting or breeding; ▪ the species preferentially utilises the larger tracts of habitat critical to the survival of the species surrounding the project area rather than small and isolated patches of habitat, such as those within the project area; and ▪ there is only a very small possibility of injury or mortality of the species during clearing within these patches of habitat, and due to the limited Regent Honeyeater activity within the area and the smaller size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.
Reduce the area of occupancy of the species.	<p>Unlikely</p> <p>The removal of 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) will not completely remove these patches of habitat. Fragmentation of these patches will occur with a clearing of up to 60 metres wide through these patches. This minor level of habitat fragmentation is considered to have minimal impact on Regent Honeyeater, given the availability of larger</p>

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	tracts of habitat adjacent to the project area and elsewhere in the region. The removal of the habitat within the development footprint will also result in an inconsequential reduction in habitat connectivity, particularly considering the species is highly mobile. As the removal of habitat will not completely remove patches of habitat, will result in only minor levels of habitat fragmentation and an inconsequential reduction in habitat connectivity, the area of occupancy of the species is unlikely to be reduced.
Fragment an existing population into two or more populations.	Unlikely The Regent Honeyeater comprises a single population (Garnett et al. 2011) and is not severely fragmented (Department of the Environment 2015a). The species is highly mobile and the removal of only 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) will not fragment the existing population into two or more populations.
Adversely affect habitat critical to the survival of a species.	Likely A total of 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) is proposed to be removed. This habitat is considered to be habitat critical to the survival of the species. The proposed removal of this habitat is considered to adversely affect habitat critical to the survival of the species.
Disrupt the breeding cycle of a population.	Unlikely Regent Honeyeater breeding events have been recorded in the Cement Mills-Durikai region (Department of the Environment 2016) including adjacent to the project area. The species has not been recorded breeding within the project area. It is also noted there are no key breeding areas or other breeding areas for the species mapped within Queensland (Department of the Environment 2016). As a result, the action is unlikely to disrupt the breeding cycle of the Regent Honeyeater population.
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Unlikely The removal of only 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) that is also considered habitat critical to the survival of the species is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline as: <ul style="list-style-type: none"> ▪ larger tracts of Regent Honeyeater habitat that are also considered habitat critical to the survival of the species (and is habitat where the species has been recorded) are located within Protected Areas and along waterways within close proximity to the project area, including in Durikai State Forest and along MacIntyre Brook and Branch Creek; ▪ habitat for the species within the development footprint is restricted to five small and isolated patches, with one patch containing 1.645 hectares of potential habitat within the development footprint and within the Traprock Important Bird Area for Regent Honeyeater; ▪ the species is only found regularly at a few localities in NSW and Victoria where most of the sightings have been recorded (Department of the Environment 2015a; Department of the Environment 2016); ▪ the species has not been recorded within the project area, although when key tree and mistletoe species are flowering in the identified patches within the development footprint, the species may forage here;

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	<ul style="list-style-type: none"> ▪ there is no evidence that Regent Honeyeater utilise the patches of habitat within the project area for roosting or breeding; and ▪ the species preferentially utilises the larger tracts of habitat critical to the survival of the species surrounding the project area rather than small and isolated patches of habitat, such as those within the project area.
Result in invasive species that are harmful to a critically endangered species becoming established in the critically endangered species' habitat.	<p>Unlikely</p> <p>Invasive weeds and rabbits cause degradation of Regent Honeyeater habitat and have been identified as a threat to the species (Department of the Environment 2015a). The removal of 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) is not considered to increase the likelihood of invasive species that are harmful to the species becoming established in the species habitat throughout the project area. It is noted that a project-specific Preliminary Vegetation and Fauna Management Plans includes measures to reduce the impact of invasive species on all biota, including on the Regent Honeyeater.</p>
Introduce disease that may cause the species to decline.	<p>Unlikely</p> <p>Due to the small size of the population, the species is at greater risk from the potential impact of stochastic events including disease (Department of the Environment 2016). The action is not considered likely to introduce disease during construction and operation that may cause Regent Honeyeater to decline.</p>
Interfere with the recovery of the species.	<p>Likely</p> <p>Strategy 1 of the National Recovery Plan of the Regent Honeyeater is to improve the extent and quality of Regent Honeyeater habitat (Department of the Environment 2016). The removal of 4.665 hectares of Regent Honeyeater habitat (1.889 hectares of high quality habitat and 2.776 hectares of potential habitat) that is also considered habitat critical to the survival of the species will marginally reduce the extent of Regent Honeyeater habitat and marginally interfere with the recovery of the species.</p>

7.3.3. Painted Honeyeater

An assessment against the significant impact criteria outlined in the Matters of National Environmental Significance Significant impact guidelines 1.1 (Department of the Environment 2013) is provided for Painted Honeyeater in Table 4 and identifies that the action is unlikely to significantly impact the species.

Table 4: Significant impact assessment for Painted Honeyeater

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
Lead to a long-term decrease in the size of an important population of a species.	<p>Unlikely</p> <p>Painted Honeyeater important populations have not been identified in the species’ conservation advice (Department of the Environment 2015b). Considering its dispersive habits, the species is considered to have a single population (Garnett et al. 2011).</p> <p>The removal of 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) is unlikely to lead to a long-term decrease in the size of the population as:</p> <ul style="list-style-type: none"> ▪ a maximum of seven percent of the trees in the canopy layer contain mistletoe in these patches, which is not considered a significant quantity of mistletoe for Painted Honeyeater; ▪ the species may occasionally forage in the patches of habitat within the project area at times when mistletoe is fruiting and flowering; ▪ the species is more common in larger, continuous blocks of remnant woodland than in narrower strips (Department of the Environment 2015b) such as the patches of Painted Honeyeater habitat within the project area; ▪ the distribution of records in the region demonstrates that the species is found in Protected Areas and larger tracts of remnant vegetation with one record within remnant vegetation in the Millmerran Road corridor and no records of the species within the patches of habitat within the project area; ▪ when mistletoe is fruiting and flowering in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest) Painted Honeyeater would preferentially forage and breed in these areas as well as narrow roadside strips, where and when ample mistletoe fruit and flower is available (Department of the Environment 2015b), rather than within the three small, isolated patches of habitat within the project area; ▪ the habitat within the project area is not considered important habitat for the species as the patches are small and isolated, the species may only occasionally forage in these patches and the patches of habitat do not contain a significant quantity of mistletoe for Painted Honeyeater; and ▪ there is only a very small possibility of injury or mortality of the species during clearing within these patches of habitat, and due to the limited Painted Honeyeater activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.
Reduce the area of occupancy of an important population.	<p>Unlikely</p> <p>The removal of 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) will not completely remove these patches of habitat. Fragmentation of these patches will occur with a clearing of up to 60 metres</p>

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	wide through these patches. This minor level of habitat fragmentation is considered to have minimal impact on Painted Honeyeater, given the availability of larger tracts of habitat adjacent to the project area and elsewhere in the region. The removal of the habitat within the development footprint will also result in an inconsequential reduction in habitat connectivity, particularly considering the species is highly mobile. As the removal of habitat will not completely remove patches of habitat, will result in only minor levels of habitat fragmentation and an inconsequential reduction in habitat connectivity, the area of occupancy of the species is unlikely to be reduced.
Fragment an existing important population into two or more populations.	<p>Unlikely</p> <p>The Painted Honeyeater is considered to have a single population (Garnett et al. 2011) and is not severely fragmented (Department of the Environment 2015a). The species is highly mobile and the removal of only 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) will not fragment the existing population into two or more populations.</p>
Adversely affect habitat critical to the survival of a species.	<p>Unlikely</p> <p>A total of 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) is proposed to be removed. This habitat is not considered to be habitat critical to the survival of the species and subsequently, the proposed removal of this habitat is not considered to adversely affect habitat critical to the survival of the species.</p> <p>Habitat critical to the survival of Painted Honeyeater refers to areas that are necessary (Department of the Environment 2013):</p> <ul style="list-style-type: none"> ▪ for activities such as foraging, breeding, roosting or dispersal; ▪ for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species, such as pollinators); ▪ to maintain genetic diversity and long term evolutionary development; or ▪ for the reintroduction of populations or recovery of the species. <p>Areas that are considered <i>necessary</i> for the processes outlined immediately above to function in a region contain the following characteristics:</p> <ul style="list-style-type: none"> ▪ large, continuous blocks of remnant woodland (Department of the Environment 2015b); ▪ a significant quantity of mistletoe for Painted Honeyeater; and/or ▪ records of the species within or adjacent to the habitat. <p>Examples of areas that meet the characteristics outlined immediately above are the larger tracts of remnant vegetation in the region (such as Durikai State Forest where the species has been recorded) with fruiting and flowering mistletoe. Painted Honeyeater preferentially forage and breed in these areas where and when ample mistletoe fruit and flower is available (Department of the Environment 2015b).</p> <p>The Painted Honeyeater habitat mapped within the project area is not considered <i>necessary</i> for the processes outlined above to function in the region as:</p> <ul style="list-style-type: none"> ▪ the patches of Painted Honeyeater habitat that occur within the project area are small and isolated rather than large, continuous blocks of remnant woodland; ▪ the majority of habitat within the project area does not contain a significant quantity of mistletoe for Painted Honeyeater; and

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	<ul style="list-style-type: none"> ▪ the species has not been recorded within the project area. <p>As a result, Painted Honeyeater habitat within the project area is not considered habitat critical to the survival of the species and the proposed removal of this habitat is not considered to adversely affect habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of an important population.	<p>Unlikely</p> <p>The species exhibits seasonal north-south movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched (Department of the Environment 2015b). It is likely that numbers of Painted Honeyeaters breeding in southern and central Queensland are extremely low (Department of the Environment 2015b).</p> <p>Painted Honeyeater would preferentially breed in in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest) when mistletoe is fruiting and flowering in these areas (Department of the Environment 2015b) rather than within the small, isolated patches of Painted Honeyeater potential habitat within the project area. As a result, the action is unlikely to disrupt the breeding cycle of the Painted Honeyeater population.</p>
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>Unlikely</p> <p>The removal of only 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline as:</p> <ul style="list-style-type: none"> ▪ a maximum of seven percent of the trees in the canopy layer contain mistletoe in these patches, which is not considered a significant quantity of mistletoe for Painted Honeyeater; ▪ the species may occasionally forage in the patches of habitat within the project area at times when mistletoe is fruiting and flowering; ▪ the species is more common in larger, continuous blocks of remnant woodland than in narrower strips (Department of the Environment 2015b) such as the patches of Painted Honeyeater habitat within the project area; ▪ the distribution of records in the region demonstrates that the species is found in Protected Areas and larger tracts of remnant vegetation with one record within remnant vegetation in the Millmerran Road corridor and no records of the species within the patches of habitat within the project area; ▪ when mistletoe is fruiting and flowering in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest) Painted Honeyeater would preferentially forage and breed in these areas as well as narrow roadside strips, where and when ample mistletoe fruit and flower is available (Department of the Environment 2015b), rather than within the three small, isolated patches of habitat within the project area; and ▪ the habitat within the project area is not considered important habitat for the species as the patches are small and isolated, the species may only occasionally forage in these patches and the patches of habitat do not contain a significant quantity of mistletoe for Painted Honeyeater.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>Unlikely</p> <p>Painted Honeyeater predation by invasive species (e.g. black rat <i>Rattus rattus</i>) has been identified as a threat to the species. Grazing from rabbits results in an uneven age structure of mistletoe host trees and promotion of future collapse of mistletoe resources and has also been identified as a threat to the species (Department of the Environment 2015b). The removal of 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) is not considered to increase the likelihood of invasive species that are harmful to the species becoming established or further established in the species habitat throughout the project area. It is noted that a project-specific Preliminary Vegetation and Fauna Management Plans includes measures to reduce the impact of invasive species on all biota, including on the Painted Honeyeater.</p>
Introduce disease that may cause the species to decline.	<p>Unlikely</p> <p>Disease is not identified as a threat to Painted Honeyeater (Department of the Environment 2015b). The action is not considered likely to introduce disease during construction and operation that may cause Painted Honeyeater to decline, particularly given the species has not been recorded within the project area and is preferentially foraging in habitat within Durikai State Forest. It is noted that a project-specific Preliminary Vegetation and Fauna Management Plans include measures that will reduce the likelihood of disease introduction.</p>
Interfere substantially with the recovery of the species.	<p>Unlikely</p> <p>The removal of only 2.994 hectares of Painted Honeyeater habitat (0 hectares of high quality habitat and 2.994 hectares of potential habitat) is unlikely to interfere substantially with the recovery of the species as:</p> <ul style="list-style-type: none"> ▪ a maximum of seven percent of the trees in the canopy layer contain mistletoe in these patches, which is not considered a significant quantity of mistletoe for Painted Honeyeater; ▪ the species may occasionally forage in the patches of habitat within the project area at times when mistletoe is fruiting and flowering; ▪ the species is more common in larger, continuous blocks of remnant woodland than in narrower strips (Department of the Environment 2015b) such as the patches of Painted Honeyeater habitat within the project area; ▪ the distribution of records in the region demonstrates that the species is found in Protected Areas and larger tracts of remnant vegetation with one record within remnant vegetation in the Millmerran Road corridor and no records of the species within the patches of habitat within the project area; ▪ when mistletoe is fruiting and flowering in the larger tracts of remnant vegetation in the surrounding area (such as Durikai State Forest) Painted Honeyeater would preferentially forage and breed in these areas as well as narrow roadside strips, where and when ample mistletoe fruit and flower is available (Department of the Environment 2015b), rather than within the three small, isolated patches of habitat within the project area; ▪ the habitat within the project area is not considered important habitat for the species as the patches are small and isolated, the species may only occasionally forage in these patches and the patches of habitat do not contain a significant quantity of mistletoe for Painted Honeyeater; and

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	<ul style="list-style-type: none">there is only a very small possibility of injury or mortality of the species during clearing within these patches of habitat, and due to the limited Painted Honeyeater activity within the area and the smaller size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

7.3.4. Swift Parrot

An assessment against the significant impact criteria outlined in the Matters of National Environmental Significance Significant impact guidelines 1.1 (Department of the Environment 2013) is provided for Swift Parrot in Table 5 and identifies that the action is unlikely to significantly impact the species.

Table 5: Significant impact assessment for Swift Parrot

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
Lead to a long-term decrease in the size of a population.	<p>Unlikely</p> <p>The removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) is unlikely to lead to a long-term decrease in the size of the population as:</p> <ul style="list-style-type: none"> ▪ the species typically disperses through Victoria and New South Wales, with smaller numbers observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011); ▪ 23 of the 27 records of Swift Parrot within 50 kilometres of the project area are within the Traprock Important Bird Area, all of which are within the Durikai State Forest where the species is preferentially foraging and likely roosting in important habitat for the species; ▪ there are no records of the species within the patches of Swift Parrot habitat mapped in the project area. The species exhibits high site fidelity, returning to locations on an irregular cyclic basis (Threatened Species Scientific Committee 2016). The lack of records indicates that the habitat patches within the project area may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly; ▪ the patches of Swift Parrot habitat within the project area are not considered important habitat for the species as the patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly, are small and isolated and do not contain records of the species; ▪ the species does not breed on mainland Australia (Saunders & Tzaros 2011); and ▪ there is only a very small possibility of injury or mortality of the species during clearing of these patches of habitat, and due to the limited Swift Parrot activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.
Reduce the area of occupancy of the species.	<p>Unlikely</p> <p>The removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) will not completely remove these patches of habitat. Fragmentation of these patches will occur with a clearing of up to 60 metres wide through these patches. This minor level of habitat fragmentation is considered to have minimal impact on Swift Parrot, given the availability of larger tracts of habitat adjacent to the project area and elsewhere in the region. The removal of the habitat within the development footprint will also result in an inconsequential reduction in habitat connectivity, particularly considering the species is highly mobile. As the removal of habitat will not completely remove patches of habitat, will result in only minor levels of habitat fragmentation and an inconsequential reduction in habitat connectivity, the area of occupancy of the species is unlikely to be reduced.</p>

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
Fragment an existing population into two or more populations.	<p>Unlikely</p> <p>The Swift Parrot comprises a single population (Garnett et al. 2011). The species is highly mobile and the removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) will not fragment the existing population into two or more populations.</p>
Adversely affect habitat critical to the survival of a species.	<p>Unlikely</p> <p>A total of 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) is proposed to be removed. This habitat is not considered to be habitat critical to the survival of the species.</p> <p>Habitat critical to the survival of the Swift Parrot includes (Saunders & Tzaros 2011):</p> <ul style="list-style-type: none"> ▪ those areas of priority habitat for which the Swift Parrot has a level of site fidelity or possess phenological characteristics likely to be of importance to the Swift Parrot: or ▪ are otherwise identified by the recovery team. <p>Priority habitat for Swift Parrot are areas of particular importance for conservation management which are used (Saunders & Tzaros 2011):</p> <ul style="list-style-type: none"> ▪ for nesting; ▪ by large proportions of the Swift Parrot population; ▪ repeatedly between seasons (site fidelity); or ▪ for prolonged periods of time (site persistence). <p>The Swift Parrot habitat within the project area is not considered priority habitat for the species as the patches of Swift Parrot habitat within the project area are:</p> <ul style="list-style-type: none"> ▪ not used for nesting with nesting occurring in Tasmania (Saunders & Tzaros 2011); ▪ not used by large proportions of the Swift Parrot population with no records of the species within the project area from WildNet, Birddata and Atlas of Living Australia databases and following targeted surveys for the species as well as following Bird Utilisation Surveys and fauna surveys throughout the project area (GHD 2020b, Nature Advisory 2020b, Nature Advisory 2020c). It is noted there are some Swift Parrot records within the adjacent Durikai State Forest (as shown in Figure 7 and detailed in Section 6.3); ▪ not repeatedly used between seasons (lack of site fidelity) with no records of the species within the project area. It is noted there are some Swift Parrot records within the adjacent Durikai State Forest with records from July 2017 to September 2017, from May 2018 to September 2018 and in June 2021; and ▪ not used for prolonged periods of time (lack of site persistence) with no records of the species within the project area. <p>The Swift Parrot habitat within the project area is also not identified by the recovery team as priority habitat for the species (Saunders & Tzaros 2011). It is noted that the WildNet, Birddata and Atlas of Living Australia records for the species in the adjacent Durikai State Forest indicate a level of Swift Parrot site fidelity with records from July 2017 to September 2017, from May 2018 to September 2018 and in June 2021, and as a result these areas within Durikai State Forest are considered priority habitat and habitat critical to the survival of the species.</p>

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	<p>It is noted that the Swift Parrot habitat within the project area may possess phenological characteristics that may support Swift Parrot foraging if sufficient levels of lerp and nectar are available in winter flowering eucalypt species, however, there are no Swift Parrot records within any of these patches and high quantities of lerp was not observed in these patches. This indicates that these patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage and are therefore not considered likely to be of importance to the Swift Parrot. If one or more of the patches of Swift Parrot habitat within the project area (or within the adjacent proposed MacIntyre Wind Farm or Karara Wind Farm) contained one or more records of Swift Parrot and/or high quantities of lerp or very heavy flowering in winter flowering eucalypt species had been observed in these patches, the Swift Parrot habitat within the project area would be considered to possess phenological characteristics likely to be of importance to the Swift Parrot and therefore habitat critical to the survival of the species.</p> <p>As a result of the above, Swift Parrot habitat mapped within the project area is not considered habitat critical to the survival of the species.</p>
Disrupt the breeding cycle of a population.	<p>Unlikely</p> <p>The Swift Parrot breeds in Tasmania in summer and the entire population migrates north and leaves the island for the winter. While on mainland Australia, the Swift Parrot typically disperses through Victoria and New South Wales, however, smaller numbers are observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011). As the species does not breed on mainland Australia, the action will not disrupt the breeding cycle of the Swift Parrot population.</p>
Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>Unlikely</p> <p>The removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline as:</p> <ul style="list-style-type: none"> ▪ the species typically disperses through Victoria and New South Wales, with smaller numbers observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011); ▪ 23 of the 27 records of Swift Parrot within 50 kilometres of the project area are within the Traprock Important Bird Area, all of which are within the Durikai State Forest where the species is preferentially foraging and likely roosting in important habitat for the species; ▪ there are no records of the species within the patches of Swift Parrot habitat mapped in the project area. The species exhibits high site fidelity, returning to locations on an irregular cyclic basis (Threatened Species Scientific Committee 2016). The lack of records indicates that the habitat patches within the project area may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly; ▪ the patches of Swift Parrot habitat within the project area are not considered important habitat for the species as the patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly, are small and isolated and do not contain records of the species; ▪ the species does not breed on mainland Australia (Saunders & Tzaros 2011);
Result in invasive species that are	<p>Unlikely</p>

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
Criteria	Likelihood
harmful to a critically endangered species becoming established in the critically endangered species' habitat.	Resource competition with the introduced European Honeybee (<i>Apis mellifera</i>) is likely to pose a threat to the Swift Parrot and the potential introduction of the invasive Large Earth Bumblebee (<i>Bombus terrestris</i>) to mainland Australia also poses a threat to over-wintering foraging habitat for Swift Parrot (Saunders & Tzaros 2011). The action is not considered to increase the likelihood of European Honeybee and Large Earth Bumblebee becoming established in the Swift Parrot habitat with the project area. It is noted that project-specific Preliminary Vegetation and Fauna Management Plans includes measures to reduce the impact of invasive species on all biota, including on the Swift Parrot.
Introduce disease that may cause the species to decline.	<p>Unlikely</p> <p>Psittacine Beak and Feather Disease (Pbfd) is a common and potentially deadly disease of parrots (Saunders & Tzaros 2011) and is known to occur in Swift Parrots (Sarker et al. 2013). This disease could potentially have serious implications for the Swift Parrot population should the general health of these birds be reduced from stress associated with competition for food resources (Saunders & Tzaros 2011). The proposed removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) within the project area is not considered to increase the stress associated with the competition for food resources, particularly given the species has not been recorded within the project area and is preferentially foraging in habitat within Durikai State Forest.</p> <p>Considering the way in which the project will be implemented, it is unlikely that this disease will be introduced or spread by the project.</p>
Interfere with the recovery of the species.	<p>Unlikely</p> <p>The removal of only 4.466 hectares of Swift Parrot habitat (1.690 hectares of high quality habitat and 2.776 hectares of potential habitat) that is not considered habitat critical to the survival of the species will not interfere with the recovery of the species as:</p> <ul style="list-style-type: none"> ▪ the species typically disperses through Victoria and New South Wales, with smaller numbers observed in south-east Queensland on a regular basis (Saunders & Tzaros 2011); ▪ 23 of the 27 records of Swift Parrot within 50 kilometres of the project area are within the Traprock Important Bird Area, all of which are within the Durikai State Forest where the species is preferentially foraging and likely roosting in important habitat for the species; ▪ there are no records of the species within the patches of Swift Parrot habitat mapped in the project area. The species exhibits high site fidelity, returning to locations on an irregular cyclic basis (Threatened Species Scientific Committee 2016). The lack of records indicates that the habitat patches within the project area may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly; ▪ the patches of Swift Parrot habitat within the project area are not considered important habitat for the species as the patches may not produce sufficient levels of lerp and/or nectar to allow the species to forage regularly, are small and isolated and do not contain records of the species; ▪ the species does not breed on mainland Australia (Saunders & Tzaros 2011); and ▪ there is only a very small possibility of injury or mortality of the species during clearing of these patches of habitat, and due to the limited Swift Parrot activity within the area and the small size of these patches, this possibility can be removed with the implementation of a Construction Management Plan (CMP), based on the

An action is likely to have a significant impact on a critically endangered species if there is a real chance or possibility that it will:	
<i>Criteria</i>	<i>Likelihood</i>
	Preliminary Vegetation Management and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified.

7.3.5. White-throated Needletail

An assessment against the significant impact criteria outlined in the Matters of National Environmental Significance Significant impact guidelines 1.1 (Department of the Environment 2013) is provided for White-throated Needletail in Table 6 and identifies that the action is unlikely to significantly impact the species.

Table 6: Significant impact assessment for White-throated Needletail

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
<p>Lead to a long-term decrease in the size of an important population of a species.</p>	<p>Unlikely</p> <p>White-throated Needletail important populations have not been identified in the species' conservation advice (Threatened Species Scientific Committee 2019). Though the two subspecies of White-throated Needletails breed in separate populations in the Northern Hemisphere, only one occurs in Australia, where they do not occur as smaller populations (Department of Agriculture, Water and the Environment 2021). As a result, the White-throated Needletail subspecies that occurs in Australia is considered a single population.</p> <p>The action is unlikely to lead to a long-term decrease in the size of the population as:</p> <ul style="list-style-type: none"> ▪ No roosting habitat for White-throated Needletail is present within the project area and no White-throated Needletail habitat is proposed to be removed; ▪ The airspace over the project area is not of particular significance to the species as there is generally an even distribution of records of the species over the project area as there is within 50 kilometres of the project area; ▪ There is a very small possibility of injury or mortality of the species during clearing within the development footprint, although due to the absence of White-throated Needletail roosting habitat within the project area, this possibility is considered remote. Any residual risk of impacts can be removed with the implementation of a Construction Management Plan (CMP), based on Preliminary Vegetation and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified; ▪ White-throated Needletail mortality from collision with overhead wires within Australia is known to occur, although is a low severity threat and affects a small number of birds (Hull et al. 2013). A threshold of mortality of 10 individuals annually can be considered a significant impact on the species (Department of the Environment 2015c). Given there are not extensive records of the species within the project area and that overhead wires affect a small number of individuals, this threshold is not expected to be exceeded with the construction and operation of the proposed MacIntyre Wind Farm transmission line corridor; ▪ The loss of forest and woodland habitats may have resulted in the decline of invertebrate prey for White-throated Needletail, which may be contributing to the decline of the species (Threatened Species Scientific Committee 2019). While 133 hectares of remnant vegetation may be removed for the action, approximately 20,500 hectares of remnant vegetation occurs within five kilometres of the project area. This is not considered a significant reduction in treed remnant vegetation that would reduce invertebrate prey to an extent that would impact the capacity for the airspace over the project area to provide foraging habitat for the species. ▪ The use of insecticides, particularly organochlorines, has been identified as a possible cause of decline of White-throated Needletails, either through a decrease in the abundance of invertebrates from wide use of insecticides or from secondary poisoning by insecticides accumulated as sublethal doses in prey

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	(Threatened Species Scientific Committee 2019). The action will not lead to an increase in the use of these chemicals within the project area so impacts on insect abundance are not anticipated.
Reduce the area of occupancy of an important population.	<p>Unlikely</p> <p>The action is unlikely to reduce the area of occupancy of the White-throated Needletail population as:</p> <ul style="list-style-type: none"> ▪ the action is not considered to create a barrier for the species to access the airspace over or adjacent to the project area given the long-ranging daily movements and flight height range of White-throated Needletail; and ▪ no roosting habitat for White-throated Needletail is present within the project area and no White-throated Needletail habitat is proposed to be removed.
Fragment an existing important population into two or more populations.	<p>Unlikely</p> <p>The action is unlikely fragment the White-throated Needletail population into two or more populations as:</p> <ul style="list-style-type: none"> ▪ the action is not considered to create a barrier for the species to access the airspace over or adjacent to the project area given the long-ranging daily movements and flight height range of White-throated Needletail; and ▪ no roosting habitat for White-throated Needletail is present within the project area and no White-throated Needletail habitat is proposed to be removed.
Adversely affect habitat critical to the survival of a species.	<p>Unlikely</p> <p>Habitat critical to the survival of the species is not considered to be present within or above the project area, as such the action is unlikely to adversely affect habitat critical to the survival of the species.</p> <p>Habitat critical to the survival of White-throated Needletail refers to areas that are necessary (Department of the Environment 2013):</p> <ul style="list-style-type: none"> ▪ for activities such as foraging, breeding, roosting, or dispersal; ▪ for the long-term maintenance of the species (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators); ▪ to maintain genetic diversity and long term evolutionary development; or ▪ for the reintroduction of populations or recovery of the species. <p>While the airspace above the project area provides an area for White-throated Needletail to forage and disperse; will assist with the long-term maintenance of the species; will help to maintain genetic diversity and long-term evolutionary development; and provides habitat for the recovery of the species; the airspace above the project area is not considered necessary for these processes to occur. The species also breeds in the Northern Hemisphere and roosting habitat is not considered to be present within the project area. As a result, habitat critical to the survival of the species is not considered to be present within or above the project area.</p>
Disrupt the breeding cycle of an important population.	<p>Unlikely</p> <p>The White-throated Needletail subspecies that occurs in Australia is <i>Hirundapus caudacutus caudacutus</i>. This subspecies is a trans-equatorial migrant that breeds in the Northern Hemisphere summer and migrates south for the Southern Hemisphere summer</p>

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	(Threatened Species Scientific Committee 2019). As the species does not breed in Australia, the action will not disrupt the breeding cycle of the species' population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	<p>Unlikely</p> <p>The action is unlikely to lead to modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline as:</p> <ul style="list-style-type: none"> ▪ no roosting habitat for White-throated Needletail is present within the project area and no White-throated Needletail habitat is proposed to be removed; ▪ the airspace over the project area is not of particular significance to the species as there is generally an even distribution of records of the species over the project area as there is within 50 kilometres of the project area; ▪ the loss of forest and woodland habitats may have resulted in the decline of invertebrate prey for White-throated Needletail, which may be contributing to the decline of the species (Threatened Species Scientific Committee 2019). While 133 hectares of treed remnant vegetation may be removed for the action, approximately 20,500 hectares of treed remnant vegetation occurs within five kilometres of the project area. This is not considered a significant reduction in treed remnant vegetation that would reduce invertebrate prey to an extent that would impact the capacity for the airspace over the project area to provide foraging habitat for the species. ▪ the use of insecticides, particularly organochlorines, has been identified as a possible cause of decline of White-throated Needletails, either through a decrease in the abundance of invertebrates from wide use of insecticides or from secondary poisoning by insecticides accumulated as sublethal doses in prey (Threatened Species Scientific Committee 2019). The action will not lead to an increase in the use of these chemicals within the project area so impacts on insect abundance are not anticipated.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<p>Unlikely</p> <p>Invasive species have not been identified as a threat to White-throated Needletail (Threatened Species Scientific Committee 2019). The action is unlikely to result in invasive species that are harmful to the species becoming established in the species' habitat. It is noted that a project-specific Preliminary Vegetation and Fauna Management Plans have been prepared to reduce the impact of invasive species on habitats in the project site.</p>
Introduce disease that may cause the species to decline.	<p>Unlikely</p> <p>Disease is not identified as a threat to White-throated Needletail. The action is not considered likely to introduce disease during construction and operation that may cause White-throated Needletail to decline, particularly given the species is mostly aerial in Australia (Threatened Species Scientific Committee 2019). The execution of the project combined with the way the species uses the landscape will not create opportunities for disease to spread.</p>
Interfere substantially with the recovery of the species.	<p>Unlikely</p> <p>The action is unlikely to interfere substantially with the recovery of the species as:</p> <ul style="list-style-type: none"> ▪ No roosting habitat for White-throated Needletail is present within the project area and no White-throated Needletail habitat is proposed to be removed;

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
Criteria	Likelihood
	<ul style="list-style-type: none"> ▪ The airspace over the project area is not of particular significance to the species as there is generally an even distribution of records of the species over the project area as there is within 50 kilometres of the project area. ▪ There is a very small possibility of injury or mortality of the species during clearing within the development footprint, although due to the absence of White-throated Needletail roosting habitat within the project area, this possibility is considered remote. Any residual risk of impacts can be removed with the implementation of a Construction Management Plan (CMP), based on Preliminary Vegetation and Fauna Management Plans, that ensures that the species is not present before vegetation is removed or modified. ▪ White-throated Needletail mortality from collision with overhead wires within Australia is known to occur, although is a low severity threat and affects a small number of birds (Hull et al. 2013). A threshold of mortality of 10 individuals annually can be considered a significant impact on the species (Department of the Environment 2015c). Given there are not extensive records of the species within the project area and that overhead wires affect a small number of individuals, this threshold is not expected to be exceeded with the construction of aboveground power lines for the action. ▪ The loss of forest and woodland habitats may have resulted in the decline of invertebrate prey for White-throated Needletail, which may be contributing to the decline of the species (Threatened Species Scientific Committee 2019). While 133 hectares of treed remnant vegetation may be removed for the action, approximately 20,500 hectares of treed remnant vegetation occurs within five kilometres of the project area. This is not considered a significant reduction in treed remnant vegetation that would reduce invertebrate prey to an extent that would impact the capacity for the airspace over the project area to provide foraging habitat for the species. ▪ The use of insecticides, particularly organochlorines, has been identified as a possible cause of decline of White-throated Needletails, either through a decrease in the abundance of invertebrates from wide use of insecticides or from secondary poisoning by insecticides accumulated as sublethal doses in prey (Threatened Species Scientific Committee 2019). The action will not lead to an increase in the use of these chemicals within the project area so impacts on insect abundance are not anticipated.

8. Conclusions

This investigation provides detailed information on habitat for the Regent Honeyeater, Painted Honeyeater, Swift Parrot and White-throated Needletail within the project area and refines the original predicted habitat mapping (based on field-verified Regional Ecosystem mapping) presented for these species in the Ecological assessment report of the MacIntyre Wind Farm (GHD 2020a).

Regent Honeyeater habitat (4.665 hectares, which is also considered habitat critical to the survival of the species), Painted Honeyeater habitat (2.994 hectares) and Swift Parrot habitat (4.466 hectares) within the development footprint represents relatively small areas compared with the project area, which totals 508 hectares and the development footprint, which totals 426 hectares. The removal of this habitat is considered acceptable as these species are understood to utilise the habitat adjacent to the project area and within the wider region rather than being dependent on the habitat within the project area. It is noted that no White-throated Needletail roosting habitat is present within the project area.

Mortality and indirect impacts to Regent Honeyeater, Painted Honeyeater and Swift Parrot during construction and operation of the proposed MacIntyre Wind Farm transmission line corridor are considered unlikely. A Construction Management Plan (CMP) will be implemented to reduce this very low residual risk of an impact further.

9. References

- BirdLife International 2020, Important Bird Areas factsheet: Traprock. Downloaded from <http://www.birdlife.org> on 28th August 2020.
- Corben, C, Roberts, G, Smyth, A 1982, Roosting of a White-throated Needletail. *Sunbird*. **12**,47-48.
- Day, N 1993, Tree perching and presumed roosting of White-throated Needletails *Hirundapus caudacutus*. *Australian Bird Watcher*. **15**, 43-44.
- Department of Agriculture, Water and the Environment 2021, Species Profile and Threats Database *Hirundapus caudacutus* - White-throated Needletail [online] Available at: http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=682 [Accessed 12 January 2021].
- Department of the Environment 2013, Matters of National Environmental Significance - Significant impact guidelines 1.1 Environment Protection and Biodiversity Conservation Act 1999. Commonwealth of Australia, Canberra.
- Department of the Environment 2015a, Conservation Advice *Anthochaera phrygia* Regent Honeyeater. Department of the Environment, Canberra.
- Department of the Environment 2015b, Conservation Advice *Grantiella picta* Painted Honeyeater. Department of the Environment, Canberra.
- Department of the Environment 2015c, Draft referral guideline for 14 birds listed as migratory species under the EPBC Act. Department of the Environment, Canberra.
- Department of the Environment 2016, National Recovery Plan of the Regent Honeyeater (*Anthochaera phrygia*), Commonwealth of Australia, Canberra.
- Department of Environment, Land, Water and Planning 2020, Old growth forest identification - Assessment Tool July 2020. Conservation Regulator, Melbourne.
- Garnett, ST, Szabo, JK & Dutton, G 2011, The Action Plan for Australian Birds 2010. *Birds Australia*, CSIRO Publishing, Melbourne.
- Geering, D & French, K 1998, Breeding biology of the Regent Honeyeater *Xanthomyza phrygia* in the Capertee Valley, New South Wales. *Emu*, **98**, 104-116.
- GHD 2020a, MacIntyre Wind Farm Project - Ecological Assessment Report 12525037-REP-MB-002, Report for ACCIONA Energy Global Pty Ltd, GHD, Brisbane, QLD.
- GHD 2020b, MacIntyre Wind Farm Project - Overhead Transmission Line MNES Significant Impact Assessment Report 12525037-REP-MWF-005, Report for ACCIONA Energy Global Pty Ltd, GHD, Brisbane, QLD.
- Higgins, PJ, Peter, JM, & Steele, WK 2001, Handbook of Australian, New Zealand and Antarctic Birds. *Volume 5: Tyrant-flycatchers to Chats*. Oxford University Press, Melbourne.
- Hines, HB 2008, Some observations on the vertebrate fauna of Durikai State Forest, southeast Queensland, 2000-2008. *The Queensland Naturalist*, **46**, 6-8.
- Hull, C.L., Stark, E.M., Peruzzo, S. & Sims, C.C. (2013). Avian collisions at two wind farms in Tasmania, Australia: taxonomic and ecological characteristics of colliders versus noncolliders. *New Zealand Journal of Zoology*, **40**, 47-62.
- Nature Advisory 2020a, MacIntyre and Karara Wind Farms - Threatened woodland bird assessment Report No. 20033 (6.1), Report for ACCIONA Energy Australia Global Pty Ltd.
- Nature Advisory 2020b, MacIntyre Wind Farm Bird Utilisation Survey Baseline Report, Report No. 20033 (17.1), Report for ACCIONA Energy Australia Global Pty Ltd.

- Nature Advisory 2020c, Karara Wind Farm Bird Utilisation Survey Baseline Report, Report No. 20033 (18.1), Report for ACCIONA Energy Australia Global Pty Ltd.
- Oliver, DL, Chambers, MA & Parker, DG 2003, Habitat and resource selection of the Painted Honeyeater (*Grantiella picta*) on the northern floodplains region of New South Wales. *Emu*, **103**, 171-176.
- Oliver, DL, Ley, AJ & Williams, B 1998, Breeding success and nest-site selection of the Regent Honeyeater *Xanthomyza phrygia* near Armidale, New South Wales. *Emu*, **98**, 97-103.
- Quested, T 1982, Spine-tailed Swift landing in tree. *Australian Birds*, 16:64.
- Sarker S, Ghorashi SA, Forwood JK & Raidal SR 2013. Whole-Genome Sequences of Two Beak and Feather Disease Viruses in the Endangered Swift Parrot (*Lathamus discolor*). *Genome Announcements*, 1, e00842-1.
- Saunders, DL & Tzaros CL 2011, National Recovery Plan for the Swift Parrot *Lathamus discolor*, Birds Australia, Melbourne.
- Saunders, DL, Tzaros, CL, Webb, M & Thurstans, S 2010, Background Document - National Recovery Plan for the Swift Parrot *Lathamus discolor*. Department of Environment, Climate Change and Water, Queanbeyan and Birds Australia, Melbourne.
- Stanton, M 2011, The Diet of Barking Owls in the Pilliga Forest, MSc thesis, University of New England, Armidale.
- Tarburton, MK 1993, Radiotracking a White-throated Needletail to roost. *Emu*, **93**:121–124.
- Threatened Species Scientific Committee 2016, Conservation Advice *Lathamus discolor* Swift Parrot, Department of the Environment, Canberra.
- Threatened Species Scientific Committee 2019, Conservation Advice *Hirundapus caudacutus* White-throated Needletail, Department of the Environment and Energy, Canberra.