

# Appendix 5

## Bushfire Impact Assessment of Matters of National Environmental Significance

prepared by

Niche Environment and  
Heritage Pty Ltd

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## **Bowdens Silver Project**

# **Bushfire impact assessment of Matters of National Environmental Significance**

Prepared for RW Corkery & Co Pty Ltd | 16 June 2021



## Document control

Project number	Client	Project manager	LGA
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## Executive summary

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### Project outline

Niche Environment and Heritage Pty Ltd (Niche) has been commissioned by RW Corkery & Co Pty Ltd on behalf of Bowdens Silver to undertake an assessment of the impacts of the Summer 2019/2020 bushfires on Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for relevant species potentially occurring within the study area for the Bowdens Silver Project (the Project). This assessment is a requirement of the Department of Agriculture, Water and Environment (DAWE) and will form an appendix to the Submissions report.

The Project was declared State Significant Development (SSD) by the NSW Department of Planning, Industry and Environment (DPIE) and later referred to DAWE. On 5 April 2019, advice was received from DAWE stating that the Project was determined to be a controlled action under the EPBC Act due to the potential for impacts to listed threatened species and communities protected under the EPBC Act. The action is being assessed under the bilateral agreement between the NSW and Commonwealth Governments using an accredited assessment process (the Framework for Biodiversity Assessment (FBA)).

The Project Biodiversity Assessment Report (BAR) (EnviroKey 2021) identified impacts for a number of threatened species and communities requiring offsets under the FBA including MNES species. Following preparation of the project BAR and submission of environmental documentation to DAWE and NSW DPIE, the eastern seaboard of Australia experienced widespread bushfires in the 2019/2020 fire season. This report seeks to clarify the potential for additional impacts for species identified by DAWE as potentially significantly impacted by the Project.

This report has assessed the status of one TEC and five threatened species listed under the EPBC Act in response to the 2019/20 bushfires. Neither the Project area or Offset area were directly impacted by the 2019/20 bushfires, however it was vital to assess the importance of habitat at these locations and within a 100 km buffer of these locations in the wake of the fires. We have provided a desktop assessment of each threatened entity, their historical responses to fire, and the extent and severity of the 2019/20 bushfires within the region.

We have concluded that:

- The Project area and Offset area are considered an important local and regional refuge for Koala populations and Koala habitat, as they contain medium to high quality contiguous Koala habitat which remained unburnt in the 2019/2020 bushfires. As such, the Project area and Offset area may experience a small increase in interactions and/or competition from surrounding Koala populations or relocated individuals from burnt areas, however this is unlikely given the extent of unburnt habitat in proximity to the Project area and Offset area. Furthermore, with an increase in time since fire, there is likely to be a reduction in the significance of this habitat due to vegetation recovery in burnt areas.
- No areas of roosting or breeding habitat for the Large-eared Pied Bat would be impacted by the Project. Given the extent of post-fire vegetation recovery by the time construction begins, and being a highly mobile species, the Large-eared Pied Bat is unlikely to be relying on the Project area as a refuge site and there is unlikely to be a significant increase in pressure on habitat within these areas from displaced individuals.

- Regent Honeyeaters may be more reliant on habitat within the Project area and Offset area in the short-term, however, with an increase in time since fire, there is likely to be a return of the Regent Honeyeater to its favoured locations.
- Given that the Swift Parrot would not have been in NSW during the 2019/20 bushfires, the main threat as a result of the fires is loss of foraging resources. With an increase in time since fire, and a mosaic of vegetation recovery within fire-adapted communities, there is likely to be a return of this species throughout the landscape as it responds to foraging opportunities.
- Four Small Purple-pea plants occur within the Project area. No Small Purple-pea populations within the Project area or Offset area were directly impacted by the 2019/20 bushfires. Approximately 6,383 ha of possible habitat for this species was impacted by high to extreme severity fires, with no 'likely' areas of habitat within the Study area impacted by the 2019/20 bushfires. An Assessment of Significance under the EPBC Act was conducted by EnviroKey (2021) and concludes that Small Purple-pea would not be significantly impacted by the Project.
- While impacts to EPBC-listed Box gum woodland TEC would have been extensive across NSW, as a vegetation community which is well adapted to fire, there will be a mosaic of vegetation recovery across the landscape. A total of 148 ha of Box gum woodland TEC would be removed for the Project, and substantial areas of EPBC-listed Box gum woodland TEC would be secured within the Offset area.

It is important to note that impacts associated with the Project are unlikely to commence until 2022, at least two years after the 2019/20 bushfires, and would occur progressively over the duration of mine construction and operational phases. A significant degree of vegetative recovery in burnt areas (outside of the Project area) would be expected, particularly those areas impacted by low to moderate severity fire. As such, the increased significance of the habitat within the Project and Offset areas will reduce over time and the assessment outcomes of the BAR would not be significantly affected by the 2019/20 bushfires.

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## 1. Introduction

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### 1.1 Background

Niche Environment and Heritage Pty Ltd (Niche) has been commissioned by RW Corkery & Co Pty Ltd on behalf of Bowdens Silver to undertake an assessment of the impacts of the Summer 2019/2020 bushfires on Matters of National Environmental Significance (MNES) protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for relevant species potentially occurring within the study area for the Bowdens Silver Project (the Project). This assessment is a requirement of the Department of Agriculture, Water and Environment (DAWE) and will form an appendix to the Submissions report. Niche did not undertake the initial biodiversity impact assessment as part of the Biodiversity Assessment Report (BAR) (EnviroKey 2021) for the Project, therefore it is important to state that the findings within the BAR are not our own. Findings from the BAR have been assumed as correct for the purpose of conducting this assessment.

### 1.2 Project assessment context

The Project was declared State Significant Development (SSD) by the NSW Department of Planning, Industry and Environment (DPIE) and later referred to DAWE. On 5 April 2019, advice was received from DAWE stating that the Project was determined to be a controlled action under the EPBC Act due to the potential for impacts to listed threatened species and communities protected under the EPBC Act. The action is being assessed under the bilateral agreement between the NSW and Commonwealth Governments using an accredited assessment process (the Framework for Biodiversity Assessment (FBA)).

The Project BAR identified impacts for a number of threatened species and communities requiring offsets under the FBA (see Likelihood of occurrence table for EPBC-listed species in Annex 2) including MNES species. Niche prepared a Biodiversity Offset Strategy for the Project which includes a suite of likely offset sites and outlines the overall offset strategy (Niche 2020).

Following preparation of the project BAR and submission of environmental documentation to DAWE and NSW DPIE, the eastern seaboard of Australia experienced widespread bushfires in the 2019/2020 fire season. These fires impacted substantial areas of native vegetation, including threatened ecological communities (TEC) and habitat for listed threatened species. Given the severity and extent of the fires, DAWE is taking a precautionary approach in relation to approval decisions under the EPBC Act for projects that will impact EPBC listed species which have been affected by those fires.

This report seeks to clarify the potential for additional impacts for species identified by DAWE as potentially significantly impacted by the Project. Many species and communities will take years to recover, particularly those not adapted to fire or impacted by prolonged drought or other threatening processes (DPIE 2021a); however, eucalypt communities such as those present within the region are fire-adapted, and significant recovery of vegetation is expected by Project commencement (early 2022).

### 1.3 Consultation

Consultation has been undertaken with DAWE (email received 16 December 2020) to confirm their requirements (i.e. the form and scope of the assessment including the final suite of species to be assessed).

## 1.4 Scope of works

The following five species and one TEC listed under the EPBC Act constitute the subject species for this assessment.

- Koala (EPBC-Vulnerable)
- Large-eared Pied Bat *Chalinolobus dwyeri* (Vulnerable, EPBC Act)
- Regent Honeyeater *Anthochaera phrygia* (Critically Endangered, EPBC Act)
- Swift Parrot *Lathamus discolor* (Critically Endangered, EPBC Act)
- Small Purple-pea *Swainsona recta* (Endangered, EPBC Act)
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community (Box gum woodland) – (Critically Endangered Ecological Community (CEEC), EPBC Act).

The subject species above were identified by DAWE as significantly impacted by the Project at the Referral stage, with the exception of Small Purple-pea which was added to the scope on a precautionary basis due to its discovery at the site post Referral.

Particular emphasis has been placed on those species that have been identified by DAWE as vulnerable from the 2019-2020 bushfires. On Monday 20 January 2020, the Department released an initial list of listed threatened or migratory species which have more than 10% of their known or predicted distribution in areas affected by bushfires in southern and eastern Australia. DAWE has identified that between 10%-30% of the modelled likely or known distribution of the Regent Honeyeater, Swift Parrot, Koala and Large-eared Pied Bat is within the area burnt by the fires (DAWE 2020). The Koala and Regent Honeyeater have been listed as priority species requiring urgent management action. The assessment by DAWE (2020) states that for all priority species, protecting unburnt areas within or adjacent to recently burnt ground that provide refuges is essential.

Due to stakeholder concerns and the availability of data, detailed assessments have been provided for the Koala and Regent Honeyeater. A more basic assessment has been undertaken for the remaining species and Box gum woodland TEC.

As requested by DAWE, the assessments include the following information.

- Advice as to whether the proposed Project area<sup>1</sup> and the proposed Offset area were burnt in the 2019/20 bushfires.
- The area (in hectares) of habitat for the six MNES listed above within the Project area and Offset area directly impacted by the fires (if any).
- Any available information regarding the impacts of the fires on the population size (where relevant) for the above listed MNES within and surrounding the Project area and Offset area.
- The area of regional habitat for each species/ecological community that was burnt and remained unburnt in the fires. In this assessment regional habitat has been defined as an area of 100 km surrounding the Project area.
- The percentage of regional habitat for each species/ecological community that was burnt and remained unburnt in the fires.
- A discussion regarding the importance and capacity of the remaining habitat within the Project area and Offset areas for supporting remaining populations of each species.

<sup>1</sup> The Project area incorporates all areas of proposed disturbance, including the water supply pipeline corridor.

The aim of these assessments is to clarify the importance of habitat within the Project area and Offset area in the context of the 2019/20 bushfires.

## 2. Description of the project

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### 2.1 Project overview

The Project is located approximately 26 kilometres (km) east of Mudgee, New South Wales (Figure 1).

The Project comprises seven principal components:

1. A main open cut pit and two satellite open cut pits collectively covering up to approximately 52 hectares.
2. A processing plant and related infrastructure covering approximately 22 hectares.
3. A waste rock emplacement (WRE) covering approximately 77 hectares.
4. A low-grade ore stockpile covering approximately 14 hectares (9 hectares of which overlaps the WRE).
5. An oxide ore stockpile covering 8 hectares.
6. A tailings storage facility (TSF) covering approximately 117 hectares.
7. A southern barrier to provide visual and acoustic protection to properties south of the Mine Site covering approximately 32 hectares.

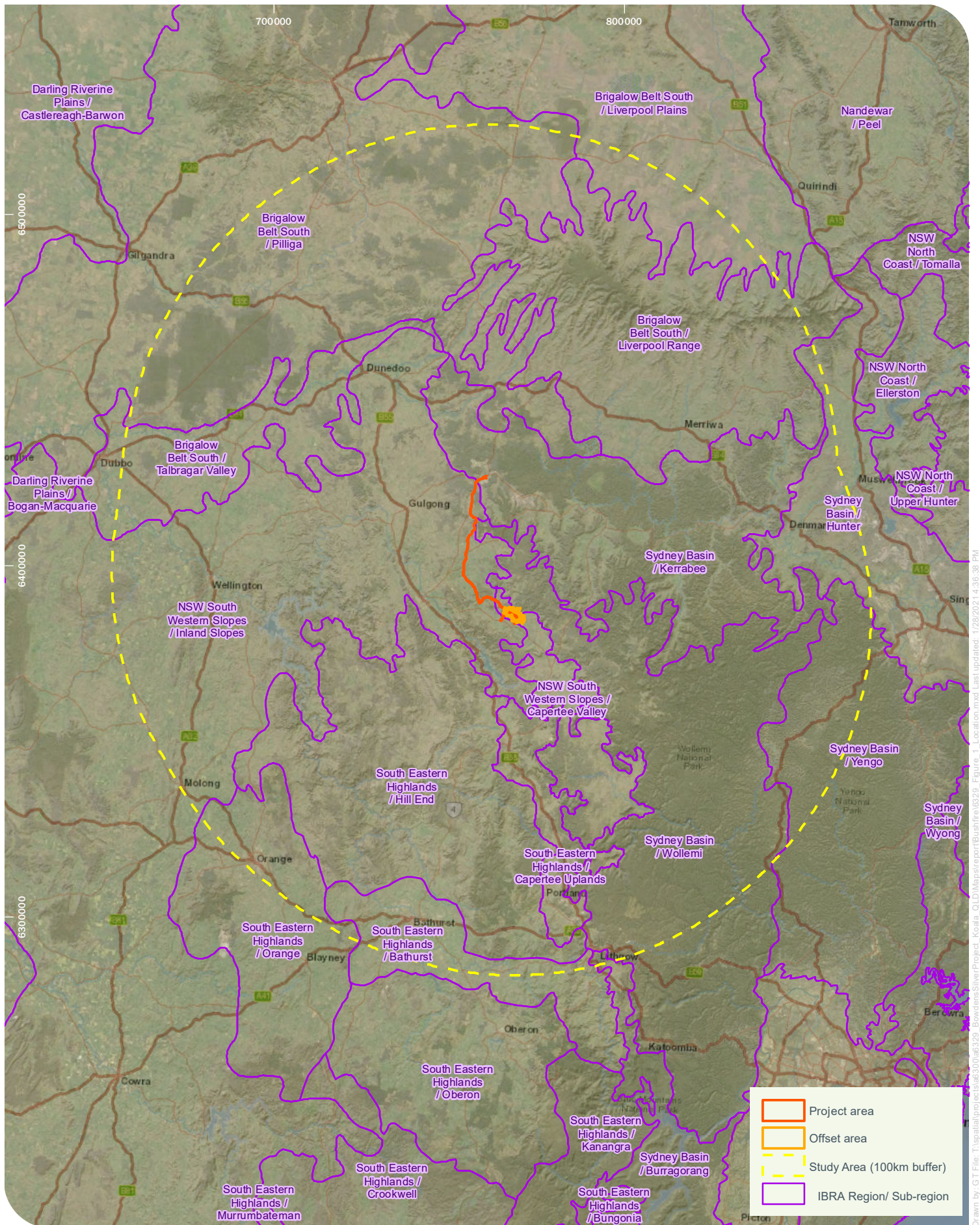
The above components would be supported by a range of on-site and off-site infrastructure. The on-site infrastructure comprises haul roads, water management structures, power/water reticulation, workshops, stores, compounds and offices/amenities. The off-site infrastructure comprises a relocated section of Maloneys Road (including a new railway bridge crossing and new crossing of Lawsons Creek) and a water supply pipeline for the delivery of water from the Ulan coalfields area.

The total impact area (subject land) of the Project would be approximately 495.67 hectares of which approximately 381.84 hectares is native vegetation. Of this native vegetation, 147.82 ha qualifies as EPBC-listed Box gum woodland TEC (EnviroKey 2021).

#### 2.1.1 Location

The Project and Offset areas are located within two Interim Biogeographic Regionalisation for Australia (IBRA) Bioregions; the Sydney Basin Bioregion and the NSW South Western Slopes Bioregion. Within the Sydney Basin Bioregion, the Project and Offset areas occur within the Wollemi subregion. Within the NSW South Western Slopes Bioregion, the Project and Offset areas occur within both the Inland Slopes subregion and the Capertee Valley subregion. Due to the linear form of the Project and its location on the edge of multiple subregions, we have assessed bushfire impacts within 100 km of the Project and Offset areas, instead of each subregion as recommended by DAWE (Figure 1).





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## 3. Methodology

### 3.1 Desktop assessment

To undertake the assessment Niche used available spatial layers to determine the areas of the Project and Offset areas burnt and any habitat within the broader region that may have been impacted by the fires. The following three areas were used in the analysis (Figure 1).

- The Project area (496 hectares [ha]) and surrounds – the area that was used in the initial impact assessment (EnviroKey 2021) and detailed in the Project description section above.
- The Offset area (795 ha) – The area within and surrounding the Mine Site that has been identified as the area to provide a large proportion of required biodiversity offsets.
- The Study area (4,130,623 ha) – the Project area and Offset area plus a 100 km buffer.

A list of the datasets utilised in the preparation of this report is given in Table 3-1.

**Table 3-1: Datasets used and their relevance**

Name	Relevance	Link
<b>Fire</b>		
National Indicative Aggregated Fire Extent Dataset (NIFAD)	To determine how much of the Project area, Offset area and Study area was burnt in the 2019/2020 bushfires	<a href="http://www.environment.gov.au/fed/catalog/search/resource/detail.s.page?uuid=%7B9ACDCB09-0364-4FE8-9459-2A56C792C743%7D">http://www.environment.gov.au/fed/catalog/search/resource/detail.s.page?uuid=%7B9ACDCB09-0364-4FE8-9459-2A56C792C743%7D</a>
Fire Extent and Severity Mapping (FESM)	Provides a more detailed assessment of different fires across the landscape (NSW) with standardised severity classes.	<a href="https://data.nsw.gov.au/data/data-set/fire-extent-and-severity-mapping-fesm">https://data.nsw.gov.au/data/data-set/fire-extent-and-severity-mapping-fesm</a>
<b>All species</b>		
Species of National Environmental Significance (public grids)	Species distributions for nationally listed species	<a href="http://www.environment.gov.au/fed/catalog/search/resource/detail.s.page?uuid=%7B337B05B6-254E-47AD-A701-C55D9A0435EA%7D">http://www.environment.gov.au/fed/catalog/search/resource/detail.s.page?uuid=%7B337B05B6-254E-47AD-A701-C55D9A0435EA%7D</a>
<b>Koala</b>		
Koala habitat	The previously mapped Koala habitat for the Project was used to determine the area of Koala habitat burnt within the Project area and Offset area.	EnviroKey (2021)
Predictive Koala Habitat Model (North-west Slopes)	Used to determine the area of Koala habitat within the Study area that was impacted by the 2019/2020 bushfires. This model produces a map of Koala habitat in parts of NSW by using environmental variables which are correlated with Koala records, such as vegetation, soil type and climate.	<a href="https://www.planningportal.nsw.gov.au/opendata/dataset/koala-habitat-information-base-habitat-suitability-models-v1-0">https://www.planningportal.nsw.gov.au/opendata/dataset/koala-habitat-information-base-habitat-suitability-models-v1-0</a>
<b>Box gum woodland</b>		
NSW Sheep-Wheat Belt Box-Gum Woodland Biodiversity Survey Sites 2004-2007 . VIS_ID 4091	A primary focus of this project was to survey "off reserve" distribution of Box-Gum Woodland (White Box - Yellow Box - Blakely's Red Gum) EEC within the Murray, Murrumbidgee, Lachlan, Central West,	<a href="https://datasets.seed.nsw.gov.au/dataset/nsw-sheep-wheat-belt-box-gum-woodland-biodiversity-survey-sites-2004-2007-vis_id-4091ab03f">https://datasets.seed.nsw.gov.au/dataset/nsw-sheep-wheat-belt-box-gum-woodland-biodiversity-survey-sites-2004-2007-vis_id-4091ab03f</a>

Name	Relevance	Link
	Hunter-Central Rivers, Namoi and Border Rivers-Gwydir Catchment Management Authority areas.	
Australia - Ecological Communities of National Environmental Significance Distributions (public grids)	Contains the generalised distribution maps of the Environment Protection and Biodiversity Conservation (EPBC) Act 1999 listed threatened Ecological Communities	<a href="https://www.environment.gov.au/fed/catalog/search/resource/downloadData.page?uuid=%7B184A3793-2526-48F4-A268-5406A2BE85BC%7D">https://www.environment.gov.au/fed/catalog/search/resource/downloadData.page?uuid=%7B184A3793-2526-48F4-A268-5406A2BE85BC%7D</a>

## 4. Results

### 4.1 Overview of the 2019/20 bushfires

The 2019/20 bushfires impacted 31.5 million hectares of habitat between the period spanning 1 July 2019 to 21 April 2020 (Todd & Maurer 2020). This includes 5.4 million hectares of land in NSW (DPIE 2020). Approximately 173,000 ha of vegetation was burnt within the Mid-western Regional Council. The fires likely killed more than three billion native vertebrates (van Eeden *et al.* 2020) and populations of almost 800 animal and plant species. Within the NSW South Western Slopes, a total vegetated area of 283,163 ha was burnt, impacting approximately 4,580,963 individual birds (van Eeden *et al.* 2020). Within the Sydney Basin bioregion, a total vegetated area of 1,652,483 ha was burnt with 30,302,601 individual birds impacted (van Eeden *et al.* 2020).

In relation to the Project, the 2019/2020 bushfires did not impact either the Project area or nominated Offset areas (Figure 2). As such, no areas of habitat within the Project area and Offset area suitable for any of the six MNES listed entities were directly impacted by the fires. The closest large fire occurred approximately 15 km to the south-east of the Project area (FESM data), and 12.8 km to the south-east of the Offset area. Within the Study area approximately 645,302 ha of habitat was burnt. Table 4-1 provides a summary of the areas burnt within each relevant IBRA bioregion and within the Study area.

**Table 4-1 Habitat burnt within IBRA Bioregions and within the Study Area**

IBRA bioregion	Total habitat burnt (ha) within IBRA bioregion <sup>2</sup>	Habitat burnt (ha) within Study Area <sup>3</sup>
Brigalow Belt South	222,675	4,339
NSW South Western Slopes	283,163	11,072
South Eastern Highlands	1,351,462	27,633
Sydney Basin	1,652,483	602,258
<b>TOTAL</b>	<b>3,509,783</b>	<b>645,302</b>

<sup>2</sup> Van Eeden *et al.* (2020)

<sup>3</sup> National Indicative Aggregated Fire Extent Dataset (NIAFED)







## 4.2 Koala

The 2019/2020 bushfires impacted over 3.5 million hectares (25%) of suitable koala habitat in eastern New South Wales (DPIE 2020a). There are nine koala model regions in New South Wales, with six of them containing the greatest percentage of best koala habitat in the fire ground; South Coast (68%), Northern Tablelands (34%), North Coast (30%), Central and Southern Tablelands (27%), Central Coast (15%) and Northwest Slopes (2%). The Project area is within the Central and Southern Tablelands koala model region which was the fourth most impacted koala model region within eastern New South Wales. Approximately 73% of this koala model region remained unburnt (DPIE, 2020a).

Within the Study area 470,408 ha (21%) of 'likely' habitat was burnt, with another 174,893 ha (9.3%) of habitat burnt where koalas 'may' occur (Table 4-2).

**Table 4-2 Koala habitat and burnt habitat estimates within the Study area**

Koala habitat	Potential koala habitat within Study area	Habitat burnt (ha) within Study area	% habitat burnt within Study area
Likely to occur	2,245,830	470,408	21%
May occur	1,884,793	174,893	9.3%

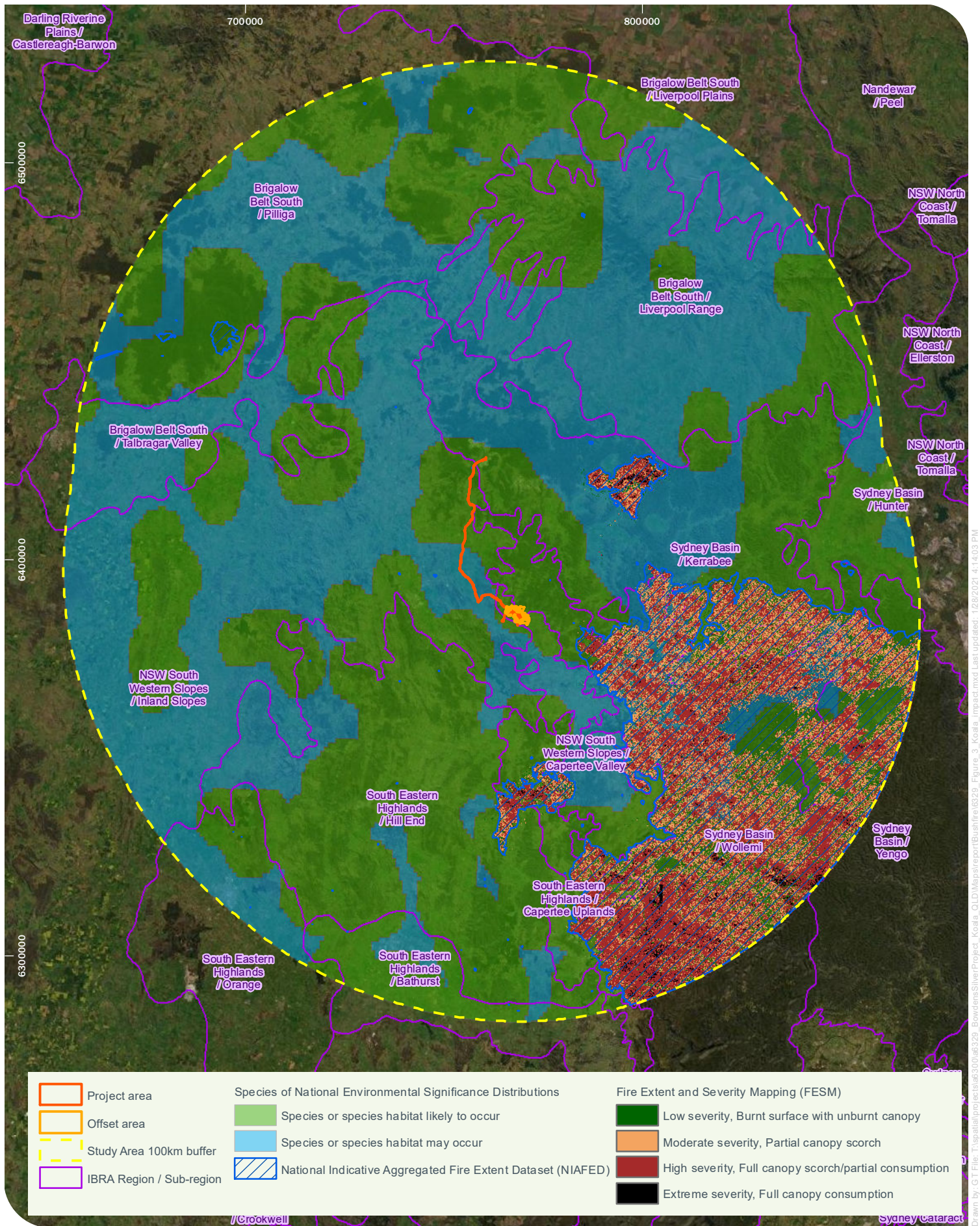
According to the National Indicative Aggregated Fire Extent Dataset (NIAFED), the largest fire scar (burnt area) of 608, 133 ha occurs approximately 13 km to the south-east of the Project area / Offset area which impacted a significant area of National Park estate within the Sydney basin, including Wollemi National Park and Yengo National Park (Figure 3). This burnt area ranges from low koala habitat suitability to high koala habitat suitability (see Figure 4) according to Koala habitat suitability modelling which predicts the spatial distribution of potential koala habitat across NSW using a value between 0 and 1 (i.e. a higher value represents a higher probability that a specific location will contain habitat suitable for koalas). It is highly likely that koala populations and the extent and quality of suitable koala habitat have been impacted within this area due to the 2019/2020 wildfires. Two other large fire scars occur within the Study area; approximately 30 km to the east of the northern section of the proposed road realignment (14,482 ha) and 35 km to the south of the Offset area (17,568 ha). In addition to these significant burnt areas, there are multiple isolated and relatively small fire scars within the Study area which are difficult to discern at the scale presented in Figure 3. The closest one in proximity to the Offset area is an isolated small area of 1.06 ha which is approximately 9 km to the north east of the Offset area. This area is modelled as suitable Koala habitat of moderate to high quality (Figure 3). An additional isolated fire scar (4.95 ha) is located 500 m to the west of the northern section of the proposed road realignment. This area is modelled as moderate quality Koala habitat (Figure 3).

Koalas are usually solitary, however they are territorial and individual home ranges may overlap (SEWPac 2012). The home range of a Koala can vary according to many factors, including habitat quality, structure and connectivity. A Koala's home range in poor habitat quality is generally larger than a Koala's home range in high quality habitat (SEWPac, 2012). A dominant male Koala's home range usually overlaps with several females (Eco Logical, 2013), the extent of which is established during the mating season (Queensland Government, 2020). The Lower Hunter Koala Expert Workshop (Koala Expert Workshop) reports Koala populations in Yengo National Park (the National Park located at the south-east boundary of the Study area) to have an estimated home range of 80 ha due to low quality habitat (Eco Logical, 2013). In comparison, a home range of 10 ha with high quality habitat is generally suitable to support a few Koalas in the Port Stephens area (Eco Logical, 2013). Koala's home ranges are known to be altered as a result of fire, as demonstrated by observations of one individual Koala which was known to persist within a 2 ha home

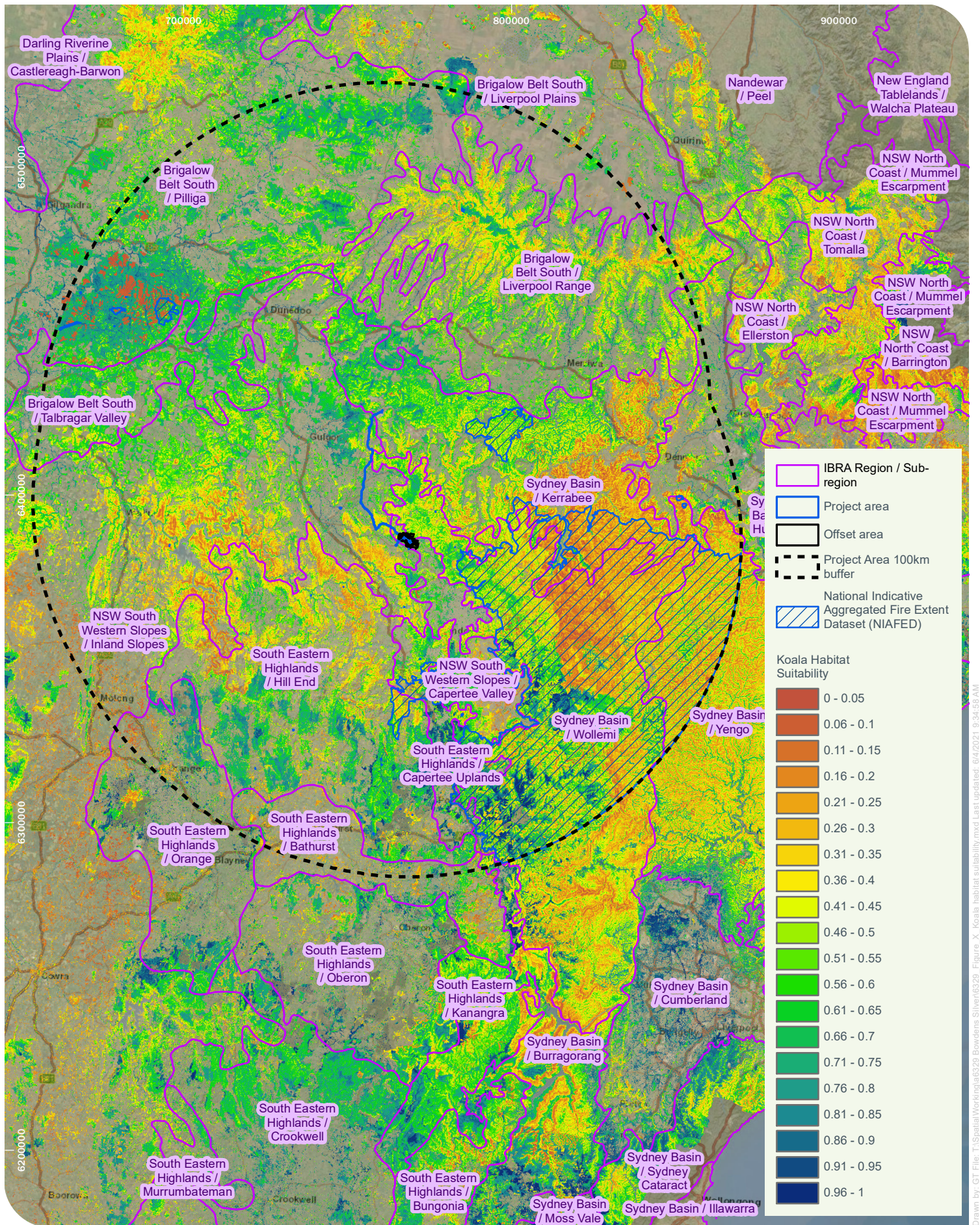
range after being forced out of its original home range due to fire (Eco Logical, 2013). According to this information (i.e. typical home ranges of between 10 ha and 80 ha), and given that there have only been four koala sightings within the Project area since 2020 (EnviroKey 2021), the Project area and the Offset area (containing a total area of 1,314 ha) has the potential to support a Koala population ranging between 16 to 134 individuals.

If koala home ranges are altered this may lead to increased aggression between males during the breeding season (September- February) as they seek to determine their divisions of breeding females (DPIE, 2020b). Other impacts include increased foraging pressure which may lead to a decrease in koala habitat quality and increased interactions of koala populations which may result in increased transmission of diseases such as chlamydia (DPIE, 2020b). A reduction in suitable koala habitat surrounding the Project area and Offset area due to 2019/2020 bushfires may lead some surviving individuals to move into the Project area and Offset area, at least until there is extensive recovery of the canopy at burnt sites. The Project area and Offset area may experience a small increase in interactions and/or competition from surrounding Koala populations due to the proximity of smaller fires, however given the extent of unburnt habitat in proximity to the Project area and Offset area, there is unlikely to be a discernible increase in koala numbers. Anecdotal data to date suggests that there has not been an increase in the koala population within the Project area / Offset area since the 2019/20 bushfires, with three sightings in 2020 and one sighting as of July 2021. Furthermore, it is unlikely that there would be an increase in interactions and competition within the Project area / Offset area from the three areas impacted by large fires as koalas have limited ability to flee during a fire event, are attached to place, and sub-adults have a dispersal distance of only 1-10 km (DAWE 2020).









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### 4.3 Large-eared Pied Bat

The Large-eared Pied Bat is dependent on the presence of diurnal roosts for shelter. Roosts are utilised during the day and also at night when not feeding, as well as for the raising of young. This species has been known to roost in disused mine shafts, caves, overhangs and abandoned fairy martin (*Hirundo ariel*) nests (Schulz 1998; DERM 2011). Maternity roosts have been recorded at Pilliga scrub and Coonabarabran, and lactating females have been captured adjacent to sandstone cliffs near Ulan, NSW (Fly By Night 2004; DERM 2011). Ulan is located at the northern end of the water supply pipeline within the Project area, and Pilliga Scrub is approximately 140 km north of Ulan. A study in the western Blue Mountains found that day-roosting occurred from 700 m up to 2.5 km (on a single occasion) from a foraging area. The Large-eared Pied Bats in this study had foraging ranges up to 114 ha. Large-eared Pied Bats were recorded at two locations within the Project area, approximately 3 km and 3.5 km north-east of Lue (EnviroKey 2021). It is likely that this species is roosting within 2.5 km of those recorded locations. Old mine shafts, escarpment and cliffs adjacent to the Project footprint contain potential breeding and roosting habitat, however these sites would not be impacted by the Project and have not been affected by the 2019/20 bushfires.

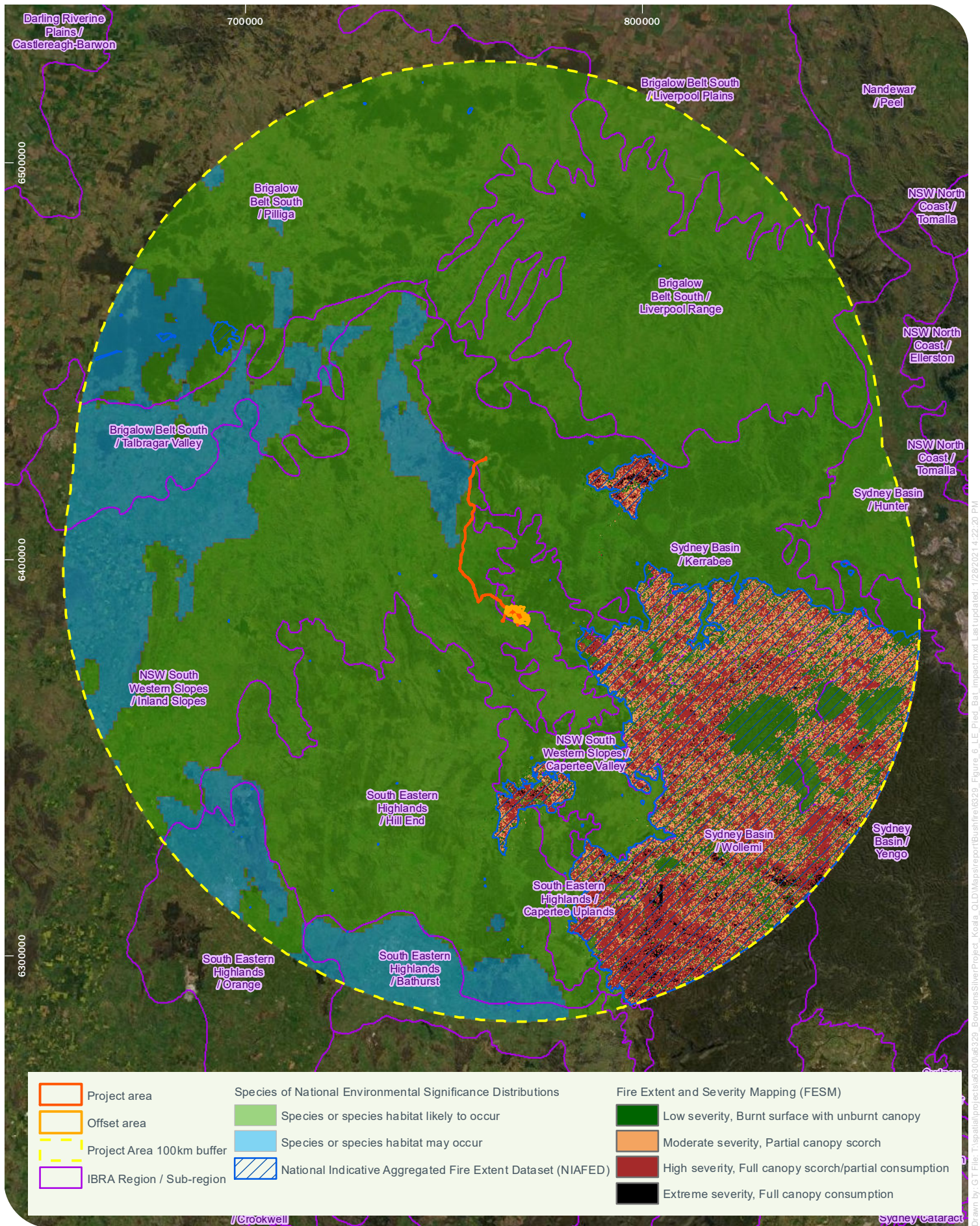
It is estimated that 10-30% of the Large-eared Pied Bat's habitat in southern and eastern Australia was impacted by the 2019/20 bushfires (DoEE 2020). Within the Study area, approximately 3,531,155 ha of habitat is mapped as 'likely' habitat (Table 4-3). Of this, 476,964 ha (13.51%) was burnt by the 2019/20 bushfires.

**Table 4-3 Large-eared Pied Bat habitat and burnt habitat estimates**

	Potential habitat within study area	Habitat burnt (ha)	% habitat burnt
<b>Likely to occur</b>	3,531,155	476,964	13.51
<b>May occur</b>	599,258	0	0

An ecological disturbance such as wildfire may initiate torpor due to a decrease in consumable energy and changes in ambient temperature from alterations in buffered microclimates (Alencar *et al.* 2015; Doty *et al.* 2016). Thus, bats may use torpor to manage the constraints associated with food and water shortage. The incidence of wildfire significantly changes the structure of an insect community (York 1999; Swengel 2001; Moretti *et al.* 2004; Law *et al.* 2018) and it has been observed that some bat species may move from an unburnt landscape into a burnt landscape, possibly in response to a rapid increase in insect abundance following fire (Law *et al.* 2018). Lacki *et al.* (2009) found a 34 % increase in microbat prey items 3 months following a prescribed fire, and Doty *et al.* 2016 also recorded an increase in microbat prey abundance post-wildfire. Fire can increase foraging habitat for microbats by decreasing vegetative clutter (Owen *et al.* 2004; Loeb and Wal-drop 2008; Womack *et al.* 2013) and therefore results in increased activity and efficiency of insect detection (Doty *et al.* 2016). As a highly mobile species, the Large-eared Pied Bat may not have suffered as severely as other less mobile species (i.e. Koala). Roosting and breeding habitat preferred by the Large-eared Pied Bat, such as caves and cliffs, were less likely to be structurally impacted by the bushfires and would continue to provide habitat for this species provided foraging resources are present. Direct impacts of the fire on this species are yet unknown, however a highly mobile species such as the Large-eared Pied Bat is probably one of the first to repopulate an area after fire due to their roosting preferences and the potential increase in insect abundance at fire sites. Given the extent of post-fire vegetation recovery by the time construction begins, the Large-eared Pied Bat is unlikely to be relying on the Project area and Offset area as refuge sites and there is unlikely to be a significant increase in pressure on habitat within these areas from displaced individuals.







#### 4.4 Regent Honeyeater

Within NSW, the Regent Honeyeater's breeding sub-populations are fragmented and now occur mainly around the Capertee Valley in central-eastern NSW and the Bundarra-Barraba region in northern inland NSW. Minor and sporadic breeding occurs in other areas such as Warrumbungle National Park, Pilliga forests, Mudgee-Wollar region, and the Hunter and Clarence Valleys (DPIE 2019). The Regent Honeyeater inhabits eucalypt open forests and woodlands, predominantly box-ironbark types, but also Spotted Gum and Swamp Mahogany dominated areas on the coast. This species builds a cup-shaped nest of fibres located in forks in live eucalypt or she-oak canopy. A clutch of two or three eggs is laid from late winter to early summer, with multiple breeding attempts per season. The Regent Honeyeater mostly feeds on nectar from flowering eucalypts, especially Boxes and Ironbarks, and from Mistletoe (*Amyema cambagei*). They also feed on the sugary exudates of insects (e.g. lerps) which become an important part of their diet when breeding (DPIE 2019).

The Regent Honeyeater is recognised as a national priority bird species because an estimated 10% or more of its Area of Occupancy (AOO) was burnt in the 2019/20 bushfires (DoEE 2020). Prior to the 2019/20 bushfires there were estimated to be 250-400 individuals left in the wild (Crates *et al.* 2019). Key threats as a result of the bushfires include loss of potential breeding habitats to fire, impacts in unburnt refuges on breeding from competitor species such as Noisy Miners, and subsequent loss or minimal flowering of primary feed trees from a combination of drought and fire impacts (LLS 2020). Given the Regent Honeyeater's breeding season, from August to January, the fires would have impacted breeding success both directly and indirectly.

Todd & Maurer (2020) produced a report which focuses on Key Biodiversity Areas (KBAs) affected by the 2019/20 bushfires. KBAs are areas that are critical to maintaining biodiversity in Australia, according to a rigorous, internationally recognised, scientific standard (IUCN 2016; Todd & Maurer 2020). The following KBAs are within 30 km of the Project area: Capertee Valley, Greater Blue Mountains and Mudgee-Wollar. Capertee Valley KBA covers 71,627 hectares (Table 4-4). Of this, 2,800 hectares is mapped as the species Area of Occupancy (AOO), and 20% of that was burnt in the 2019/20 fires (Table 4-5). The Greater Blue Mountains KBA covers over one million hectares. Of this, 5,200 hectares is mapped as the species AOO, and 78% of that was burnt (Table 4-5). The Mudgee-Wollar KBA covers 165,316 ha, of which 8% was burnt. Due to sporadic breeding in this area, Regent Honeyeater AOO data is unavailable for the Mudgee-Wollar KBA. The water supply pipeline associated with the Project crosses through the Mudgee-Wollar KBA. The Mine Site within the Project area and the Offset area is approximately 17 km to the west of the Greater Blue Mountains KBA and 30 km north of the Capertee KBA.

**Table 4-4 Key Biodiversity Areas adjacent to the Project area and impacted by 2019/20 fires**

KBA	KBA area (ha)	Area burnt	% burnt	% badly burnt
Capertee Valley	71,627	10,269	14	7
Greater Blue Mountains	1,074,505	857,231	80	45
Mudgee-Wollar	165,316	13,266.37	8	0

**Table 4-5 Regent Honeyeater area of occupancy (AOO) and burnt habitat in Key Biodiversity Areas**

KBA	National Core AOO (ha)	AOO in KBA (ha)	% of AOO in KBAs	% of AOO burnt in KBA	% unburnt AOO in KBA
	104100		51		54
Capertee Valley	-	2800	-	20	-
Greater Blue Mountains	-	5200	-	78	-

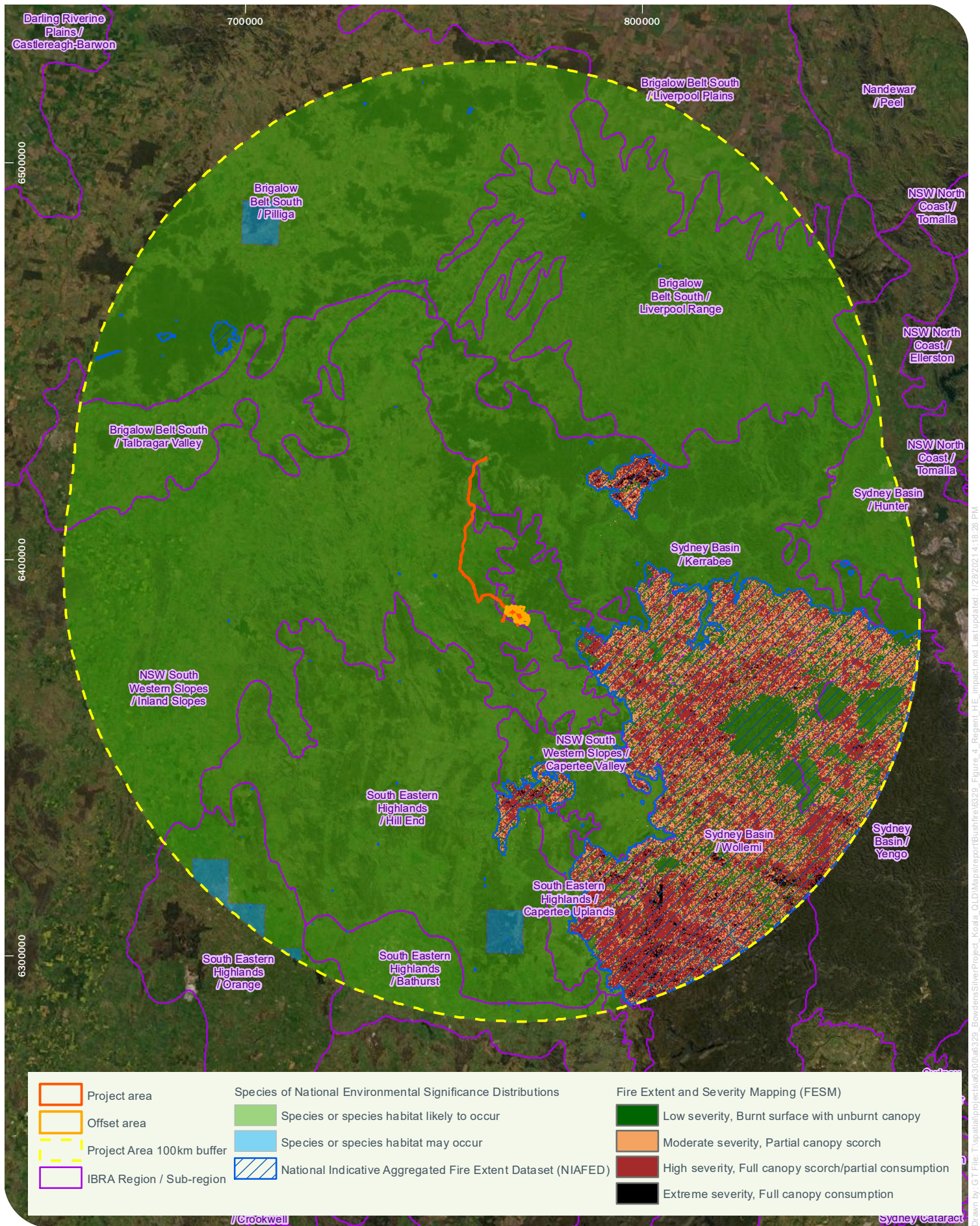
The BAR (EnviroKey 2021) did not detect the Regent Honeyeater within the Project area or Offset area despite extensive surveys, but this may be due to the rarity of this species. EnviroKey (2021) declares that the Project area may comprise critical habitat for the species, as it provides suitable habitat, and is located in between the Mudgee-Wollar key area (DoE 2016) and the Capertee Valley breeding area. Sightings of banded Regent Honeyeaters indicate that there is regular movement of birds between Capertee, Mudgee, the Central Coast and the Hunter Valley which are almost certainly driven by flowering of eucalypts (Roderick *et al.* 2013). Approximately 14% of the Capertee Valley KBA was burnt, and therefore the Regent Honeyeater is more likely to rely on habitat within both the Project area and Offset area, at least until there is substantial recovery of those sites which received full or partial canopy burn, with enough foraging and nesting resources. The Regent Honeyeater is known to undertake large-scale nomadic movements in the order of hundreds of kilometres, however, the exact nature of these movements is poorly understood. It is likely that movements are dependent on spatial and temporal flowering and other resource patterns (OEH 2020c). Open-forest eucalypts usually flower every year, but flowering season varies within and between species and sites (House 1997; Peeters & Butler 2014). Most open forest eucalypt species develop a lignotuber in the early months of growth, and this enables them to survive all but the most severe fires, and to regrow rapidly if their crowns are damaged (Florence 1996; Peeters & Butler 2014). Severe fires may slow the growth of trees, but fires of low to moderate intensity are likely to have little effect on the growth of open forest eucalypt species (Florence 1996). Law *et al.* (2000) found that myrtaceous trees on the mid-north coasts of NSW flowered at pre-fire level 1-3 years after both low-intensity burns and wildfires. Resprouting eucalypts have been found to produce flowers as soon as 139 weeks after fire (Kubiak 2009). As such, those areas affected by low to moderate severity fire may already (one-year post-fire) provide the eucalypt foraging resources required by the Regent Honeyeater. Loyn (1997) studied birds just before, and for three years after, a large wildfire in East Gippsland, Victoria. They found that bird abundance declined immediately after the fire, to an average of 60% of pre-fire levels. Honeyeaters were found to disappear after fire, due to a loss in eucalypt and shrub blossom, however their abundance reached 60% of pre-fire levels within three years of the fire. Prolific flowering can also occur after fire, with a study by Smith (1989) finding an increase in honeyeaters after bushfire in southern NSW. As such, an analysis of fire severity is important. High severity fires that reach the canopy can kill mistletoes (Gill 1996) which are an important foraging and nesting resource for Regent Honeyeaters. Assessing Regent Honeyeater habitat within the Study area using broadscale distribution maps is unlikely to be as meaningful as the above data (Table 4-4 and Table 4-5) as the KBA data are the result of extensive on-ground surveys. However, to maintain consistency in this report and to assess the importance of habitat within the Study area, it is estimated that 442,891 ha (10.91%) of 'likely' Regent Honeyeater habitat was burnt, and 34,073 ha of habitat was burnt where the species 'may' occur (Table 4-6). FESM data indicates that approximately 13,348 ha of potential Regent Honeyeater habitat was impacted by extreme severity fire (0.32%) within the Study area, and 265,473 ha of potential habitat was impacted by high severity fire (6.43%).

**Table 4-6 Regent Honeyeater habitat and burnt habitat estimates**

	Habitat within study area	Habitat burnt (ha)	% habitat burnt
Likely to occur	4,058,996	442,891	10.91
May occur	71,626	34,073	47.57

Given the location of the Study area between identified important sites at Capertee Valley and Mudgee-Wollar, and the extent and severity of fires in the region, Regent Honeyeaters may be more reliant on habitat within the Project area and Offset area in the short-term. However, the mosaic of vegetation recovery throughout the burned landscape is likely to already provide a mosaic of foraging and nesting resources for this species. With an increase in time since fire at burnt sites, there is likely to be a return of this species to its favoured locations.







## 4.5 Swift Parrot

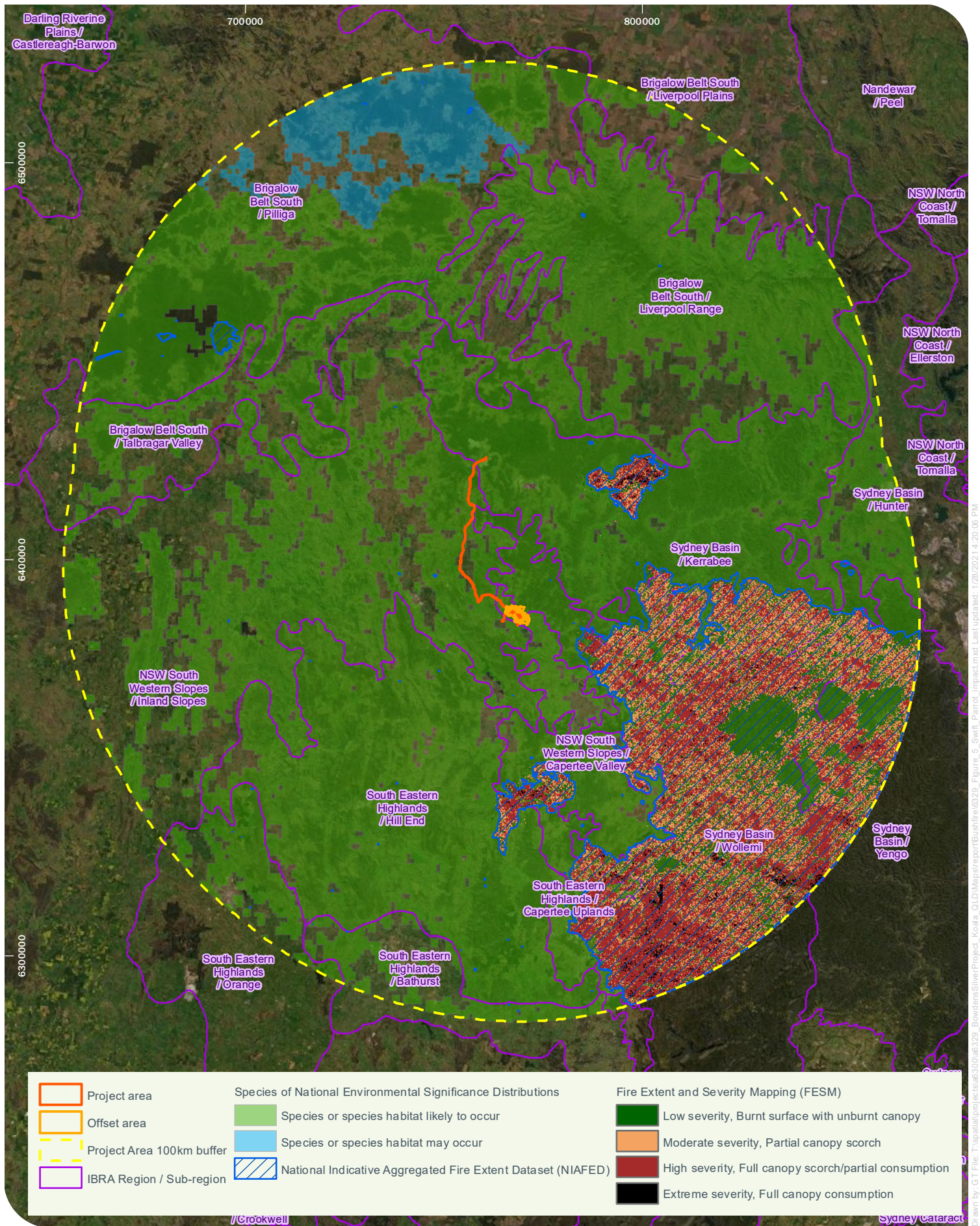
There is estimated to be less than 300 Swift Parrots left in the wild (Olah *et al.* 2020). This species breeds during the Australian summer and only in Tasmania (Webb *et al.* 2019), therefore the subregions affected by the 2019/20 bushfires contain non-breeding habitat for this species only. This species has a broad winter migration range, therefore anywhere with prolific eucalypt flowering during this period has the potential to provide important habitat for this species. On mainland Australia, Swift Parrots are found in dry sclerophyll forests including Spotted Gum, Swamp Mahogany, Ironbark, Grey Gum and Blackbutt dominated vegetation. The TECs that provide habitat for the Swift Parrot include Swamp sclerophyll forest on floodplains, dominated by Swamp Mahogany and Lower Hunter Spotted Gum – Ironbark forest, dominated by the distinctive Spotted Gum, and Ironbarks, and Box-Gum Grassy Woodland, dominated by Yellow Box. Swift Parrots roost communally, often in the same tree each night and only come to the ground to drink from puddles (LLS 2019). A study in Box-Ironbark forests and woodlands of Victoria found the Swift Parrot relied heavily on drainage lines and foraged on 12 eucalypt and one Acacia species (Kennedy & Tzaros 2005). EnviroKey (2021) did not detect the species on site, but acknowledged that the Project area and Offset area are located at the northern extent of the Capertee KBA, and with previous records in the locality it is possible that Swift Parrot could use the Study area from time to time. Capertee Valley is a KBA for this species which covers 71,627 hectares. Of this, 2,500 hectares is mapped as the species Area of Occupancy (AOO) in that KBA, and 5% of that was burnt in the 2019/20 fires (Todd & Maurer 2020). The Project area / Offset area does not contain Swift Parrot Mapped Important Area (DPIE 2021b), however given this species is highly mobile there is the possibility that they may be more reliant on habitat within both the Project area and Offset area until there is substantial recovery of foraging resources at burnt sites in the region and surrounds.

Using broadscale species distribution maps and existing FESM data, approximately 476,919 ha (14.7%) of habitat where the Swift Parrot is likely to occur was impacted by the 2019/20 fires (Table 4-7 and Figure 7). Within this area, 198,116 ha was affected by low to moderate severity fire and is likely to currently (17 months post-fire) provide winter foraging resources required by the Swift Parrot. However, the remaining 278,803 ha of habitat within the Study area impacted by high to extreme severity fire may take longer to produce the required nectar resources. Given that this species would not have been in NSW during the 2019/20 bushfires, the main threat as a result of the fires is loss of foraging resources. With an increase in time since fire at burnt sites, there is likely to be a return of this species throughout the landscape.

**Table 4-7 Swift Parrot habitat and burnt habitat estimates**

	Habitat within Study area	Habitat burnt (ha)	% habitat burnt
Likely to occur	3,245,221	476,919	14.70
May occur	130,619	0	0







## 4.6 Small Purple-pea

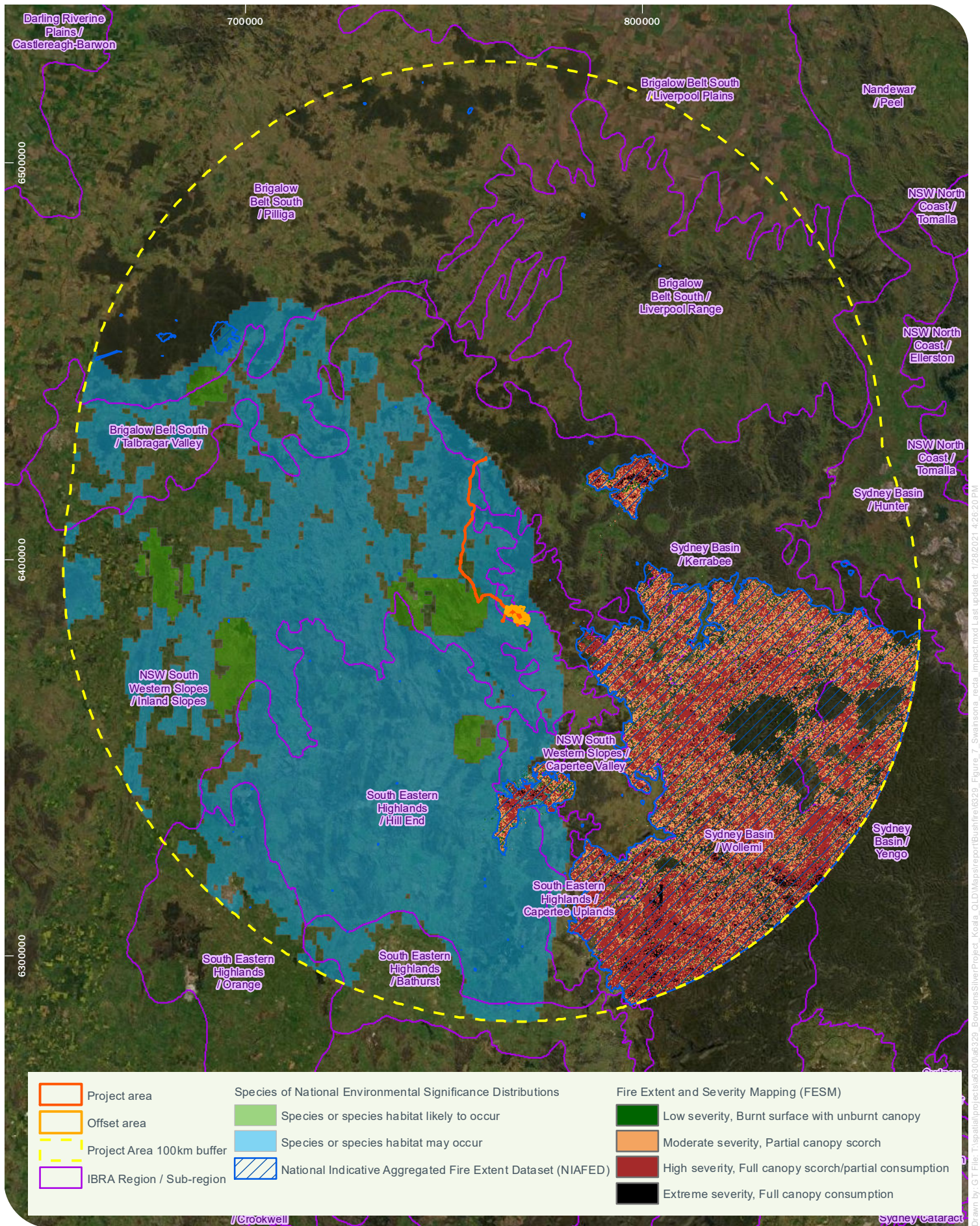
Small Purple-pea is a perennial forb which occurs predominantly in grassy woodlands. There are approximately 12 populations situated within NSW, the ACT and Victoria with an estimated cumulative population size of 9,500 plants (OEH 2012). In 2018, two new populations were identified in the Mudgee region; at Campbells Creek (south of Mudgee) and Breakfast Creek (east of Mudgee). Four plants have been located within the southern portion of the Project area during targeted threatened species searches by AREA Environmental (see EnviroKey 2021), following initial detection by Bowdens Silver personnel. An additional three sites (totalling 12-17 plants) were located outside of the Project area. None of these sites were directly impacted by the 2019/20 bushfire. Within the Study area, no habitat was burnt where this species is 'likely' to occur (Table 4-8 and Figure 8). Approximately 10,114 ha (0.84%) of habitat where this species 'may' occur was impacted by the fires.

**Table 4-8 *Swainsona recta* habitat and burnt habitat estimates**

	Habitat within Study area	Habitat burnt (ha)	% habitat burnt (ha)
Likely to occur	80,896	0	0
May occur	1,207,428	10,114	0.84

The species responds well to periodic burning, particularly on sites where the tree cover has been removed or thinned and there is high competition from native and exotic groundcover species (OEH 2012). Fire can reduce the build-up of dead plant matter, especially from Kangaroo Grass *Themeda triandra*, and reduce competition between Small Purple-pea and other native grassland species. Fire is an important factor in seedling regeneration, as dormancy of the hard-coated seed is broken by fire. Overall, disturbance can benefit this species. It is estimated that the species benefits from a fire frequency of 4 to 5 years. The severity of the fire may affect the species ability to recover, however, despite a high intensity fire in the ACT as a result of the 2003 Canberra Bushfires, a population of Small Purple-pea responded by producing spring growth and flowers in the same year (ACT Government 1998). The National Recovery Plan (OEH 2012) states that all populations and the habitat they occupy are critical to the survival of the species. Given the cryptic nature of this species, it may occur in other locations within the Project area and Offset area. There is very little information on the survivorship of this species as a result of high severity fire but, taking a precautionary approach, we can assume that high severity fire may eliminate populations of this species, whereas low to moderate severity fire may benefit a population. Approximately 6,383 ha of high to extreme severity fire within the Study area may have impacted potential Small Purple-pea populations, but these fires only occurred in habitat where the species 'may occur'.







## 4.7 Box gum woodland TEC

Box gum woodland TEC (EPBC Act) is geographically widespread (Annex 1) but highly fragmented throughout Queensland, NSW, ACT and Victoria. In 2010 it was estimated that only 405,000 ha of the ecological community in various condition states remain (Australian Government 2007; DECCW 2010). Thomas *et al.* (2000) estimated that approximately 59,468 hectares remained in south-eastern NSW as of the year 2000, which is less than 4% of its original extent. A suite of fauna are dependent upon Box gum woodland habitat resources for foraging, roosting, nesting, raising young, dispersal, movement and/or migration. These include birds, arboreal and ground-dwelling mammals, reptiles, amphibians and invertebrates. Nectar, an important food resource for fauna, is more abundant on the fertile soils on which Box gum woodland TEC is found. There are 14 EPBC Act-listed flora species and 12 EPBC Act-listed fauna species which are associated with Box gum woodland TEC (DECCW 2010).

This ecological community can withstand fire, however the frequency and intensity can influence the degree of recovery. As a rule, TECs have pre-existing and ongoing threats that can reduce their resilience to fire, such as severe drought, fragmentation, soil disturbance, grazing and invasive species (Good & Rumpf 2020). Studies have shown that vegetation recovery is between 5 to 7 years in dry sclerophyll forests, woodlands, and heathlands in the Sydney Basin (van Loon 1977, Conroy 1993, Penman and York 2010, Heath *et al.* 2016). Woodland tree species that can resprout are likely to be resilient to variations in the fire regime in the short to medium (decades) term. For example, Yellow Box *Eucalyptus melliodora* (like many Eucalypts) form a lignotuber which is capable of resprouting after fire, and the thick bark at the base of Yellow Box trees protects them from damage by fire. Fire can provide suitable seedbed conditions, and reduce competition (Graham *et al.* 2013). NPWS (2004) recommend a fire frequency of between 5 and 40 years for grassy woodland ecosystems across NSW. Plants in Western Slopes Grassy Woodlands, with their moderate rainfall and moderately fertile soils, are unlikely to grow as fast as their counterparts on the Cumberland Plain where rainfall is higher, nor as slowly as plants in grassy woodlands at high altitude where temperatures are cooler.

It is unknown how many hectares of EPBC-listed Box gum woodland TEC was impacted by the 2019/20 fires, however given its extent throughout NSW, it is likely to be significant. Approximately 148 ha of this community would be impacted by the Project (EnviroKey 2021) with approximately 520 ha of Box gum woodland TEC within the lands assessed by EnviroKey (2021) which would not be impacted by the Project. Neither of these areas were directly impacted by the 2019/20 bushfires (Figure 2), however highly mobile fauna species may be more reliant on Box gum woodland within the Project area post-fire. As discussed previously, these eucalypt communities are well adapted to fire and with an increase in time since fire, there will be less reliance from fauna species on unburnt areas.

## 5. Conclusion

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This report has assessed the status of one TEC and five threatened species listed under the EPBC Act in response to the 2019/20 bushfires. Neither the Project area or Offset area were directly impacted by the 2019/20 bushfires, however it was vital to assess the importance of habitat at these locations and within a 100 km buffer of these locations in the wake of the fires. We have provided a desktop assessment of each threatened entity, their historical responses to fire, and the extent and severity of the 2019/20 bushfires within the region.

We have concluded that:

- The Project area and Offset area are considered an important local and regional refuge for Koala populations and Koala habitat, as they contain medium to high quality contiguous Koala habitat which remained unburnt in the 2019/2020 bushfires. The Project area and Offset area are considered an important local and regional refuge for Koala populations and Koala habitat, as they contain medium to high quality contiguous Koala habitat which remained unburnt in the 2019/2020 bushfires. As such, the Project area and Offset area may experience a small increase in interactions and/or competition from surrounding Koala populations or relocated individuals from burnt areas, however this is unlikely given the extent of unburnt habitat in proximity to the Project area and Offset area. Furthermore, with an increase in time since fire, there is likely to be a reduction in the significance of this habitat due to vegetation recovery in burnt areas.
- No areas of roosting or breeding habitat for the Large-eared Pied Bat would be impacted by the Project. Given the extent of post-fire vegetation recovery by the time construction begins, and being a highly mobile species, the Large-eared Pied Bat is unlikely to be relying on the Project area as a refuge site and there is unlikely to be a significant increase in pressure on habitat within these areas from displaced individuals.
- Regent Honeyeaters may be more reliant on habitat within the Project area and Offset area in the short-term, however, with an increase in time since fire, there is likely to be a return of the Regent Honeyeater to its favoured locations.
- Given that the Swift Parrot would not have been in NSW during the 2019/20 bushfires, the main threat as a result of the fires is loss of foraging resources. With an increase in time since fire, and a mosaic of vegetation recovery within fire-adapted communities, there is likely to be a return of this species throughout the landscape as it responds to foraging opportunities.
- Four Small Purple-pea plants occur within the Project area. No Small Purple-pea populations within the Project area or Offset area were directly impacted by the 2019/20 bushfires. Approximately 6,383 ha of possible habitat for this species was impacted by high to extreme severity fires, with no 'likely' areas of habitat within the Study area impacted by the 2019/20 bushfires. An Assessment of Significance under the EPBC Act was undertaken by EnviroKey (2021) concluding that the individuals recorded within the Project area do not comprise plants critical to the survival of the species, nor that the habitat to be removed is critical to the survival of the species. For these reasons, EnviroKey (2021) concluded that the proposed action is unlikely to result in a significant impact to Small Purple-pea. An updated BAR prepared by EnviroKey (2021) includes an Assessment of Significance under the EPBC Act and concludes that Small Purple-pea would not be significantly impacted by the Project.



- While impacts to EPBC-listed Box gum woodland TEC would have been extensive across NSW, as a vegetation community which is well adapted to fire, there will be a mosaic of vegetation recovery across the landscape. A total of 148 ha of Box gum woodland TEC would be removed for the Project, and substantial areas of EPBC-listed Box gum woodland TEC would be secured within the Offset area.

It is important to note that impacts associated with the Project are unlikely to commence until 2022, at least two years after the 2019/20 bushfires, and would occur progressively over the duration of mine construction and operational phases. A significant degree of vegetative recovery in burnt areas (outside of the Project area) would be expected, particularly those areas impacted by low to moderate severity fire. As such, the increased significance of the habitat within the Project and Offset areas will reduce over time and the assessment outcomes of the BAR would not be significantly affected by the 2019/20 bushfires.

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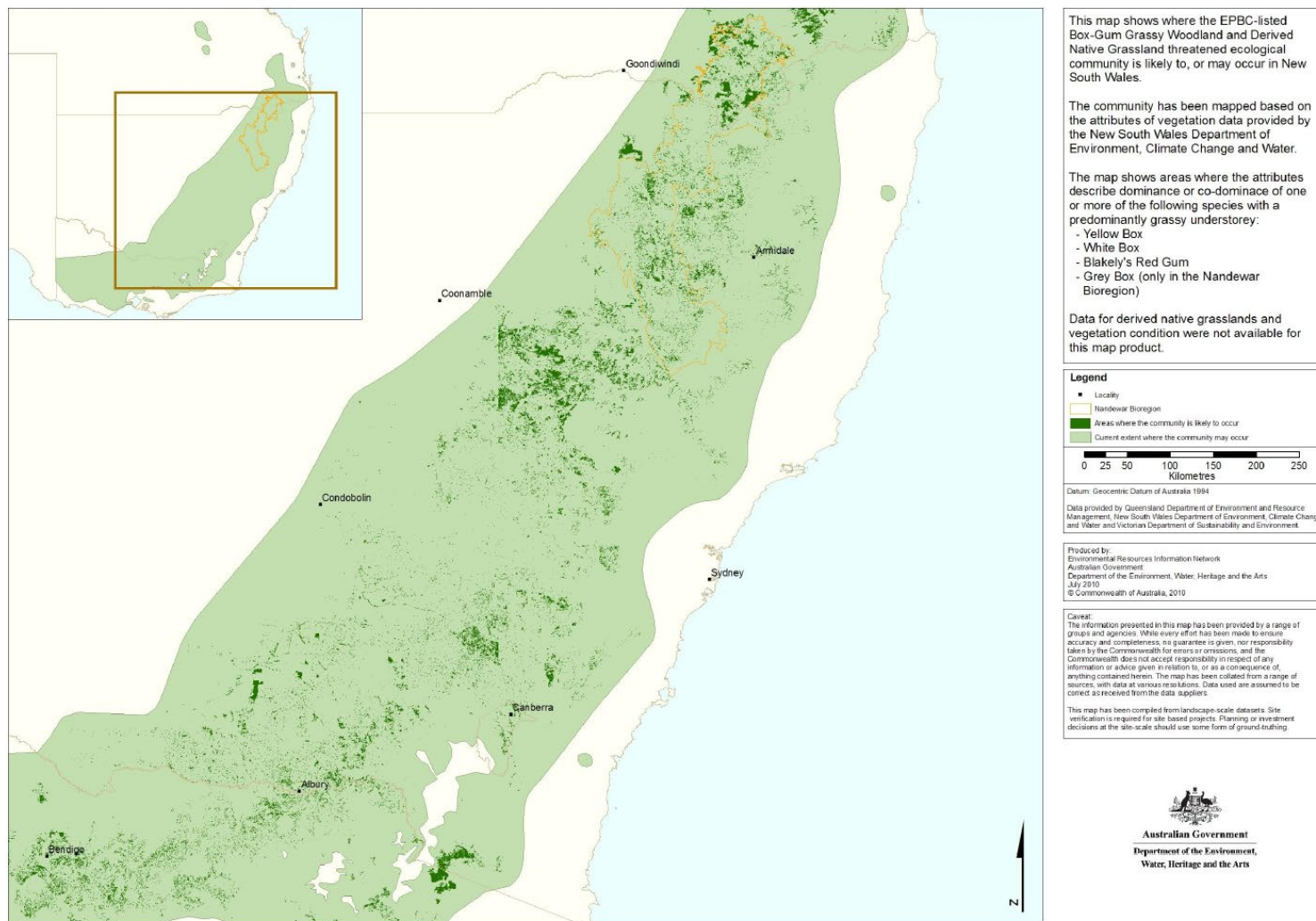


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## Annex 1 Box Gum Woodland and Derived Native Grassland (EPBC Act) distribution in NSW (DECCW 2010)

### Box-Gum Grassy Woodland and Derived Native Grassland - New South Wales





## Annex 2 MNES Species Predicted to Occur in the Study Area

Listed below are the MNES that were identified by DAWE as priority species that are present or have the potential to occur within the Project area and that are likely to have been negatively impacted by the 2019/20 bushfires.

Key to EPBC Act status codes: E = Endangered; V = Vulnerable, CE = Critically Endangered, R = Rare, Ex = Presumed Extinct, M = Migratory

Please note, unless indicated otherwise the impact assessments in this table have not been undertaken by Niche and have been transcribed directly from EnviroKey (2021).

Scientific name	Common name	EPBC Act	Recorded? EnviroKey (2021)	Potential impact? EnviroKey (2021)
<b>Threatened Ecological Communities</b>				
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		CE	Present	Yes, This TEC was recorded in the Project area during the comprehensive vegetation surveys.
<b>Mammals</b>				
<i>Phascolarctos cinereus</i>	Koala	V	Present	Yes. Koala has been recorded four times within the Project area since 2020. The species has also been previously recorded in the locality.
<i>Dasyurus maculatus maculatus</i>	Spotted-tail Quoll	E	No	Yes. While not recorded by the comprehensive field surveys, two records of Spotted-tailed Quoll, both of which were recorded as roadkill, occur in relatively close proximity to the Project area. The first, a male was found dead on Lue Road, 800 metres west of Lue Tip in 2017, while the second was on Maloneys Road near 'Bara Downs' about 5 kilometres north of the Project area in 2005.
<i>Petrogale penicillata</i>	Brush-tailed Rock Wallaby	V	No	No. The Project area does not contain any cliff lines, or other suitable habitat, therefore, it is not likely to occur there. Given this, the species would not be impacted by the Project.

Scientific name	Common name	EPBC Act	Recorded? EnviroKey (2021)	Potential impact? EnviroKey (2021)
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	No	No. This species was not recorded within the Project area despite comprehensive fauna surveys carried out in accordance with the seasonal requirements of this species. The species has not been recorded previously within the locality and is not likely to occur in the Project Area. Therefore, it would not be impacted by the Project.
<i>Chalinolobus dwyer</i>	Large-eared Pied Bat	V	Yes	Yes (but foraging habitat only). This species has been recorded within the Project area, but roosting or maternity habitat is not present.
<b>Birds</b>				
<i>Grantiella picta</i>	Painted Honeyeater	V	No	No. This species was not recorded within the Project area despite comprehensive fauna surveys carried out in accordance with the seasonal requirements of this species. The species has been recorded previously within the locality near Ulan however, it is not likely to occur in the Mine Site due to its geographic location well to the south. Therefore, it would not be impacted by the Project.
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	No	Yes. No Regent Honeyeater individuals were recorded despite comprehensive surveys and surveys being completed during the appropriate survey period. However, given the rarity of the species (critically endangered), presence of suitable habitat, previous records in the locality, and the location of the Project area at the northern extent of the Capertee Important Bird Area (IBA) (a known Regent Honeyeater 'hotspot', it is probable that Regent Honeyeater uses the Project area from time to time but went undetected.

Scientific name	Common name	EPBC Act	Recorded? EnviroKey (2021)	Potential impact? EnviroKey (2021)
<i>Lathamus discolor</i>	Swift Parrot	CE	No	Yes. No Swift Parrot individuals have been recorded in the Project area, despite some of the field surveys being carried out in appropriate survey period (April). Given the rarity of the species (critically endangered), presence of suitable habitat, previous records in the locality, and the location of the Project area at the northern extent of the Capertee Important Bird Area (IBA), it is possible that Swift Parrot could use the Project area from time to time but went undetected.
<i>Polytelis swainsonii</i>	Superb Parrot	V	No	No. This species was not recorded within the Project area despite comprehensive fauna surveys carried out in accordance with the seasonal requirements of this species. The species has not been recorded previously within the locality and is not likely to occur in the Project area based on an absence of records. Therefore, it would not be impacted by the Project.
<b>Reptiles and Amphibians</b>				
<i>Litoria booroolongensis</i>	Booroolong Frog	E	No	No. The Booroolong frog was not recorded within the Project area despite adequate fauna surveys being carried out within the seasonal requirements of this species. Although some permanent creeks with fringing vegetation do occur, these areas are heavily degraded and modified by past agricultural and clearing activity. This species is not likely to occur within the Project area and therefore, would not be impacted by the Project.
<i>Delma impar</i>	Striped Legless Lizard	V	No	No. This species was not recorded within the Project area despite comprehensive fauna surveys carried out in accordance with the seasonal requirements of this species. The species has not been recorded previously within the locality and is not likely to occur in the Project area. Therefore, it would not be impacted by the Project.



Scientific name	Common name	EPBC Act	Recorded? EnviroKey (2021)	Potential impact? EnviroKey (2021)
<i>Aprasia parapulchella</i>	Pink-tailed Worm-lizard	V	No	No. This species was not recorded within the Project area despite comprehensive fauna surveys carried out in accordance with the seasonal requirements of this species. The species has not been recorded previously within the locality and is not likely to occur in the Project area. Therefore, it would not be impacted by the Project.
<b>Flora</b>				
<i>Prasophyllum sp. Wybong</i>	a leek-orchid	CE	No	No. This species has not been recorded within the Project area. While survey timing was not optimal for this species, the sensitivity of this species to grazing, confirms that it is unlikely to be present within the Project area given the long grazing history of the site. It is highly unlikely to occur within the Project area and therefore would not be impacted by the Project.
<i>Philotheca ericifolia</i>		V	No	No. The species has been recorded previously within the locality (Munghorn Gap NR); however, it has not been recorded within the Project area despite comprehensive surveys undertaken during the appropriate survey period. Given its apparent absence from the Project area, it is considered unlikely to occur and would not be impacted by the Project.
<i>Prasophyllum petilum</i>	Tarengo Leek Orchid	E	No	No. This species was not recorded within the Project area despite comprehensive vegetation surveys. Field surveys were carried out in months where the species is known to flower elsewhere. The species has not been recorded previously within the locality and is not likely to occur in the Project area. Therefore, it would not be impacted by the Project.
<i>Swainsona recta</i>	Small Purple-pea	E	Present – four groups of individuals recorded one affected group located in the southern portion of the study area (EnviroKey 2021)	Yes. One group of four individuals is within the Project area and would be impacted (EnviroKey 2021)

Scientific name	Common name	EPBC Act	Recorded? EnviroKey (2021)	Potential impact? EnviroKey (2021)
<i>Euphrasia arguta</i>		CE	No	No. Despite extensive vegetation survey, this species was not recorded within the Project area. There is a single record south-east of Lue. Based on the absence of this species in the project area it is considered unlikely to occur and therefore would not be impacted by the Project.



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## Our services

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Wildlife Schools and training

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Aboriginal heritage  
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Conservation management  
Community consultation  
Archaeological, built and landscape values

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Development and activity approvals  
Rehabilitation  
Stakeholder consultation and facilitation  
Project management

### Environmental offsetting

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Accredited BAM assessors (NSW)  
Biodiversity Stewardship Site Agreements (NSW)  
Offset site establishment and management  
Offset brokerage  
Advanced Offset establishment (QLD)

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