

APPENDIX 7 – ASSESSMENT OF SIGNIFICANCE (EPBC ACT)

DISCLAIMER

This report was prepared by Australian Wildlife Conservancy in good faith exercising all due care and attention, but no representation or warranty, express or implied, is made as to the relevance, accuracy, completeness or fitness for purpose of this document in respect of any particular user's circumstances. Users of this document should satisfy themselves concerning its application to, and where necessary seek expert advice in respect of, their situation. The views expressed within are not necessarily the views of the Office of Environment and Heritage (OEH) and may not represent OEH policy.

© Copyright State of NSW and the Office of Environment and Heritage

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 a proposed action requires referral to the Australian Government Department of Environment for assessment and approval because it 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, except for Mitchell's Hopping-mouse, are listed under the EPBC Act. The Protected Matters Search Tool (PMST) report for an area of radius 50 km around a central point of the proposed activity (Appendix 2) identified the following as potentially occurring in the study area:

- 1 listed threatened ecological community
- 26 listed threatened species
- 8 migratory species.

All of the species and the Threatened Ecological Communities (TEC) are listed in Table 21. The likelihood that any of the species or the TEC occurring in the vicinity of the proposal area was assessed and results are tabulated in Table 21.

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 21: Threatened species and ecological communities and Migratory species listed under the EPBC Act and identified in the PMST report (Appendix 2) for an area of 50 km radius around a central point of the proposal. The assessed likelihoods of a threatened ecological community or of habitats that could support populations of threatened species occurring within the vicinity of the proposed conservation fence and associated infrastructure are in the right-hand column.

Common Name Scientific Name Legal Status	PMST 'Type of presence' within 50 km radius	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring within study area
EXTINCT MAMMALS TO BE REINTRODUCED				
Western Quoll <i>Dasyurus geoffroii</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Red-tailed Phascogale <i>Phascogale calura</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Numbat <i>Myrmecobius fasciatus</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Western Barred Bandicoot <i>Perameles bougainville</i> Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Bilby <i>Macrotis lagotis</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Burrowing Bettong <i>Bettongia lesueur</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species

Common Name Scientific Name Legal Status	PMST 'Type of presence' within 50 km radius	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring within study area
Brush-tailed Bettong <i>Bettongia penicillata ogilbyi</i> Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Bridled Nailtail Wallaby <i>Onychogalea fraenata</i> Endangered	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
Greater Stick-nest Rat <i>Leporillus conditor</i> Vulnerable	None	Presumed Extinct in NSW	Presumed Extinct in NSW	Yes, as a reintroduced species
AVIFAUNA				
Australian Painted Snipe <i>Rostratula australis</i> Endangered Migratory	Species or species habitat likely to occur within 50 km radius	No	No	Low
Australasian Bittern <i>Botaurus poiciloptilus</i> Endangered	Species or species habitat known to occur within 50 km radius	No	Yes	Unlikely
Black-eared Miner <i>Manorina melanotis</i> Endangered	Species or species habitat may occur within 50 km radius	No	No	Low
Common Greenshank <i>Tringa nebularia</i> Migratory	Species or species habitat likely to occur within 50 km radius	No	No	No
Curlew Sandpiper <i>Calidris ferruginea</i> Critically Endangered Migratory	Species or species habitat likely to occur within 50 km radius	No	No	No
Eastern Curlew <i>Numenius madagascariensis</i> Critically Endangered Migratory	Species or species habitat may occur within 50 km radius	No	No	No

Common Name Scientific Name Legal Status	PMST 'Type of presence' within 50 km radius	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring within study area
Fork-tailed Swift <i>Apus pacificus</i> Migratory	Species or species habitat likely to occur within 50 km radius	No	No	Moderate
Latham's Snipe <i>Gallinago hardwickii</i> Migratory	Species or species habitat may occur within 50 km radius	No	No	No
Malleefowl <i>Leipoa ocellata</i> Vulnerable	Species or species habitat known to occur within 50 km radius	Yes	Yes	Yes
Mallee Emu-wren <i>Stipiturus mallee</i> Endangered	Species or species habitat likely to occur within 50 km radius	No	No	Low
Night Parrot <i>Pezoporus occidentalis</i> Endangered	Extinct within area	No	No	Unlikely
Painted Honeyeater <i>Grantiella picta</i> Vulnerable	Species or species habitat likely to occur within 50 km radius	No	No	Low
Plains-wanderer <i>Pedionomus torquatus</i> Critically Endangered	Species or species habitat may occur within 50 km radius	No	No	Low
Regent Parrot (eastern subspecies) <i>Polytelis anthopeplus monarchoides</i> Vulnerable	Breeding likely to occur within area	No	No	Low
Satin Flycatcher <i>Myiagra cyanoleuca</i> Migratory	Species or species habitat known to occur within 50 km radius	No	No	Low
Sharp-tailed Sandpiper <i>Calidris aculate</i> Migratory	Species or species habitat likely to occur within 50 km radius	No	No	Unlikely
Swift Parrot <i>Lathamus discolor</i>	Species or species habitat may occur within 50 km radius	No	No	No

Common Name Scientific Name Legal Status	PMST 'Type of presence' within 50 km radius	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring within study area
Critically Endangered				
Yellow Wagtail <i>Motacilla flava</i> Migratory	Species or species habitat may occur within 50 km radius	No	No	No
FISH				
Flathead Galaxias <i>Galaxias rostratus</i> Critically Endangered	Species or species habitat likely to occur within 50 km radius	No	No	No
Macquarie Perch <i>Macquaria australasica</i> Endangered	Species or species habitat may occur within 50 km radius	No	No	No
Murray Cod <i>Maccullochella peeli</i> Vulnerable	Species or species habitat may occur within 50 km radius	No	No	No
Murray Hardyhead <i>Craterocephalus fluviatilis</i> Endangered	Species or species habitat likely to occur within 50 km radius	No	No	No
Silver Perch <i>Bidyanus</i> Critically Endangered	Species or species habitat known to occur within 50 km radius	No	No	No
FROGS				
Growling Grass Frog <i>Litoria raniformis</i> Vulnerable	Species or species habitat known to occur within 50 km radius	No	No	No
MAMMALS				
Corben's Long-eared Bat <i>Nyctophilus corbeni</i> Vulnerable	Species or species habitat known to occur within 50 km radius	No	Yes	Low
Koala <i>Phascolarctos cinereus</i> Vulnerable	Species or species habitat may occur within 50 km radius	No	No	No

Common Name Scientific Name Legal Status	PMST 'Type of presence' within 50 km radius	Recorded during survey	Recorded previously in locality	Likelihood of biota occurring within study area
THREATENED ECOLOGICAL COMMUNITIES				
Buloke Woodlands of the Riverina and Murray-Darling Depression Bioregions Endangered	Community known to occur within 50 km radius	No	No	No
FLORA				
A grass <i>Austrostipa metatoris</i> Vulnerable	Species or species habitat known to occur within 50 km radius	No	No	Low
Greencomb Spider-orchid <i>Caladenia tensa</i> Endangered	Species or species habitat likely to occur within 50 km radius	No	No	No
Menindee Nightshade <i>Solanum karsense</i> Vulnerable	Species or species habitat likely to occur within 50 km radius	No	No	No
Slender Darling-pea <i>Swainsona murrayana</i> Vulnerable	Species or species habitat likely to occur within 50 km radius	No	No	Unlikely
Yellow Swainson-pea <i>Swainsona pyrophila</i> Vulnerable	Species or species habitat likely to occur within 50 km radius	No	Yes	Moderate
Winged Peppergrass <i>Lepidium monoplocoides</i> Endangered	Species or species habitat likely to occur within 50 km radius	No	No	Low

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 summarised below.

To be reintroduced

- Western Quoll, vulnerable EPBC Act
- Red-tailed Phascogale, vulnerable EPBC Act
- Numbat, vulnerable EPBC Act

- Western Barred Bandicoot, endangered EPBC Act
- Bilby, vulnerable EPBC Act
- Burrowing Bettong, vulnerable EPBC Act
- Brush-tailed Bettong, endangered EPBC Act
- Bridled Nailtail Wallaby, endangered EPBC Act
- Greater Stick-nest Rat, vulnerable EPBC Act

Known to occur

- Malleefowl, vulnerable EPBC Act

Moderate to High likelihood of occurrence

- Fork-tailed Swift, Migratory EPBC Act (moderate)
- Yellow Swainson-pea, vulnerable EPBC Act

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 12 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 12) and is designed to provide data that will identify any potential impacts of the proposal on matters of NES that might develop over time so that measures can be taken to prevent such impacts.

Proposed measures to avoid or reduce potential impacts on matters of NES 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 (9,570 ha) to support viable populations of reintroduced species (Table 22) as well as extant species that are matters of NES (see Section 4 of this Appendix for more details).

Table 22: Locally extinct mammals listed in the EPBC Act that are proposed for reintroduction into Mallee Cliffs National Park and the likely increase to population size should this proposal proceed

Species	Population estimate (2012)	Proposed Mallee Cliffs feral predator-free fenced area: potential population estimate*	Increase
Western Quoll	13,500	90 inside fence, plus up to 350 outside fence	1-3%
Red-tailed Phascogale	<10,000	1,700	17%
Numbat	<1,000	270	27%
Western Barred Bandicoot	3,000	1,600	53%
Bilby	10,000	1,100	11%
Burrowing Bettong	14,500	2,900	20%
Brush-tailed Bettong	<18,000	1,800	10%
Bridled Nailtail Wallaby	2,300	2,150	93%
Greater Stick-nest Rat	4,500	1,800	40%

- *Note: Population estimates are based on best available data, using information on home range and/or density from areas of similar habitat and from other locations where feral predators are effectively controlled or absent, to the extent possible. Populations are expected to vary considerably with rainfall.
- 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.
- Threatened ecological communities: The proposed fence, operations base and new tracks 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 and avoid any threatened plants that could be impacted.
- Malleefowl mounds: Surveys have been carried out along the proposed fenceline and track routes and in the area of the proposed operations base to identify any nearby Malleefowl mounds. They will be protected by a buffer of at least 50 m.
- 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 such 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: Reintroduction success for regionally extinct species is likely to be dependent, in part, on the availability of suitable habitat. Since all of the species proposed for reintroduction have been extinct in NSW for more than 100 years, the details of the habitat requirements for each species are poorly known. The previous ranges of each regionally-extinct species are known to have included the project area so, given the uncertainty about local habitat requirements, the

approach taken has been to ensure that all of the main vegetation types in the Mallee Cliffs NP are well represented inside the conservation fence. In addition, the habitat needs of the Malleefowl were given special consideration so as to avoid or minimise impacts on such habitat. In addition, the location of the proposed fence is designed to ensure the feral predator-free area is of sufficient size to support viable populations of reintroduced species.

- **Watercourses:** The fence has been sited to avoid waterways.
- **Intensive ongoing monitoring:** As indicated above, AWC has developed a detailed draft Ecological Health Monitoring Framework (EHMF) for the Mallee Cliffs EMA project area (see Appendix 12); the EHMF is designed to provide data that will identify any potential impacts of the proposal on matters of NES that might develop over time so that measures can be taken to prevent such impacts.
 - **Barrier effects:** To the extent the fence operates as a barrier, it will not impact on any matter of NES.
 - **Populations of reintroduced animals:** In the absence of pre-European predators (Dingoes and humans), population sizes of some of the threatened (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 threatened mammals attain high densities. The only matter of NES that is potentially relevant is the Yellow Swainson-pea. 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 any required management intervention ahead of reintroductions. Instead, AWC will monitor key elements of the extant biota (including the Yellow Swainson-pea) as well as population sizes of reintroduced mammals, to determine empirically the consequences of reintroductions. If monitoring reveals the potential for significant impacts of reintroduced mammals on the Yellow Swainson-pea, then AWC will take action to reduce and avoid the potential impact of reintroduced mammals on the Yellow Swainson-pea 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 Mallee Cliffs NP); or
- reducing impacts of reintroduced mammals by exclusion fencing around Swainson-pea habitat within the reintroduction site. This approach has been adopted at Mulligan's Flat, primarily for research purposes.

These measures will ensure implementation of the proposed action avoids or reduces any potential impacts on matters of national environmental significance such that the level of

impact is not significant. There is a high level of certainty about the effectiveness of these measures.

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

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:

- a) approximately 41 ha is proposed for clearing along the entire 37.2 km perimeter of the conservation fence
- b) this clearing will be implemented as a narrow strip up to 11 m in width
- c) a separate area of approximately 11 ha will be partially cleared for the proposed operations base.

d) establishment of up to 54 km of tracks (comprising 11.0 km of proposed firetrail and 42.6 km of proposed minor tracks), resulting in the linear modification of up to 24 ha (the area of modification for tracks would increase to up to about 27 ha if an alternative access track is required).

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.

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 23: 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
<ul style="list-style-type: none"> • lead to a long-term decrease in the size of a population 	<ul style="list-style-type: none"> • lead to a long-term decrease in the size of an important population of a species
<ul style="list-style-type: none"> • reduce the area of occupancy of the species 	<ul style="list-style-type: none"> • reduce the area of occupancy of an important population
<ul style="list-style-type: none"> • fragment an existing population into two or more populations 	<ul style="list-style-type: none"> • fragment an existing important population into two or more populations
<ul style="list-style-type: none"> • adversely affect habitat critical to the survival of a species 	<ul style="list-style-type: none"> • adversely affect habitat critical to the survival of a species
<ul style="list-style-type: none"> • disrupt the breeding cycle of a population 	<ul style="list-style-type: none"> • disrupt the breeding cycle of an important population
<ul style="list-style-type: none"> • modify, destroy, remove, isolate or decrease the availability or quality of habitat 	<ul style="list-style-type: none"> • modify, destroy, remove or isolate or decrease the availability or quality of habitat

to the extent that the species is likely to decline	to the extent that the species is likely to decline
<ul style="list-style-type: none"> result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat 	<ul style="list-style-type: none"> result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
<ul style="list-style-type: none"> introduce disease that may cause the species to decline; or 	<ul style="list-style-type: none"> introduce disease that may cause the species to decline; or
<ul style="list-style-type: none"> interfere with the recovery of the species. 	<ul style="list-style-type: none"> 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 12). 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.

Red-tailed Phascogale: 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 Red-tailed Phascogales 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 12). 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.

There is no recovery plan for the Red-tailed Phascogale.

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

Conclusion

The proposed action will not have a significant impact on the Red-tailed Phascogale.

Numbat: 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 Numbats from reintroduced populations (Scotia, Yookamurra, Mt Gibson or other reintroduced WA populations). The intention would be to maximise the genetic diversity of the reintroduced population, without adversely affecting remnant populations.

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 12). 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 Numbats has identified translocations as a key recovery action to increase the extent of occurrence for this species (DPW 2017). The proposal is consistent with this plan.

Conclusion

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

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 12). 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.

Burrowing Bettong: 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.

Burrowing Bettongs have been successfully reintroduced to predator-free locations at AWC's Scotia (NSW), Yookamurra (SA) and Faure Island (WA) sanctuaries, and to Arid Recovery (SA), Boodie Island (WA) and Heirison Prong (WA). There are recent reintroductions to Alpha Island (WA) and to fenced area at Lorna Glen (WA). Reintroductions to Kangaroo Island (SA) in 1924 and Gibson Desert (WA) in 1992 failed due to predation.

For this project, AWC would seek to source Burrowing Bettongs from wild populations in Western Australia, and/ or reintroduced populations in NSW, SA and WA (including AWC properties); founders would be sourced 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 12). 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 Burrowing Bettong identified key recovery actions for the species. This includes the continuation of reintroduction of the species to predator-free sites across its former range (Richards 2012). The proposed activity is consistent with the recommendations of the National Recovery Plan.

Conclusion

The proposed action will not have a significant impact on the Burrowing Bettong.

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 12). 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 sites (Yeatman and Groom 2012). The proposed feral predator-free fenced area is consistent with the recommended 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 12). 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 Naitail 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 Naitail Wallaby.

Greater Stick-nest Rat: 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 12). 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.

There is no recovery plan for the Greater Stick-nest Rat.

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

Conclusion

The proposed action will not have a significant impact on the Greater Stick-nest Rat.

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.

Mallee Cliffs NP is thought to contain a significant population of Malleefowl, although only 3 of 149 known mounds were active in 2016-early 2017 (NPWS/AWC observations). During surveys along the proposed track network in August 2017, six additional mounds (two of which were active) were identified and it is likely that there are more unknown mounds in the

park. The location of the conservation fence was altered early in the planning process to include Malleefowl mounds within the fence, given the expected benefits to Malleefowl from protection from feral predators. For example, at Scotia, of 54 known Malleefowl mounds in 2016-2017, 5 were active – all of which were located inside the 8,000 ha predator-proof fence (AWC, unpublished data).

OEH (2017d) identify the following threats to this species:

- Loss of habitat due to clearing has led to a decline in distribution and abundance.
- Fragmentation, resulting from clearing or degradation of habitat, may reduce the size of populations and increase the extent to which they are isolated. Small, isolated populations have a greater risk of extinction due to genetic effects and chance events (e.g., drought and fire).
- Degradation of the habitat, a result of inappropriate grazing or fire regimes, may result in changes to the physical and biological nature of the habitat (e.g., changes in the structure and floristics of vegetation, diversity and abundance of invertebrates). These changes may render habitat unsuitable or increase the risk posed by other threatening processes (e.g., predation).
- Fire removes litter for mound construction, shelter from predators, and food sources, especially seeds. Mounds are not usually constructed in an area within 15-20 years after a fire and it may be 40 years before maximum densities are attained.
- Predation by foxes or cats has a significant impact on populations, particularly on young birds.
- Accidental death of a small number of birds occurs each year. For small isolated populations these losses can be significant. Birds crossing roads or feeding on spilt grain beside roads are particularly vulnerable.
- Anthropogenic climate change is a long-term threat as it may alter habitat characteristics (e.g., change in physical structure or productivity) such that its capacity to support viable populations is reduced.
- Uncertainty with respect to the species' reproductive ecology and the effects of different predators on breeding success.
- Competition for food, and disturbance to nesting mounds, by feral goats.
- Disturbance to nesting mounds by feral pigs.

The proposed activity is unlikely to contribute significantly to these potential threats. The key points relating to the impact of the proposed activity are that:

a) approximately 41 ha is proposed for clearing along the entire 37.2 km perimeter of the conservation fence

b) this clearing will be implemented as a narrow strip up to 11 m in width

c) a separate area of approximately 11 ha will be partially cleared for the proposed operations base.

d) establishment of up to 54 km of tracks (comprising 11.0 km of proposed firetrail and 42.6 km of proposed minor tracks), resulting in the linear modification of up to 24 ha (the area of modification for tracks would increase to up to about 27 ha if an alternative access track is required).

The proposed activity will result in the clearing or modification of up to approximately 76 ha (78 ha if the alternative access track is required) within an area of 58,118 ha (up to 0.14%) which, in turn, is within the 600,000-ha Mungo landscape.

The limited extent and narrow, linear nature of this clearing will have no impact on the habitat of Malleefowl given that this species forages over large areas and birds can readily fly across fences (AWC, unpublished data, Scotia and Yookamurra sanctuaries).

The habitat that will be removed or modified is a very small percentage of that available to the species across Mallee Cliffs. 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 very small percentage of that available to the species across Mallee Cliffs, and the species is mobile, so is not likely to be affected by the proposed narrow corridors of clearing or structures. The area of occupancy of the Malleefowl across Mallee Cliffs is unlikely to be reduced.

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. The proposal will not affect their survival. Habitat for the Malleefowl will be improved by the removal of feral predators.

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

No.

The proposal will result in the removal of feral predators, the primary threat to the breeding success of Malleefowl, from 9,570 ha of Mallee Cliffs. The narrow, linear nature of most of the clearing limits the potential impact of clearing on Malleefowl. The fenceline and new tracks have been aligned to avoid Malleefowl nests. The fence will not be a barrier to the movement of Malleefowl.

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 Mallee Cliffs. The narrow zones affected will not fragment habitats for this mobile species. Any impact on the availability or quality of habitat will be negligible and will not result in any decline in 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.

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 9,750 ha fenced area is a significant component of this consistency.

Conclusion

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

Yellow Swainson-pea: EPBC Vulnerable

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

No.

The Yellow Swainson-pea occurs in mallee scrub on sandy or loamy soil, and is a short-lived, fire-adapted species occurring only after a fire (Tonkinson and Robertson 2010). The Yellow Swainson-pea is previously known from Mallee Cliffs NP from three records (BioNET database).

OEH (2017d) have identified the following threats to this species:

- Habitat destruction (clearing and agricultural activities).
- Altered fire regimes (dependent upon fire to stimulate germination).
- Feral animal disturbance (goat and rabbit invasion in sandy habitats may precipitate soil erosion and vegetation loss, especially in vulnerable post-fire sites).
- Viability of seeds in the soil seedbank.
- Younger plants may be palatable to goats and stock.

The proposed activity is unlikely to contribute significantly to these potential threats. The key points relating to the impact of the proposed activity are that:

- a) approximately 41 ha is proposed for clearing along the entire 37.2 km perimeter of the conservation fence
- b) this clearing will be implemented as a narrow strip up to 11 m in width
- c) a separate area of approximately 11 ha will be partially cleared for the proposed operations base.
- d) establishment of up to 54 km of tracks (comprising 11.0 km of proposed firetrail and 42.6 km of proposed minor tracks), resulting in the linear modification of up to 24 ha (the area of modification for tracks would increase to up to about 27 ha if an alternative access track is required).

In the absence of fire within the project area, no individual plants of this species were identified by AWC botanists during the survey of areas to be cleared. However, it may occur in the seed bank.

The proposed activity will result in the clearing or modification of up to approximately 76 ha (78 ha if the alternative access track is required) within an area of 58,118 ha (up to 0.14%) which, in turn, is within the 600,000-ha Mungo landscape. The area to be cleared represents a tiny proportion of potential habitat for the species and will not lead to a long term decrease in the size of a population.

Key threats from goats, pigs and rabbits would be removed within the 9,570 ha fenced area. Changes to fire management as described in this REF would also provide a conducive

environment for this species to germinate (if it is actually present). This is a significant long-term benefit to the Yellow Swainson-pea should it occur there.

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

No.

The proposed activity will result in the clearing or modification of up to approximately 76 ha (78 ha if the alternative access track is required) within an area of 58,118 ha (up to 0.14%) which, in turn, is within the 600,000-ha Mungo landscape. The area to be cleared represents a tiny proportion of potential habitat for the species and will not lead to a reduction in the area of occupancy.

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

No.

The proposal would not isolate or fragment habitats as some ground cover will remain in the fenceline clearing. Clearing would not impede genetic exchange of individuals (via pollen transfer, potentially seed dispersal, e.g. by ants, as known for other native peas) should the species occur in the project area.

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

No. The project area is not habitat critical to the survival of the species; in any event, the area to be cleared represents a tiny proportion of potential habitat for the species in the region and the project will therefore not have any material adverse impact on habitat for the species.

Furthermore, the proposed action will protect habitat from the threats of feral predators and herbivores, the latter of which may be having an impact on the species.

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

No.

Clearing would not impede genetic exchange of individuals (via pollen transfer, potentially seed dispersal, e.g., by ants, as known for other native peas) should the species occur in the project 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 area to be cleared represents a tiny proportion of potential habitat for the species in the region; the project will therefore not decrease the availability or quality of habitat to the extent the species is likely to decline.

Furthermore, the proposed action will protect habitat from the threats of feral predators and herbivores, the latter of which may be having an impact on the species. The project will thus increase the quality and availability of habitat for 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.

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

No.

There is a national recovery plan for the Yellow Swainson-pea (Tonkinson and Robertson 2010). The proposal is generally consistent with the recovery objectives of that plan specifically in determining distribution and abundance (particularly in post-fire conditions), managing threats to populations within the 9,570 ha proposed feral-free fenced area (once constructed), and research into the life history of the species.

Conclusion

The proposed action will not have a significant impact on the Yellow Swainson-pea.

REFERENCES

See Section 10 of main report.