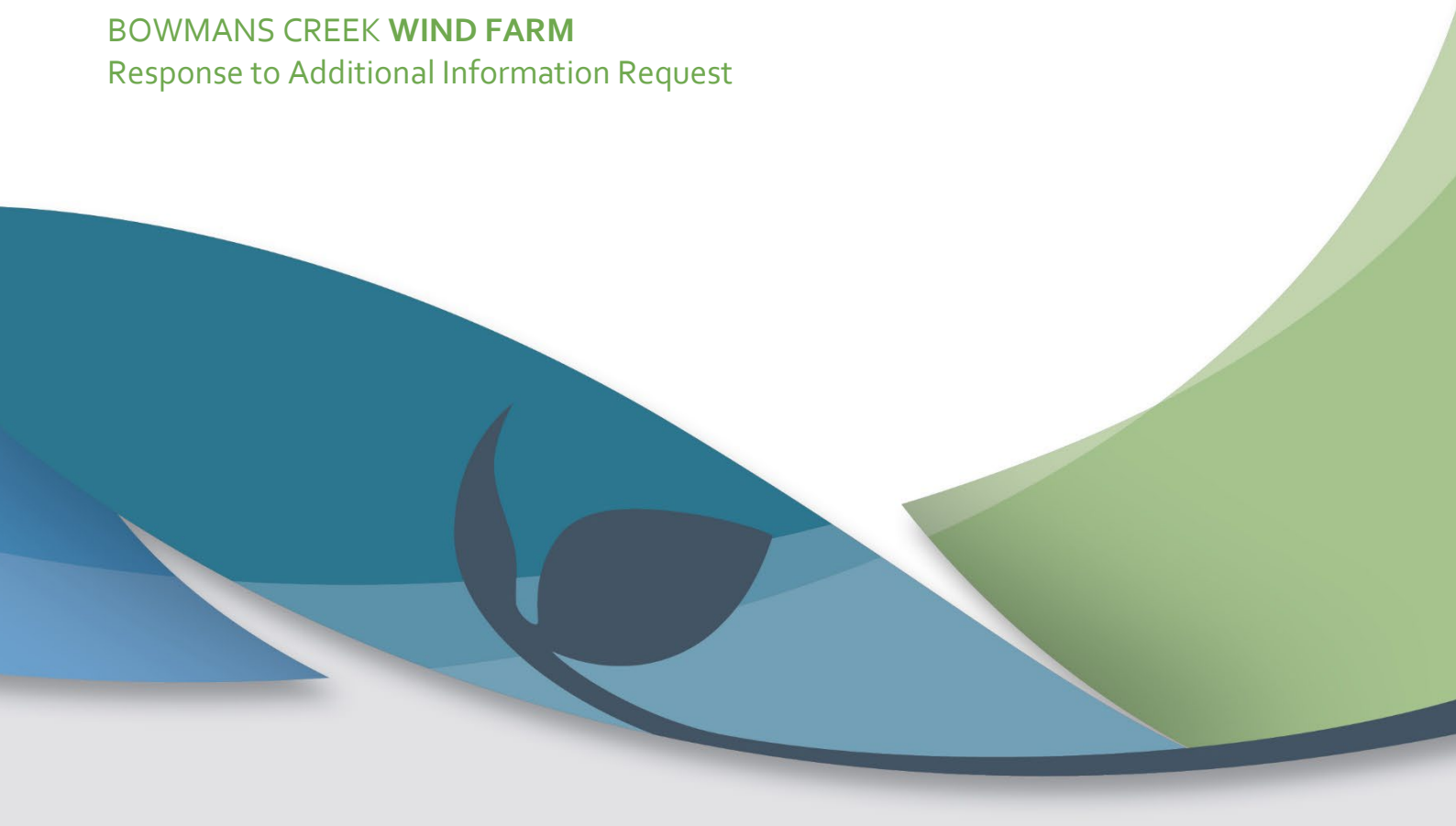
EPURON

JAMES BAILEY & ASSOCIATES
Environmental and Planning Consultants

APPENDIX H

BIODIVERSITY ADDENDUM REPORT

BOWMANS CREEK **WIND FARM**
Response to Additional Information Request



21 February 2022

James Bailey
James Bailey and Associates
Via email: jbailey@baileyassociates.com.au

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Addendum Report for Bowmans Creek Wind Farm: Responses to a Submission from the Biodiversity Conservation Division (BCD) in relation to the Amendment Report BDAR.

Dear James,

The purpose of this letter is to provide responses to the issues raised by the Hunter Region Biodiversity Conservation Division (BCD) following the submission of an Amendment Report (AR) and Response to Submissions Report (RtS) for the Bowmans Creek Wind Farm. The AR report was supported by an amended Biodiversity Development Assessment Report (the AR - BDAR), dated 17 September 2021 (REF: 19144RP2).

Comments by BCD on the AR-BDAR were received in a letter to the Department of Industry Planning and Environment (DPIE) dated 1 November 2021 and broadly comprise six topics:

- Threatened flora species – survey effort and assumed presence;
- Threatened fauna species – minimum required survey effort;
- Requirements of Sections 6.7.16, 6.7.18 (prescribed impacts) and 9.2.18 (blade strike) of the BAM and how they have been met;
- Descriptions of frequency and intensity of impacts
- Field data sheet for surveys conducted in August 2021; and
- Additional information for Matters of National Environmental Significance (MNES).

Following a consultation meeting with the BCD on 24 November 2021, which included discussion about how to best provide the additional information required by BCD, it was agreed that the appropriate process would be to provide the requested information in an Addendum Report.

Appendix A to this letter provides an Addendum Report comprising responses to each of the BCD comments. It includes references to the relevant sections and tables of the AR - BDAR. Updated credit reports are provided in **Appendix B** while updated AR – BDAR figures, as requested by the BCD are provided at the end of this letter.

If any further information is required, or if you would like to discuss this matter further, please do not hesitate to contact me, or David Robertson, via email or at our Sydney office on (02) 9868 1933.

Yours sincerely

Gitanjali Katrak
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APPENDIX A :
Addendum Report

A.1. Purpose

The purpose of this Addendum Report is to provide responses, with supporting information, to the issues raised by the Hunter Region Biodiversity Conservation Division (BCD) in their review of the Amendment Report (AR) and the Response to Submissions Report (RtS) for the Bowmans Creek Wind Farm. BCD's comments, in their letter to DPIE dated 1 November 2021, particularly related to the revised Biodiversity Development Assessment Report (the AR - BDAR), dated 17 September 2021 (REF: 19144RP2) prepared over the Project and included in the Amendment Report (AR). It also considers matters discussed in a consultation meeting with the BCD on 24 November 2021 and subsequent email advice received on 3 December 2021 and 9 December 2021.

The comments by BCD on the AR-BDAR broadly comprise six topics, including:

- Threatened flora species – survey effort and assumed presence;
- Threatened fauna species – minimum required survey effort;
- Requirements of Sections 6.7.16, 6.7.18 (prescribed impacts) and 9.2.18 (blade strike) of the BAM and how they have been met;
- Descriptions of frequency and intensity of impacts;
- Field data sheet for surveys conducted in August 2021; and
- Additional information for Matters of National Environmental Significance (MNES).

Each BCD issue is reproduced in italics and then addressed in detail below. References are made to the AR – BDAR where relevant.

A.2. Threatened Flora

Recommendation 1 of the BCD letter states "*The proponent should undertake targeted surveys for all potentially occurring threatened flora species in accordance with Surveying threatened plants and their habitats: NSW survey guide for the Biodiversity Assessment Method (DPIE 2020). Where surveys are not possible (due to safety or access reasons) either, the assumed presence technique should be applied, or an expert report should be prepared.*"

RESPONSE

It is noted that Section 6.4.1.21 of the BAM states:

An assessor must establish whether each of the species credit species is present, or is likely to use suitable habitat, on the subject land (or specific vegetation zones), by either:

(a) assuming it is present (development sites or land proposed to be biodiversity certified only), or

(b) undertaking a threatened species survey in accordance with Section 6.5, or

(c) obtaining an expert report in accordance with Subsection 6.5.2.

The BAM allows any projects covered by BDAR reports to assume presence of threatened species rather than conduct surveys. There are no BAM restrictions that prevent assumed presence to be applied within a BDAR.

As outlined in the *Section 3.3.2.3* of the AR – BDAR, consultation meetings were held with the BCD in relation to concerns raised regarding threatened flora survey effort for the preparation of the AR-BDAR. Based on the precedent set for prior SSD projects, as raised by the BCD, a strategy of assumption of presence with an allowance to subsequently submit a modification to reduce/remove species credit liability following the conduct of appropriate targeted surveys was discussed at a meeting with BCD on 17 June 2021 and the AR-BDAR was updated accordingly.

It should be noted that the BCD's concerns regarding suitability of the surveys are acknowledged, and all species targeted during the previous surveys for the project have been reassessed based on assumed presence. However, as BAM requires all survey effort to be documented in the BDAR, the AR-BDAR retained the description of the surveys as they were conducted.

Following the consultation meeting with BCD on 24 November 2021, it is understood that the BCD accepts the assumed presence pathway utilised for most threatened flora species but maintains that insufficient justification has been provided to exclude five flora species for which presence was not assumed in the AR-BDAR, namely:

- *Acacia pendula;*
- *Callistemon linearifolius;*
- *Eucalyptus glaucina;*
- *Rhodamnia rubescens;* and
- *Rhodomyrtus psidioides*.

As agreed at the 24 November 2021 meeting with BCD, the BAM-C calculations have been updated to include assumed presence of the five species listed above following acceptance by the BCD of a proposed methodology for flora species with a unit measure of 'Count' (email from Robert Gibson, dated 3 December 2021). The specific details for assumed presence for each of these species is detailed in the following sections. The updated species polygons for assumed presence of these five flora species is shown in ***Figures 15.1 – 15.6*** provided at the end of this report.

Please note that to maintain consistency with the AR-BDAR, the figure numbers as per the AR-BDAR have been utilised for this addendum report.

A.2.1. Credit Calculation Methodology

a. Acacia pendula

The unit of measure for this species is 'Area'. As per the TBDC profile for *Acacia pendula* (EES, 2021a), this species is associated with the following Plant Community Types (PCTs) mapped within the Hunter IBRA region of the subject land: PCT 1691, PCT 1603 and PCT 1692.

As detailed in *Section 5.2.14.1* of the AR-BDAR, the occurrence of PCT 1692 is limited to a small, isolated patch (total 0.24 ha in survey area, 0.07 ha within subject land) consisting of dense regrowth of *Allocasuarina luehmannii* (Bulloak) with no other tree or shrub species present. Therefore, this vegetation zone is substantially degraded such that it is unlikely to support any occurrence of *Acacia pendula*. Assumption of presence for *Acacia pendula* is therefore confined to areas of PCT 1603 and PCT 1691 in the Hunter IBRA subregion.

It is noted that this species is listed as a candidate Serious and Irreversible Impact (SAII) entity. However, this species is unlikely to occur and presence is being assumed solely as a precautionary measure until further site surveys can be conducted. For this reason, a SAII assessment has not been conducted for this species. If any species are recorded during future surveys, the assessment to support any future modifications will include a SAII assessment.

b. Callistemon linearifolius

The unit of measurement for this is species is 'Count'. As per the TBDC profile for *Callistemon linearifolius* (EES, 2021c), this species is associated with only one PCT mapped within the subject land, namely PCT 1604, and potential occurrence as a candidate species credit species is limited to the Hunter and Upper Hunter IBRA subregions.

To determine an estimated number of individuals that could occur within a specified area of habitat the following steps were taken:

1. The BAM growth form for *Callistemon linearifolius* was determined to be 'Shrub'.
2. The PCTs within the subject land that *Callistemon linearifolius* is associated with was determined to be limited to PCT 1604.
3. The BAM plot data for all flora recorded within PCT 1604 plots was filtered to limit the list to recorded species associated with the 'Shrub' growth form.
4. As the list of species in the 'Shrub' growth form contained a variety of species from different families, the list was further filtered to determine shrub species from the same genus or same family (Myrtaceae) as *Callistemon linearifolius*.
5. As no other Callistemon or Myrtaceae shrubs were recorded within the PCT 1604 BAM plots, the plant profiles of recorded shrub species listed in PlantNet, were reviewed to determine a shrub species of similar height/spread (3-4m) as *Callistemon linearifolius*. The most similar species in terms of height range to *Callistemon linearifolius* within the PCT 1604 BAM plots was *Diospyros australis*.
6. The average estimated abundance of *Diospyros australis* across the PCT 1604 BAM plots (~3 individuals/plot or 3 individuals/0.04 ha) was extrapolated to obtain an estimated count of 75 individuals/ha.
7. The estimated count of 75 individuals/ha was applied on a *pro-rata* basis for impacted areas of PCT 1604 in the Hunter (6.16 ha) and Upper Hunter (0.09 ha) IBRA subregions.

c. Eucalyptus glaucina

The unit of measurement for this species is 'Count'. As per the TBDC profile for *Eucalyptus glaucina* (EES, 2021d) this species is associated with the following Plant Community Types (PCTs) mapped within the Hunter and Upper Hunter IBRA regions of the subject land: PCT 1604, 1691, PCT 1603 and PCT 1692.

As detailed in *Section 5.2.14.1* of the AR-BDAR, the occurrence of PCT 1692 is limited to a small, isolated patch (total 0.24 ha in survey area, 0.07 ha within subject land) consisting of dense regrowth of *Allocasuarina luehmannii* (Bulloak) with no other tree or shrub species present. Therefore, this vegetation zone is substantially degraded such that it is unlikely to support any occurrence of *Eucalyptus glaucina*. Assumption of presence is therefore limited to areas of PCT 1604, 1603 and PCT 1691 across the Hunter and Upper Hunter IBRA subregions.

To determine an estimated number of individuals that could occur within a specified area of habitat the following steps were taken:

1. The BAM growth form for *Eucalyptus glaucina* was determined to be 'Tree'.
2. The PCTs within the subject land that *Eucalyptus glaucina* is associated with and are in suitable condition to support this species was determined to be limited to PCT 1604, PCT 1691 and PCT 1603.
3. The BAM plot data for all flora recorded within PCT 1604, PCT 1691 and PCT 1603 plots was filtered to limit the list to recorded species associated with the 'Tree' growth form.
4. As the list of species in the 'Tree' growth form contained a variety of species from different families, the list was further filtered to determine tree species from the same genus (Eucalyptus) or same family (Myrtaceae) as *Eucalyptus glaucina*. This reduced the list to six species namely: *Corymbia maculata, Eucalyptus albens x moluccana, Eucalyptus blakelyi, Eucalyptus crebra, Eucalyptus melliodora* and *Eucalyptus punctata*.
5. As *Eucalyptus glaucina* does not comprise a dominant or co-dominant canopy species within the associated PCTs, the abundance of the sub-dominant canopy trees within the plots – namely *Eucalyptus melliodora* and *Eucalyptus punctata* was used as a 'proxy' for *Eucalyptus glaucina*.
6. The average estimated abundance of both *Eucalyptus melliodora* and *Eucalyptus punctata* across the PCT 1604, PCT 1691 and PCT 1603 BAM plots was ~2 individuals/plot or 2 individuals/0.04 ha for each species. This abundance was extrapolated to obtain an estimated count of 50 individuals/ha.
7. The estimated count of 50 individuals/ha was applied on a pro-rata basis for impacted areas of PCT 1604 (Hunter = 6.16 ha, Upper Hunter = 0.09 ha), PCT 1691 (Hunter = 1.48 ha) and PCT 1603 (Hunter = 1.93 ha).

d. Rhodamnia rubescens

The unit of measurement for this species is 'Count'. As per the TBDC profile for *Rhodamnia rubescens* (EES, 2021k) this species is associated with the following PCTs mapped within the Upper Hunter IBRA subregion of the subject land: PCT 1541 and PCT 1584.

To determine an estimated number of individuals that could occur within a specified area of habitat the following steps were taken:

1. The BAM growth form for *Rhodamina rubescens* was determined to be 'Shrub'.

2. The PCTs within the subject land that *Rhodamina rubescens* is associated with was determined to be limited to PCT 1541 and PCT 1584.

3. The BAM plot data for all flora recorded within PCT 1541 and PCT 1584 plots was filtered to limit the list to recorded species associated with the 'Shrub' growth form.

4. As the list of species in the Shrub growth form contained a variety of species from different families, the list was further filtered to determine shrub species from the same genus or same family (Myrtaceae) as *Rhodamnia rubescens*.

5. As no other Rhodamnia or Myrtaceae shrubs were recorded within the PCT 1541 or PCT 1584 BAM plots, the plant profiles of recorded shrub species, as listed in PlantNet, were reviewed to determine a shrub species of similar height/spread (up to ~20m) as *Rhodamnia rubescens*. The most similar species in terms of height range to *Rhodamnia rubescens* within the PCT 1541 and PCT 1584 BAM plots was *Pittosporum undulatum*.

6. The average estimated abundance of *Pittosporum undulatum* across the PCT 1541 and PCT 1584 BAM plots (~6.8 individuals/plot or 6.8 individuals/0.04 ha) was extrapolated to obtain an estimated count of 171 individuals/ha.

7. The estimated count of 171 individuals/ha was applied on a pro-rata basis for impacted areas of PCT 1541 (0.63 ha) and PCT 1584 (1.27 ha) in the Upper Hunter IBRA subregion.

It is noted that this species is listed as a candidate SAII entity. However, as it is unlikely to occur within the subject land and presence is being assumed solely as a precautionary measure until further site surveys can be conducted. For this reason, a SAII assessment has not been conducted for this species. If any species are recorded during future surveys, the assessment to support any future modifications will include a SAII assessment.

e. Rhodomyrtus psidioides

The unit of measure for this species is 'Area'. As per the TBDC profile for *Rhodomyrtus psidioides* (EES, 2021l), this species is associated with only one PCT mapped within the subject land, namely PCT 1584 and potential occurrence as a candidate species credit species is limited to the Upper Hunter IBRA subregion. Therefore, presence has been assumed within all areas of PCT 1584 within the Upper Hunter IBRA subregion.

It is noted that this species is listed as a candidate Serious and Irreversible Impact (SAII) entity. However, as it is maintained that this species is considered unlikely to occur and presence is being assumed solely as a precautionary measure until further site surveys can be conducted. For this reason, a SAII assessment has not been conducted for this species. If any species are recorded during future surveys, the assessment to support any future modifications will include a SAII assessment.

A.2.2. Assumed Flora Species and Credit Requirements

The summary table listing all threatened flora species for which presence has been assumed (*Table 21* of the AR-BDAR) has been updated and is provided as **Table 1** below. The summary of credit requirements for assumed presence of threatened flora (*Table 32* of the AR-BDAR) is provided in **Table 2**. Note that as per *Section 3.3.2.3* and *Section 8.5.1.1* of the AR – BDAR, future threatened plant surveys will target all assumed species, as well as species for which presence has not been assumed. Following this the credit requirements will be recalculated.

Table 1 Updates areas of habitat for assumed threatened flora species within the subject land/disturbance area (Note this is Table 21 in the AR – BDAR). Shading indicates newly added assumed presence species.

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
Acacia bynoeana	Bynoe's Wattle	Semi-prostrate shrub to a metre high. Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites	Hunter	1604				H: 6.16				
Acacia pendula	Acacia pendula population in the Hunter catchment	Erect or spreading tree 5-13 m high with a pendulous habit. Their bark is hard, fissured, dark grey to black.	Hunter	1691, 1603							H: 1.48	H: 1.93
Asperula asthenes	Trailing Woodruff	Low, trailing perennial herb. Occurs in damp sites, often along riverbanks	Hunter	1603								H: 1.93
Callistemon linearifolius	Netted Bottle Brush	Shrub up to 3-4 m tall, with linear (long and narrow) to linear-lanceolate (lance shaped) leaves 8-10 cm long, and 5-7 mm wide with an sharp tip, thickened	Hunter, Upper Hunter	1604				H: 6.16 U: 0.09 (@ 75 ind/ha)				

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
		margins, and distinct lateral veins.										
Cynanchum elegans	White-flowered Wax Plant	A climber or twiner with a highly variable form. Usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include Spotted Gum *Corymbia maculata* aligned open forest and woodland	Hunter, Upper Hunter Tomalla, Ellerston	1541, 1584, 1604, 1603	U: 0.63 E: 0.77	U: 1.27 T: 9.73 E: 16.86		H: 6.16 U: 0.09 E: 5.41				H: 1.93
Diuris tricolor	Pine Donkey Orchid	Terrestrial ground orchid with leaves up to 30 centimetres long and 4 mm wide. Grows in sclerophyll forest among grass. Found in sandy soils, either on flats or small rises.	Hunter	1604, 1691, 1603				H: 6.16			H: 1.48	H: 1.93
Eucalyptus glaucina	Slaty Red Gum	Medium-sized tree to 30 m tall with smooth and mottled white to slaty grey bark. The juvenile leaves are oval in shape and blue-green with a whitish bloom	Hunter, Upper Hunter	1604, 1691, 1603				H: 6.16 U: 0.09 (@ 50 ind/ha)			H: 1.48 (@ 50 ind/ha)	H: 1.93 (@ 50 ind/ha)

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	A low spreading to erect shrub, usually less than a metre high. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. Found over a range of altitudes from flat, low-lying areas to upper slopes and ridge crests and often occurs in open, slightly disturbed sites such as along tracks.	Upper Hunter, Hunter	1604, 1603				H: 6.16 U: 0.09				H: 1.93
Monotaxis macrophylla	Large-leafed Monotaxis	Erect herb to 25 cm tall. Great diversity in the associated vegetation encompassing coastal heath, arid shrubland, forests and montane heath. Distribution within NSW is related to the occurrence of fire and has not been found in the absence of fire.	Hunter	1604, 1603				H: 6.16				H: 1.93

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
Ozothamnus tesselatus	-	Dense shrub to 1 m high. Grows in eucalypt woodland	Hunter	1604				H: 6.16				
Pomaderris queenslandica	Scant Pomaderris	Medium-sized shrub 2 - 3m tall. Found in moist eucalypt forest or sheltered woodlands with a shrubby understorey	Hunter, Tomalla, Ellerston	1607, 1608, 1603					T: 1.21 E: 0.46	T: 25.53 E: 10.06		H: 1.93
Prasophyllum petilum	Tarengo Leek Orchid	Onion orchid up to about 35cm tall. Plants can be very cryptic when growing in small numbers and within tall grasses. Grows in grassy woodland and natural temperate grasslands	Hunter	1604, 1691				H: 6.16			H: 1.48	
Prostanthera cineolifera	Singleton Mint Bush	Erect shrub, 1 - 4 m high. Grows in open woodlands	Hunter	1604				H: 6.16				
Pterostylis chaetophora	-	Terrestrial orchid with a slender flowering stem to 40 cm. Preferred habitat is seasonally moist, dry sclerophyll forest with a	Upper Hunter, Hunter	1602, 1604, 1691, 1603,			H: 1.55 U: 0.32	H: 6.16 U: 0.09			H: 1.48	H: 1.93

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
		grass and shrub understorey										
Pterostylis gibbosa	Illawarra Greenhood	Has a rosette of rounded leaves at the base of the stem, each to 35 mm long. All known populations grow in open forest or woodland, on flat or gently sloping land with poor drainage	Hunter	1603								H: 1.93
Rhodamnia rubescens	Scrub Turpentine	Shrub or small tree to 25 m high with reddish/brown, fissured bark. Young stems densely covered in fine hairs.	Upper Hunter	1541, 1584	U: 0.63 (@ 171 ind/ha)	U: 1.27 (@ 171 ind/ha)						
Rhodomyrtus psidioides	Native Guava	Shrub or small tree to 12 m high with brown scaly bark. Young branchlets and inflorescences covered with pale hairs.	Upper Hunter	1584		U: 1.27						
Rutidosis heterogama	Heath Wrinklewort	Small perennial herb to 30 cm tall. Grows in heath on sandy soils and moist areas in open forest and has	Upper Hunter, Hunter	1604				H: 6.16 U: 0.09				

Scientific Name	Common name	Species and Habitat description	Relevant sub-regions	Associated PCTs	Zone 2 – 1541 (ha)	Zone 5 – 1584 (ha)	Zone 7 – 1602 (ha)	Zone 8 – 1604 (ha)	Zone 11 – 1607 (ha)	Zone 12 – 1608 (ha)	Zone 14 – 1691 (ha)	Zone 15 – 1603 (ha)
		been recorded along disturbed roadsides.										
Senna acclinis	Rainforest Cassia	Shrub up to 3 m tall, can be mistaken for introduced Senna species. Grows on the margins of subtropical, littoral and dry rainforests	Upper Hunter	1541	U: 0.63							
Thesium australe	Austral Toadflax	Small, straggling herb to 40 cm tall. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast	Hunter, Upper Hunter, Ellerston	1603, 1604				H: 6.16 U: 0.09 E: 5.41				H: 1.93

Table 2 Assumed Presence Flora Species Credit Liability (Note this is part of Table 32 in the AR – BDAR). Shading indicates newly added assumed presence species

Species Credit Species	Biodiversity Weighting	Risk	Vegetation Zones	Area (ha)/Count (# ind/ha)	Credits	Total Credits
Acacia bynoeana	2		1604_Zone8_Moderate	6.16	213	213
Acacia pendula	3		1691_Zone14_Moderate	1.48	77	170
			1603_Zone15_Moderate	1.93	93	
Asperula asthenes	2		1603_Zone15_Moderate	1.93	62	62

Species Credit Species	Biodiversity Weighting	Risk	Vegetation Zones	Area (ha)/Count (# ind/ha)	Credits	Total Credits
Callistemon linearifolis	1.5		1604_Zone8_Moderate	75 ind/ha for 6.25 ha	974	974
Cynanchum elegans	2		1541_Zone2_Moderate	1.4	54	1611
			1584_Zone5_Moderate	27.86	1100	
			1604_Zone8_Moderate	11.66	395	
			1603_Zone15_Moderate	1.93	62	
Diuris tricolor	1.5		1604_Zone8_Moderate	6.16	160	246
			1691_Zone14_Moderate	1.48	39	
			1603_Zone15_Moderate	1.93	47	
Eucalyptus glaucina	2		1604_Zone8_Moderate	50 ind/ha for 6.25 ha	626	966
			1691_Zone14_Moderate	50 ind/ha for 1.48 ha	148	
			1603_Zone15_Moderate	50 ind/ha for 1.93 ha	192	
Grevillea parviflora subsp. parviflora	2		1604_Zone8_Moderate	6.25	216	278
			1603_Zone15_Moderate	1.93	62	
Monotaxis macrophylla	2		1604_Zone8_Moderate	6.16	213	275
			1603_Zone15_Moderate	1.93	62	
Ozothamnus tesselatus	1.5		1604_Zone8_Moderate	160	0	160
Pomaderris queenslandica	2		1603_Zone15_Moderate	1.93	62	1374
			1607_Zone11_Moderate	1.67	43	
			1608_Zone12_Moderate	35.59	1269	
Prasophyllum petilum	2		1604_Zone8_Moderate	6.16	213	265

Species Credit Species	Biodiversity Weighting	Risk	Vegetation Zones	Area (ha)/Count (# ind/ha)	Credits	Total Credits
			1691_Zone14_Moderate	1.48	52	
Prostanthera cineolifera	2		1604_Zone8_Moderate	6.16	213	213
Pterostylis chaetophora	2		1602_Zone7_Moderate	1.87	67	397
			1604_Zone8_Moderate	6.28	216	
			1691_Zone14_Moderate	1.48	52	
			1603_Zone15_Moderate	1.93	62	
Pterostylis gibbosa	2		1603_Zone15_Moderate	1.93	62	62
Rhodamnia rubescens	3		1541_Zone2_Moderate	171 ind/ha for 0.63 ha	324	975
			1584_Zone5_Moderate	171 ind/ha for 1.27 ha	651	
Rhodomyrtus psidioides	3		1584_Zone5_Moderate	1.27	75	75
Rutidosis heterogama	2		1604_Zone8_Moderate	6.25	216	216
Senna acclinis	2		1541_Zone2_Moderate	0.63	24	24
Thesium australe	1.5		1604_Zone8_Moderate	11.66	296	343
			1603_Zone15_Moderate	1.93	47	

A.3. Threatened Fauna

Recommendation 2 of the BCD letter states "*The accredited assessor should demonstrate how fauna survey effort has met the minimum required survey effort for each species. If that is unable to be done then the species must be assumed to be present or an expert report is provided to assess the likely presence of the species on the development footprint.*"

The BCD letter further states that "*However, Section 3.4.2 'Threatened Species Survey' does not demonstrate how survey effort for each candidate species has met the survey guidelines. BCD recommends that Table 8 'Fauna survey effort' is updated to state which threatened survey guideline, or guidelines were used for each species, and to state the minimum survey effort required, and to show how each element of the surveys undertaken compared with the minimum requirements for each species. BCD also recommends that Figures 6.1 to 6.21 are revised (or new figures are prepared) that where to show where spotlighting call playback, hollow watching, tree hollow searches, and raptor nest searches were undertaken in relation to areas of suitable habitat for each candidate threatened fauna species that requires onground assessment. That is for:*

- *Gang-gang cockatoo*
- *Glossy black-cockatoo*
- *White-bellied sea-eagle*
- *Little eagle*
- *Square-tailed kite*
- *Barking owl*
- *Masked owl*
- *Powerful owl*
- *Large-eared pied bat*
- *Southern myotis.*

If it is not possible to demonstrate that the minimum survey effort has been undertaken for these species then the proponent must assume their presence on incompletely surveyed parts of the development footprint, or provide an expert report that assesses their likely presence on site".

RESPONSE

The minimum survey effort for the 10 threatened fauna species listed above has been met as detailed in the following sections. As minimum survey effort has been met, the calculation of credits as per the AR-BDAR in relation to threatened fauna species is maintained.

The fauna survey effort figures (***Figures 6.1 – 6.21*** of the AR – BDAR) have been updated to provide further clarity on location of surveys. As is the case with threatened flora, the figure numbers as per the AR-BDAR have been utilised for this addendum report.

A.3.1. Fauna Survey requirements

A.i. Gang-gang Cockatoo

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Gang-gang Cockatoo, the breeding habitat constraint comprises eucalypt tree species with hollows greater than 9 cm diameter (EES, 2021e).

The TBDC profile (EES, 2021e) further states that: "*Assessors should look for SIGNS OF BREEDING on site as follows; (a) lone adult males identified during the breeding season (October to January); or (b) an occupied nest. Where signs of breeding on site are present, POTENTIAL NEST TREES should be identified. Potential nest trees are forest and woodland eucalypts containing hollows that are; (i) at least 9 m above the ground; and (ii) with hollow diameter of 10 cm or larger. Where potential nest trees are identified on site, monitor for this species during the breeding season (October to January) to confirm the presence of any ACTUAL NEST TREES on site. DPIE is currently developing survey guidance for threatened bird species. In the interim, assessors must undertake a species survey using best practice methods that can be replicated for repeat surveys (as per the BAM threatened species survey requirements)*."

As outlined in Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for hollows, and bird surveys were conducted across several weeks of survey including within the breeding season for this species (October – January). While some hollows of suitable site were recorded, no signs of breeding such as an occupied nest were recorded. Furthermore, it is noted that Gang-gang cockatoos have never been recorded in the area by local bird watchers. As no signs of breeding by Gang-gang cockatoos was recorded and no potential nest sites were identified, it was determined that the species credit components for this dual credit species were absent and no further surveys for breeding habitat were required. This species has therefore been assessed for its ecosystem components only.

A.ii. Glossy-black Cockatoo

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Glossy-Black Cockatoo, the breeding habitat constraint comprises Living or dead tree with hollows greater than 15cm diameter and greater than 8m above ground (EES, 2021f).

The TBDC profile (EES, 2021f) further states that: "*1. Assessors should look for SIGNS OF BREEDING on site as follows; (a) begging birds of any age or sex; or (b) lone adult males identified during the breeding season (April to August); or (c) an occupied nest. 2. Where signs of breeding on site are present, POTENTIAL NEST TREES should be identified. Potential nest trees contain hollows that are; (i) at least 8 m above the ground; and (ii) in stems with a diameter of at least 30 cm; and (iii) hollow diameter is at least 15 cm; and (iv) stem angle is at least 45 degrees, and may be near-vertical or vertical. 3. Where potential nest trees are identified on site, monitor for this species during the breeding season (Apr – Aug) to confirm the presence of any ACTUAL NEST TREES on site. DPIE is currently developing survey guidance for threatened bird species. In the interim, assessors must undertake a species survey using best practice methods that can be replicated for repeat surveys (as per the BAM threatened*

species survey requirements). Note that the species may need larger patches and more intact landscapes for breeding."

As outlined in Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for hollows, and bird surveys were conducted across several weeks of survey, including within the breeding season for this species (April to August at the time of survey, recently updated to January - September). While some hollows of suitable size were recorded during habitat assessments conducted between September 2019 and March 2020, the bird surveys did not record any individuals of this species. As the initial bird surveys were conducted outside of the breeding season of this species (as listed at the time of survey) and bird lists, as provided by local bird watchers, indicated the historic presence if this species in the locality further targeted surveys were conducted in August 2020, i.e during the breeding season for this species. In addition to bird surveys, all recorded hollows of suitable site were checked for indications of nesting material and surrounding vegetation was checked for indications of Glossy-Black Cockatoo such as chewed cones. As no signs of breeding by Glossy-black Cockatoos was recorded and no potential nest sites were identified, it was determined that the species credit components for this dual credit species were absent and no further surveys for breeding habitat were required. This species has therefore been assessed for its ecosystem components only.

A.iii. White-bellied Sea Eagle

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the White-bellied Sea Eagle the breeding habitat constraint comprises "Living or dead mature trees within suitable vegetation within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines" (EES, 2021o).

The TBDC profile (EES, 2021o) further states that: "*The species is highly selective in nesting locations. Breeding habitat is live large old trees within 1km of a rivers, lakes, large dams or creeks, wetlands and coastlines <u>AND</u> the presence of a large stick nest within tree canopy; or an adult with nest material; or adults observed duetting within breeding period. Due to the similarities in nest structure and use of the same nests by White-bellied Sea Eagles and Wedge-tailed Eagles, where a nest is observed without a bird present, searches for prey remains/feathers below the structure should be undertaken. The differing diets of both species and distinctive adult feathers, should provide evidence of nest use, however; where prey items/feathers are absent, repeat visits to the nest until a bird is observed should be undertaken.*"

As outlined in Section 3.4.1, Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for searches for raptor nests, was undertaken across several weeks within the nominated survey period for this species (June – December). No individuals were sighted, no raptor nests were recorded within 1km of waterbodies and the large-stick nests recorded during bird surveys were observed to be those of Wedge-tailed Eagles. Furthermore, it is noted that the bird lists provided by local birdwatchers list this species as rarely sighted in the locality. As no signs of breeding by White-bellied Sea Eagle was recorded, it was determined that the species credit components for this dual credit species were absent and no further surveys for breeding habitat were required. This species has therefore been assessed for its ecosystem components only.

A.iv. Little Eagle

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Little Eagle, the breeding habitat constraint comprises - live (or occasionally dead) large old trees within vegetation (EES, 2021h).

The TBDC profile (EES, 2021h) further states that: "*Breeding habitat is live (occasionally dead) large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy*."

As outlined in Section 3.4.1, Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for searches for raptor nests, was undertaken across several weeks within the nominated survey period for this species (September - October).

No individuals were sighted during surveys and the large-stick nests recorded during bird surveys were observed to be those of Wedge-tailed Eagles. Furthermore, it is noted that the bird lists provided by local birdwatchers list indicate no historic sightings of this species in the locality. As no signs of breeding by Little Eagle was recorded, it was determined that the species credit components for this dual credit species were absent and no further surveys for breeding habitat were required. This species has therefore been assessed for its ecosystem components only.

A.v. Square-tailed Kite

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Square-tailed Kite, the breeding habitat constraint comprises Nest trees (EES, 2021n).

The TBDC profile (EES, 2021n) further states that: "*It will be difficult to identify a Kite nest (there are lots of comparable sized stick nests built by other species), especially given Kites have large territories and other stick nesters will undoubtedly also be nesting where Kites might be recorded. Kites will need be in attendance to confirm breeding sites. Breeding habitat is live large old trees within suitable vegetation AND the presence of a male and female; or female with nesting material; or an individual on a large stick nest in the top half of the tree canopy*."

A single individual was sighted during surveys conducted in January 2020 which is within the breeding period for this species (September – January). However, only one bird without nesting material was sighted and no large stick nests were recorded in the vicinity of the sighting. Furthermore, the location where the individual was sighted has been removed from the development footprint as part of the revised layout assessed in the AR-BDAR. As no signs of breeding by Square-tailed Kite was recorded, it was determined that the species credit components for this dual credit species were absent and no further surveys for breeding habitat were required. This species has therefore been assessed for its ecosystem components only.

A.vi. Powerful Owl

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Powerful Owl, the breeding habitat constraint comprises Living or dead trees with hollow greater than 20cm diameter (EES, 2021j). As per the TBDC profile this species has a high fidelity to established nest trees.

The TBDC profile (EES, 2021j) further states that: "*In addition, or where there are no known nest trees on site, assessors should apply the following process: 1. Look for SIGNS OF BREEDING on site as follows; suitable habitat AND (a) presence of male and female OR (b) calling to each other (duetting) OR (c) find nest. Note that this species does not respond as well to call-play-back and could require stagwatching and other evidence of nesting. 2. Where signs of breeding on site are present, POTENTIAL NEST TREES should be identified. Potential nest trees are living or dead trees with hollows greater than 20 cm diameter. 3. Where potential nest trees are identified on site, night monitoring at the identified potential nest locations for a minimum of 2 nights should be undertaken to detect the presence of any owl of this species using a potential nest tree or demonstrating behaviour focussed on a potential nest tree (e.g. investigating the hollow or roosting within 10 m). DPIE is currently developing survey guidance for threatened bird species. In the interim, assessors must undertake species surveys using best practice methods that can be replicated for repeat surveys (as per the BAM threatened species survey requirements)*."

As outlined in Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for hollows were conducted across several weeks of survey. As some hollows of suitable size for this species were recorded during habitat assessments conducted between September 2019 and March 2020 and information from local birdwatchers indicated the presence of a territory for this species in the north-western parts of the subject land, targeted surveys for this species, as well as other large forest owls were conducted in August 2020.

As outlined in Section 3.2.4.5, targeted surveys for threatened owls were conducted over four nights and included a mix of hollow watches, spotlighting and call playback. These targeted surveys were also supplemented by diurnal hollow checks of all suitably large hollows observed within the subject land for other indications of owl nests such as owl wash and indications of prey.

The targeted surveys were conducted at potential nest sites over four nights thus exceeding the minimum requirements listed in the TBDC profile. As no signs of breeding by Powerful Owl was recorded, it was determined that the species credit components for this dual credit species were absent, and this species was assessed for its ecosystem components only.

A.vii. Barking Owl

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Barking Owl, the breeding habitat constraint comprises Living or dead trees with hollows greater than 20 cm diameter and greater than 4m above the ground (EES, 2021b).

The TBDC profile (EES, 2021b) further states that: "*In addition, or where there are no known nest trees on site, assessors should apply the following process: 1. Look for SIGNS OF BREEDING on site as follows; suitable habitat AND (a) presence of male and female OR (b) calling to each other (duetting) OR (c) find nest. 2. Where signs of breeding on site are present, POTENTIAL NEST TREES should be identified. Potential nest trees are living or dead trees with hollows greater than 20 cm diameter and greater than 4 m above the ground. 3. Where potential nest trees are identified on site then, night monitoring at the identified potential nest locations for a minimum of 2 nights should be undertaken to detect the presence of any owl of this species using a potential nest tree or demonstrating behaviour focussed on a potential nest tree (e.g. investigating the hollow or roosting within 10 m). DPIE is currently developing survey guidance for threatened bird species. In the interim, assessors must undertake species surveys using best practice methods that can be replicated for repeat surveys (as per the BAM threatened species survey requirements)*.

As outlined in Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for hollows were conducted across several weeks of survey. As some hollows of suitable size for this species were recorded during habitat assessments conducted between September 2019 and March 2020, targeted surveys for this species, as well as other large forest owls were conducted in August 2020.

As outlined in Section 3.2.4.5, targeted surveys for threatened owls were conducted over four nights and included a mix of hollow watches, spotlighting and call playback. These targeted surveys were also supplemented by diurnal hollow checks of all suitably large hollows observed within the subject land for other indications of owl nests such as owl wash and indications of prey.

The targeted surveys were conducted at potential nest sites over four nights thus exceeding the minimum requirements listed in the TBDC profile. As no signs of breeding by Barking Owl was recorded, it was determined that the species credit components for this dual credit species were absent, and this species was assessed for its ecosystem components only.

A.viii. Masked Owl

This species comprises a dual credit species and is a species credit species for breeding habitat only. As per the TBDC profile for the Masked Owl, the breeding habitat constraint comprises Living or dead trees with hollows greater than 20cm diameter (EES, 2021i).

The TBDC profile (EES, 2021i) further states that: "*Patch size selected is based on that fact that the species will use areas that are quite small, especially as foraging habitat but also as roosting habitat and occasionally as breeding habitat. In Tas and Vic Masked owls have been recording nesting in paddock trees. Note that the species has been found to nest in caves in Tasmania (and maybe the Nullabor?) but there is no evidence to suggest that this occurs in NSW. Dead stags are especially popular for roosting/breeding habitat and are a limited resource due to natural attrition.*

Where a breeding site has been identified in accordance with the BAM the species polygon should be established by providing a circular buffer with a 100m radius around the nest tree. The purpose of the buffer is to minimise disturbance/avoid clearing, for a development application, or to conserve and improve habitat, for a biodiversity stewardship agreement, within the area essential for breeding. This includes habitat suitable for male roosts, feeding/grooming perches and fledgling requirements. It does not account for foraging habitat. The shape of the buffer can be modified where evidence provided in the Biodiversity Assessment Report indicates an alternative shape would better meet the species needs in the context of the assessment site. For example, extant vegetation is linear and the nest tree is already located near the edge of the wooded area. DPIE is currently developing survey guidance for threatened bird species. In the interim, assessors must undertake a species survey using best practice methods that can be replicated for repeat surveys (as per the BAM threatened species survey requirements."

As outlined in Table 6 and Table 8 of the AR-BDAR, habitat assessments, including searches for hollows were conducted across several weeks of survey. As some hollows of suitable size for this species were recorded during habitat assessments conducted between September 2019 and March 2020, targeted surveys for this species, as well as other large forest owls were conducted in August 2020.

As outlined in Section 3.2.4.5, targeted surveys for threatened owls were conducted over four nights and included a mix of hollow watches, spotlighting and call playback. These targeted surveys were also

supplemented by diurnal hollow checks of all suitably large hollows observed within the subject land for other indications of owl nests such as owl wash and indications of prey.

The targeted surveys were conducted at potential nest sites over four nights thus exceeding the minimum requirements listed in the TBDC profile. As no signs of breeding by Masked Owl was recorded, it was determined that the species credit components for this dual credit species were absent, and this species was assessed for its ecosystem components only.

A.ix. Large eared Pied Bat

This species comprises a full species credit species because it cannot be reliably predicted to occur on a site based on vegetation and other landscape features (either foraging or breeding) (EES, 2021g) .

As per the TBDC profile (EES, 2021g) surveys must be undertaken as per the Threatened Bat Survey Guide (NSW Government, 2018). The threatened bat survey guide lists a requirement of a minimum of four nights using a combination of acoustic detectors and harp traps/mist nests. Traps should be set in woodlands, valley floors, riparian areas, and relatively fertile parts of the subject land where possible.

As outlined in Section 3.4.2.3 of the AR-BDAR, targeted surveys using a combination of acoustic detectors and harp traps was conducted over five days/four nights. Therefore, the minimum survey requirements for this species as per the TBDC profile and Threatened Bat Survey Guide have been met.

A.x. Southern Myotis

The species comprises a full species credit because it is dependent on waterways with pools of 3m wide or greater for foraging and habitat surrounding waterways for breeding and roosting (EES, 2021m).

As per the TBDC profile (EES, 2021m) the species can be detected via survey using appropriate techniques listed in the Threatened Bat Survey Guide (NSW Government, 2018). The threatened bat survey guide lists a requirement of a minimum of four nights using a combination of acoustic detectors, roost searches (bridges, buildings) and harp traps/mist nests in PCTs associated with the species (as per the TBDC) within 200 meters of any medium to large permanent creeks, rivers, lakes or other waterways.

As outlined in Section 3.4.2.3 of the AR-BDAR, targeted surveys using a combination of acoustic detectors and harp traps was conducted over five days/four nights. Therefore, the minimum survey requirements for this species as per the TBDC profile and Threatened Bat Survey Guide have been met.

A.3.2. Threatened Fauna Survey effort

As agreed during the 24 November 2021 meeting with the BCD, *Table 6* of the AR-BDAR has been amended to state which threatened survey guidelines were used for each species, and to state the minimum survey effort required and to show how each element of the surveys undertaken compared with the minimum requirements for each species. It is noted that the BCD letter states that *Table 8* is to be updated. However, *Table 6* of the AR-BDAR has been updated below as this table focuses on the threatened species listed in the BCD table.

Table 3 Threatened fauna survey dates and methods (Updated version of Table 6 of the AR-BDAR, highlighted columns contain new/updated information)

Scientific Name	Common Name	BAM Recommended Survey Period and TBDC Requirements	Survey Guidelines	Dates of Survey	Survey Method
Callocephalon fimbriatum	Gang-gang Cockatoo	Survey Period: Jan, Oct-Dec Minimum requirements: Determine signs of breeding and potential nest trees	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; 19-21, 27 August 2020; 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Tree hollow searches and Diurnal bird surveys (across a period of ~37 field days)
Calyptorhynchus lathami	Glossy Black-Cockatoo	Survey Period: Jan - Sep Minimum requirements: Determine signs of breeding and potential nest trees	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; 19-21, 27 August 2020; 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Tree hollow searches and Diurnal bird surveys (across a period of ~37 field days)

Scientific Name	Common Name	BAM Recommended Survey Period and TBDC Requirements	Survey Guidelines	Dates of Survey	Survey Method
Haliaeetus leucogaster	White-bellied Sea-Eagle	Survey Period: Jul-Dec Minimum requirements: Determine signs of breeding and presence of nests	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; 19-21, 27 August 2020; 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Raptor nest searches and Diurnal bird surveys (across a period of ~37 field days)
Hieraaetus morphnoides	Little Eagle	Survey Period: Aug-Oct Minimum requirements: Determine signs of breeding and presence of nests	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; 19-21, 27 August 2020; 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Raptor nest searches and Diurnal bird surveys (across a period of ~37 field days)
Lophoictinia isura	Square-tailed Kite	Survey Period: Jan, Sep-Dec Minimum requirements: Determine signs of	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019;	Raptor nest searches and Diurnal bird surveys

Scientific Name	Common Name	BAM Recommended Survey Period and TBDC Requirements	Survey Guidelines	Dates of Survey	Survey Method
		breeding and presence of nests		14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; 19-21, 27 August 2020; 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	(across a period of ~37 field days)
Ninox connivens	Barking Owl	Survey Period: May – Dec Minimum requirements: Determine signs of breeding and potential nest trees, at least 2 nights of surveys at potential nest trees	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; ***19-21, 27 August 2020;*** 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Tree hollow searches (across a period of ~37 field days) Checks of trees with suitably large hollows (across 4 days in Aug 2020), 4 nights of Call playback, hollow watch, spotlighting in Aug 2020
Ninox strenua	Powerful Owl	Survey Period: May-Aug Minimum requirements: Determine signs of breeding and potential nest trees, at least 2 nights	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020;	Tree hollow searches (across a period of ~37 field days) Checks of trees with suitably large hollows (across 4 days in Aug

Scientific Name	Common Name	BAM Recommended Survey Period and TBDC Requirements	Survey Guidelines	Dates of Survey	Survey Method
		of surveys at potential nest trees		23 – 26 March 2020; ***19-21, 27 August 2020;*** 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	2020), 4 nights of Call playback, hollow watch, spotlighting in Aug 2020
Tyto novaehollandiae	Masked Owl	Survey Period: May-Aug Minimum requirements: Determine signs of breeding and potential nest trees, at least 2 nights of surveys at potential nest trees	Draft Threatened Species Survey and Assessment Guidelines	16 – 20 September 2019; 30 September – 4 October 2019; 14 – 18 October 2019; 25 – 29 November 2019; 13 – 15 January 2020; 23 – 26 March 2020; ***19-21, 27 August 2020;*** 27 – 28 October 2020; 3 – 4 November 2020; 17 – 19 August 2021;	Tree hollow searches (across a period of ~37 field days) Checks of trees with suitably large hollows (across 4 days in Aug 2020), 4 nights of Call playback, hollow watch, spotlighting in Aug 2020
Chalinolobus dwyeri	Large-eared Pied Bat	Survey Period: Jan, Nov-Dec Minimum requirements: Surveys to be conducted in accordance with Threatened Bat Survey guide (minimum 4 nights of surveys required)	'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method	13 – 17 January 2020;	Ultrasonic call detection, harp trapping. Ultrasonic call detection – 12 units recording 12 hours per night each over a total of 4 nights (576 hours recorded) Harp traps – 6 traps set up for 12 hours per

Scientific Name	Common Name	BAM Recommended Survey Period and TBDC Requirements	Survey Guidelines	Dates of Survey	Survey Method
					night each over a total of 4 nights (288 trapping hours)
Myotis macropus	Southern Myotis	Survey Period: Jan-Mar, Oct-Dec Minimum requirements: Surveys to be conducted in accordance with Threatened Bat Survey guide (minimum 4 nights of surveys required)	'Species credit' threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method	13 – 17 January 2020;	Ultrasonic call detection, harp trapping. Ultrasonic call detection – 12 units recording 12 hours per night each over a total of 4 nights (576 hours recorded) Harp traps – 6 traps set up for 12 hours per night each over a total of 4 nights (288 trapping hours)

Draft Threatened Species Survey and Assessment Guidelines (DEC (NSW), 2004)

'Species credit' threatened bats and their habitats (NSW Government, 2018)

A.4. Prescribed Impacts (blade strike)

Recommendation 3 of the BCD letter states "*Further information should be provided to show how the requirements of Sections 6.7.1.6, 6.7.1.8 (prescribed impacts) and 9.2.1.8 (blade strike) of the BAM have been met. If survey effort has not been met then BCD recommends further surveys are undertaken that allow for a full assessment of potential prescribed impacts and the impact of wind turbine strike on protected animals to be made.*"

RESPONSE

A.4.1. Section 6.7.1.6

Section 6.7.1.6 of the BAM states "*The assessor must undertake targeted surveys for each of the candidate species which must include use methods appropriate for the species being targeted, use methods that measure movement of a species, for example ultrasonic bat detectors, be performed at times of the year appropriate for identifying the species and be based on a repeatable method for inclusion in any ongoing monitoring program post-approval.*" In the case of wind farms, the list of candidate species is also to include non-threatened species such as avifauna and bats, as per Section 6.7.1.5 which states "*that where the proposed development is for a wind farm a candidate list of species that may use the development site as a flyway or migration route should be identified including resident threatened aerial species, resident raptor species and nomadic and migratory species that are likely to fly over the project area*".

The BAM provides no details on the required duration/ frequency of required surveys for non-threatened species. Therefore, surveys conducted for the project have been guided by available survey guidelines for threatened species.

As outlined in ***Section A.3*** above, the minimum survey requirements to determine presence of threatened avifauna and threatened microchiropteran bats has been met.

The bird surveys (*Section 3.4.2.4* of the AR-BDAR) and fauna habitat assessments (*Section 3.4.1* of the AR-BDAR) were conducted across several weeks to compile a comprehensive list of avifauna (threatened and non-threatened) that may use the subject land as a flyway or migration route. The data from the bird surveys was supplemented by data provided by local birdwatchers (*Section 3.4.2.7* of the AR-BDAR) and database records (*Section 3.7.2* of the AR-BDAR).

We therefore maintain that the requirements of Section 6.7.1.6 of the BAM have been met. Nonetheless, in accordance with correspondence received from BCD (email from Robert Gibson dated 9 December 2021), further surveys will be conducted as part of micro-siting studies as well as during on-going monitoring under the proposed Bird and Bat Adaptive Management Plan. These surveys will be designed with due consideration to the recommended survey methodology and approach outlined in the BCD letter to DPIE, dated 1 November and will be refined in consultation with the BCD, particularly if surveys are to commence prior to the release of relevant Departmental guidelines.

A.4.2. Section 6.7.1.8

Section 6.7.1.8 of the BAM states that "Based on the outcomes of the targeted survey, t*he assessor is required to: (a) predict and map the habitual flight paths for nomadic and migratory species likely to fly over the project area on the Location Map and Site Map; and (b) map the likely habitat for resident threatened aerial and raptor species on the Site Map.*"

Figure 2 Location Map includes an inset showing locations of broadscale mapping of wildlife corridors relative to the subject land.

As stated in *Section 6.5.1* of the AR-BDAR, the surveys indicate a paucity of nomadic and migratory species and so the site is not considered to be a habitual flight path for nomadic and migratory species. As the outcomes of the surveys conducted did not show any indications of a habitual flight path, no flight paths for nomadic and migratory species have been mapped. Given the presence of large waterbodies distant to the subject land, predicted flight paths for waterbirds have been mapped in *Figure 16* of the AR-BDAR.

All mapped areas of woodland habitat as well as adjacent native grasslands are considered to comprise habitat (roosting, nesting, foraging) for resident aerial and raptor species. These have been mapped as PCTs in *Figure 8.1 – 8.21* and vegetation zones in *Figure 10.1 – 10.21* of the AR-BDAR.

Therefore, it is maintained that the requirements of Section 6.7.1.8 of the BAM have been met. It is acknowledged that the requisite mapping has not been shown on the Site Map or Location Map as listed in the BDAR. However, given the level of information already provided within the Site Maps (*Figure 1.1 – 1.21* of the AR-BDAR) and Location Map (*Figure 2* of the AR-BDAR), the information was provided on separate maps to enable the information to be clearly viewed.

A.4.3. Section 9.2.1.8

The BCD letter notes that not all the 11 requirements of Section 9.2.1.8 of the BAM have been met and states that the following information should be provided:

- Map the following significant landscape & habitat features: rock outcrops, cliffs, overhangs or escarpments (such as the Yellow Rock Cliff (mentioned on page 45 of the BDAR)). [This information is also required for BAM Section 6.7.1.8.].
- Predict & describe indirect impacts on aerial species for migratory pathways, breeding, feeding & resting.
- Predict the likely cost of avoidance behaviour by migratory species.

A.4.3.1. Significant Landscape Features

It is acknowledged that page 45 of the AR-BDAR states that Yellow Rock Cliff is '*present in the assessment area in close proximity to a section of proposed underground reticulation in the eastern parts of the subject land.*'.

This statement is a legacy statement from the original EIS BDAR that was included by error/oversight in the AR-BDAR updates. As part of the proposed amendments to the project layout, as assessed in the AR-BDAR, the areas of proposed development in the vicinity of Yellow Rock Cliff have been removed from the amended layout and Yellow Rock Cliff no longer occurs within the assessment area of the project.

Nonetheless, the indicative location of Yellow Rock Cliff has been shown in updated versions of **Figure 11, Figure 17** and **Figure 18** of the AR-BDAR which are provided at the end of this letter report. Other significant habitat features include hollow bearing trees and raptor nests which have previously been mapped in *Figure 17* of the AR-BDAR.

A.4.3.2. Indirect Impacts on aerial species

Aerial species comprise birds that have adapted their behaviour to do activities, such as feeding and drinking, while remaining in flight. Within the dataset of recorded and potential bird species, the species that can be classified as aerial species are limited to the following migratory species:

- Fork-tailed swift (*Apus pacificus*); and
- White-throated Needletail (*Hirundapus caudacutus*).

The Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia and is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground to forage (DAWE, 2021b). The White-throated Needletail is a non-breeding visitor in Australia and is almost exclusively aerial and generally forages at 'cloud level' , i.e more than 1,000 m above the ground (DAWE, 2021a).

As outlined in *Section 6.5.1.2* and *Section 6.5.3* of the AR-BDAR the subject land is not considered to comprise part of a migratory flight path. Therefore, no indirect impacts on migratory flight paths (such as a significant change or shift in flight path) are predicted for either species. As both species comprise non-breeding visitors to Australia, no impacts on breeding habitat for aerial species is predicted.

The project has potential to indirectly impact on foraging and resting habitat for these species via avoidance behaviour whereby the species avoid previously utilised habitats due to the presence of turbines. However, given the paucity of records for both species in the locality of the subject land and the availability of suitable foraging habitat in the locality (including developed areas over which both species are known to forage), the indirect impacts from avoidance behaviour are not predicted to be significant.

A.4.3.3. Avoidance Behaviour by migratory species

Avoidance behaviour can result in indirect habitat loss for avifauna if they ultimately avoid areas previously utilised prior to construction of the wind farm. Barrier effects from the presence of turbines may cause migratory species to alter or shift their migratory flight pathways to avoid the wind farm area, i.e. the ridgelines and hilltops where the turbines are located.

As outlined in *Section 6.5.1.2* and *Section 6.5.3,* the subject land is not considered to comprise part of a migratory flight path. Given the paucity of migratory species in the area and the lack of migratory flight paths, significant avoidance behaviour by migratory species such that they are affected by indirect habitat loss is not predicted to be significant.

A.5. Impact Frequency and Intensity

Recommendation 4 of the BCD letter states that "*The direct and indirect impacts of the project that cannot be avoided should be described in terms of the frequency and intensity of direct and indirect impacts that are unable*

to be avoided." The BCD letter further states that "*Chapter 8 'Impact assessment' describes the direct and indirect impacts of the project on vegetation and other biodiversity. However, it is not clear how the assessment of, for example Table 27 'Indirect impacts of the Project', describes the frequency or intensity of indirect impacts as required by Sections 9.1 and 9.2 of the BAM.*"

RESPONSE

Section 9.1 (Assessing impacts on native vegetation and habitat) of the BAM states that: "*The assessor must determine the impacts on native vegetation and habitat in accordance with Subsections 9.1.2, 9.1.3 and 9.1.4.*". These subsections comprise:

- 9.1.2 Assessing the impact of clearing native vegetation, threatened ecological communities and threatened species habitat;
- 9.1.3 Calculating the change in the vegetation integrity score for clearing of native vegetation, threatened ecological communities and threatened species habitat; and
- 9.1.4 Assessing indirect impacts on native vegetation and habitat.

The requirements of Section 9.1.2 of the BAM are addressed in *Table 24* and *Table 25* of the AR-BDAR which identify the extent or areas of impacted vegetation/habitat (note that **Table 1** and **Table 2** of **Section A.2** of this letter identify the areas of impacted habitat for the additional five assumed flora species), while the requirements of Section 9.1.3 of the BAM are addressed in *Section 8.1.1* and *Table 26* of the AR-BDAR which identify the change in vegetation integrity scores.

Section 8.1.2 and *Table 27* of the AR-BDAR address the requirements of Section 9.1.4 of the BAM. It should be noted that Section 9.1.4.2 of the BAM provides a list of indirect impacts that need to be assessed while 9.1.4.3 of the BAM states that:

"*The assessment of indirect impacts must:*

(a) describe the nature, extent and duration of short-term and long-term impacts

(b) identify the threatened species, threatened ecological communities and habitats likely to be affected

(c) predict the consequences of the impacts for the bioregional persistence of the threatened species, threatened ecological communities and their habitats."

Table 27 of the AR-BDAR was structured to address each of the items listed in Items (a) to (c) of Section 9.1.4.3. Therefore, it is considered that the requirements of Section 9.1 of the BAM have been addressed in the AR-BDAR.

Nonetheless it is acknowledged that in terms of indirect impacts, Section 9.1.1.2 (b) of the BAM requires a BDAR to describe "*the nature, extent, frequency, duration and timing of indirect impacts of the proposal*". Therefore *Table 27* of the AR-BDAR has been updated to provide further information about indirect impacts as outlined in the advice received from BCD (email from Robert Gibson, dated 3 December 2021).

Section 9.2 (Assessing prescribed biodiversity impacts) of the BAM requires relevant prescribed impacts to be addressed in terms of the nature, extent and duration of the prescribed impact. This is addressed in *Section 8.2* of the AR-BDAR with additional information in relation to Section 9.2.1.8 of the BAM being provided in S**ection A.4** of this report.

Table 4 Indirect impacts of the Project (this is an updated version of Table 27 of the AR-BDAR, highlighted columns comprise new/updated information)

Indirect Impact	Nature	Extent	Duration	Frequency	Intensity	Threatened Entities Likely Affected	Consequences
Inadvertent impacts on adjacent habitat or vegetation	Construction activities may result in inadvertent impacts on retained vegetation, such as increased sedimentation.	Retained vegetation within the survey area.	Short term (during construction)	Episodic during construction phase; Rare during operational phase	Moderate Impact, localised around construction sites	White Box - Yellow Box - Blakely's Red Gum Woodland, Central Hunter Grey Box – Ironbark Woodland and Lower Hunter Valley Dry Rainforest	Reduced condition of the adjoining TEC.
Reduced viability of adjacent habitat due to edge effects	Modification of vegetation extent within the subject land may increase edge effects.	Retained vegetation within the survey area.	Potential long-term	Ongoing following clearing of vegetation	Moderate impact; Widespread in that edge effects can occur along the entire length of the linear development, particular around access tracks and turbines.	White Box - Yellow Box - Blakely's Red Gum Woodland, Central Hunter Grey Box – Ironbark Woodland and Lower Hunter Valley Dry Rainforest, Ecosystem credit species, Large-eared Pied bat, Powerful Owl, Glossy-Black	Reduced condition of the adjoining TEC or species habitat

Indirect Impact	Nature	Extent	Duration	Frequency	Intensity	Threatened Entities Likely Affected	Consequences
						Cockatoo, Brush-tailed Phascogale	
Reduced viability of adjacent habitat due to noise, dust or light spill	The construction and operational activities associated with the project are likely to increase the noise, dust and light above current levels within the subject land.	Retained vegetation within the survey area.	Potential long-term	Ongoing during construction phase, Episodic during operational phase	High impact, particularly for noise during construction phase, Moderate to low impact during operational phase	Ecosystem credit species, Large-eared Pied bat, Powerful Owl, Glossy-Black Cockatoo, Brush-tailed Phascogale	Disruption of fauna habitat usage during construction and operation.
Transport of weeds and pathogens from the site to adjacent vegetation	Some environmentally significant weeds (e.g African Olive) are known to occur in parts of the subject land and may be inadvertently spread to other areas within the survey area	Retained vegetation within the survey area.	Potential long-term	Episodic during construction phase, Rare during operational phase	Moderate intensity as the surrounding vegetation already experiences weed incursions from existing land uses.	White Box - Yellow Box - Blakely's Red Gum Woodland, Central Hunter Grey Box – Ironbark Woodland and Lower Hunter Valley Dry Rainforest	Reduced condition of the adjoining TEC.

Indirect Impact	Nature	Extent	Duration	Frequency	Intensity	Threatened Entities Likely Affected	Consequences
Loss of breeding habitats	The project will result in the removal of hollow-bearing trees.	Vegetation zones 1 – 12	Long-term	Ongoing during construction phase as trees are felled, rare to unlikely during operational phase	Moderate to high intensity as formation of new hollows is a long-term process	Hollow-dependent ecosystem credit species (e.g. microchiropteran bats)	Reduction in available breeding habitat of hollow-dependent fauna and increased competition for hollows outside of the subject land.

A.6. BAM data sheets

Recommendation 5 of the BCD letter states that "*A copy of the field data sheet for BAM plot Q63 (August 2021) should be included in the BDAR*."

RESPONSE

As outlined during the consultation meeting on 24 November 2021, the process followed for the EIS BDAR was repeated for the AR – BDAR and all datasheets, including Q63, were included as attachments in the BAM-C case. *Section 5.4* of the AR - BDAR specifically mentions that all datasheets are provided in the BAM-C. However, it is understood that attachments in the BAM-C are not always readily accessible. Therefore, all datasheets utilised for the AR-BDAR have been provided directly to the BCD (email to Robert Gibson, dated 29 November 2021).

A.7. Matters of National Environmental Significance.

Recommendation 6 of the BCD letter states that "*Additional information on the assessment of Matters of National Environmental Significance should be provided in Appendix A of the BDAR to address the issues outlined in this letter.*"

The BCD letter further states that:

- *Details are required of how survey effort for EPBC Act-listed threatened species met Commonwealth survey requirements, where applicable, – such as the Draft Survey Guidelines for Australia's Threatened orchids: Guidelines for detecting orchids listed as 'threatened under the Environment Protection and Biodiversity Conservation Act 1999' (DoEE, 2013). This is required for Acacia bynoeana, Angophora inopina, Asperula asthenes, Cryptostylis hunteriana, Cynanchum elegans, Eucalyptus parramattensis subsp. decadens, Eucalyptus pumila, Eucalyptus glaucina, Grevillea parviflora subsp. parviflora, Melaleuca biconvexa Ozothamnus tesselatus, Prasophyllum sp. Wybong, Prostanthera cineolifera, Pterostylis gibbosa, and Thesium australe.*

- *The proponent must provide a statement about the potential impact (i.e. likely significant, low risk of impact or not occurring) to any of the matters listed in the Referral Decision (dated 3 June 2020), such as threatened species and communities that occur or are predicted to occur on the proposed development site and in the vicinity. Where DAWE has determined a likely significant impact will occur for an endangered community or species this must be discussed, the impact quantified, and appropriate offsets proposed. For those species, communities and other matters that the Commonwealth have determined are likely to be significantly impacted by the project, but that the proponent considers will not be impacted, the proponent must provide robust evidence in support of their conclusion, e.g. maps of habitat or known distribution in relation to the project area.*

- *Provide a summary of the results of the BAM assessment of the impacts or likely impacts of the project on MNES. This includes facilitated and downstream impacts. The assessment must include the quantum of BAM credits required to offset impacts on each affected MNES matter, such as threatened species and communities*

listed in the referral decision, plus any added by the proponent, and the consequences of those impacts on the species and communities. The nature and significance of the impacts must be discussed in the context of any relevant Conservation Advice Recovery Plans and Threat Abatement Plans. Include a statement of where there are no current relevant Conservation Advice Recovery Plans and Threat Abatement Plans for the particular MNES.

- *For threatened species and communities and migratory species, identify whether any EPBC Act-listed species have not been assessed by the BAM, i.e. migratory species, and describe how they have been assessed in accordance with the SEARs.*

RESPONSE

A.7.1. Survey Effort

It is noted that the referral decision stated that the project is to be assessed under the assessment bilateral agreement with New South Wales, meaning in accordance with the BAM. Therefore, assessments for all threatened species, including MNES species, have been conducted in accordance with the BAM. That is surveys have been limited to targeted surveys for relevant fauna species credit species (or species credit components of dual credit species).

In accordance with the allowances of the BAM, presence has been assumed as a precautionary measure for threatened flora species, including MNES species, considered to be candidate species requiring further assessment. This includes assumption of presence for the following MNES flora species (including three additional assumed species comprising MNES as per **Section A.2** of this report, as underlined below):

- *Acacia bynoeana* (Bynoe's Wattle);
- *Aperula asthenes* (Trailing Woodruff);
- *Cynanchum elegans* (White-flowered Wax Plant);
- *Eucalyptus glaucina* (Slaty Red Gum);
- *Grevillea parviflora subsp. parviflora* (Small-flower Grevillea);
- *Ozothamnus tesselatus*;
- *Pomaderris queenslandica* (Scant Pomaderris);
- *Prasophyllum* Sp Wybong (as *Prasophyllum petilum* (Tarengo Leek Orchid));
- *Prostanthera cineolifera* (Singleton Mint Bush);
- *Pterostylis gibbosa* (Illawarra Greenhood);
- *Rhodamnia rubescens* (Scrub Turpentine);
- *Rhodomyrtus psidioides* (Native Guava);

- *Rutidosis heterogama* (Heath Wrinklewort); and
- *Thesium australe* (Austral Toadflax);

The following MNES flora species have been excluded as candidate entities in accordance with the BAM based on geographic constraints, known distribution and habitats and degradation of associated habitats/PCTs.

- *Angophora inopina;*
- *Cryptostylis hunteriana;*
- *Eucalyptus parramattensis subsp decadens;*
- *Eucalyptus pumila;* and
- *Melaleuca biconvexa;*

Further details on the justification for the removal of these five species from consideration is provide in *Table 16* and *Table 36* of the AR-BDAR.

As presence has been assumed for threatened flora, including 14 MNES species, the Commonwealth survey guidelines are currently not considered to be applicable. Nonetheless, relevant Commonwealth guidelines, such as *Draft Survey Guidelines for Australia's Threatened orchids* will be taken into consideration when planning future targeted surveys in conjunction with relevant BAM survey guidelines.

A.7.2. Potential Impacts to Matters listed in the Referral Decision

Based on the Referral documentation (EPBC 2020/8631), the Commonwealth determined that there was likely to be to be significant impacts to:

- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community listed as critically endangered;
- Central Hunter Valley eucalypt forest and woodland listed as critically endangered;
- Regent Honeyeater (*Anthochaera phrygia*) listed as critically endangered;
- Swift Parrot (*Lathamus discolor*) listed as critically endangered; and
- Koala (*Phascolarctos cinerus*) listed as vulnerable.

Additionally, the Commonwealth determined that the proposed action may have a significant impact on the following migratory species:

- Fork-tailed swift (*Apus pacificus*); and
- White-throated Needletail (*Hirundapus caudacutus*);

Additionally, the Commonwealth determined that there was some risk that there may be significant impacts on the following matters and levels of impact should be further investigated:

- Austral Toadflax (*Thesium australe*) listed as vulnerable;
- Slaty Red Gum (*Eucalyptus glaucina*) listed as vulnerable;
- Leek-orchid (*Prasophyllum* sp. Wybong (C. Phelps ORG 5269) listed as critically endangered;
- Eastern Bristlebird (*Dasyornis brachypterus*) listed as endangered;
- Large-eared Pied Bat (*Chalinolobus dwyeri*) listed as vulnerable;
- Spotted-tailed Quoll *(Dasyurus maculatus maculatus*) listed as endangered;
- Grey-headed Flying-fox (*Pteropus poliocephalus*) listed as vulnerable; and
- Green and Golden Bell Frog *(Litoria aurea*) listed as vulnerable.

Both communities listed above have been retained and assessed in the AR-BDAR in accordance with the BAM. Of the species listed above, only the Eastern Bristlebird and Green and Golden Bell Frog have been assessed as unlikely to occur and have been excluded from the BAM-C. All other listed species have been retained (or partly retained in the case of dual credit species) and assessed as per the BAM.

The potential impacts to each of the matters listed in the Referral Decision is summarised in **Table 5** below.

Table 5 Summary of impacts to MNES listed in Referral Decision

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE	Yes	Yes	Plant Community Type: PCT 1608 (Zone 12), PCT 618_DNG (Zone 13)	Direct impacts: A total area of ~215.54 ha (comprising 36.95 ha of Woodland and 180.16 ha of DNG) occurs within the disturbance footprint. While this area is likely to reduce following detailed design and micrositing, this 'worst case' scenario has nonetheless been assessed as potentially cleared. Indirect impacts: This community is potentially subject to indirect impacts such as sedimentation, edge effects and weed incursion.	Like-for-like ecosystem credits comprising: 1647 credits for PCT 1608 (Woodland); 1796 credits for PCT 618 (DNG);

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Central Hunter Valley eucalypt forest and woodland	CE	Yes	Yes	Plant Community Type: PCT 1602 (Zone 8), PCT 1604 (Zone 9), PCT 1691 (Zone 14), PCT 1603 (Zone 15)	Direct impacts: A total area of ~22.86 ha (comprising four different Woodland PCTs) occurs within the disturbance footprint. While this area is likely to reduce following detailed design and micrositing, this 'worst case' scenario has nonetheless been assessed as potentially cleared.Indirect impacts: This community is potentially subject to indirect impacts such as sedimentation, edge effects and weed incursion	Like-for-like ecosystem credits comprising: 240 credits for PCT 1602; 395 credits for PCT 1604; 52 credits for PCT 1691; 62 credits for PCT 1603
Regent Honeyeater (*Anthochaera phrygia*)	CE	Yes	Yes	Dual credit species. Subject land is outside Mapped Important areas so species is assessed as an Ecosystem credit species for Ecosystem components only	Direct Impacts: The proposed action (prior to detailed design and micrositing) is estimated to reduce the extent of potential foraging habitat for this species. These comprise PCTs 486, 1602, 1604, 1607, 1608, 1691 and 1603 covering a total area of 62.56 ha.Prescribed Impacts: As the project comprises a Wind Farm all avifauna are potentially at risk of the prescribed impact of Blade Strike. The risk assessment for the Regent Honeyeater determined that the Risk rating for this species is Low	Ecosystem credits for associated PCTs comprising: 26 credits for PCT 486; 240 credits for PCT 1602; 395 credits for PCT 1604; 38 credits for PCT 1607; 1647 credits for PCT 1608; 52 credits for PCT 1691; 62 credits for PCT 1603

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Swift Parrot (*Lathamus discolor*)	CE	Yes	Yes	Dual credit species. Subject land is outside Mapped Important areas so species is assessed as an Ecosystem credit species for Ecosystem components only	Direct Impacts: The proposed action (prior to detailed design and micrositing) will reduce the extent of potential foraging habitat for this species. These comprise PCTs 1583, 1604, 1691, 1603 and 1692 covering a total area of 19.94 ha.Prescribed Impacts: As the project comprises a Wind Farm all avifauna are potentially at risk of the prescribed impact of Blade Strike. The risk assessment for the Swift Parrot determined that the strike risk for this species is Low	Ecosystem credits for associated PCTs comprising: 157 credits for PCT 1583; 395 credits for PCT 1604; 52 credits for PCT 1691; 62 credits for PCT 1603; 1 credit for PCT 1692
Koala (*Phascolarctos cinerus*)	V	Yes	Yes	Dual credit species. Assessments in accordance with BAM determined that breeding habitat (species credit component) is absent, so Species is assessed as an Ecosystem credit species for Ecosystem components only	Direct Impacts: The proposed action (prior to detailed design and micrositing) will reduce the extent of potential foraging habitat for this species. The PCTs associated with foraging habitat for the Koala include PCTs 1583, 1604 and 1603 covering a total area of 18.39 ha. Indirect Impacts: The Koala may be potentially affected by indirect impacts such as elevated noise, dust and light levels.	Ecosystem credits for associated PCTs comprising: 157 credits for PCT 1583; 395 credits for PCT 1604; 62 credits for PCT 1603

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Fork-tailed swift (*Apus pacificus*)	M	Yes	Yes	Migratory species - not listed in BAM-C	Direct impacts: Although this species is almost exclusively aerial, the proposed action (prior to detailed design and micrositing) would potentially impact upon habitats over which this species forages and may occasionally utilise for resting. While this species was not listed in the BAM-C, it is assumed that it would be associated with similar habitats as the White-throated Needletail. The PCTs assumed to comprise habitat for the Fork-tailed Swift includes PCTs 1541, 1583, 1584, 1683, 1602, 1604, 1607, 1608, 1691 and 1603 covering a total area of ~97.29 ha.Prescribed Impacts: As the project comprises a Wind Farm all avifauna are potentially at risk of the prescribed impact of Blade Strike. The risk assessment for the Fork-tailed Swift determined that the strike risk for this species is Negligible	n/a as this species does not appear in the BAM-C. No offsets proposed for potential prescribed impacts.

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
White-throated Needletail (*Hirundapus caudacutus*)	V, M	Yes	Yes	Ecosystem credit species - retained in assessment	Direct impacts: Although this species is almost exclusively aerial, the proposed action (prior to detailed design and micrositing) would potentially impact upon habitats over which this species forages and may occasionally utilise for resting. The PCTs associated with habitat for the White-throated Needletail includes PCTs 1541, 1583, 1584, 1683, 1602, 1604, 1607, 1608, 1691 and 1603 covering a total area of ~97.29 ha.Prescribed Impacts: As the project comprises a Wind Farm all avifauna are potentially at risk of the prescribed impact of Blade Strike. The risk assessment for the White-throated Needletail determined that the strike risk for this species is Negligible	Ecosystem credits for associated PCTs comprising: 47 credits for PCT 1541; 157 credits for PCT 1583; 825 credits for PCT 1584; 59 credits for PCT 1683; 240 credits for PCT 1602; 395 credits for PCT 1604; 38 credits for PCT 1607; 1647 credits for PCT 1608; 52 credits for PCT 1691; 62 credits for PCT 1603.

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Austral Toadflax (*Thesium australe*)	V	Yes	Yes	Species credit species - presence assumed on a precautionary basis until targeted surveys can be conducted	Direct impacts: This species has been assumed to occur as a precautionary basis until targeted surveys can be completed. Based on assumed presence, a total of 13.59 ha of potential habitat for this species (prior to detailed design and micrositing) may be clearedIndirect impacts: This Species is potentially subject to indirect impacts such as sedimentation, edge effects and weed incursion.	Species credits totalling 343 credits for the *Thesium australe*
Slaty Red Gum (*Eucalyptus glaucina*)	V	Yes	Yes	Species credit species - presence assumed on a precautionary basis until targeted surveys can be conducted	Direct impacts: This species has been assumed to occur as a precautionary basis until targeted surveys can be completed. Based on assumed presence, a total of 483 individuals of this species (prior to detailed design and micrositing) may be cleared Indirect impacts: This Species is potentially subject to indirect impacts such as sedimentation, edge effects and weed incursion.	Species credits totalling 966 credits for the *Eucalyptus glaucina*

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Leek-orchid (*Prasophyllum* sp. Wybong	CE	Yes	Yes	Species credit species - presence assumed on a precautionary basis until targeted surveys can be conducted	Direct impacts: This species has been assumed to occur as a precautionary basis until targeted surveys can be completed. Based on assumed presence, a total of 7.64 ha of potential habitat for this species (prior to detailed design and micrositing) may be clearedIndirect impacts: This Species is potentially subject to indirect impacts such as sedimentation, edge effects and weed incursion.	Species credits totalling 265 credits for the *Prasophyllum* Sp *Wybong* (as *Prasophyllum petilum* in BAM-C)

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Eastern Bristlebird (*Dasyornis brachypterus*)	E	Yes	No	The Eastern Bristlebird was filtered out of the BAM-C species list as this species is not associated/considered to occur within IBRA subregions present within the subject land. Further checks of the NSW BioNet Atlas records indicated no records of Eastern Bristlebird within a 15km buffer of the subject land. Avifauna lists provided by local birdwatchers also indicated no records of Eastern Bristlebird within the locality. Therefore, species not added to BAM-C species list, especially as heath and heathy understorey habitats are absent.	n/a	n/a

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Large-eared Pied Bat (*Chalinolobus dwyeri*)	V	Yes	Yes	Species credit species - recorded within subject land and assessed in accordance with BAM (i.e species polygon defined)	Direct Impacts: The proposed action (prior to detailed design and micrositing) is estimated to reduce the extent of potential foraging habitat by 0.18 ha based on the mapped species polygon.Prescribed Impacts: As the project comprises a Wind Farm all bats are potentially at risk of the prescribed impact of Blade Strike. The risk assessment for the Regent Honeyeater determined that the Risk rating for this species is Low.	Species credits totalling 12 credits for the Large-eared Pied Bat

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Spotted-tailed Quoll (*Dasyurus macalutus macalatus*)	E	Yes	Yes	Ecosystem credit species - retained in assessment	Direct Impacts: The proposed action (prior to detailed design and micrositing) will reduce the extent of potential habitat for this species. The PCTs associated with habitat for the Spotted-tailed Quoll include PCTs 486, 1541, 1583, 1584, 1683, 1602, 1604, 1607, 1608, 1691, 1603, 1692, 1731 and 1071 covering a total area of 98.64 ha.Indirect Impacts: The Spotted-tailed Quoll may be potentially affected by indirect impacts such as elevated noise, dust and light levels	Ecosystem credits for associated PCTs comprising: 26 credits for PCT 486; 47 credits for PCT 1541; 157 credits for PCT 1583; 825 credits for PCT 1584; 59 credits for PCT 1683; 240 credits for PCT 1602; 395 credits for PCT 1604; 38 credits for PCT 1607; 1647 credits for PCT 1608; 52 credits for PCT 1691; 62 credits for PCT 1603; 1 credit for PCT 1692; 10 credits for PCT 1731; 12 credits for PCT 1071

MNES entity	EPBC Act Status	Entity assessed in Referral	Entity retained in BAM/BDAR assessment	Status in BAM	Impacts	Offset
Grey-headed Flying-fox (*Pteropus poliocephalus*)	V	Yes	Yes	Dual credit species. Subject land does not contain any GHFF camps, so Species is assessed as an Ecosystem credit species for Ecosystem components only	Direct Impacts: The proposed action (prior to detailed design and micrositing) will reduce the extent of potential foraging habitat for this species. The PCTs associated with foraging habitat for the Koala include PCTs 1541, 1583, 1604, 1691, 1603 and 1692 covering a total area of 21.34 ha.Indirect Impacts: The Koala may be potentially affected by indirect impacts such as elevated noise, dust and light levels	Ecosystem credits for associated PCTs comprising:47 credits for PCT 1541157 credits for PCT 1583395 credits for PCT 160452 credits for PCT 169162 credits for PCT 16031 credit for PCT 1692
Green and Golden Bell Frog (*Litoria aurea*)	V	Yes	No	Species credit species - Assessments in accordance with the BAM determined that habitats are suitably degraded such that the microhabitats are unlikely to support this species. Furthermore, no records have been found in the locality in the last 10 years. Site is largely outside of the known areas of occurrence.	n/a	n/a

CE = Critically Endangered, E = Endangered, V = Vulnerable, M = Migratory

A.7.3. BAM Assessment of Impacts to MNES

As requested by the BCD, a summary of the results of the BAM assessment of the impacts of the project on MNES, including consequences of the impacts, proposed offsets and consistency with relevant Recovery Plans and Threat Abatement Plans is provided in **Table 6** below.

Table 6 Summary of impacts on MNES

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland	-	CEEC	PCT 1608, PCT 618	Community mapped as occurring on site. Direct impacts: Clearing of vegetation Indirect Impacts: Sedimentation/Erosion, Edge effects,	Reduction in extent of occurrence of community; potential reduction in habitat values of retained vegetation due to edge effects	Like-for-like ecosystem credits comprising: 1647 credits for PCT 1608 (Woodland); 1796 credits for PCT 618 (DNG);	The overall objective of the National Recovery Plan for White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland is to promote the recovery and prevent the extinction of the critically endangered ecological community, known as Box-Gum Grassy Woodland. In accordance with the BAM the proposed action will offset for residual impacts that cannot be avoided via provision of appropriate like for like credits which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve the community in perpetuity. The proposed offsets are therefore considered to be in accordance with the objectives of the National Recovery Plan for this community

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Central Hunter Valley Eucalypt Forest and Woodland	-	CEEC	PCT 1602, PCT 1604, PCT 1691, PCT 1603	Community mapped as occurring on site. Direct impacts: Clearing of vegetation Indirect Impacts: Sedimentation/Erosion, Edge effects,	Reduction in extent of occurrence of community; potential reduction in habitat values of retained vegetation due to edge effects	Like-for-like ecosystem credits comprising: 240 credits for PCT 1602 (Woodland); 395 credits for PCT 1604 (Woodland); 52 credits for PCT 1691 (Woodland); 62 credits for PCT 1603 (Woodland)	n/a
Acacia bynoeana	Bynoe's Wattle	V	Species Credit Species	Species not recorded within PMST search. Considered unlikely to occur. Within the BDAR presence is assumed as a	Potential loss of individuals if determined to be present within the site	213 species credits calculated as a precautionary measure until further targeted	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				conservative measure only until further targeted searches can be conducted		surveys can be completed	
Asperula asthenes	Trailing Woodruff	V	Species Credit Species	Species considered unlikely to occur for referral, not raised as species requiring further consideration in Referral decision. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	62 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Cynanchum elegans	White-flowered Wax Plant	E	Species Credit Species	Species onsidered unlikely to occur for referral, not raised as species requiring further consideration in Referral decision. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	1611 species credits calculated as a precautionary measure until further targeted surveys can be completed	The following Threat Abatement Plans (TAPs) are relevant to this species:- - TAP for competition and land degradation by rabbits - TAP for predation, habitat degradation, competition and disease transmission by feral pigs - TAP for competition and land degradation by unmanaged goats The goal of the TAP for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditions The goals of the TAP for predation, habitat degradation, competition and disease transmission by feral pigs are to prevent further species and ecological communities from becoming threatened or extinct due to predation, habitat degradation, competition and disease transmission by feral pigs, and to improve protection for EPBC-listed species and ecological communities currently threatened by feral pigs. The proposed action occurs in an agricultural landscape which may already be affected by potential feral pig populations (though none have been sighted in surveys to date). As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals of the TAP as it will not result in increased risk of impacts by feral pigs beyond current conditions

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							The goals of the TAP for competition and land degradation by unmanaged goats minimise the impact of unmanaged goat competition and land degradation on biodiversity in Australia and its territories by protecting affected native species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape and may already be subject to impacts from unmanaged goats (though none have been sighted in surveys to date). As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is considered to be consistent with the goals of the TAP as it will not result in increased risk of impacts by unmanaged goats beyond current conditions

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Eucalyptus glaucina	Slaty Red Gum	V	Species Credit Species	Species mentioned as requiring consideration in Referral decision. Species not recorded during surveys conducted and presence not assumed under BAM as considered unlikely to occur	Potential loss of individuals if determined to be present within the site	966 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	Species Credit Species	Species not recorded within PMST search. Considered unlikely to occur. Within the BDAR presence is assumed as a conservative measure only until further targeted	Potential loss of individuals if determined to be present within the site	278 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				searches can be conducted			
Ozothamnus tesselatus		V	Species Credit Species	Species considered unlikely to occur for referral, not raised as species requiring further consideration in Referral decision. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	160 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Prasophyllum sp. Wybong (as Prasophyllum petilum in BAM-C)	Tarengo Leek Orchid	E	Species Credit Species	Species mentioned as requiring consideration in Referral decision (as Prasophyllum sp Wybong). Species considered unlikely to occur. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	265 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Prostanthera cineolifera	Singleton Mint Bush	V	Species Credit Species	Species not recorded within PMST search. Considered unlikely to occur. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	213 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a
Pterostylis gibbosa	Pouched Greenhood	E	Species Credit Species	Species considered unlikely to occur for referral, not raised as species requiring further consideration in Referral decision. Within the BDAR presence is assumed as a	Potential loss of individuals if determined to be present within the site	62 species credits calculated as a precautionary measure until further targeted surveys can be completed	The overall objective of the Recovery plan is to protect known populations of *Pterostylis gibbosa* from decline and to develop a management regime, based on current knowledge, designed to promote the plant's conservation and evolutionary potential *in situ*. Although this species is considered unlikely to occur, as a conservative approach, species credits for *P.gibbosa* have been calculated until targeted surveys can determine the presence of this species within the subject land. The proposed

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				conservative measure only until further targeted searches can be conducted			action is therefore considered to be consistent with the objectives of the recovery plan as targeted surveys will be conducted to determine the presence of this species and if detected measures will be taken to avoid impacts on this species with appropriate offsets provided for unavoidable impacts. In accordance with the BAM offset credits will ultimately require establishment of conservation sites (or Stewardship sites) with known populations of the species and involve management and conserve of the species in perpetuity. The following Threat Abatement Plans (TAPs) are relevant to this species: - TAP for competition and land degradation by rabbits The goal of the Threat Abatement Plan (TAP) for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities, and preventing further species and ecological communities from becoming threatened. The

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditions.
Rhodamnia rubescens	Scrub Turpentine	CE	Species Credit Species	Species not included in referral and not listed as requiring consideration as species was listed under EPBC Act in December 2020, i.e after Referral decision was made. Within the BDAR presence is assumed as a	Potential loss of individuals if determined to be present within the site	975 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				conservative measure only until further targeted searches can be conducted			
Rhodomyrtus psidioides	Native Guava	CE	Species Credit Species	Species not included in referral and not listed as requiring consideration as species was listed under EPBC Act in December 2020, i.e after Referral decision was made. Within the BDAR presence is assumed as a	Potential loss of individuals if determined to be present within the site	75 species credits calculated as a precautionary measure until further targeted surveys can be completed	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				conservative measure only until further targeted searches can be conducted			
Rutidosis heterogama	Heath Wrinklewort	V	Species Credit Species	Species not recorded within PMST search. Considered unlikely to occur. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	216 species credits calculated as a precautionary measure until further targeted surveys can be completed	The following Threat Abatement Plans (TAPs) are relevant to this species:- TAP for competition and land degradation by rabbitsThe goal of the Threat Abatement Plan (TAP) for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditions

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Thesium australe	Austral Toadflax	V	Species Credit Species	Species mentioned as requiring consideration in Referral decision. Species considered unlikely to occur. Within the BDAR presence is assumed as a conservative measure only until further targeted searches can be conducted	Potential loss of individuals if determined to be present within the site	343 species credits calculated as a precautionary measure until further targeted surveys can be completed	The following Threat Abatement Plans (TAPs) are relevant to this species: - TAP for competition and land degradation by rabbits The goal of the Threat Abatement Plan (TAP) for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is considered to be consistent with the goals of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditions

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Anthochaera phrygia	Regent Honeyeater	CE	Dual Credit Species	Species mentioned as likely to be impacted in Referral decision. Species assessed in accordance with the BAM - removed from consideration as species credit species based on mapped important areas. Retained as Ecocystem credit species for foraging habitat	Potential loss of foraging habitat due to vegetation clearing; potential reduction in quality of foraging habitat due to potential indirect impacts on foraging habitat	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising:26 credits for PCT 486240 credits for PCT 1602395 credits for PCT 160438 credits for PCT 16071647 credits for PCT 160852 credits for PCT 169162 credits for PCT 1603	The objectives of the Recovery plan for Regent Honeyeater are to Reverse the long-term population trend of decline and increase the numbers of regent honeyeaters to a level where there is a viable, wild breeding population, even in poor breeding years and to Enhance the condition of habitat across the regent honeyeaters range to maximise survival and reproductive success and provide refugia during periods of extreme environmental fluctuation. In accordance with the BAM assessments, the proposed action lies outside the Mapped Important Areas for this speices and therefore is outside of the areas of breeding habitat for this species. In accordance with the BAM, impacts to foraging habitat are to be offset via credits for habitat surrogates (PCTs). In accordance with the BAM the proposed action will offset for residual impacts to foraging habitat that cannot be avoided via provision of appropriate like for like credits which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve foraging habitat for this species in perpetuity. The proposed offsets are therefore considered to be

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							in accordance with the objectives of the National Recovery Plan for this species. The following Threat Abatement Plans (TAPs) are relevant to this species: - TAP for competition and land degradation by rabbits The goal of the Threat Abatement Plan (TAP) for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditions

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Chalinolobus dwyeri	Large-eared Pied Bat	V	Species Credit Species	Species mentioned as requiring consideration in Referral decision. Species recorded onsite and assessed further in accordance with the BAM. Only foraging habitat for this speices is impacted. Species considered to be at low risk of blade strike	Potential loss of foraging habitat due to vegetation clearing; potential reduction in quality of foraging habitat due to potential indirect impacts on foraging habitat; Loss of individuals from blade strike considered to be low to unlikely	12 species credits calculated for impacts to foraging habitat for this species	The objective of the National recovery plan for the large-eared pied bat is to ensure the persistence of viable populations of the large-eared pied bat throughout its geographic range. This species has been recorded as occurring within the disturbance area and therefore has been assessed as an impacted species credit species. In accordance with the BAM, offsets in the form of credits have been calculated for impacts that can't be avoided. The proposed action is therefore considered to be consistent with the objectives of the recovery plan as measures have been taken to avoid impacts on this species with appropriate offsets provided for unavoidable impacts. In accordance with the BAM offset credits will ultimately require establishment of conservation sites (or Stewardship sites) with known populations of the species and involve management and conserve of the species in perpetuity.
Dasyurus maculatus	Spotted-tailed Quoll	E	Ecosystem Credit Species	Species mentioned as requiring consideration in	Potential loss of habitat due to vegetation clearing;	Ecosystem credits for habitat using associated	The overall objective of the National Recovery Plan for the Spotted-tailed Quoll is to reduce the rate of decline of the species and ensure that viable populations remain throughout its current

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				Referral decision. Species retained as Predicted species and assessed in accordance with the BAM. Impacts not considered to be significant	potential reduction in quality of habitat due to potential indirect impacts on habitat	PCTs as surrogates comprising:26 credits for PCT 48647 credits for PCT 1541157 credits for PCT 1583825 credits for PCT 158459 credits for PCT 1683240 credits for PCT 1602395 credits for PCT 160438 credits for PCT 16071647 credits for PCT 160852 credits for PCT 169162 credits for PCT 16031 credit for PCT	range in eastern Australia. In accordance with the BAM this species has been assessed as an ecosystem credit species, i.e PCTs that this species is associated with are considered to comprise habitat for the speices even if there are no confirmed records for the species. In accordance with the BAM the proposed action will offset for residual impacts to habitat for this species that cannot be avoided via provision of appropriate like for like credits for habitat surrogates which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve habitats for this species in perpetuity. The proposed offsets are therefore considered to be in accordance with the objectives of the National Recovery Plan for this species The following Threat Abatement Plans (TAPs) are relevant to this species: - TAP for predation by feral cats - TAP for predation by the European red fox The goals of the TAP is to minimise the impact of feral cats on biodiversity in Australia and its territories by protecting affected native species

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
						169210 credits for PCT 173112 credits for PCT 1071	and ecological communities, and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural/rural residential landscape and may already be subject to impacts from feral cats. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is considered to be consistent with the goals of the TAP as it will not result in increased risk of impacts by feral cats beyond current conditions.The goals of the TAP to minimise the impact of the European Red Fox on biodiversity in Australia and its territories by protecting affected native species and ecological communities, and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural/rural residential landscape that is already subject to impacts from foxes. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							of the TAP as it will not result in increased risk of impacts by foxes beyond current conditions.
Grantiella picta	Painted Honeyeater	V	Ecosystem Credit Species	Species not raised as species requiring further consideration in Referral decision. Species assessed in accordance with the BAM - removed from consideration based on habitat constraints	n/a	n/a	n/a
Hirundapus caudacutus	White-throated Needletail	V	Ecosystem Credit Species	Species mentioned as requiring consideration in Referral decision. Impacts assessed as unlikely to be significant based	Potential loss of habitat due to vegetation clearing; potential reduction in quality of habitat due to	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 47 credits for	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				on lack of sightings during surveys and paucity of records. Significant Impact Criteria assessment provided as precautionary measure only	potential indirect impacts on habitat	PCT 1541 157 credits for PCT 1583 825 credits for PCT 1584 59 credits for PCT 1683 240 credits for PCT 1602 395 credits for PCT 1604 38 credits for PCT 1607 1647 credits for PCT 1608 52 credits for PCT 1691 62 credits for PCT 1603	

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Lathamus discolor	Swift Parrot	CE	Dual Credit Species	Species mentioned as likely to be impacted in Referral decision. Species assessed in accordance with the BAM - removed from consideration based on mapped important areas. Significant Impact Criteria assessment provided as precautionary measure only	Potential loss of foraging habitat due to vegetation clearing; potential reduction in quality of foraging habitat due to potential indirect impacts on foraging habitat	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising:157 credits for PCT 1583395 credits for PCT 160452 credits for PCT 169162 credits for PCT 16031 credit for PCT 1692	The objectives of the Recovery plan for Swift Parrot are to prevent further population decline of the Swift Parrot and to achieve a demonstrable sustained improvement in the quality and quantity of Swift Parrot habitat to increase carrying capacity. In accordance with the BAM assessments, the proposed action lies outside the Mapped Important Areas for this species and therefore is outside of the areas of breeding habitat for this species. In accordance with the BAM, impacts to foraging habitat are to be offset via credits for habitat surrogates (PCTs). In accordance with the BAM the proposed action will offset for residual impacts to foraging habitat that cannot be avoided via provision of appropriate like for like credits which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve foraging habitat for this species in perpetuity. The proposed offsets are therefore considered to be in accordance with the objectives of the National Recovery Plan for this species.

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							The following Threat Abatement Plans (TAPs) are relevant to this species: - TAP for predation by feral cats The goals of the TAP is to minimise the impact of feral cats on biodiversity in Australia and its territories by protecting affected native species and ecological communities, and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural/rural residential landscape and may already be subject to impacts from feral cats. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is considered to be consistent with the goals of the TAP as it will not result in increased risk of impacts by feral cats beyond current conditions.

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Phascolarctos cinereus	Koala	V	Dual Credit Species	Species mentioned as likely to be impacted in Referral decision. Species assessed in accordance with the BAM - removed from consideration as species credit species based on lack of important areas as per survey. Retained as Ecocystem credit species for foraging habitat	Potential loss of foraging habitat due to vegetation clearing; potential reduction in quality of foraging habitat due to potential indirect impacts on foraging habitat	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising:157 credits for PCT 1583395 credits for PCT 160462 credits for PCT 1603	n/a

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
Pseudomys oralis	Hastings River Mouse,	E	Ecosystem Credit Species	Species not raised as species requiring further consideration in Referral decision. Species retained as Predicted species and assessed in accordance with the BAM	Potential loss of habitat due to vegetation clearing; potential reduction in quality of habitat due to potential indirect impacts on habitat	Ecosystem credits for habitat using associated PCTs as surrogates comprising:157 credits for PCT 1583	The objective of the adopted Recovery Plan for the Hastings River Mouse is to recover the species to a position of viability in nature via implementation of actions such as the identification of significant populations and appropriate actions to protect and secure these populations. In accordance with the BAM this species has been assessed as an ecosystem credit species, i.e PCTs that this species is associated with are considered to comprise habitat for the species even if there are no confirmed records for the species. In accordance with the BAM the proposed action will offset for residual impacts to habitat for this species that cannot be avoided via provision of appropriate like for like credits for habitat surrogates which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve habitats for this species in perpetuity. The proposed offsets are therefore considered to be in accordance with the objectives of the Recovery Plan for this species The following Threat Abatement Plans (TAPs) are relevant to this species:

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							- TAP for competition and land degradation by rabbits - TAP for predation by the European red fox The goal of the Threat Abatement Plan (TAP) for competition and land degradation by rabbits is to minimise the impact of rabbit competition and land degradation on biodiversity in Australia and its territories by protecting affected threatened species and ecological communities and preventing further species and ecological communities from becoming threatened. The proposed action occurs in an agricultural landscape which is already impacted by rabbit populations. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is considered to be consistent with the goals of the TAP as it will not result in increased risk of impacts by rabbits beyond current conditionsThe goals of the TAP to minimise the impact of the European Red Fox on biodiversity in Australia and its territories by protecting affected native species and ecological communities, and preventing further species and ecological communities from becoming

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
							threatened. The proposed action occurs in an agricultural/rural residential landscape that is already subject to impacts from foxes. As the proposed action will entail a suite of environmental management plans to reduce the risk of introduction/spread of weeds and ferals, the proposed action is consistent with the goals of the TAP as it will not result in increased risk of impacts by foxes beyond current conditions.
Pteropus poliocephalus	Grey-headed Flying-fox	V	Dual Credit Species	Species mentioned as requiring consideration in Referral decision. Species assessed in accordance with the BAM - removed from consideration as species credit species based on lack of important areas as per	Potential loss of foraging habitat due to vegetation clearing; potential reduction in quality of foraging habitat due to potential indirect impacts on foraging habitat	Ecosystem credits for foraging habitat using associated PCTs as surrogates comprising:47 credits for PCT 1541157 credits for PCT 1583395 credits for PCT 160452 credits	The objectives of the National Recovery Plan for the Grey-headed Flying-fox are to improve the Grey-headed Flying-foxes national population trend by reducing the impact of the threats through habitat identification, protection, restoration and monitoring, and to assist communities and Grey-headed Flying-foxes to coexist through better education, stakeholder engagement, research, policy and continued support to fruit growers. In accordance with the BAM assessments, the proposed action does not contain any Flying fox camps and therefore is outside of the areas of breeding habitat for this species. In accordance with the BAM, impacts to

MNES Entity/ Scientific Name	Common Name	EPBC Act Status	BAM assessment entity or type	Impact Assessment	Consequences of impacts	Proposed offsets	Recovery Plan/Threat Abatement Plan
				survey. Retained as Ecocystem credit species for foraging habitat.		for PCT 169162 credits for PCT 16031 credit for PCT 1692	foraging habitat are to be offset via credits for habitat surrogates (PCTs). In accordance with the BAM the proposed action will offset for residual impacts to foraging habitat that cannot be avoided via provision of appropriate like for like credits which ultimately require establishment of conservation sites (or Stewardship sites) which manage, revegetate and conserve foraging habitat for this species in perpetuity. The proposed offsets are therefore considered to be in accordance with the objectives of the National Recovery Plan for this species.
Rostratula australis	Australian Painted Snipe	E	Ecosystem Credit Species	Species not raised as species requiring further consideration in Referral decision. Species retained as Predicted species and assessed in accordance with the BAM	Potential loss of habitat due to vegetation clearing; potential reduction in quality of habitat due to potential indirect impacts on habitat	Ecosystem credits for habitat using associated PCTs as surrogates comprising: 12 credits for PCT 1071	n/a

A.7.4. EPBC Act listed species not assessed by the BAM

Of the EPBC Act species listed in the Referral Decision, the following species were not included in the BAM-C

- Fork-tailed swift (*Apus pacificus*); and
- Eastern Bristlebird (*Dasyornis brachypterus*)

The Fork-tailed Swift is listed as a Migratory species under the EPBC Act and does not have any listing under the NSW BC Act. Nonetheless, potential impacts to the Fork-tailed Swift, primarily prescribed impacts, have been assessed in accordance with the BAM. This is detailed in *Section 6.5* of the AR-BDAR with further information provided in **Section A.4.3** and **Table 5** of this addendum report.

The Eastern Bristlebird is listed as Endangered under the EPBC Act and the BC Act. This species was filtered out by the BAM-C as this species is not associated with the PCTs/IBRA subregions present within the subject land. This is detailed in *Section 6.1.2, Section 6.4* and *Table 36* of the AR-BDAR and in **Table 5** of this addendum report.

Several migratory species listed in the PMST search conducted for the Referral were not included in the BAM-C. The justification for the removal or retention of these species is outlined in *Table 36* of the AR-BDAR and summarised in **Table 7** below

Table 7 EPBC listed (migratory) species considered

Scientific Name	Common Name	EPBC Act Status	Source	Species included in Referral	BAM_C	Justification for removal/retention
Cuculus optatus	Oriental Cuckoo	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Monarcha melanopsis	Black-faced Monarch	M	PMST search, BioNet search	Yes	Yes	Species assessed for strike risk and migratory flight path impacts (See Section 6.5 of AR-BDAR) given presence of records in BioNet. Potential for impact considered to be low given paucity of records and lack of migratory flight paths within the subject land

Scientific Name	Common Name	EPBC Act Status	Source	Species included in Referral	BAM_C	Justification for removal/retention
Monarcha trivirgatus	Spectacled Monarch	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Motacilla flava	Yellow Wagtail	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Myiagra cyanoleuca	Satin Flycatcher	M	PMST search, BioNet search	Yes	Yes	Species assessed for strike risk and migratory flight path impacts (See Section 6.5 of AR-BDAR) given presence of records in BioNet. Potential for impact considered to be low given paucity of records and lack of migratory flight paths within the subject land
Rhipidura rufifrons	Rufous Fantail	M	PMST search, BioNet search	Yes	Yes	Species assessed for strike risk and migratory flight path impacts (See Section 6.5 of AR-BDAR) given presence of records in BioNet. Potential for impact considered to be low given paucity of records and lack of migratory flight paths within the subject land
Actitis hypoleucos	Common Sandpiper	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search

Scientific Name	Common Name	EPBC Act Status	Source	Species included in Referral	BAM_C	Justification for removal/retention
Calidris acuminata	Sharp-tailed Sandpiper	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Calidris melanotos	Pectoral Sandpiper	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Gallinago hardwickii	Latham's Snipe	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Numenius madagascariensis	Eastern Curlew	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search
Tringa nebularia	Common Greenshank	M	PMST search	Yes	No	Species assessed as unlikely in referral, not listed in as requiring further consideration in Referral decision. Not assessed in BDAR due to lack of records in BioNet search

A.8. References

DAWE. (2021a). Hirundapus caudacutus - White-throated Needletail. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=682

DAWE. (2021b). SPRAT Profile: Apus pacificus - Fork-tailed Swift. Retrieved from http://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=678

DEC (NSW). (2004). *Threatened Biodiversity Survey and Assessment: Guidelines for Development and Activities. Working Draft*. Sydney: Department of Environment and Conservation (NSW).

EES. (2021a). Acacia pendula - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=10967&pType=Population&a=1

EES. (2021b). Barking Owl - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10561&pType=SpeciesCode&a=1

EES. (2021c). Callistemon linearifolius - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=10129&pType=SpeciesCode&a=1

EES. (2021d). Eucalyptus glaucina - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=10295&pType=SpeciesCode&a=1

EES. (2021e). Gang-gang Cockatoo - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10975&pType=SpeciesCode&a=1

EES. (2021f). Glossy Black-Cockatoo - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10140&pType=SpeciesCode&a=1

EES. (2021g). Large-eared Pied Bat - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=10157&pType=SpeciesCode&a=1

EES. (2021h). Little Eagle - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=20131&pType=SpeciesCode&a=1

EES. (2021i). Masked Owl - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10820&pType=SpeciesCode&a=1

EES. (2021j). Powerful Owl - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10562&pType=SpeciesCode&a=1

EES. (2021k). Rhodamnia rubescens - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=20341&pType=SpeciesCode&a=1

EES. (2021l). Rhodomyrtus psidioides - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/LinksEdit.aspx?pId=20342&pType=SpeciesCode&a=1

EES. (2021m). Southern Myotis - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10549&pType=SpeciesCode&a=1

EES. (2021n). Square-tailed Kite - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=10495&pType=SpeciesCode&a=1

EES. (2021o). White-bellied Sea Eagle - TBDC profile. Retrieved from https://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/ProfileEdit.aspx?pId=20322&pType=SpeciesCode&a=1

NSW Government. (2018). *'Species credit' threatened bats and their habitats - NSW survey guide for the Biodiversity Assessment Method*. Sydney: Office of Environment and Heritage.

APPENDIX B :
Updated BAM Credit reports

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020156/BAAS17064/20/00020160	19144 - Bowmans Wind Farm_Hunter - AR layout_Addendum response Feb 2022	24/11/2021
Assessor Name	**Report Created**	**BAM Data version ***
	21/02/2022	50
Assessor Number	**BAM Case Status**	**Date Finalised**
	Finalised	21/02/2022
Assessment Revision	**Assessment Type**	
4	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Bull Oak grassy woodland of the central Hunter Valley												
7	1692_Zone16_Moderate	Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	32.8	32.8	0.07	PCT Cleared - 53%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		1
											Subtotal	**1**
Narrow-leaved Ironbark - Bull Oak - Grey Box shrub - grass open forest of the central and lower Hunter												
6	1603_Zone15_Moderate	Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	64.5	64.5	1.9	PCT Cleared - 77%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		62
											Subtotal	**62**

Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter												
3	1604_Zone8_Moderate	Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	69.1	69.1	6.2	PCT Cleared - 71%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		213
											Subtotal	**213**
Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter												
5	1691_Zone14_Moderate	Central Hunter Grey Box—Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions	69.6	69.6	1.5	PCT Cleared - 77%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		52
											Subtotal	**52**

Phragmites australis and Typha orientalis coastal freshwater wetlands of the Sydney Basin Bioregion												
9	1071_Zone18_Poor	Not a TEC	58.6	58.6	0.4	PCT Cleared - 75%	High Sensitivity to Potential Gain			2.00		12
											Subtotal	**12**
River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range												
1	486_Zone1_Moderate	Not a TEC	70.4	70.4	0.13	PCT Cleared - 40%	High Sensitivity to Potential Gain			1.50		3
											Subtotal	**3**
Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter												
2	1602_Zone7_Moderate	Not a TEC	72.3	72.3	1.6	PCT Cleared - 54%	High Sensitivity to Potential Gain			1.75		49
											Subtotal	**49**
Swamp Oak - Weeping Grass grassy riparian forest of the Hunter Valley												
8	1731_Zone17_Poor	Not a TEC	26.8	26.8	0.88	PCT Cleared - 62%	High Sensitivity to Potential Gain			1.75		10
											Subtotal	**10**

White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley												
4	618_Zone 13_DNG	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	19.3	19.3	14.1	PCT Cleared - 73%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	170

10	618_Zone 19_Planted	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	65.6	65.6	2	PCT Cleared - 73%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	83
											Subtotal	**253**
											Total	**655**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Acacia bynoeana / Bynoe's Wattle (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Endangered	Vulnerable	False	213
								Subtotal	**213**

Acacia pendula - endangered population / Acacia pendula population in the Hunter catchment (Flora)									
1691_Zone14_Moderate	69.6	69.6	1.5			Endangered Population	Not Listed	True	77
1603_Zone15_Moderate	64.5	64.5	1.9			Endangered Population	Not Listed	True	93
								Subtotal	**170**
Asperula asthenes / Trailing Woodruff (Flora)									
1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Vulnerable	False	62
								Subtotal	**62**
Callistemon linearifolius / Netted Bottle Brush (Flora)									
1604_Zone8_Moderate	N/A	N/A	642			Vulnerable	Not Listed	False	963
								Subtotal	**963**
Cynanchum elegans / White-flowered Wax Plant (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Endangered	Endangered	False	213
1603_Zone15_Moderate	64.5	64.5	1.9			Endangered	Endangered	False	62
								Subtotal	**275**
Diuris tricolor / Pine Donkey Orchid (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Not Listed	False	160
1691_Zone14_Moderate	69.6	69.6	1.5			Vulnerable	Not Listed	False	39

1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Not Listed	False	47
								Subtotal	**246**
Eucalyptus glaucina / Slaty Red Gum (Flora)									
1604_Zone8_Moderate	N/A	N/A	308			Vulnerable	Vulnerable	False	616
1691_Zone14_Moderate	N/A	N/A	74			Vulnerable	Vulnerable	False	148
1603_Zone15_Moderate	N/A	N/A	96			Vulnerable	Vulnerable	False	192
								Subtotal	**956**
Grevillea parviflora subsp. parviflora / Small-flower Grevillea (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Vulnerable	False	213
1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Vulnerable	False	62
								Subtotal	**275**
Monotaxis macrophylla / Large-leafed Monotaxis (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Endangered	Not Listed	False	213
1603_Zone15_Moderate	64.5	64.5	1.9			Endangered	Not Listed	False	62
								Subtotal	**275**

Ozothamnus tesselatus / Ozothamnus tesselatus (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Vulnerable	False	160
								Subtotal	**160**
Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Not Listed	False	213
1691_Zone14_Moderate	69.6	69.6	1.5			Vulnerable	Not Listed	False	52
1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Not Listed	False	62
1692_Zone16_Moderate	32.8	32.8	0.07			Vulnerable	Not Listed	False	1
1731_Zone17_Poor	26.8	26.8	0.88			Vulnerable	Not Listed	False	12
								Subtotal	**340**
Pomaderris queenslandica / Scant Pomaderris (Flora)									
1603_Zone15_Moderate	64.5	64.5	1.9			Endangered	Not Listed	False	62
								Subtotal	**62**
Prasophyllum petilum / Tarengo Leek Orchid (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Endangered	Endangered	False	213
1691_Zone14_Moderate	69.6	69.6	1.5			Endangered	Endangered	False	52

								Subtotal	**265**
Prostanthera cineolifera / Singleton Mint Bush (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Vulnerable	False	213
								Subtotal	**213**
Pterostylis chaetophora / Pterostylis chaetophora (Flora)									
1602_Zone7_Moderate	72.3	72.3	1.6			Vulnerable	Not Listed	False	56
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Not Listed	False	213
1691_Zone14_Moderate	69.6	69.6	1.5			Vulnerable	Not Listed	False	52
1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Not Listed	False	62
								Subtotal	**383**
Pterostylis gibbosa / Illawarra Greenhood (Flora)									
1603_Zone15_Moderate	64.5	64.5	1.9			Endangered	Endangered	False	62
								Subtotal	**62**
Rutidosis heterogama / Heath Wrinklewort (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Vulnerable	False	213
								Subtotal	**213**
Thesium australe / Austral Toadflax (Flora)									
1604_Zone8_Moderate	69.1	69.1	6.2			Vulnerable	Vulnerable	False	160

1603_Zone15_Moderate	64.5	64.5	1.9			Vulnerable	Vulnerable	False	47
								Subtotal	**207**

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020156/BAAS17064/20/00020159	19144 - Bowmans Wind Farm_Upper Hunter - AR layout_Addendum response Feb 2022	24/11/2021
Assessor Name	**Report Created**	**BAM Data version ***
	21/02/2022	50
Assessor Number	**BAM Case Status**	**Date Finalised**
	Finalised	21/02/2022
Assessment Revision	**Assessment Type**	
4	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter												
6	1607_Zone11_Moderate	Not a TEC	51.7	51.7	0.03	PCT Cleared - 51%	High Sensitivity to Potential Gain			1.75		1
											Subtotal	**1**
Grey Box - Grey Gum - Rough-barked Apple - Blakely's Red Gum grassy open forest of the central Hunter												
7	1608_Zone12_Moderate	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	71.3	71.3	1.4	PCT Cleared - 50%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	61
											Subtotal	**61**

Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter												
5	1604_Zone8_Moderate	Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	66.2	66.2	0.09	PCT Cleared - 71%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		3
											Subtotal	**3**
River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range												
1	486_Zone1_Moderate	Not a TEC	68.8	68.8	0.16	PCT Cleared - 40%	High Sensitivity to Potential Gain			1.50		4
											Subtotal	**4**
Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter												
4	1602_Zone7_Moderate	Not a TEC	69.6	69.6	0.32	PCT Cleared - 54%	High Sensitivity to Potential Gain			1.75		10
											Subtotal	**10**

Whalebone Tree - Red Kamala dry subtropical rainforest of the lower Hunter River												
2	1541_Zone2_Moderate	Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions	77.8	77.8	0.63	PCT Cleared - 68%	High Sensitivity to Potential Gain	Vulnerable Ecological Community	Not Listed	1.75		21
											Subtotal	**21**

White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley												
8	618_Zone 13_DNG	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	15.8	15.8	6.4	PCT Cleared - 73%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	63
											Subtotal	**63**
White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley												
3	1584_Zone5_Moderate	Not a TEC	79	79.0	1.3	PCT Cleared - 42%	High Sensitivity to Potential Gain			1.50		38
											Subtotal	**38**
											Total	**201**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Callistemon linearifolius / Netted Bottle Brush (Flora)									
1604_Zone8_Moderate	N/A	N/A	7			Vulnerable	Not Listed	False	11
								Subtotal	**11**
Cynanchum elegans / White-flowered Wax Plant (Flora)									
1584_Zone5_Moderate	79.0	79.0	1.3			Endangered	Endangered	False	50
1604_Zone8_Moderate	66.2	66.2	0.09			Endangered	Endangered	False	3
1541_Zone2_Moderate	77.8	77.8	0.63			Endangered	Endangered	False	24
								Subtotal	**77**
Eucalyptus glaucina / Slaty Red Gum (Flora)									
1604_Zone8_Moderate	N/A	N/A	5			Vulnerable	Vulnerable	False	10
								Subtotal	**10**
Grevillea parviflora subsp. parviflora / Small-flower Grevillea (Flora)									
1604_Zone8_Moderate	66.2	66.2	0.09			Vulnerable	Vulnerable	False	3
								Subtotal	**3**

Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)									
1604_Zone8_Moderate	66.2	66.2	0.09			Vulnerable	Not Listed	False	3
								Subtotal	**3**
Pterostylis chaetophora / Pterostylis chaetophora (Flora)									
1602_Zone7_Moderate	69.6	69.6	0.32			Vulnerable	Not Listed	False	11
1604_Zone8_Moderate	66.2	66.2	0.09			Vulnerable	Not Listed	False	3
								Subtotal	**14**
Rhodamnia rubescens / Scrub Turpentine (Flora)									
1541_Zone2_Moderate	N/A	N/A	108			Critically Endangered	Not Listed	True	324
1584_Zone5_Moderate	N/A	N/A	217			Critically Endangered	Not Listed	True	651
								Subtotal	**975**
Rhodomyrtus psidioides / Native Guava (Flora)									
1584_Zone5_Moderate	79.0	79.0	1.3			Critically Endangered	Not Listed	True	75
								Subtotal	**75**
Rutidosis heterogama / Heath Wrinklewort (Flora)									
1604_Zone8_Moderate	66.2	66.2	0.09			Vulnerable	Vulnerable	False	3
								Subtotal	**3**

Senna acclinis / Rainforest Cassia (Flora)									
1541_Zone2_Moderate	77.8	77.8	0.63			Endangered	Not Listed	False	24
								Subtotal	**24**
Thesium australe / Austral Toadflax (Flora)									
1604_Zone8_Moderate	66.2	66.2	0.09			Vulnerable	Vulnerable	False	2
								Subtotal	**2**

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020156/BAAS17064/20/00020158	19144 - Bowmans Wind Farm_Tomalla- AR layout_Addendum response Feb 2022	24/11/2021
Assessor Name	**Report Created**	**BAM Data version ***
	21/02/2022	50
Assessor Number	**BAM Case Status**	**Date Finalised**
	Finalised	21/02/2022
Assessment Revision	**Assessment Type**	
4	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter												
6	1607_Zone11_Moderate	Not a TEC	51.7	51.7	1.2	PCT Cleared - 51%	High Sensitivity to Potential Gain			1.75		27
											Subtotal	**27**
Grey Box - Grey Gum - Rough-barked Apple - Blakely's Red Gum grassy open forest of the central Hunter												
7	1608_Zone12_Moderate	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	71.3	71.3	25.5	PCT Cleared - 50%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	1138
											Subtotal	**1138**

River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range												
1	486_Zone 1_Moderate	Not a TEC	68.8	68.8	0.13	PCT Cleared - 40%	High Sensitivity to Potential Gain			1.50		3
											Subtotal	**3**
Silvertop Stringybark - Tussock Grass grassy open forest of the Northern Tablelands escarpment and Barrington Tops												
4	1683_Zone6_Moderate	Not a TEC	91.7	91.7	1.7	PCT Cleared - 35%	High Sensitivity to Potential Gain			1.50		59
											Subtotal	**59**
Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter												
5	1602_Zone7_Moderate	Not a TEC	69.6	69.6	0.19	PCT Cleared - 54%	High Sensitivity to Potential Gain			1.75		6
											Subtotal	**6**
Thin-leaved Stringybark - Grey Gum - Broad-leaved Apple shrub - grass tall open forest on ranges of the lower North Coast												
2	1583_Zone4_Moderate	Not a TEC	87.4	87.4	4.8	PCT Cleared - 10%	High Sensitivity to Potential Gain			1.50		157
											Subtotal	**157**

White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley												
8	618_Zone 13_DNG	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	15.8	15.8	101.3	PCT Cleared - 73%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	1002
											Subtotal	**1002**
White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley												
3	1584_Zone5_Moderate	Not a TEC	79	79.0	9.7	PCT Cleared - 42%	High Sensitivity to Potential Gain			1.50		288
											Subtotal	**288**
											Total	**2680**

Species credits for threatened species

BAM Credit Summary Report

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Chalinolobus dwyeri / Large-eared Pied Bat (Fauna)									
1583_Zone4_Moderate	87.4	87.4	0.18			Vulnerable	Vulnerable	True	12
								Subtotal	**12**
Cynanchum elegans / White-flowered Wax Plant (Flora)									
1584_Zone5_Moderate	79.0	79.0	9.7			Endangered	Endangered	False	384
								Subtotal	**384**
Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)									
1583_Zone4_Moderate	87.4	87.4	4.8			Vulnerable	Not Listed	False	210
								Subtotal	**210**
Pomaderris queenslandica / Scant Pomaderris (Flora)									
1607_Zone11_Moderate	51.7	51.7	1.2			Endangered	Not Listed	False	31
1608_Zone12_Moderate	71.3	71.3	25.5			Endangered	Not Listed	False	910
								Subtotal	**941**

BAM Credit Summary Report

Proposal Details

Assessment Id	Proposal Name	BAM data last updated *
00020156/BAAS17064/20/00020157	19144 - Bowmans Wind Farm_Ellerston - AR layout_Addendum response Feb 2022	24/11/2021
Assessor Name	**Report Created**	**BAM Data version ***
	21/02/2022	50
Assessor Number	**BAM Case Status**	**Date Finalised**
	Finalised	21/02/2022
Assessment Revision	**Assessment Type**	
4	Major Projects	

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Ecosystem credits for plant communities types (PCT), ecological communities & threatened species habitat

Zone	Vegetation zone name	TEC name	Current Vegetation integrity score	Change in Vegetation integrity (loss / gain)	Area (ha)	Sensitivity to loss (Justification)	Species sensitivity to gain class	BC Act Listing status	EPBC Act listing status	Biodiversity risk weighting	Potential SAII	Ecosystem credits

Blakely's Red Gum - Narrow-leaved Ironbark - Rough-barked Apple shrubby woodland of the upper Hunter												
6	1607_Zone11_Moderate	Not a TEC	51.7	51.7	0.46	PCT Cleared - 51%	High Sensitivity to Potential Gain			1.75		10
											Subtotal	**10**
Grey Box - Grey Gum - Rough-barked Apple - Blakely's Red Gum grassy open forest of the central Hunter												
7	1608_Zone12_Moderate	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	71.3	71.3	10.1	PCT Cleared - 50%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	448
											Subtotal	**448**

Narrow-leaved Ironbark - Grey Box - Spotted Gum shrub - grass woodland of the central and lower Hunter												
5	1604_Zone8_Moderate	Central Hunter Ironbark—Spotted Gum—Grey Box Forest in the New South Wales North Coast and Sydney Basin Bioregions	66.2	66.2	5.4	PCT Cleared - 71%	High Sensitivity to Potential Gain	Endangered Ecological Community	Critically Endangered	2.00		179
											Subtotal	**179**
River Oak moist riparian tall open forest of the upper Hunter Valley, including Liverpool Range												
1	486_Zone1_Moderate	Not a TEC	68.8	68.8	0.63	PCT Cleared - 40%	High Sensitivity to Potential Gain			1.50		16
											Subtotal	**16**
Spotted Gum - Narrow-leaved Ironbark shrub - grass open forest of the central and lower Hunter												
4	1602_Zone7_Moderate	Not a TEC	69.6	69.6	5.7	PCT Cleared - 54%	High Sensitivity to Potential Gain			1.75		175
											Subtotal	**175**

Whalebone Tree - Red Kamala dry subtropical rainforest of the lower Hunter River												
2	1541_Zone2_Moderate	Not a TEC	77.8	77.8	0.77	PCT Cleared - 68%	High Sensitivity to Potential Gain			1.75		26
											Subtotal	**26**
White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley												
8	618_Zone13_DNG	White Box - Yellow Box - Blakely's Red Gum Grassy Woodland and Derived Native Grassland in the NSW North Coast, New England Tableland, Nandewar, Brigalow Belt South, Sydney Basin, South Eastern Highla	15.8	15.8	56.8	PCT Cleared - 73%	High Sensitivity to Potential Gain	Critically Endangered Ecological Community	Critically Endangered	2.50	TRUE	561
											Subtotal	**561**

White Mahogany - Spotted Gum - Grey Myrtle semi-mesic shrubby open forest of the central and lower Hunter Valley												
3	1584_Zone5_Moderate	Not a TEC	79	79.0	16.9	PCT Cleared - 42%	High Sensitivity to Potential Gain			1.50		499
											Subtotal	**499**
											Total	**1914**

Species credits for threatened species

Vegetation zone name	Habitat condition (Vegetation Integrity)	Change in habitat condition	Area (ha)/Count (no. individuals)	Sensitivity to loss (Justification)	Sensitivity to gain (Justification)	BC Act Listing status	EPBC Act listing status	Potential SAII	Species credits
Cynanchum elegans / White-flowered Wax Plant (Flora)									
1541_Zone2_Moderate	77.8	77.8	0.77			Endangered	Endangered	False	30
1584_Zone5_Moderate	79.0	79.0	16.9			Endangered	Endangered	False	666
1604_Zone8_Moderate	66.2	66.2	5.4			Endangered	Endangered	False	179
								Subtotal	**875**
Phascogale tapoatafa / Brush-tailed Phascogale (Fauna)									
1604_Zone8_Moderate	66.2	66.2	5.4			Vulnerable	Not Listed	False	179
								Subtotal	**179**

Pomaderris queenslandica / Scant Pomaderris (Flora)									
1607_Zone11_Moderate	51.7	51.7	0.46			Endangered	Not Listed	False	12
1608_Zone12_Moderate	71.3	71.3	10.1			Endangered	Not Listed	False	359
								Subtotal	**371**
Thesium australe / Austral Toadflax (Flora)									
1604_Zone8_Moderate	66.2	66.2	5.4			Vulnerable	Vulnerable	False	134
								Subtotal	**134**

APPENDIX C :
BCD Correspondence

Gitanjali Katrak

From: Robert Gibson <Robert.Gibson@environment.nsw.gov.au>
Sent: Thursday, December 9, 2021 3:57 PM
To: Gitanjali Katrak
Cc: David Robertson; James Bailey; Steven Crick
Subject: RE: HPE CM: RE: HPE CM: Bowmans Creek Wind Farm - 24th Nov meeting follow up actions

Dear Gitanjali,
In relation to question of survey effort for prescribed impacts for the proposed Bowmans Creek windfarm BCD has given further consideration to this issue since our meeting on November 24th and can advise the following:

Section 9.2.1.8 of the BAM 2017 requires a detailed assessment of the impacts of wind turbine strikes on protected species. The survey effort and approach recommended in our letter dated 1 November 2021 would be ideal. However, in the absence of Departmental guidelines (which are still in preparation), it has largely been up to proponents to develop their own survey methodology to assess prescribed impacts. This has led to a focus of survey effort being done post-consent, particularly when addressing the issue of micro siting of wind turbines, or through monitoring during the operation. This is not ideal as turbines may inadvertently be positioned in flyways or within other areas of high use by local birds or microbats.

BCD acknowledges that the survey and assessment work done for the Bowmans Creek windfarm project has identified four species of birds and three species of microbats likely to be at the greatest risk of turbine strike because they fly at a height at which the wind turbine blades would operate. For this project, given its location away from large waterbodies or wetlands, and where there is a suggested absence of flyways for migratory species BCD will accept further surveys to be done during micro siting studies and during on-going monitoring under a Bird and Bat Adaptive Management Plan. For future windfarm projects there is likely to be a requirement for more surveys to be done during the preparation of the EIS to provide a more detailed analysis of bird and bat utilisation of sites of future projects.

If you have any questions about this advice then please call me on 4927 3154 to discuss.

Kind regards,
Robert

Robert Gibson
Senior Regional Biodiversity Conservation Officer, Hunter Central Coast Branch

Biodiversity & Conservation Division | Department of Planning, Industry and Environment
T 02 4927 3154 | **E** robert.gibson@environment.nsw.gov.au
6 Stewart Avenue, Newcastle NSW 2300
Locked Bag 1002, Dangar NSW 2309
www.dpie.nsw.gov.au

Please note our branch email address has changed. Please send all new planning requests to huntercentralcoast@environment.nsw.gov.au where they will be entered into our document management system and will be forwarded to our Senior Team Leader.

From: Gitanjali Katrak <gitanjali.katrak@cumberlandecology.com.au>
Sent: Friday, 3 December 2021 3:39 PM
To: Robert Gibson <Robert.Gibson@environment.nsw.gov.au>
Cc: david.robertson@cumberlandecology.com.au; James Bailey <jbailey@baileyassociates.com.au>; Steven Crick <Steven.Crick@environment.nsw.gov.au>
Subject: HPE CM: RE: HPE CM: Bowmans Creek Wind Farm - 24th Nov meeting follow up actions

Hello Robert,

Thank-you for the confirmation. We will proceed with our responses based on the confirmation/advice below in relation to credit calculations and frequency/intensity of impacts.

Are you able to please provide an indication of when we could expect a response in relation to the outstanding item – survey effort for prescribed impacts.

Regards,

Gitanjali Katrak | Senior Project Manager/Ecologist

Cumberland Ecology | Sydney - Brisbane
t 02 9868 1933
e gitanjali.katrak@cumberlandecology.com.au

From: Robert Gibson <Robert.Gibson@environment.nsw.gov.au>
Sent: Friday, 3 December 2021 3:23 PM
To: Gitanjali Katrak <gitanjali.katrak@cumberlandecology.com.au>
Cc: David Robertson <David.Robertson@cumberlandecology.com.au>; James Bailey <jbailey@baileyassociates.com.au>; Steven Crick <Steven.Crick@environment.nsw.gov.au>
Subject: RE: HPE CM: Bowmans Creek Wind Farm - 24th Nov meeting follow up actions

Dear Gitanjali,
Thank you for your e-mail with the summary from our meeting on 24 November about the Response to Submissions response for the Bowmans Creek Windfarm. I apologise for the delay in getting back to you.

In relation to Cumberland Ecology's proposed methodology for estimating numbers of species-credit plant species that are measured by count, BCD accepts Cumberland Ecology's proposal.

In relation to Table 27 in the revised BDAR BCD recommends that two new columns are added to the table to 'frequency' and 'intensity'. In relation to 'frequency' add text to describe whether the indirect impact is likely to be on-going, daily, weekly, episodic or rare in occurrence. In relation to 'intensity' add text to describe whether the impact is likely to be of low, moderate or high impact, and whether its effects are likely to be localised or widespread.

In relation to the amount of survey effort for prescribed impacts for windfarms BCD will get back to you later with advice.

If you have any questions about this e-mail then please call me on 4927 3154 to discuss.

Kind regards,
Rob

Robert Gibson
Senior Regional Biodiversity Conservation Officer, Hunter Central Coast Branch

Biodiversity & Conservation Division | Department of Planning, Industry and Environment
T 02 4927 3154 | **E** robert.gibson@environment.nsw.gov.au
6 Stewart Avenue, Newcastle NSW 2300
Locked Bag 1002, Dangar NSW 2309

www.dpie.nsw.gov.au

Please note our branch email address has changed. Please send all new planning requests to huntercentralcoast@environment.nsw.gov.au where they will be entered into our document management system and will be forwarded to our Senior Team Leader.

From: Gitanjali Katrak <gitanjali.katrak@cumberlandecology.com.au>
Sent: Monday, 29 November 2021 11:57 AM
To: Robert Gibson <Robert.Gibson@environment.nsw.gov.au>
Cc: david.robertson@cumberlandecology.com.au; James Bailey <jbailey@baileyassociates.com.au>; Steven Crick <Steven.Crick@environment.nsw.gov.au>
Subject: HPE CM: Bowmans Creek Wind Farm - 24th Nov meeting follow up actions

Hello Robert,

Following on from the 24th Nov meeting for the Bowmans Creek Wind Farm – please find attached our summary of the requisite actions for each of the six issues discussed at the meeting.

1. Input/guidance from the BCD is required for Item 3 and Item 4 – could these please be provided sometime this week.

2. With regard to Item 1 – please find below our proposed methodology for calculating credits for the three species where Count is the unit of measure. Could you please provide written confirmation of acceptance of this methodology by ***30th November*** so that we can commence conducting the requisite calculations.

   Relevant Species for Bowmans Creek Project
   - *Eucalyptus glaucina*
   - *Callistemon linearifolius*
   - *Rhodamnia rubescencs*

   Proposed Methodology
   - Confirm BAM Growth form (Tree or Shrub) of each of the relevant threatened flora species
   - Confirm associated PCTs that each threatened species is associated with.
   - Determine estimated abundance/# of individuals of species with same growth form within BAM plots of relevant PCTs, use average where there are multiple PCTs/plots to get an average # of individuals/0.04 ha BAM plot. Extrapolate this to #individuals/ha
   - Utilise calculated #individuals/ha values for each species to calculate credits

3. With regard to Item 5 – please find below Dropbox link with all attachments that were uploaded to the BAM-C parent case

   https://www.dropbox.com/sh/7hiexb6xxzcz9ek/AACgTgJu_qavpOiMrIBcRn9Fa?dl=0

Regards,

Gitanjali Katrak
Senior Project Manager/Ecologist

Cumberland Ecology | Sydney - Brisbane
t 02 9868 1933
e gitanjali.katrak@cumberlandecology.com.au
w cumberlandecology.com.au

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Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the NSW Office of Environment, Energy and Science.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

FIGURES

Figure 15.1. Species polygon - Hunter and Upper Hunter subregions (Section 3)

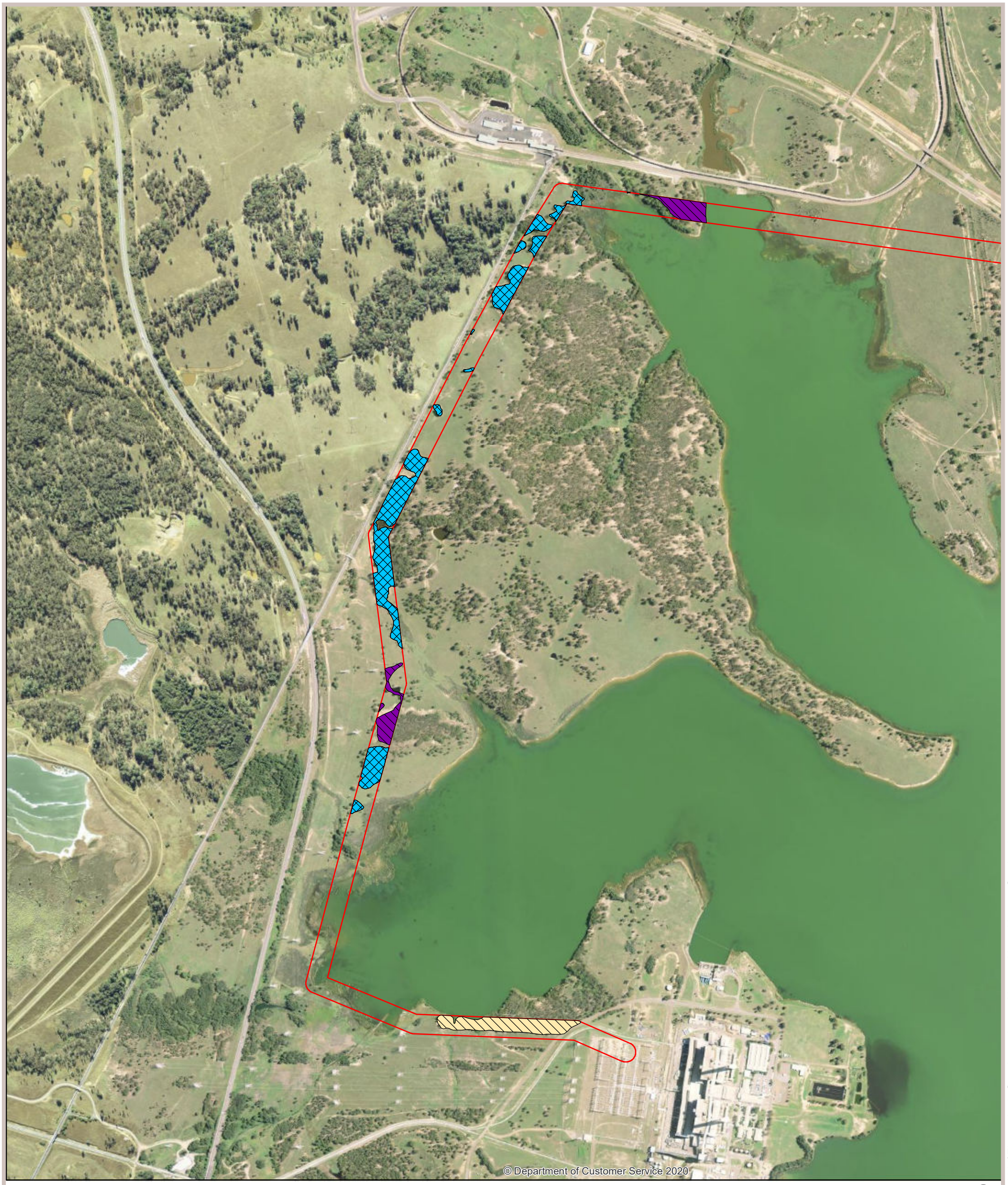


Figure 15.2. Species polygon - Hunter and Upper Hunter subregions (Section 6)

Legend

Subject Land

Species Polygon

1602 - Pterostylis chaetophora

1603 - Acacia pendula, Asperula asthenes, Diuris tricolor, Grevillea parviflora, Monotaxis macrophylla, Pterostylis chaetophora, Pterostylis gibbosa

1604 - Acacia bynoeana, Diuris tricolor, Grevillea parviflora subsp. parviflora, Monotaxis macrophylla, Ozothamnus tesselatus, Prasophyllum petilum , Prostanthera cineolifera, Pterostylis chaetophora, Rutidosis heterogama

Callistemon linearifolius – estimated count/ha

Eucalyptus glaucina – estimated count/ha

Coordinate System: MGA Zone 56 (GDA 94)

cumberland ecology

0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 15\20211206\Figure 15.3. Species polygon_Hunter_UpperHunter_Section 7

Figure 15.3. Species polygon - Hunter and Upper Hunter subregions (Section 7)

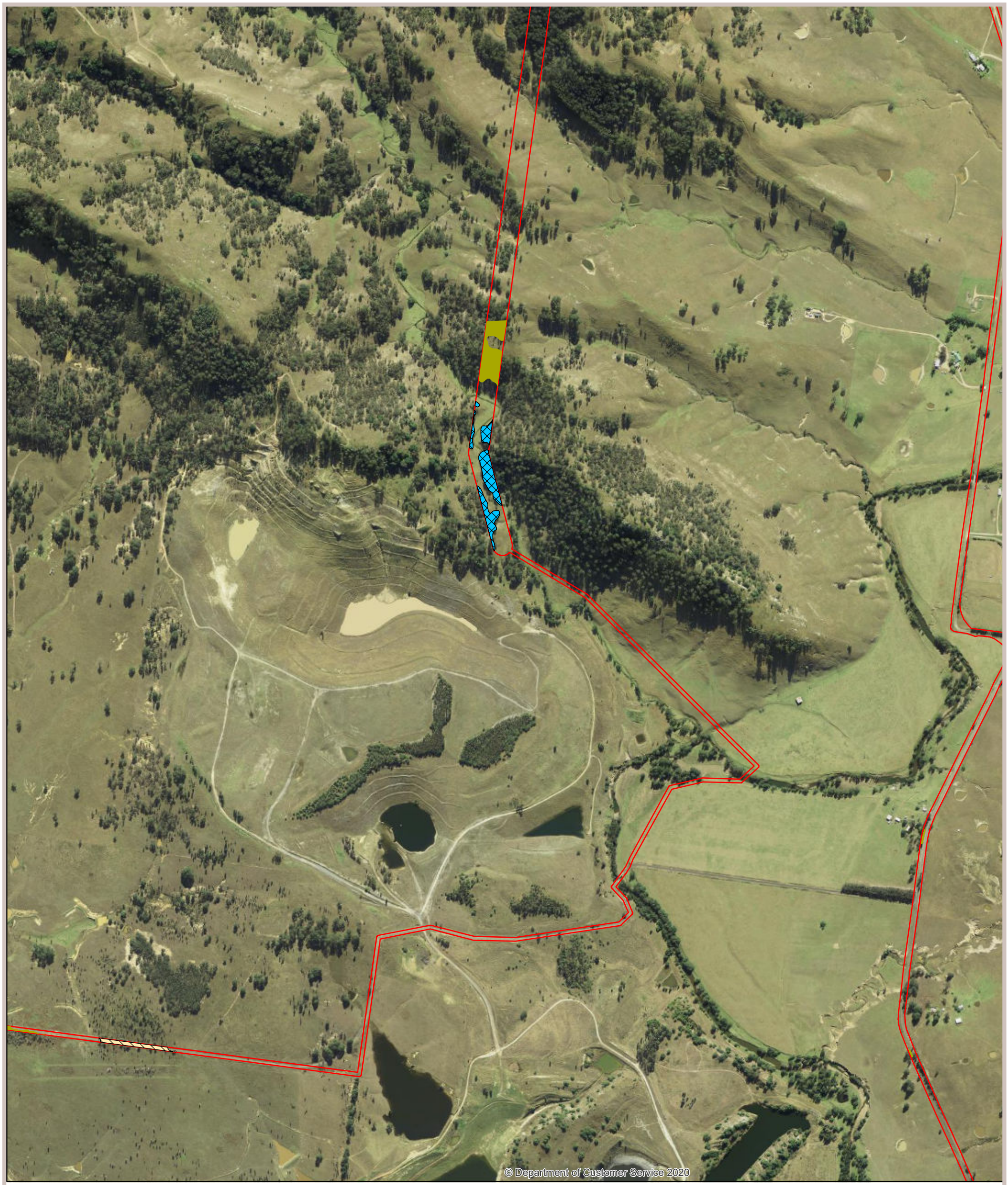
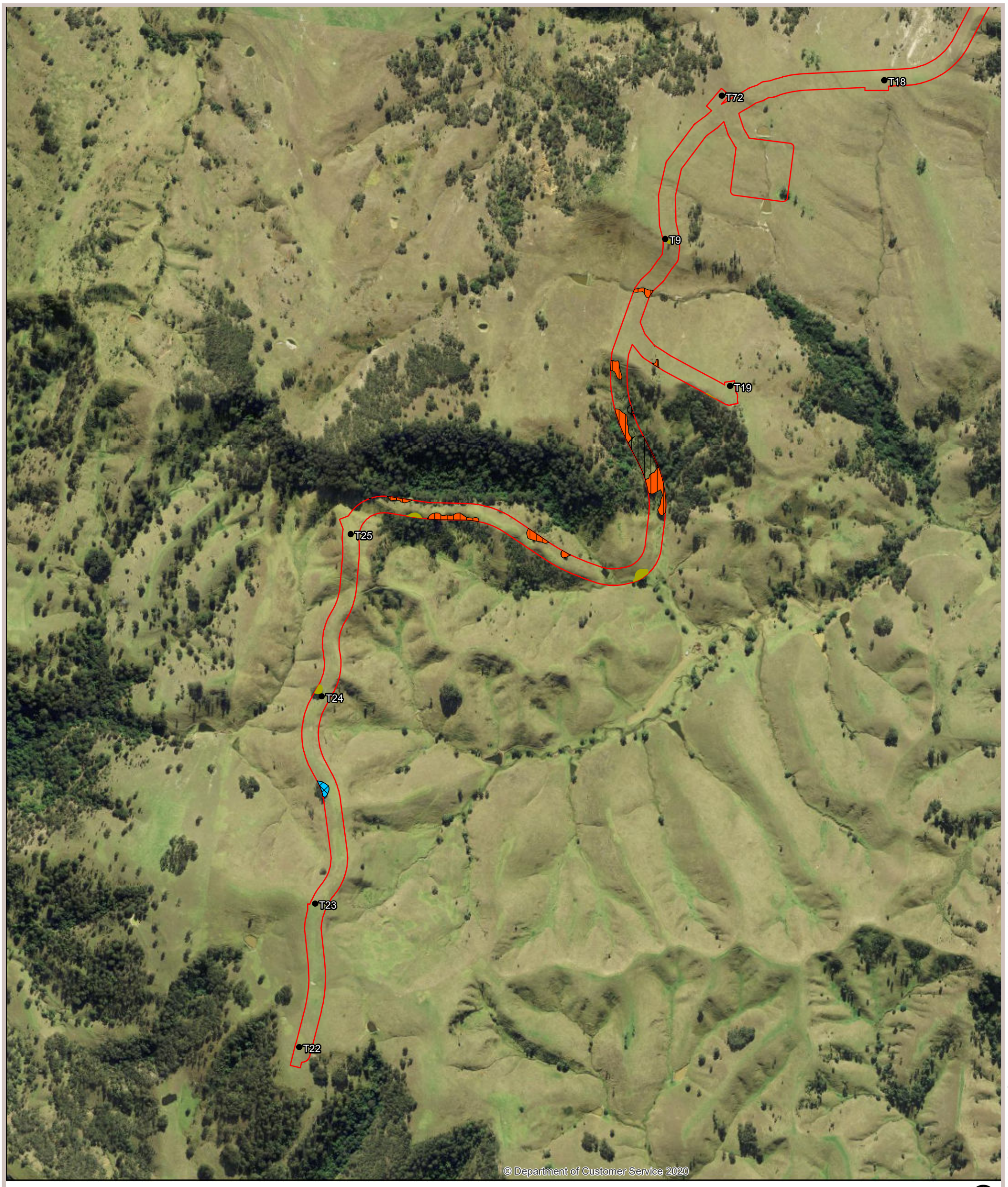


Figure 15.4. Species polygon - Hunter and Upper Hunter subregions (Section 8)

Figure 15.5. Species polygon - Hunter and Upper Hunter subregions (Section 18)



Legend

Subject Land

Turbine Locations

Species Polygon

1584 - Rhodomyrtus psidioides

1602 - Pterostylis chaetophora

1604 - Acacia bynoeana, Diuris tricolor, Grevillea parviflora subsp. parviflora, Monotaxis macrophylla, Ozothamnus tesselatus, Prasophyllum petilum , Prostanthera cineolifera, Pterostylis chaetophora, Rutidosis heterogama

Callistemon linearifolius – estimated count/ha

Eucalyptus glaucina – estimated count/ha

Rhodamnia rubescens – estimated count/ha

Coordinate System: MGA Zone 56 (GDA 94)

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I:\...\19144\Figures\Letter 8\Figure 15\20211206\Figure 15.6. Species polygon_Hunter_UpperHunter_Section 21

Figure 15.6. Species polygon - Hunter and Upper Hunter subregions (Section 21)

0 100 200 300 400 m

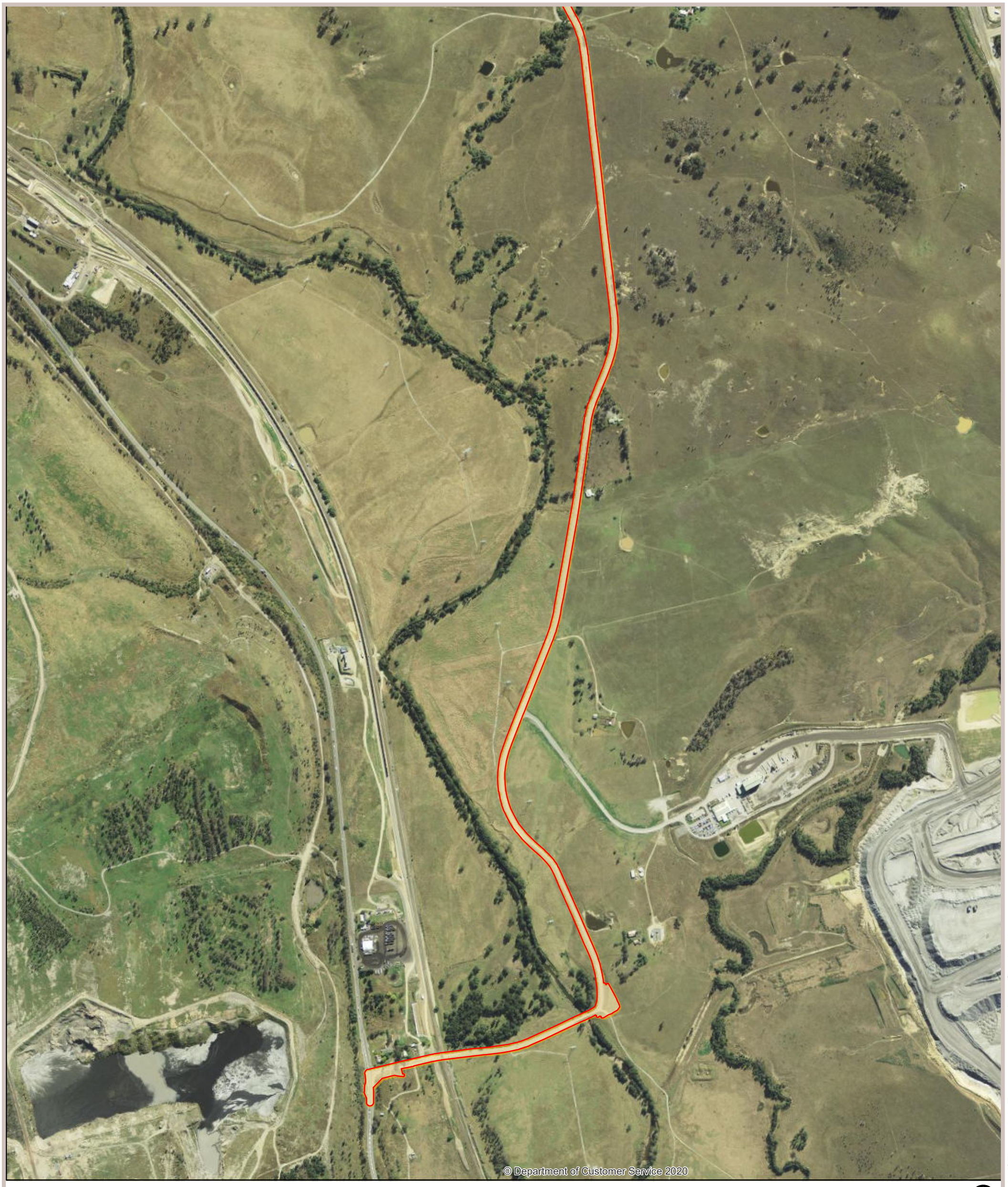

Figure 6.1. Fauna survey locations (Section 1)

Figure 6.2. Fauna survey locations (Section 2)

Figure 6.3. Fauna survey locations (Section 3)

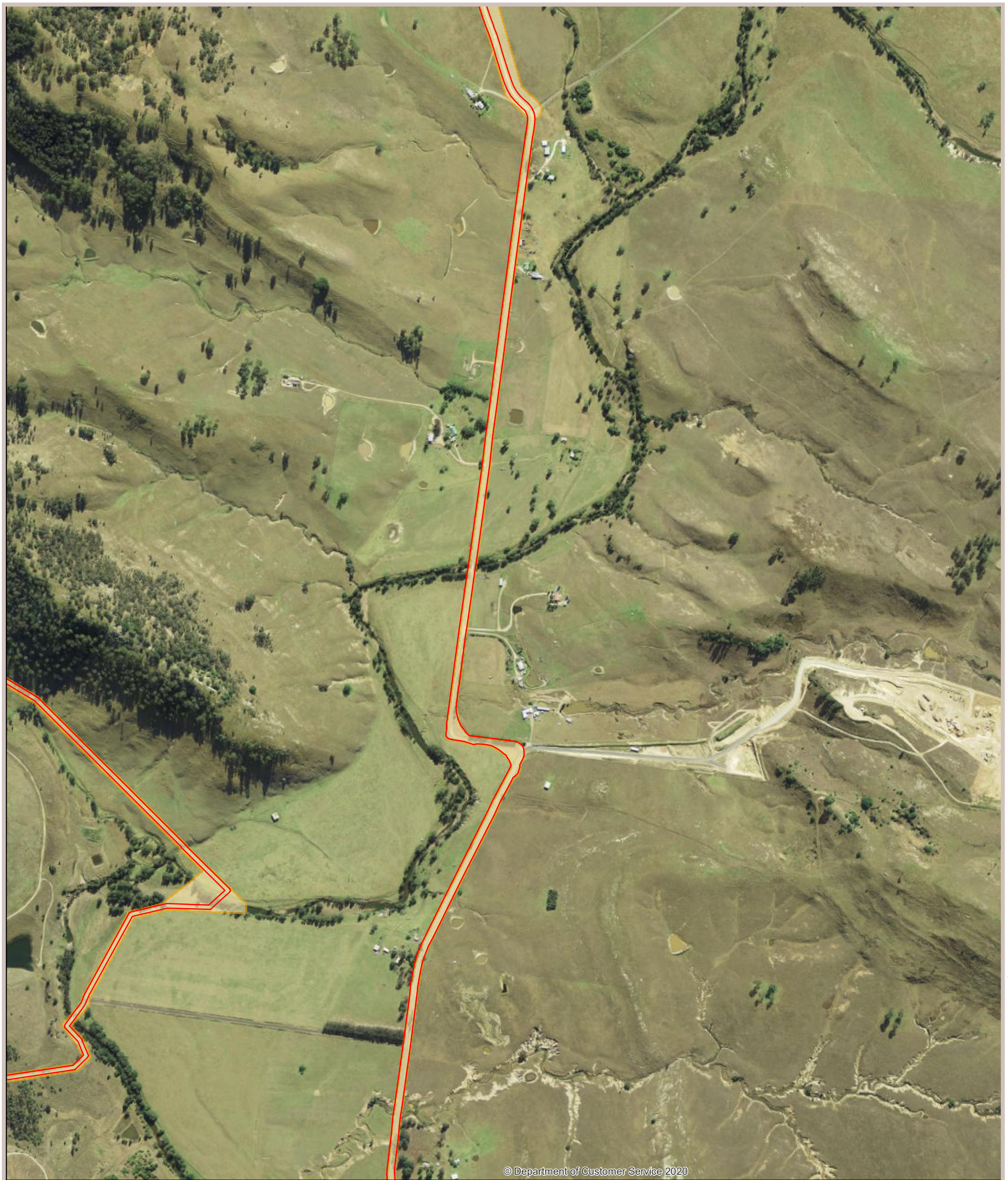

Figure 6.4. Fauna survey locations (Section 4)

Figure 6.5. Fauna survey locations (Section 5)

Figure 6.6. Fauna survey locations (Section 6)

Figure 6.7. Fauna survey locations (Section 7)

Figure 6.8. Fauna survey locations (Section 8)

Figure 6.9. Fauna survey locations (Section 9)

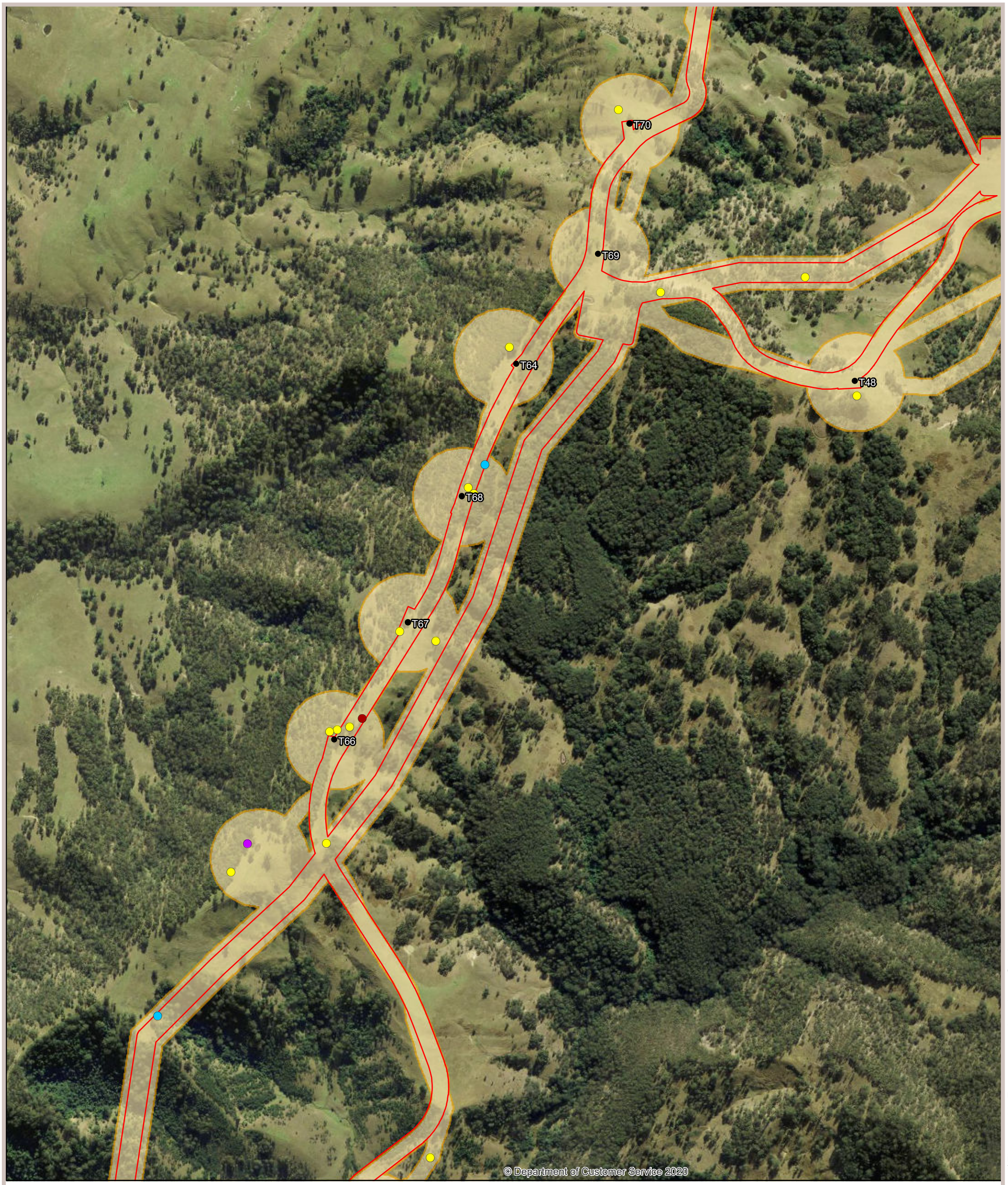

Figure 6.10. Fauna survey locations (Section 10)

Legend

- Subject Land
- Survey Area
- Turbine Locations

Fauna Survey Locations

- Fauna Habitat Assessment (including tree hollow and raptor nest searches)
- Targeted bat surveys
- Bird Census

Coordinate System: MGA Zone 56 (GDA 94)

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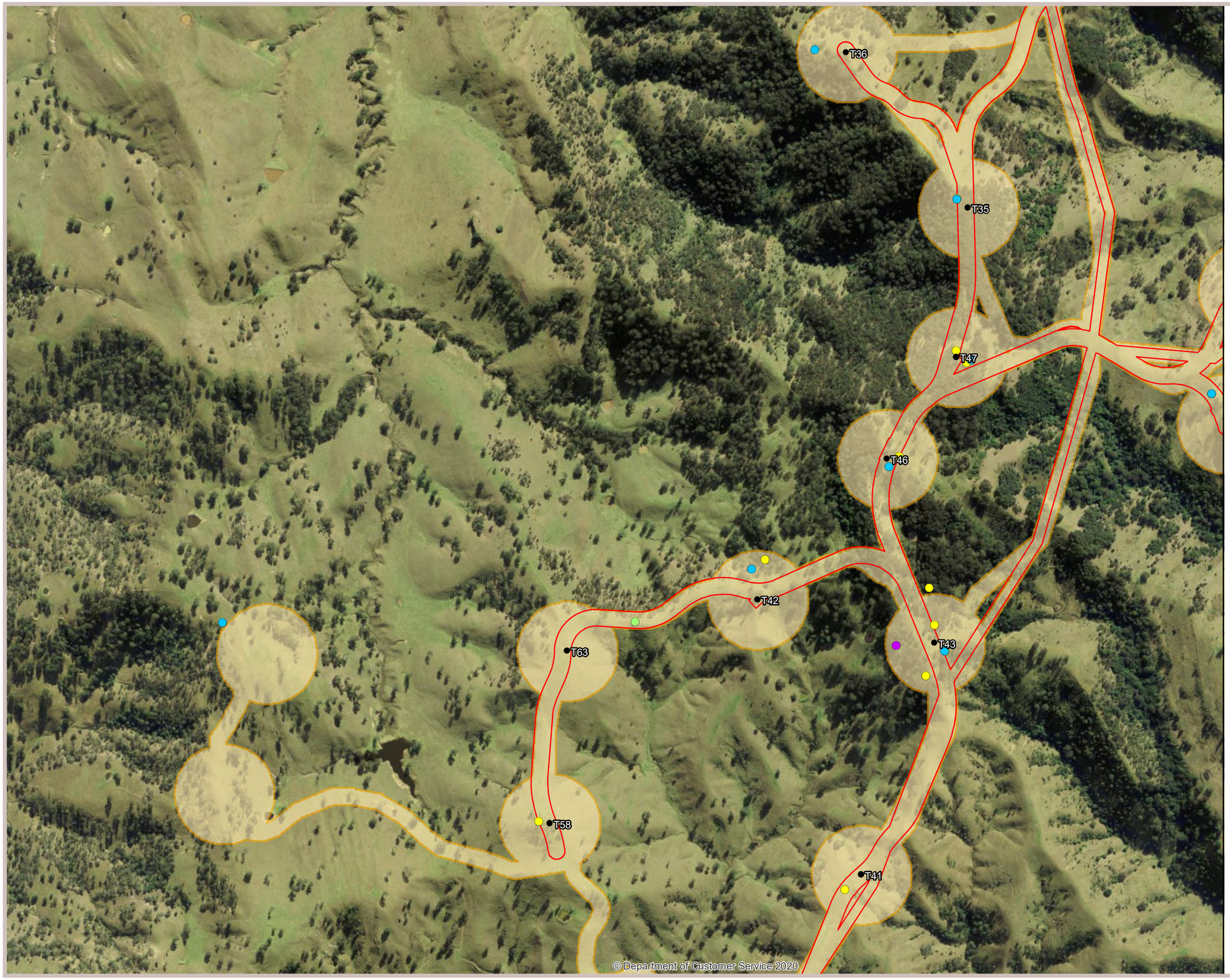
0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 6\202111206\Figure 6.11. Fauna survey locations_Section 11

Figure 6.11. Fauna survey locations (Section 11)



Legend

- Subject Land
- Survey Area
- Turbine Locations

Fauna Survey Locations

- Fauna Habitat Assessment (including tree hollow and raptor nest searches)
- Targeted bat surveys
- Bird Census
- Hollow Check

Coordinate System: MGA Zone 56 (GDA 94)

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0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 6\20211206\Figure 6.12. Fauna survey locations_Section 12

Figure 6.12. Fauna survey locations (Section 12)

Legend

- Subject Land
- Survey Area
- Turbine Locations

Fauna Survey Locations

- Fauna Habitat Assessment (including tree hollow and raptor nest searches)
- Targeted bat surveys
- Bird Census
- Bird Census/Chewed Cone searches

Coordinate System: MGA Zone 56 (GDA 94)

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0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 6\20211206\Figure 6.13. Fauna survey locations_Section 13

Figure 6.13. Fauna survey locations (Section 13)

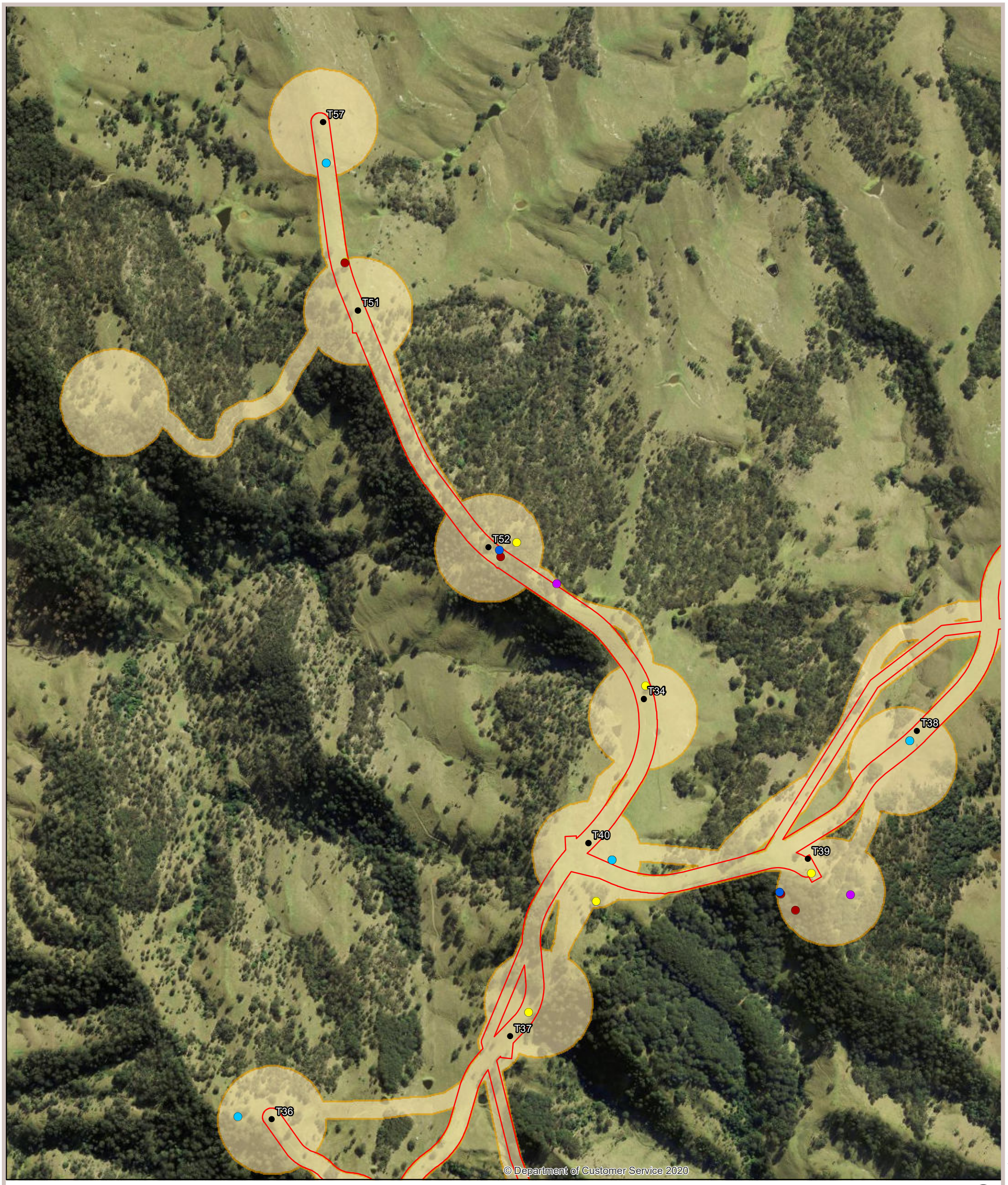

Figure 6.14. Fauna survey locations (Section 14)

Legend

- Subject Land
- Survey Area
- Turbine Locations

Fauna Survey Locations

- Fauna Habitat Assessment (including tree hollow and raptor nest searches)
- Bird Census
- Hollow Check

Coordinate System: MGA Zone 56 (GDA 94)

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0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 6\202111206\Figure 6.15. Fauna survey locations_Section 15

Figure 6.15. Fauna survey locations (Section 15)

Legend

- Subject Land
- Survey Area
- Turbine Locations

Fauna Survey Locations

- Fauna Habitat Assessment (including tree hollow and raptor nest searches)
- Targeted bat surveys
- Bird Census
- Hollow Check

Coordinate System: MGA Zone 56 (GDA 94)

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0 100 200 300 400 m

I:\...\19144\Figures\Letter 8\Figure 6\20211206\Figure 6.16. Fauna survey locations_Section 16

Figure 6.16. Fauna survey locations (Section 16)

Figure 6.17. Fauna survey locations (Section 17)

Figure 6.18. Fauna survey locations (Section 18)

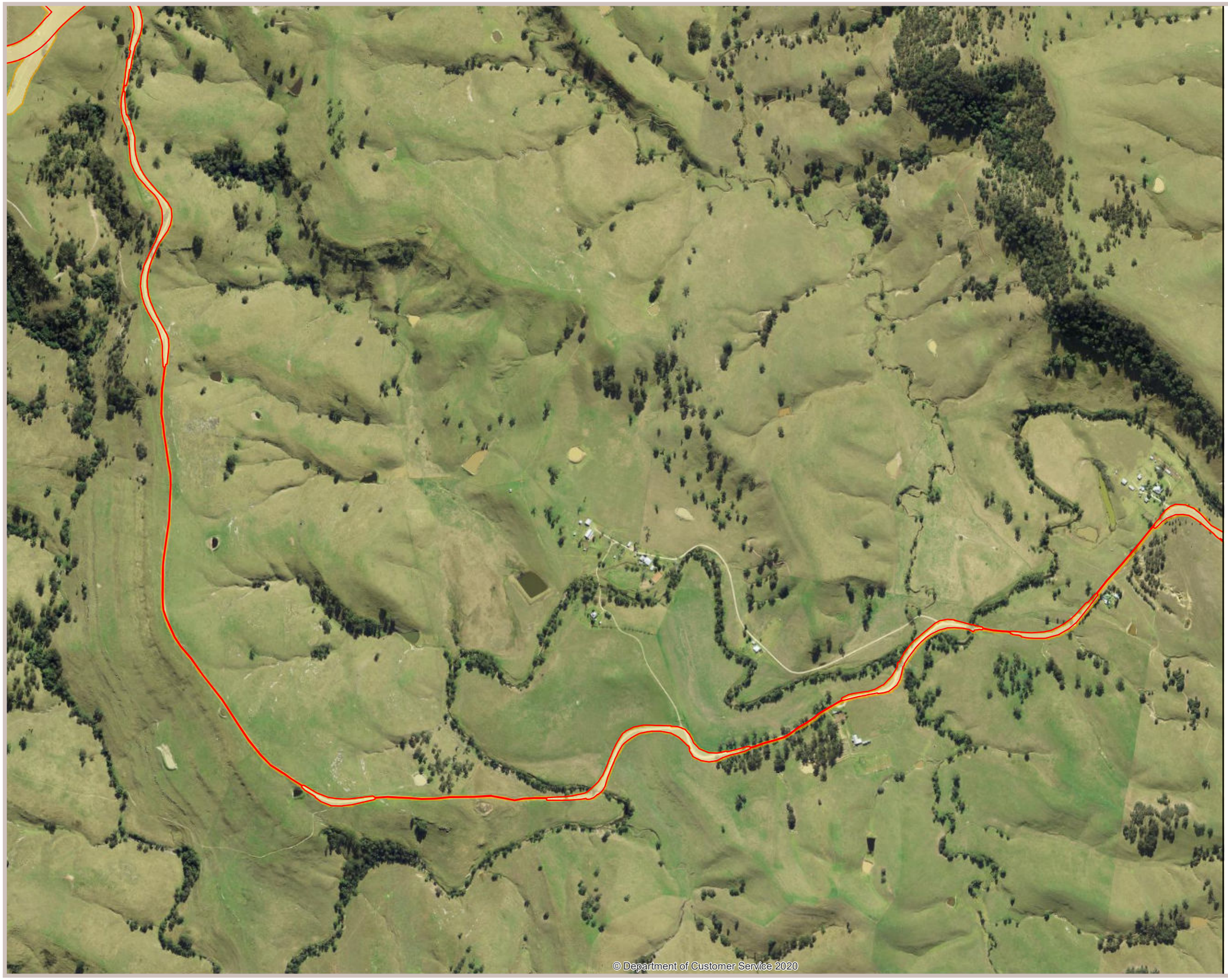


Figure 6.19. Fauna survey locations (Section 19)

Figure 6.20. Fauna survey locations (Section 20)

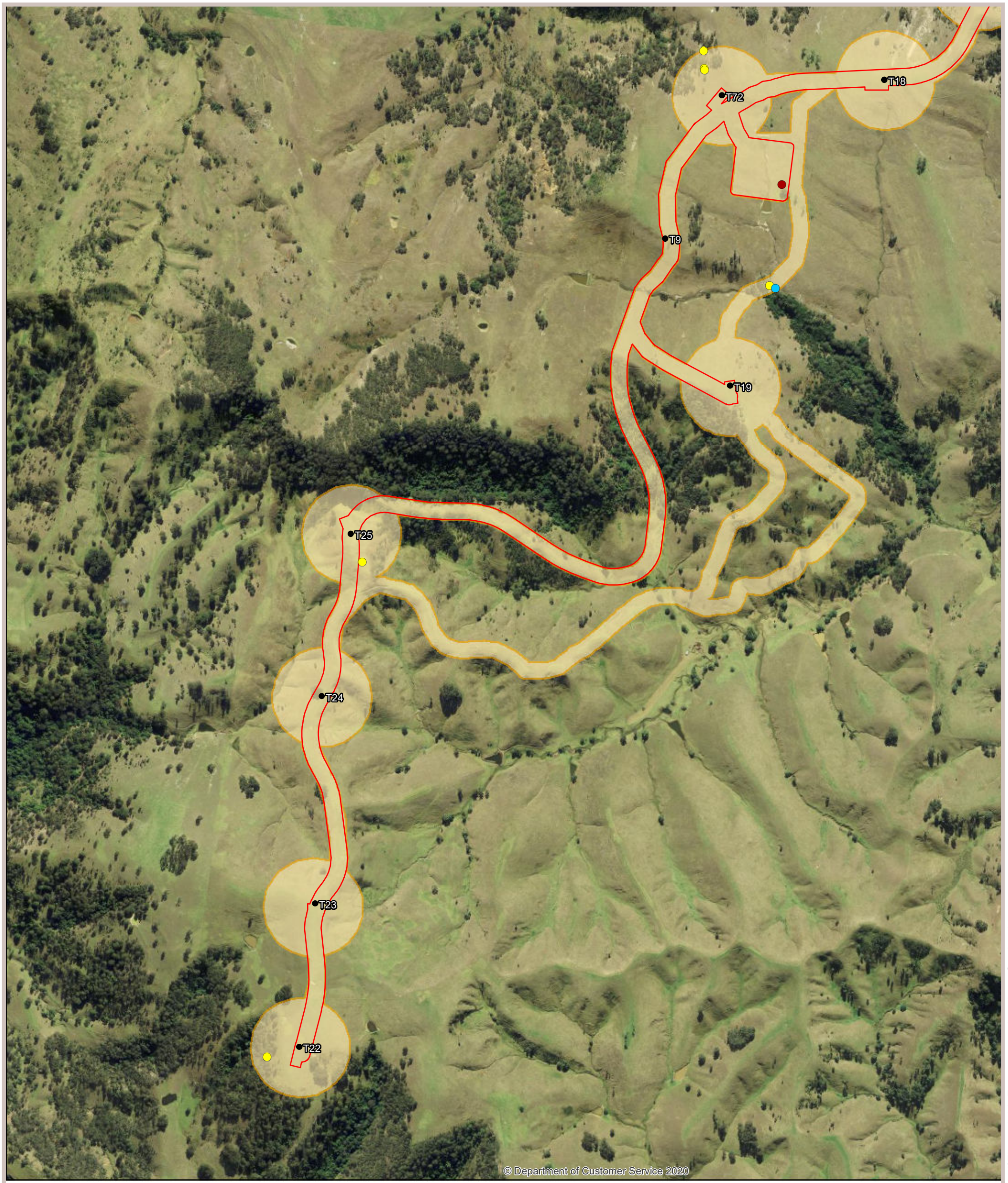
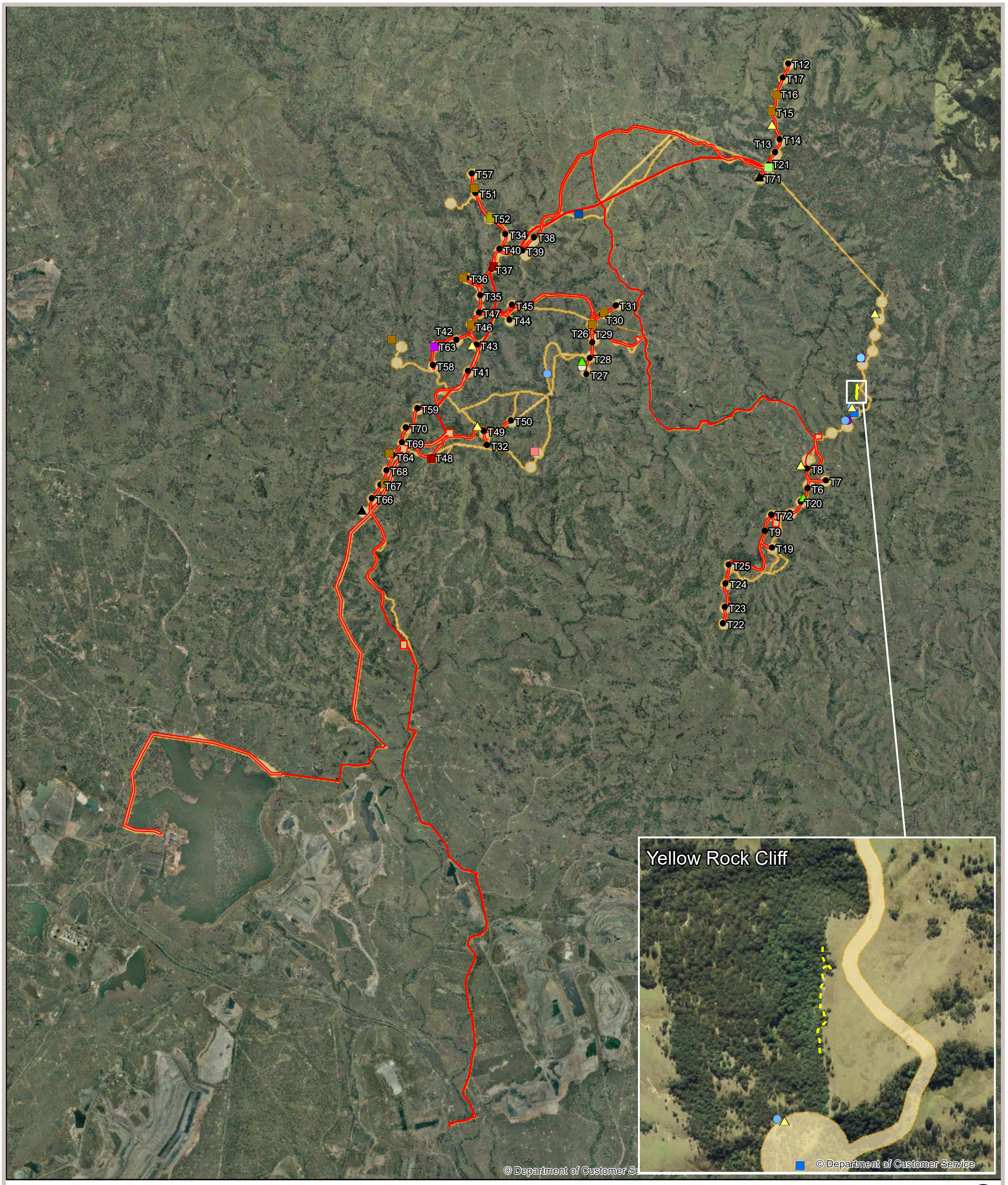


Figure 6.21. Fauna survey locations (Section 21)



Legend

Coordinate System: MGA Zone 56 (GDA 94)

- Subject Land
- Survey Area
- Turbine Locations
- Yellow Rock Cliff

Threatened Bat Records

- Large-eared Pied Bat
- Large Bentwing Bat
- Eastern coastal free-tailed bat
- Yellow-bellied sheathtail bat

Threatened Woodland Bird Records

- Brown treecreeper
- Dusky Woodswallow
- Scarlet Robin
- Speckled Warbler
- Little Lorikeet

Raptor Records

- Brown Falcon
- Brown Goshawk
- Collared Sparrowhawk
- Nankeen Kestrel
- Spotted Harrier
- Square-tailed Kite
- Wedge-tailed Eagle
- Southern Boobook (heard)

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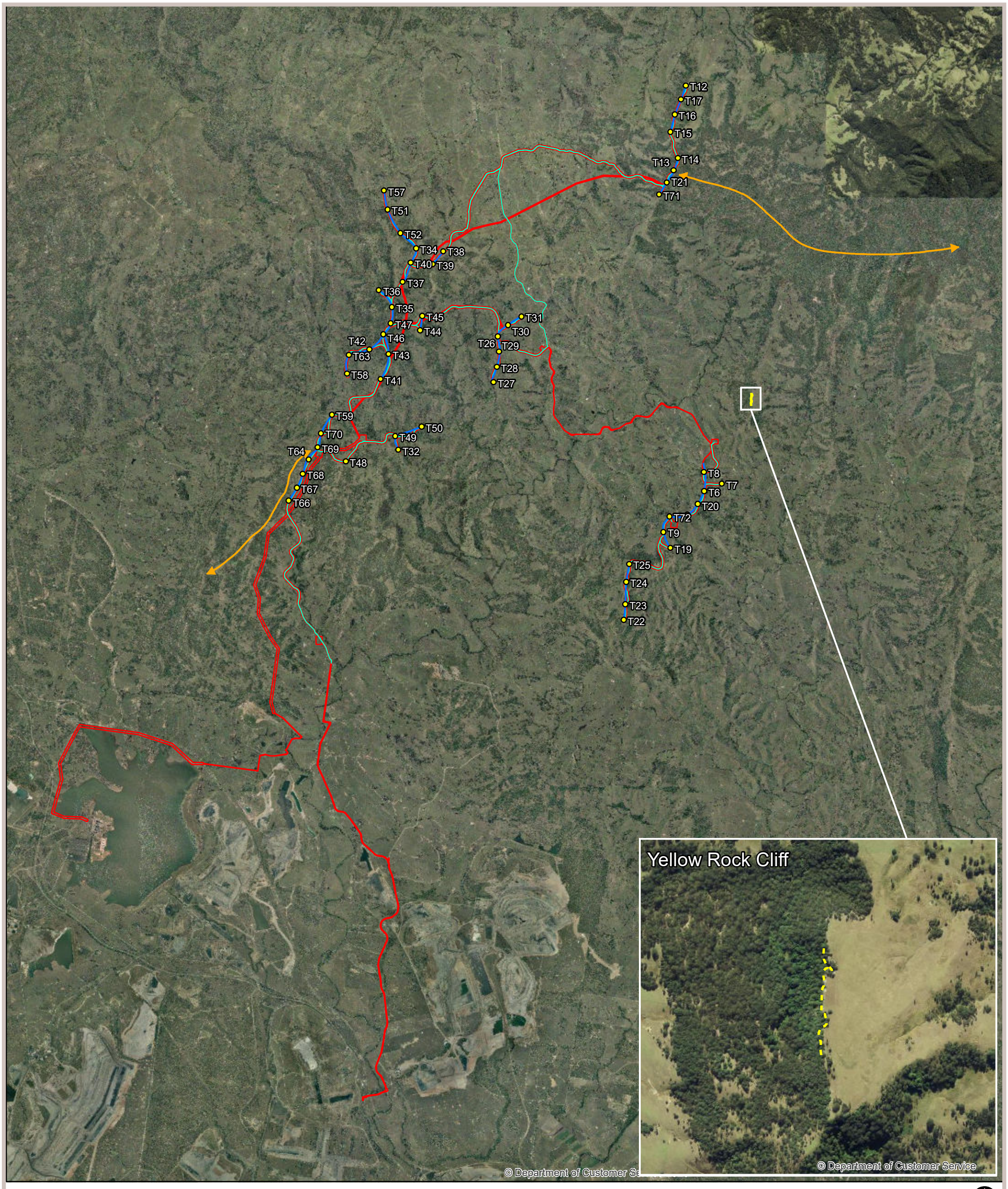
I:\...\19144\Figures\Letter 8\Figure 11\20211206\Figure 11. TS and raptors

Figure 11. Location of threatened fauna species and raptor species

0 1 2 3 4 km



Legend

Subject Land

Yellow Rock Cliff

Prescribed Impacts

Vehicle Strike

Connectivity

Barrier Effect

Blade Strike/Barotrauma

Coordinate System: MGA Zone 56 (GDA 94)

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I:\...\19144\Figures\Letter 8\Figure 17\20211206\Figure 17. Prescribed impacts

Figure 17. Extent of prescribed impacts

0 1 2 3 4 km

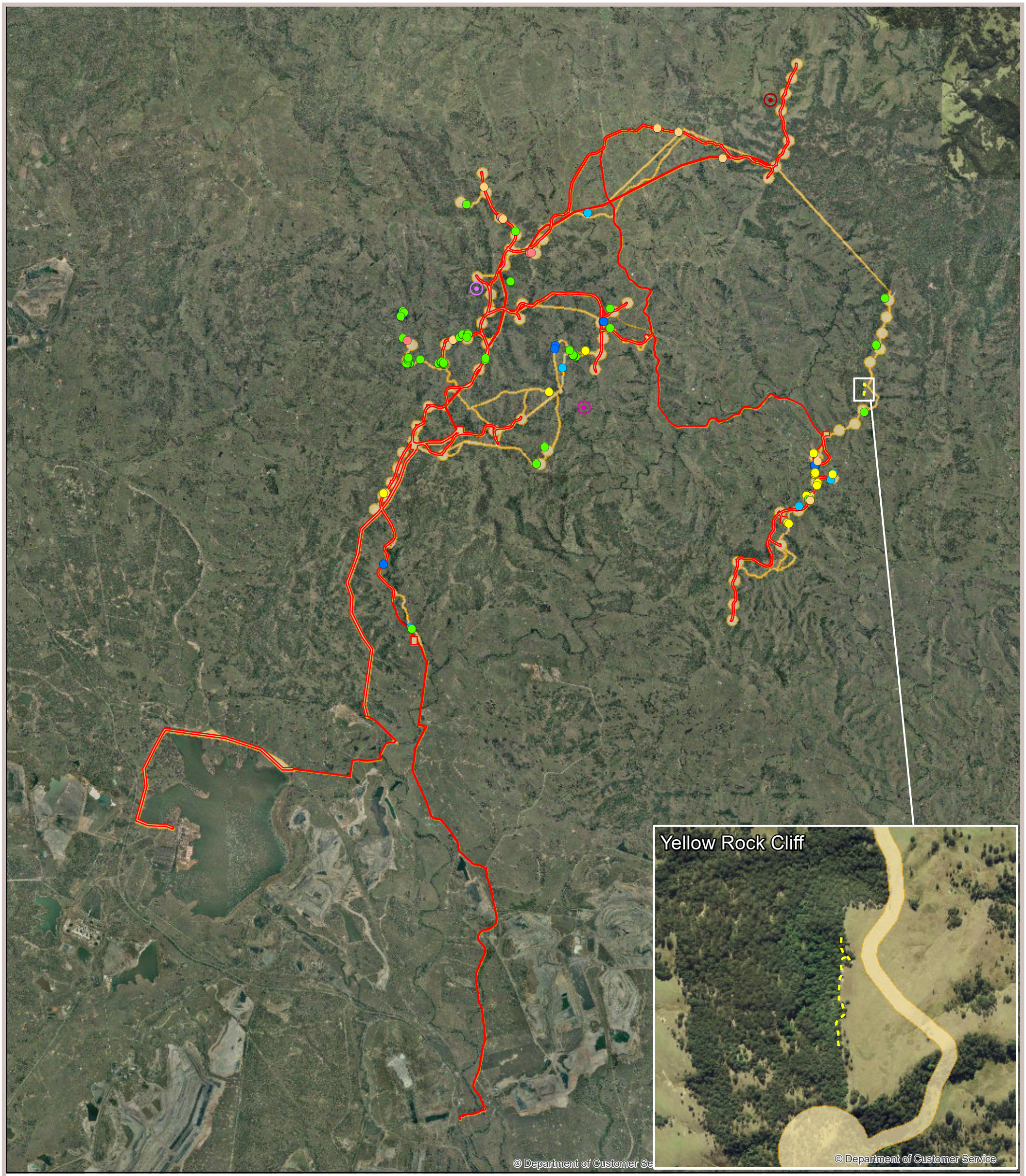

Figure 18. Location of recorded hollow-bearing trees and raptor nests across the subject land