Appendix K

Biodiversity assessments

Appendix H.1 Assessments of Significance

Tests of significance have been conducted for threatened species, populations and communities that were recorded in the proposal area during field surveys or were identified as having a moderate or higher potential to occur in the proposal area based on the presence of habitat.

Section 7.3 of the BC Act outlines the 'test of significance' that is to be undertaken to assess the likelihood of significant impact upon threat-listed species, populations or ecological communities listed under the BC Act. As a new guideline has not been produced by the OEH, these tests of significance have been undertaken in accordance with the guidelines provided in the Threatened Species Assessment Guidelines: The Assessment of Significance (Department of Environment and Climate Change, 2007) which outlines a set of guidelines to help applicants/proponents of a development or activity with interpreting and applying the factors of assessment in the former 'seven-part test'. The guidance provided by the Department of Environment and Climate Change (2007) has been used here in preparing these tests of significance and in determining whether there is likely to be a significant effect to a threatened species, population or ecological community listed under the BC Act. The threatened species subject to this assessment are outlined in **Table H-1**.

For threatened biodiversity listed under the EPBC Act, significance assessments have been completed in accordance with the EPBC Act Policy Statement 1.1 Significant Impact Guidelines (Department of Environment, 2013). Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment that is affected, and upon the intensity, duration, magnitude and geographic extent of the impacts (Department of Environment, 2013). Importantly, for a 'significant impact' to be 'likely', it is not necessary for a significant impact to have a greater than 50 per cent chance of happening; it is sufficient if a significant impact on the environment is a real or not remote chance or possibility (Department of Environment, 2013). This advice has been considered while undertaking the assessments. The Grey-headed flying fox was the only EPBC Act species to be assessed (see **Table H-1**).

The full assessments are provided in the following sections.

Table H-1 Threatened species subject to this assessment

Species	BC Act	EPBC Act
Dusky Woodswallow (Artamus cyanopterus cyanopterus)	V	-
Little Eagle (Hieraaetus morphnoides)	V	-
Spotted Harrier (Circus assimilis)	V	-
Eastern Bentwing-bat (Miniopterus schreibersii oceanensis)	V	-
Grey-headed Flying-fox (Pteropus poliocephalus)	V	V

Biodiversity Conservation Act 2016 assessment

Threatened bird species

Dusky Woodswallow (Artamus cyanopterus cyanopterus)

Little Eagle (Hieraaetus morphnoides)

Spotted Harrier (Circus assimilis)

Threatened birds including the Dusky Woodswallow, Little Eagle, and Spotted Harrier are likely to fly over the proposal area on occasion and may temporarily perch on trees. However, the proposal area is considered unlikely to form suitable breeding habitat for these species and habitat use would be intermittent and minimal.

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Dusky Woodswallow is widespread in eastern, southern and south western Australia. It inhabits dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey of eucalypt saplings, acacias and other shrubs, and ground-cover of grasses or sedges and fallen woody debris.

The Little Eagle occupies open eucalypt forest and woodland where it nests in tall living trees within a remnant patch. It preys on birds, reptiles and mammals, occasionally adding large insects and carrion. These two species occupy large hunting ranges greater than 100 square kilometres in size which may include the proposal area.

The Spotted Harrier occurs widely in NSW and comprise a single population. It is found in grassy open woodland including Acacia and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Given its wide-ranging nature, it may occasionally occur in the proposal area.

The removal of habitat would affect the lifecycle of these species if they are present. However, due to the abundance of aggressive birds such as Noisy Miners, and adjacent urbanisation, the quality of the habitat is not considered high. Any birds that may use the habitat in the proposal area would also likely use adjacent habitats that are of higher quality. After the proposal has been built there would be sufficient habitat left in the proposal area for these species to complete their lifecycles and the habitat quality of remaining patches is considered likely to remain in a similar state to pre-construction conditions. The proposal is not considered likely to have an adverse effect on the life cycle of these species such that a viable local population of these species is likely to be placed at risk of extinction.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

c) in relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The extent of habitat removal for these species is nine Malus pumila (apple tree) and a small area of planted shrubs and immature trees. This is a small impact compared to the extent of habitat availability in the locality.

Fragmentation is unlikely to occur from the proposal as the work would largely involve removing vegetation from patch edges rather than breaking apart of large blocks of vegetation into many smaller patches. Importantly, the proposal would not result in the breaking apart of large blocks of high-quality habitats. No further habitat fragmentation on a landscape scale would occur because of the proposal. Isolation of

habitats is likely to increase by a small extent as the distance between patches on either side of road would be increased.

The proposal area does not contain high quality habitats for these species. These species may utilise the habitat on occasion but would not use it preferentially. The larger adjacent habitats are considered more important for these species than the roadside vegetation in the proposal area. No breeding habitat is present in the proposal area so the importance of the habitat for these species is considered to be limited.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposal will not impact on any declared area of outstanding biodiversity value.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A Key Threatening Process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population or ecological community. Key threatening processes are listed under the BC Act and at the present there are currently 38 listed KTPs. Of the 38 listed KTPs under the BC Act, nine are applicable to this assessment (see Table E.1). However, hygiene and weed control measures would reduce or avoid the impact of most KTPs with the exception of clearing of native vegetation and removal of dead wood and dead trees.

Conclusion

These bird species would suffer a small reduction in extent of foraging habitat from the proposal. No breeding habitat would be affected. The proposal is unlikely to reduce the population size of these species or decrease the reproductive success of these species. After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant effect to threatened birds.

Eastern Bentwing-bat (Miniopterus schreibersii oceanensis)

The proposal area provides some habitat for species of threatened insectivorous Eastern Bentwing-bat (listed as vulnerable under the BC Act). This species has been recorded in the general area and is likely to forage in the habitats in the proposal area. Tree hollows are not present but the habitat is likely to be suitable as foraging habitat. The Eastern Bentwing-bat may utilise the area for foraging on a seasonal basis but is unlikely to roost in the stormwater drain on site given its size and construction.

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Eastern Bentwing-bat primarily roosts in caves, but will also use derelict mines, storm-water tunnels, buildings and other man-made structures. The Eastern Bentwing-bat forms populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young. At other times of the year, populations disperse within about 300 km range of maternity caves.

All vegetation within the proposal area is likely to provide foraging habitat for this bat species. Riparian zones are also likely to be a focal point for foraging for all species subject to this assessment. No hollow-bearing trees would be affected by the proposal, so no breeding habitat is predicted to be affected. The pipe at the stormwater outlet is not considered likely to be used by the Eastern Bentwing-bat due to its size and construction.

Impacts are likely to be restricted to loss of foraging habitat. The impacts of the proposal are not expected to have an adverse effect on the life cycle of these species such that a viable local population is likely to be placed at risk of extinction. Considerable foraging habitat would remain in the locality.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

Not applicable.

c) in relation to the habitat of a threatened species or ecological community:

iii. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

iv. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

v. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The proposal would remove minimal potential foraging habitat compared to foraging habitat in the locality at large. The habitat within the proposal area is not limiting for these species. No roosting or breeding habitat would be affected.

Importantly, the proposal would not result in fragmentation of habitat for the species. The species is highly mobile and will freely fly long distances over open areas to move between habitats. The proposal would not affect the movement of the species between habitat patches.

The vegetation in the proposal area would form a small component of a larger foraging range for the species. Riparian vegetation is likely to be a focal point of foraging activity, as are the edges of vegetation patches. The loss of native vegetation from the proposal area would reduce the amount of foraging habitat available for these species by a small amount. However, when compared to the larger and higher quality vegetation remnants in the locality, the vegetation within the proposal area is not considered as important for the long-term survival of the species.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)

The proposal will not impact on any declared area of outstanding biodiversity value.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A Key Threatening Process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population or ecological community. Key threatening processes are listed under the BC Act and at the present there are currently 38 listed KTPs. Of the 38 listed KTPs under the BC Act, nine are applicable to this assessment (see Table E.1). However, hygiene and weed control measures would reduce or avoid the impact of most KTPs with the exception of clearing of native vegetation and removal of dead wood and dead trees.

Conclusion

The Eastern Bentwing-bat would be subject to a small reduction or modification of foraging habitat from the proposal. No roosting habitat would be affected. The proposal is unlikely to reduce the population size of these species or decrease the reproductive success of these species. After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant effect to the Eastern Bentwing-bat.

Grey-headed Flying-fox (Pteropus poliocephalus)

The Grey-headed Flying-fox is likely to forage in the trees within the proposal area, particularly Malus pumila and planted specimens of Eucalyptus spp. The Bathurst, Machattie Park roost camp is located near the proposal area and this species is likely to forage in the proposal area.

The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction.

The Grey-headed Flying-fox occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Annual mating commences in January and conception occurs in April or May; a single young is born in October or November.

While there is a roost camp present in Machattie Park, Bathurst located near the proposal area, at the time of this assessment, the proposal would not directly impact on any known breeding / maternity site. As such, the impacts of the proposal to the Grey-headed Flying-fox would be limited to loss of feeding habitat caused by direct clearing or damage to native vegetation during the construction phase.

The proposal would remove around nine, apple Malus pumila trees of potential foraging habitat (although not this entire habitat is likely to be used). Removal of other vegetation likely to be used for foraging would be avoided. The affected area of foraging habitat would represent a small percentage of the total extent of important foraging vegetation types present within the locality. Given the relative widespread nature of similar planted vegetation in the locality and abundance of higher quality foraging habitat within the feeding range of the camps located near the proposal area, the proposal is not expected to significantly affect the life cycle of the species.

The proposal is unlikely to reduce the population size of the Grey-headed Flying-fox or decrease the reproductive success of this species.

b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

Not applicable.

c) in relation to the habitat of a threatened species or ecological community: i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality.

The potential habitat of the Grey-headed Flying-fox within the proposal area is limited to foraging habitat and includes all vegetation where fruiting and flowering trees and shrubs are present. The extent of potential foraging habitat for the Grey-headed Flying-fox would be reduced by nine Malus pumila (apple tree). This amount of habitat removal is small when the amount of available foraging habitat in the locality is considered.

Importantly, the proposal would not result in fragmentation of habitat for the Grey-headed Flying-fox. This species is highly mobile and will freely fly long distances (up to 50 km) over open areas including urbanised city centres to move between roost camps and foraging sites. The proposal would not affect the movement of the Grey-headed Flying-fox between habitat patches.

Importantly, the proposal would not affect the most important habitats for Grey-headed Flying-fox within the locality. The most important habitats for the local Grey-headed Flying-fox sub- populations are the roosting camps at Machattie Park. This camp would not be affected by the proposal. Foraging habitat within the proposal area is likely to form part of an overall foraging range of these sub-populations and would only form a small proportion of available habitat for this species. As such, the foraging habitat within the

proposal area is unlikely to be of critical importance for the survival of the Grey-headed Flying-fox within the locality.

d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

The proposal will not impact on any declared area of outstanding biodiversity value.

e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A Key Threatening Process (KTP) is a process that threatens, or may have the capability to threaten, the survival or evolutionary development of species, population or ecological community.

Key threatening processes are listed under the BC Act and at the present there are currently 38 listed KTPs. Of the 38 listed KTPs under the BC Act, nine are applicable to this assessment (see Table E.1). However, hygiene and weed control measures would reduce or avoid the impact of most KTPs with the exception of clearing of native vegetation and removal of dead wood and dead trees.

Conclusion

The Grey-headed Flying-fox would suffer a small reduction in extent of suitable foraging habitat from the proposal of nine Malus pumila (apple tree). No roosting camps or other important habitat would be impacted. As such, the proposal is considered unlikely to reduce the population size of the Grey- headed Flying-fox or decrease the reproductive success of this species. After consideration of the factors above, an overall conclusion has been made that the proposal is unlikely to result in a significant effect to the Grey-headed Flying-fox.

Environment Protection and Biodiversity Conservation Act 1999 Assessment

Grey-headed Flying-fox (Pteropus poliocephalus)

The Grey-headed Flying-fox is considered moderately likely to utilise habitat within the proposal area for foraging habitat.

The Grey-headed Flying-fox is not known but the species exists as one interconnected population along the eastern Australian coastal belt from Rockhampton in central Queensland to Melbourne in Victoria. As a result, for this assessment, the impact has been considered in terms of 'important habitat' as opposed the presence of an 'important population'.

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

1. lead to a long-term decrease in the size of an important population of a species

There are no roost camps in the proposal area and the action would not affect any known permanent roosting, breeding / maternity site. Therefore, it is likely that the impacts of construction and operation of the action would be confined to minor loss of foraging habitat caused by direct clearing or damage to native vegetation during the construction phase. There is also a low risk of vehicle strike during operation.

The proposal would remove nine Malus pumila (apple tree) of foraging habitat. Given the relatively widespread nature of similar native vegetation and planted vegetation in the locality and abundance of higher quality foraging habitat within the feeding range of local individuals, the proposal is not expected to significantly affect important habitat or lead to a long-term decrease in the size of an important population.

2. reduce the area of occupancy of an important population

The area of occupancy of the Grey-headed Flying-fox is not known but the species exists as one interconnected population along the eastern Australian coastal belt from Rockhampton in central Queensland to Melbourne in Victoria. The area occupied by this species would remain the same after the action. No decrease in the area of occupancy for this species expected as a result of the proposal.

3. fragment an existing important population into two or more populations

Highly mobile species such as bats are expected to be less impacted by fragmentation. The Grey-headed Flying-fox is particularly well adapted to accessing widely spaced habitat resources given its mobility and preference for seasonal fruits and blossom in differing parts of the landscape. The proposal would not fragment an important population of the Grey-headed Flying-fox. Individuals would still be able to disperse between roosts along the east Australian coast. Genetic exchange within the population and dispersal would not be disrupted by the proposal.

4. adversely affect habitat critical to the survival of a species

This species typically exhibits very large home range and Grey-headed Flying-fox is known to travel distances of at least 50 kilometres from roost sites to access seasonal foraging resources. There is a roost camp present in Machattie Park, Bathurst located near the proposal area. However, at the time of this assessment, the proposal would not directly impact on any known breeding / maternity site. As such, the impacts of the proposal to the Grey-headed Flying-fox would be limited to loss of feeding habitat caused by direct clearing or damage to native vegetation during the construction phase.

The draft recovery plan for the Grey-headed Flying-fox identifies critical foraging habitat for this species as:

- Productive during winter and spring, when food bottlenecks have been identified

- Known to support populations of >30,000 individuals, within an area of 50 kilometre radius of a camp site
- Productive during the final weeks of gestation, and during the weeks of birth, lactation and conception (Sept-May)
- Productive during the final stages of fruit development and ripening in commercial crops affected by Grey-headed Flying-foxes
- Known to be continuously occupied as a camp site.

Native vegetation within the proposal area is unlikely to constitute critical foraging habitat due to its small patch size and fragmentation. Given the extensive nature of high-quality foraging habitats along the escarpment, the proposal is not expected to adversely affect foraging habitat critical to the survival of this species in this region.

5. disrupt the breeding cycle of an important population

As stated above there would be a minor impact on foraging habitat during the breeding cycle of the species. The upgrade would not directly impact on a known roost camp / breeding or maternity site. Extensive foraging resources are available in the locality that would provide suitable resources during the maternity season. The habitats in the proposal area are not limiting for this species.

6. modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The impacts to foraging habitat are minimal and this impact is not expected to lead to a decline in the species in this region considering the magnitude of this impact and the expanse of high-quality foraging habitat available to local animals.

7. result in invasive species that are harmful to a vulnerable species becoming established in the Vulnerable species' habitat

The action is unlikely to result in an invasive species harmful to the Grey-headed Flying-fox becoming established in the habitat. The potential for weed invasion was considered possible with a proposal of this nature and appropriate controls are required during construction and operation of the road to reduce this threat. The management of invasive species would be managed under the construction environmental management plan and during operation of the road using best practice methods.

8. introduce disease that may cause the species to decline, or

There are no known disease issues affecting this species in relation to the action. The action would be unlikely to increase the potential for significant disease vectors to affect local populations.

Infection of native plants by Phytophthora cinnamomi has been identified as being spread by construction machinery. This water-borne mould infects the roots of plants and has the potential to cause dieback. Machinery associated with vegetation clearance and subsequent construction has the potential to transmit the fungus to remaining native vegetation remnants of the species. This is a potential indirect impact to the species through the transmission of pathogens into retained habitat near the road. This can be mitigated through the development and implementation of suitable control measures for vehicle and plant hygiene and is unlikely to have a significant impact. It is the intention to use current best practice hygiene protocols as part of the CEMP to prevent the introduction or spread of pathogens.

The project mitigation strategy and environmental management procedures would include guidance for preventing the introduction and/or spread of disease-causing agents such as bacteria and fungi interfere substantially with the recovery of the species.

The Draft National Recovery Plan for the Grey-headed Flying-fox (Pteropus poliocephalus) (Department of Environment Climate Change and Water, 2009) outlines the following actions:

- Identify and protect foraging habitat critical to the survival of Grey-headed Flying-foxes across their range
- Enhance winter and spring foraging habitat for Grey-headed Flying-foxes
- Identify, protect and enhance roosting habitat critical to the survival of Grey-headed Flying-foxes
- Significantly reduce levels of deliberate Grey-headed Flying-fox destruction associated with commercial horticulture
- Provide information and advice to managers, community groups and members of the public that are involved with controversial flying-fox camps
- Produce and circulate educational resources to improve public attitudes toward Grey-headed Flying-foxes, promote the recovery program to the wider community and encourage participation in recovery actions
- Monitor population trends for the Grey-headed Flying-fox
- Assess the impacts on Grey-headed Flying-foxes of electrocution on powerlines and entanglement in netting and barbed wire, and implement strategies to reduce these impacts
- Oversee a program of research to improve knowledge of the demographics and population structure of the Grey-headed Flying-fox
- Maintain a National Recovery Team to oversee the implementation of the Grey-headed Flying-fox National Recovery Plan.

The recovery actions listed above are largely not applicable to the action and the action is not expected to interfere substantially with the recovery of the species.

Conclusion

The Grey-headed Flying-fox would be subject to a small reduction in extent of suitable foraging habitat from the action. No breeding camps or other important habitat would be impacted. The action is unlikely to reduce the population size of the Grey-headed Flying-fox or decrease the reproductive success of this species. The action would not interfere with the recovery of the Grey-headed Flying-fox and would not contribute to the key threats to this species. After consideration of the factors above, an overall conclusion has been made that the action is unlikely to result in a significant impact to the Grey-headed Flying-fox.

Appendix H.2 Likelihood of occurrence

The following assessment identifies the list of threatened flora (**Table H.3**) and fauna (**Table H.4**) species recorded from a 10 kilometres radius of the proposal and compares the preferred habitat of these species with the habitats identified in the proposal area to make an assessment of the likelihood of the species being present in the proposal area (i.e. subject species). The criteria used in the assessment are detailed in **Table H.2**. Species in the table are classified as CE = Critically endangered, E = Endangered, V = Vulnerable and M= Migratory according to the BC Act and EPBC Act.

Table H.2 Likelihood of occurrence classification and criteria

Likelihood	Criteria
Recorded	The species was observed in the proposal area during the field survey.
High	It is highly likely that the species inhabits the proposal area and is dependent on identified suitable habitat (ie. for breeding or important life cycle periods such as winter flowering resources), has been recorded recently in the locality (10km) and is known or likely to maintain resident populations in the proposal area. Also includes species known or likely to visit the proposal area during regular seasonal movements or migration.
Moderate	Potential habitat is present in the proposal area. Species unlikely to maintain sedentary populations, however may seasonally use resources within the proposal area opportunistically or during migration. The species is unlikely to be dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on habitat within the proposal area, or habitat is in a modified or degraded state. Includes cryptic flowering flora species that were not seasonally targeted by surveys and that have not been recorded.
Low	It is unlikely that the species inhabits the proposal area and has not been recorded recently in the locality (10km). It may be an occasional visitor, but habitat similar to the proposal area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods such as winter flowering resources) on available habitat. Specific habitat is not present in the proposal area or the species are noncryptic perennial flora species that were specifically targeted by surveys and not recorded.
Unlikely	Suitable habitat is absent from the proposal area.

Table H.3 Threatened flora likelihood of occurrence assessment

Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Eucalyptus aggregata	Black Gum	V	V	Black gum is endemic to south-eastern Australia and is found in the ACT, NSW and in a small isolated sub-population in Victoria. In the ACT the species occurs to a very minor extent, with only 16 known mature trees in the wild in 2014. In NSW, the species occurs predominantly in the South Eastern Highlands IBRA bioregion with the most eastern part of the distribution being located just within the Sydney Basin IBRA bioregion. All known Victorian stands are located within four kilometres of the town of Woodend, occurring primarily along roadsides and streamlines and are considered a sub-population given they are located several hundred kilometres from the closest stands in NSW. The species occurs mainly in the wetter, cooler and higher parts of the tablelands and is found at altitudes of 600–1200 m and generally in areas with annual rainfall of 600–900 (up to1800) mm. It occurs on alluvial soils in, poorly-drained flats and hollows adjacent to swamps, creeks and small rivers and up adjoining slopes (up to eight metres above waterline) onto Ordovician Sandstones and shales. It is usually found in open woodland with a grassy understory dominated by river tussock (*Poa labillardierei*) or kangaroo grass (*Themeda triandra*) and with few shrubs present. Black gum is often found with other eucalypts including snow gum (*Eucalyptus. pauciflora*), manna or ribbon gum (*E. viminalis*), candlebark (*E. rubida*), black sallee (*E. stellutata*) and swamp gum (*E. ovata*).	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Eucalyptus pulverulenta	Silver-leafed Gum	V	V	The Silver-leafed Gum is found in two quite separate areas, the Lithgow to Bathurst area and the Monaro (Bredbo to Bombala). Grows in shallow soils as an understorey plant in open forest, typically dominated by Brittle Gum (*Eucalyptus mannifera*), Red Stringybark (*E. macrorhyncha*), Broad-leafed Peppermint (*E. dives*), Silvertop Ash (*E. sieberi*) and Apple Box (*E. bridgesiana*).	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Euphrasia scabra	Rough Eyebright	-	E	There are three extant populations in NSW: Bondi State Forest, South East Forests National Park and near Nunnock Swamp. Total NSW population is between 250 and 500 plants. This number varies with season with few plants appearing in some years. Occurs in or at the margins of swampy grassland or in sphagnum bogs, often in wet, peaty soil.	Bionet – 1	Unlikely – Species not recorded during field survey and Species' distribution is highly restricted to certain geographical areas not within the works footprint
Lepidium hyssopifolium	Aromatic Peppercress	E	E1	In NSW, there is a small population near Bathurst, one population at Bungendore, and one near Crookwell. The species was also recorded near Armidale in 1945 and 1958; however, it is not known whether it remains in this area. A specimen collected in the Cooma area about 100 years ago may also be Aromatic Peppercress. In NSW the species was known to have occurred in both woodland with a grassy understorey and in grassland. The species may be a disturbance opportunist, as it was discovered at the most recently discovered site (near Bungendore) following soil disturbance. The cryptic and non-descript nature (appearing like several weed species) of the species makes it hard to detect.	Bionet – 4 PMST	Low – Species not recorded during field survey. Habitats which are present in the proposal area, are heavily degraded and at best marginal.
Swainsona sericea	Silky Swainson-pea		V	Silky Swainson-pea has been recorded from the Northern Tablelands to the Southern Tablelands and further inland on the slopes and plains. There is one isolated record from the far north-west of NSW. Its stronghold is on the Monaro. Also found in South Australia, Victoria and Queensland. Found in Natural Temperate Grassland and Snow Gum *Eucalyptus pauciflora* Woodland on the Monaro. Found in Box-Gum Woodland in the Southern Tablelands and South West Slopes.	Bionet – 3	Unlikely – Species not recorded during field survey and specific habitat requirements are

Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
				Sometimes found in association with cypress-pines *Callitris spp*. Habitat on plains unknown. Regenerates from seed after fire.		not present in the proposal area.
Dichanthium setosum	Bluegrass	V	V	*Dichanthium setosum* has been reported from mid-coastal to inland NSW and Queensland. *Dichanthium setosum* occurs on the New England Tablelands, North West Slopes and Plains and the Central Western Slopes of NSW, extending west to Narrabri. *Dichanthium setosum* is associated with heavy basaltic black soils and red-brown loams with clay subsoil.	PMST	Low – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Euphrasia arguta		CE	CE	Historically, *Euphrasia arguta* has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. Was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Historic records of the species noted the following habitats: 'in the open forest country around Bathurst in sub humid places', 'on the grassy country near Bathurst', and 'in meadows near rivers. Plants from the Nundle area have been reported from eucalypt forest with a mixed grass and shrub understorey; here, plants were most dense in an open disturbed area and along the roadside, indicating the species had regenerated following disturbance.	PMST	Low – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Leucochrysum albicans var. tricolor	Hoary Sunray	E	-	Endemic to south-eastern Australia, where it is currently known from three geographically separate areas in Tasmania, Victoria and south-eastern NSW and ACT. In NSW it currently occurs on the Southern Tablelands adjacent areas in an area roughly bounded by Albury, Bega and Goulburn, with a few scattered localities know from beyond this region. Occurs in a wide variety of grassland, woodland and forest habitats, generally on relatively heavy soils. Can occur in modified habitats such as semi-urban areas and roadsides. Highly dependent on the presence of bare ground for germination.	PMST	Low – Species not recorded during field survey. At best marginal is present in the proposal area.

Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Philotheca ericifolia	-	V	-	Known only from the upper Hunter Valley and Pilliga to Peak Hill districts of NSW. The records are scattered over a range of over 400 km between West Wyalong and the Pilliga Scrub. Site localities include Pilliga East State Forest, Goonoo State Forest, Hervey Range, Wingen Maid Nature Reserve, Toongi, Denman, Rylestone district and Kandos Weir. Grows chiefly in dry sclerophyll forest and heath on damp sandy flats and gullies. It has been collected from a variety of habitats including heath, open woodland, dry sandy creek beds, and rocky ridge and cliff tops. Associated species include *Melaleuca uncinata*, *Eucalyptus crebra*, *E. rossii*, *E. punctata*, *Corymbia trachyphloia*, *Acacia triptera*, *A. burrowii*, *Beyeria viscosa*, *Philotheca australis*, *Leucopogon muticus* and *Calytrix tetragona*. Flowering time is in the spring. Fruits are produced from November to December.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Swainsona recta	Small Purple-pea	E	E	Small Purple-pea was recorded historically from places such as Carcoar, Culcairn and Wagga Wagga where it is probably now extinct. Populations still exist in the Queanbeyan and Wellington-Mudgee areas. Over 80% of the southern population grows on a railway easement. Before European settlement Small Purple-pea occurred in the grassy understorey of woodlands and open-forests dominated by Blakely's Red Gum *Eucalyptus blakelyi*, Yellow Box *E. melliodora*, Candlebark Gum *E. rubida* and Long-leaf Box *E. goniocalyx*. Grows in association with understorey dominants that include Kangaroo Grass *Themeda australis*, poa tussocks *Poa spp.* and spear-grasses *Austrostipa spp*.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Thesium australe	Austral Toadflax	V	V	Found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast. Often found in association with Kangaroo Grass (*Themeda australis*).	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are

Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
						not present in the proposal area.

Table H.4 Threatened fauna likelihood of occurrence assessment

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Bird	*Anseranas semipalmata*	Magpie Goose	-	V	Mainly found in shallow wetlands (less than 1m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Activities are centred on wetlands, mainly those on floodplains of rivers and large shallow wetlands formed by run-off; breeding can occur in both summer and winter dominated rainfall areas and is strongly influenced by water level; most breeding now occurs in monsoonal areas; nests are formed in trees over deep water; breeding is unlikely in south-eastern NSW.	Bionet – 3	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Phaethon rubricauda*	Red-tailed Tropicbird	-	V	Ranges throughout tropical and subtropical zones of the Indian and West Pacific Oceans, breeding on oceanic islands. Lord Howe Island is said to have the greatest breeding concentration in the world. Breeds in coastal cliffs and under bushes in tropical Australia. Nests on cliffs of the northern hills and southern mountains on the main island at Lord Howe Island.	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Apus pacificus*	Fork-tailed Swift	M	-	Recorded in all regions of NSW. The Fork-tailed Swift is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher.	Bionet – 1 PMST	Moderate – Species not recorded during field survey, but while unlikely to maintain

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
							sedentary populations, the species may seasonally use resources within the proposal area opportunistically or during migration
Bird	*Hirundapus caudacutus*	White-throated Needletail	M	-	Widespread in eastern and south-eastern Australia. Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. They also commonly occur over heathland but less often over treeless areas, such as grassland or swamps.	Bionet – 1 PMST	Moderate – Species not recorded during field survey, but while unlikely to maintain sedentary populations, the species may seasonally use resources within the proposal area opportunistically or during migration
Bird	*Plegadis falcinellus*	Glossy Ibis	M	-	Preferred habitat for foraging and breeding are fresh water marshes at the edges of lakes and rivers, lagoons, flood-plains, wet meadows, swamps, reservoirs, sewage ponds, rice-fields and cultivated areas under irrigation.	Bionet – 1	Unlikely – Species not recorded during field survey and there is no inundated habitat in the proposal area considered

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
							suitable for this species.
Bird	*Circus assimilis*	Spotted Harrier	-	V	The Spotted Harrier occurs throughout the Australian mainland, except in densely forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population. Occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodland, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands.	Bionet – 2	Moderate – this species has been recorded within 10km of the proposal area and has a large home range. It forages over grassland and agricultural land. Therefore, it may fly over proposal area and forage on ground on occasion.
Bird	*Hieraaetus morphnoides*	Little Eagle	-	V	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. Occupies open eucalypt forest, woodland or open woodland. Sheoak or *Acacia* woodlands and riparian woodlands of interior NSW are also used.	Bionet – 2	Moderate –this species has been recorded within 10km of the proposal area and has a large home range. It forages over cleared grassland and therefore may fly over proposal area and forage on ground on occasion.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Bird	*Falco subniger*	Black Falcon	-	V	Widely, but sparsely, distributed in New South Wales, mostly occurring in inland regions. Some reports of 'Black Falcons' on the tablelands and coast of New South Wales are likely to be referrable to the Brown Falcon. In New South Wales there is assumed to be a single population that is continuous with a broader continental population, given that falcons are highly mobile, commonly travelling hundreds of kilometres (Marchant & Higgins 1993). The Black Falcon occurs as solitary individuals, in pairs, or in family groups of parents and offspring.	Bionet – 2	Low – Species not recorded during field survey, It may be an occasional visitor, but habitat similar to the proposal area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle) on available habitat. Specific habitat is not present in the proposal area.
Bird	*Rostratula australis*	Australian Painted Snipe	E, M	E	Most records are from south east Australia, particularly the Murray Darling Basin, with scattered records across northern Australia. They generally inhabit shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum *Muehlenbeckia* or canegrass. Breeding habitat requirements may be quite specific; shallow wetlands with areas of bare wet mud and both low cover and canopy cover nearby; nest records nearly all from or near small islands in freshwater wetlands.	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					Has also been recorded nesting in and near swamps, canegrass swamps, flooded areas including samphire, grazing land, among cumbungi, sedges and grasses; one nest has been found in the centre of a cow-pat in a clump of long grass.		
Bird	*Calidris acuminata*	Sharp-tailed Sandpiper	M	-	The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. Most of the population migrates to Australia, mostly to the south-east and are widespread in both inland and coastal locations and in both freshwater and saline habitats. Many inland records are of birds on passage. Prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation; this includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersalie inland. They also occur in saltworks and sewage farms. They use flooded paddocks, sedgelands and other ephemeral wetlands, but leave when they dry. They use intertidal mudflats in sheltered bays, inlets, estuaries or seashores, and also swamps and creeks lined with mangroves. They tend to occupy coastal mudflats mainly after ephemeral terrestrial wetlands have dried out, moving back during the wet season. Sometimes they occur on rocky shores and rarely on exposed reefs.	Bionet – 2 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Gallinago hardwickii*	Latham's Snipe	M	-	Recorded along the east coast of Australia from Cape York Peninsula through to south-eastern South Australia. Occurs in permanent and ephemeral wetlands up to 2000 m above sea-level.	Bionet – 2 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Bird	*Callocephalon fimbriatum*	Gang-gang Cockatoo	-	V	In summer, occupies tall montane forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests with an acacia understorey. Also occur in subalpine Snow Gum woodland and occasionally in temperate or regenerating forest. In winter, occurs at lower altitudes in drier, more open eucalypt forests and woodlands, particularly in box ironbark assemblages, or in dry forest in coastal areas, occasionally feeding on exotic plant species on urban fringe areas. Favours old growth forest and woodland attributes for nesting and roosting. Nesting occurs in spring and summer with nests located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.	Bionet – 7	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Ninox connivens*	Barking Owl	-	V	Found throughout continental Australia except for the central arid regions. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas.	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Merops ornatus*	Rainbow Bee-eater	M	-	Distributed across much of mainland Australia and occurs on several near-shore islands. Occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation.	Bionet – 1 PMST	Moderate – Species not recorded during field survey but recorded in the area and may use specific habitats or resources which are present in the proposal area, but these habitats

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
							are in a poor or modified condition.
Bird	*Climacteris picumnus victoriae*	Brown Treecreeper (eastern subspecies)	-	V	Endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Hollows in standing dead or live trees and tree stumps are essential for nesting.	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Anthochaera Phrygia (Xanthomyza phrygia)*	Regent Honeyeater	CE	CE	The Regent Honeyeater that has a patchy distribution between south-east Queensland and central Victoria. It mostly inhabits inland slopes of the Great Dividing Range, in areas of low to moderate relief with moist, fertile soils. It is most commonly associated with box-ironbark eucalypt woodland and dry sclerophyll forest, but also inhabits riparian vegetation such as sheoak (*Casuarina spp*) where it feeds on needle-leaved mistletoe and sometimes breeds. It sometimes utilises lowland coastal forest, which may act as a refuge when its usual habitat is affected by drought. It also uses a range of disturbed habitats within these landscapes including remnant patches in farmland and urban areas and roadside vegetation. It feeds primarily on the nectar of eucalypts and mistletoes and, to a lesser extent, lerps and honeydew; it prefers	Bionet – 6 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					taller and larger diameter trees for foraging. It is nomadic and partly migratory with its movement through the landscape being governed by the flowering of select eucalypt species. There are four known key breeding areas: three in NSW and one in Victoria. Breeding varies between regions and corresponds with flowering of key eucalypt and mistletoe species. It usually nests in horizontal branches or forks in tall mature eucalypts and Sheoaks.		
Bird	*Epthianura albifrons*	White-fronted Chat	-	V	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas. Gregarious species usually found foraging on bare or grassy ground in wetland areas, singly or in pairs. They are insectivorous, feeding mainly on flies and beetles caught from or close to the ground. Have been observed breeding from late July through to early March, with 'open-cup' nests built in low vegetation. Nests in the Sydney region have also been seen in low isolated mangroves. Nests are usually built about 23 cm above the ground (but have been found up to 2.5 m above the ground).	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Melithreptus gularis*	Black-chinned Honeyeater (eastern subsp.)	-	V	Extends south from central Queensland, through NSW, Victoria into south eastern South Australia, though it is very rare in the last state. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. Occupies mostly upper levels of drier open forests or woodlands dominated by box and ironbark eucalypts, especially Mugga Ironbark (*Eucalyptus sideroxylon*),	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					White Box (*E. albens*), Inland Grey Box (*E. microcarpa*), Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*) and Forest Red Gum (*E. tereticornis*). Also inhabits open forests of smooth-barked gums, stringybarks, ironbarks, river sheoaks (nesting habitat) and tea-trees.		not present in the proposal area.
Bird	*Artamus cyanopterus*	Dusky Woodswallow	-	V	The Dusky Woodswallow has two separate populations. The eastern population is found from Atherton Tableland, Queensland south to Tasmania and west to Eyre Peninsula, South Australia. The other population is found in south-west Western Australia. The Dusky Woodswallow is found in open forests and woodlands and may be seen along roadsides and on golf courses.	Bionet – 1	Moderate – Species not recorded during field survey but known to be found along roadsides and in urban areas and recorded in vicinity of Bathurst.
Bird	*Petroica phoenicea*	Flame Robin	-	V	The Flame Robin ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands. Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. The groundlayer of the breeding habitat is dominated by native grasses and the shrub layer may be either sparse or dense. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes.	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Stagonopleura guttata*	Diamond Firetail	-	V	Found in grassy eucalypt woodlands, including Box-Gum Woodlands and Snow Gum (*Eucalyptus pauciflora*) Woodlands. Also occurs in open forest, mallee, Natural Temperate Grassland,	Bionet – 3	Low – Species not recorded during field

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					and in secondary grassland derived from other communities. Often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. Nests are globular structures built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.		survey but may use specific habitats or resources which are present in the proposal area but these habitats are in a poor or modified condition.
Bird	*Calidris ferruginea*	Curlew Sandpiper	CE	E	In Australia, Curlew Sandpipers occur around the coasts of all states and are also quite widespread inland, though in smaller numbers. They occur in Australia mainly during the non-breeding period but also during the breeding season when many non-breeding one-year old birds remain. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They generally roost on bare dry shingle, shell or sand beaches, sandspits and islets in or around coastal or near-coastal lagoons and other wetlands, occasionally roosting in dunes during very high tides and sometimes in saltmarsh and in mangroves.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Grantiella picta*	Painted Honeyeater	V	V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of birds, and almost all breeding, occur on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution. Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests. A specialist feeder on the fruits of mistletoes	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					growing on woodland eucalypts and acacias. Prefers mistletoes of the genus Amyema.		not present in the proposal area.
Bird	*Lathamus discolor*	Swift Parrot	CE	E	The swift parrot breeds in Tasmania during the summer and the entire population migrates north to mainland Australia for the winter. Whilst on the mainland the swift parrot disperses widely to forage on flowers and psyllid lerps in eucalypt species, with the majority being found in Victoria and NSW. In NSW they forage in forests and woodlands throughout the coastal and western slopes regions each year. Coastal regions tend to support larger numbers of birds when inland habitats are subjected to drought. Non-breeding birds preferentially feed in inland box-ironbark and grassy woodlands, and coastal swamp mahogany (*E. robusta*) and spotted gum (*Corymbia maculata*) woodland when in flower; otherwise often in coastal forests. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as *Eucalyptus robusta, Corymbia maculata, C. gummifera, E. sideroxylon*, and *E. albens*. Commonly used lerp infested trees include *E. microcarpa, E. moluccana* and *E. pilularis*.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Leipoa ocellata*	Malleefowl	E	V	The stronghold for this species in NSW is the mallee in the south west centred on Mallee Cliffs NP and extending east to near Balranald and scattered records as far north as Mungo NP. Predominantly inhabit mallee communities, preferring the tall, dense and floristically-rich mallee found in higher rainfall (300 - 450 mm mean annual rainfall) areas. Utilises mallee with a spinifex understorey, but usually at lower densities than in areas with a shrub understorey. Less frequently found in other eucalypt woodlands, such as Inland Grey Box, Ironbark or Bimble Box Woodlands with thick understorey, or in other woodlands such dominated by Mulga or native Cypress Pine species. Prefers areas of light sandy to sandy loam soils and habitats with a dense but	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					discontinuous canopy and dense and diverse shrub and herb layers.		
Bird	*Numenius madagascariensis*	Eastern Curlew	CE, M	-	Within Australia, the Eastern Curlew has a primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sand flats, often with beds of seagrass.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Polytelis swainsonii*	Superb Parrot	V	V	Found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Inhabit Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest. In the Riverina the birds nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum Forest or Woodland. On the South West Slopes nest trees can be in open Box-Gum Woodland or isolated paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Nest in small colonies, often with more than one nest in a single tree.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Bird	*Monarcha melanopsis*	Black-faced Monarch	M	-	Widespread in eastern Australia. Mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Bird	*Motacilla flava*	Yellow Wagtail	M	-	Rare but regular visitor around Australian coast, especially in the NW coast Broome to Darwin. Found in open country near swamps, salt marshes, sewage ponds, grassed surrounds to airfields, bare ground; occasionally on drier inland plains.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Fish	*Maccullochella macquariensis*	Trout Cod	E	E	The Trout Cod is a riverine species, inhabiting a variety of flowing waters in the mid to upper reaches of rivers and streams. Trout Cod use river positions where large cover, in the form of woody debris and boulders, is present in high quantity, close to deeper water and high surface velocity, further from the river bank. At present only two potentially sustainable populations are known; a naturally occurring population in the Murray River (NSW) downstream of the Yarrawonga Weir between Yarrawonga and Barmah and the translocated population in Seven Creeks below Polly McQuinns Weir (Vic). There have been no recent records in the Murray River downstream from Echuca (NSW, SA), Macquarie River (NSW), Murrumbidgee River (NSW, ACT), and the Goulburn, Broken, Campaspe, Ovens, King, Buffalo and Mitta Mitta Rivers (Vic). The wild populations formerly occurring in these rivers are now probably extinct. Trout Cod and Murray Cod translocated into Cataract Dam (Nepean River NSW) have hybridised, and the cod population existing there is composed largely of hybrids.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Fish	*Maccullochella peelii*	Murray Cod	V	-	The Murray Cod occurs naturally in the waterways of the Murray-Darling Basin (ACT, SA, NSW and Vic) and is known to live in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat. Some translocated populations exist	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					outside the species' natural distribution in impoundments and waterways in NSW and Vic which are maintained by the release of hatchery bred fish.		not present in the proposal area.
Fish	*Macquaria australasica*	Macquarie Perch	E	E	The Macquarie Perch is a riverine species that prefers clear water and deep, rocky holes with abundant cover such as aquatic vegetation, large boulders, debris and overhanging banks. In Victorian parts of the Murray-Darling, only small natural populations remain in the upper reaches of the Mitta Mitta, Ovens, Broken, Campaspe and Goulburn Rivers; translocated populations occur in the Yarra River and Lake Eildon. In NSW, natural inland populations are isolated to the upper reaches of the Lachlan and Murrumbidgee Rivers. Populations of the eastern form are confined to the Hawkesbury-Nepean and Shoalhaven river systems. Translocated populations in NSW are found in the Mongarlowe River, Queanbeyan River upstream of the Googong Reservoir and in Cataract Dam. In the ACT, it is restricted to the Murrumbidgee, Paddys and Cotter Rivers	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Frogs	*Litoria aurea*	Green and Golden Bell Frog	V	E	Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range; however, they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Ephemeral and permanent freshwater wetlands, ponds, dams with an open aspect and fringed by Typha and other aquatics, free from predatory fish.	Bionet – 4 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area. The dams did not provide suitable habitat for this species at the time of survey.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
							Not recorded in the locality since 1973.
Frogs	*Litoria booroolongensis*	Booroolong Frog	E	-	Restricted to tablelands and slopes in NSW and north-east Victoria at 200–1300 m above sea level. Occurs along permanent streams with some fringing vegetation cover such as ferns, sedges or grasses.	Bionet – 23 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Frogs	*Litoria castanea*	Yellow-spotted Tree frog	E	CE	There is only a single known population of the Yellow-Spotted Bell Frog, which occurs on the Southern Tablelands. Historically, this species occurred in two separate highland ranges, on the New England Tableland and on the southern and central highlands from Bathurst/Orange to Bombala. Require large permanent ponds or slow flowing streams with plenty of emergent vegetation such as bulrushes.	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Invertebrate	*Paralucia spinifera*	Bathurst Copper Butterfly	V	E	Occurs on the Central Tablelands of NSW in an area approximately bounded by Oberon, Hartley and Bathurst. The butterfly is found at 35 locations, all within the Greater Lithgow, Bathurst Regional and Oberon local government areas. It is possible that additional locations will be identified, and these may lie outside the currently known distribution. Occurs above 850 m elevation, at sites with a south-west to north-west aspect, usually where direct sunlight reaches the habitat, and with extremes of cold such as regular winter snowfalls or heavy frosts. Geology, soils and dominant vegetation canopy species vary between habitat locations. However, vegetation structure is consistent, commonly open woodland or open forest with a sparse understorey that is	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					dominated by the shrub, Blackthorn *Bursaria spinosa subsp. lasiophylla*.		
Mammals	*Dasyurus maculatus*	Spotted-tailed Quoll	E	V	Wet and dry sclerophyll forests and rainforests, and adjacent open agricultural areas. Generally associated with large expansive areas of habitat to sustain territory size. Requires hollow-bearing trees, fallen logs, small caves, rock crevices, boulder fields and rocky-cliff faces as den sites.	Bionet – 2 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Mammals	*Phascolarctos cinereus*	Koala	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. Inhabit eucalypt woodlands and forests. Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species.	Bionet – 15 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area. Not enough habitat present to maintain species.
Mammals	*Petaurus norfolcensis*	Squirrel Glider	-	V	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or *Acacia* midstorey.	Bionet – 1	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
Mammals	*Pteropus poliocephalus*	Grey-headed Flying-fox	V	V	Generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young.	Bionet – 29 PMST	Recorded
Mammals	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	V	Forages over a broad range of open forest and woodland habitats, this species is a cave roosting bat which favours sandstone escarpment habitats for roosting, in the form of shallow overhangs, crevices and caves.	Bionet – 1 PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Mammals	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	-	V	Occurs on east and north west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other manmade structures.	Bionet – 4	Moderate – may occasionally forage in the proposal area.
Mammals	*Petauroides volans*	Greater Glider	V	-	The Greater Glider occurs in eucalypt forests and woodlands along the east coast of Australia from north east Queensland to the Central Highlands of Victoria from sea level to 1200 m altitude. It feeds exclusively on eucalypt leaves, buds, flowers and mistletoe and favours forests with a diversity of eucalypt species, due to seasonal variation in its preferred tree species. It roosts in tree hollows, with a particular selection for large hollows in large, old trees. Individuals use multiple hollows and a relatively high	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					abundance of tree hollows (at least 4-8 suitable hollows per hectare) seems to be needed for the species to persist. Individuals occupy relatively small home ranges with an average size of 1 to 3 ha but the species has relatively low persistence in small forest fragments, and disperses poorly across vegetation that is not native forest. Forest patches of at least 160 km2 may be required to maintain viable populations.		
Mammals	*Petrogale penicillata*	Brush-tailed Rock-wallaby	V	E	Range extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north. Browse on vegetation in and adjacent to rocky areas eating grasses and forbs as well as the foliage and fruits of shrubs and trees.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Reptiles	*Aprasia parapulchella*	Pink-tailed Legless Lizard	V	V	The Pink-tailed Legless Lizard is only known from the Central and Southern Tablelands, and the South Western Slopes. There is a concentration of populations in the Canberra / Queanbeyan Region. Other populations have been recorded near Cooma, Yass, Bathurst, Albury and West Wyalong. This species is also found in the Australian Capital Territory. Inhabits sloping, open woodland areas with a predominantly native grassy groundlayer, particularly those dominated by Kangaroo Grass (*Themeda australis*). Sites are typically well-drained, with rocky outcrops or scattered, partially-buried rocks. Commonly found beneath small, partially-embedded rocks and appear to spend considerable time in burrows below these rocks; the burrows have been constructed by and are often still inhabited by small black ants and termites.	PMST	Unlikely – Species not recorded during field survey and specific habitat requirements are not present in the proposal area.
Reptiles	*Delma impar*	Striped Legless Lizard	V	V	The Striped Legless Lizard occurs in the Southern Tablelands, the South West Slopes and possibly on the Riverina. Populations are known in the Goulburn, Yass, Queanbeyan, Cooma and Tumut	PMST	Low – Species not recorded during field

Group	Species name	Common name	EPBC Act Status	BC Act Status	Distribution and habitat	No. records in locality	Likelihood of occurrence
					areas. Also occurs in the ACT, Victoria and south-eastern South Australia. Found mainly in Natural Temperate Grassland but has also been captured in grasslands that have a high exotic component. Also found in secondary grassland near Natural Temperate Grassland and occasionally in open Box-Gum Woodland. Habitat is where grassland is dominated by perennial, tussock-forming grasses such as Kangaroo Grass *Themeda australis*, spear-grasses *Austrostipa spp.* and Poa tussocks *Poa spp.*, and occasionally wallaby grasses *Austrodanthonia spp.* Sometimes present in modified grasslands with a significant content of exotic grasses. Sometimes found in grasslands with significant amounts of surface rocks, which are used for shelter.		survey, It may be an occasional visitor, but habitat similar to the proposal area is widely distributed in the local area, meaning that the species is not dependent (ie. for breeding or important life cycle periods) on available habitat. Specific habitat is not present in the proposal area.

Appendix H.3 Migratory species

An area of 'important habitat' for a migratory species is:

- habitat used by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or
- habitat that is of critical importance to the species at particular life-cycle stages, and/or
- habitat used by a migratory species which is at the limit of the species range, and/or
- habitat within an area where the species is declining.

The habitat of the proposal area does not contain any unique or rare features, such key foraging roosting or breeding areas for migratory species and it is not located in a region that is likely an ecologically significant proportion of the population of the species. It is therefore unlikely to be of critical importance to the species at particular life-cycle stages. It is not located at or near the limit of the range of any migratory species. The White-throated Needletail has undergone a decline in both its area of occupancy and extent of occurrence in Australia. All habitat throughout the extensive range of the species in Australia could therefore be considered to be habitat within an area where the species is declining; the locality of the proposal is not associated with a higher rate of decline than elsewhere in Australia and is not considered important on the basis if this factor. The population of the Fork-tailed Swift is stable.

The habitat of the proposal area is unlikely to be important habitat.

Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species

There is no evidence to suggest that an important habitat for any migratory species exists within the study area. The proposal is therefore unlikely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.

Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species

There is no evidence to suggest that an important habitat for any migratory species exists within the study area. The proposal is therefore unlikely to substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species.

Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

There is no evidence to suggest that an ecologically significant proportion of the population of a migratory species exists within the study area. The proposal is therefore unlikely to seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

Conclusion

The proposal is unlikely to significantly impact migratory species.