APPENDIX 8 – ASSESSMENT OF SIGNIFICANCE (EPBC ACT)

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The Significant Impact Guidelines (DOTE, 2013) for the Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) set out criteria to assist in determining whether an action requires referral to the Australian Government Department of Environment for assessment and approval if a proposed action is considered likely to have a significant impact on a matter of National Environmental Significance (NES). These criteria are:

1. Are there any matters of national environmental significance located in the area of the proposed action (noting that 'the area of the proposed action' is broader than the immediate location where the action is undertaken; consider also whether there are any matters of national environmental significance adjacent to or downstream from the immediate location that may potentially be impacted)?

2. Considering the proposed action at its broadest scope (that is, considering all stages and components of the action, and all related activities and infrastructure), is there potential for impacts, including indirect impacts, on matters of national environmental significance?

3. Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance (and if so, is the effectiveness of these measures certain enough to reduce the level of impact below the 'significant impact' threshold)?

4. Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts (important, notable, or of consequence, having regard to their context or intensity)?

1. Matters of NES located in the area

1. Are there any matters of national environmental significance located in the area of the proposed action?

All mammal species proposed for reintroduction are listed under the EPBC Act. The Protected Matters Search Tool (PMST) report (Appendix 2) identified the following as potentially occurring in the study area:

- 6 listed threatened ecological communities
- 30 listed threatened species
- 8 migratory species.

All of the species and Threatened Ecological Communities (TECs) are listed in Table A8-1. The PMST report covered an area of 50 km radius around the proposed activity. The likelihood that any of the species or TECs occur in the vicinity of the proposal area was assessed and results are tabulated in Table A8-1

When evaluating which threatened and migratory biota are likely to occur within the study area, the following factors were taken into consideration:

- the presence of potential habitat;
- condition of and approximate extent of potential habitat;
- species occurrence within study area and wider locality.

The following criteria were applied to each entity based on the above to determine the likelihood of species occurrence within the study area:

- No (no suitable habitat present and the species not previously recorded within the locality; or in the case of flora, study area extensively searched during the appropriate time of year for detection and species not present);
- Unlikely (no suitable habitat is present, but previously recorded within the locality);

- Low (some suitable habitat present and the species known from the locality; species may infrequently visit the study area en route to foraging resources, but do not depend on the habitats of the study area for survival);
- Moderate (study area contains habitat that could support a population of a species);
- High (study area contains habitat that is likely to support a population of the species including roosting, breeding and foraging habitat);
- Yes (species recorded during field surveys by AWC or NPWS ecologists).

Table A8-1: Threatened species and ecological communities and Migratory and Marine species listed under the EPBC Act and identified in the PMST report (Appendix 2) for an area of 50 km radius. The assessed likelihoods of these species and ecological communities occurring within the area of the proposed conservation fence and associated infrastructure are in the right-hand column.

Common Name ***Scientific Name*** **EPBC Status**	**PMST 'Type of presence'**	**Recorded during survey**	**Recorded previously in locality**	**Likelihood of biota occurring in the vicinity of the proposed CFAI**
EXTINCT MAMMALS TO BE REINTRODUCED				
Western Quoll *Dasyurus geoffroii* Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Western Barred Bandicoot *Perameles bougainville* Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Bilby *Macrotis lagotis* Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Northern Hairy-nosed Wombat *Lasiorhinus krefftii* Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Brush-tailed Bettong *Bettongia penicillata ogilbyi* Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Bridled Nail Wallaby *Onychogalea fraenata* Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Plains Mouse *Pseudomys australis* Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
AVIFAUNA				
Australian Painted Snipe *Rostratula australis* Endangered	Species or species habitat likely to occur within 50 km radius	No	Yes	Low
Australasian Bittern *Botaurus poiciloptilus* Endangered	Species or species habitat likely to occur within 50 km radius	No	Yes	Low
Black-faced Monarch *Monarcha melanopsis* Migratory	Species or species habitat known to occur	No	No	Low

Common Name *Scientific Name* EPBC Status	PMST 'Type of presence'	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring in the vicinity of the proposed CFAI
	within 50 km radius			
Curlew Sandpiper *Calidris ferruginea* Critically Endangered, Migratory	Species or species habitat may occur within 50 km radius	No	No	Unlikely
Fork-tailed Swift *Apus pacificus* Migratory	Species or species habitat likely to occur within 50 km radius	No	No	Moderate
Latham's Snipe *Gallinago hardwickii* Migratory	Species or species habitat may occur within 50 km radius	No	Yes	Low
Malleefowl *Leipoa ocellata* Vulnerable	Species or species habitat known to occur within 50 km radius	No	Yes	Moderate
Painted Honeyeater *Grantiella picta* Vulnerable	Breeding known to occur within 50 km radius	No	Yes	Moderate
Regent Honeyeater *Anthochaera phrygia* Critically Endangered	Species or species habitat known to occur within 50 km radius	No	Yes	Moderate
Rufous Fantail *Rhipidura rufifrons* Migratory	Species or species habitat known to occur within 50 km radius	No	No	Low
Satin Flycatcher *Myiagra cyanoleuca* Migratory	Species or species habitat known to occur within 50 km radius	Yes	No	Yes
Superb Parrot *Polytelis swainsonii* Vulnerable	Species or species habitat known to occur within 50 km radius	Yes	Yes	Yes
Swift Parrot *Lathamus discolor* Critically Endangered	Species or species habitat may occur within 50 km radius	No	No	Low
Yellow Wagtail *Motacilla flava* Migratory	Species or species habitat may occur within 50 km radius	No	No	Low

Common Name *Scientific Name* EPBC Status	PMST 'Type of presence'	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring in the vicinity of the proposed CFAI
White-throated Needletail *Hirundapus caudacutus* Migratory	Species or species habitat known to occur within 50 km radius	Yes	Yes	Yes
FISH				
Murray Cod *Maccullochella peeli* Vulnerable	Species or species habitat may occur within 50 km radius	No	No	No
MAMMALS				
Brush-tailed Rock Wallaby *Petrogale penicillata* Vulnerable	Species or species habitat may occur within 50 km radius	No	Yes	Unlikely
Corben's Long-eared Bat *Nyctophilus corbeni* Vulnerable	Species or species habitat known to occur within 50 km radius	No	Yes	Moderate
Grey-headed Flying-fox *Pteropus poliocephalus* Vulnerable	Foraging, feeding or related behavior may occur within 50 km radius	No	No	No
Koala *Phascolarctos cinereus* Vulnerable	Species or species habitat known to occur within 50 km radius	Yes	Yes	Yes
Pilliga Mouse *Pseudomys pilligaensis* Vulnerable	Species or species habitat known to occur within 50km radius	Yes	Yes	Yes
Spotted-tail Quoll *Dasyurus maculatus maculatus* (SE mainland population) Endangered	Species or species habitat likely to occur within 50 km radius	No	Yes	Low
Large-eared Pied Bat *Chalinolobus dwyeri* Vulnerable	Species or species habitat known to occur within 50 km radius	No	Yes	Moderate
REPTILES				
Border Thick-tailed Gecko *Uvidicolus sphyrurus* Vulnerable	Species or species habitat likely to occur within 50 km radius	No	No	No

Common Name *Scientific Name* EPBC Status	PMST 'Type of presence'	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring in the vicinity of the proposed CFAI
Five-clawed Worm-skink *Anomalopus mackayi* Vulnerable	Species or species habitat known to occur within 50 km radius	No	Yes	No
Pink-tailed Worm-lizard *Aprasia parapulchella* Vulnerable	Species or species habitat may occur within 50 km radius	No	No	No
Striped Legless Lizard *Delma impar* Vulnerable	Species or species habitat may occur within 50 km radius.	No	No	No
THREATENED ECOLOGICAL COMMUNITIES				
Brigalow (*Acacia harpophylla* dominant and codominant) Endangered	Known to occur within 50 km radius	No	Yes	No
Coolibah-Black Box Woodland of the Darling Riverine Plains and the Brigalow Belt South Bioregions Endangered	Likely to occur within 50 km radius	No	Yes	No
Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-eastern Australia Endangered	May occur within 50 km radius	No	Yes	No
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland Critically Endangered	Likely to occur within 50 km radius	No	No	No
Weeping Myall Woodlands Endangered	May occur within 50 km radius	No	Yes	No
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered	Likely to occur within 50 km radius	No	Yes	No
FLORA				
Austral Pipewort *Eriocaulon australasicum* Endangered	Species or species habitat known to occur within 50 km radius	No	Yes	No
Austral Toadflax *Thesium australe* Vulnerable	Species or species habitat	No	No	No

Common Name *Scientific Name* EPBC Status	PMST 'Type of presence'	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring in the vicinity of the proposed CFAI
	may occur within 50 km radius			
Bluegrass *Dichanthium setosum* Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	No
Ooline *Cadellia pentastylis* Vulnerable	Species or species habitat likely to occur within 50 km radius	No	No	Unlikely
Androcalva procumbens (syn. *Commersonia procumbens)* Vulnerable	Species or species habitat likely to occur within 50 km radius	Yes	Yes	Yes
Bertya opponens Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	No
Philotheca ericofolia Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	No
Slender Darling-pea *Swainsona murrayana* Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	No
Spiny Peppercress *Lepidium aschersonii* Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	No
Tylophora linearis Endangered	Species or species habitat likely to occur within 50 km radius	Yes	Yes	Yes

The species or TECs that were considered to be moderately likely, highly likely, or were known to occur in the vicinity of the activity are summarized below.

To be reintroduced

- Western Quoll, vulnerable EPBC Act
- Western Barred Bandicoot, endangered EPBC Act
- Bilby, vulnerable EPBC Act

- [Northern Hairy-nosed Wombat, endangered EPBC Act – reintroduction subject to further assessment]
- Brush-tailed Bettong, endangered EPBC Act
- Bridled Nailtail Wallaby, endangered EPBC Act
- Plains Mouse, vulnerable EPBC Act

Known to occur

- Satin Flycatcher, migratory EPBC Act
- Superb Parrot, vulnerable EPBC Act
- White-throated Needletail, migratory EPBC Act
- Koala, vulnerable EPBC Act
- Pilliga Mouse, vulnerable EPBC Act
- *Androcalva procumbens* (syn, *Commersonia procumbens*), vulnerable EPBC Act
- *Tylophora linearis*, endangered EPBC Act

Moderate to High likelihood of occurrence

- Fork-tailed Swift, migratory EPBC Act (moderate)
- Malleefowl, vulnerable EPBC Act (moderate)
- Painted Honeyeater, vulnerable EPBC Act (moderate)
- Regent Honeyeater, critically endangered EPBC Act (moderate)
- Corben's Long-eared Bat, vulnerable EPBC Act (moderate)
- Large-eared Pied Bat, vulnerable EPBC Act (moderate)

These species were assessed against the EPBC's significant impact guidelines (Section 4 below).

2. Potential for impacts on matters of NES

2. Considering the proposed action at its broadest scope (that is, considering all stages and components of the action, and all related activities and infrastructure), is there potential for impacts, including indirect impacts, on matters of national environmental significance?

The proposed action has the potential to have impacts on the 20 matters of NES identified in the previous section. The significance of the possible impacts are assessed in detail in Section 4 below.

3. Measures to avoid or reduce impacts on matters of NES

3. Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance (and if so, is the effectiveness of these measures certain enough to reduce the level of impact below the 'significant impact' threshold)?

The planning of the proposed action has focused on avoiding and reducing potential impacts on matters of NES with emphasis on removing threats (feral predators, feral herbivores); minimising the area of habitat to be affected; and selecting fence, track and other infrastructure sites that avoid impacts on matters of NES where possible. Ongoing, intensive monitoring is proposed (AWC's draft Ecological Health Management Framework, Appendix 13) and is designed to provide data that will indicate the impacts of the proposal on matters of NES that might develop over time. Measures already taken or that will be taken in the future are described below.

- Feral predators and feral herbivores: Feral predators and herbivores will be removed from the site of proposed mammal reintroductions. This measure will also reduce threats to the extant populations of matters of NES.

- Adequate area of habitats to support viable populations of species: The proposed fence area is of sufficient size (5,822 ha) to support viable populations of reintroduced species (Table A8-2) as well as extant species that are matters of NES (see Section 4 for more details).

Table A8-2: Global population of locally extinct mammals proposed for reintroduction into Pilliga and the estimated increase to population size as a result of the proposal.

Species	Global population estimate (2012)	Proposed Pilliga feral predator-free fenced area: potential population estimate	% increase
Bridled Nailtail Wallaby	2,300	2,100	90%
Western Barred Bandicoot	3,000	1,550	50%
Bilby	10,000	850	8%
Brush-tailed Bettong	<18,000	2,900	16%
Plains Mouse	10,000	1,000 (600-5,800)	10%
Western Quoll	13,500	90 inside, 210 outside fence	1-2%

- Optimising the area to perimeter ratio to minimise clearing for the fence: While a circular fenced area would have the shortest perimeter, it would be impracticable in terms of the existing road network and would also compromise the structural strength of the fence. Various options were assessed before the proposed location was selected: for instance, square or rectangular designs would not fit well with the existing road network, and would have required more clearing for new access tracks. The proposed design makes use of existing roads for access to gates.
- Threatened ecological communities: The proposed fence, operations base and new track have been sited to avoid threatened ecological communities. None are affected by the proposal.
- Threatened plants: The proposed routes of the fence and the new track, as well as the operations base area, have been surveyed by botanists to identify any threatened plants that could be impacted.
- Pre-clearing surveys: A pre-clearance fauna survey will be completed by suitably qualified persons. This will generally involve inspections of logs, rocks and leaf litter and fallen timber for frogs, reptiles and mammals. Any fauna found will be relocated to adjacent habitat. This survey will occur on the same day as clearing takes place.
- Vegetation communities within the proposed fenced area: The fenced area has been sited to encompass a wide variety of vegetation communities to meet the ecological needs of the reintroduced mammals, given the physical constraints on fence location – notably, drainage lines, wetlands and roads. The proposed fenced area contains 10 vegetation types (based on Plant Community Types (PCTs)). A precautionary approach suggests a diverse mix of habitats will optimise the likelihood of successful establishment of the Pilliga reintroduction species. The mammals to be reintroduced to the Pilliga are expected to have a range of habitat preferences, although definitive habitat preferences in the proposed fenced area are unknown, due to the long absence of all species from NSW.

- Watercourses: The fence has been sited to limit impacts on waterways.
- Optimising the design of the operations base site: The proposed operations base has to balance the needs for minimising disturbance to habitats, for proximity to the fence (to enable effective patrols and general security), and for safety (primarily in terms of bushfire), amongst other considerations. In terms of habitat, guidelines that were taken into account include:
    - that the footprint should be located primarily on the most common and widespread vegetation type in the park (i.e. Buloke-White Cypress Pine woodland);
    - that the footprint should be located predominantly in an area that had been previously disturbed;
    - that the footprint should be located outside of a 50 m creek buffer to protect the more sensitive riparian zone vegetation community that consists largely of red gums and Rough-barked Apple.

  The layout of the operations base has been designed to balance the need to ensure that buildings have enough distance between them to limit the risk of fire transferring from one building to another in the case of a bushfire, with the need to limit the area of habitat affected by the proposal.

- Intensive ongoing monitoring: AWC has developed a detailed draft Ecological Health Monitoring Framework (EHMF) for the Pilliga EMA project area (see Appendix 13). Under this draft EHMF, AWC ecologists will undertake regular biological surveys to measure a suite of indicators including:
    - biodiversity indicators (species such as Koalas, etc.);
    - threat indicators; and
    - indicators related to ecological processes.

  The objectives of this monitoring program include to: (a) track the ecological health of the Pilliga EMA project area over time; (b) monitor the success of endangered mammal reintroductions; and (c) measure the changes in ecological health that occur as a result of the removal of feral animals and the reintroduction of endangered mammals. The last will allow AWC to evaluate the outcomes of the reintroduction project for extant species and ecosystems at sites both inside and outside the fence.

- Barrier effects: The fence will be a permanent barrier to the movement of medium and large non-volant mammal species, large reptiles and Emus. The fence will not be a barrier to the movement of other bird species, small reptiles, frogs, fish or invertebrates. Plants dispersed by birds (with the exception of species dispersed by the Emu), wind and water will also be unaffected by the fence.

  The species potentially affected include Echidna, Common Brushtail Possum, Black-striped Wallaby, Red-necked Wallaby and Swamp Wallaby. Another four species – Koala, Spotted-tailed Quoll, Rufous Bettong and Common Ringtail Possum – would also potentially be affected by the fence as a barrier, if they were present in the proposed fenced area. However, none of these species have yet been detected in the proposed fenced area in baseline surveys conducted by AWC.

  Population sizes of all potentially-affected medium-sized mammals will be monitored by AWC both inside and outside the fenced area. While populations of medium-sized mammals are expected to increase in the fenced area following the eradication of feral cats and foxes, populations may still be sufficiently small to be subject to loss of genetic diversity over the long term. In these cases, occasional manual dispersal (i.e. capture and release) of individuals across the fence is likely to be sufficient to maintain connectivity between populations. AWC will conduct targeted research to

inform strategies for maintaining genetic diversity in threatened species such as the Koala that may be subject to a barrier effect from the fence.

- Populations of reintroduced animals: In the absence of pre-European predators (Dingoes and humans), population sizes of some reintroduced mammals may eventually attain relatively high densities within the fenced area. Reintroduced mammals are expected to alter the abundances of some extant plants and animals, such as preferred prey species, and these impacts are likely to be particularly evident when reintroduced mammals attain high densities. However, given the lack of baseline data, such as information on the historically prevailing abundances of any species, it is difficult to determine the 'carrying capacity' of the fenced area for reintroduced mammals ahead of the reintroduction. Further, if reintroduced mammals are regulated primarily by resource availability, rather than by predation, considerable variation in the abundance of both reintroduced mammals and their preferred food plants or prey can be expected over time, ultimately driven by rainfall. These 'boom'/'bust' cycles are characteristic of biota in the Australian semi-arid zone.

  For these reasons, it is not possible to identify 'triggers' for management intervention ahead of reintroductions. Instead, AWC will monitor key elements of the extant biota (vegetation, fauna) as well as population sizes of reintroduced mammals, to determine empirically the consequences of reintroductions. If monitoring reveals significant impacts of reintroduced mammals on extant biota that are considered to lie outside the bounds of acceptable change, then AWC may seek to reduce impacts of reintroduced mammals by:

  - reducing the population size of reintroduced mammals through:
    - release of a proportion of individuals outside the fence (this action is part of the next stage of the EMA project, but would only occur in conjunction with intensive feral predator control outside the fence);
    - translocation of individuals to another reintroduction site (AWC has multiple reintroduction sites for the candidate species); or
    - by other means, such as introduction of terrestrial native predators such as the Western Quoll (which is planned for reintroduction at the Pilliga site);
  - reducing impacts of reintroduced mammals on particular plants – e.g. threatened plants – by exclusion fencing within the reintroduction site. This approach has been adopted at Mulligan's Flat, primarily for research purposes.

The effectiveness of these measures is certain enough to reduce the level of impact below the 'significant impact' threshold for each of the relevant matters of NES, as determined in Section 4 below.

4. Significance of impacts assessments

4. Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts (important, notable, or of consequence, having regard to their context or intensity)?

Assessments for each of the NES that could be impacted are given below, with Migratory species first, and then Threatened species.

Listed migratory species that are not threatened

- Fork-tailed Swift
- Satin Flycatcher
- White-throated Needletail

Protected under several international agreements to which Australia is a signatory, Migratory species are considered matters of National Environmental Significance under the EPBC Act. For migratory species, the Significant Impact Guidelines (DOTE, 2013) state:

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

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

Under the EPBC Act, an action is likely to have a significant impact on a migratory species if it substantially modifies, destroys or isolates an area of 'important habitat' for the species (DOTE, 2013) where important habitat is defined as:

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

The potential for the proposed action to have a significant impact on the habitat of each of the species is assessed below.

Fork-tailed Swift

Is the proposed activity likely to substantially modify, destroy or isolate an area of 'important habitat' for the species?

The Fork-tailed Swift is a high elevation aerial forager that flies over huge areas in its daily movements.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created.

The area to be affected by the project is not "important habitat" for the species. It does not meet any of the four limbs:

- the habitat does not support an ecologically significant population;
- the habitat is not of critical importance to the species at particular life-cycle stages;
- the habitat is not at the limit of the species' range;
- the habitat is not within an area where the species is declining.

Furthermore, the proposal will not substantially modify, destroy or isolate habitat for the species. The proposed activity will affect only a negligible portion of the habitat in the study area and this would have an insignificant impact on the Fork-tailed Swift considering its life-style and ecology.

Will the proposed activity result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species?

No.

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

No.

Conclusion

The proposed action is not likely to have a significant impact on the Fork-tailed Swift.

Satin Flycatcher

Is the proposed activity likely to substantially modify, destroy or isolate an area of 'important habitat' for the species?

The Satin Flycatcher is normally found in the moist forests and woodlands at higher elevation than the proposal area, closer to the Great Dividing Range. It is likely that any records in the Pilliga forests are vagrants. As such, the habitats important to the species will not be affected by the proposed activity.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The area to be affected by the project is not "important habitat" for the species. It does not meet any of the four limbs:

- the habitat does not support an ecologically significant population;
- the habitat is not of critical importance to the species at particular life-cycle stages;
- the habitat is not at the limit of the species' range;
- the habitat is not within an area where the species is declining.

Furthermore, the proposal will not substantially modify, destroy or isolate habitat for the species. The proposed activity will affect only a negligible portion of the habitat in the study area and this would have an insignificant impact on the Satin Fly-catcher considering its life-style and ecology.

Will the proposed activity result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species?

No.

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

No.

Conclusion

The proposed action is not likely to have a significant impact on the Satin Fly-catcher.

White-throated Needletail

Is the proposed activity likely to substantially modify, destroy or isolate an area of 'important habitat' for the species?

The White-throated Needletail is a high elevation aerial forager that flies over huge areas in its daily movements. As such, the habitats important to the species will not be affected by the proposed activity.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The area to be affected by the project is not "important habitat" for the species. It does not meet any of the four limbs:

- the habitat does not support an ecologically significant population;
- the habitat is not of critical importance to the species at particular life-cycle stages;
- the habitat is not at the limit of the species' range;
- the habitat is not within an area where the species is declining.

Furthermore, the proposal will not substantially modify, destroy or isolate habitat for the species. The proposed activity will affect only a negligible portion of the habitat in the study area and this would have an insignificant impact on the White-throated Needletail considering its life-style and ecology.

Will the proposed activity result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species?

No.

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

No.

Conclusion

The proposed action is not likely to have a significant impact on the White-throated Needletail.

Threatened species

Under the EPBC Act, impacts of a proposal are considered 'significant' if they meet one of the criteria below. Note that criteria are stronger for critically endangered and endangered species, than for vulnerable species.

Table A8-3. Criteria used to determine whether an impact is significant for species listed under the EPBC Act as (i) critically endangered or endangered, and (ii) vulnerable.

Critically endangered and endangered species	Vulnerable species
• lead to a long-term decrease in the size of a population	• lead to a long-term decrease in the size of an important population of a species

• reduce the area of occupancy of the species	• reduce the area of occupancy of an important population
• fragment an existing population into two or more populations	• fragment an existing important population into two or more populations
• adversely affect habitat critical to the survival of a species	• adversely affect habitat critical to the survival of a species
• disrupt the breeding cycle of a population	• disrupt the breeding cycle of an important population
• modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	• 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 critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	• 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	• introduce disease that may cause the species to decline; or
• interfere with the recovery of the species.	• interfere substantially with the recovery of the species.

Western Quoll: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

For this project, AWC would seek to source Western Quolls from a number of wild populations in WA, supplemented with captive bred animals if required. The intention would be to maximise the genetic diversity of the reintroduced population.

Will the action reduce the area of occupancy of an important population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing important population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of an important population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere substantially with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Western Quoll has identified translocations as a key recovery action to increase the extent of occurrence for this species (DEC, 2012). The proposal is consistent with this plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Western Quoll.

Western Barred Bandicoot: EPBC Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

Western Barred Bandicoots have been introduced successfully to two predator-free locations: AWC's Faure Island in Shark Bay (WA) and Arid Recovery (SA). An introduction to a partly fenced mainland location on WA (Heirisson Prong) failed, presumably because of predation.

Western Barred Bandicoots were introduced to AWC's Faure Island wildlife sanctuary in 2005. This population has persisted, with population estimates of several hundred in recent years.

For this project, AWC would seek to source Western Barred Bandicoots from wild populations in WA (Bernier and Dorre Islands), if possible, to maximise the genetic diversity of the reintroduced population. Additional sources include reintroduced populations on AWC's Faure Island and Arid Recovery (if available). Captive breeding may be used to increase the number of founders.

Will the action reduce the area of occupancy of the species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of a population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Western Barred Bandicoot has identified a range of key recovery actions (Richards, 2012). One of these actions is to reintroduce the Western Barred Bandicoot to suitable mainland and island sites if available. The proposed CFAI creates a suitable mainland site, so is consistent with the actions of the National Recovery Plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Western Barred Bandicoot.

Bilby: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals

from relevant government agencies, such that no existing population will be materially impacted.

Bilbies have been successfully reintroduced to predator-free locations at AWC's Scotia (NSW), Yookamurra (SA) and Mt Gibson (WA) sanctuaries, and to Arid Recovery (SA), Thistle Island (SA) and Lorna Glen (WA). However, populations in several partly or inadequately fenced areas have collapsed due to incursions of feral predators.

For this project, AWC would seek to source Bilbies from wild populations (including reintroduced wild populations) in Queensland, NT and WA (including AWC properties), supplemented with animals from captive breeding to optimise genetic diversity.

Will the action reduce the area of occupancy of an important population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing important population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of an important population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere substantially with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Bilby identified key recovery actions for the species. This includes the continuation of reintroduction of Bilby to predator-free or predator controlled sites across their former range (Pavey, 2006). The proposed activity is consistent with the National Recovery Plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Bilby.

Northern Hairy-nosed Wombat: EPBC Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

Will the action reduce the area of occupancy of the species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to

approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide protected habitat to assist the survival of the species.

Will the action disrupt the breeding cycle of a population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide protected habitat for the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Northern Hairy-nosed Wombat identifies key recovery actions for the species (Horsup, 2004). This includes the translocation of Northern Hairy-nosed Wombats. The proposed activity is consistent with the National Recovery Plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Northern Hairy-nosed Wombat.

Brush-tailed Bettong: EPBC Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

Brush-tailed Bettongs have been introduced successfully to numerous locations in south-west WA in conjunction with broadscale fox control, to fenced areas in WA (including AWC's Karakamia and Mt Gibson sanctuaries, as well as Perup, Whiteman Park and Wadderin) and fenced areas and islands outside WA including AWC's Scotia (NSW) and Yookamurra (SA) sanctuaries, and St Peters Island and Wedge Island (SA). A number of reintroductions to sites on the mainland, including to partly-fenced areas (Francois Peron NP, WA and Yathong Nature Reserve, NSW), have failed because of predation.

Will the action reduce the area of occupancy of the species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of a population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Brush-tailed Bettong identified a number of key recovery actions including the reintroduction of this species to suitable mainland and island sites if available (Richards, 2012). The proposed feral predator-free fenced area creates a suitable mainland site, so is consistent with the actions of the National Recovery Plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Brush-tailed Bettong.

Bridled Nailtail Wallaby: EPBC Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

This species was successfully reintroduced to AWC's fenced Scotia Sanctuary (stage 1, 2004; stage 2, 2008); this population has expanded to c. 2,000 animals.

Will the action reduce the area of occupancy of the species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of a population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases

with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Bridled Nailtail Wallaby identified a number of key recovery actions including the reintroduction of this species to areas of suitable habitat (Lundie-Jenkins and Lowry, 2005) The proposed feral predator-free area creates suitable habitat, so is consistent with the actions of the National Recovery Plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Bridled Nailtail Wallaby.

Plains Mouse: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not lead to a long-term decrease in the size of the population in the study area; it will increase it. In addition, the proposal will not adversely affect source populations of the species. Translocations will be subject to the conditions of a Translocation Proposal and approvals from relevant government agencies, such that no existing population will be materially impacted.

Will the action reduce the area of occupancy of an important population?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not reduce the occupancy area; it will increase it.

Will the action fragment an existing important population into two or more populations?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action will not fragment an existing population in the study area. The impacts on source populations for reintroductions will be assessed in a Translocation Proposal which will be subject to approvals from relevant government agencies which will ensure that no existing population will be fragmented for this proposal.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species.

Will the action disrupt the breeding cycle of an important population?

No.

The proposed action aims to increase the breeding success of the species by protecting it from feral predators. Timing of reintroductions will be subject to conditions of Translocation Proposals to be approved by government agencies and these will incorporate breeding cycle considerations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The purpose of the proposed action is to provide habitat protected from the threats of feral predators which are currently adversely affecting the survival of the species. It will therefore increase the availability of quality habitat with the expectation that the action will aid in the recovery of the species.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

The species is locally extinct in the vicinity of the proposal, so the proposed action cannot cause a decline in the local population. Safeguards to prevent the introduction of diseases with translocated animals will form part of the Translocation Proposal which will be subject to approval from relevant government agencies. Once established, reintroduced populations will be monitored regularly for diseases as part of the program outlined in the draft Ecological Health Monitoring Framework (Appendix 13). Any outbreaks of concern will be managed according to standard protocols or be the subject of research if protocols do not already exist.

Will the action interfere substantially with the recovery of the species?

No.

The purpose of the proposed action is to enhance the recovery of the species.

The National Recovery Plan for Plains Mouse (Moseby, 2012) identifies a number of key recovery actions. While none relate specifically to translocation, the proposed action would involve delivery of other actions in the Recovery Plan including mapping habitat preferences/use, developing detection and monitoring methods and identifying key refugial habitat.

Conclusion

The proposed action ***will not*** have a significant impact on the Plains Mouse.

Superb Parrot: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

Superb Parrots are known to nest in box-gum woodland, riparian woodland and isolated paddock trees, where they may travel as far as 10 km to suitable foraging habitat (Baker-Gabb, 2011). Breeding areas are located in the NSW south-west slopes (core breeding habitat has been identified as roughly bordered by the towns of Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west) and within the corridors of the Murrumbidgee, Murray and Edward Rivers. Landscape movements of these populations occur at the end of the breeding season, when birds move north toward the Upper Namoi and Gwydir River regions (Baker-Gabb, 2011, Manning et al., 2004, Manning et al., 2006).

Superb Parrots are known to occur within the vicinity of the proposed activity and across the Pilliga forests. During the AWC field survey, Superb Parrots were recorded on six occasions.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The Superb Parrot habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest (about 62 ha out of more than 500,000 ha of forest), so the levels of roosting and foraging resources available to the Superb Parrot across the Pilliga forests will not be significantly affected. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in an important population.

Will the action reduce the area of occupancy of an important population?

No.

The Superb Parrot habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest, and the species is highly mobile, so is not likely to be affected by the proposed narrow corridors of clearing or structures. The area of occupancy of the Superb Parrot across the Pilliga forests is unlikely to change.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats given most of the clearing will be in a narrow strip and that Superb Parrots fly and forage across large cleared areas.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to protect habitat for threatened species. A small proportion of the hollow-bearing trees that are in the vicinity will be removed for fence and infrastructure construction and for fire protection, but surveys have shown that hollow-bearing trees are abundant throughout the study area. The very small area of habitat potentially affected by the proposal is not critical to the survival of the species.

Will the action disrupt the breeding cycle of an important population?

No.

Superb Parrots move to the broader Namoi-Gywdir area which includes the Pilliga forests outside of the breeding season. All breeding activity occurs in the NSW South Western Slopes, Riverina and Murray region.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this mobile species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for Superb Parrots associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

There is a national recovery plan for the Superb Parrot (Baker-Gabb, 2011). Should the proposed CFAI be approved, AWC's draft Ecological Health Monitoring Framework provides a framework to address two objectives of the national recovery plan: a) determine population trends, and b) increase level of knowledge of ecological requirements. Given this, the proposal is consistent with the national recovery plan.

Conclusion

The proposed action ***will not*** have a significant impact on the Superb Parrot.

Koala: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The Koala occurs in fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia (DECC, 2008a, DOTE, 2014, Kavanagh et al., 2007, Matthews et al., 2007, McAlpine et al., 2006, McAlpine et al., 2015). The Koala is an arboreal marsupial, weighing 6-12 kg for males and 5-8 kg for females (OEH, 2017d), which spends most of its time within tree canopies, but is vulnerable to predation when it comes to the ground to move between food trees.

Koalas feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but display preferences for different tree species depending on regional location (DECC, 2008a). In the Pilliga forests, Koalas have been shown to preferentially select the leaves of several red gum species that are present (Dirty Gum, Blakely's Red Gum, River Red Gum) and the endemic Pilliga Box, but they also forage in a number of other local tree species (e.g. Narrow-leaved Ironbark) in proportion to their availability (Kavanagh et al. 2007). Habitat suitability more generally is largely dependent on tree species and maturity, soil fertility, the area of habitat and its disturbance history (DECC, 2008a). Local studies in the Pilliga and on the nearby Liverpool Plains have shown that Koalas use trees from across a wide range of diameter size-classes, including extensive use of young eucalypt plantations that consist of favoured tree species (Kavanagh et al. 2007, Kavanagh and Stanton 2012).

The Pilliga forests were estimated to support more than 15,000 Koalas at the end of the 1990s, a decade of above average rainfall, but the population declined significantly during an extended drought (2001-2009) combined with extended periods of above-average temperatures (Kavanagh and Barrott 2001, McAlpine et al. 2015, Lunney et al. 2017). The forest types occurring within the Pilliga study area contain all of the food tree species known to be used by the Koala in the region. Recent surveys by AWC located Koalas at 5 of the 60 sites (each 2.5 km apart and spaced on a grid) surveyed in spring 2016 in the Pilliga EMA project area, however none of these records were located within the proposed feral predator-free fence. One additional opportunistic sighting of a Koala was located adjacent to the proposed feral predator-free fence, and it is likely that a small number of individuals may occur within it because potential habitat for the Koala is widespread within the proposal area.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The Koala habitat that will be removed or modified is a very small proportion of the habitat in the Pilliga EMA project area. Experimental habitat manipulations (before-after-control-impact) in the Pilliga (i.e. selective logging within the home-ranges of 30 Koalas) have shown that individual radio-tagged Koalas were unaffected by greater levels of disturbance than the narrow strip of clearing that is proposed in this project (Kavanagh et al., 2007). The proposal will not lead to a reduction in the size of an important population, rather it is expected to lead to an increase in the population remaining in the Pilliga project area, given the removal of feral cats, foxes and wild dogs from the fenced area. AWC will monitor the Koala in the project area and as necessary will exchange animals across the fence to maintain genetic diversity, such that the adaptive potential of the population will be maintained.

Will the action reduce the area of occupancy of an important population?

No.

The Koala habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest. There should be no material impact on the area of occupancy.

Will the action fragment an existing important population into two or more populations?

No.

The project will be managed to ensure that, if there are Koalas inside the area to be fenced, there is ongoing genetic exchange between Koalas inside the fence and outside the fence.

Recent surveys by AWC located Koalas at 5 of the 60 sites (each 2.5 km apart and spaced on a grid) surveyed in spring 2016 in the Pilliga EMA project area, however none of these records were located within the proposed feral predator-free fence. One additional opportunistic sighting of a Koala was located adjacent to the proposed feral predator-free fence, and it is likely that a small number of individuals may occur within it because potential habitat for the Koala is widespread within the proposal area

The fence will be a barrier to the movement of Koalas. At present, there are no known Koalas within the proposed fenced area, but suitable habitat occurs within it and a small number of individuals may occur there. To ensure no effective fragmentation of the population, AWC will monitor the population inside and outside the fence: if there is any risk to the genetic viability of either population, AWC will carry out an exchange of animals between the two populations. In this way, the project will be implemented to ensure there is no effective fragmentation of an existing population (assuming there are animals within the fenced area).

Will the action adversely affect habitat critical to the survival of a species?

No.

The Koala habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest.

Will the action disrupt the breeding cycle of an important population?

No.

There is ample habitat to facilitate the breeding cycle of the Koala, if the species is present within the Pilliga EMA project area. As indicated above, there are no known Koalas within the proposed fenced area, but suitable habitat occurs within it and a small number of individuals may occur there. To mitigate any impacts, AWC will monitor the population inside and outside the fence: if there is any risk to the genetic viability of either population, AWC will carry out an exchange of animals between the two populations.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The Koala habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest. The impact of the proposed action on the availability/quality of habitat will not cause any decline in the Koala population. Experimental habitat manipulations (before-after-control-impact) in the Pilliga (i.e. selective logging within the home-ranges of 30 Koalas) have shown that individual radio-tagged Koalas were unaffected by greater levels of disturbance than the narrow strip of clearing that is proposed in this project (Kavanagh et al., 2007).

The fence will protect Koalas from feral predators; however, it will also be a barrier to the movement of Koalas. At present, there are no known Koalas within the fenced area, but suitable habitat occurs within the fenced area and a small number of individuals may occur there. To mitigate any impacts, AWC will monitor the population inside and outside the fence: if there is any risk to the genetic viability of either population, AWC will carry out an exchange of animals between the two populations.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for the Koala associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

The Koala recovery plan (DECC, 2008a) identifies predation by dogs, foxes and feral cats as factors threatening the recovery of the Koala. The proposal is consistent with the plan by reducing threats posed by these predators.

Conclusion

The proposed action ***will not*** have a significant impact on the Koala.

Pilliga Mouse: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The Pilliga Mouse typically occurs at low densities and appears to prefer areas with sparse ground cover. Evidence exists of marked population fluctuations (Tokushima et al., 2009, Tokushima and Jarman, 2009).

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The Pilliga Mouse habitat that will be removed or modified is a negligible percentage of that available to the species across the 500,000 ha of the Pilliga forest. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in the population.

Will the action reduce the area of occupancy of an important population?

No.

The action will not affect the area of occupancy of the Pilliga Mouse. The area of occupancy of the Pilliga Mouse extends across an area of more than 100,000 ha in the Pilliga State Forest and State Conservation Areas alone (Paul et al. 2014). The clearing of 62 ha within this region will not materially affect the area of occupancy.

It is not known if the small areas to be cleared or modified are occupied by any Pilliga Mice, but the narrow nature of the most of the areas to be disturbed mean that there are likely to be larger areas of similar, undisturbed habitat either side of the clearings available for occupation.

In addition, the pre-disturbance surveys are proposed and expected to identify any Pilliga Mice in the affected area and these would be moved to undisturbed sites.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats as clearing will only occur along narrow strips through the habitats. Pilliga Mice will be able to move through the fence.

Will the action adversely affect habitat critical to the survival of a species?

No.

The areas to be cleared or modified (less than 62 ha) form a negligible proportion of the habitats available to Pilliga Mice throughout the 500,000 ha of the Pilliga forests.

Will the action disrupt the breeding cycle of an important population?

No.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for Pilliga Mouse associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

The proposed action is intended to assist in the recovery of threatened species.

There is no recovery plan for the Pilliga Mouse.

Conclusion

The proposed action ***will not*** have a significant impact on the Pilliga Mouse.

Androcalva procumbens (syn. *Commersonia procumbens*): EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

Androcalva procumbens is Endemic to NSW, mainly confined to the Dubbo-Mendooran-Gilgandra region, but is also in the Pilliga and Nymagee areas. Recent collections have been made from the Upper Hunter region, and additional populations have been found in Goonoo SCA in response to the 2007 fires. This species grows in sandy sites, often along roadsides. It has been recorded in *Eucalyptus dealbata* and *Eucalyptus sideroxylon* communities, *Melaleuca uncinata* scrub, under mallee eucalypts with a *Calytrix tetragona* understorey, and in a recently burnt Ironbark and *Callitris* areas. Also found in *Eucalyptus fibrosa subsp. nubila*, *Eucalyptus dealbata*, *Eucalyptus albens* and *Callitris glaucophylla* woodlands north of Dubbo. Other associated species include *Acacia triptera*, *Callitris endlicheri*, *Eucalyptus melliodora*, *Allocasuarina diminuta*, *Philotheca salsolifolia*, *Xanthorrhoea* species, *Exocarpos cupressiformis*, *Leptospermum parvifolium* and *Kunzea parvifolia*. The species is often found as a pioneer species of disturbed habitats. It has been recorded colonising disturbed areas such as roadsides, the edges of quarries and gravel stockpiles and a recently cleared easement under power lines.

Many hundreds of plants were observed by AWC in 2016 and 2017. One collection (from adjacent to Old Fence Road) was sent to the National Herbarium of NSW where the identification was confirmed, and the specimen retained for their collection.

The field inspection by AWC included searches of all suitable habitat for *A. procumbens* within the study area. It was found to occur only in very recently burnt (< 4-5 years) vegetation of either Fringe Myrtle-Westringia heath, Broom Bush heath, or Burrow's Wattle woodland. This plant is particularly abundant (often the dominant low ground cover) in areas burnt in 2015. Individuals were found only very rarely in heathlands burnt in 2012, where plants were most common on the road edge where grading of the road had possibly extended the germination period. It was not found in very similar heathlands nearby which were burnt in 2010.

AWC surveys in transects perpendicular to Broom Road also found that this species was abundant throughout that heathland patch, and these areas would not be directly impacted by the clearing of native vegetation.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The *A. procumbens* habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest. In addition, the species is associated with recently burnt habitats, and germination is stimulated by road grading. This species is mostly threatened by long fire intervals. Given that it is likely to be present in the seed bank of many areas that have not been recently burnt, it is unlikely that the proposed activity will lead to a long-term decrease in the population.

A recent (August 2017) estimate is *c.* 4,300 plants occur along the proposed management track (4 m width) and *c.* 17,000 within 50 m either side of the track. It was estimated from satellite imagery that the proposed track will occupy approximately 0.3% of the area burnt

between 2012 and 2016 and will thus remove about 0.3% of the current population of *A. procumbens*. *A. procumbens* was observed to occur at high densities on roadsides so the longer term impact will be reduced to the extent that plants colonise the road edges beyond vehicle width. *A. procumbens* is short-lived and it is likely that the current population of standing plants will be greatly reduced over the next few years in areas burnt 2012-2016, as most plants senesce and die.

The proposed activity includes the reintroduction of several omnivorous mammals (the Western Barred Bandicoot, Bilby, Brush-tailed Bettong, Plains Mouse) and a grazer - Bridled Nailtail Wallaby – inside the fenced area, initially, and potentially outside the fence, subject to development of an 'outside the fence' strategy. While reintroduced species may possibly browse on a species of threatened plant as part of their diets, none of the reintroduced species specialise on threatened plants and hence any impacts of reintroduced species on threatened plants can be safely presumed to be minor. Further, as the reintroduction is to be conducted in conjunction with the removal of goats and other large introduced herbivores from the fenced area, the overall grazing impacts are likely to be reduced. Some impacts of reintroduced species on threatened plants may be positive, due to the roles that threatened mammals play in seed and mycorrhizal fungi dispersal, and in creating diggings that trap nutrients and water, promoting seed germination. In any case, any impacts on threatened plants will be monitored through AWC's Ecological Health Monitoring Framework (EHMF). Given the estimated size of the population of *A. procumbens* in the proposal area, monitoring can be expected to detect any adverse impacts from grazing in sufficient time to develop and adopt any required mitigation measures.

Will the action reduce the area of occupancy of an important population?

No.

The area to be disturbed by the proposed activity is minor compared to the area of suitable habitat that is likely to have seed stored in the seedbank in the vicinity.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats as clearing will only occur along narrow strips through the habitats.

Will the action adversely affect habitat critical to the survival of a species?

No.

The habitat areas to be cleared or modified form a negligible proportion of the suitable habitats for *A. procumbens* across the Pilliga forests.

Will the action disrupt the breeding cycle of an important population?

No.

Seed of the species is dormant until disturbed by earthworks, fire, etc. The initial disturbance during the construction phase and subsequent fire management operations would be more likely to encourage the breeding cycle than to disrupt it.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests. The narrow

zones affected (mostly less than 15 m wide) will not fragment habitats for this species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for *A. procumbens* associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

The proposed action is intended to assist in the recovery of threatened species.

There is no recovery plan for *A. procumbens*.

Conclusion

The proposed action <u>*will not*</u> have a significant impact on *Androcalva procumbens*.

Tylophora linearis: EPBC Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

This inconspicuous twiner is sparsely distributed, and flowers and fruits sporadically and then dies back to a tuber (OEH, 2017d). AWC confirmed its presence along the proposed fenceline and track in several locations and AWC found several other locations away from the fenceline. The AWC records were not restricted to any particular vegetation types in this area, though presence of shrubs to climb on is probably an important factor. Discovery of many new populations of this taxon (Forster et al., 2004) subsequent to its original NSW status listing as Endangered, lead to its downgrading to Vulnerable (OEH, 2017d). However it remains Endangered under the EPBC Act (SPRAT, 2017). In the Pilliga region, the species is widespread. Over 400 individuals were recorded in surveys conducted in the east Pilliga for the proposed Santos development, with predicted abundance in that area of over 30,000 individuals.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

Fifteen *T. linearis* plants were identified in the vicinity of the proposed fence and additional plants were found at seven locations along the route of the proposed new track inside the

fence (see below). The clearing of 62 ha of native vegetation, and the removal of these *T. linearis,* is necessary to create the proposed feral predator-free area. It is not likely that this will result in a material long-term decrease in population size given the affected plants represent a tiny proportion of the local population.

A recent (August 2017) survey recorded 11 plants, in seven localities, within 5 m either side of the proposed management track (which is proposed to be only 4 m in total width) and a further 20 plants within 50 m either side and perpendicular to the alignment at each of these seven localities. *T. linearis* does not appear to have any specific habitat preferences and plants recorded on the survey traverse provide an unbiased estimate of the population density over the study area as a whole. The 11 plants recorded within a 10 m x 8.2 km strip equates to a mean density of *c.* 1.34 plants ha^{-1}. This provides an estimate of almost 8,000 plants over the approximately 5,900 ha proposal area. Assuming the track removes habitat over a 4 m width, it will remove approximately 0.06% of the *T. linearis* habitat in the proposed fenced area and will result in a long-term depletion of the *T. linearis* population by about that same amount. In the short term, effects on the population may be avoided by minor realignments to avoid existing plants. However, this will not have any long-term benefit as *T. linearis* is relatively short lived and fails to persist at present locations in the longer term. Currently nothing precise is known about the longevity or persistence of *T. linearis*, but its seed characteristics indicate that it is readily dispersed.

The proposed activity includes the reintroduction of several omnivorous mammals (the Western Barred Bandicoot, Bilby, Brush-tailed Bettong, Plains Mouse) and a grazer - Bridled Nailtail Wallaby – inside the fenced area, initially, and potentially outside the fence, subject to development of an 'outside the fence' strategy. While reintroduced species may possibly browse on a species of threatened plant as part of their diets, none of the reintroduced species specialise on threatened plants and hence any impacts of reintroduced species on threatened plants can be safely presumed to be minor. Further, as the reintroduction is to be conducted in conjunction with the removal of goats and other large introduced herbivores from the fenced area, the overall grazing impacts are likely to be reduced. Some impacts of reintroduced species on threatened plants may be positive, due to the roles that threatened mammals play in seed and mycorrhizal fungi dispersal, and in creating diggings that trap nutrients and water, promoting seed germination. In any case, any impacts on threatened plants will be monitored through AWC's Ecological Health Monitoring Framework (EHMF). Given the estimated size of the population of *T. linearis* in the proposal area, monitoring can be expected to detect any adverse impacts from grazing in sufficient time to develop and adopt any required mitigation measures.

Will the action reduce the area of occupancy of the species?

No.

The area to be disturbed by the proposed activity is minor compared to the area of suitable habitat that is available to the species in the vicinity.

Will the action fragment an existing population into two or more populations?

No.

The proposal would not isolate or fragment habitats as clearing will only occur along narrow strips through the habitats, and the plants are naturally scattered across the region.

Will the action adversely affect habitat critical to the survival of a species?

No.

The habitat areas to be cleared or modified form a negligible proportion of the suitable habitats for *T. linearis* across the Pilliga forests.

Will the action disrupt the breeding cycle of a population?

No.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests. The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for *T. linearis* associated with the proposed activity.

Will the action interfere with the recovery of the species?

No.

The proposed action is intended to assist in the recovery of threatened species.

There is no recovery plan for *T. linearis*.

Conclusion

The proposed action ***will not*** have a significant impact on *Tylophora linearis*.

Malleefowl: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

Malleefowl is a large, ground dwelling bird that primarily occurs in mallee across southern Australia but is also known to inhabit eucalypt woodlands and acacia shrublands that provide some refuge in the form of dense shrubby understory (Benshemesh, 2007, NPWS, 1999, Parsons et al., 2008, Priddel and Wheeler, 1999). Malleefowl vary in the size of their home range which is likely influenced by the level of available resources. These are known to range between 50 and 500 ha in area. Malleefowl incubate eggs in large mounds that comprise large volumes of sandy soil and leaf litter. Males continually add leaf litter to these mounds as the decomposition provides moisture and heat required for successful egg incubation.

Malleefowl have been previously recorded in the general locality, although not for almost 20 years.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

If Malleefowl are present, the habitat that will be removed or modified is a negligible percentage of that available to the species across the 500,000 ha Pilliga forest. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in the population.

Will the action reduce the area of occupancy of an important population?

No.

The Malleefowl habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest, and the species is mobile, so is not likely to be affected by the proposed narrow corridors of clearing or structures. If present, the area of occupancy of the Malleefowl across the Pilliga forests is unlikely to change significantly.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats given most of the clearing will be in a narrow strip and that Malleefowl fly and forage across large areas.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to protect habitat for threatened species. If Malleefowl are not present, the proposal will not affect their survival. If Malleefowl are present, their habitat will be improved by the removal of feral predators.

Will the action disrupt the breeding cycle of an important population?

No.

No active Malleefowl nests have been identified in the vicinity of the proposal. Pre-construction inspections along fence and track routes will ensure that if any do exist, they will be avoided.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this mobile species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for Malleefowl associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

The proposal is generally consistent with the objectives of the national recovery plan for Malleefowl (Benshemesh, 2007). The removal of feral predators from inside the proposed 5,822 ha fenced area is a significant component of this consistency.

Conclusion

The proposed action ***will not*** have a significant impact on Malleefowl.

Painted Honeyeater: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

The Painted Honeyeater is nomadic species that occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland.

They are known to occur in Box-gum woodland, Box-ironbark forest, Brigalow and Boree shrublands (Oliver et al., 2003, Oliver et al., 1998). A specialist feeder, they feed preferentially on the fruits of mistletoe with a preference for the genus *Amyena*.

Painted Honeyeater are predicted to occur within the vicinity of the proposal given their highly mobile and nomadic nature and the presence of mistletoe.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The Painted Honeyeater habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest (about 62 ha out of more than 500,000 ha of forest), so the levels of foraging resources available to the Painted Honeyeater across the Pilliga forests will not be significantly affected. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in the population.

Will the action reduce the area of occupancy of an important population?

No.

The Painted Honeyeater habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest, and the species is highly mobile, so is not likely to be affected by the proposed narrow corridors of clearing or structures. The area of occupancy of the Painted Honeyeater across the Pilliga forests is unlikely to change significantly.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats given most of the clearing will be in a narrow strip and that Painted Honeyeaters fly and forage across large cleared areas.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to protect habitat for threatened species. The small area of vegetation which will be disturbed will not be critical to the survival of the species.

Will the action disrupt the breeding cycle of an important population?

No.

Breeding activity occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this mobile species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for Painted Honeyeaters associated with the proposed activity.

Will the action interfere substantially with the recovery of the species?

No.

There is no recovery plan or threat abatement plan for Painted Honeyeater.

Conclusion

The proposed action ***will not*** have a significant impact on the Painted Honeyeater.

Regent Honeyeater: EPBC Critically Endangered

Will the action lead to a long-term decrease in the size of a population?

No.

Regent Honeyeater occurs mainly in temperate woodlands and open forests of the inland slopes of south-east Australia (Menkhorst et al., 1999). Considered a flagship threatened woodland bird, the conservation of the Regent Honeyeater benefits a large suite of other threatened and declining woodland fauna. Regent Honeyeater are found in woodlands and forests that support a high abundance and richness of bird species. These habitats generally have a significantly large number of mature trees, high canopy cover and abundance of mistletoes.

There are no records of the Regent Honeyeater within the proposal area but they may occur within the vicinity of the proposal given the extensive area of forest and woodland within the 33,386 ha Pilliga SCA.

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The Regent Honeyeater habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest (about 62 ha out of more than 500,000 ha of forest), so the levels of foraging resources available to the Regent Honeyeater across the Pilliga forests will not be significantly affected. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in the population.

Will the action reduce the area of occupancy of the species?

No.

The Regent Honeyeater habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest, and the species is highly mobile, so is not likely to be affected by the proposed narrow corridors of clearing or structures. The area of occupancy of the Regent Honeyeater across the Pilliga forests is unlikely to change.

Will the action fragment an existing population into two or more populations?

No.

The proposal would not isolate or fragment habitats given most of the clearing will be in a narrow strip and that Regent Honeyeaters fly and forage across large cleared areas.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to protect habitat for threatened species. The small area of vegetation which will be disturbed will not be critical to the survival of the species.

Will the action disrupt the breeding cycle of a population?

No.

There are no known recent records of the Regent Honeyeater in the proposal area.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for this mobile species. The species is not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for Regent Honeyeaters associated with the proposed activity.

Will the action interfere with the recovery of the species?

No.

The National Recovery Plan (NRP) for Regent Honeyeater identifies specific objectives for the recovery for this species (Menkhorst et al., 1999). The draft AWC Ecological Health Monitoring Framework provides the opportunity to target specific monitoring and research objectives for the Regent Honeyeater that are presented in the NRP within the Pilliga.

Conclusion

The proposed action ***will not*** have a significant impact on the Regent Honeyeater.

Corben's Long-eared Bat and the Large-eared Pied Bat: EPBC Vulnerable

Will the action lead to a long-term decrease in the size of an important population of a species?

No.

Corben's Long-eared Bat and the Large-eared Pied Bat are microchiropteran bats. The Large-eared Pied Bat is known to use derelict mine shafts for roosting and maternity purposes and tree hollows and crevices (Churchill, 2008) while the Corben's Long-eared Bat uses tree hollows, crevices and loose bark for roosting and maternity sites (NPWS, 2001a, NPWS, 2001b).

Microchiropteran bats are regarded as highly mobile fauna, extending their foraging ranges over tens of kilometres from their roosting site and are unlikely to rely on a single location for foraging (Pavey and Burwell, 2004, Pennay and Freeman, 2005).

The key points relating to the potential impact of the proposed activity are that:

(i) a linear clearing, about 32 km long, for the fence perimeter will require approximately 48 ha of vegetation removal; the cleared strip will average 15 m in width;
(ii) a separate area of approximately 11 ha will be partially cleared for the proposed operations base; and
(iii) one new management track (8.2 km long, 4 m wide) will be created (3 ha clearing).

The microchiropteran bat habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest (about 62 ha out of more than 500,000 ha of forest), so the levels of roosting and foraging resources available to the bats across the Pilliga forests will not be significantly affected. Therefore, it is unlikely that the proposed activity will lead to a long-term decrease in populations.

Will the action reduce the area of occupancy of an important population?

No.

The microchiropteran bat habitat that will be removed or modified is a negligible percentage of that available to the species across the Pilliga forest, and bats are highly mobile, so are not likely to be affected by the proposed narrow corridors of clearing or structures. The area of occupancy of the microchiropteran bats across the Pilliga forests is unlikely to change.

Will the action fragment an existing important population into two or more populations?

No.

The proposal would not isolate or fragment habitats given most of the clearing will be in a narrow strip and that microchiropteran bats fly and forage across large cleared areas.

Will the action adversely affect habitat critical to the survival of a species?

No.

The purpose of the proposed action is to protect habitat for threatened species. A small proportion of the hollow-bearing trees that are in the vicinity will be removed for fence and infrastructure construction and for fire protection, but surveys have shown that hollow-bearing trees are abundant throughout the study area.

Will the action disrupt the breeding cycle of an important population?

No.

Will the action modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline?

No.

The extent of removal and modification of habitat for the proposed activity is negligible in the context of the habitat available to the species throughout the Pilliga forests (about 62 ha in a region of more than 500,000 ha of forest). The narrow zones affected (mostly less than 15 m wide) will not fragment habitats for these mobile species. The species are not likely to decline as a result of habitat changes associated with the proposed activity.

Will the action result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat?

No.

The purpose of the proposed action is to achieve the opposite: to remove harmful invasive species to protect habitat for threatened species. This includes harmful flora as well as fauna.

Will the action introduce disease that may cause the species to decline?

No.

There is no known risk of disease introduction for microchiropteran bats associated with the proposed activity.

Will the action interfere with the recovery of the species?

No.

There is no recovery plan for these species.

Conclusion

The proposed action ***will not*** have a significant impact on microchiropteran bats, including Corben's Long-eared Bat and the Large-eared Pied Bat.

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