1. EPBC Act Assessments of Significant Impact

The *Environment Protection and Biodiversity Conservation Act 1999* specifies factors to be taken into account in deciding whether a development is likely to significantly affect Threatened Ecological Communities, threatened species, and migratory species listed at the Commonwealth level. The following assesses the significance of the likely impacts associated with the proposed works on:

- White Box – Yellow Box – Blakeley's Red Gum – Grassy Woodland and Derived Native Grassland (Critically Endangered),
- Bluegrass *Dichanthium setosum* (Vulnerable),
- Koala *Phascolarctos cinereus* (Endangered),
- Satin Flycatcher *Myiagra cyanoleuca* (Migratory), and
- Rainbow Bee-eater *Merops ornatus* (Migratory).

Different significant impact criteria apply depending on the level at which a species or community is listed (i.e., vulnerable, endangered, critically endangered etc.). The appropriate criteria have been applied to the entities listed above.

In the context of the assessments below, 'the action' refers to 'the proposal' as described in Section 1.1.

Significant Impact Criteria

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

- Lead to a long-term decrease in the size of a population,
- Reduce the area of occupancy of the species,
- Fragment an existing population into two or more populations,
- Adversely affect habitat critical to the survival of a species,
- Disrupt the breeding cycle of a population,
- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,
- Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat,
- Introduce disease that may cause the species to decline, or
- Interfere with the recovery of the species.

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- A geographically distinct regional population, or collection of local populations, or
- A population, or collection of local populations, that occurs within a particular bioregion.

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

- Lead to a long-term decrease in the size of an important population of a species,

- Reduce the area of occupancy of an important population,
- Fragment an existing important population into two or more populations,
- Adversely affect habitat critical to the survival of a species,
- Disrupt the breeding cycle of an important population,
- Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline,
- Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat,
- Introduce disease that may cause the species to decline, or
- Interfere substantially with the recovery of the species.

Each of these criteria are addressed below. An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:

- Key source populations either for breeding or dispersal, or
- Populations that are necessary for maintaining genetic diversity, and/or populations that are near the limit of the species range.

1.1 White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (Critically Endangered Ecological Community)

a) reduce the extent of an ecological community?

The EPBC listed form of Box-gum Woodland CEEC covers approximately 38.84 ha within the Subject Land. The proposal would remove approximately 0.67 ha of this community, or 1.7% of the community within the Subject Land.

As trees of this TEC within 75 m of each other are considered part of the same patch, patches of the community extend outside the Subject Land to the south for many hundreds of hectares. As such, the extent of the community within the locality will be reduced by less than 0.01%.

b) fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines

Historical clearing for livestock grazing and cropping has resulted in significant fragmentation of Box-gum Woodland CEEC in the locality. Within the Subject Land the community persists along the Banyandah Creek riparian corridor as well is in patches adjacent to Middlebrook Road and on the eastern/south-eastern boundaries (see Figure 3-13 of the BDAR).

These areas will be almost completely avoided by the Development Footprint. The only direct impacts will occur to a small patch of the community adjacent to Middlebrook Road consisting of approximately 10 trees. This impact will not significantly increase fragmentation of the community within the Subject Land. Higher quality patches of the community within the Subject Land, particularly along Banyandah Creek, will not be fragmented by the proposal.

c) Will modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns

Abiotic factors that support Box-gum Woodland CEEC within the Subject Land and locality will not be modified or destroyed by the proposal. Overall ground disturbance and the removal of groundcover would be minimal and largely limited to internal roads and hardstands for the substation, inverters, and ancillary buildings. Runoff from the Subject Land would continue to drain northwards as it does under existing conditions with little or no concentration of runoff, consistent with existing surface runoff conditions. Indirectly, the proposed works would involve a range of activities that could disturb soils though impacts are considered low and can be appropriately managed. These impacts are addressed in detail in Section 7.3.4 of the BDAR.

With the effective implementation of the safeguards and mitigation measures detailed in the BDAR and the accompanying EIS, the proposal is not considered to significantly affect any abiotic processes that support Box-gum Woodland CEEC.

d) cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting?

The proposal will remove approximately 0.67 ha of Box-gum Woodland CEEC. The removal of this small patch of vegetation will not result in a substantial change in the species composition of the community within the Subject Land, or even within the impacted patch which continues southwards along Middlebrook Road. White Box *Eucalyptus albens* is a functionally important species from the community and will be removed in this impact area, however, the vast majority of several hundred White Box within the Subject Land have been retained and will be completely avoided by the Development Footprint.

e) cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:

- **assisting invasive species, that are harmful to the listed ecological community, to become established, or**
- **causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or**

f) interfere with the recovery of an ecological community.

The proposal will not assist any invasive species that are harmful to Box-gum Woodland CEEC given that a weed management plan will be implemented during construction including a procedure for declared priority weeds and a hygiene protocol for all machinery and fill (see Section 8 of the BDAR for further details).

The proposal does not involve the regular mobilisation of any fertilisers, herbicides, or chemical pollutants which could potentially impact Box-gum Woodland CEEC.

The removal of 0.67 ha of Box-gum Woodland CEEC, or less than 0.01% of the community within the locality, is unlikely to interfere with the recovery of the community, especially given the proposed rehabilitation of disturbed areas as per the vegetation management plan for the proposal.

Conclusion

The vast majority of Box-gum Woodland CEEC within the Subject Land has been avoided by the final Development Footprint layout, with only 0.67 ha or 1.7% being directly impacted. With the effective implementation of the safeguards and mitigation measures described in the BDAR and the accompanying EIS, the proposal is not considered to have a significant impact on the community and a referral to DCCEEW has not been recommended.

1.2 Koala Phascolarctos cinereus (Endangered)

a) Lead to a long-term decrease in the size of a population

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered, or vulnerable threatened species, occurrences include but are not limited to:

- A geographically distinct regional population, or collection of local populations, or
- A population, or collection of local populations, that occurs within a particular bioregion.

Habitat for Koala is present within the Subject Land in the form of 72.13 ha of wooded areas including riparian vegetation as well as 409 scattered trees.

No Koala or evidence of Koala were observed during targeted surveys for the species despite viable habitat being present. There are also no records of Koala are within 10 km of the Subject Land. There are clusters of records further away at Quirindi and to the east at Nundle, but generally Koala records within a 30 km radius of the Subject Land are sparse. This suggests that the species does not have population within the Subject Land or locality as defined above.

As such, the proposal is unlikely to lead to a long-term decrease in the size of a population of Koala. Assuming a Koala population was present within the Subject Land or locality, the proposed removal of 2.12 ha of woodland vegetation and 197 scattered trees is also unlikely to lead to a long-term decrease in the size of a population. Approximately 70.01 ha of woodland vegetation will be completely avoided by the final Development Footprint, which is equivalent to 97.1% of woodland vegetation within the Subject Land. 228 scattered trees will also be retained within the Subject Land.

b) Reduce the area of occupancy of the species

Given that a population of Koala does not currently occupy the Subject Land or locality, the proposal will not reduce the area of occupancy for the species. Approximately 2.12 ha of suitable habitat plus 197 scattered trees which may be used by the species will be removed by the proposal.

c) Fragment an existing population into two or more populations

Given that a population of Koala does not currently occupy the Subject Land or locality, the proposal will not fragment an existing population into two or more populations.

d) Adversely affect habitat critical to the survival of a species

The EPBC Act referral guidelines for Koala (DoE 2014) focus on the impacts of proposals to habitat critical to the survival of the Koala. Table 4 of the guidelines provide a habitat assessment tool that allows for a flowchart to be followed in determining whether the habitat proposed to be impacted should be considered critical habitat. In the case of this proposal, the habitat to be impacted generated a score of 5 and is therefore considered critical habitat (see Table 7-5 of the BDAR). Up to 2.12 ha of critical habitat plus 197 scattered trees would be adversely impacted by

the proposal. Due to the limited nature of this impact and lack of Koala population in the locality, referral to DCCEEW has not been recommended.

e) Disrupt the breeding cycle of a population

Given that a population of Koala does not currently occupy the Subject Land or locality, the proposal will not disrupt the breeding cycle of a population of Koala.

f) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline

The extent of habitat modification and removal proposed would marginally reduce the extent of resources available for Koala within the Subject Land. Up to 2.12 ha of woodland vegetation plus 197 scattered trees would be removed by the proposal. Approximately 97.1% of woodland habitat plus 228 scattered trees will be retained within the Subject Land. This avoidance of higher quality habitat areas will maintain connectivity for the species such that no areas of habitat would be isolated. Given the absence of a population of Koala in the locality and the relatively poor quality of the vegetation to be removed, the impacts are unlikely to cause the species to further decline.

g) Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat

The proposal will not result in any invasive species harmful to Koalas or their habitat becoming established in the Subject Land or locality. The proposal is not considered likely to generate an increase in feral predators such as dogs and impacts to Koala habitat from environmental weeds will be managed by the implementation of a weed management plan (see Section 8 of the BDAR for further details).

h) Introduce disease that may cause the species to decline, or

There are no vectors by which the proposal could cause the introduction of *Chlamydia* into a population of Koalas in the locality. The potential introduction of *Phytophthora cinnamomi* into the Subject Land will be managed by hygiene protocols for all machinery and fill as per the safeguards and mitigation measures detailed in Section 8 of the BDAR.

i) Interfere with the recovery of the species.

The EPBC Act referral guidelines for the Koala (DoE 2014) list several potential impacts that could interfere substantially with the recovery of the species including:

- Increasing Koala fatalities in habitat critical to the survival of the Koala due to dog attacks to a level that is likely to result in multiple, ongoing mortalities.
- Increasing Koala fatalities in habitat critical to the survival of the koala due to vehicle-strikes to a level that is likely to result in multiple, ongoing mortalities.

- Facilitating the introduction or spread of disease or pathogens such as *Chlamydia* or *Phytophthora cinnamomi* to habitat critical to the survival of the koala that are likely to significantly reduce the reproductive output of Koalas or reduce the carrying capacity of the habitat.
- Creating a barrier to movement to, between, or within habitat critical to the survival of the Koala that is likely to result in a long-term reduction in genetic fitness or access to habitat critical to the survival of the Koala.
- Changing hydrology which degrades habitat critical to the survival of the Koala to the extent that the carrying capacity of the habitat is reduced in the long-term.

Indirect impacts of the proposal such as these are assessed in Sections 7.2 and 7.3 of the BDAR. Direct mortality of individuals from actions such as vehicle strike and disruption of breeding is considered unlikely as such impacts can be reliably mitigated. Similarly, disease/pathogen spread and altered hydrology can be effectively managed with the mitigation measures specified in the BDAR and accompanying EIS. The proposal will not create a barrier to movement as passage through the Subject Land will be maintained via creeklines and riparian corridors. The extent of habitat removal is considered unlikely to reduce the carrying capacity of any population that may utilise the Subject Land in the future. As such, indirect impacts on Koala can all be sufficiently mitigated such that they will not interfere with the recovery of the species.

Conclusion

No Koalas or evidence of Koalas were detected during targeted surveys and a population of the species is not considered to occur within the Subject Land or locality. Given the presence of potential habitat within the Subject Land and the connectivity of this habitat with significant areas of habitat in the landscape, the habitat present can be considered critical to the survival of Koala under the referral guidelines. However, the proposal would only remove up to 2.12 ha of Koala habitat plus 197 scattered trees, with 70.01 ha of Koala habitat within the Subject Land (97.1%) plus 228 scattered trees being retained. All indirect impacts to Koala may be effectively mitigated with the implementation of the safeguards detailed in the BDAR and accompanying EIS. On this basis, the proposal is not considered to have a significant impact on Koalas or their habitat and referral to DCCEEW has not been recommended.

1.3 Bluegrass *Dichanthium setosum* (Vulnerable)

a) Lead to a long-term decrease in the size of an important population of a species?

An important population is defined as one that is necessary for a species' long-term survival and recovery, and includes:

- A key source population either for breeding or dispersal,
- A population that is necessary for maintaining genetic diversity, and/or
- A population that is near the limit of the species' distribution range.

Bluegrass is often found in moderately disturbed areas such as cleared woodland, grassy roadside remnants, and highly disturbed pasture. It is often collected from disturbed open grassy woodlands on the northern tablelands where the habitat has been variously grazed, nutrient-enriched and water-enriched. It is open to question whether the species tolerates or is promoted by a certain amount of disturbance, or whether this is indicative of the threatening processes behind its depleted habitat. It is locally common or found as scattered clumps in broader populations. The extensive distribution and wide environmental tolerances make predictions about suitable habitat difficult (TBDC 2023).

Initial environmental risk assessments for threatened species deemed Bluegrass *Dichanthium setosum* as having the potential of being present within the Subject Land. Targeted surveys did not detect the species within the Subject Land. The species was also not observed in any 2020 surveys which involved widespread and repeated traversal of the Subject Land. Were a population, or part thereof, of Bluegrass present within the Subject Land, it would not be considered an important population as the number of individuals would likely be low and their presence would be well within the known distribution of the species. As such, any individuals potentially present within the Subject Land are not considered to constitute or be part of an important population of the species.

b) Reduce the area of occupancy of an important population

Bluegrass was not recorded within the Subject Land. Any population of the species occurring within the proposal site is not considered to constitute an important population. As such, the proposal is not considered likely to reduce the area of occupancy of an important population.

c) Fragment an existing important population into two or more populations

An important population of Bluegrass is not considered to be present.

d) Adversely affect habitat critical to the survival of a species

There is approximately 51.17 ha of potential Bluegrass habitat within the Subject Land including all areas of PCT 433 and PCT 599 which are associated with the species. The proposal would permanently impact approximately 4.29 ha of potential Bluegrass habitat, or 8.4% of potential habitat within the Subject Land. This habitat is not considered critical to the survival of the species given its wide distribution, abundance, and environmental tolerance within the Nandewar region.

e) Disrupt the breeding cycle of an important population
Any population of the Bluegrass occurring within the Subject Land is not considered to constitute an important population of the species. As such, the proposal is not considered likely to disrupt the breeding cycle of an important population.
f) Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
The removal of approximately 4.29 ha of potential Bluegrass habitat is considered unlikely to cause the species to further decline. Approximately 46.88 ha (or 91.6%) of potential Bluegrass habitat will be retained within the Subject Land. Avoidance of higher quality potential habitat will maintain connectivity such that no areas of habitat would be isolated.
g) Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
The proposal is considered unlikely to generate an increase in invasive species harmful to Bluegrass such that it would constitute a substantial reduction in the quality or integrity of the potential habitat within the Subject Land. A weed management plan will be implemented during construction including a procedure for declared priority weeds and a hygiene protocol for all machinery and fill (see Section 8 of the BDAR for further details). Additionally, the proposal is considered unlikely to generate an increase in feral herbivores such as Rabbits.
h) Introduce disease that may cause the species to decline
The proposal is considered unlikely to introduce disease that may cause the species to decline.
i) Interfere substantially with the recovery of the species.
The proposal is considered unlikely to interfere with the recovery of the species given that it will not impact on any known populations of the species.
Conclusion
As the proposal is not considered to impact upon important population of Bluegrass, a significant impact resulting from the proposal is considered unlikely. As such, referral to DCCEEW has not been recommended.

1.4 Rainbow Bee-eater *Merops ornatus* & Satin Flycatcher *Myiagra cyanoleuca* (Migratory)

a) 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

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

a. Habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, and/or

b. Habitat that is of critical importance to the species at particular life-cycle stages, and/or

c. Habitat utilised by a migratory species which is at the limit of the species range, and/or

d. Habitat within an area where the species is declining.

Rainbow Bee-eater is most often found in open forests, woodlands and shrublands, and cleared areas, usually near water. It will be found on farmland with remnant vegetation and in orchards and vineyards. It will use disturbed sites such as quarries, cuttings and mines to build its nesting tunnels (BirdLife Australia 2023). Rainbow Bee-eater is found throughout mainland Australia as well as eastern Indonesia, New Guinea and, rarely, the Solomon Islands. In Australia it is widespread, except in desert areas, and breeds throughout most of its range, although southern birds move north to breed (Ibid).

Satin Flycatcher is found along the east coast of Australia from far northern Queensland to Tasmania, including south-eastern South Australia. It is also found in New Guinea. Satin Flycatcher is not a commonly seen species, especially in the far south of its range, where it is a summer breeding migrant and is found in tall forests, preferring wetter habitats such as heavily forested gullies, but not rainforests. It is a migratory species, moving northwards in winter to northern Queensland and Papua New Guinea, returning south to breed in spring (Ibid).

Rainbow Bee-eater and Satin Flycatcher were heard within the Subject Land during targeted surveys. However, given the very broad distribution of the species and their ability to utilise multiple habitats included degraded areas, the habitat within the Subject Land is not considered important habitat for either species as per the definition above.

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

The proposal will not result in any invasive species harmful to Rainbow Bee-eater or Satin Flycatcher or their habitats becoming established in the Subject Land or locality. The proposal is not considered likely to generate an increase in feral predation and impacts to migratory bird habitat from environmental weeds will be managed by the implementation of a weed management plan (see Section 8 of the BDAR for further details).

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

Listed migratory species cover a broad range of species with different life cycles and population sizes. As such, an 'ecologically significant proportion' of the population varies with the species. Some factors that should be considered include the species' population status, genetic distinctiveness and species-specific behavioural patterns (for example, site fidelity and dispersal rates).

Rainbow Bee-eater and Satin Flycatcher are widely distributed across NSW and Australia. The concept of discrete locations is difficult to apply to these species because of their widespread distribution and their ability to undertake long-distance movements. The total population size of these species in Australia has not been estimated. However, the population size is assumed to be reasonably large based on reporting rates for the species (i.e., the Atlas of Australian Birds has received more than 30,000 records of the Rainbow Bee-eater since 1998 and the Atlas of Living Australia has received approximately 14,000 records of the Satin Flycatcher since 1990). It is not known if the total population of the Rainbow Bee-eater is divided into a series of discrete subpopulations. However, the mobility of the species suggests that it is unlikely that any local or regional population would be genetically isolated from the remainder of the Australian population. The proposal will have a marginal impact on the availability of breeding, feeding, migration, and resting resources for the species and as such is considered unlikely to seriously disrupt the life cycle of any ecologically significant proportion of any population.

Conclusion

As the proposal is not considered to impact upon important habitat for Rainbow Bee-eater or Satin Flycatcher or an ecologically significant proportion of their population, a significant impact resulting from the proposal is considered unlikely. As such, referral to DCCEEW has not been recommended.